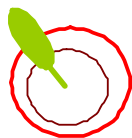


ASSESSMENT OF THE SOLID WASTE MANAGEMENT SYSTEM OF BAHIR DAR TOWN AND THE GAPS IDENTIFIED FOR THE DEVELOPMENT OF AN ISWM PLAN



Forum for Environment

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Forum for Environment



UNEP
Division of Technology, Industry and Economics
International Environmental
Technology Centre

**in
collaboration with**

**Bahir Dar
City Administration**

Dream Light Plc



Bahir Dar University



**Bahir Dar
Forum for Environment**



**ANRS Region Bureau of
Environmental Protection, Land
Administration and Use**

Assessment of the Solid Waste Management System of Bahir Dar town and the gaps identified

- Federal, Regional and Local Policies and Laws
- Institutional Setup
- Operational & Technology gaps
- Financial gaps
- Stakeholders' Role

A. National and Local Policies

1. Laws/ Acts

Ethiopia has Environmental policy. The policy addresses different environmental issues including Solid Waste Management (SWM). The bases for the Environmental Policy of Ethiopia (EPE) are articles 92.1 and 92.2 of the constitution of the Federal Democratic Republic of Ethiopia. These articles enshrine the following rights

Article 92.1:- “Government shall endeavor to ensure that all Ethiopians live in a clean and healthy environment”

Article 92.2:- “Government and citizens shall have the duty to protect the environment.

Some of the articles of the EPE directly or indirectly address solid waste management issues. These include:

Article 3.7 addresses issues related to **Human Settlement, Urban Environment and Environmental Health,**

Article 3.8 addresses issues related to the **Control of Hazardous Materials and Pollution from Industrial Waste**

Article 3.9 addresses **Atmospheric Pollution and Climate Change**

Federal Laws and Regulations-1

Proclamation/Regulation Number and Date	Title
Proc. No. 513/2007	1. Solid Waste Management Proclamation
Proc. No. 300/2002	2. Environmental Pollution Control Proclamation
Proc. No. 299/2002	3. Environmental Impact Assessment Proclamation
Proclamation 414/2004	4. Ethiopian Criminal Code article No. 520(a,b,c),article No. 519, Article No.830
Proc. No. 200/2000	5. Public Health Protection Proclamation
Regulation 159/2001 E.C.	6. Prevention of Industrial Pollution Regulation

SWM Activity	Law or act	Description
Source reduction/Segregation		
Households	Solid Waste Management Proclamation Article 11.1	Household shall ensure that recyclable solid waste are segregated
(industrial)	Regulation 159/2001 E.C.	<ul style="list-style-type: none"> ◦ prevent or, if that is not possible, shall minimize the generation of every pollutant to an amount not exceeding the limit set by the relevant environmental standard ◦ dispose of it in an environmentally sound manner ◦ handle equipment, inputs and products in a manner that prevents damage to the environment and to human and animal health
Collection and storage	Solid Waste Management Proclamation Article 11.2 Article 5.2.b & c	Urban administration shall ensure that adequate HH solid waste collection facilities are in place ensure the installation of marked waste bins by streets and in other public places ensuring the collection of SW from waste bins with sufficient frequency
Transportation	>> Article 13.2	Urban administration shall set standards to determine the skills of drivers and equipment operators and prevent overloads of solid waste
Treatment	Environmental Pollution Control Proclamation Article 5.1	All urban administrations shall ensure the collection, transportation, and, as appropriate, the recycling, treatment or safe disposal of municipal waste through the institution of an integrated municipal waste management system.
Disposal /Land fill	Solid Waste Management Proclamation Article 14, 15	14. Construction of solid waste disposal sites 15. Auditing existing solid waste disposal site
Incineration		
Recycling and reuse	Solid Waste Management Proclamation Article 7.1	Manufacturer or importer of glass container or tin cans shall...collect and recycle used glass or tins
Hazardous waste	Environmental Pollution Control Proclamation Article 4.2	Any person engaged in the collection, recycling, transportation, treatment or disposal of any hazardous waste shall take appropriate precaution to prevent any damage to the environment or to human health or well-being.

	Ethiopian Criminal code article No. 520(a,b,c)	Whoever : a) fails to manage hazardous wastes or materials in accordance with the relevant laws; or b) fails to label hazardous wastes or materials; or c) unlawfully transfers hazardous wastes or materials, is punishable
Construction and demolition	Solid waste management proclamation Article 12	Construction debris and demolition wastes

Regional Laws-1

	Law/Act
General	Hygiene and environmental health protection regulation of Amhara Regional State Health Bureau Reg. No. 16/2000 Basic solid waste management directive of Amhara Regional state Health bureau on 2009
Source reduction	Basic Solid waste management directive of Amhara Regional State Health bureau 2009 part 3, No 2.2
Garbage classification	Basic Solid Waste Management directive of Amhara Regional state Health bureau on 2009 part 3, No 2.3
Collection and storage	Basic Solid Waste Management directive of Amhara Regional state Health bureau on 2009 part 3, No 2.3
Transport and administration	Basic Solid Waste Management directive of Amhara Regional state Health bureau on 2009 part 3, No 2.3
Treatment and Disposal	Law/Act
Land fill	Basic solid waste management directive of Amhara Regional state Health bureau on 2009 part 3, No. 2.3
Incineration	
Circulation	
Recycling and reuse	Basic solid waste management directive of Amhara Regional state Health bureau on 2009 part 3, No.2.3

Local Laws-1

	Law/Act
General	Regulations to protect illegal acts in Bahir Dar city , Regulation number 14/2008, Part 2
Source reduction	
Garbage classification	
Collection and storage	Regulations to protect illegal acts in Bahir Dar city , Regulation number 14/2008, Part 2, No. 8 and part 4
Transport and administration	

International Conventions

The Federal Democratic Republic of Ethiopia has ratified several international conventions that have meaningful implication to solid waste management in the country. The conventions are ratified by the House of Representatives through the following proclamations and they are part and parcel of the laws of the land.

Proclamation Number and Date	Convention
Proclamation No. 192/2000	THE BASEL CONVENTION ON THE CONIROL OF THE TRANSBOUNDARY MOVEMENTS OF HAZARDOUS WASTES AND THEIR DISPOSAL
Proclamation No. 278/2002.	THE ROTTERDAM CONVENTION ON PRIOR INFORMED CONSENT ROCEDURE FOR CERTAIN HAZARDOUS CHEMICALS AND PESTICIDES IN INTERNATIONAL TRADE
Proclamation No. 279/2002	THE STOCKHOLM CONVENTION ON PERSISTENT ORGANIC POLLUTANTS
Proclamation No. 356/2003	THE BASEL CONVENTION AMENDMENT
Proclamation No. 362/2003	THE CARTAGENA PROTOCOL ON BIOSAFETY TO THE CONVENTION ON BIOLOGICAL DIVERSITY
Proclamation No. 439/2005.	THE KYOTO PROTOCOL ON THE REDUCTION OF GREENHOUSE GASES

Gaps Identified

- The region has not yet proclaimed any law or act on environmental issues. It is rather using the federal laws but facing difficulty on enforcement and monitoring.
- Even if there are laws and regulations at federal and regional levels, their implementations and enforcement are very weak.

B. Institutional Arrangement

- The current institutional arrangement of the Solid Waste Management of the Bahir Dar city is depicted in the following figure (Figure 1).

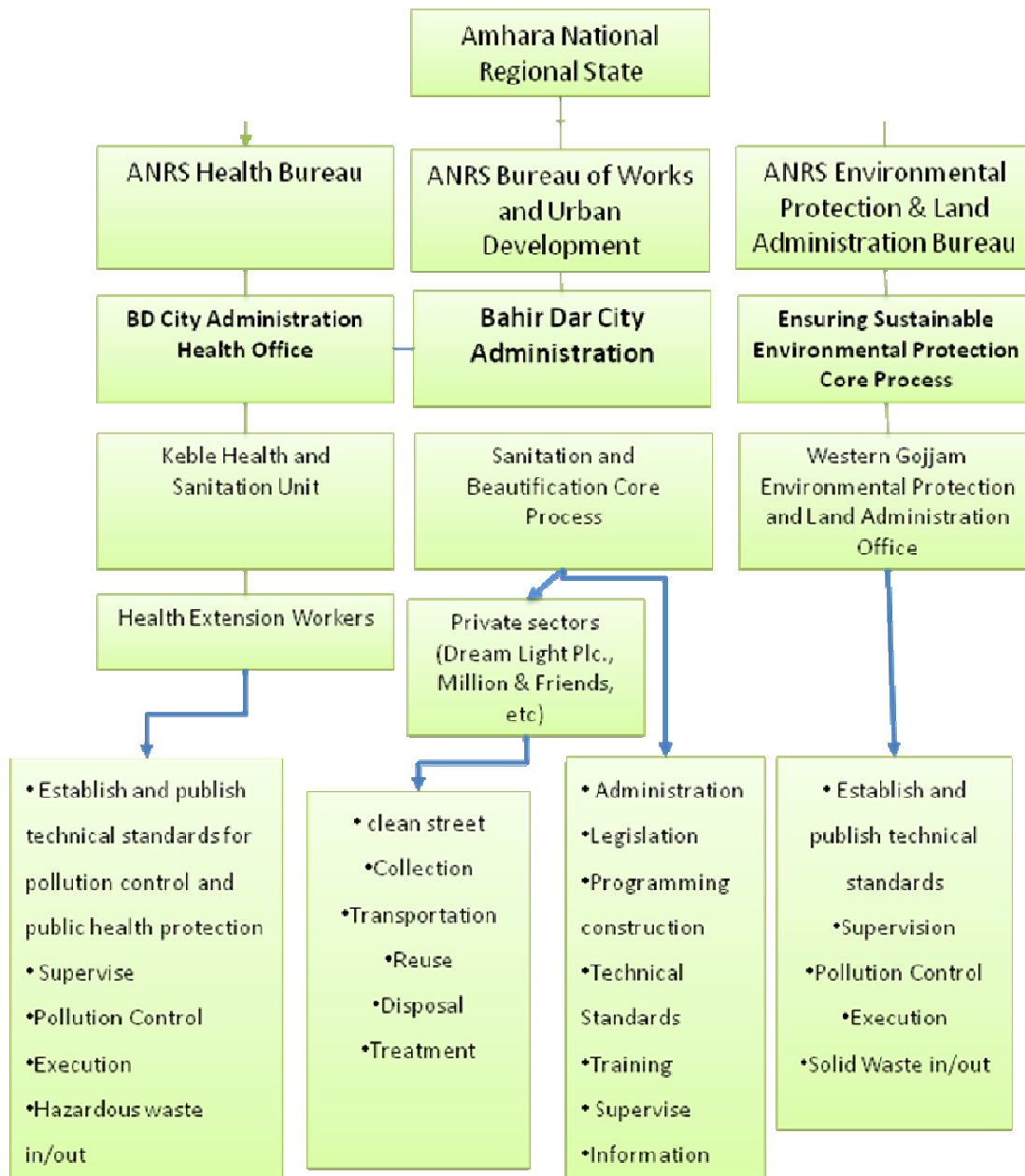


Figure 1 Institutional Arrangement of the SWM of Bahir Dar Town

Gaps Identified

- The current institutional arrangement of the solid waste management has no integration or coordination. Each sector is working independently.
- There is no a clear bridge between the Federal (National) institutions and the regional (or local) institutions
- There is no any financial support from the federal side to the locals.

C. Technology (MSW)

□ Primary collection & Transfer stations

- The door to door collection of solid wastes from households, institutions and commercials areas is conducted by a private solid waste management company named Dream Light plc. The responsibility of the waste generators is to accumulate the solid waste within bags and wait till the collectors come and regularly collect the garbage. Waste generators pay the service fee.



Figure 2 Part of Solid waste collection activities

- Some part of the Street sweeping (6 km from the total 35 km of streets) are outsourced to a small and micro business groups; the remaining are covered by the city service itself.
- Currently there are no large containers for solid waste (Garbage) storage in the city (which were used before Dream Light Company started the house to house collection.)

*Before 2009 there were about 70 Garbage containers in different corners of the city.



Figure 3 previously used solid waste storage container

- Solid waste is collected from the source using push carts to the temporary transfer stations (Not legally approved sites (on the street sides).
- There are no standard transfer stations in the city.
- Door to door collection covers all residences and commercials, and some institutions.
- All healthcare and industries follow their way of removal. Most of them burn the waste; while some others dispose it to the nearby river (Abay or Blue Nile) or Lake Tana.

Gaps Identified:

- No waste segregation at the source
- No standard solid waste transfer station
- Solid waste collection does not cover all solid waste generators
- Service fee are inadequate to cover the service costs

❑ Transportation

Transportation of the solid waste to the dumping site is also done by the Dream Light plc. The company has 7 low skip trucks (which are not standard types specifically designed for this work).

As the trucks are small in size and not the standard type,

- The frequency of trips to and from the disposal area is large and not cost effective.
- Since the trucks are not closed types, wind disperses wastes to the surrounding area while transportation
- All the waste is transported without segregation

Gaps Identified:

- Transportation trucks are not standardized for solid waste transportation purposes
- No waste segregation before transportation

❑ Treatment:

There is no any treatment facility for MSW. Some healthcare and governmental institutions have incinerators to burn their wastes.

❑ Recycling and recovery:

The recycling of the solid waste is insignificant (<1%). Most of the solid waste is disposed to the open field dumping site; but the city administration initiated composting from the organic wastes. Dream light also started selling used papers to paper recycling industries. There are also some scavengers who collect some goods from the waste and resale or recycle it at small scale level.

Gap Identified

- There is no separate place for waste recycling
- No financial or technical support for waste recyclers

❑ Disposal facility:

- Open field disposal (no sanitary landfill).
- Disposal site is close to rural settlements & about 3-4 km from the center of the city. This is affecting the community living nearby the site and easy to access for domestic and wild animals. As a result, farmers are losing their animals because of eating plastic bags and die as a result.
- There is no any treatment at the disposal site.
- There is no any machinery (compactor or graders) that regularly works at the disposal site.
- Daily about 70 % of the generated MSW(69 tons per day) is collected and disposed to the disposal area
- About 2% of waste(2 ton per day) is used to produce compost in the city service compost site
- The remaining 27.6% (27 ton) is not collected by the Dream Light Company. That means, it is either burned or buried in their compound or disposed to lakesides or into the river



Figure 4 Partial view of the solid waste disposal site

D. Financing Mechanisms

Before 2009 financing of the MSW management was totally covered by the city administration. And the cost was incorporated in its annual budget; which was a big burden for the city administration but now this has been changed (after 2009) since the waste generators share the costs to some extent.

Currently the community covers about 50% of the cost of collection and transportation of the MSW by paying service fee to the Dream Light Company.

Each household pays about **\$0.8 USD** per month as a service fee to the company. And the service fee for commercials ranges from **\$1 USD - to -\$75 USD** per month. Even though the service fee is set by the service providers and takers, there is no any chance to increase the fee from the already set. The reason is that the community is still lack knowledge and awareness to the importance of proper solid waste management.

Still there are gaps between the fee and the costs of solid waste management. Some of the gaps are covered by the city administration and the company and, which becomes a big challenge to the company to work effectively and efficiently.

Gaps Identified

- Even if there is a polluter-pay-principle (policy) in the country, was not practiced or implemented in the city.
- There is no set directives or guidelines how to pay fees equivalent to the service provided
- Awareness of the public towards solid waste management is at very low level
- Financial sources are not identified



Figure 5 Partial view of Stakeholders' Workshop

E. Stakeholders participation

MSW management major stakeholders

1. Bahir Dar City Administration... financing, disposal management, control and monitoring, recycling(compost production)
2. Regional B.E.P.L.A.U ensuring sustainable environmental protection, assessment, report review, monitoring and auditing
3. Regional Health Bureau. controlling the management of the healthcare waste, controlling the sanitary of public service centers like hotels, restaurants etc..
4. Private sectors..... Cleaning, collection, transportation, disposal and recycling
5. NGOs..... There are NGOs like forum for environment actively participating in awareness creation and developing waste management plan
6. Bahir Dar University research and study works
7. Households..... Primary collection and paying service fee
8. Commercials.... Primary collection and paying service fee

9. Institutions..... Primary collection and paying service fee, burning the waste in incinerations
10. Informal recyclers..... collecting recyclable and reusable materials from door to door as well at the disposal site

Stakeholder's role in the current waste management system

Waste stream	Activity	Stakeholders directly involved	Regulators
Municipal Solid Waste, healthcare and industrial	Collection	Households, commercials, some institutions, city service, private company, small and micro business groups.	City administration, A.N.R.S Environmental Protection & Land Administration Bureau, A.N.R.S Health Bureau
	Transportation	Private company	City administration, A.N.R.S health Bureau
	Reuse/recycling	Informal sectors, city service, private company	
	Incineration	Healthcare and industries and some institutions	A.N.R.S Health Bureau Environmental Protection & Land Administration Bureau
	Land fill/disposal	Private company, city service	City administration, A.N.R.S environmental protection & land administration bureau, A.N.R.S health bureau

References:

Federal Democratic Republic of Ethiopia Constitution

Environmental Policy of Ethiopia

Federal, Regional and Local Proclamations, regulations and directives