Waste Management Plan 2027

Bo City

Part A: Strategy

WASTE advisers on urban environment and development, presents this report, Waste Management Plan 2020 Bo City, as the outcome of the project funded by WHH in collaboration with Bo City.

The authors are:

Lilliana Abarca,
WASTE

Raphael Thurn, WHH
and Working Group

Table of Contents

List of tables

List of figures

Acronyms

BCC	Bo City Council
CBE	Community Based Enterprises
CBO	Community Based Organization
DFID	Department for International Development (UK Government)
DHMT	District Health Medical Team
EHD	Environmental Health Division
EPA	Environmental Protection Agency Bo
GoSL	Government of Sierra Leone
HCW	Health Care Waste
INWMSP	Integrated National Waste Management Strategic Plan 2012-2016
LGSC	Local Government Service Commission
MoHS	Ministry of Health and Sanitation
MoU	Memorandum of Understanding
MoYS	Ministry of Youth and Sports
MSE	Micro and small enterprises
OWL	One World Link
PHU	Public Health Unit
PPP	Public Private Partnership
SC	Steering Committee
UNDP	United Nations Development Programme
WHH	Welthungerhilfe
WMP	Waste Management Plan

Definitions

Household waste: Consisting of everyday items that are discarded by the public. Its composition varies greatly from country to country and changes significantly with time. It consists of other types of waste, such as organic, recyclable, construction, electronic, hazardous, medical, etc.

Commercial waste: Any waste generated as a result of carrying out a business, its composition varies depending on commercial sector. It consists of other types of waste, such as organic, recyclable, construction, electronic, hazardous, medical, etc.

Health care waste: Includes all the waste generated by health-care establishments, research facilities, and laboratories. In addition, waste originating from "minor" or "scattered" sources, such as that produced in the course of health care undertaken in the home. It is classified in the following main categories: infectious waste, pathological waste, sharps, pharmaceutical waste, and radioactive waste.

Electric and electronic waste:	Consists of end of life products and comprises of a range of electrical and electronic items such as: Refrigerators, IT and telecommunication equipment, freezers, electrical and electronic tools, washing machines, medical equipment toasters, monitoring and control instruments, televisions, etc. Sources are all users of electrical and electronic equipment from householders to all types of commercial and industrial activities.
Sewage waste:	Refers to the residual, semi-solid material left from industrial or municipal wastewater, or sewage treatment processes, also called sludge. Depending on its origin, can be considered hazardous waste.
Hazardous waste:	Has properties that make it potentially dangerous or harmful to human health or the environment, can be liquids, solids, or contained gases; can be the by-products of manufacturing processes, discarded used materials, or discarded unused commercial products, such as cleaning fluids (solvents) or pesticides. The four characteristics of hazardous waste are: ignitability, corrosivity, reactivity, or toxicity.
Industrial waste:	Manufacturing industry waste comprises many different waste streams arising from a wide range of industrial processes. Some of the largest waste generating industrial sectors include the production of basic metals, food, beverage and tobacco products, wood and wood products and paper and paper products.
Agricultural waste:	Agricultural waste is composed of organic wastes, such as animal excreta in the form of slurries and farmyard manures, spent mushroom compost, soiled water and silage effluent; and waste as plastic, scrap machinery, fencing, pesticides, waste oils and veterinary medicines.
Household waste:	Consisting of everyday items that are discarded by the public. Its composition varies greatly from country to country and changes significantly with time. It consists of other types of waste, such as organic, recyclable, construction, electronic, hazardous, medical, etc.
Sharp waste:	Sharps are a subcategory of infectious healthcare waste and include objects that are sharp and can cause injuries. It includes: syringe needles, scalpels, infusion sets, knives, blades, broken glass. Examples are syringes, scalped blades, puncture-resistant containers, and alike.

Infectious waste:	Discarded materials from healthcare activities on humans or animals which have the potential of transmitting infectious agents to humans. These include discarded materials or equipment from the diagnosis, treatment and prevention of disease, assessment of health status or identification purposes that have been in contact with blood and its derivatives, tissues, tissue fluids or wastes from infection isolation wards. It includes: cultures and stocks; tissues; dressings, swabs or other items soaked with blood; blood bags. Sharps, whether contaminated or not, should be considered as a subgroup of infectious healthcare waste. Examples are cotton with blood, gauze with human secretions, plasters and alike.
Pharmaceutical waste:	Consisting of/or containing pharmaceuticals. It includes pharmaceuticals expired, no longer needed; their containers, items contaminated by or containing pharmaceuticals (bottles, boxes, etc.) Examples are medicines, expired tablets, medicine cups, medical sachets and alike.
Pathological waste:	Examples are human parts, amputated limps, foetus, umbilical cord and alike
Chemical waste:	Consists of/or containing chemical substances. It includes laboratory chemicals; film developer; disinfectants expired or no longer needed; solvents, cleaning agents and other. Examples are alcoholic, gentian violet (GV), cleaning chemicals/disinfectants, povidon and alike.
Radioactive waste:	Consisting of/or containing radioactive substances. It includes unused liquids from radiotherapy or laboratory research; contaminated glassware, packages or absorbent paper; urine and excreta from patients treated or tested with unsealed radionuclides; sealed sources. Example is X-Rays.
Pressurized containers:	Consists of containers (full or empty) with pressurized liquid, gas or powdered materials.
Anatomic waste:	Consists of recognizable body parts.

Preface by Bo City Council

The Bo City Council is saddled with the heavy responsibility of managing waste products indiscriminately disposed of by its inhabitants. This by any measure is a gigantic task taking into consideration the population explosion taking place in the city as a result of rural-urban migration and the multiplicity of the wastes being churned out on a daily basis.

In line with the government of Sierra Leone's integrated waste management program, the Bo City Council with support from its partners especially Welthungerhilfe has initiated an integrated waste management project for Bo city and its environs that is geared towards reducing waste disposal, reuse and recycling. A waste management plan was development that served as a blue print in implementing waste management activities from 2014 to 2020 for Bo City But this enormous task cannot be achieved without reviewing the waste management plan that can direct the activities and actions of the Council.

The enormity of the task requires massive strategies and action steps that will direct the path of waste management in the city from 2022- 2027.

Cognisant of the above, as Chief Administrator Bo City Council, solid waste management has been engaging my mind for the better part of my stay here in the Bo City Council. In recognition of the population explosion in the city, the issue of waste management occupied my mind and set it in motion.

The approach we have used has been largely participatory and all-embracing as long as it can help in curbing waste in the city. We have coined our buzz words which is dubbed the 3 Rs (reuse, reduction and recycling). With that as the cornerstone of waste management we have kicked started serious work and hope accomplish our objectives by the end of 2027.

We have engaged the people themselves in waste management with the initiation of a waste ideas contest. This contest sought to galvanise ideas that are useful in waste reduction. The details of it are in the newsletter and you can know about it as you read along. We have also encouraged the idea of a public private partnership with the training of youth groups in door-to-door garbage collection. The objective here is to transform waste to wealth and make the youths involved in a sustainable waste management activity that derives a two-way benefit for them and for the people.

There are other activities we hope to undertake in the coming months and years that will help us achieve our dream of being the hub of waste management in the country and beyond. I hope this plan gives you an insight into the actions that council will take to achieve a sustainable waste management system.

Veronica J Fortune

Chief Administrator

Bo City Council.

CHAPTER 1

1.1 Introduction

Background information

After the end of the conflict in 2002, the Government of Sierra Leone (GoSL) has taken steps to address Solid Waste Management (SWM) issues in the country. Urban areas in Sierra Leone are facing increasing population levels, rapid urbanization (3.3%)[1], high unemployment, uncontrolled growth of settlements and mushrooming of informal businesses, all of which puts severe pressure on the provision of basic services such as water supply, sanitation and solid waste management. Rural to urban migration for better employment opportunities has also increased demand on public services. On the other hand, City Councils that are responsible for providing these services face problems in supplying effective and efficient services due to a lack of technical knowledge, inadequate organisation and limited finances and human resources[2].

Bo City, the second largest city in Sierra Leone (after Freetown), is the Headquarter of Bo District and the provincial capital of the Southern Region. It is situated approximately 155 miles (250 km) southeast of Freetown. After Freetown, Bo is the leading financial, educational and commercial centre of Sierra Leone. With a rapidly increasing urban population, mainly as a result of the economic growth and establishment of agri-businesses and mining companies, existing waste management systems are unable to cope with increased demands.

With support of different waste management programs BCC has built up additional capacity in recent years. In 2013, a pilot project was implemented sponsored by the WASH Facility in Sierra Leone, through a consortium led by WHH with the supported of BCC, Klin Salone, One World Link and WASTE. The goal was to develop a strategy, among others, which would guide the improvement of the solid waste management system in a process to 2020.

This document is the result of that process. A sustainable Waste Management Strategy 2020 prepared by a consortium supported by the composed of Bo City Council (BCC), Klin Salone, Welthungerhilfe (WHH), One World Link (OWL) and WASTE. It was publically presented and adopted by the City Council in 2014.

1.2 Strategic Plan for Integrated Solid Waste Management of Bo City

1.2.1 Document structure

This document has four sections: introduction, Situational Analysis, health care waste, problem statement and planning strategy. Additionally, the Action Plan is presented where

[1] https://www.cia.gov/library/publications/the-world-factbook/geos/sl.html

[2] Lilliana Abarca & Verele de Vreede, 2012. Waste management situational analysis in urban WASH Consortium areas in Freetown

the specific objectives, activities, time frame, responsibilities assigned and products expected are proposed.

1.2.2The importance of Strategic Planning[3]

Strategic Planning for waste management in Bo is a systematic process of envisioning a desired waste management system for the future, and translating this vision into broadly defined goals or objectives and a sequence of steps to achieve them. It allows all stakeholders in the coming years to work on identifying obstacles on the road to a sustainable system and finding solutions to overcome them.

The importance of Strategic Planning is that it has permitted, together with local Stakeholders, identifying major challenges in waste management and proffer possible solutions. The Plan has been intended up to 2027.

The vision, mission and goal of the Strategic Planning for Bo City are the following:

Vision

A functional integrated sustainable waste management system delivering efficient, high quality services that are acceptable, accessible, equitable and affordable for all people in Bo City and its environs.

Mission

To contribute to socio-economic development by promoting waste management and ensuring access to quality services by the population of Bo City through effectively functioning waste management system for all identified waste categories: household waste, commercial waste, healthcare waste, industrial waste, hazardous waste, sewage waste, electric and electronic waste, hazardous waste, agricultural waste, construction waste as well as sanitation products such as baby's diapers and sanitary napkins.

Goal

The Goal of the Integrated Sustainable Waste Management is to ensure sound environmental management, minimize the impact of communicable diseases related to poor waste management (water borne, airborne and vector transmitted diseases), reduce mothers and children mortality, and minimize poverty by involving the private sector and to attain healthy environment for people in Bo City and its environs.

[3] www.wastekeysheets.net [5] Based on the Integrated National Waste Management Strategic Plan of Sierra Leone, Draft 1, 2011.

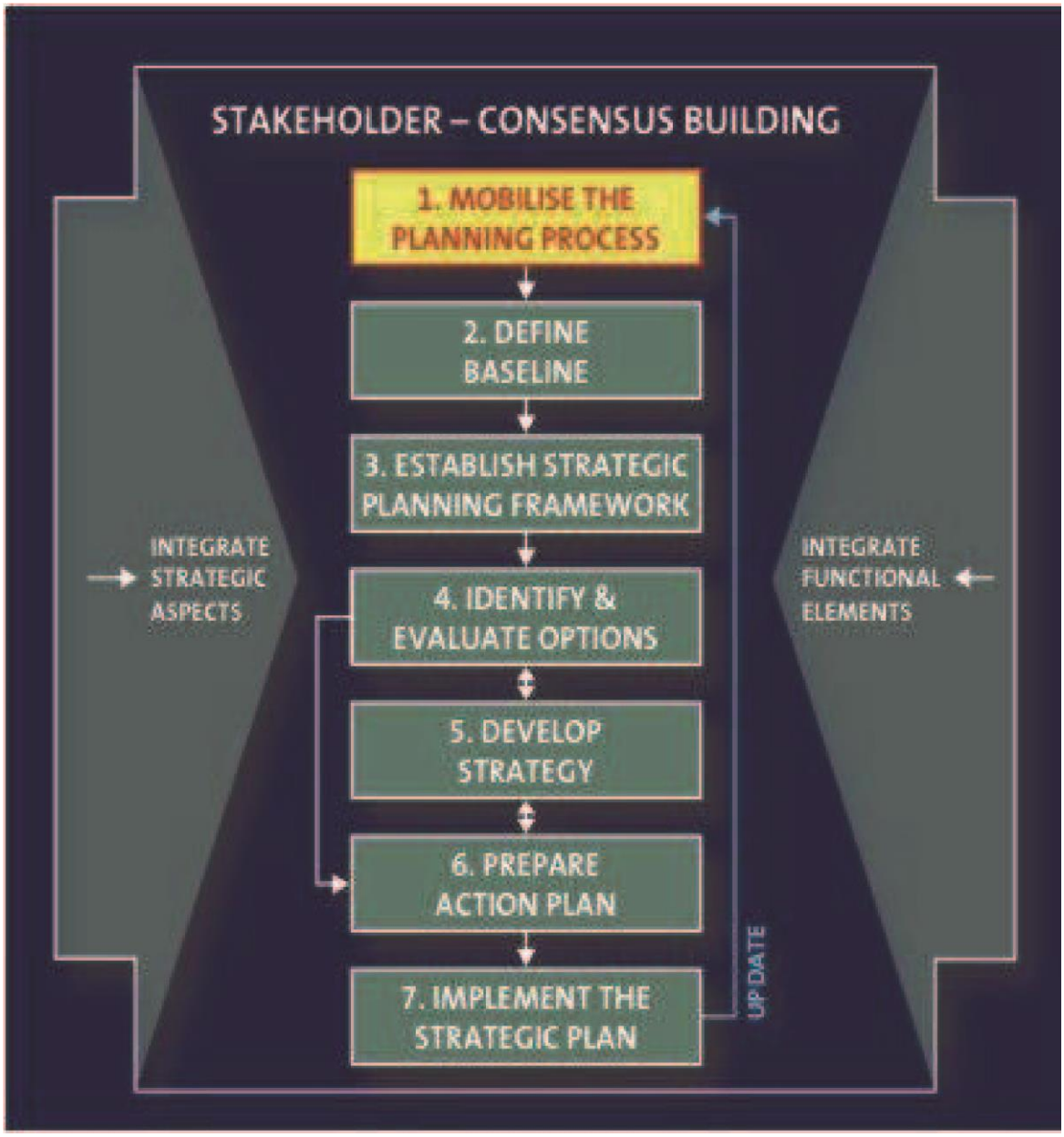

Figure 1. Steps for Strategic Planning

1.2.3 Context of Bo City "municipal solid waste management"

The Integrated National Waste Management Strategic Plan 2012-2016, proposed by the national leaders in 2011, has the purpose to:

1. Protect the public health and safety, protect and preserve the environment of this country, and recover resources which have the potential for further usefulness by providing for, in the most environmentally safe, economically feasible and cost effective manner, the storage, collection, transport, separation, treatment, processing, recycling, and disposal of solid waste.

2. Establish and maintain a national program for providing planning assistance, technical assistance, and financial assistance to local governments for municipal solid waste management.
3. Require local governments to adequately plan for and provide efficient, environmentally acceptable solid waste management services and programs.
4. Promote the establishment of resource recovery systems that preserve and enhance the quality of air, water, and land resources from pollution.
5. Ensure that solid waste is transported, stored, treated, processed, and disposed of in a manner adequate to protect human health, safety, and welfare and the environment.
6. Promote the reduction, recycling, reuse, and treatment of municipal solid waste, and the recycling of materials which would otherwise be disposed of as solid waste.
7. Encourage local governments to contract with private entities to provide management services or operate management facilities on behalf of the local government, when it is cost effective to do so.
8. Promote the education of the general public and the training of municipal solid waste professionals to reduce the generation of solid waste, to ensure proper disposal of solid waste, and to encourage recycling.
9. Encourage the development of waste reduction and recycling programs through planning assistance, technical assistance, grants, and other incentives.
10. Encourage the development of recycling industries by promoting the successful development of markets for recycled items and by promoting the acceleration and advancement of the technology used in manufacturing processes that use recycled items.
11. Require municipalities to develop and implement source separation, resource recovery, or recycling programs, or all of the above, or enhance existing programs so that valuable materials may be returned to productive use, energy and natural resources conserved, and the useful life of solid waste management facilities extended.
12. Require local governments and national agencies to determine the full cost of providing storage, collection, transport, separation, treatment, recycling, and disposal of solid waste in an environmentally safe manner.
13. Encourage local governments to pursue regional approach to solid waste management.

The Strategic Plan 2020 for Bo City is framed into the ideals of the National Plan. It focuses initially into municipal solid waste management and health care management, with the goal to create local capacities that can further develop the Plan for other sectors such as industrial, sewage waste, electric and electronic waste, hazardous waste, sanitation products, agricultural waste and construction waste.

1.3 Planning Process Methodology

The planning process has followed data collection based on the Strategic Planning Guide[4], stakeholders' consultations, data bases, assessments, on-site observations, interviews and learning by doing.

A Waste Management Steering Committee was created composed by 16 members representing different works of life. Their task was to serve as an advisory body for the well implementation of the project[5]. They provided advices in decisions to be made, formulation of MoUs, arbitrary issues and alike. Institutions represented in the steering committee are as follows;

The Mayor, Bo City Council
Chief administrator, BCC
Environment and social Officer, BCC
Monitoring and Evaluation Officer, BCC
Manager, WMD
Medical Superintendent, DHMT-Bo
Paramount Chief, Kakua
Chairman, Drivers Union Bo
Brigade Commander, RSLAF-Bo
Chairman Klin Bo
Chairman, Waste to Wealth Entrepreneurs Association
Youth Officer, Ministry Of Youth, Southern Province
Chairman, Council of Principals Southern Region
Civil Society, South
EPA, South
AIG, South.

Some limitations of the study were:

1. Municipal waste and health care waste were the only waste streams included into the study. Other wastes were not assessed.
2. Health care waste was assessed through a questionnaire. Detail composition and quantities were not analysed.
3. Some of the selected health care centres did not provide information due to the fact that there was not financial compensation for the data they would provide.
4. Some PHUs did not provide information because they were suspicious that the study had the objective to increase taxes.

1.3.1 Working Group

Members who contributed in data collection and the review of this document are as follows;

[4] www.keysheets.net
[5] Support to local public and private sector for solid waste

Name	Organization
Samuel Hinga. Navo	Manager Waste Management Department BCC
Juliana Bah	Environment and Social Officer, Bo City Council
Bockarie Kassoh	Waste Disposal and Landfill Officer
Joseph Tengbeh	Environment Protection Agency

Moreover, special support was received from Ferras Hussein Head of Project, Welthungerhilfe together with Thomas Foray, Deputy Head of Project and Christopher Samai Waste Technician WHH.

Chapter 2.

Baseline

2.1 Background information

The responsibility for solid waste management in Bo City lies with BCC, although the policy has yet to be laid out by the national government. In the late 1990s, Bo was part of a waste management modernization project called the IDA Transport Sector Project. This project aimed to generate employment, through local contracts and was implemented by the Sierra Leone Roads Authority under the overall supervision of the Coordinating and Monitoring Unit of the Ministry of Transport and Communications. This project was relatively successful, but the service contract ended in March 2002 and the Ministry of Health and Sanitation (MoHS) continued as the responsible agency for the operation and management of refuse collection and disposal services[6].

In 2005, MoHS and UNDP assessed the environmental health and waste management situation in Bo and developed a project concept for sustainable waste management. At the same time the World Bank agreed to fund the provision and preparation of landfill sites at six locations including Bo. In 2007 BCC got appropriate funding to implement an improved and comprehensive waste management programme. It included strategically placed skips for waste segregation into compostable and non-compostable fractions, a multifunctional vehicle to transfer the full skips out of the city and a mechanical plant for landfill management.

In the period 2008-2010, UNDP supported, on request of the City Councils, a solid waste management programme in Bo with the aim to strengthen the waste management capacity of the City Councils[7]. As part of this initiative, One World Link (a UK-based organisation) trained waste management operators and introduced new ideas on governance and waste management issues, while UNDP provided equipment and paid for their maintenance. Apart

[6] Alhaji Brima Gogra et al., 2010, Journal of American Science [9]
Alhaji Brima Gogra et al., 2010, Journal of American Science

[7] Anonymous, Document provided by Thomas Amara, MoHS. 2012. Personal communication [11] Sahid Abu Dinge, UNDP, 2012

from the equipment, staff trained on waste management issues and improved awareness within the local Council on waste management and governance, an important result of the initiative is the increased willingness of the community to pay for waste collection services, following improvements in service delivery[11].

Additionally, the project considered the construction of a controlled disposal site and theoretical and practical training for operators, supervisors and management. At the end of the pilot project the City Council clearly indicated that the service provided worked well within the type of setting and on that basis the Council was keen to see it rolled out fully to all communities in the City.

In 2013, the project called "Support to local public and private sector for solid waste management of Bo City and the environments"[8], was implemented with the support of the WASH Facility in Sierra Leone sponsored by DFID. A consortium was created led by WHH and supported by BCC, Klin Salone, One World Link and WASTE. The aim was to ensure that Bo City, through a participatory approach, developed and implemented a sustainable waste management plan 2020 (WMP-2020) that would improve city-wide solid waste management services through private sector and CBOs involvement (through the development of PPPs) and the creation of livelihood opportunities by improving the value chain for waste-derived products. A PPP committee, composed by prominent citizens of Bo City was created with the objective to support the development and implementation of PPP activities (Annex 2)

The project prepared baseline information on the waste management situation of the city, increased levels of waste collection and transportation by the creation of youth groups providing the service, strengthened the capacities of already existing entrepreneurs in recycling value chain activities, built capacities on waste management at different levels of society and increased awareness on pollution and its prevention activities. The project was implemented from March 2013 till February 2014.

2.2 Bordering conditions

The City of Bo is located within the Kakua Chiefdom in the Bo District of the Southern region of the Republic of Sierra Leone. It is the second largest city in Sierra Leone, after Freetown. The District boarders are with Tonkolili in the North and Kenema in the East. It has an area of 1500 square miles (approximately 3885 square kilometres) whilst Bo City has an area of approximately 10 square miles (around 26 square kilometres). The township is politically divided into three wards namely, North, East and West. Some parts of the city are under the administration of the District Council. At present moves are on the way for the city to be expanded and get new areas under its administration, especially the settlements on its immediate outskirts.

[8] Project proposal presented to the WASH Facility, Sierra Leone, 2012.

After Freetown, Bo is the leading financial, educational and commercial centre of Sierra Leone. With a rapidly increasing urban population, mainly as a result of the economic growth and establishment of agri-businesses and mining companies, existing waste management systems are unable to cope with increased demands.

Bo District is for all intentions and purposes considered being 'Mende Country (Figure 2). This is because the majority of the population, being the largest tribal group in Sierra Leone – the Mende tribe. The Map shows Bo City as a whole, including the parts that are still under the administration of the District Council (due to urban expansion - the city is growing into the District Council).

Figure 2. Map showing Bo City

2.3 Population and main activities

Population and demographic characteristics

Human beings are the targets of development. They are both producers and consumers of the fruits of development. Therefore human numbers, their age and sex composition, their spatial distribution and other characteristics must have a center stage in all development planning activities.

2.3.1 Location and Physical Characteristics

The municipality is located within the Kakua Chiefdom in the Bo District of the Southern region in the republic of Sierra Leone. It is fastly engulfing the immediate surrounding villages at an alarming rate, within the next few years it is expected to cover an area significantly larger than 12 square miles ,since it is centrally located ,it serves as the gateway not only the Northern head quarter town of Makeni but also Eastern and Southern regions.

Bo City has an area of approximately 10 square miles. Plans are however underway to expand the municipality into what would later be known as GREATER BO.

Bo District is for all intends and purposes considered to be 'Mende Country (see Annex map showing location of Bo city). This is because the majority of the population, being the largest tribal group in Sierra Leone – the Mende tribe.

However, it must be noted that the municipality of Bo is the administrative headquarters of the entire Southern Province.

The main sources of livelihoods of the population are Public and private sector employment, petty trading, crop farming, artisan works, driving, weaving, and Hairdressing. A greater proportion of the youths have recently engaged themselves in motorbike riding on commercial basis.

The township is politically divided into North, East and West with three constituency 86, 87 and 88 respectively and seventeen political wards.

Bo city has an active social life. The existence of a reliable electricity supply encourages social activities including the running of nightclubs, bars and restaurants.

The main vegetation types are secondary farm bush, grassland, mangrove and inland valley swamps, which are all useful for agricultural purposes. The activities of the people e.g. farming methods (indiscriminate felling of trees, continuous cultivation and the creation of new settlements) have however severely affected the vegetation of the city.

2.3.1 Population size

The total population of the city is estimated about 174,369 according as to the last census figure of December 2015 Population and Housing Census, currently total population is over 200,000

2.3 2 Geography and climate

Bo City experiences a wet semi-equatorial climate with two seasons. The rainy season begins in May and ends in October with the heaviest rains in July and August; and the dry season begins in November and ends in April. The main vegetation types are secondary farm bush, grassland, mangrove and inland valley swamps, which are all useful for agricultural purposes.

Mean annual rainfall figures in Bo[9] can be seen in Table 1. The relative humidity is 72% in the rainy season and 80% during the dry season. The average annual temperature is about 28 degrees Celsius.

Table 1. Average precipitation in Bo City

Average	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
(mm)	5.8	15.8	41.6	114.2	254.7	328.5	429.3	488.9	428.2	338.4	148.9	22.3

2.3.3 Natural resources

The main natural resources of the City comprise of arable lands suitable for Agriculture activities. Mining is also practiced on a small scale in the environs of the city. Gold and diamond transactions are carried out in the city due to its central location.

Fuel wood still plays a major part of energy requirements of many households in the township and environs.

2.3.4 Age-sex distribution of population

The results of the population census indicated that males account for 48%.52 of the total population and females 52%. This gives a sex ratio of 90.54, which means that there are slightly more but insignificant females than males within the municipality.

2.3.5 Household size

. In Sierra Leone the urbanization rate of the country is 2.9% per annum, with a potential to double in 20 years if that continues.

[9] http://www.bo.climatemps.com/precipitation.php

For Bo City this translates that the population increase will triple in 25 years (2015 to 2040), from c 174,000 to c, 520,000. That is an increase in population of 346,000.

For planning in Sierra Leone, based on family size and cultural norms, an occupancy level of 8 people per dwelling was allowed for. At 8 people per dwelling the population increase equates to 43,250 dwellings by 2040. At a mid-range density of 40 dwellings per ha this equates to 1,081 ha of land that needed to be identified

2.3.6 Environmental situation

A large part of the city population depend on bio-diversity products for use as foodstuff, fuel (fuel, wood and charcoal), construction materials, thatching and roofing materials, ropes, crafts, medicinal plants, fodder, recreational materials (raffia, ornaments), spices, perfumes, poisons, composts, herbicides and insecticides.

With the intensification of the war, the local population increased the wildlife cropping, targeting animals such as mammals, birds, reptiles, frogs and insect.

The activities constituting major threats on biodiversity and unhealthy environment include agriculture, livestock farming, forest exploitation, fishing, energy exploitation, mining, transportation, urbanization (infrastructure development) and waste disposal.

Like any other setting a greater percent of the population of the city are below the poverty level a (less than 1$ per day) and depend on subsistence agriculture for their livelihoods.

Another source of livelihood is the mining and marketing of Gold and Diamonds.

Most of the youths are involved in these activities, which has greatly affected the agriculture sector.

2.3.7 Culture and arts

Within the city, there exists a diversity of traditional and cultural patterns as characterized by the diversity of ethnic groups inhabiting the area.

Arts are typified in the production of numerous artifacts and masks and crafts depicting symbols of traditional and ‘secret’ societies and their ancestral heritage. Perhaps the most important among these could be found in the performing arts as characterized by the Towama Cultural Dance Troop.

The literacy level in the urban cities in the country is about 35%. This applies to the literacy level of the Township.

2.4 Present situation ISWM analysis

Integrated Sustainable Waste Management (ISWM) Model is a model that allowed the analysis of the present situation of waste management in Bo City. It acknowledges the importance of three dimensions: the stakeholders that have an interest in solid waste management the elements or stages of the movement or flow of materials from the generation points towards treatment and final disposal and the aspects or "lenses" through which the system has been analysed (Figure 3).

Figure 3. The ISWM Model (WASTE 2004; adapted from ISSOWAMA Consortium, 2009)

2.5 Key stakeholders

The main stakeholders of Bo City waste management systems identified during the workshop are presented in Table 2. Participants acknowledged the local government, the youth groups, the Ministry of Health and the households as the most important ones.

Table 2. Major stakeholders recognized by workshop participants

Bo City Council	Project Team (WHH)	Religious Leaders
Bo City Council Waste Management Department	District Health Medical Team Njala University	Health Alert
Bo District Council	Media	Head Teachers Association
Youth Groups	SL Police (SLP)	Ministry of Social Welfare
Ministry of Agriculture Bo	BO Government Hospital	SALWACO
Households	Ministry of Education Bo	SL Teachers Union

Njala University Trade Unions Waste Management Committee	School children Local Administration Kakua and Tikonko	Environmental Protection Agency Bo (EPA)

Less mentioned stakeholders are presented in Table 3.

Table 3. Less mentioned stakeholders but important in the system

Pot Makers	Banks	Water Companies (5)
Environmental Forum for Africa (EFA)	CEDA	Market Heads
WARD Committee Members	Sierra Leone Association of Journalists	Local Mattress Makers
Mercury International	Scrap Metal Association	Help Salone
SLRA (road works)	YMCA	One World Link (OWL)
Ministry of Lands and Surveys	Milla	Consumer welfare
Benni Mix	Cleaning Agency - Bo	Nassit
	Political Parties	Shankerdas & So
		Hotels Hospital

2.5.The Waste Management Department

There is a clear need and benefit for the establishment of the WMD. The current design appears to have strong stakeholder support and has been subject to considerable consultation within Bo. The design of the WMD aims to address some key challenges in the Bo CC management of waste services. These include the tracking and ring-fencing of waste mandated funds, and the decision making control by the waste function of Bo CC on the expenditures and activities of waste management. The design also seeks to increase funding to the Bo CC WMD by generating own source revenue, and to use some of these funds for the salaries of department staff, Maintenance and other expenditure.

The BCC Waste Management Department will be responsible to regulate the solid and liquid Waste management Sector within the policy framework agreed and guided by, the Full Council and to provide effective and cost efficient Liquid as well as solid waste Management services to the citizens of Bo City and its environs. The BCC Waste Management Department will provide services in waste reduction, reuse, recycling, collection, transportation as well as environmentally sound waste disposal.

The day to day running of the department is been managed by the Head of the department (Manager) who reports to the Chief Administrator who in turn is been supervised by the mayor. The overall accountability stays with the CA.

There are five sub units within the Waste Management Department. They Include;

1. Finance and Administration:

2. Office for Waste Reduction, Reuse and Recycling
3. Office for Waste Collection and Transportation
4. Office for Waste Disposal and Management of Disposal Sites
5. Office for Liquid Waste Management

2.6 Elements

The elements are stages of the movement or flow of materials from the generation points towards the final disposal. The elements considered are: generation and separation, collection, transport, treatment and final disposal. They are analyzed in detail in the next sections.

2.6.1 Generation and separation [10]

Waste is been generated at household, industrial and commercial level. A research conducted by Welthungerhilfe and Bo City Council proved that 55% of the waste produced in Bo City is organic whilst the remaining 45% is inorganic.

The assessment performed allowed to determine the quantities and composition of the waste produced at the household level. Table 4 reports the quantities per individual per day, week, month and year. Figure 5 shows the amount of waste produced weekly in the different wards.

Table 4. Average of household waste (dry and wet) generated individually in Bo City (Lamin, 2013)

	Waste per day (kg)	Waste per week (kg)	Waste per month (kg)	Waste per year (kg)
Total waste	0.37	2.60	11.37	136.41

Table 4 shows the **weekly** values per individual in each ward per day, week, month and year.

It is found out from the analysis that 73% of the population surveyed do not separate waste. This brings challenges for waste collection, and for people working in composting and plastic recycling. Also, this can reflect the lack of awareness in terms of waste sorting and/or lack of the required means/facilities of sorting in the targeted cities. Moreover, this can be easily observed during the monitoring of the daily practices applied by the waste collection teams, whether they are youth groups) or the waste management department of the city council. The field observation showed very limited or complete absence of separation at-source. That notwithstanding, waste sorting is being practice by waste pickers/scavengers

[10] Full report can be found in annex 3

who pick out useful material from the waste stream that are of economic importance to them.

2.6.2 Collection

About 55% of waste generated is being collected and disposed at the landfill site Waste collection is done at different location/point. The waste management department is practicing door-to-door waste collection at household level as well as commercial level at the central business district. Waste is also collect at public places such as parks markets etc using compactor truck or skip loader temporarily to collect waste from the market and parks as well as waste gathered by street sweepers. Trash bins are also located at the road sides within the Central Business District for pedestrians to deposit trash.

The handling of waste on household level is primarily done by women and children. Mainly children are responsible to bring the waste from the households to 3 skips situated in different points of the city (Lamin, 2013). Additionally, a compactor collects commercial waste on a daily basis. The practice is to honk the horn in specific points, wait for 30 minutes and the users of the service deliver the waste to the vehicle.

According to survey conducted 2021 by Welthungerhilfe and Bo City Council, it was revealed that several households and other businesses have a kind of container where waste is being collected for onward disposal.

The treatment and disposal practices of households in the city are the following: Waste is burned, put in the garden, brought to collection points, buried, place in bags and left outside the compound, throw in drainage system, put in adjacent areas just outside the compound, composted the organic fraction, giving organic waste to livestock, recover and sell recyclables, waste pickers are picking out certain materials and other practices not described (See Lamin, 2013).

2.6.3 Transportation

Transportation of waste is mainly practiced by BCC, Bo District Council and the private sector as well as certain institutions and individual capable of transporting their own waste to the disposal site. Household as well as market/public waste is collected from the skips by BCC skip loader.. Waste is transported to the disposal site using different types of vehicles and equipment: tricycles, compactor, skip loader, front end loader/JCB, waste trucks, monitoring vehicles and motor-bikes. The conditions are reported in the table below.

Table 6. BCC Vehicle Fleet - Waste Transportation Sector[11]

[11] Photo documentation of Bo City Council's fleet found in annex 9

Item	Details	Picture	Remarks
1 Tricycle			Condition: Good Usage: To collect waste from institutions. The tricycle is used on a daily basis (except Sunday's). *Fuel consumption*: 25 litres a week *Donated*: By WHH/BMZ
2. Compactor	Mercedes Benz Truck (Axor1823) Engine No: 16A0629021115101 Chassis No: WDB9505221L101722 Plate No: AND 209 Date: 2005		Condition: Very Old *Usage*: To collect waste in the central business district *Donated by* Libyan Government through the Government of Sierra Leone
3 Compactor	**SINO TRUCK 03** Engine No: YN38EE-1*ADR18000023		Condition: Fairly good *Usage*: To collect waste in the central business district but also in the periphery; for door-to-door waste collection
5. Compactor			*Beyond Repairs*

6. Compactor	Year: 2021		*Condition:* New *Usage:* Specifically used for door-to-door waste collection at households
7. Compactor	Year: 2021		*Condition:* New *Usage:* Specifically used for door-to-door waste collection at households
8 Skip Loader			*Condition:* Beyond Repairs *Donated*: By UNDP
9. Skip Loader	**SINO TRUCK 02** Engine Model: 4-cylinder Engine No: E0400-81278 Date: 2018		*Condition:* Good *Usage:* To collect and transport skip containers *Donated By:* Chinese Government

10. Skip Loader	SINO TRUCK 01 Engine Model: 4-cylinder Engine No: E0400 Chassis No: LJVA8CDB7JY006997		*Condition:* Good *Usage:* To collect and transport skip containers *Donated By:* Chinese Government
11. Dumper Truck	**Mercedes Benz Actros 3340** Engine Model: V-engine Engine No: 54192300-445412 Chassis No: WDB9321631L1111396 License Plate: AND 207 Date: 2005		*Condition: Old* *Usage: To collect bulk waste as well as for haulage of waste to disposal site* *Donated*: by Libyan Government
12 Front-End-Loader (JCB)	Fairly good		*Condition: Beyond Repairs* *Donated*: By UNDP
13. Front-End-Loader (CAT)	Engine model: CAT 938H Engine No: 3291GG214 License Plate: ALP 150 Date: 2016		Condition: Old Usage: used to load waste into trucks as well as used for pushing back waste at the disposal site
14. Tractor Loader (**Tryma)**	Engine Model: 4-cylinder Engine No: 87840862 Chassis No: FONN7488CD		Condition: Good Usage: used to load waste into trucks as well as used for pushing back waste at the disposal site. It is also use to power implement such as shredder

15. Cesspool Emptier	**HINO – 500** Engine model: 4-cylinder Engine No:AL0162 Chassis No: JHDFD1JL4C1513284 License plate: AIE 883		Condition: Good Usage: Emptying of cesspit. Donated by: ADB through SALAWCO
16. Cesspool Emptier	**Mercedes Benz Actros** Engine No: 541940-00-1826671 Chassis No: WDB9521431K580469 License Plate: AIP 151		Condition: Good Usage: Emptying of cesspit. Donated by: BMZ through Welthungerhilfe

Figure 7. Location of skips waste collection points

Figure 7 shows the places where the skips are situated. From those skips waste is transported to the disposal site. The transportation of the waste to the legal disposal site is highly affected by the conditions of the road and the distance. The road leading to the official site is 8 km away. Moreover, it is in a very poor condition and is understood to have been constructed in the 1930's (Photo 3).

Photo 3.
Mile 5 road outside official disposal site

2.6.4 Treatment

The waste produced in the city does not receive any treatment before disposal. Households sometimes burn waste on site due to the absence of the door-to-door collection system. This situation is expected to change due to increase in services provide by the council and the private sector. That notwithstanding, the council sometimes fumigate the disposal site and the markets as well to eradicate pests and rodents

2.6.5 Final disposal

All waste collected in Bo City is been disposed-off at the official disposal site (Mile 5 Disposal Site) five miles off the city. An environmental Social and Health Impact Assessment was done in order to proffer mitigation measures to reduce the negative potential impacts. Weighing Bridge, office building, garage, sorting station, lagoon and a business unit (Storage).

There is an existing liquid waste disposal facility constructed by SALWACO funded by the African Development Bank. It's a sludge treatment plant for storage, treatment and processing feacal sludge. The rationale for its location close to the solid waste disposal site is to enhance co-composting.

The current management practice at the site is just basic open disposal. The waste is disposed on a daily basis and once in a while a bull dozer or front-End-Loader pushes the waste back to create space. There is an existing once cell that is not properly utilized as a result the waste is dumped all over the disposal site.

Figure 9. Location of official

There are illegal dumpsites found within the city. They are located on the streets, ditches sides, empty lots, rivers and private properties. They diminish the quality of life and livability of the surrounding area. They create a public nuisance, divert land from more productive uses and depress the value of surrounding land. They can also pose the following health, safety and environmental threats: fire and explosion, injury to children playing in or around the disposal site, disease carried by mosquitoes, flies and rodents, contamination of streams and rivers, contamination of soil and groundwater, contamination of drinking water wells, damage to plant and wildlife habitats and decrease in the quality of life to nearby communities and residents. Illegal disposal takes place for several reasons. In Bo City 5% of the residents expressed their practice to dispose illegally due to the far distance to designated places which is bigger than 300 meters.

2.6.6 Recycling

Recycling is being done at a minimal scale in Bo City. Recycling is being facilitated by waste separation and sorting. Small and Medium Entrepreneurs involved in waste recycling are being monitored by the council. These SME's were trained and capacitated by the council funded by DFID and BMZ.

Collection for recycling takes place in the city. A baseline survey has shown that there are professional waste buyers[12] in Bo City (mainly informal sector): The recyclers buy waste from the youth groups as well as scavengers who pick waste within the city and the disposal site.

The household waste study (Lamin, 2013) reports the quantities of recyclables present in Bo City total waste (Table 7).

Table 7. Quantity of recyclables goods calculated per day and year (Values based on Lamin, 2013)

Material	**Type**	**Bo City (Total Counts of different types of material)**	
		Per day	Per year
Plastics	Bottles	14.345	5.239.482
	Empty water sachets	114.861	41.952.933
	Other soft plastics (e.g. Packaging for food)	60.900	22.243.590
	Other plastics (e.g. Slippers)	8.224	3.003.790
TOTAL		196.934	71.340.844
Metals	Empty drink cans	9.541	3.484.887
	Scrap metals (e.g. iron, brass, copper)	3.429	1.252.496
	Empty food tins	11.457	4.184.811
	Others	1.452	530.469
TOTAL		25.880	9.374.054
Paper	Hard paper (e.g. cartons)	15.895	5.805.587
	Soft paper (e.g. Writing Paper, newspaper, etc.)	49.541	18.094.873
	Other paper (e.g. Wrapping papers)	7.121	2.600.773
TOTAL		72.557	26.234.835
Glass	Broken glass	2.501	913.584
	Glass bottles	6.052	2.210.292
	Other glass (e.g. food containers and other glass mater)	565	206.294
		9.118	3.298.218

[12] Recycling materials buyers in Bo City found in annex 13

Hazardous Wastes		9.622	3.491.114

2.7 Aspects

The aspects are "lenses" through which the system has been analysed. They are: financial, institutional, environmental, technical, information and communication, socio-cultural and legal. They are described in the following sections.

2.7.1 Financial

The BCC WMD operates on a zero base budgeting system where remaining funds are rolled over to the following years activities. The fiscal year starts in 1st January and ends 31st December. The WMD prepares its annual budget to be approved by the council.

Segregation of Roles:

There are several fiscal "roles" within the BCC and the BCC WMD custody, authorization, execution, and monitoring. For example, the person who has authority to sign cheques is acting in the custodial role. The person who approves payment of a bill is authorizing. The Council as a whole acts in an authorizing role when it approves the annual budget. The person who prepares the cheques for signature by an authorized cheque signer is acting in the execution role, executing an action that has been authorized by the Council through the annual budget or by the individual responsible for approving payment of the bill. The person who reconciles the bank statement acts in the monitoring role. The Council also acts in a monitoring role when it reviews the monthly financial reports to be sure that its plan the budget is being executed properly. As much as possible, the BCC WMD seeks to separate the responsibilities for fiscal roles so that at least two and preferably more individuals fulfill these roles. It is particularly important that the same person does not authorize, execute and monitor any transaction.

2.7.1.1 Receipt of Funds

The BCC WMD has two broad categories of funding. It receives funding's as grants and Generate funding locally known as own source revenue.

2.7.1.2 Grants

The council receives grants for waste management activities from one main source, the Government of Sierra Leone (GoSL). These grants are received through bank transfers. The GoSL grant is transferred to the Councils Administrative Account for onward transfer to the BCC Solid Waste Management GoSL Account. In addition to the policies and procedures set forth in the 'Waste Management Department Policies and Procedure Document' (see Annex) these grants requires that BCC and the BCCWMD Follow certain specific policies and procedures as set out by GoSL

2.7.1.3 Own source revenue

Own source revenue are received in two folds, one is a percentage of the revenue generated

by the council on Property Tax and Market Dues and the other are revenues generated directly by or on behalf of the BCC WMD on waste related activities. The Own Source
Revenue therefore comprises! of:

- 15% of total property tax collected by the council
- 5% of the total market dues collected by the council
- Business registration fees by individuals, organization and businesses that do waste business (i.e. all registration for those involved in waste transportation, reuse and recycling)
- Business license fees by individuals, organisation and businesses whose primary business is waste transportation, reuse and recycling
- Signboard fees by individuals, organization and businesses whose primary business is Waste transportation, reuse and recycling
- All leases and rents from the WMIIZ
- Rents of waste management vehicles
- Consultancy fees from the BCCWMD
- Central business district waste collection fees
- Door-to-door waste collection fees
- Pay as you throw (PAYT)
- Burial Fees
- Fines
- Sale of sorted waste at landfill site
- Other sources of revenue as may be approved by the BCC

With the creation of the door-to-door waste collection both at the CBD and the households, in Bo City, the waste management department is collecting the fees for waste collection directly from the households or payment made directly to the BCCWMD account. The payment is based on the type of container and the collection frequency. The table below shows the price list for waste collection

BO CITY COUNCIL
WASTE MANAGEMENT DEPARTMENT
GOVERNMENT RESERVATION ROAD, BO
TEL: +23276770288/ +23276225131

Bo City Council will collect waste from your home, business and institution at the time you choose: daily, three times per week, or weekly. We offer service for three bin sizes, and different categories.

Different sizes and collection schedules available to suit your needs!

BIN OPTIONS	

<table>
<tr>
<td> 
Basket
 
Rubber</td>
<td><u>BO CITY COUCNIL CAN PROVIDE YOU WITH FULL-DRUM BINS!</u>
FULL DRUM: <u>200.000 Le</u> (One-Time Payment) OR <u>20,000 Le</u> (Monthly)*
 
Full-Drum</td>
</tr>
<tr>
<td><u>BO CITY COUNCIL CAN PROVIDE YOU WITH HALF-DRUM BINS!</u>
HALF DRUM: <u>100.000 Le</u> (One-Time Payment) OR <u>10000 Le</u> (Monthly)*
 
Half-drum</td>
<td></td>
</tr>
</table>

CATEGORY	**AMOUNT (Le)**
Super Market	250,000
Building Material Shop	200,000
Pharmacies	100,000
Hotel	300,000 – 1,500,000
Restaurant	200,000 – 500,000
Offices/Banks	200,000
Domestic Houses	30,000 – 200,000
Cold Rooms	150,000
Small Shops (Kiosk)	30,000
Medium Shop	50,000
Large	100,000
Saw dust	150,000 – 1,000,000
Others	Negotiable

Note: There is a 20% fee charge for unsorted waste (Organic from Inorganic)
Special Arrangement can be made for collection of bulk waste upon request.

◆◆◆ **SUBSCRIBE TO BO CITY COUNCIL AND HELP KEEP YOUR COMMUNITY CLEAN** ◆◆◆

2.7.1.4

Expenses

Current, the city spends an estimated 30% of its budget on waste management However, resources are not sufficient to cover the costs necessary to extent services to all its residents and at the same time provide regular and quality service to wards already being serviced. An estimated 30% of councils' expenditures are currently directed towards waste management. This amount is largely allocated to facilitate the transportation of waste from transfer points to the disposal site, the payment of staff and the organization of cleaning days. Additionally costs occur for maintenance and operation of equipment.

2.7.2 Institutional

The Mayor who i s the head of the BCC is being elected by universal suffrage. Such local council elections are taking place every four years. At the moment his worship the mayor Harold Logie Tucker was elected in November 2012 and re-elected in 2018, representing the opposition party of Sierra Leone SLPP. The Chief Administrator is being selected by the Local Government Service Commission (LGSC). Veronica J Fortune is the current chief administrator at BCC (since 2020). She is the lead of the administration.

Bo City Council has created a Waste Management Committee that has the responsibility of monitoring and evaluating waste management activities, proposing policies to the City Council, and alike. It has an oversight role as well. There are four councilors and a chairman in the waste management committee

2.7.2.1 Oversight Bodies of the BCC Waste Management Department

The BCC WMD has two oversight bodies directly attached to it. On the one hand there is the BCC Finance and Budget Committee that is in charge of approving yearly budgets and overseeing their implementation and on the other hand there is the Waste Management Steering Committee (WMSC) that is in charge of overseeing the implementation of activities and of advising in thematic areas. Therefore the WMSC serves as a compass for the BCCWMD by giving critical feedback on running programs and recommendations on implementation strategies and planned activities.

2.7.2.2 BCC Finance and Budget Committee

The BCC Finance and Budget committee will give the first approval to the yearly budgets and final approval will be done by the Full Council. The BCC Finance and Budget Committee will also oversee the implementation of the approved budgets.

2.7.2.3 Waste Management Steering Committee

There is an established WMSC of the Council that performs an oversight function to the BCCWMD. The WMSC is comprised of representatives of important local governmental and social institutions, civil society as well as councilors that have been assigned to give oversight to the BCCWMD. The WMSC is in charge of overseeing the implementation of activities and of advising in thematic areas. Therefore the WMSC serves as a compass for the BCC WMD by giving critical feedback on running programs and recommendations on implementation strategies and planned activities. Members of the Waste Management Steering Committee: Desirous of making it representative of all relevant sectors of the Bo community, the WMSC membership is drawn from various categories of major stakeholders dealing with or involved in waste management in one or the other way. The following individuals, ‘institutions and organizations are represented in the WMSC (in total 27 official members):

1. Head of the Waste Management Department
2. Chairperson Waste Management Bo City Council
3. Chairperson Health Committee Bo City Council
4. Councilors assigned by BCC (4 Councilors)

5. Environmental and Social Officer Bo City Council
6. Gender and Social Service Officer Bo City Council
7. Ministry of Health and Sanitation (2 Representatives)
8. Environmental Protection Agency
9. Environmental and Health Officer Bo District Council
10. Sierra Leone Police
11. Sierra Leone Water Company (SALWACO)
12. Njala University
13. Inter-Religious Council
14. Sierra Leone Teachers Union (2 Representatives)
15. Traders Union
16. Drivers Union
17. Civil Society (2 Representatives)
18. Sierra Leone Association of Journalists
19. Bo City Youth Leader
20. Chairperson Waste to Wealth Entrepreneurs Association
21. Chairperson Klin Bo Services Umbrella Organisation

Ex-Officio Member:

22. BCC Information, Education and Communication Officer

2.7.3 Environmental

Waste management in Bo is characterized by low collection rates (41% of HH waste is currently collected by BCC), bad treatment practices, illegal disposal sites and underperforming legal disposal site. Bad waste management can lead to the contamination of water, soil and air, all of which have a major impact on public health and the spread of epidemics such as diarrhea, typhoid, malaria and cholera.

In as much as the council do collect waste from public places and households, Waste is sometimes disposed-off illegally in drainages and water ways. This is causing water lodging and potentially flooding within the city.

The practice of burning waste is common in many low and middle income countries, as a way to reduce volumes, but this can cause environmental pollution especially when burning plastics with chlorine molecules, which produce dioxins or furans which are highly toxic. During the visit, burning waste was observed in some parts of the city.

The official site has clay like base extending at least 5 metres in-depth. During a preliminary site investigation, groundwater was not encountered in the trial pit dug to 5 metres.

2.7.4 Technical

Even though series of capacity building programs have been administered to the staff of the waste management department, there are still some technical factors influencing the waste

management system in Bo City which are related to lack of technical skills among personnel within the City Council, deficient infrastructure to manage the increasing amounts and complexity of waste, poor roads and vehicles insufficient technologies and reliable data.

2.7.5 Information and Communication

The BCC Information, Education and Communication office, which is under the supervision of the CA, gives support to organize and facilitate awareness raising campaigns and education programs on the importance of solid and liquid waste management as and when necessary and upon request. The BCC Information, Education and Communication Office is also required to assist in the creation of a communication strategy, if this is requested for by the BCCWMD. The BCC leadership approves major requests by the BCC WMD before the BCC Information, Education and Communication Office provides its support.

2.7.6 Socio-cultural

Waste management in Bo City has been perceived as the sole duty of the City Council and responsibility of local authorities, and that the public was not expected to contribute. There is an absence of coordination and cooperation between the City Council and the citizens. The operational efficiency of solid waste management depends upon the active participation of both the City Council and the citizens. Since 2013 the situation has improved by the creation of the Waste Management Steering Committee composed of stakeholder from civil society and the City Council.

2.7.7 Legal

The Ministry of Health & Sanitation oversees the policy formulation and other national level processes around sanitation and waste management. In May 2003, the Ministry of Youth and Sports (MoYS) was responsible for managing the city's wastes. The transfer of solid waste management to the Ministry of Youth & Sports (MoYS) also created an ideal enabling environment to partially tackle unemployment, drug abuse, and the homelessness of city's vast numbers of unemployed youth. Since the enactment of the local Governement Act in 2004, the councils took over the management of waste within their jurisdiction.

The country has developed a set of National Policy, Strategy and Implementation Plans. Bo City Council has developed Bye-Laws with the objective to strengthen their work in relation to the improvement of waste management issues. These laws and bye-laws are presented in the following section.

2.7.7.1 Laws

2.7.7.1.1 Integrated National Waste Management Policy

This Policy has been approved in October 2012. It is in line with the government need for attaining the Millennium Development Goals (MDGs), for which 6 out of 8 goals are being addressed. Proper waste management will minimize transmission of water borne diseases

(diarrhoea, cholera, etc.), malaria (by destroying habitats for mosquitoes), and increase environmental sustainability in Sierra Leone.

This Policy provides the framework that will guide the efforts of the Ministry of Health and Sanitation (MoHS) and its partners over the next five years in attaining the health related MDGs. It reflects the Ministry's fundamental belief that waste management and sanitation is a measure of human health and poverty, while striving to make sure that health services are made available, accessible and affordable to all people without discrimination.

The Policy further reflects the belief that waste management fundamentally affects individual productivity (in business facilities, households, in health and industrial facilities) and is therefore a critical input for long-term development of the country. The Policy statements focus especially on the needs of health workers, community members in cities and towns, household members, industrial workers, etc. For these vulnerable groups, ill health due to poor waste management is not only a personal tragedy but also an economic burden that reinforces poverty nationally. Whilst laying emphasis on these beneficiaries, the Policy concomitantly emphasizes strengthening of the entire waste management system as a key strategy to enhancing efficiency and effectiveness in provision of quality services that will ultimately improve health outcomes.

2.7.7.1.2 Integrated National Waste Management Strategic Plan 2012-2016 (INWMSP) The Strategic Plan has been approved in October 2012. The INWMSP provides the framework that guides the efforts of the Ministry of Health and Sanitation (MoHS) and its partners in attaining the health related MDGs. It reflects the Ministry's fundamental belief that waste management and sanitation is a measure of human health and poverty. The GoSL has the goal to assure waste management services becoming accessible to all Sierra Leoneans. The Plan reflects the belief that waste management fundamentally affects individual productivity (in business facilities, households, in health and industrial facilities) and is therefore a critical input for long-term development of the country.

The strategies contained in the Plan focus especially on the needs of health workers, community members in cities and towns, household members, industrial workers, etc. For these vulnerable groups, ill health due to poor waste management is not only a personal tragedy but also an economic burden that reinforces poverty nationally. Whilst laying emphasis on these beneficiaries, the Plan concomitantly emphasizes strengthening of the entire waste management system as a key strategy to enhancing efficiency and effectiveness in provision of quality services that will ultimately improve health outcomes.

In cognisance of the aforementioned, the plan is developed around strengthening of six key pillars of the health system, namely: (1) leadership and governance, (2) service delivery, (3) human resources for waste management, (4) waste management equipment and technologies, (5) waste management financing, and (6) waste management information systems. The priorities are to improve waste management with the aim of progressively moving towards universal coverage, reducing the burden of communicable diseases and

improving the quality of services provided by retaining highly qualified and motivated staff in an enabling environment through training.

2.7.7.1.3 Implementation Plan 2012-2016

The implementation plan has been approved in April 2012. It covers the first year of the 2012-2016 Strategic Plan and gives the tools for effective execution of the plan. The activities are in accordance with the plan presented in the strategic plan and also in the management of the three waste categories: healthcare waste, municipal solid and liquid waste, and industrial waste. The liquid waste management is covered under municipal solid waste since the two waste types are undertaken by the same unit under the Environmental Health Division (EHD).

To prepare the MoHS for implementation, this plan presents the implementation process covering: evaluation of the strategic plan, creation of the implementation vision, identification of team members, preparation of schedules for meetings, and the need for involving the upper management during implementation. The highlights on the personnel and staffing requirements cover areas such as: current status of personnel in the EHD, types of skills and competence required, knowledge needed to achieve the performance criteria, etc. Other key issues of the implementation process presented include consistence in performance, training needs, means of configuring the management interface, and list of major tasks. Performance measuring tools are also included by outlining performance measures, monitoring plan effectiveness, data collection, analysis and target setting, setting the key performance indicators for the implementation plan and using the indicators to improve performance.

A detailed analysis of the impacts of this implementation plan to the society, environment, health workers, health facilities, industry and workers, the government, MoHS and its implementing team, is presented. The last part of the implementation plan describes the possible constraints, limitations and outstanding issues which should be streamlined before or during implementation.

2.7.7.1.5 Public Health Ordinance

This is an ordinance of parliament enacted in 1960. It takes into cognizance all public health issues relating to Waste management, Drainage, Market, cemetery, latrine etc.

2.7.7.1.6 Local Government Act

This was passed into law in 2004. It gives city council the mandate to coordinate all development activity as well as to carry out waste management activities within the locality.

2.7.7.2Bye-Laws

2.7.7.2.1 Bo City Council Bye Law No. 1

City of Bo Garbage Control Bye law 2008 (Passed by Bo City Council but not enacted by Central Government) [Highly Relevant]

This Bye-law has the objective to provide a waste-free environment in the City of Bo. It describes the responsibilities to the City Council and contains the definition of offences and penalties.

2.7.7.2.2 Bo City Council Bye Law No. 2

City of Bo Truck Operation Bye-Law 2008 (Passed by Bo City Council but not enacted by Central Government) [Highly Relevant]

This Bye-law provides regulations for loading and off-loading of commercial trucks in designated areas and for stipulated periods in the City of Bo and for related matters. It sets responsibilities to the City Council, the truck drivers and provides the penalties to the ones not following the regulation.

2.7.7.2.3 Bo City Council Bye Law No. 3

City of Bo Vehicle Entry Permit By Law (Passed by Bo City Council but not enacted by Central Government) [Highly Relevant]

This Bye-law introduces the payment of entry permit for certain classes of vehicle entering the city. It defines the responsibilities of the City Council, of the drivers, states the entry permit rates and penalties.

According to the understanding during the development of this Plan, none of the mentioned Bye-Laws have been approved at a National level.

2.7.7.2.4 Bo City Council Bye Law No. 4

Community Law Banning Illegal Dumpsites and cleaning Saturdays.

This law was enacted in June 2015. This law was enacted to ensure that Bo city is the cleanest in the country of Sierra Leone and with the intent of creating a healthy environment for the citizens, and also cognisant of the responsibilities placed on the local authorities for the management of waste in the communities

Chapter 3

Health Care Waste Baseline

3.1 Introduction

The rise of population in Bo City has increased the needs of health care services. As a result more health care waste has been produced which is at present not managed in a safe way.

Hospitals and public health units (PHUs) have limited facilities for storing and disposing the waste daily produced.

The City has a Government hospital, four private hospitals with 28 functioning peripheral health unites. However, the administration of the Hospital has been taken back to center Government. Of the 28 functioning PHUs, four of them (Kowama CHC, Yemoh Town CHC, New police barracks CHC and Torkpoi Town CHC) are government owned structure while the remaining 24 are private owned structures supported by MOH and council.

The management of health care waste in Bo city has posed costly challenges to the city's authorities over the past years. Low service coverage, inadequate equipment, low quality service, low labour productivity, poor public attitudes and widespread illegal dumping.

A study on health care waste (HCW)[13] reported that the health care centres produced sharps, pharmaceuticals, pathological, infectious, radioactive, chemicals, anatomical and pressurized containers.

From the investigated institutions, none is labeling their waste nor practicing sterilization. 95% informed that they mostly store the waste in their premises. They use waste bins, safety boxes, cartons and rubber bowls, plastic bags and waste baskets. Some of the health care centres showed their interest to sort their waste before storing (33.3%).

Health care waste is collected by the use of the skips (66.7%), compactor (2.5%), private personal employee so called "lunatics" (waste pickers), trash bins (2.5%) and 25.1% by other means (Figure 8). It is collected daily in hospitals and PHUs and once a week in the pharmacies.

[13] Vandi, I., Koroma, S., Bawoh, J., Kallon, M., 2013. Analyses of the existing health care waste situation in Bo City

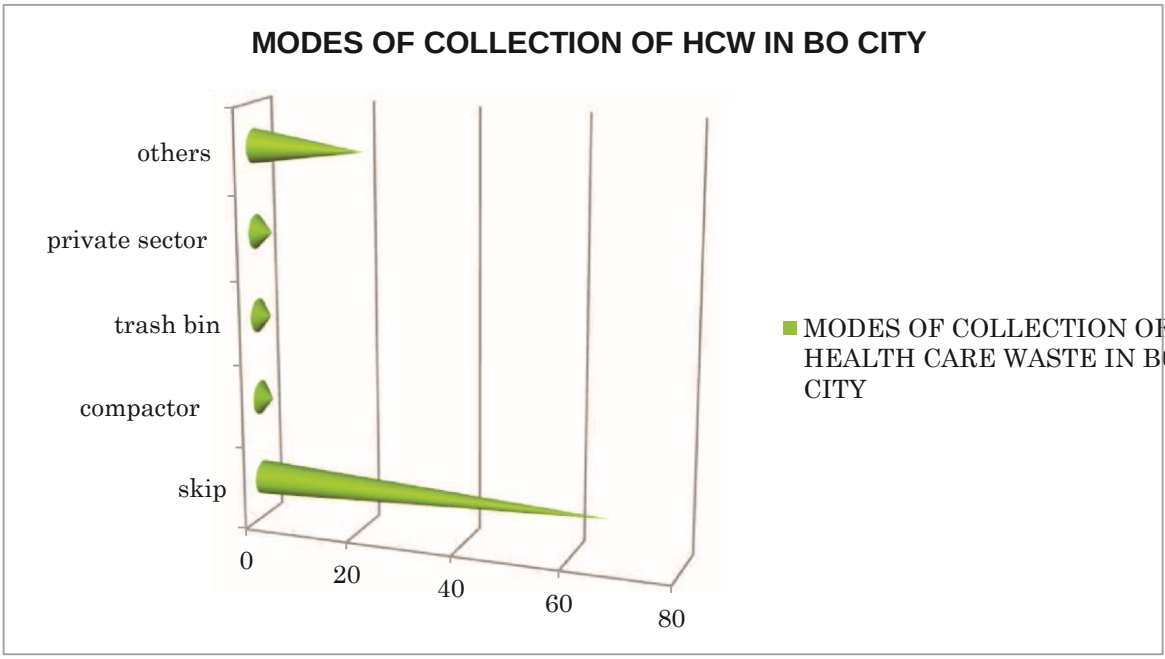

Figure 8. Five modes of collection of health care waste in Bo city

In general terms, the perception of the population is that HCW is badly managed in Bo City which creates health hazards.

Chapter 4.

Strategic Main Issues

The Integrated Sustainable Waste Management model (Figure 3) allowed structuring the collected information. This section presents the main findings and the topics to be developed for the improvement of Bo City's waste management system. They are grouped around the following issues:

1. Financial
2. Institutional
3. Collection transfer and transport
4. Final disposal
5. Treatment
6. Recycling
7. Capacity development
8. Reduction special activity
9. Legal
10. Health care

The specific activities to be developed in the coming years are introduced and prioritized in the Action Plan (document 2).

4.1 Financial findings

- There is no centralized structure of costs related to the management of municipal solid waste.
- The costs of solid waste management in the Municipality are scattered without a centralized planning based on goals and objectives
- The acquiring basic resources such as fuel, spare parts, and repair are subject to extensive administrative steps between departments
- There is hardly investment with City Council's own resources or depreciation of existing assets in financial planning
- There is a dependence on international support for acquiring equipment as well as future investments for infrastructure
- Automation and digitalization of revue collection and disbursement is yet to be practiced
- The Process 5% and 15% of market due and property tax respectively transfer of funds to the waste management department is not clearly defined.
- There are some other revenue lines to be tapped into by the department as well as inefficient collection of revenue

Topics to be developed

Develop a sustainable, efficient, effective financial system that guarantees the functioning of the solid waste operative system.

- To set up a differentiated fee/tariff system for different waste streams based on a "Polluter Pays Principle"
- To improve the tariff/fee collection system
- To establish and implement a financial management plan for the operation of the present and future waste management system

Develop a transparent registration system of the costs related to the operation of the waste management system.

- To design an accounting system to determine the costs related to the waste management system
- To design a control system to monitor the expenditures related to the waste management system

Engage financial sector in solid waste services.

- Establish a micro-finance product (Waste Venture type, e.g. co-loans, seed funding, guarantee funds, subsides and alike)

Develop an automated revenue and expenditure system

- Procure train and installed financial management software for the department
- Link or create access to daily financial update

4.2 Institutional Gaps

- The vision of BCC in the last years has concentrated primarily on donor funds to finance the infrastructure investment.
- The responsibilities assigned to the coordinator of the waste Management Department are too many to be performed by the amount of staff working in waste management issues.
- Limited access to funds to perform an efficient waste management service. Most of the financial resources available are used for salaries, fuel, spare parts, lubricants, etc.
- No staff appraisal and effective human resource monitoring and Absence of evaluation of skills needed in the personnel working on waste management activities.
- Staff welfare is not properly handled. Staffs are not satisfied with the remuneration and incentive giving to them.
- Poor information systems available that generate data related to solid waste management. No coordination procedures to cross information between departments. Limited analysis of information in order to monitor progress and make informed decisions.
- Limited number of private sector involved in waste management
- Private sectors involved in waste management (Collection, transportation and recycling) mostly informal.
- Legislation related to solid waste management (Bye-laws) has been formulated, but is still not approved by parliament.
- No central prosecution system for defaulter (Sanitation court)

Topics to be developed

Create conditions to strengthen the planning and management for an integral and sustainable waste management system.

- To revise the institutional setting of the BCC waste management
- To establish a legal framework for the functioning of the system
- To ensure autonomy in the operations of the department.

Promote the institutional strengthening for waste management.

- To determine the capacity needs among BCC staff and political leaders
- To improve on the number of existing staff and strengthen the capacities of BCC staff and political leaders
- To develop a set of indicators in order to measure the efficiency and effectiveness of the waste management staff and system
- To create an information system that collects the gathered data
- Develop a set of indicators in order to measure the efficiency and effectiveness of the waste management system

- Create an information management system that collects, process and evaluate waste related data
- Regulate the activities of institutions and/or individuals involved in waste management activities.
- Promote the formulation and enforcement of environmental laws by creation and special sanitation prosecuting system.
- Improve on staff welfare and conditions of service. Occupational Health and Safety should be implemented and enforced

Promote the creation of PPP for service delivery.

- To assign the responsibilities related to PPP arrangements to a specific department
- To create/formalise an Advisory and Consultative Committee that has the responsibility to support PPP activities e.g. contracts, MoU's, technical issues and alike

Propose mechanism for oversight of the waste management system.

- To create a Waste Management Steering Committee that has the responsibility to execute the Action Plan

4.3 Collection, transfer and transport Gaps

- The amount of skips are not enough for an efficient and effective waste collection in public places
- All household solid waste arrived to the skips in a mixture of dry and wet waste
- There is no differentiated service for special waste such as health care waste, construction waste, bulky waste, tires, old vehicles and alike
- The collection vehicles and equipment are old and not enough to have a higher coverage rate.
- Vehicle maintenance is not effective and slow
- The road network to the disposal site is rough and rugged.
- Waste collection means for pedestrian are inadequate and the existing ones are all worn out
- Service coverage for door-to-door waste collection is significantly low.

Topics to be developed

To improve the collection and transport of non-hazardous waste.

- To improve the planning of collection of non-hazardous waste
- To expand on the coverage of door-to-door waste collection system.by enlarging CBEs including youth groups involve in door-to door collection systems
- Council should improve on the number of waste collection vehicles and maintenance and repair the existing ones
- To promote the incorporation of the private sector through strategic alliances such as PPP, CBOs, MSEs, including norms that allow BCC to control the system
- To improve the transfer waste process to avoid spillage and further pollution

- To improve the public cleansing system
- Source separation of waste should be initiated with possible incentive and punitive measures attached for compliance and default.
- The council should establish a special professional waste collection service for specific waste such as Health care waste, electronics waste, waste oil etc.
- To improve on road network to the disposal site.

To improve the collection and transport of hazardous waste.

- Develop a collection and transportation of hazardous waste from Industries, HH and health care centres

4.4 Treatment findings

- Municipal waste does not receive any type of treatment
- Households often burn the waste to reduce its volume
- Some households compost their organic waste in their houses

Topics to be developed

To develop compost initiatives.

- To prepare a home composting and community composting and back yard gardening action plan
- To prepare and implement strategies for collection of clean wet waste at HHs and Markets
- To create Market for compost products
- To develop and implement a pilot compost project for one market

4.5 Final disposal gaps

- At the disposal sites there is no control of potential pollution
- The city has many illegal small disposal sites
- Infrastructure management at the official site is very poor
- The environmental management plan hasn't been reviewed
- There is no machinery at the site for management waste.
- There is no special facility for disposal of hazardous and medical waste
- Access way within the disposal site is terrible especially during the rains
- There is no assigned dedicated staff at the disposal site to manage the facility.
- No power source to run the facilities

Topics to be developed

To assure that non-hazardous waste is safely disposed.

- Maintenance 5 mile (8 km) of feeder road and road network at disposal site
- Determine materials and costs for improvement of conditions, repair fence and gate for the disposal site

- Analyse the proper zoning of the disposal site
- Determine infrastructure for zoning and management areas

To assure that hazardous waste is safely disposed.

- Evaluate options of safe disposal of hazardous waste
- Determine costs for hazardous waste safe disposal
- Set up hazardous waste disposal facility within the site.

To eliminate illegal disposal sites.

- Map out illegal disposal sites and remediation possibilities
- Set up a plan for regular collection of waste at illegal disposal site
- Define a penalty system for polluters

To assure proper management and functional site

- Construct road network within the site
- Improve on management system at the disposal site.
- Review environmental and social management plan for Mile 5
- Assign dedicated staff at the site
- Improve on the power source at the disposal site.
- Machineries should be made available at the site for management of waste.

4.6 Health Care Waste findings

- Inadequate and unskilled personnel involved in health care waste management.
- Lack of routine collection of health care waste.
- Poor methods of health care waste management.
- Inadequate resources for health waste management.

Topics to be developed

Create conditions to strengthen the planning and management for an integral and sustainable health care waste management system. - T

- To create a task force for HCW management
- To develop on-site assessments on quantities and composition of HCW
- To develop an integral HCW management system
- To strengthen the capacities of health care workers and BCC staff
- To establish a legal framework for HCW management

Promote the institutional strengthening for health care waste management.

- To identify the capacity needs among health care waste management staff
- To strengthen the capacities of health care and BCC staff

- To develop a set of indicators in order to measure the efficiency and effectiveness of the HCW management system
- To create an information system that collects the gathered data

Promote the creation of PPP for service delivery.

- To assign the responsibilities related to PPP arrangements to a specific private operator

Propose mechanism for oversight the HCW management system.

- To create a Steering Committee that has the responsibility to monitor and evaluate the system
- Coordinate and set up a joint monitoring system with the District Health Management Team

4.7 Recycling findings

- Informal sector is collecting recyclable materials such as scrap iron, aluminum, copper and brass, aluminum cans, lead, glass bottles, rubber bottles, plastic sachets, slippers, tins and tires.
- Limited and incapacitated number of waste recyclers within the city.
- There is limited market for most of the recycled /compost product.
- Recyclers hardly expand on the varieties of products and add value to their existing product to compete with rivalry products.
- Recycling is done manually without some basic health and environmental safety measures
- Awareness by citizens on the availability of waste recycled product is low

Topics to be developed

Strengthen the waste trading sector to increase recycling rates

- To increase recycling rates
- To involve more CBEs/SMEs in processing of waste-derived products (Waste-to-Wealth activities)
- Capacitate the SME's/CBEs operating in waste recycling business
- Facilitate the creation of market for recycled products and compost.
- Sensitize the community on the availability and use of recycled products and improve of the marketing strategy.

Develop locally a recycling initiative.

- Establish a new recycling initiative as PPP in paper or plastic recycling. Involve CBEs/SMEs in processing of waste-derived products (Waste-to-Wealth activities)
- Train or encourage recyclers to learn new technologies and skills to add value to their existing products.
- Mechanize production and improve and enforce safety measures.

4.8 Capacity development findings

- Lack of adequate skilled personnel at the Waste Management Department
- Inadequate understanding by citizens on pollution due to improper waste management
- Efforts to provide environmental awareness to population are being made through radio programmes and the publication of newspaper articles and newsletters.

Topics to be developed

Prepare environmental awareness programme for the community.

- To develop an educational program on waste minimisation, separation, reuse, recycling and environmental sound waste disposal

Develop capacities of main stakeholders.

- To strengthen capacity of Bo City groups and individuals
- To provide exchange visits for capacity development
- To strengthen the involvement and capacity of the Local City Councils' Association in solid waste management
- To strengthen the capacity of staff at the waste management Department

4.9 Legal issues

- National legislation existing for waste management, but not approved
- Bye-laws created by the City Council not approved
- No stationed enforcement officers or unit at the Waste Management Department

Topics to be developed

Strengthening the legal framework for SWM.

- To set up the norms and regulations that allow the improvement of the waste management system
- To review byelaws and push for parliamentary approval
- To assign and capacitate dedicated enforcement officers to the waste Management department

References

Abarca, L., de Vreede, V., 2012. Waste management situational analysis in urban WASH Consortium areas in Freetown. Report Freetown WASH Consortium.

Alhaji Brima Gogra, Jun Yao, Victor Tamba Simbay Kabba, Edward Hinga Sandy, Gyula Zaray, Solomon Peter Gbanie, Tamba Samuel Bandagba. 2010. A situational analysis of waste management in Freetown, Sierra Leone. Journal of American Science, 6(5), 124-135.

CIA (Central Intelligence Agency). The World Factbook. https://www.cia.gov/library/publications/the-world-factbook/geos/sl.html [Accessed October, 2013].

Fleet, G., Greedy, D., 2013. Solid waste project report.

Lamin, J.M., 2013. Bo City Council household waste service assessment and audit report. BCC / WHH

Munawar, D., Fellner, J., 2013. Guidelines for design and operation of municipal solid waste landfills in tropical climates. International Solid Waste Association Report.

Vandi, I., Koroma, S., Bawoh, J., Kallon, M., 2013. Analyses of the existing health care waste situation in Bo City Report.

List of Annexes

Annex 1. Members of the Waste Management Steering Committee
Annex 2. Members of the PPP working group
Annex 3. Household waste service assessment and audit report
Annex 4. Informed consent statement

Annex 5. Waste survey template
Annex 6. Composition and amount of household waste in Bo City
Annex 7. Housing indicator
Annex 8. One World Link solid waste report
Annex 9. Photo documentation of the vehicle fleet of BCC including vehicle daily routines
Annex 10. Members of Youth Groups involved in door-to-door waste collection services
Annex 11. Guidelines for design and operation of municipal landfills in tropical countries
Annex 12. Price of recyclable materials
Annex 13. List of waste buyers/traders in Bo City
Annex 14. List of key stakeholders in solid waste in Bo City Council
Annex 15. Bo City Council Bye-Laws
Annex 16. Health care waste study
Annex 17. Basics on composting and marketing
Annex 18. Public Private Partnership basics

STRUCTURE OF THE ACTION PLAN

Background

This action plan takes as a basis the specific objectives presented as the components of the "Bo City Integrated Sustainable Waste Management Plan 2027". With the goal to fulfill those objectives, a set of activities are proposed, including the time frame for its achievement, the entity entities responsible for the implementation and products.

Waste Management Department

The waste management department will be responsible to implement the waste management plan. This will be done in conjunction with other relevant departments within the city council and relevant stakeholders as well. All activities will be approved or endorsed by the chief Administrator.

Follow up of the implementation of the Action Plan

The follow up of the Action Plan is key for its success. During the first year BCC together with the Waste Management Steering Committee will be responsible for the monitoring of the advances and reporting to Bo City Council. Once the Solid Waste Management Department is well functioning, they will take that responsibility, since it will be assigned as one of their tasks. The Waste Management Steering Committee could act as an Advisory body.

Execution of the Action Plan

For each activity of the objectives and sub-objectives, it will be necessary to follow the next steps:

1. To prepare a working plan
2. To assign a coordinator who is responsible to:
   - Coordinate the sub-activities
   - Give follow up to the activities
   - Report over the advances of the sub-activities to the Waste Management Steering Committee
3. To determine the necessary BCC personnel to execute the activities:
   - Report to the Human Resources Department and to the Administrative Department the new personnel needed for the implementation of the activities
   - Define and assign roles and responsibilities to the personnel and include those into their working plans
   - Modify function manuals as needed
4. To review and update the budget to execute the activities
5. To coordinate with the different departments of planning and development involved in waste management and external stakeholders (in case needed)

SUMMARY OF SPECIFIC OBJECTIVES AND PRODUCTS

1. Financial Aspect

Specific Objective 1.1 Develop a sustainable, efficient, effective financial system that guarantees the functioning of the solid waste operative system.

Sub-objectives	Time Frame	Responsible	Products /Deliverables
	2022	WMD/Consultant/Njala University	Current profile costs and benefits analysis report
1.1.1 To set up a differentiated fee/tariff system for different waste streams based on a "Polluter Pays Principle"	2022	BCCWMD/Consultant	Analysis of waste management costs report
	2022	BCCWMD/Njala University	Update inventory on clients for waste management services
	2022-2023	BCCWMD / Consultant	Study on tariff/fee setting for waste management presented and revised Elaborated, approved and implemented tariff/fee system different sectors

	2023	BCC	Bye-law for the implementation of tariff/fee presented and approved
	2022	BCC	Revision and update of tariffs/fees
1.1.2 To improve the tariff/fee collection system	2022	BCC-IEC/PPP	Plan for diffusion of information of new tariffs/fees
	2022 -2023	BCC/PPP	Efficient tariff/fee collection system plan revised and approved (e.g. mobile payment system for waste service developed)

	2023	BCC	Incentive plan for payment on time developed
1.1.3 To establish and implement a financial management plan for the operation of the present and future waste management system	2022	Consultant	Training in waste management financial issues
	2022	BCCWMD/	Waste management budget developed
	2022	BCC/WMD/ Consultant	Effective and transparent financial management plan developed
	Monthly	BCC	Waste management monthly report prepared, revised and approved

	Anually	BCC	Annual plan for following year prepared, revised and approved
Specific Objective 1.2 Develop a transparent registration system of the costs related to the operation of the waste management system.			
Sub-objectives	Time Frame	Responsible	Products
1.2.1 To design an accounting system to determine the costs related to the waste management system	2022	BCC/WMD	Organized group within BCC with a plan developed
	2023	BCCWMD/ Njala University / consultant(s)	Trained personnel for the registration system
	2022	BCC/WMD/Njala University / consultant(s)	Transparent accounting system designed according to international and national standards
	2022	BCC/Consultant	Financial software acquired and personnel trained in its use
	Annually	BCC/consultant	Transparent and earmarked budget allocated for waste management

1.2.2 To design a control system to monitor the expenditures related to the waste management system	2022	BCC/WMD/consultant	Financial tools for budget tracking and control in place for the Waste Management Unit
Specific Objective 1.3 Engage the financial sector in solid waste services.			
Sub-objectives	Time Frame	Responsible	Products
1.3.1 Establish a micro-finance product (Waste Venture type, e.g. co-loans, seed funding, guarantee funds, subsides and alike)	2022	Consultant/Njala University	Study on small and medium enterprises funding opportunities in solid waste
	2022	WMD/Consultant/Njala University	Analysis of market assessment for entrepreneurs working in solid waste management (demand side).
	2022	WMD/Consultant/Njala University	Analysis of funding institution or financial partners available (supply side)
	2022	Consultant	Selection of financial partner(s)
	2022-2025	Financial partner	Development of a waste related financial product

	2022-2025	Consultant/ Financial entity	Setting up the venture fund
Specific Objective 1.4 Develop an automated revenue and expenditure system			
Sub-objectives	Time Frame	Responsible	Products
1.4.1 Procure train and installed financial management software for the department	2022	BCC/WMD/Consultant/Njala University	Financial software procured and personnel trained in its use
1.4.2 Link or create access to daily financial update	2022	Consultant	All computers networked between relevant staff

2. Institutional Aspect

Specific Objective 2.1 Create conditions to strengthen the planning and management for an integral and sustainable waste management system.

Sub-objectives	Time Frame	Responsible	Products
2.1.1 To revise the institutional setting of the BCC waste management Department	2023	BCC/consultant	Institutional diagnosis and recommendations
	2023	BCC/consultant	Report on the analysis of different models
	2023	BCC/consultant	Selection criteria for new institutional setting
2.1.2 To establish a legal framework for the functioning of the system	2023	BCC	Set of Bye-Laws supporting the system
	2023	BCC	BCC decree accepting the model
	2023	BCC	Organogram of the new model
	2023	BCC	Inventory of the personnel needed
	2023	BCC	Revised Operations manual
	2023	BCC	Roles and responsibilities well defined and assigned

	2023	BCC	Procedures for selection of personnel

	2023-2024	BCC/WMD	Planning and reporting systems developed
2.1.3 To ensure autonomy in the operations of the department	2023		Signed MoU with clear roles and responsibilities
	2023		Registration certificate

Specific Objective 2.2 Promote the institutional strengthening for waste management.

Sub-objectives	Time Frame	Responsible	Products
2.2.1 To determine the capacity needs among BCC staff and political leaders	2022	BcC/Consultant	Capacity needs assessment report
2.2.2 - To improve on the number of existing staff and strengthen the capacities of BCC staff and political leaders	2022-2023	BCC/WMD/Njala University/	Capacity Development Plan
	2023	BCC/WMD	Recruitment plan

	2022-2023	Consultant	Training schedules
2.2.3 To develop a set of indicators in order to measure the efficiency and effectiveness of the waste management system	2024	BCC/WMD	Monitoring and Evaluation Plan
	2022	Consultant	Indicators tool
	2022	BCC/consultant	Training on the use of how to monitor and evaluate using the indicator tool
2.2.4 To create an information system that collects the gathered data	2023	BCCWMD/ /Consultant	Information system developed
	2023	BCC/WMD	Best practices documented
	2023	BCC/WMD	Lessons learned systematised
	2024	WM Department at BCC	Dissemination Plan on best practices and lessons learned
	Annually	WMD	Newsletters published bi-annually/updated Website

2.2.5 To develop a set of indicators in order to measure the efficiency and effectiveness of the waste management system	2022	BCC/WMD	Monitoring and Evaluation Plan
2.2.6 Create an information management system that collects, process and evaluate waste related data	2022	BCC/WMD/Consultant	Data Collection Software procured and installed
	2022	BCC/WMD/Consultant	Workers trained in the use of software
2.2.7 Regulate the activities of institutions and/or individuals involved in waste management activities.	2022	BCC/WMD	Registration certificate and Database of registered institution
	2022		Map of operational areas and waste actors
2.2.8 Promote the formulation and enforcement of environmental laws by creation and special sanitation prosecuting system.	2022	BCC/WMD/Consultant	Bye laws formulated and approved
	2022	BCC/WMD/Consultant	Functional sanitation court
2.2.9 Improve on staff welfare and conditions of service. Occupational Health and Safety should be implemented and enforced	2022	BCC/WMD	Salary, incentive and conditions of service reviewed
	2022	BCC/WMD/Consultant	Workers trained in basic occupational Health and safety measures

Specific Objective 2.3 Promote the creation of PPP for service delivery.			
Sub-objectives	Time Frame	Responsible	Products
2.3.1 To assign the responsibilities related to PPP arrangements to a specific department	2022	BCC/Consultant	Capacity needs assessment report
	2022	BCC/Consultant	Capacity development plan on PPP
	2023	BCC/consultant	PPP tender procedures elaborated and approved by City Council
	2023	BCC/WMD	Basic contracts for different PPP models prepared and approved by City Council
	2023	BCC/consultant	PPP Monitoring system elaborated and approved by City Council
	2023	BCC/Njala University/ consultant	Capacity development in contracting and monitoring PPP

2.3.2 To create/formalise an Advisory and Consultative Committee that has the responsibility to support PPP activities e.g. contracts, MoUs, technical issues and alike	2023	BCC/consultant	Roles and responsibilities defined and institutionalized
Specific Objective 2.4 Propose mechanism for oversight of the waste management system.			
Sub-objectives	Time Frame	Responsible	Products
2.4.1 To create a Waste Management Steering Committee that has the responsibility to oversee the execution of the Action Plan	2022	BCC/WMD	Roles and responsibilities of the SC prepared and formalized including meetings' schedule
	2022	WMD/ consultant	Training on waste management issues to SC

3. Collection and transport of waste

Specific Objective 3.1 To improve the collection and transport of non-hazardous waste.

Sub-objectives	Time Frame	Responsible	Products
3.1.1To improve the planning of collection of non-hazardous waste	2022/2023	WMD/youth groups	A systems for secondary collection and transfer designed
	2022	BCC/youth groups	Coordination mechanisms among departments defined at BCC for planning and monitoring waste management
	2022	BCC/WMD	Waste collection schedule
3.1.2 - To expand on the coverage of door-to-door waste collection system.by enlarging CBEs including youth groups involve in door-to door collection systems door collection systems	2022	BCC/INGO	A starter kit for youth groups via a revolving fund
	2022	BCC/WMD/youth groups	Training provided in door-to-door collection
	2022	WMD/youth groups	Collection schedules defined and published
	2022	WMD/youth groups	Analysis of the solid waste coverage in the city
	2022	WMD/Youth Groups	Expanded customer data base

	2022	WMD/youth groups	Routing systems revised and improved

	2022	BCC/WMD	Guidelines and rules for equipment transferred to youth groups
	2022	Youth groups	Bi-monthly report on the state of the transferred equipment to Waste Management Department
3.1.3 - Council should improve on the number of waste collection vehicles and maintenance and repair the existing ones	2022	BCC/WMD	Fleet assessment report
	2023	WMD/youth groups	Definition on modalities for non-hazardous waste collection and transport for difficult areas/pro poor areas
	2022	WMD/youth groups	Analysis of infrastructure and equipment needed for collection and transportation systems
	2022	BCC/WMD/youth groups	Technical specifications of equipment needed
	2022	BCC	Equipment approval and budget allocated
	2023	BCC/WMD	Outsourcing plan for collection and transportation
	2022	Consultant in mechanics	Training on maintaining of collection and transportation systems

3.1.4 To promote the incorporation of the private sector through strategic alliances such as PPP, CBOs, MSEs, including norms that allow BCC to control the system	2022	BCC/WMD	Tender document prepared
	2023	BCC/WMd	Due diligence on the on the existing PPP's
	2022	BCC	Road improved to official disposal site
	2022	BCC	PPP supported for collection and transport of waste to disposal site called

3.1.5 To improve on the transfer of waste process to avoid spillage and further pollution	2022	BCC/WMD	Transfer stations situation analysis
	2022	BCC/WMD	Plan developed for efficient transfer stations
	2022	BCC/WMD	Equipment acquired for well managed transfer stations and transportation process eg. Skip step, Skip Cover etc
3.1.7 To improve the public cleansing system	2022	BCC/WMD/Njala University	Efficiency analysis report on public cleansing process
	2022	BCC/WMD/Njala University	Plan for the improvement of public cleansing activities including avoidance of illegal disposal sites
	2022	BCC/WMD/Njala University	Public and business areas reports on waste management activities
	2014	BCC/WMD/Njala University	Plan for the improvement of public and business areas waste collection and transportation

3.1.8 Source separation of waste should be initiated with possible incentive and punitive measures attached for compliance and default.	2024	BCC/WMD	Two bin collection system instituted
	2024	BCC/WMD	Differentiated Waste collection schedule
	2024	BCC/WMD	Incentive measures and punitive action documented and approved for patroits and defaulters respectively
3.1.8 The council should establish a special professional waste collection service for specific waste such as Health care waste, electronics waste, waste oil etc.	2022	WMD	Special waste collection schedule
	2022	WMD	MoU/contract with specialized waste producers
	2023	WMD	Specialized waste collection and disposal facilities
3.1.9 To improve on road network to the disposal site.	2023	BCC/Consultant	Contract award for maintenance of road
	2023	BCC/Consultant	Road rehabilitation plan
Specific Objective 3.2 To improve the collection and transport of hazardous waste.			

Sub-objectives	Time Frame	Responsible	Products
3.2.1 To develop a collection and transportation of hazardous waste from industries, HH and health care centers	2022-2023	BCC/WMD/MoHShealth care centers	Proper storage at health care centres
	2022-2023	Njala University/ consultant/ WHO	Definition on modalities for hazardous waste (e.g. paints, medicines, solvents, collection and transport for household and health care centres
	2022-2023	WMD/Njala University/ consultant/ WHO	Training in safety and safety equipment acquired for collection
	2014-2015	Njala University/ consultant/ WHO	Training to health care workers on safety for collection of HCW
	2023	BCC/WMD/Consultant	Hazardous waste disposal facilities created
	2014-2015	BCC/WMD/consultant/WHO	Monitoring system for hazardous waste collection

4. Treatment (Composting Activities)

Specific Objective 4.1 To develop compost initiatives.				
Sub-objectives	**Time Frame**	**Responsible**	**Products**	
4.1.1 To prepare a home composting and community composting and back yard gardening action plan	2023	BCC/WMD/Njala University/ Waste to Wealth Entrepreneurs Association	Home composting plan	
	2023	BCC/WMD/Njala University/ Waste to Wealth Entrepreneurs Association	Home composting training	
	2023	BCC/WMD/ Waste to Wealth Entrepreneurs Association	Gardening competition with prizes included	
	2023	BCC/WMD/ Waste to Wealth Entrepreneurs Association	Packaged branded compost	
4.1.2 To prepare and implement strategies for collection of clean wet waste at HHs and markets	2023	WMD/Youth groups and interested entrepreneurs	Waste Collection plan	

4.1.3 To create Market for compost products	2023-2024	BCC/WMD/Youth groups, interested entrepreneurs, Ministry of Agriculture, farmer associations, mining companies	Marketing plan
	2023	BCC/WMD/ Ministry of Agriculture, farmer associations, mining companies	Policy on the use of compost
4.1.4 To develop and implement a pilot compost project for one market	2023	BCC/WMD/Consultant/SME's	Pilot project prepared and implemented for collection and separation in one market
	2023	BCC /WMD/SME's	Site selected and method for composting activities
	2023	Njala University/ consultant/ entrepreneurs in composting	Training on composting
	2024	BCC/WMD/Njala University/ consultant/ entrepreneurs in composting,	Implementation of composting of organic waste from all the vegetable markets

	2015 on wards	BCC/WMD/Youth groups, interested entrepreneurs, Ministry of Agriculture, farmer associations, mining companies	Coordination plan with Ministry of Agriculture, farmer associations, mining companies

5. Final Disposal

Specific Objective 5.1 To assure that non-hazardous waste is safely disposed Official disposal site.

Sub-objectives	Time Frame	Responsible	Products
5.1.1 Maintenance 5 mile (8 km) of feeder road and road network at disposal site	2023/24	BCC/WM/Government	Prepared design Specification and tender documentation
	2014	BCC	Secured fund
	2014/15	BCC/WMD	Advertised tendered and evaluated contract for road construction and carried out construction work

5.1.2 Determine materials and costs for improvement of conditions, fence and gate for the official disposal site	2022	OWL	Assessment on improvement of conditions of disposal site
	2014	BCC	Cost analysis and budget allocation approved for improvement, fence and gate of disposal site and secured fund
5.1.3 Analyse the proper zoning of the disposal site	2013		Technical proposals assessment for design of disposal site
5.1.4 Determine infrastructure for zoning and management areas	2022/23	BCC/WHH/OWL	Prepared outline brief from design of Resource Park
	2022/23	OWL	Training in management and operations of disposal sites
	2022	BCC/WMD	Budget for management of disposal site including all capital and revenue costs
	2023	BCC/WMD/Consultant	Prepared design specification for construction of Resource Park for design and build contract

Specific Objective 5.3 To assure that hazardous waste is safely disposed.			
Sub-objectives	Time Frame	Responsible	Products

5.3.1 Evaluate options of safe disposal of hazardous waste	2023/24	BCC/WMD/Njala University and consultant	Evaluation report on HCW and hazardous waste
5.3.2 Determine costs for hazardous waste safe disposal	2023/24	BCC/WMD/consultant	Costs report
	2014/15	BCC and consultant	Setting tariff/fee for HCW disposal services
5.3.3 Set up hazardous waste disposal facility within the site	2023	WMD/Consultant	Hazardous waste disposal Guidelines
	2023	WMD/Consultant	Hazardous waste disposal section
Specific Objective 5.4 To eliminate illegal small dump sites.			
Sub-objectives	Time Frame	Responsible	Products
5.4.1 Map out illegal disposal sites	2022	BCC/WMD	List of illegal dumpsites
5.4.2 Set up a plan for regular collection of waste at illegal disposal site	2022	WMD	Eradication of illegal disposal sites plan developed
	2022/2023	BCC/WMD	Illegal dumpsite clearing schedule and secured funds

5.4.3 Define a penalty system for polluters	2022	BCC/WMD/Local Authorities	Bye-Law with enforcement procedures created
Specific Objective 5.5 To assure proper management and functional site			
Sub-objectives	Time Frame	Responsible	Products
5.5.1 Construct road network within the site	2023	BCC /WMD/Government	Contract award for construction of road
	2023	BCC/WMD	Road Construction plan
5.5.2 Improve on management system at the disposal site.	2023	WMD/Consultant	Disposal Site management guidelines
	2023	Consultant	Trained workers on the operation of the facilities
5.4.3 Review environmental and social management plan for Mile	2014	BCC	Revised Environmental and Social Management Plan

5.5.4 Assign dedicated staff at the site	2022	BCC/WMD	Staff employed at the disposal site
	2022	WMD	Duty roster for assigned staff
5.5.5 Improve on the power source at the disposal site	2022	BCC/Consultant	Report on energy survey
	2023	BCC/WMD/Donor	Sustainable power source installed
5.5.6 Machineries should be made available at the site for management of waste.	2022	BCC/WMD/Donor	Earth moving machines procured for management of waste at the disposal site
	2022	BCC/WMD/Consultant	Updated Fleet Management policy

6. Health Care Waste

Specific Objective 6.1 Create conditions to strengthen the planning and management for an integral and sustainable health care waste management system.

Sub-objectives	Time Frame	Responsible	Products
6.1.1 To create a task force for HCW management	2023	BCC/WMD/Njala University/Health care centres representatives	Task forced institutionalised with clear roles and responsibilities
	2023	BCC/WM/MoHS	List of members of the Task Force
6.1.2 To develop on-site assessments on quantities and composition of HCW	2022	BCC/WMD/Njala University	Health care waste management diagnosis and recommendations
6.1.3 To develop an integral HCW management system	2023	BCC/WMD/consultant	Definition of the model(s) adapted to hospitals, PHUs and pharmacies
6.1.4 To create capacities among health care personnel	2023	BCC/WMD/MoHS	Capacity needs assessment report
	2023	BCC/WMD/Njala University/ consultant	Health care centres personnel trained on HCW management

6.1.5 To establish a legal framework for HCW management	2022	BCC	Bye-Law developed for HCW management
Specific Objective 6.2 Promote the institutional strengthening for health care waste management.			
Sub-objectives	Time Frame	Responsible	Products
6.2.1 To identify the capacity needs among health care waste management staff	2023	BCC/WMD/MoHS/ consultant	Capacity needs assessment report
6.2.2 To strengthen the capacities of health care and BCC staff	2023	BCC/Njala University/ consultant	Capacity Development Plan
	2023	Njala University/ consultant	Training schedules
6.2.3 Develop a set of indicators in order to measure the efficiency and effectiveness of the health care waste management system	2024	BCC/WMD/Njala University/ consultant	Monitoring and Evaluation Plan
	2024	BCC/WMD/Njala University/ consultant	Indicators tool
	2024	Njala University/ consultant	Training on the use of how to monitor and evaluate the using the indicator tool

6.2.4 Create an information system that collects the gathered data	2023	Health care task force	Information system developed
	2024	Health care task force	Best practices documented
	2024	Health care task force	Lessons learned systematised
	2024	Health care task force	Dissemination Plan on best practices and lessons learned
	2024	Health care task force	Newsletters published bi-annually
Specific Objective 6.3 Promote the creation of PPP for service delivery.			
Sub-objectives	Time Frame	Responsible	Products
6.3.1 To assign the responsibilities related to PPP arrangements to a private operator	2023	Njala University/ consultant	Capacity development plan on PPP
	2023	BCC/WMD/ / consultant	PPP tender procedures elaborated and approved by City Council
	2023	BCC/WMD/Njala University/ consultant	Basic contracts for different PPP models prepared and approved by City Council
	2023	UNDP/Njala University/ consultant	PPP Monitoring system elaborated and approved by City Council

	2023	UNDP/Njala University/ consultant	Capacity development in contracting and monitoring PPP
	2023	BCC	Signed PPP contract agreement for HCW management
Specific Objective 6.4 Propose mechanism for oversight the waste management system.			
Sub-objectives	Time Frame	Responsible	Products
6.4.1 To create a Waste Management Steering Committee that has the responsibility to monitor and evaluate the system	2022	BCC/WMD	Terms of reference, Rules and regulations of SC prepared and formalized including meetings' schedule
	2023	BCC/WMD/MoHS/ Njala University/ consultant	Training on health care waste management issues to SC
	2023	BCC/WMD/MoHS/ Njala University	Monitoring and evaluation plan in place with monitoring indicators
6.4.2 -Coordinate and set up a joint monitoring system with the District Health Management Team	2023	BCC/WMD/MoHS	List of Members of the Joint Monitoring Team

	2023	BCC/WMD/MoHS	Joint Monitoring Plan

7. Recycling

Specific Objective 7.1 Strengthen the waste trading sector

Sub-objectives	Time Frame	Responsible	Products
7.1.1 To increase recycling rates	2022	BCC/WMD/Donor	Recycling Unit Re-organization
	2022	WMD/Recycling Union/Njala University	Assessment report of existing waste streams (recyclables) and recycling companies
	2022	WMD/Recycling Union/Njala University	Identification of waste sellers
	2022	BCC/Recycling Union/ INGO	Network of recyclable goods traders developed
	2022	WMD/Recycling Union/Njala University	Formalization procedures for traders developed and approved
	2023	WMD/Recycling Union/Njala University/INGO	List of national and international recyclables goods traders

	2023 onwards	WMD/Recycling Union/Njala University / INGO	Linking with biggest recyclable goods buyers plan developed
	2023 onwards	BCC/WMD/Recycling Union/ INGO	Exchange sessions with sister initiatives in other parts of the country
	2022 onwards	BCC/WMD/Recycling Union/Njala University / INGO	Established drop-off points for recyclable goods
7.1.2 To involve CBEs/SMEs in processing of waste-derived products (Waste-to-Wealth activities)	2022	WMD/Recycling Union/ INGO	Assessment of existing and potential business/Networking ideas created
	2023-2024	Njala University/ consultant	Trainings provided on business plans and other topics
	2022 onwards	BCC	Business registration
	2022 onwards	BCC/WMD	Licensing developed
	2022	WMD/consultant	Training and capacity development provided on waste processing to marketable products
7.1.3 - Capacitate the SME's/CBEs operating in waste recycling business	2022	WMD/Recycling Union/ INGO	Capacity building plan for SME's
	2022	SMEs/INGO/WMD	Business plan
7.1.4 -Facilitate the creation of market for recycled products and compost	2022	Recycling Union/ INGO	Assessment of existing and potential business/Networking ideas created
7.1.5Sensitize the community on the availability and use of recycled products and improve of the marketing strategy.	2022	BCC/WMD/ Recycling Union	Communication streyety
Specific Objective 7.2 Develop locally a recycling initiative.			

Sub-objectives	Time Frame	Responsible	Products
7.2.1 To establish a new recycling initiative as PPP in paper or plastic recycling	2023	BCC/WMD/Njala University/ INGO/consultant/Chamber of Commerce SL	Market survey report
	2022	BCC/WMD/INGO/consultant/ Chamber of Commerce SL	Capacity assessment plan
7.2.2Train or encourage recyclers to learn new technologies and skills to add value to their existing products.	2022	BCC/WMD/ INGO/consultant/ Chamber of Commerce SL	Assessment of business to be developed as a pilot
	2022	BCC/WMD/INGO	Tender for a pilot
	2022	BCC/WMD	Business registration
	2022	BCC/WMD	Licensing developed
	2022	BCC/INGO/ Recycling Union	Profit management plan
7.2.3 Mechanize production and improve and enforce safety measures.	2022	BCC/WMD/ INGO/consultant/ Chamber of Commerce SL	Low cost technology secured.
	2022	BCC/WMD/Consultant	Occupational Health and safety policy

8. Capacity Development

Specific Objective 8.1 Prepare environmental awareness programme for the community.

Sub-objectives	Time Frame	Responsible	Products	
9.1.1 To develop an educational program on waste minimisation, separation, reuse, recycling and environmental sound waste disposal	2023	Njala University/EPA/ MoHS/ Chief/CBO/ NGO/ INGOs	Environmental education plan available	
	2023	BCC/Njala University/ /EPA/MoHS/Chief/CBO/ NGO/	Communication strategy Plan for all types of stakeholders	
	2023	BCC/Njala University/ Ministry of Education/EPA/ MoHS/ Chief	Community Participation Plan	

	2023	Njala University/ Ministry of Education/EPA/ MoHS/ ChiefConsultant	Training provided to teachers
	2023	BCC/WMD/Njala University/ /EPA/MoHS/CBO/INGO	Support materials for teachers and students printed

	2023	WMD/School teachers/ MoHS	Waste management school clubs
	2023	WMD/School teachers/ MoHS	Recycling and composting facilities at school level
	2023	School teachers/ MoHS	Competition programme for recycling among schools with prizes provided
	2023	BCC/WMD/ Ministry of Education/EPA/ MoHS/ Chief/CBO/ NGO/ INGOs	Monitoring indicators produced

	2024 onwards	BCC/Njala University/ Ministry of Education/EPA/ MoHS/ Chief/CBO/ NGO/ INGOs	Evaluation of the programme
Specific Objective 8.2 Develop capacities of main stakeholders.			
Sub-objectives	Time Frame	Responsible	Products
8.2.1 To strengthen capacity of Bo City groups and individuals	2023 on wards	BCC/WMD/Njala University/ CBOs/NGOs and other forms of association	Capacity development plan prepared including training schedules
8.2.2 To provide exchange visits for capacity development	2023 onwards	BCC/WMD/INGO	Inter-city exchange programme developed
	2023	BCC/WMD/INGO	International visit programme developed
8.2.3 -To strengthen the involvement and capacity of the Local City Councils' Association in solid waste management	2023	BCC /WMD	Local City Councils Association trained in solid waste management issues

8.2.4 To strengthen the capacity of staff at the waste management Department	2022	Consultant	Training on so;lid waste management

10. Legal Aspects

Specific Objective 10.1 Strengthen the legal framework for SWM.

Sub-objectives	Time Frame	Responsible	Products
10.1.1 To set up the norms and regulations that allow the improvement of the waste management system	2022 onwards	BCC and National Government	Creation of needed Bye-Laws
	2022 onwards	BCC/Chief/ and National Government	Approval of Bye-Laws
10.1.3 - To assign and capacitate dedicated enforcement officers to the waste Management department	2023	BCC/WMD	Recruitment of enforcement Officers

	2023	BCC and National Government	Training of Enforcement Officers