



International Organization for Migration (IOM)  
The UN Migration Agency

# Study on the issues and opportunities of Solid Waste Management within Internally Displaced Persons (IDPs) settings in West and Central Africa

External version

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## Acronyms

<b>AfDB</b>	African Development Bank
<b>AFD</b>	Agence Française de Développement
<b>APEJ</b>	Agence pour la Promotion de l'Emploi des Jeunes
<b>BOSEPA</b>	Borno State Environment Protection Agency
<b>CAR</b>	Central African Republic
<b>CEAS</b>	Centre Écologique Albert Schweitzer
<b>CBO</b>	Community-Based Organisation
<b>CCCM</b>	Camp Coordination and Camp Management
<b>CfW</b>	Cash-for-Work
<b>EAWAG</b>	Swiss Federal Institute of Aquatic Science and Technology
<b>EU</b>	European Union
<b>EWB</b>	Engineers Without Borders
<b>FCC</b>	Freetown City Council
<b>FSM</b>	Faecal Sludge Management
<b>GEF</b>	Global Environment Fund
<b>GGGI</b>	Global Green Growth Institute
<b>GSAT</b>	Gestion des Sites d'Accueil Temporaire
<b>ICRC</b>	International Committee of the Red Cross
<b>IDP</b>	Internally Displaced Person
<b>IGAs</b>	Income Generating Activities
<b>ILO</b>	International Labour Organization
<b>INGO</b>	International Non-Governmental Organization
<b>IRS</b>	Informal Recycling Sector
<b>IOM</b>	International Organization for Migration
<b>IFRC</b>	International Federation of Red Cross and Red Crescent Societies
<b>IRC</b>	International Rescue Committee
<b>JEU</b>	UN Environment/OCHA Joint Environmental Unit
<b>JICA</b>	Japan International Cooperation Agency
<b>LWF</b>	Lutheran World Federation
<b>MECC</b>	Migration, Environment and Climate Change
<b>NCA</b>	Norwegian Christian Aid
<b>NGO</b>	Non-Governmental Organization
<b>NGI</b>	Norwegian Geotechnical Institute
<b>NRC</b>	Norwegian Refugee Council
<b>OCHA</b>	Office for the Coordination of Humanitarian Affairs
<b>PARCA</b>	Projet d'Appui aux Réfugiés et aux Communautés d'Accueil
<b>SWM</b>	Solid Waste Management
<b>UNHCR</b>	United Nations High Commissioner for Refugees
<b>UGC</b>	Unité de Coordination de la Gestion des Déchets (Senegal)
<b>VCA</b>	Value Chain Analysis
<b>WASH</b>	Water Sanitation and Hygiene
<b>WCA</b>	West and Central Africa

# Introduction

## Background of the study

The countries of the West and Central Africa (WCA) region have around 6 million<sup>1</sup> Internally Displaced Persons (IDPs), living largely in IDPs camps, camp-like settings and areas of concentration of IDPs in host communities. The general lack of proper Solid Waste Management (SWM) systems in these IDP settings, including storage, collection, transportation, treatment, recovery and final disposal operations has a wide range of negative effects, including direct implications on human health, environmental degradation as well as indirect effects on infrastructure and livelihood.

The situation is usually similar in host communities, with existing SWM systems already deficient and challenged by sustained population growth and rapid urbanization. On the other hand, Solid Waste Management, notably through reuse and recovery practices, could also become a source of green job and livelihood opportunities for camp residents and host communities.

Recognizing that a healthy environment is intrinsically linked to the well-being and resilience of migrants and host communities, IOM launched in 2017 its institutional Environmental Sustainability Programme (ESP), based within the Migration, Environment and Climate Change (MECC) division. This program reflects IOM's commitment to improve the sustainability of its operations at the strategic, programmatic and facility levels, with SWM being one of the focus areas of the program<sup>2</sup>.

The present study is embedded in this global effort, as part of the project “Enhancing the capacity of IOM staff to mainstream environment and climate change within the wider framework of Migration Management in West and Central Africa – Senegal as a concrete example”, funded by a Netherlands' voluntary contribution to IOM (MIRAC funding).

## Objectives

The general objective of the study is to identify the issues and opportunities of Solid Waste Management within IDPs camps, camp-like settings and areas of concentration of IDPs in West and Central Africa. More particularly, the study is expected to provide:

- A review of good practices related to SWM globally, with a specific attention to those offering waste reduction, re-use, recovery and job opportunities that could practically be applied in IDP settings in West and Central Africa;
- A review of good practices related to SWM in the perspective of reintegration, prevention of migration, general improvement of living conditions and development of economic opportunities, that can be applied in Senegal and in other countries in the region that are not facing specifically IDPs situation;
- A set of recommendations for the region, in both IDPs and non-IDPs settings.

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<sup>1</sup> International Organization for Migration for West and Central Africa, 2020. “The Forgotten Ones: Displaced in West and Central Africa Amidst the COVID-19 Crisis”, Situation Report – COVID-19 Response, n°8, p. 1 (<https://rodakar.iom.int/sites/default/files/document/publications/Sitrep%208%20RO%20Dakar.pdf>)

<sup>2</sup> The other focus areas are Greenhouse Gas Emissions and water (IOM's engagement in Migration, Environment and Climate Change. IOM, 2018).

## Methodology and structure of the report

In order to achieve the objectives described above, the following activities were implemented:

- A **review of available literature** and documentation related to SWM in IDP settings, including project reports, existing guidelines, press releases, websites, etc.;
- An **online survey** targeting IOM key staff in countries of West and Central Africa (particularly the focal points for Water, Sanitation and Hygiene (WASH), Camp Coordination Camp Management (CCCM), and MECC), designed to gather information on the current situation, existing needs and practices, details on ongoing IOM interventions as well as references of key organisations and projects to be contacted;
- Direct contacts and **interviews**, both with IOM staff as well as staff from other organisations, in West and Central Africa and globally.

This report includes a presentation of the main components and actors of SWM, the related impacts and opportunities in IDP settings, an analysis of the current situation in West and Central Africa, an identification of good practices in the region and globally (together with key factors for replicability), as well as references to existing resources available for future design and implementation.

# 1 General framework of Solid Waste Management in IDP setting

## 1.1 Components of Solid Waste Management

Solid Waste Management (SWM) systems are typically composed by different stages including storage, collection, transportation, processing, recovery and final disposal of waste. It usually involves a diversity of stakeholders, including public institutions, the formal and informal private sector, and connects to other economic sectors such as industry (manufacturing), energy and agriculture.

### Production and storage

Waste production and storage is the first step of any SWM system. Quite often, the conditions of waste management within the households will affect directly the subsequent phases of the system.

As an example, waste segregation at source, which requires proper storage equipment in the households, can influence greatly the potential and quality of further waste recovery processes.

Actions aiming at reducing the waste production are also important to be considered in order to improve sustainability of SWM systems.

### Collection and transportation

Waste collection and transportation is often the costliest phase of the SWM system, both financially and in terms of human resources and equipment.

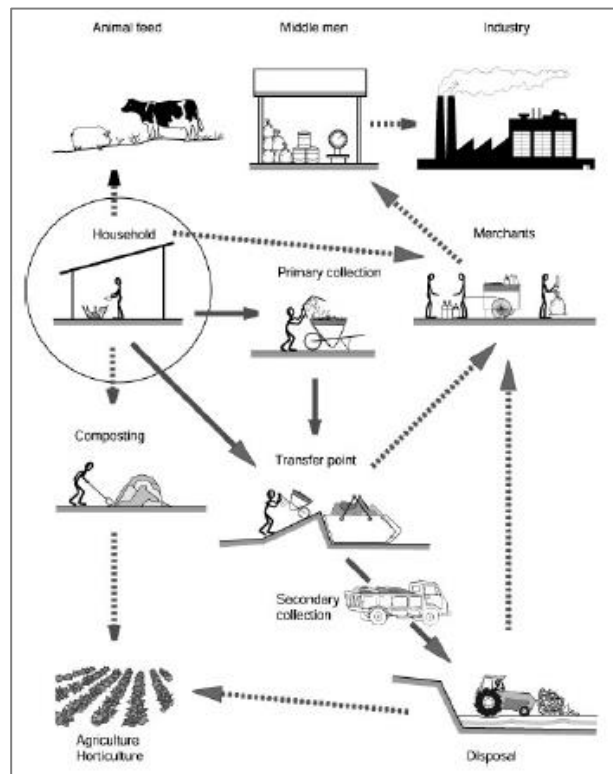


Figure 1 - Typical elements of a SWM system in low- or middle-income countries (source: SANDEC/EAWAG)

In low and middle-income countries, it can usually be divided in two sub-phases:

- Primary collection, performed by small formal and informal operators using small equipment such as handcart or tricycles, with waste disposed of at transfer points (containers) available in the vicinity;
- Secondary collection with larger trucks collecting waste from transfer points and transporting it to final disposal locations, usually performed by local authorities or by sub-contracted private service providers.

### Waste recovery

The recovery of waste into valuable material can take different forms, depending on the type of waste and the processes involved:

- Recyclable material (plastic, metal, paper, etc.) follow a complex value chain which include several steps of collection, segregation, pre-processing, conditioning into raw material, until the manufacturing into new products, which can happen locally or after exportation to international markets.

- Organic material can also be recovered in different ways, which include composting (aerobic processing), anaerobic digestion (biodigesters), and pyrolysis (production of biochar);
- In more advanced settings, waste recovery can also integrate waste-to-energy processes, such as large incinerators or transformation plants of biogas into energy.

## Final disposal

Solid waste that has not previously been recovered finally needs to be disposed of. Due to the lack of properly engineered landfill, waste final disposal is often a source of large environmental impacts, including pollution of ground and surface water resources, open burning and related diffusion of Persistent Organic Pollutants (POPs) into the environment, and production of greenhouse gases such as methane due to the anaerobic decomposition of the waste body.

Waste final disposal also often faces the issue of land availability, with direct impacts on collection and transportation costs when this land cannot be found in the vicinity of the area of production.

## Integrated Solid Waste Management

In order to be sustainable, the planning and implementation of SWM systems need to integrate not only the physical components presented above, but also the question of Governance, the analysis of financial sustainability, and the engagement of all key stakeholders, including the population itself.

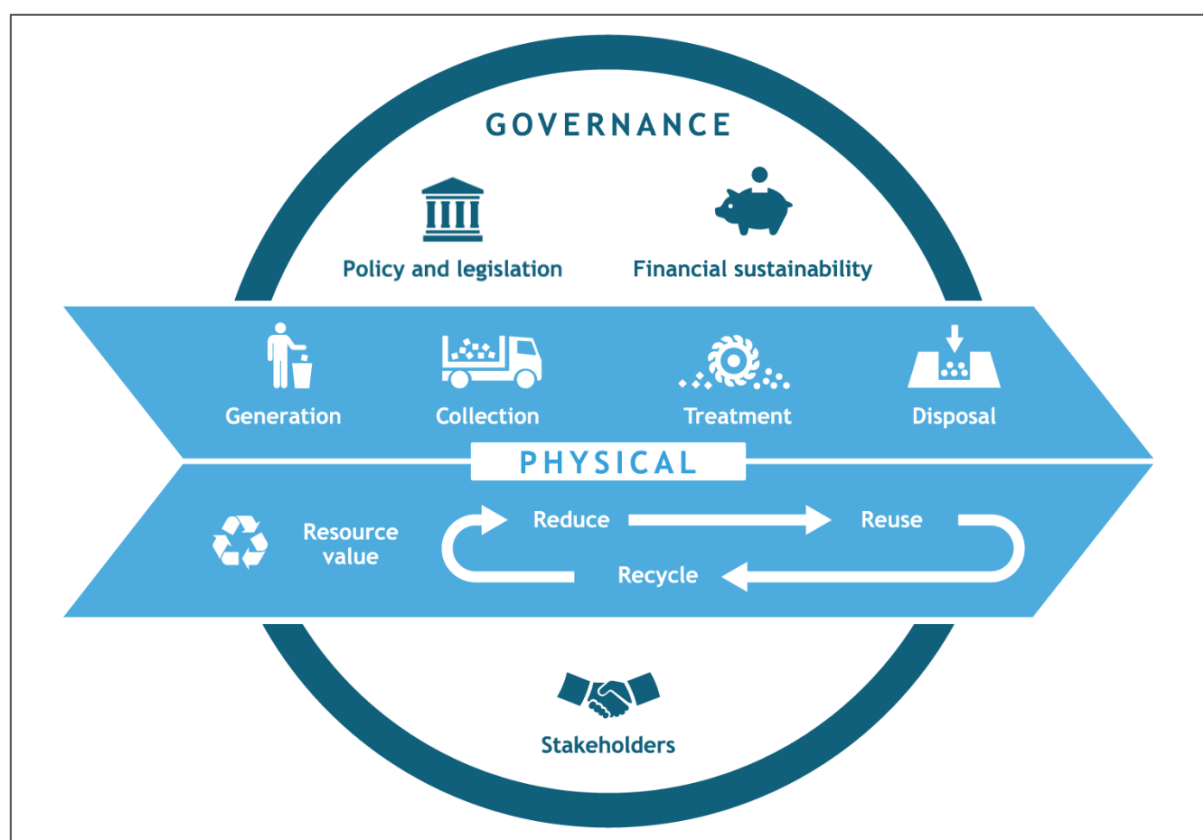


Figure 2 – Overview of Integrated Solid Waste Management (source EAWAG)

## 1.2 Impacts and opportunities of Solid Waste Management in IDP settings

Solid Waste Management is usually not the first priority in rapid-onset emergencies generating major displacement, due to other life-saving components of humanitarian support such as provision of shelter, food and non-food items, water and basic sanitation, health or protection services<sup>3</sup>.

However, there are numerous negative impacts of mismanagement of Solid Waste that need to be taken into consideration, including direct impacts on health and the environment, as well as indirect impacts on livelihood, protection, drainage and sanitation. Most of these negative impacts are not specific to IDP settings, however the level of vulnerability and the precarious living conditions of the population in such settlements make these impacts more acute.

At the same time, SWM also represents opportunities for both IDPs and host communities, either in the form of direct job opportunities or indirectly through synergies with other socio-economic sectors (energy, agriculture, environment).

*Table 1 – Potential impacts and opportunities related to Solid Waste Management*

<p><b><u>Direct impacts</u></b></p> <ul style="list-style-type: none"> <li>• Threat to the environment, with potential permanent pollution of soil, ground and surface waters</li> <li>• Threat to public health, linked to inadequate waste management practices (e.g. emissions of dioxins from open burning, use of plastic waste for cooking), to the pollution of natural resources, or to the proliferation of vectors (rodents, flies, mosquitoes, etc.)</li> </ul>	<p><b><u>Direct opportunities</u></b></p> <ul style="list-style-type: none"> <li>• Job creation related to waste collection service provision</li> <li>• Livelihood opportunity in the recycling value chain</li> </ul>
<p><b><u>Indirect impacts</u></b></p> <ul style="list-style-type: none"> <li>• Death of livestock due to the ingestion of plastic, affecting pastoral livelihoods</li> <li>• Protection issue: potential security concerns related to waste disposal, both inside the camp (disposal by the IDP population) and outside the camps (risk for service providers, particularly in location with security issues)</li> <li>• Blockage of drainage infrastructure, with potential issues such as water logging, flooding and waterborne diseases</li> <li>• Operational difficulties of Faecal Sludge Management (FSM) linked to the presence of waste mixed with human waste in the latrines</li> <li>• Conflicts with host communities due to the use of land for final waste disposal</li> </ul>	<p><b><u>Indirect opportunities</u></b></p> <ul style="list-style-type: none"> <li>• Potential reduction of the needs for charcoal linked to production of fuel resources from organic waste (biogas, biochar), with direct impact on local wood resources and reduction of security risks related to wood collection activities, as well as increased availability of children for school</li> <li>• Potential positive inputs on other sectors of livelihood, such as agriculture and reforestation (use of compost), or manufacturing (with recyclable material)</li> </ul>

<sup>3</sup> As an example, the Gap Analysis in Emergency Water, Sanitation and Hygiene Promotion (HFI, 2013) indicates that SWM ranks only 24th/26 in the list of emergency issues raised by partners



### 1.3 Mapping of actors of Solid Waste Management in IDP settings

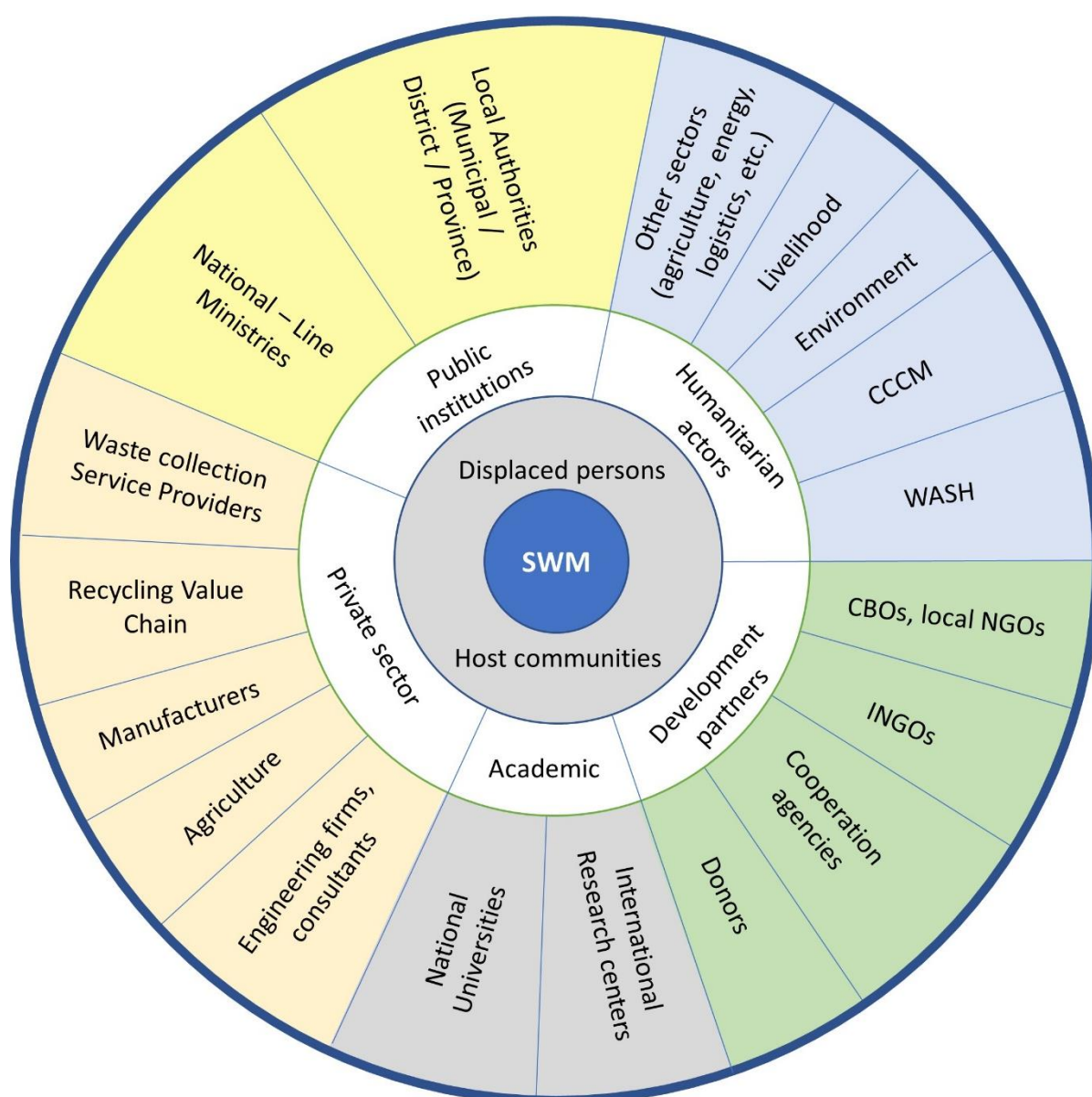


Figure 3 – Mapping of actors involved in SWM in IDP settings

The figure above presents the main categories of actors usually involved directly or indirectly in SWM activities. These categories and some examples of the actors that are active in the West and Central Africa region are described below. A detailed list of all key-stakeholders identified globally and in several countries of the region is presented in Annex.

#### Population (displaced persons and host communities)

The population has a central role in any SWM system, as beneficiaries of the SWM services but most importantly as active stakeholders of this system and potential agents of change in their own communities. Involving the IDPs and host community in the definition and the implementation of SWM is essential in order to define solutions that are adapted to the local context, the culture, and to ensure ownership that will help maintaining the systems functional and sustainable.

## Humanitarian actors

Within the humanitarian architecture, the responsibility of SWM falls **officially under the WASH sector**. However, in practice, SWM is often also addressed by members of other sectors, particularly **Camp Coordination Camp Management (CCCM)** and **Shelter**, as part of the general maintenance of the camps, and notably of the drainage infrastructures. From a larger viewpoint, all humanitarian sectors have a role to play in relation to SWM, either as producers (waste directly produced by the humanitarian activities, distributions of food and non-food items, etc.) or as potential final users of recovered materials (agriculture, energy, environment sectors).

Some humanitarian organizations have been specializing in the provision of support in different environmental aspects of humanitarian operations, including SWM. The UN Environment/OCHA Joint Environmental Unit (JEU), for example, has been supporting the development of guidelines on Disaster Waste Management and provides specialized technical support for the management of hazardous waste in emergencies. Another example is the Swedish Contingency Agency (MSB) that has been providing secondment of SWM experts in emergencies to other organisations on the field.

## Development actors

Even in emergency and IDP settings, development actors such as donors, cooperation agencies, international and national non-governmental organizations (INGOs/NGOs) and UN agencies, have an important role to play in the perspective of the Humanitarian-Development nexus and the delivery of long-lasting results. Emergency situations often last several years, and the sustainable improvement of SWM requires an integrated and long-term approach covering both IDP and host communities.

Some key traditional development donors that have been supporting the SWM sector in West and Central Africa include the Government of Japan and JICA<sup>4</sup>, the Agence Française de Développement (AFD), the World Bank, the European Union (EU), the African Development Bank (AfDB), GIZ and International Labour Organization (ILO). The SWM interventions supported by these donors include large municipal development projects (provision of infrastructure, equipment, and development of strategic and operational capacities within local infrastructure) as well as projects for social cohesion and socio-economic development and exploring small business opportunities around waste collection and recovery<sup>5</sup>.

Implementing partners specialized in SWM in the region include INGOs such as the Gret<sup>6</sup> and WASTE AID<sup>7</sup> as well as local organizations like the Centre Écologique Albert Schweitzer (CEAS) in Burkina Faso.

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<sup>4</sup> JICA has supported the creation in 2017 of the African Clean Cities Platform (ACCP), with the purpose of sharing knowledge on waste management, promoting public and private partnership and financial investment, and working towards sustainable development goals (SDGs) - <https://africancleancities.org/>

<sup>5</sup> Example of projects linking SWM and development of business/job opportunities:

- In Burkina Faso : "Moins de déchets, plus d'opportunités : l'économie verte au service des micro, petites et moyennes entreprises de Ouagadougou", funded by the EU ([https://eeas.europa.eu/delegations/burkina-faso/45443/node/45443\\_ka](https://eeas.europa.eu/delegations/burkina-faso/45443/node/45443_ka))

- In Senegal : ILO support to formalization of waste collectors into cooperatives (<https://www.un-page.org/senegal-and-ilo-continue-work-waste-collection>)

<sup>6</sup> Several ongoing projects funded by AFD: in Burkina Faso ("Projet d'appui à la gestion des déchets municipaux dans les villes"), Togo ("Valorisation des déchets à Lomé"), Cameroon ("Projet AFRICOMPOST 2")

<sup>7</sup> Ongoing projects for prevention of plastic pollution and supporting plastic recycling in Cameroon (<https://wasteaid.org/wasteaid-projects/>)

Increasingly, the SWM sector is also supported by global environment and climate-related programs such as the Global Environment Fund (GEF) and Global Green Growth Institute (GGGI)<sup>8</sup>, recognizing the potential for reducing the emissions of pollutants of the sector, including Greenhouse Gases (GHG), and the impacts of natural disasters such as flooding, particularly in urban areas.

## Public Institutions

Public institutions are an essential component of SWM, as they are usually responsible for the delivery of these services to the population. They are also in charge of defining and implementing SWM strategies (Masterplans, National strategies, etc.), with which ideally all initiatives from partners should be well aligned. Key public institutions identified as part of the study include municipalities/local authorities, such as Freetown City Council (FCC) in Sierra Leone, as well as regional authorities such as Borno State Environment Protection Agency (BOSEPA) in Nigeria, both in charge of SWM within their area of jurisdiction.

Other public actors particularly relevant to SWM in the perspective of the development of business and job opportunities are employment promotion agencies such as the Agence pour la Promotion de l'Emploi des Jeunes<sup>9</sup> (APEJ) in Mali.

## Private sector

The private sector is a key actor of SWM, particularly involved in the provision of SW collection services and in the recycling value chain. The typology of actors within the private sector is very diverse, going from large companies to small Community-Based Organisations (CBOs) and informal waste pickers.

The private sector also includes engineering companies providing training, capacity building, and developing innovative technologies, such as Gestion & Valorisation des Déchets (GVD)-Afrique in Niger or more globally, such as the Dutch organization WASTE.

## Universities

Finally, universities can also play an important role in capitalizing and creating knowledge around Solid Waste Management, and in building the future local capacity to manage properly SWM systems through university education. Two types of academic actors were identified as part of this study:

- Research centres addressing SWM globally, such as the Swiss Federal Institute of Aquatic Science and Technology (EAWAG), which has been developing several studies, guidelines, and Massive Open Online Courses on SWM in developing countries;
- Local universities, such as the University of Maiduguri, Nigeria, which have developed research work on local SWM issues.

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<sup>8</sup> Example of SWM project funded by GGGI in Senegal: Project for management of plastic waste, wastewater and waste from electric and electronic equipment (WEEE) in Dakar, Touba and Tivaouane (<https://gggi.org/project/project-reference-profiles-senegalsn2-green-secondary-cities-wastewater-plastic-waste-and-weee-management-innovative-business-model/>)

<sup>9</sup> Institution involved in project Emploi des Jeunes au Mali (EJOM), including SWM activities

## 2 Response and practices in West and Central Africa

### 2.1 General situation of SWM and IDP situation in West and Central Africa

#### 2.1.1 General situation of SWM

With a few exceptions (Ghana, Togo), the countries of West and Central Africa region are characterized by deficient Solid Waste collection systems, with collection rates<sup>10</sup> close to or below 50%. The situation is often very different between urban and rural areas, with most of the collection effort concentrated in the cities<sup>11</sup>.

Another major SWM issue in the region is the lack of proper infrastructure for controlled waste disposal, with 10 of the 50 largest dumpsites in the World being located in the WCA region (6 are located in Nigeria and the others in Mali, Sierra Leone, Senegal and Ghana).

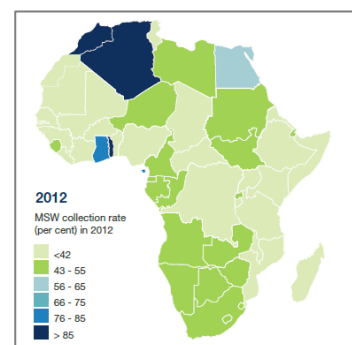


Figure 4 – Waste collection rates in 2012 in Africa (UN Environment Programme, 2018)

Existing waste recovery practices and recycling markets vary greatly between the different countries of the region and within the countries themselves. Mali, for example, is reported as having a high rate of organic waste reuse for animal feeding (UN Environment Programme, 2018), and the development of informal recycling of electric and electronic waste in Nigeria (including illegal imports) is raising environmental and health concerns<sup>12</sup>.

#### 2.1.2 IDPs and situation of migration

There are different problematics in relation to population displacements in the region. Conflicts, inter-communal tensions and insecurity are the main source of forced displacement, with the main countries affected being Nigeria, Cameroun, the Central African Republic (CAR), Burkina Faso, Niger, Mali and Chad. Natural disasters, such as the flooding in CAR, Chad or Cote d'Ivoire in 2019 and 2020, are also generating significant displacements.

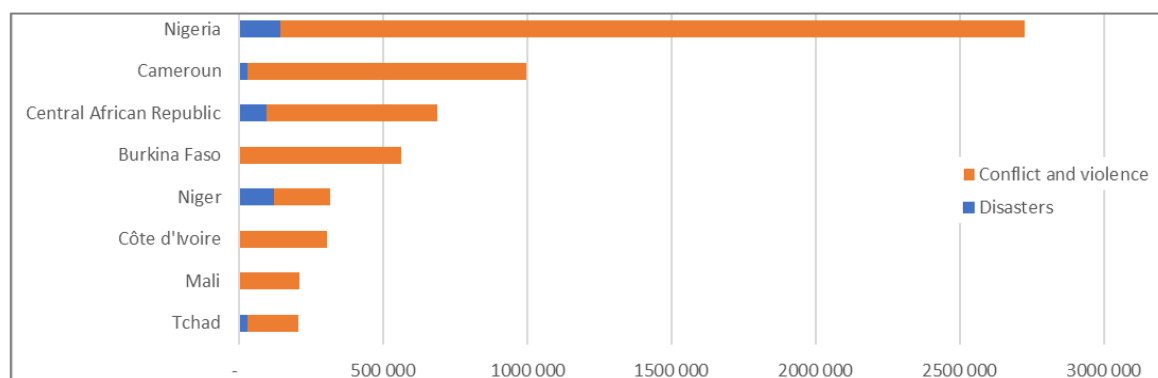


Figure 5 – Internally Displaced Persons as of 31<sup>st</sup> December 2019 (Global Report on Internal Displacements - GRID, 2020)<sup>13</sup>

<sup>10</sup> Africa Waste Management Outlook, UN Environment Programme, 2018

<sup>11</sup> According to the World Bank, the average waste collection rate in sub-Saharan Africa is of 43 % in urban areas, and only 9 % in rural area (What a waste 2.0, World Bank, 2018).

<sup>12</sup> <https://www.trtworld.com/magazine/nigeria-has-become-an-e-waste-dumpsite-for-europe-us-and-asia-24197>

<sup>13</sup> Burkina Faso has known a major increase in displacement in 2020, reaching more than 1 million IDPs in September 2020 (UN-OCHA), and becoming the second country with the larger number of IDPs in the region.

The typologies of IDP settings in the region are very diverse (mixed with host communities, planned camps, informal settlements, spontaneous sites, all of various sizes, in urban/rural areas, facing various security situations, etc.), and this is expected to impact both the criticality of the SWM needs and response and the potential options for improvement.

In addition to forced displacements, the West and Central Africa region is also facing large migration movements, mainly to Europe, with migrants originating from most countries.

These migration movements raise the questions of reintegration process for returnees, through the improvement of living conditions and social cohesion, as well as the management of transit centres.

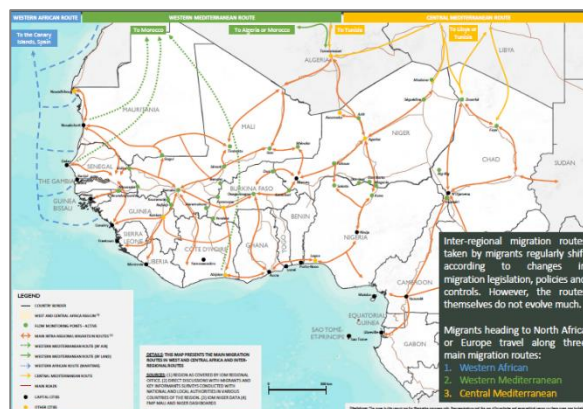


Figure 6 - Migration routes from WCA region to Europe and other areas (IOM, 2020)

## 2.2 Specific SWM response and practices in IDP settings in the region

A quick assessment of existing SWM response and practices in IDP settings in the region indicates that systematic interventions in this sector are still very limited. The results of the survey confirm this general trend, with the SWM situations in the camps described either as difficult.

The sections below will look in further details into the specific strategies and concrete interventions in the main countries hosting IDPs in the region, including IOM's interventions. The analysis is not meant to be exhaustive but rather to give an overview, based on the information available, of the situation in each country, including specific approaches, challenges and opportunities. Good practices identified are presented in a more detailed manner, with the identification of key factors of replicability in other locations.

### 2.2.1 Burkina Faso

In Burkina Faso, SWM is clearly defined as one of the responsibilities of the WASH sector<sup>14</sup>, and the Humanitarian Response Plan (2019) identifies the need to establish SWM systems that take into consideration the existing systems in place.

Several WASH partners are reporting SWM activities in IDP settings in the country<sup>15</sup>. As part of the harmonization effort of WASH interventions, the sector has defined the content for environmental sanitation kits distributed to support community-based cleaning campaigns: one kit for 50 households, including basic items such as rakes, shovels, brooms, wheelbarrows, gloves and boots (Proposition de contenu harmonisé pour les kits WASH, March 2020).

<sup>14</sup> Burkina Faso | Termes de référence du Groupe sectoriel WASH Urgence, 2019

<sup>15</sup> 5W of WASH sector – September 2020 (main reporting partners are INGOs Solidarité Internationale, OXFAM, Helvetas, and national NGOs 4A's, AGED and ATAD) - <https://drive.google.com/drive/folders/1u4QtB1zhKSz9cAHfElMMbASG3psgs4dz>



Apart from the WASH sector, other members of the CCCM working group (locally called Groupe de travail de Gestion des Sites d'Accueil Temporaires - GSAT) are also implementing some SWM activities as part of their Camp Management services and community-based initiatives.

The main activities reported by the WASH and GSAT partners contacted as part of the study (SI, ACTED, ICAHD) include: community clean-up campaigns, sensitization, distribution of environmental sanitation kits and construction of basic waste disposal infrastructure (waste pits and concrete disposal facilities). No waste reduction or recovery initiatives could be identified.



Figure 7 – Concrete containers constructed by Solidarité Internationale (SI)

Burkina Faso offers a lot of partnership opportunities with donors, development actors, local associations and organizations involved in SWM, as there are many initiatives in the country related to SWM collection, plastic waste recycling, recovery of organic waste into compost and biochar, etc.<sup>16</sup>

### 2.2.2 Cameroon

A few relevant assessments and initiatives could be identified in relation to SWM in IDP and refugees' settings in the country:

- A recent multi-sector rapid assessment in IDP settings in the city of Yaoundé and its surroundings (CHOI, 2019) clearly identifies the lack of regular waste collection services as one of the key issues to be addressed in priority<sup>17</sup>. A similar assessment in the North-West and South-West regions also indicates that only half of the population surveyed has access to a SWM system (IFRC, 2019)<sup>18</sup>.
- The strategy to support municipalities and the multi-annual empowerment of refugees from CAR (UNHCR, 2017)<sup>19</sup> defines as its first strategic focus the improvement of basic social services, including SWM, through the Community Led Total Sanitation approach. This strategic line is well aligned with the national strategy for Community Led Total Sanitation, prepared in 2017 by the Ministry of Water and Energy with the support of UNICEF, which also covers the SWM sector<sup>20</sup>.
- The intervention in the refugee camp of Minawao, which has been benefitting of a strong attention from partners in several environmental sectors, including SWM (see details below). These activities are part of the effort of the Livelihood and Environment sector to reinforce the resilience of Nigerian refugees in the camp and in host communities by developing Income Generating Activities (IGAs) related to waste management and waste transformation<sup>21</sup>.

<sup>16</sup> Detailed list of initiatives available on: [www.burkinadoc.milecole.org/eco-developpement/article-assainissement-gestions-des-dechets-solides-au-burkina-faso/](http://www.burkinadoc.milecole.org/eco-developpement/article-assainissement-gestions-des-dechets-solides-au-burkina-faso/)

<sup>17</sup> Évaluation Initiale Rapide Multi secteur des besoins des IDPs dans la ville de Yaoundé et ses environs, Cameroon Humanitarian Organizations Initiative, November 2019

<sup>18</sup> Rapport d'évaluation multi sectorielle des besoins des populations déplacées et populations hôtes dans les régions de l'Ouest et du Littoral affectées par la crise en cours dans les régions du Nord-Ouest et du Sud-Ouest Cameroun, October 2019

<sup>19</sup> Stratégie de soutien aux communes et d'autonomisation multi-annuelle aux réfugiés centrafricains, UNHCR, 2017

<sup>20</sup> Stratégie nationale de l'assainissement total piloté par la communauté – ATPC pour le Cameroun. Guide de mise en œuvre, MWE, 2017.

<sup>21</sup> Nigeria Regional Refugee Response Plan, 2017

## Solid Waste Management in Minawao Camp, Cameroon

### Main activities

- Primary Waste Collection
- Sorting of different waste streams (organic / non-organic)
- Organic waste recovery (production biochar)
- Waste treatment and disposal

### Context / Factors of replicability

- Medium-size camp (approx. 68 000 refugees)
- Other environmental areas addressed in parallel (integrated approach): reforestation, sustainable energy, etc.
- Several sectors involved (WASH, Livelihood and Environment, CCCM)

### Description

As part of the 2017 Nigeria regional response plan, the Livelihoods and Environment sector was planning to develop Income Generating Activities (IGAs) related to SWM and waste transformation in Minawao camp.

The interventions planned included the construction of fully functional waste treatment plants to deal with the challenge of waste disposal, the sensitization of residents on how to collect waste for processing, and the conduct of a rapid market analysis to identify potential revenue streams from recycling.

The plan also contemplated the recovery of organic and wooden waste into compost and fuel briquettes, and the construction of a waste management plant that will provide cash-for-work opportunities.

According to the information provided by UNHCR, the current SWM system in Minawao camp includes the following components:

- Collection (installation of bins) and transportation of waste;
- Waste sorting (separation between organic and non-organic);
- Management and recovery of organic waste (production of biochar)

The approach implemented in Minawao camp also integrates other areas of intervention such as liquid waste management, reforestation (planting of fruit trees), energy-efficient stoves, benefitting both refugee and host community population.

Key actors involved in the activities include line ministries in charge of Water and Environment, UNHCR, Lutheran World Federation (LWF), local authorities (Municipality) as well as refugees and host community populations.



*Figure 8 –Top: Primary waste collection (UNHCR) / Bottom: Transformation of biomass waste into charcoal (Lutheran World Federation)*

### 2.2.3 Central African Republic

With one in every four Central African being displaced<sup>22</sup>, the Central African Republic has been facing acute needs in all sectors of humanitarian assistance. In 2017, the WASH cluster developed together with the Ministry of Mines, Energy and Hydraulic, an Operational Strategic Framework for WASH in emergency situation, including a specific strategy for Solid Waste Management. This strategy sets minimum standards for waste storage, collection and final disposal operations, for both immediate and intermediate response phases. The strategy also defines different approaches to improve sanitation depending on the typology of location supported (IDP sites, rural areas, etc.).

The Humanitarian Response Plan for 2020 for the Central African Republic is well aligned with this strategy. It includes the construction of sanitary infrastructures for an improved management of solid waste in IDP sites, health infrastructure and schools (incinerators, waste pits), and the implementation of the PHAST approach (Participatory Hygiene and Sanitation Transformation) for the construction of sanitation infrastructure in the areas of return, with a focus on social marketing (use of local material and participation of beneficiaries).

In practice, very limited information could be found on ongoing SWM interventions by partners specifically in IDP settings.

The INGO ACTED is currently launching a project in Bangui related to the prevention and response to flooding. It will include some SWM activities, such as the collection of solid waste in some areas of the city producing large quantities (markets, bus stations, etc.) and its evacuation to final disposal site, with the objective to reduce the occurrence of drains blocked by the accumulation of uncollected solid waste.



*Figure 9 – Major drainage filled with waste in Bangui, after the 2019 flooding (IOM)*

### 2.2.4 Chad

In Chad, the responsibility for delivering SWM services to the IDP population is under the CCCM sector<sup>23</sup>, although resources have not allowed for the development of a strong SWM system<sup>24</sup>.

The project PARCA (Projet d'Appui aux Réfugiés et aux Communautés d'accueil), funded by the World Bank since 2018, aims at supporting Refugee and Host communities<sup>25</sup> in general, and particularly the access to basic services (Health, Education, other sectors), which could include SWM.

### 2.2.5 Mali

As for Chad, very limited SWM activities by humanitarian actors in Mali, and SWM does not appear clearly in the 2020 Humanitarian Response Plan.

On the development side, an interesting project could be identified, linking indirectly SWM with the topic of migration. The project EJOM (Emploi des Jeunes au Mali), financed by the EU trust fund and

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<sup>22</sup> Aperçu des besoins humanitaires, République Centrafricaine, October 2020.

<sup>23</sup> Source: WASH cluster

<sup>24</sup> According to the Humanitarian Needs Overview (2020), only 8 % of the population nationally dispose of their waste in an adequate manner

<sup>25</sup> <http://cfs-tchad.org/index.php/projets/item/64-le-projet-d-appui-aux-refugies-et-aux-communautes-d-accueil-parca>



implemented since 2018 by a consortium of national and international organizations (SNV, ICCO, WASTE, APEJ), aims at contributing to the development of economic opportunities and creation of jobs for young men and women and for returning migrants in Mali. Several economic sectors are being explored by the project, including horticulture and organic farming, agribusiness, handicrafts, SWM and food chains in urban agriculture (see details below).

Project EJOM (Emploi des Jeunes au Mali), Mali	
<b>Main activities</b> <ul style="list-style-type: none"> <li>• Plastic recycling / opportunities for job creation</li> <li>• Primary waste collection</li> </ul>	<b>Context / Factors of replicability</b> <ul style="list-style-type: none"> <li>• Large and medium-size municipalities</li> <li>• Some pre-existing recyclable value chain</li> </ul>
<b>Description</b> <p>The project is implemented in four cities of Mali (Kayes, Koulikoro, Gao, district of Bamako) where young people face systemic employment challenges, and developed the following activities related to SWM<sup>26</sup>:</p> <ul style="list-style-type: none"> <li>• A <b>baseline study on current SWM situation</b> in the 4 cities, together with an analysis of current status of private sector engagement in the sector;</li> <li>• A <b>detailed Value Chain Analysis (VCA) for plastic waste</b> in the different cities, looking at opportunities for job creation and evolution of prices for different plastic types along the different processes of the value chain (waste picking, sorting, aggregation, shredding, washing, compacting, pelletizing, etc.);</li> <li>• An <b>overview of business opportunities / case studies from different locations in Africa</b> (several processes presented including: production of construction material from recycled plastic, composting, biochar, etc.);</li> <li>• A <b>catalogue on machinery for recycling of plastic waste</b>;</li> <li>• <b>Business cases for different SWM opportunities</b> (primary waste collection services with/without sales of recyclable material, grinding of hard plastic into flakes, processing of low-grade plastic waste into paving tiles, etc.);</li> <li>• A <b>Guide for Entrepreneurship</b> for individuals interested in starting operations related to SWM, looking at different business opportunities within the service provision and recycling sectors.</li> </ul>	

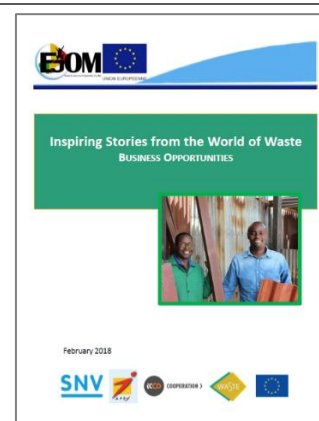


Figure 10 – Publication from EJOM project : benchmarking of business opportunities related to SWM in Africa

## 2.2.6 Niger

Despite very limited reporting on SWM activities by WASH partners<sup>27</sup>, several SWM initiatives could be identified in the context of migration in Niger:

- In IDP camps, SWM activities implemented by partners such as UNHCR and local NGO APBE (Action Pour le Bien-Être) include the installation of community bins, the recruitment of waste collectors

<sup>26</sup>All publications related to the different studies are available on the WASTE website (<https://www.waste.nl/causes/ejom/>)

<sup>27</sup> Source: WASH 4W, 2019. ACTED was reporting some rehabilitation of SWM infrastructure, as part of a project to reinforce resilience and governance of local communities affected by the conflict in Niger

within the communities, the provision of equipment to these collectors (animal traction vehicles, personal protection equipment, etc.), and some waste recovery (recyclable, organic)<sup>28</sup>.



Figure 11 –Collection of Solid Waste in Ayorou camp, showing high contents of dry organic waste (UNHCR)

- An important actor involved in some of these initiatives is the local engineering company Gestion Valorisation Déchets (GVD). Since 2013, GVD has been supporting several humanitarian and development actors in the design and implementation of several SWM processes<sup>29</sup>, including sorting and disposal, composting, local processing of plastic (into paving tiles, latrine slabs, etc.), vocational training of economic groups, etc.



Figure 12 – Waste sorting (top) and waste disposal (middle) pits in Abala, and latrine slabs from recycled plastic (GVD)

- As for Chad, the project PARCA, funded by the World Bank, contemplates some support to municipal services, including SWM, as well as the development of economic opportunities for forcibly displaced persons and host communities<sup>30</sup>.

### 2.2.7 Nigeria

All WASH partners and public institutions<sup>31</sup> consulted as part of the study reported very similar information on current practices and challenges related to SWM in IDP settings in Borno state, Nigeria.

The main activities implemented in the camps include primary collection, either voluntarily by the IDP population or through incentives (cash-for-work), temporary disposal inside the camps (waste pits), followed by transportation and final disposal outside the camps (performed by local contractors, as the state environment protection authority BOSEPA does not have enough capacity to transport waste from all camps). There are no specific waste recovery activities, neither of recyclable nor of organic waste, and the local recycling value chain in the state is reported by BOSEPA as very limited and mostly informal.

<sup>28</sup> Information for Refugee camps of “Sayam Forage”, Diffa region and in IDP sites in Tillabéri region (source: IOM)

<sup>29</sup> Présentation GVD – Afrique, 2017

<sup>30</sup> Cadre de Politique de Réinstallation des Populations (CPRP) du Projet d’Appui Aux Réfugiés et aux Communautés d’Accueil (PARCA), 2018

<sup>31</sup> WASH cluster, IOM, FHI360, IRC, NCA, BOSEPA

While the organizations are reporting a very good collaboration from the population in maintaining the camps clean, the implementation of SWM activities is facing several challenges:

- The high level of insecurity in the region (even in the close vicinity of the camps) constitute a major challenge for SWM operations, affecting directly the transportation and disposal phases. These operations usually require military escort, making them very costly, and there is very limited control possible over the contractors and the conditions for final waste disposal.
- Land availability, both inside and outside the camps is also another major issue. This is mainly due to the security reasons described above, as well as the reluctance from the host community in making land available for waste disposal some.
- The existing limitations of the formal SWM system, in terms of coverage of collection services<sup>32</sup> and final disposal, with no proper infrastructure available in the region for disposal in environmentally sound matter.

Very similar challenges (land availability, security, lack of disposal infrastructure) are faced by WASH partners for Faecal Sludge Management (FSM), and there are some clear interactions between both sectors (as an example, deficiency of SWM is affecting directly the desludging process due to the presence of solid waste in the latrines). Considering this, an integrated approach could be foreseen for both activities, exploring innovative solutions to be able to treat solid and liquid waste within the camps (including co-processing options).

The INGO Norwegian Christian Aid (NCA), for example, is currently planning an innovative project for FSM with the objective to turn human waste into resource such as fertilizer or energy. The project is currently in the feasibility phase, with the support of an innovation company. Similar feasibility study process for innovative local solutions could be followed for SWM.

### 2.3 SWM response and practices in the context of returnees

In addition to emergency settings, there are also needs and opportunities related to SWM in the context of reintegration of returnees, and improvement of resilience and living conditions, which potentially concern all the countries in the region. The rationale behind that is that there is a close interrelation between SWM, health and environmental risks, and migration tendencies both internally and externally. The lack of adequate services and living environment, in combination with other factors such as high unemployment, are important drivers to migration to neighbouring countries or to other regions such as Europe.

The following ongoing projects from IOM and other partners in the region integrate this question:

- In Guinea Conakry, the **IOM project “Building the Resilience of Communities affected by Climate Change and environmental degradation in Guinea”** is planning to provide financial and technical support to community-based projects related with environmental protection and ecosystem regeneration, with SWM being one of several possible intervention areas. The SWM situation is

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<sup>32</sup> A 2017 study from Maiduguri University (*An assessment of waste management activities of Borno State environmental protection agency, Wunubo & all. June 2017*) indicates that even in Maiduguri metropolitan area 48 % of the population surveyed had never had their waste collected by BOSEPA.

particularly critical in the capital city Conakry, where rapid and uncontrolled urbanization related to internal migrants from rural areas poses great problems for basic services delivery such as SWM.

- In Côte d'Ivoire, IOM has been supporting the project PARSEM-PS<sup>33</sup>, a **community-based waste management project as part of the reintegration process** in the city of Daloa<sup>34</sup>, within the framework of the EU-IOM Joint Initiative for Migrant Protection and Reintegration. Implemented by CARE with the involvement of institutions such as the National Agency for SWM (ANAGED) and the Ministry of Youth, the project has been supporting around 200 people (returnees and community members) with waste collection equipment (motorized tricycle, PPEs, etc.), creating employment and business opportunities as waste collection service providers. Preliminary lessons learnt from the project indicate that the sustainability of the activities is strongly related with time and effort allocated to support and build capacity of the teams on the ground.

In Côte d'Ivoire also, the organization GVD participated in 2014-2015 in a project financed by EU, AfDB, and GIZ, with similar objectives of reinsertion of returnees. The project supported 1 200 beneficiaries organized in around 30 groups trained to manage recycling and organic waste recovery units, producing several products such as pavement tiles, compost, biochar. Some of these groups have successfully maintained their activity over time and are now acting as agents of change providing support to similar initiatives in other locations.

- In Sierra Leone, the project **“Reducing the risk of irregular migration through Employment Promotion and Entrepreneurship support to Youth”**, implemented by IOM since 2019 (until 2022), also integrates activities related to SWM (see details below).

#### IOM project “Reducing the risk of irregular migration through Employment Promotion and Entrepreneurship support to Youth”, Sierra Leone

<u>Main activities</u>	<u>Context / Factors of replicability</u>
<ul style="list-style-type: none"> <li>• Primary Waste Collection</li> <li>• Micro-entrepreneurship</li> <li>• Skill development</li> </ul>	<ul style="list-style-type: none"> <li>• Large city</li> <li>• Capacity and willingness to pay the population for waste collection services</li> <li>• Buy-in / Ownership from Local Authorities</li> <li>• Other development actors supporting in parallel other phases of SWM</li> </ul>

<sup>33</sup> Projet d'Accompagnement à la Réintégration Socio-Economique durable des Migrants et Protection Sociale dans leurs communautés d'Accueil dans les zones de forte migration en Côte d'Ivoire

<sup>34</sup> Reintegration Handbook. Annex 11: Guidance for mainstreaming environmental and climate considerations into reintegration programming - IOM, 2019.

**IOM project “Reducing the risk of irregular migration through Employment Promotion and Entrepreneurship support to Youth”, Sierra Leone**

**Description**

The project, funded by the Japanese Government, aims at empowering youth and women (including returned migrants) and expanding their opportunities of employment and entrepreneurship through vocational skills training aligned with the labour market, human resources and business needs.

Among different economic sectors, SWM was identified by the Freetown City Council (FCC) and IOM as an opportunity for both business development and improvement of existing services (current collection rate of only 21%). The objective is to minimize solid waste accumulation and provide sustainable job opportunities for youth, including rural-urban migrants, without requiring the development of complex technical capacities.

The project has been supporting the creation of 21 youth groups (10 youths per group), registered as primary waste collection operators by FCC, and getting remunerated directly by their clients. Project support includes the provision of waste collection equipment (motorized tricycles), and a continue mentoring on business management. The project also integrates the establishment of a maintenance fund directly pre-financed by the operators themselves, to ensure that maintenance issues will not jeopardize the sustainability of the operations.

This project is well embedded in the existing local strategy (*#transform Freetown – Integrated Solid and Liquid Waste Management strategy*), and other components of the municipal SWM system are receiving support in parallel from other partners (JICA, EU, DFID).



*Figure 13 - Solid waste collection by Youth Group supported by IOM in Freetown*

### 3 Review of good practices globally related to Solid Waste Management that could be applied to IDPs in WCA

#### 3.1 Global strategies and guidance notes

Over the last years, there has been an increase in awareness-raising among humanitarian actors of the need to significantly improve SWM in humanitarian operations. Several organizations have ongoing programmes to enhance environmental initiatives, such as the “Greening the blue” program for UN partners<sup>35</sup>, the “Greening the orange” initiative from Norwegian Refugee Council (NRC) and the “Green Response” from the International Federation of Red Cross and Red Crescent Societies<sup>36</sup> (IFRC), which all consider SWM as an important area of interventions.

This increased awareness on SWM has resulted in some efforts to go beyond the minimum SWM standards described in the SPHERE handbook<sup>37</sup> and to develop strategies on emerging questions such as humanitarian packaging waste and the management of electronic waste (e-waste) from solar products in camps, which are both relevant for all humanitarian interventions:

- The **Joint initiative for sustainable humanitarian packaging waste management** has been facilitated since 2019 by USAID and involves multiple humanitarian institutions, including IOM. The objective of this initiative is to explore how the humanitarian community can both minimize the impact of packaging waste and turn it into opportunities for local beneficiaries. The initiative has resulted in 2019 in a preliminary scoping of ongoing improvement in humanitarian packaging and the identification of priorities of interventions<sup>38</sup>. Next phases will consist in a collaborative roadmap process, together with the design and piloting of specific initiatives (2020-2021), and the implementation of scaled-up interventions (2021-2022).
- The IOM **E-waste Project in East Africa: Greening humanitarian responses through recovery, repair and recycling of solar products in camps** is the first attempt to look exclusively at the issue of waste from solar products in displacement settings. This project, implemented together with Innovation Norway, aims at finding cost-effective solutions to repair, reuse and recycle solar lanterns and solar home systems distributed in IDP and refugee camps in East Africa and put in place activities that create jobs, support livelihoods and provide business opportunities. A preliminary assessment was realized in 2020, including a mapping of stakeholders, an assessment of the waste produced, as well as the identification of best practices focusing on solar and e-waste. The objectives of this initiative for 2021 are to launch a call for partnership and start implementing pilot interventions.

In addition, several documents have been developed by partners, including guidance notes, compendium of good practices, which can serve as guide or “idea boxes” for designing SWM interventions in IDP settings in West and Central Africa. Below are the references of two recent compendiums of good practices and guidance documents:

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<sup>35</sup> <https://www.greeningtheblue.org>

<sup>36</sup> <https://media.ifrc.org/ifrc/green-response/>

<sup>37</sup> The 2018 Sphere handbook (<https://www.spherestandards.org/handbook-2018/>) includes a large number of recommendations related to SWM, including key actions, guidance notes and indicators as part of the standards for the following sectors: WASH, Food security and assistance, Shelter and settlements.

<sup>38</sup> <https://www.eecentre.org/2019/07/15/https-www-eecentre-org-2019-07-15-sustainable-humanitarian-packaging-waste-management/>



- **Sustainable Settlements (NRC, 2017)**<sup>39</sup> establishes a framework of existing and emerging technologies and methodologies to improve social, environmental and economic sustainability of settlements in humanitarian displacement settings. It explores how to reduce waste in general (water, organics, energy, and materials), and includes some ideas and examples of solid waste recovery interventions.
- As part of the Green Response Initiative, IFRC and the Swedish Red Cross have produced in 2020 the guideline document: **Managing Solid Waste: Sector-specific guidelines for the Red Cross Red Crescent**<sup>40</sup>. The document provides specific guidance for the several humanitarian sectors as well as general recommendations on the different SWM components, and provides links to several available external resources. Some of the resources mentioned in these guidelines are also provided in section 4.2.

### 3.2 Example of good practices in IDPs/refugees settings in other regions

This section intends to explore good practices and lessons learnt from projects implemented in locations with settings similar to those that can be found in West and Central Africa. Relevant SWM interventions in four different locations were identified. The last two are being described in more details, based on the information obtained through available documentation and interviews:

- **The pilot recycling project in the Dadaab refugee camp, Kenya**, implemented since 2016 by the International Committee of the Red Cross (ICRC) together with the Kenyan Red Cross Society<sup>41</sup>: the lessons learnt shared by ICRC highlight the difficulty in reaching full financial sustainability due to several factors, including geographical (distance to main recyclable market), technical (limited local capacity for maintenance), legal (prohibition for refugees to own a business), and economic challenges (fluctuation of prices in the recyclable market).
- **Interventions of several organizations in the context of the Syrian Refugees crisis in Jordan**, supporting SWM and recycling within the camps as part of Cash-for-work (CfW) programs. While the analysis of OXFAM's intervention in Za'tari camp<sup>42</sup> underlines the successes in terms of improvement of population's practices and environmental impacts, it also questions how to turn CfW into sustainable job opportunities, for example through the scaling-up of the initiative. The "Guidelines for Implementing Cash-for-Work Projects in the Waste Management Sector" (Disaster Waste Recovery, 2017)<sup>43</sup> include lessons learnt from several partners and emphasize the need to keep a "do-no-harm" approach, particularly in relation to the Informal Recycling Sector (IRS).
- **Response to the refugee crisis in Bangladesh, Cox's Bazar**: integrated SWM strategy and interventions led by UNDP, WASH partners, including IOM, as well as other sectors.
- **Ongoing pilot projects focusing on plastic recycling in refugee camps in Algeria and Ethiopia**, implemented by Engineer Without Borders (EWB) Norway in collaboration with UNHCR.

<sup>39</sup> <https://reliefweb.int/sites/reliefweb.int/files/resources/Sustainable%20Settlements.v2-ilovepdf-compressed.pdf>

<sup>40</sup> [https://watsanmissionassistant.org/wp-content/uploads/2020/07/20200717\\_swm\\_final\\_new\\_opt.pdf](https://watsanmissionassistant.org/wp-content/uploads/2020/07/20200717_swm_final_new_opt.pdf)

<sup>41</sup> <https://www.icrc.org/en/document/kenya-dadaab-refugee-camp-recycle-plastic-income-livelihoods>

<sup>42</sup> <https://policy-practice.oxfam.org/resources/trash-talk-turning-waste-into-work-in-jordans-zaatari-refugee-camp-620329/>

<sup>43</sup> <https://data2.unhcr.org/en/documents/download/63383>

## SWM system in Rohingya refugee's camps in Cox's Bazar, Bangladesh

### Main activities

- Primary and secondary collection
- Sorting
- Recycling (camp-level and support to existing value chains)
- Organic waste recovery
- Disposal (only non-recoverable waste)

### Context / Factors of replicability

- Very large camp (over 600,000 refugees)
- High density, limited land availability
- Pre-existing recycling market
- Integrated interventions involving several humanitarian sectors (WASH, CCCM, Environment, Livelihood, Agriculture, etc.)
- Strategy and SOPs for SWM developed and approved by humanitarian actors

### Description

In Cox's Bazar, the WASH sector partners, together with humanitarian actors from other sectors (CCCM, Shelter, Environment, etc.), local authorities, and other development partners such as UNDP have been defining and implementing a comprehensive and complete SWM strategy. This joint strategy is the results of strong coordination efforts among actors and a shared concern of issues and opportunities linked to Solid Waste Management, capitalized by the recent creation of a Technical Working Group specifically on SWM within the WASH cluster. Some key initiatives and interventions by the different partners involved include:

- A clear definition and agreement among actors on the **processes to be followed for the different waste streams**: High-value recyclable material transferred to the existing value chain in local communities nearby; Organic waste recovered inside the camp (composting, etc.); only inert and non-recoverable waste disposed of at the sanitary landfill;
- The **construction of a sanitary landfill** within the main camp (with lining, leachate control and basic gas collection system), together with clear Standard Operating Procedures;
- **Innovative initiatives** by different partners to find solutions for low-grade plastics such as plastic bags, including upscaling and production of some equipment<sup>44</sup>;
- **Support to the actors of the recycling value chain** (in host communities) including training, grant for acquisition of equipment, and support to the formalization into a cooperative.
- **Support to the elaboration of district-level SWM masterplans**, including not only the refugee camps but also host communities.

While there is still a lot to be achieved in the implementation of the strategy, the intervention in Cox's Bazar is definitely a good example to be learnt from in terms of coordination, processes, and innovative solution piloted.



Figure 14 – Final disposal of non-recoverable waste in Cox's Bazar (SMEP)

<sup>44</sup> Including a recycling facility implemented by IOM and Practical Action (<https://www.iom.int/news/recycling-plastic-alphabet-blocks-kids-and-reducing-wood-consumption-are-building-greener>)



## UNHCR – Recycling initiatives in camps in Algeria and Ethiopia

### Main activities

- Innovative solution for local plastic recycling
- Training / Capacity building
- Local manufacturing of equipment

### Context / Factors of replicability

- Relatively large camps
- Distance to major urban centres
- Limited access to energy for recycling plants (for Ethiopia)

### Description

Both projects share a common objective, which is to explore opportunities for local recovery of plastic waste in order to minimize the negative impacts of this waste stream. These impacts include particularly the death of livestock, which is threatening pastoral livelihood of both refugee and host communities, and the emission of pollutants linked to systematic open burning at final disposal sites.



*Figure 15 –Stomach of dead livestock filled with plastic waste (EWB-Norway/UNHCR)*

### Algeria

As part of the Humanitarian Innovation Program, EWB-Norway and UNHCR have developed in 2019 a multi-year strategy to improve SWM in several Sahrawi refugee camps. The main components of this strategy are the following:

- The installation of plastic recycling workshops, identified as the major opportunity of improvement of the SWM system, to reduce the need for transportation and the impacts of uncontrolled disposal.
- An assessment of potential end-market/products from recycled plastic, of the most suitable plastic recycling technologies, and a detailed business plan for the operations. It is expected that the recycling plants will offer job opportunities to 75 refugees and become profitable after 3 years.
- Other key aspects of the strategy are the need to review and optimize the waste collection system and to address the issue of open burning as final treatment solution at the dumpsites.

### Ethiopia

The project "Trash into Cash", implemented since 2019 by the Norwegian Geotechnical Institute (NGI) in collaboration with several partners (NRC, EWB-Norway, UNHCR) is working on innovative and sustainable recycling solutions adapted to the specificity of Melkadida refugee camp, Ethiopia. The main challenges faced are the lack of energy locally (apart from diesel generators) and the large distance to urban centres for maintenance of equipment. The solutions foreseen include:

- The development of a melting system (oven) based on the pyrolysis principle (heating without oxygen), using low-grade plastic (plastic bags, etc.) as a fuel for melting higher value plastics and transforming them into useful products for the camp (planks, etc.);
- The use of simple technologies for recycling and machinery that can be built and fixed locally (in basic car workshop), and a strong accent given on ownership and local capacity development.

The prototyping has been advancing off-site in 2020 due to the Covid-19 restriction, and the project's plan is to begin the operations on-site in 2021.

## 4 Recommendations in terms of SWM and reduction, re-use, recovery and job opportunities as part of SWM in IDP camps

### 4.1 General recommendations

As described in previous sections, there is a lot to be done to improve SWM in West and Central Africa, in both IDPs and non-IDPs settings. The benchmarking of good practices also shown that there are unexplored opportunities around SWM, both in terms of job opportunities and recovery of useful resources from waste. Below are a few general recommendations that can be useful for programming or implementing SWM activities:

- **Starting improving the SWM system in offices and installations** should be considered as a priority. This could include efforts to reduce the production of waste, segregation at-source of recyclable material, and working closely with waste collection service providers to improve the way waste is managed (e.g. transfer of recyclable to the local market, improvement of final disposal conditions, etc.). While such effort is important in terms of exemplarity of the organisation, it is also an excellent entry point to improve the understanding of the SWM system (local challenges, actors, opportunities, etc.).
- There is **no fit-for-all solution for SWM**, and the design of any SWM system needs to be adapted to each location and take into account the specificities of local settings (space availability, type of waste produced, existing practices and system in place, etc.). Baseline studies (see section 4.2.1), together with a direct involvement of the beneficiaries and local actors working in the SWM sector, are essential to the definition of context-adapted SWM solutions.
- **Advocacy for donors** is also important, as SWM in emergency is often underfunded and not considered a life-saving / emergency issue. To do so, it is important to assess and document all direct and indirect impacts of waste mismanagement (see Section 1.2), including those that are not visible at first sight (e.g. burning of plastic for cooking, disposal of waste in latrines, protection issues related to waste disposal, death of livestock, etc.).
- While short-term job opportunities such as Cash-for-work schemes around SWM are relatively easy to implement (assuming funding is available), turning them into sustainable livelihood and job opportunities is much more challenging. Having an **integrated approach to SWM**, looking at the complete value chain (from production to disposal, with a strong focus on reduction and recovery), and involving all relevant humanitarian and non-humanitarian actors (particularly local actors: public, private, CBOs, etc.), will help working towards self-sustainable systems.

This approach will facilitate the research of linkages and opportunities with other sectors such as Agriculture, Energy, Environment, Livelihood, Climate Change, which will increase the sustainability of the solutions and help exploring alternative donor/financing options for SWM in emergencies.

### 4.2 Specific recommendations and opportunities related to the different SWM components

#### 4.2.1 Baseline studies

Developing a good understanding of the situation on the ground is an essential step prior to the planning and implementation of SWM interventions. Baseline studies help ensuring that these

interventions will respond specifically to the existing SWM issues on the ground and will explore all existing opportunities linked to the local context. Key baseline studies for SWM include:

- **Studies on waste composition and generation:** knowing the quantity and typology of material that needs to be dealt with. It gives important insights on the potential for reduction, helps dimensioning waste collection systems (equipment, manpower, size of disposal and treatment facilities, etc.), and is a key input to assess the technical and financial viability of waste recovery opportunities (recyclable, organic).
- **Studies on existing practices and perception from the population** are important to clearly identify the issues related to SWM in IDP settings and host community, the existing challenges from the population's perspective, including some "invisible" problems (e.g. use of plastic waste for cooking, disposal in latrines). Such assessments can also be very helpful in engaging the population in the definition of solutions, in verifying their willingness to participate actively in the system, and in identifying reduction and recovery opportunities that are adapted to the local context. They shall integrate a gender perspective in order to specifically study how the perceptions vary between men and women, both in terms of problems identified and of possible solutions.
- **End-market assessments** aim at identifying and quantifying the potential demand for final products from waste recovery processes (recyclable material, manufactured products from recycled waste, biochar, compost, etc.), and are a key input for assessing the feasibility of these processes. Through **Value chain analysis (VCA)**, it is possible to assess in further details the existing recycling sector, the different steps of recycling, the formal and informal actors in this value chain, and the commercial viability of the different recycled materials.
- For existing waste collection systems, **Time and motion surveys** can be implemented to assess the effectiveness of these systems and to identify potential for improvement. These surveys consist of registering and analysing the time spent for different steps of the collection process (loading at collection points; transportation between collection points and to the disposal facility; Unloading). Associated with **cost analysis** (cost per ton of waste collected), these surveys help quantifying indirect financial benefits from waste reduction and recovery processes (i.e. what are the collection and transportation costs that can be avoided).

#### Resources – Baseline studies

##### **Making Waste Work: A Toolkit. How to measure your waste (WasteAid UK, 2017)**

<https://wasteaid.org/toolkit/how-to-measure-your-waste/>

This short guidance note provides recommendations on how to implement a waste characterisation survey (including main waste categories, staff requirements, health and safety and equipment needed, training requirements, steps of characterisation, result processing and interpretation).

##### **Practical Guide to Solid Waste Management in Pacific Island countries and territories (SPREP/JICA, 2018)**

<https://www.sprep.org/publications/practical-guide-to-solid-waste-management-in-pacific-island-countries-and-territories>

These guidelines have been prepared specifically for the Pacific region however the recommendations are applicable to other countries. The document includes detailed guidance on different waste baseline surveys: waste flow analysis, waste characterization and composition, time and motion, public opinion (see pages 9 – 13).

#### 4.2.2 Reduction

At first sight, the potential for waste reduction in IDP setting can be considered relatively low, mainly due to limited socio-economic levels and low production of waste. However, the analysis of potential for reduction often requires details from waste characterization and generation surveys (see section 4.2.1), as specific waste streams such as sand from sweeping can be significant and represent strong opportunities for reduction. To some extent, waste recovery solutions at source (e.g. home/decentralized composting) could also be considered for waste reduction, as they can help minimizing drastically the quantities of waste that will require further management (collection, transportation, sorting, processing, disposal).

In humanitarian emergency settings, waste reduction also requires taking into consideration improvement in the humanitarian distribution, procurement, and logistic processes.

##### Resources – Waste reduction

The outcomes of the next phases of the **Joint initiative for sustainable humanitarian packaging waste management** (collaborative roadmap process, design and piloting of specific initiatives, implementation of interventions - see details in section 3.1) should give some more insight on potential reduction opportunities as part of ongoing humanitarian operations.

#### 4.2.3 Collection

The waste collection phase has a strong potential for job/business opportunities, as it usually requires extensive human resources, in particular for primary waste collection services.

The self-sustainability of these activities as a business opportunity depends a lot on the existence or not of a capacity and willingness to pay from the customers. Such capacity and willingness might exist in medium to large urban areas; however, this is more challenging in IDP settings or locations with low economic level.

While cash-for-work schemes can be helpful in obtaining quick impacts (e.g. clean-up campaigns) and providing emergency livelihood opportunities, such modalities should be implemented carefully to avoid disrupting existing voluntary initiatives. In the long term, it is important to explore more sustainable waste collection systems that are not too dependent on permanent external subsidies. This can be achieved through:

- **Involving the population** as much as possible as an active actor of the collection system (voluntary drop-off systems, rotational clean-up committees, etc.).
- Looking at all potential for **optimization in the collection system** in order to reduce the needs in terms of equipment, staff, and the cost of the system: rationalization of collection schedule and collection routes, use of community bins and other temporary storage equipment facilitating the loading into transportation equipment, in replacement of waste pits and concrete bins, etc. Time-and-motion surveys (see section 4.2.1) can be very helpful in identifying which phases within the existing collection system offers opportunities for optimization.
- **Implementing waste recovery options as early as possible in the SWM value chain** (e.g. home composting, segregation at source of recyclable, decentralized waste recovery facilities, etc.), as a way of minimizing the quantities of waste to be further collected and transported to centralized disposal / treatment facilities.

## Resources – Waste collection

### **Making Waste Work: A Toolkit. How to collect waste safely and efficiently (WasteAid UK, 2017)**

<https://wasteaid.org/toolkit/how-to-collect-waste-safely-and-efficiently/>

This short guidance note addresses the different components of waste collection systems: types of containers, cleaning equipment, transportation means and collection routes.

### **Collection of Municipal Solid Waste in Developing Countries (UN Habitat, 2010)**

[https://www.eawag.ch/fileadmin/Domain1/Abteilungen/sandec/ELearning/Moocs/Solid\\_Waste/W1/Collection\\_MSW\\_2010.pdf](https://www.eawag.ch/fileadmin/Domain1/Abteilungen/sandec/ELearning/Moocs/Solid_Waste/W1/Collection_MSW_2010.pdf)

These complete guidelines provide detailed recommendation on key components of waste collection systems: methods of waste collection (chapter 4), storage systems (chapter 5), collection vehicles (chapter 7), and transfer stations (chapter 8). It also addresses related topics such as institutional and financial arrangements, recycling and final waste disposal.

## 4.2.4 Recycling

Apart from waste collection, the waste recycling value chain is often seen as the main job and business opportunity around SWM. Several considerations need to be taken into account in relation to recycling:

- Firstly, it is essential to consider that there is usually an existent local recycling value chain, composed by formal and informal actors. Any recycling initiative needs to carefully avoid disrupting this existing value chain and jeopardizing its livelihoods through new recycling schemes. This is why developing preliminary knowledge on the existing market, through VCA (see section 4.2.1), is essential before planning and setting up new recycling processes.
- If markets exist, it is preferable to strengthen them, to ensure that recyclable materials can reach them easily, rather than creating additional competition in already complicated markets. Local processing efforts could then focus on materials that do not have markets yet (e.g. low-grade plastics), with the production of products that are aligned with local needs (e.g. latrine slabs, drain covers, beams, pavement tiles, etc.).
- When assessing the financial viability of the recycling scheme, it is important to integrate in the calculation the cost avoided in other components of the SWM system (transportation, final disposal), as part of a complete cost/benefit analysis.
- The engagement and participation of the population is essential in the recycling value chain, for example through sorting-at-source which can increase the quality of recyclable material compared scavenging or centralized sorting processes (recyclable material not contaminated by other waste streams such as organics).

## Resources – Recycling

### **Making Waste Work: A Toolkit. How to prepare plastics to sell to market (WasteAid UK, 2017)**

<https://wasteaid.org/toolkit/how-to-prepare-plastics-to-sell-to-market/>

This short guidance note provides some guidance on basic pre-processing activities that can increase the value of plastic materials (cleaning, drying, sorting, agglomeration/accumulation, size reduction).

## Resources – Recycling

### **Solid Waste Value Chain Analysis – Irbid and Mafrq, Jordan (UNDP/ DWR, 2015)**

<https://www.jo.undp.org/content/jordan/en/home/library/poverty/solid-waste-valuechain-analysis.html>

This VCA study, conducted in the context of the Syrian Refugee Crisis in Jordan, can serve as an example for similar analysis to be conducted in other contexts in order to better understand the recycling sector and define well-contextualized potential interventions.

#### 4.2.5 Organic waste recovery

Considering that organic matter usually constitutes more than half of the waste produced in both IDP settings and host communities, organic waste recovery represents the main opportunity of waste reduction and recovery. Many processes and related by-products are available for organic waste recovery, such as:

- Composting (aerobic decomposition) and vermicomposting, resulting in the production of compost (natural fertilizer and soil conditioner);
- Anaerobic digestion, resulting in the production of biogas and fertilizer (the material remaining after completion of anaerobic digestion, called digestate, is rich in organic nutrients such as nitrogen and phosphorus, and can be use as fertilizer after processing to remove pathogens);
- Pyrolysis (processing at high temperature in the absence of oxygen), resulting in the production of char (solid product from slow pyrolysis) or bio-oil (from fast pyrolysis).

The choice of the more suitable options needs to take into consideration several parameters such as the characteristic of the organic waste, the space availability, the existence of a need / market for the final product, existing technical capacity, etc. The production of biochar, for example, requires ideally organic waste with low humidity and high carbon content and works particularly well with agricultural waste (e.g. rice husk, straws, etc.).

Even though organic waste recovery is often hardly financially viable, the potential products can help improving living conditions of the population, lowering the dependency on wood for example, or supporting livelihood opportunities linked to small-scale agriculture. The potential impact of decentralized organic waste processing facilities on the reduction of waste to be further collected, transported and disposed of can also result in a significant reduction of expenses for these activities.

Finally, organic waste recovery also offers opportunities for co-processing with faecal sludge, which can be interesting in locations with limited space for the implementation of sanitation infrastructures.

## Resources – Organic waste recovery

### **Biowaste Management: the key to sustainable municipal solid waste management (EAWAG/SANDEC, 2017)**

[https://www.eawag.ch/fileadmin/Domain1/Abteilungen/sandec/publikationen/SWM/General\\_Overview/biowaste\\_policybrief.pdf](https://www.eawag.ch/fileadmin/Domain1/Abteilungen/sandec/publikationen/SWM/General_Overview/biowaste_policybrief.pdf)

This policy brief includes a short presentation of the different technologies available for organic waste recovery and their key characteristics (e.g. type of organic waste, labour requirement, lifetime of infrastructure, etc.).

## Resources – Organic waste recovery

### **Decentralised composting for cities of low- and middle-income countries (EAWAG-SANDEC / WASTE Concern, 2006)**

[https://www.eawag.ch/fileadmin/Domain1/Abteilungen/sandec/publikationen/SWM/Decentralized\\_Composting/Rothenberger\\_2006\\_en.pdf](https://www.eawag.ch/fileadmin/Domain1/Abteilungen/sandec/publikationen/SWM/Decentralized_Composting/Rothenberger_2006_en.pdf)

This complete document covers all aspects required for the establishment of composting facilities in low and middle-income countries, including design options and operational needs, stakeholder involvement, waste collection system, marketing and financial sustainability.

### **Anaerobic Digestion of Biowaste in Developing countries (AEWAG/SANDEC, 2014)**

[https://www.eawag.ch/fileadmin/Domain1/Abteilungen/sandec/publikationen/SWM/Anaerobic\\_Digestion/biowaste.pdf](https://www.eawag.ch/fileadmin/Domain1/Abteilungen/sandec/publikationen/SWM/Anaerobic_Digestion/biowaste.pdf)

This complete guide on anaerobic digestion of biowaste in developing countries includes case studies from South America, Africa and Asia with detailed information on the design and size of systems, type and quantities of waste used as feedstock, resulting biogas production, as well as investment costs.

### **Pyrolysis of Biowaste in Low and Middle-Income Settings (EAWAG, 2019)**

[https://www.eawag.ch/fileadmin/Domain1/Abteilungen/sandec/publikationen/SWM/Carbonization\\_of\\_Urban\\_Bio-waste/slow\\_pyrolysis\\_manual.pdf](https://www.eawag.ch/fileadmin/Domain1/Abteilungen/sandec/publikationen/SWM/Carbonization_of_Urban_Bio-waste/slow_pyrolysis_manual.pdf)

This guide on slow pyrolysis of biowaste focuses on a double-barrel reactor system which allows efficient pyrolysis including pre-drying of biowaste, and includes recommendations on construction, operation and financial analysis.

#### 4.2.6 Final treatment and disposal

Improving final waste treatment/disposal conditions is essential to reduce the impact of waste accumulation on health and the environment. While it is difficult to implement sophisticated sanitary landfill in emergency settings, intermediary solutions are available and should be explored, such as the Fukuoka method for semi-aerobic landfill, that allows significant reduction in environmental impacts compared to open dumpsites with relatively limited investment costs. Considering the difficulties usually faced in finding space available for final disposal and the investment costs needed for environmentally sound infrastructures, a strong effort should be done to ensure that only non-recoverable materials are disposed of, thus increasing the lifespan of the infrastructure.

The open burning of waste, which is often used in emergency and non-emergency settings as a way of minimizing the quantities and visible impacts of waste, comes together with a long list of environmental and health hazards, and should be avoided as much as possible. In particular, burning of waste in uncontrolled conditions results in the production and diffusion of persistent organic pollutants (POPs), that tend to accumulate in the food chain and cause serious health effects (cancers, birth defects, impacts on immune and reproductive systems, etc.) as well as heavy metals, that can be present in both bottom and fly ashes.

Even though the final disposal phase does not offer many job opportunities, dumpsites are sometimes the main working ground for informal scavengers, and improving disposal conditions can be integrated in a larger effort to improve their working conditions.



## Resources

### **A Practical Guide to Landfill Management in Pacific Island Countries (SPREP / JICA, 2005)**

[https://www.sprep.org/att/IRC/eCOPIES/pacific\\_region/14.pdf](https://www.sprep.org/att/IRC/eCOPIES/pacific_region/14.pdf)

This guide, specifically designed for Pacific Island countries, is applicable in general for waste disposal in low and middle-income countries. The solutions presented are based on the concept of semi-aerobic landfill (Fukuoka method), and include options for improvement of existing landfills.

### **Making Waste Work: A Toolkit. How to design and operate a basic waste disposal site (WasteAid UK, 2017)**

<https://wasteaid.org/toolkit/how-to-design-and-operate-a-basic-waste-disposal-site/>

This short guidance note provides recommendations on how to design and operate a basic waste disposal site (household pit / small community disposal site), including the choice of location, selection of landfilling method and restoration and improvement of uncontrolled dumpsites.

#### 4.2.7 Capacity Development and Awareness raising

Improving SWM practices from the population and organizations involved in these services requires a strong effort in raising awareness as well in developing capacities and understanding of SWM processes. Capacity development and awareness raising programs need to be adapted to the different audiences and could include:

- Staff and implementing partners;
- Local authorities;
- Community, as part of Hygiene promotion processes;
- CBOs and actors of private sector.

As much as possible, such programs should involve local partners (e.g. local research centres, universities, engineering firms, etc.) to ensure that this capacity development is well contextualized.

## Resources

### **Massive Open Online Course (MOCC) on Solid Waste Management in developing countries (EAWAG /Université Polytechnique de Lausanne)**

<https://www.coursera.org/learn/solid-waste-management/>

This free online course comprehensively covers all key components of integrated SWM, with focus on practical solutions adapted to developing countries (and emergency settings). The course is provided in English with subtitles in French, Spanish and Portuguese.

### **Blue Schools - Linking WASH in schools with environmental education and practice (Swiss Water & Sanitation Consortium)**

<http://waterconsortium.ch/blueschool/>

This resource includes a catalogue of technologies, a facilitator's guide and a catalogue of practical exercises on different topics such as "From Soil to Food" and "From Waste to Resource". It is available in English, French and Spanish.



## Annex - Complete listing of actors and projects identified

Geographical Distribution	Category	Stakeholders <sup>45</sup>	Description / Projects
Global / Regional	UN	<u>JEU (UNEP/OCHA)</u>	Coordination and technical support globally to mainstreaming of environment in emergencies, including SWM (focus on hazardous waste streams)
		UNICEF	Coordinator of WASH Cluster globally and in most emergencies.
		<u>UNHCR</u>	Mandate for CCCM in conflict-related displacement settings. The Environment and Energy Unit is leading the effort to improve SWM within UNHCR operations (example of pilot projects for plastic recycling in camps in Ethiopia and Algeria).
		<u>UNDP</u>	Some interventions linking SWM and Emergency livelihood / Early Recovery. Example of project for sustainable SWM in refugee camps and host communities in Cox's Bazar, Bangladesh.
		ILO	Involvement in SWM projects in the perspective of employment. Example of project In Senegal - Support to formalization of waste collectors into cooperatives <a href="https://www.un-page.org/senegal-and-ilo-continue-work-waste-collection">https://www.un-page.org/senegal-and-ilo-continue-work-waste-collection</a>
	Donors and cooperation agencies	GEF / FEM (Global Environment Fund)	- Ongoing financing of large SWM project covering several countries of the region (Bénin, Niger, Senegal, Togo, Mali and Burkina Faso), co-financed by Banque Ouest-Africaine de Développement. <a href="https://www.afrik21.africa/afrique-de-louest-un-projet-de-gestion-durable-de-dechets-finalise/">https://www.afrik21.africa/afrique-de-louest-un-projet-de-gestion-durable-de-dechets-finalise/</a> - Examples of large projects in the recent past in Cameroun (municipal SWM) and CIV (composting plant). <a href="https://www.thegef.org/project/integrated-sustainable-urban-development-sudp-and-environmentally-sound-management-municipal">https://www.thegef.org/project/integrated-sustainable-urban-development-sudp-and-environmentally-sound-management-municipal</a> <a href="https://www.thegef.org/project/tt-pilot-gef-4-construction-1000-ton-day-municipal-solid-wastes-composting-unit-akouedo">https://www.thegef.org/project/tt-pilot-gef-4-construction-1000-ton-day-municipal-solid-wastes-composting-unit-akouedo</a>
		Banque Ouest-Africaine de Développement	Participation in financing of large SWM project in the region with GEF (see above).

<sup>45</sup> The Stakeholders underlined have been contacted directly as part of the study (request of documentation/information), and gave a positive response.

Geographical Distribution	Category	Stakeholders <sup>45</sup>	Description / Projects
		AfDB (African Development Bank)	<p>Financing of several projects related to SWM in the region:</p> <ul style="list-style-type: none"> <li>- Large project to improve sanitation and SWM in several regions of Tchad  <a href="https://www.afdb.org/en/news-and-events/au-tchad-la-banque-africaine-de-developpement-contribue-ameliorer-lacces-leau-potable-et-lassainissement-pour-pres-dun-million-de-personnes-37758">https://www.afdb.org/en/news-and-events/au-tchad-la-banque-africaine-de-developpement-contribue-ameliorer-lacces-leau-potable-et-lassainissement-pour-pres-dun-million-de-personnes-37758</a></li> <li>- Program PARICS in Côte d'Ivoire (Programme d'appui au Renforcement de l'Inclusion et de la cohesion sociale), co-financed by AFD, GIZ, JICA, UNDP  <a href="https://www.afdb.org/fileadmin/uploads/afdb/Documents/Project-and-Operations/C%C3%B4te_d_Ivoire_-_Programme_d_appui_au_renforcement_de_l_inclusion_et_de_la_coh%C3%A9sion_sociales_PARICS_-_Rapport_d_%C3%A9valuation.pdf">https://www.afdb.org/fileadmin/uploads/afdb/Documents/Project-and-Operations/C%C3%B4te_d_Ivoire_-_Programme_d_appui_au_renforcement_de_l_inclusion_et_de_la_coh%C3%A9sion_sociales_PARICS_-_Rapport_d_%C3%A9valuation.pdf</a></li> <li>- Project for the construction and operation of a technical landfill centre in the Abidjan Autonomous District (Côte d'Ivoire)  <a href="https://www.afdb.org/en/documents/cote-divoire-project-construction-and-operation-technical-landfill-centre-kossihouen-disposal-household-and-similar-solid-waste-abidjan-autonomous-district-daa-esia-summary">https://www.afdb.org/en/documents/cote-divoire-project-construction-and-operation-technical-landfill-centre-kossihouen-disposal-household-and-similar-solid-waste-abidjan-autonomous-district-daa-esia-summary</a></li> </ul>
		WB	<p>Financing of projects related to SWM:</p> <ul style="list-style-type: none"> <li>- Project PIRUSI (Projet d'Urgence de Réhabilitation des Infrastructures et de Services Urbains) in CAR, including some support to the improvement of SWM sector, mainly in Bangui</li> <li>- Projects PARCA (Projet d'Appui aux Réfugiés et aux Communautés d'accueil) in Tchad and Niger</li> <li>- Project recently approved (March 2020) in Senegal to strengthen SWM in coastal cities such as Saint-Louis, Dakar, Mbour  <a href="https://www.mediaterrre.org/actu,20201103022652,5.html">https://www.mediaterrre.org/actu,20201103022652,5.html</a></li> <li>- Project to reduce vulnerability to flooding in selected urban areas and improve SWM in targeted municipalities in Côte d'Ivoire  <a href="https://www.worldbank.org/en/news/loans-credits/2020/06/12/cote-divoire-urban-resilience-and-solid-waste-management-project">https://www.worldbank.org/en/news/loans-credits/2020/06/12/cote-divoire-urban-resilience-and-solid-waste-management-project</a></li> </ul>
		GGGI	<p>Example of SWM project funded by GGGI in Senegal: Project for management of plastic waste, wastewater and waste from electric and electronic equipment (WEEE) in Dakar, Touba and Tivaouane <a href="https://gggi.org/project/project-reference-profiles-senegalsn2-green-secondary-cities-wastewater-plastic-waste-and-weee-management-innovative-business-model/">https://gggi.org/project/project-reference-profiles-senegalsn2-green-secondary-cities-wastewater-plastic-waste-and-weee-management-innovative-business-model/</a></p>
		EU	<p>Example of SWM project in Burkina Faso : Project “Moins de déchets, plus d'opportunités: l'économie verte au service des micro, petites et moyennes entreprises de Ouagadougou”, implemented by ACRA with support from Fondation ARTELIA <a href="https://eeas.europa.eu/delegations/burkina-faso/45443/node/45443_k">https://eeas.europa.eu/delegations/burkina-faso/45443/node/45443_k</a></p>

Geographical Distribution	Category	Stakeholders <sup>45</sup>	Description / Projects
		<u>MSB – Swedish Contingency Agency</u>	Global support to UN partners through deployment of WM expertise in emergency settings (focus on debris management, but also includes some interventions in camps settings: e.g. Cox's Bazar, Uganda).
		AFD	Several ongoing SWM projects funded by AFD in WCA: in Burkina Faso ("Projet d'appui à la gestion des déchets municipaux dans les villes"), Togo ("Valorisation des déchets à Lomé"), Cameroon ("Projet AFRICOMPOST 2")
		GIZ	Many projects globally supporting Municipal SWM. Involvement in refugee settings in Jordan (Guidelines for Implementing CfW projects in the Waste Management Sector, 2017).
		USAID	USAID is coordinating the global project to improve sustainability in humanitarian supply chain (aiming at reducing the impact of humanitarian packaging waste)
	NGOs	<u>NRC</u>	Implication in WASH in several countries of WCA, and ongoing reflexions globally on environmental aspects of emergencies, including SWM (Greening the orange project / Publication in 2017 on sustainable settlements in refugee's context)
		<u>URD</u>	Think thank supporting environmental studies in emergency settings, including on SWM (Haiti, Jordan). Chair of the network Réseau Environnement Humanitaire (REH).
		<u>IFRC</u>	Ongoing effort to improve SWM interventions by Red Cross partners, as part of the Green Response Programme. Guidelines for SWM in emergencies published in 2020: <a href="https://watsanmissionassistant.org/solid-waste-management/">https://watsanmissionassistant.org/solid-waste-management/</a>
		<u>ICRC</u>	Some ongoing work on alternative packaging to reduce related to humanitarian distribution, also some support in the past to Kenyan Red Cross to implement pilot recycling in Dadaab refugee camp.
		OXFAM	Several interventions in IDP and refugee settings, including SWM projects.
		GRET	Involvement in many SWM projects, including in West and Central Africa
		WasteAid UK	ONG specialized in SWM, including production of practical toolkits ("Making Waste Work"). Ongoing projects for prevention of plastic pollution and supporting plastic recycling in Cameroon ( <a href="https://wasteaid.org/wasteaid-projects/">https://wasteaid.org/wasteaid-projects/</a> )
	Private sector	<u>NGI</u>	Engineering firm involved in UNHCR plastic recycling projects in Algeria and Ethiopia. Other Research and Development projects around the production of biochar (including in Zambia) from organic waste and use for soil improvement, carbon sequestration and removal of pollutants from water, soil, air ( <a href="https://www.ngi.no/eng/Projects/Biochar">https://www.ngi.no/eng/Projects/Biochar</a> )
	Universities	EAWAG	Research centre involved in improving SWM in developing countries globally, including production of guidelines, studies, tools, and Massive Open Online Courses. <a href="https://www.eawag.ch/en/departement/sandec/main-focus/municipal-solid-waste-management/">https://www.eawag.ch/en/departement/sandec/main-focus/municipal-solid-waste-management/</a>

Geographical Distribution	Category	Stakeholders <sup>45</sup>	Description / Projects
Burkina Faso	Clusters	<u>WASH Cluster</u>	Several members of the WASH Cluster reporting SWM Activities (5W available online <sup>46</sup> )
		<u>CCCM</u>	Working group Gestion des Sites d'Accueil Temporaires (GSAT), with several members implementing some SWM activities.
	NGOs <sup>47</sup>	<u>SI (Solidarité Internationale)</u>	Some basic SWM activities implemented in Burkina Faso (construction of waste concrete containers, in coordination with local authorities).
		<u>ACTED</u>	Some SWM activities as part of GSAT interventions, planning of more SWM interventions in 2021.
		<u>ICAHD</u>	Member of GSAT working group implementing SWM activities, planning some more activities to improve SWM in 2021.
		MBDHP	Member of GSAT working group implementing SWM activities.
		CEAS (Centre Ecologique Albert Schweitzer)	Major actor of SWM in Burkina Faso since 2006, providing technical support to CBOs collection waste, municipalities, support to design and construction of infrastructure, etc.
Cameroon	UN and clusters	UNHCR	Several initiatives to implement improved SWM systems, with the Minawao camp used as a pilot location - joint interventions with livelihood and environment sectors
		<u>WASH Cluster</u>	Coordination of WASH interventions in the country and North-West / South-West regions.
		UNICEF	Actor with some ongoing SWM activities (source: IOM)
	NGO	<u>Lutheran World</u>	NGO involved in UNHCR project in Manawao camp, particularly on production of briquette from waste, and other environmental aspects such as reforestation <a href="https://www.lutheranworld.org/news/cameroon-protect-environment-create-employment">https://www.lutheranworld.org/news/cameroon-protect-environment-create-employment</a>
		SI	Actor with some ongoing SWM activities (source: IOM)
		IRC	Actor with some ongoing SWM activities (source: IOM)

<sup>46</sup> <https://drive.google.com/drive/folders/1u4QtB1zhKSz9cAHfEIMMbASG3psgs4dz>

<sup>47</sup> Detailed list of local organizations, associations involved in SWM in Burkina Faso available on: [www.burkinadoc.milecole.org/eco-developpement/article-assainissement-gestions-des-dechets-solides-au-burkina-faso/](http://www.burkinadoc.milecole.org/eco-developpement/article-assainissement-gestions-des-dechets-solides-au-burkina-faso/)

Geographical Distribution	Category	Stakeholders <sup>45</sup>	Description / Projects
		PUI	Actor with some ongoing SWM activities (source: IOM)
		Africompost	Project of composting in the city of Dschang, supported by GEVALOR / GRET <a href="http://www.africompost.org/dschang/">http://www.africompost.org/dschang/</a>
Central African Republic	Cluster	<u>WASH Cluster</u>	WASH cluster active in advocating for improved SWM interventions among WASH partners.
	NGO	<u>ACTED</u>	Project currently being launched in Bangui to implement SWM and drainage cleaning campaigns to minimize the risk of flooding in the city.
		APSUD	Organization involved in SWM activities (source: IOM)
		Triangle	Organization involved in SWM activities (source: IOM)
		OXFAM	Organization involved in SWM activities (source: IOM)
Chad	UN and clusters	WASH Cluster	Sector not directly involved in SWM in Chad.
		CCCM	Sector in charge of SWM activities.
		UNHCR	Some composting activities together with reforestation and environment reported by OCHA, as part of reintegration from Chadian refugees from Soudan <a href="https://reliefweb.int/sites/reliefweb.int/files/resources/Rapport%20de%20situation%20-%20Tchad%20-%202014%20juin%202019.pdf">https://reliefweb.int/sites/reliefweb.int/files/resources/Rapport%20de%20situation%20-%20Tchad%20-%202014%20juin%202019.pdf</a>
	NGO	WASTE	Project EJOM, financed by EU, and supporting the development of value chain and youth employment, through vocational training in different sectors including SWM, for youth and migrants <a href="https://snv.org/fr/projet/lemploi-des-jeunes-cree-des-opportunités-ici-au-mali-ejom">https://snv.org/fr/projet/lemploi-des-jeunes-cree-des-opportunités-ici-au-mali-ejom</a>
	Private sector	SNV	
		Bamako Impact Hub	Organization promoting entrepreneurship In Mali.
	Public sector	APEJ	Agency in charge of promoting Youth employment, involved in the EJOM project.

Geographical Distribution	Category	Stakeholders <sup>45</sup>	Description / Projects
	UN and clusters	UNHCR	Implementing SWM activities as part of camp management (lead by Environment and Energy officer)
	NGO	ACTED	WASH partner reporting SWM activities, including project recently started Improving the living conditions of refugee and conflict-affected communities in Niger" in Tillaberi and Diffa.
		APBE	Local NGO implementing SWM activities with UNHCR.
	Private sector	<u>GVD</u>	Private company based in Niamey (Niger) involved in recycling and SWM in general (support to cities, humanitarian actors, developing of recycling machines, training of refugees and host communities, design of recovery and disposal centres, etc.). Also some projects in Burkina Faso, Mali, Côte d'Ivoire. <a href="http://www.gvdsa.com/home.html">http://www.gvdsa.com/home.html</a>
Nigeria	UN and clusters	<u>WASH Cluster</u>	Several WASH partners reporting activities linked to SWM <sup>48</sup>
		UNDP	Project supporting SWM in Borno state, Nigeria: "EU Support to Sustainable Waste Management and Environmental Protection in Borno State" <a href="https://www.ng.undp.org/content/nigeria/en/home/presscenter/articles/2020/undp-s-cash-for-work-project-continues-to-make-positive-impact-i.html">https://www.ng.undp.org/content/nigeria/en/home/presscenter/articles/2020/undp-s-cash-for-work-project-continues-to-make-positive-impact-i.html</a>
	Public Institution	<u>BOSEPA</u>	Agency in charge of environment and Solid Waste Management in Borno State, Nigeria.
	NGO	<u>NCA (Norwegian Christian Aid)</u>	Partner initiating innovation process for Faecal Sludge Management in camps.
		<u>IRC</u>	Partner implementing some SWM activities in camps in Borno State, Nigeria.
		<u>FHI 360</u>	Partner implementing some SWM activities in camps in Borno State, Nigeria.
		SI	Partner implementing some SWM activities in camps in Borno State, Nigeria.
	University	<u>University of Maiduguri</u>	Some studies on SWM in Borno State.

<sup>48</sup> Complete 5W available on : <https://drive.google.com/file/d/1HzXoFOOQclZDNeFBK6gQIXS4KZWbUNWL/view>

Geographical Distribution	Category	Stakeholders <sup>45</sup>	Description / Projects
Senegal	Public Institution	UCG (Unité de Coordination de la Gestion des Déchets)	Unit in charge of supporting Local Authorities in the SWM sector
		Ministère de la Santé	Institution involved in SWM in health facilities.
	NGO	Zero Waste Senegal	Local NGO specialized in SWM – has been supporting IOM in environmental sustainability workshops for Resource Management Officers and Project Managers
Sierra Leone	Public Institution	FCC (Freetown City Council)	Partner of IOM project “Reducing the risk of irregular migration through Employment Promotion and Entrepreneurship support to Youth”,
Côte d’Ivoire	Public Institution	ANAGED	National Agency in charge of SWM, involved in IOM project PARSEM-PS.
	NGO	CARE	Implementing partner of IOM project PARSEM-PS.
Guinea Bissau	NGO	ASPAG	Association of Basic Sanitation and Environmental Protection in the regions of Gabu and Bafata – Provides training on waste treatment, recycling and awareness of good practices and practical experiences of waste recycling in the east of the country.