



TETRA TECH
International Development



Tetra Tech International Development

NG-02 Project Fiche

Lagos circular economy solid waste management Project (Nigeria)

June 2022



Table of Contents

Table of Contents.....	2
1. Introduction.....	4
1.1 Name of the project.....	4
1.2 Sector(s) concerned.....	4
1.3 Location.....	4
1.4 Promoter.....	5
2. Planning Framework.....	5
2.1 Relevant policies and plans and reflection of project in these.....	5
2.2 Relevant key institutions.....	7
2.3 Documentation supplied by the Promoter.....	7
3. Existing situation and needs assessment.....	8
3.1 Solid waste management.....	8
3.2 Storm water.....	10
3.3 Wastewater.....	10
4. Project scope and cost.....	11
4.1 Proposed project scope and estimated cost.....	11
4.2 Assessment of project scope and alternative/complementary options.....	12
4.3 Proposed pilot projects.....	12
5. Project contribution to COI objectives.....	12
6. Project financing plans.....	12
6.1 Current Revenues.....	12
6.2 Estimated cost.....	13
6.3 Potential for revenue generation.....	13
6.4 Potential sources of financing.....	13
7. Project implementation plan.....	13
7.1 Role and responsibilities of promoter and key stakeholders.....	13
7.2 Time schedule for project preparation and implementation.....	14
7.3 Key aspects to consider in pre-feasibility study.....	14
8. Environmental and social aspects.....	15
8.1 Key environmental and social aspects.....	15
8.2 Key topics to cover in the ESIA.....	15
9. Recommendations.....	16

Disclaimer

The authors take full responsibility for the contents of this report. The opinions expressed do not necessarily reflect the view of the European Investment Bank.

The contents of this report are the sole responsibility of the Tetra Tech COPIP Consortium and can in no way be taken to reflect the views of the European Investment Bank or the European Union.

This document is issued for the party which commissioned it and for specific purposes connected with the above-captioned project only. It should not be relied upon by any other party or used for any other purpose.

We accept no responsibility for the consequences of this document being relied upon by any other party, or being used for any other purpose, or containing any error or omission which is due to an error or omission in data supplied to us by other parties.

This document contains confidential information and proprietary intellectual property. It should not be shown to other parties without consent from us and from the party which commissioned it.









Client Name: European Investment Bank (EIB)

Project Name: Clean Oceans Project Identification and Preparation Programme for Sub Saharan Africa

Contract Number:

Partners



Revision	01 (informal submission)	02
Date	23.06.22	06.07.22
Detail	Draft for submission to EIB (informal)	Updated following EIB comments for formal submission
Prepared By	Klaus Buchholz  Joanes Otero 	Klaus Buchholz 
Checked By	Jonathan Barnes  Klaus Buchholz 	Jonathan Barnes 
Approved By	Charles Reeve 	Charles Reeve 

06 July 2022

Tetra Tech International Development Europe Ltd (BV)

92C Jan Luijkenstraat, 1071 CT Amsterdam, The Netherlands
 T (+44) (0) 1189 566 066 F (+44) (0) 1189 576 066 www.tetratecheurope.com
 Registered at the Netherlands Chamber of Commerce Business Register under no: 68702132
 Vat Number: NL 85755546B01

Egis Water

889, rue de la Vieille Poste 34965 Montpellier France
 T (+44) (0) 1189 566 066 F (+44) (0) 1189 576 066 www.egis-group.com
 Registered Office: 889, rue de la Vieille Poste – CS 89017 – 34965 Montpellier Cedex 2, France
 Registered in France No: 493 378 038 00266 (RCS Montpellier)

1. Introduction

Project summary information

Project name	Lagos circular economy solid waste management project
Location	Lagos, Nigeria
Promoter	Lagos Waste Management Authority (LAWMA)
Sectors covered	Solid waste management
Main project components	Waste segregation at source, community involvement, Material Recovery Facilities (MRFs), biowaste transition, energy reduction, waste to value, circular economy
Estimated budget	51 million EUR

1.1 Name of the project

Lagos circular economy solid waste management project.

1.2 Sector(s) concerned

The project concerns: Solid Waste Management.

1.3 Location

Lagos State is a low-lying coastal zone, of which 22% consists of water found in lagoons and creeks. An additional 18% of land is very low and subject to regular flooding. The long coastline of 180km, comprising 22% of the nation’s total coastline, fringes the Atlantic Ocean. Metropolitan Lagos, comprising several urban land uses, is estimated to cover about 85% of the land area of the state and continues to encroach upon the remaining non-urban land areas. The estimated population figures vary between 21 and 25 million inhabitants.

Figure 1: Project Location



Figure 1a: Map of Nigeria & Lagos

Figure 1b: Lagos Metropolitan showing local government areas (LGAs)

1.4 Promoter

1.4.1 Institution

Lagos State Waste Management Authority (LAWMA)

1.4.2 Contact persons

Lagos Waste Management Authority (LAWMA)

2. Planning Framework

2.1 Relevant policies and plans and reflection of project in these

There are several statutory regulations guiding waste management in Nigeria.

Table 1: Policies and Plans

Statutory regulation	Description
Constitution of the Federal Republic of Nigeria (1999)	<p>The constitution, as the national legal order, recognizes the importance of improving and protecting the environment and makes provision for it. Relevant sections are:</p> <ul style="list-style-type: none"> • Section 20 makes it an objective of the Nigerian State to improve and protect the air, land, water, forest and wildlife of Nigeria. • Section 12 establishes, though impliedly, that international treaties (including environmental treaties) ratified by the National Assembly should be implemented as law in Nigeria. • Section 33 and 34 which guarantee fundamental human rights to life and human dignity respectively, have also being argued to be linked to the need for a healthy and safe environment to give these rights effect.
National Environmental Standards and Regulation Enforcement Agency (NESREA) Act 2007	<p>Administered by the Ministry of Environment, the National Environment Standards and Regulation Enforcement Agency (NESREA) Act of 2007 replaced the Federal Environmental Protection Agency (FEPA) Act. It is the embodiment of laws and regulations focused on the protection and sustainable development of the environment and its natural resources. The following sections are worth noting: -</p> <ul style="list-style-type: none"> • Section 7 provides authority to ensure compliance with environmental laws, local and international, on environmental sanitation and pollution prevention and control through monitory and regulatory measures. • Section 8 (1)(K) empowers the Agency to make and review regulations on air and water quality, effluent limitations, control of harmful substances and other forms of environmental pollution and sanitation. • Section 27 prohibits, without lawful authority, the discharge of hazardous substances into the environment. This offence is punishable under this section, with a fine not exceeding, N1 000 000 (One Million Naira) and an imprisonment term of

Statutory regulation	Description
	5 years. In the case of a company, there is an additional fine of N50 000, for every day the offence persists
National Policy on Solid Waste Management 2020	A shared national vision on sustainable management of solid waste
Federal Solid and Hazardous Waste Management Regulations (1991).	<p>Section 1 makes it an obligation for industries to identify solid hazardous wastes which are dangerous to public health and the environment and to research into the possibility of their recycling.</p> <p>Section 20 makes notification of any discharge to the Agency mandatory.</p> <p>Section 108 stipulates penalties for contravening any regulation.</p>
National Policy on Plastic Waste Management 2020	Lays foundations for a circular economy with regards to plastics, where the design and production fully comply with the 5R's (Reduce, Reuse, Repair, Recycle and Recovery).
Environmental Impact Assessment (EIA) Act, Cap E12, LFN, 2004	<p>Section 2 (1) requires an assessment of public or private projects likely to have a significant (negative) impact on the environment.</p> <p>Section 2 (4) requires an application in writing to the Agency before embarking on projects for their environmental assessment to determine approval.</p> <p>Section 13 establishes cases where an EIA is required and</p> <p>Section 60 creates a legal liability for contravention of any provision.</p>
National Environmental Standards and Regulation Enforcement Agency (NESREA) Act, 2007	Provision for solid waste management and its administration and prescribes sanction for offenses or acts which run contrary to proper and adequate waste disposal procedures and practices.
National environmental (sanitation and wastes control) regulations, 2009	Guidelines for adoption of sustainable and environmentally friendly practices in environmental sanitation and waste management to minimize pollution.
National Policy on Solid Waste Management 2017	Guidelines and shared vision on the sustainable management of solid waste in Nigeria.
National policy on environment (revised 2016)	Coordinate environmental protection and natural resources conservation for sustainable development
National urban development policy (2006)	Foster sustainable economic growth promote efficient urban and regional development and ensure improved standard of living and wellbeing of Nigerians.
National effluents limitations regulation	Mandates industrial facilities to install anti-pollution equipment, make provision for further effluent treatment, prescribe maximum limit of effluent parameters allowed for discharge and spell out penalties for contravention.
The harmful waste (special criminal provision, etc) Act 2004	Prohibits carrying, depositing, and dumping of harmful waste on any land, territorial waters, contiguous zone, exclusive economic zone of Nigeria or inland water ways and prescribes severe penalties for any person found guilty of any crime relating thereto.

Statutory regulation	Description
Lagos State Environmental Management and Protection Law 2017	A law to consolidate all laws relating to the environment for the management, protection, and sustainable development of the environment in Lagos State and for connected purposes.
Environmental Pollution Control Law	Section 12 of this law under the Laws of Lagos State makes it an offence to cause or permit a discharge of raw untreated human waste into any public drain, water course or onto any land or water. This offence is punishable with a fine not exceeding N100, 000 (One hundred thousand naira) and in the case of a company, a fine not exceeding N500, 000
Environmental Sanitation Law	It punishes in varying degrees acts like street obstruction, failure to clean sidewalks, cover refuse bins or dispose wastes proper

2.2 Relevant key institutions

Table 2: Key Institutions

Institution	Description
Federal Ministry of Environment	Responsible for environmental protection, natural resources conservation and sustainable development
Department of Pollution Control, Federal Ministry of Environment	Responsible for oversees solid waste management project in line with policies related to National Policy on Solid Waste Management and National Policy on Plastic Waste Management
National Environmental Standards & Regulations Enforcement Agency (NESREA)	An agency of the Federal Ministry of Environment charged with the responsibility of enforcing environmental laws, regulations and standards in deterring people, industries and organizations from polluting and degrading the environment.
Lagos State Waste Management Authority (LAWMA)	Responsible for the regulations, monitoring of solid waste management in the state, they monitor the activities of private waste collectors, recyclers, management of transfer loading stations, etc.
Lagos State Environmental Protection Agency (LASEPA)	Environmental regulator for Lagos assisting the public and private organizations, industries, businesses, and non-governmental organizations to achieve compliance by providing environment friendly solutions to varied environmental challenge
Lagos State Wastewater Management Office (LASWAMO)	Carved out of the erstwhile Sewage department of the office of drainage services in the Ministry of the Environment, Lagos State on the 3rd of September 2010 to oversee wastewater management in the state. The office was incorporated into the Lagos water corporation.

Other Government Agencies responsible for guidance on waste legislation: Ministry of Health, Ministry of Environment and Water Resources, Ministry of Agriculture and Rural Development (responsible for agricultural waste).

2.3 Documentation supplied by the Promoter

- Organogram
- Two notes of Meeting
- Newest Business Plan is under renewal

3. Existing situation and needs assessment

3.1 Solid waste management

Solid Waste Management (SWM) is the responsibility of the Department of Pollution Control, Solid Waste Management and Technology, under the Ministry of Environment. The Department is responsible for municipal, medical and hazardous waste.

Nigeria has a national policy on solid waste management and a national budget for solid waste management. However, there is no basic law neither on municipal solid waste nor on sanitary landfills. It is also important to note that Nigeria is home to six of the biggest dumpsites in Africa, according to Waste Atlas 2014 report on World’s 50 Biggest Dumpsites published by D-Waste. The dumpsites are located in most important cities namely Lagos (Olusun, Solous 2 and Epe dumpsites), Port Harcourt (Eneka dumpsite) and Ibadan (Awotan, Lapite dumpsites)

The estimated total amount of domestic waste per annum in Nigeria is about 63 million tonnes (0.45kg/capital/annum)¹ out of which less than 20% is collected through a formal system². The existing solid waste management system is affected by economic, institutional, legislative, technical, and operational constraints.

According to UN Habitat’s waste wise cities tool, Lagos generates close to 11 349 tonnes of waste per day. This comprises many elements that can be profitably recycled. The largest proportion is vegetables (45%) followed by Plastics (15%), Papers (10%), Putrescible items (8%), Fine Grade material (8%), Glass (5%), Metals (5%) and Textiles (4%)³. The present collection rate is 48%, city recovery rate 8% and total amount of municipal solid waste (MSW) that is collected and managed in controlled facilities is only 8% (887tonnes/d)⁴. The summary of waste data for Lagos, Nigeria is provided in figures 2, 3, 4 and 5.

Figure 2: Summary of key waste data, Lagos

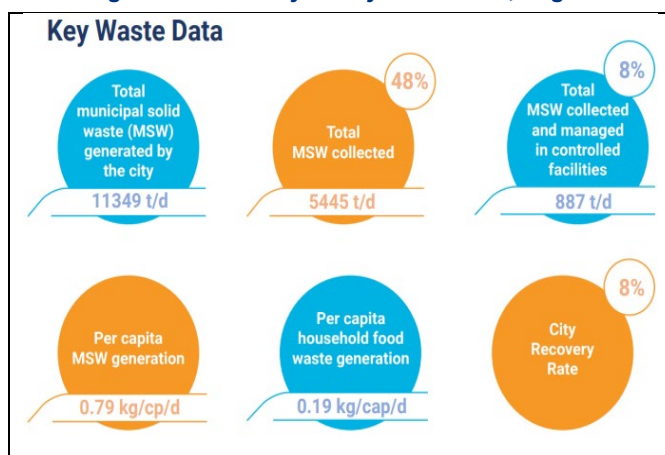


Figure 3: WaCT flow chart

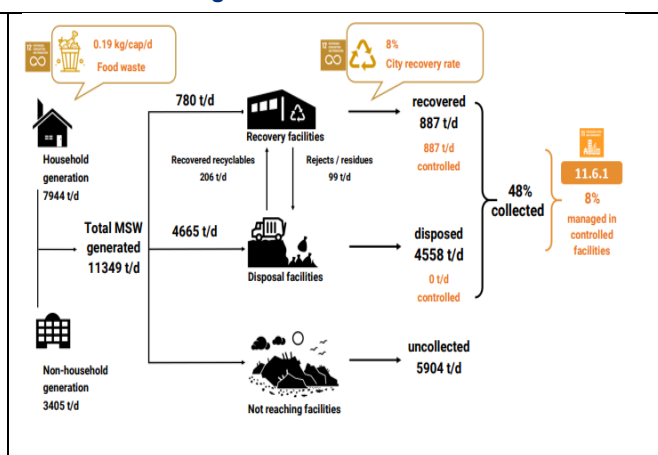


Figure 4: Potential recyclables from households

¹ National Policy on the Environment (Revised 2016) [\(link\)](#)
² EnvironReview [\(link\)](#)
³ Lagos State Development Plan 2012-2025 [\(link\)](#)
⁴ UN Habitat waste wise cities tool [\(link\)](#)

	Average household waste generation (kg/capita/day)	Total population	Total MSW generated by households (t/day)
High income	0.65	2,155,249	1,410
Middle income	0.44	5,028,916	2,206
Low income	0.60	7,184,166	4,329
TOTAL	0.55	14,368,331	7,944

Total MSW generated from non-household sources (t/day): **3,405**
calculated using proxy of 30 % of total MSW

Source: UN Habitat WaCT

Waste management in Lagos is characterized by delayed collection of household solid waste and indiscriminate dumping of refuse spaces, e.g markets, drainages, and open tracts in residential areas.

In some cases, the wastes are not collected until after a week or two, consequently, the waste bin overflows and litters the surroundings. Improper garbage disposal and lack of reliable transport infrastructure means that collected wastes are soon dispersed to other localities. Another unwelcome practice is overloading of collection trucks with 5-6 tons of waste to reduce the number of trips⁵.

There are three major dumpsites serving Lagos state at the present namely:

1. Olushosun dumpsite

The largest dumpsite in Nigeria and Lagos covering an area of about 43 hectares and has a life span of 35 years⁶ from the date of establishment in 1992. It receives close to 2.1 million tonnes of waste annually comprising municipal solid waste, construction waste and electronic waste. A population of about 5 million people live around The first Landfill Gas Recovery and Utilisation project at Olushosun landfill site is currently at the pre-engineering design stage. The project is being executed by LAWMA in association with the United Nations Environment Programme and the African Carbon Asset Development. The project is seen as a contribution to reducing Lagos' carbon footprint and therefore fulfilling Nigeria's commitment to combatting climate change.

10 km radius from the site and numerous health problems like skin irritation, dysentery, water-related diseases, nausea etc. have been reported by residents living around 3 km radius from the site⁷.

2. Solous 2 dumpsite

It occupies around 8 hectares of land along Lasu-Iba road and receives about 820,000 tonnes of waste annually. It has received around 5.8 million tonnes of Municipal Solid Waste (MSW) since establishment in 2006. The dumpsite is located just 200 meters away from the nearest dwellings and almost 4 million people live within 10 km radius from the site⁸. Due to the vulnerable sand formation of the area, leachate produced at the dumpsite flows into groundwater causing its contamination.

3. Epe dumpsite

Epe dumpsite occupies about 80 hectares of land and it is located 500 meters away from the nearest settlement. The dumpsite is also just 2km away from Osogbo River and 7km away from Lekki Lagoon. The dumpsite was opened in 2010 and has an annual input of 12 000 tonnes of MSW⁹. Lagos State government is planning to upgrade Epe dumpsite to an engineered landfill and it is set to replace Olushosun dumpsite after its closure.

LAWMA's vision is to develop a system for efficient waste collection and recycling including necessary infrastructure and machinery to sort, package, compress and dispose waste in compliance with the highest international standards. There are two Transfer Loading Stations (TLS) located at Simpson and Oshodi. Each TLS has an installed capacity of 1,000 metric tonnes and accommodates refuse collected during the day from the local council areas from where they are converted to small volumes and moved with vehicles at night to

⁵ BioEnergy Consult Powering a Greener Future ([link](#))

⁶ Olorunfemi, F. B. "Landfill development and current practices in Lagos metropolis, Nigeria." Journal of Geography and Regional Planning 4, no. 12 (2011): 656. ([link](#))

⁷ A Glance at Biggest Dumpsites in Nigeria by Suhaib Arogundade (April 13, 2022) ([link](#))

⁸ Glance at Biggest Dumpsites in Nigeria by Suhaib Arogundade (April 13, 2022) ([link](#))

⁹ Ibid

dumpsites. The TLS also include a hydroclave medical treatment plant. The aim is to have 20 TLS plants in Lagos.

3.2 Storm water

Flood frequency in Lagos is increasing, and therefore, denotes the need for improved stormwater infrastructure and flood prevention and management measures. The frequent flooding incidents are attributed to the fact that Lagos has not kept up with its infrastructure needs and the unregulated growth and expansion of the city.

Besides, many parts of the city were originally low-lying mangrove swamps and wetlands which have been reclaimed and settled, mostly by poorer communities and more recently through concerted efforts by the government. These low-lying areas are particularly at risk of flooding, and the situation is complicated by buildings being constructed on water ways, and bad waste dumping habits which block the drains. About 70% of the population of Lagos live in slums, with the density of people being as much as 120,000 people per square kilometre¹⁰ with no proper stormwater drains and waste management infrastructure.

Lagos experiences three types of flooding: urban area flooding which is generated by extremely flat topography (in low-lying areas), excessive rainfall, inadequate stormwater drainage system and obstruction of natural steams and water courses; coastal area flooding which is due to the inundation of the lagoon, estuary and coastlands with ocean wave and storm surges, high tidal levels and arbitrary / unregulated modification of the shoreline; and river flooding due to extremely high water levels in rivers. There are five main rivers discharging both running water and sandy sediments into Lagos Lagoon and Lagos creeks.

3.3 Wastewater

Lagos State Water Corporation (LAWC) which operates independently as a parastatal but within the general purview of the Ministry of Environment is responsible for supplying clean potable water. In 2010 LAWC took over responsibility for sanitation from the sewerage section of the Ministry of the Environment, creating a new branch called the Lagos State Wastewater Management Office (LSWMO)¹¹.

The current sanitation arrangements in Lagos have been a cause for concern for some time. There are five Lagos State Government-owned Wastewater Treatment Plants (WWTPs).

Table 3: Lagos State owned wastewater treatment plants

Location	Year of construction	Designed plant capacity	Upgraded plant capacity
Abesan	1985	50 000	250 000
Oke-Afa	1985	40 000	150 000
Iponri	1983	10 000	20 000
Alausa	1982	10 000	15 000
Amuwo-Odofin	1982	30 000	30 000

Source: Lagos State Development Plan 2012-2025

There are also two Federal Government-owned WWTPs at Festac and Eric Moore, both of which are non-functional and several small privately owned WWTPs scattered across the state with a total capacity of about 200 000 people¹².

¹⁰ The Conversation ([link](#))

¹¹ Lagos State Development Plan 2012-2025 ([link](#))

¹² Lagos State Development Plan 2012-2025 ([link](#))

4. Project scope and cost

4.1 Proposed project scope and estimated cost

LAWMA proposal to build 14 Transfer Stations was objected by COPIP because in as much as it would have contributed to a higher collection rate, it would also signify an increase or creation of more landfills and impede reduction of plastic waste or attainment of circular economy solution to waste management.

It was agreed with LAWMA to create systems and infrastructure that would double existing share of correctly collected, segregated, and recycled waste from the current 900 t/day or (approx. 8% of total waste) to almost 2,000 t/day.

This shall achieve through a circular economy approach maximizing on additional employment opportunities, highest possible recycling quote with further processing of the waste streams within the country, reduced machinery, and energy input. Private partners and investment partners shall be taken into consideration.

Thus, a LAWMA flagship for circular economy might be created.

4.1.1 Solid waste management

Following project components with estimated costs were agreed with LAWMA:

Table 4: Summary of Components & estimated Costs

No	Scope	Contribution & EIB eligibility
1	segregation at source with about 100 community's participation for approx. 200,000 households	yes
2	Establish MRF's with PV equipped roofs by partly using existing Transfer Stations	yes
3	Introduce an electric vehicle fleet for the short-range household collection vans and tuk-tuks	yes
4	Equip each MRF with PtF container plants to produce daily about 3,200 litres of diesel from non-recyclable plastic waste for the fuel operated long distance transport trucks out	possible Leasing cooperation with private company "Biofabrik"
5	Establish a "black soldier" factory to implement a benefit-oriented value chain to produce animal feed, fertilizer and cooking pellets	use of private investment and knowledge
6	Establish a plastic bottle recycling hub with hot wash, flaking and fibre or bottles production.	in case source out to private funding
7	Long-term Tech. Assistance	yes
8	Educational Recreational Center/facility for water bodies protection	
9	attach a Polycare resin-concrete mass house production line to one of the MRF's	private company Polycare

	50.45 Million EUR	
--	--------------------------	--

4.1.2 Stormwater drainage

The stormwater sector is not in the focus of this project. Nevertheless, it was a special wish from LAWMA to incorporate a Recreational Center/facility for water bodies protection. It could be established with support from the LAWMA Academy, which has been offering training on waste awareness and skills.

4.2 Assessment of project scope and alternative/complementary options

The above scope was selected after a long and detailed discussions with LAWMA. The Mega City Lagos offers many possibilities as the huge amount of solid waste related problems cannot be solved in mid-term run.

A purely private approach was discussed as there are several bigger recycling enterprises in the country. But referring projects never ended-up successfully in big scale.

Nevertheless, the above project scope leaves the door open for private investments in any form: leasing, PPP or direct.

4.3 Proposed pilot projects

A new pilot project is not foreseen as the huge informal sector demonstrates possibility of successful recycling initiatives. Besides, LAMA itself has started a waste segregation - related pilot under the name Blue Box (see above 4.1.1). As it only commenced in March 2022, the results are not known yet.

The COPIP team will refer to the separately executed 5 pilot projects in other countries and replicate/consider the lessons.

5. Project contribution to COI objectives

The project contributes to the objectives of COI as follows:

Expanding and improving MSW collection rate and recycling in Lagos will significantly reduce leakage of plastics and other wastes to the ocean and the other water resources like the rivers. Expanding and strengthening LAWMA's capacity to undertake separate collection of dry and wet waste as well as incorporating the informal waste pickers into waste management value chain will improve door-to-door collection, segregation at source and support creation of decent job opportunities for youths and communities in the informal settlements. Besides, there is a potential to get quality/clean recyclable materials from low-income areas/informal settlements that lack waste collection services.

6. Project financing plans

6.1 Current Revenues

It is difficult to identify the current revenue as the actual collection service is mostly outsourced to so called "Private Sector Participants (PSP's)", who are responsible for one town district and transport the waste to the Transfer Stations (TLS) over different lengths with different tariffs. Only from the TLS LAWMA is transporting the waste to the landfills.

Nevertheless, it is known that the average monthly expenses per household for waste services are approximately 2,000 N (Nigerian Naira), equal to 4.5 EUR. In comparison:

- the monthly expenses for electricity are between 5-20,000 Naira (10 to 40 EUR/month)
- the cost of renting a small one-room apartment out of town is 15,000 Naira (35 EUR)
- the cost of renting a small one room apartment in town is about 85,000 Naira (210 EUR)

6.2 Estimated cost

With a waste collection of 1,000 t/day (as suggested for this COPIP project) and an estimated administration/ awareness building, collection/ transfer + landfilling cost of € 25 /t, costs of waste management are expected to rise as per the data in Table 3. All based on the above-mentioned average waste household fee of 4.5 EUR/month and 30 EUR/tonne (see calculation in chapter 6.3 below):

Table 5: Estimated cost

Year	Waste generation	Annual Costs	Income from waste fees	Financing gap
	tonnes/day	EUR/annum	EUR/annum	EUR/annum
2021	1 000	9 125 000	10 950 000	(+) 1 825 000
2030	1 200	10 950 000	13 140 000	(+) 2 190 000
2040	1 300	11 862 500	14 235 000	(+) 2 373 000

The results indicate that the existing waste fee are sufficient to cover the costs of conventional landfilling.

Therefore, a detailed Pre-Feasibility Study (PFS) should confirm these figures and identify if the surplus sum can be used for the additional costs of the proposed circular economy approach project.

6.3 Potential for revenue generation

Beside the income from the waste streams by the referring recyclers, the theoretical monthly revenue from waste fees for 200 000 households would be 400 million Naira (equal to 910,000 EUR). Supposing an annual waste production of 1.8 tonnes/year per household, the revenue per household would be 30 EUR/t,year.

Beside the household revenues, there are as well revenues from industry and commerce. As they are usually higher than the household tariffs, the above balance would be even more stable. Unfortunately, this scope could not be identified during the scope and period of a Fiche and must be proofed within a PFS or Feasibility Study (FS).

6.4 Potential sources of financing

The LAWMA has regular income by fees but supporting financing by Federal Government of Nigeria is needed. Further, potential for savings for operational costs (e.g. energy) can be taken into consideration.

7. Project implementation plan

7.1 Role and responsibilities of promoter and key stakeholders

Table 6: Stakeholder roles and responsibilities

Stakeholder	Mandate and responsibility in target sector	Role in the project
LAWMA	Coordination and implementation	Project promoter
Ministry of Finance	Coordination support for the project	Central Financing institute
Ministry of Environment	Providing legal framework	Overall coordination
Development Bank Nigeria	Initiate start-ups	Financial co-Implementation
NGO's, CBO's, waste picker initiatives	Waste (pre-) collection, transport	Ensure the waste segregation at source

Private sector	recycling	Ensure waste to value chain , co-financing
----------------	-----------	--

In addition to these key stakeholders, the EIB regional office in Abidjan would have an important role in a potential COPIP project in Lagos. Such a project needs to be coordinated with other donors (World Bank, JICA, AFD, KfW, etc.) to avoid overlaps and duplications.

7.2 Time schedule for project preparation and implementation

The preparation and implementation of the project depend on decision of LAWMA and availability of the 50% co-financing. The above-mentioned Pre-Feasibility Study is expected to take 4 - 6 months and can be thus completed in early 2023 under the EIB-financed COPIP programme.

A minimum of 2 years is a first estimate of the project implementation period for the Lagos project.

7.3 Key aspects to consider in pre-feasibility study

The Terms of Reference for the COPIP programme require at least following general components in the Pre-Feasibility Study:

- Institutional and regulatory aspects.
- Technical aspects.
- Market aspects related to both feedstock and offtake of outputs.
- Financial and affordability aspects.
- Environmental aspects.
- Social aspects, including possible needs for resettlements.
- Climate aspects including risk and Vulnerability Assessment.
- Contribution to the Clean Ocean Initiative objectives.

Other specific aspects relevant to the LAWMA project type and context are:

- Approximate dimensions, capacity and technology of project elements, esp. for the MRF's.
- Assessment of existing SWM facilities.
- Needs for technical assistance (human and financial resources).
- Household income and expenditure surveys to facilitate an affordability study which will determine the potential for SWM cost recovery utilizing existing as well as other potential revenue instruments, e.g., collection tariffs, landfill gate fee, property tax, other taxes, fines/penalties, potential revenue from recycling options, composting, biogas.
- Assess the funding gap in the context of project costs, affordable tariffs, and other financial instruments highlighted above.
- Identify any other potential economic, environmental and social benefits which could be utilized to justify bridging the funding gap.
- Conduct a financial analysis of project cost and revenue streams (discounted cost and revenue streams over 20-25 years).
- Conduct a cost benefit analysis of potential economic, environmental and social impacts (quantifying these impacts to the extent feasible).

- Estimate financial and economic rates of return. Here the financial rate of return will almost certainly be negative, but the economic rate of return may be positive as it would incorporate quantified economic, environmental, and social benefits.
- Identify COPIP project financing modalities (grant/ loan/ loan conditions) to fill the funding gap.

8. Environmental and social aspects

8.1 Key environmental and social aspects

The costs and benefits of environmental and social aspects (impacts) need to be expressed and quantified more clearly to justify the subsidies required to bridge the funding gap as discussed in 7.3 above. From this point of view, they will need to be clearly defined by environmental and social specialists. They may include e.g. improved income and productivity of affected populations, reduced environmental degradation caused by plastic and other waste, reduction in greenhouse gas emissions resulting from relevant investments, improved sustainability of land based and ocean resources etc.

The benefits from the proposed infrastructure within the newly established waste collection system need to be assessed.

8.2 Key topics to cover in the ESIA

8.2.1 The establishment of new recycling industries

As it will be crucial to increase the number of waste or plastic recycling facilities within this project, it needs to be carefully checked under which conditions and requirements such facilities can be implemented in Lagos, how the feedstock can be secured, and in which locations they could be established.

8.2.2 Environmental awareness and Safety Training for the involved informal waste pickers

The existing local waste pickers initiatives and the “Waste Collection Welfare Initiative” need to be assessed and investigated what type of further training and skills are required.

8.2.3 General Issues as per TOR to be covered in the ESIA

Table 7: ESIA Components

	ESIA Components as per COPIP TOR	Applicable for Pre-FS LAWMA	Priority
1	Project description including technical characteristics, location, and description of project alternatives (including no project option) evaluated to reach the selected option under assessment.	Yes	
2	Relevant national legislation and standards and applicable international framework with indication of which approvals the project is required to obtain before construction and the related approval process.	Yes	
3	Description of methodologies that will be applied in the assessment and indication of specific issues that are relevant to the data collection exercise and that may affect the conclusions of the ESIA.	Yes	
4	Environmental and social Baseline with a comprehensive description of environmental aspects potential subject to impacts, such as population, fauna, flora, soil, water, air, climate, landscape, tangible assets, cultural heritage Identification of potential E&S Impacts during construction, operation and decommissioning.	Yes	

5	Assessment of the likely significance of E&S impacts.	Yes	
6	A comprehensive Environmental and Social Management Plan (ESMP) including: Description of mitigation measures for the identified impacts, applied using the mitigation hierarchy (eliminate, reduce, compensate) and follow up of consideration of cost of such measures in the Preliminary Engineering Design (PED); Arrangements for monitoring and evaluation of impact management	No only in FS	
7	Climate Vulnerability Assessment to determine the sensitivity of the project (or one of its components) to predicted consequences of climate change. Identification of measures to increase resilience of the project and follow up of consideration of cost of such measures in the Preliminary Engineering Design (PED).	No only in FS	
8	Stakeholder identification and analysis, engagement and consultation.	Yes	
9	Non-Technical Summary (NTS).	Yes	
10	The potential impacts of population movements (involuntary resettlement and in/out migration).	None	
11	The potential impacts on vulnerable groups.	Yes	
12	Attaining core labour standards.	In FS	
13	Dealing with occupational and public health, safety and security.	Yes	
14	Stakeholder engagement in project preparation and implementation.	Yes	

9. Recommendations

Based on the findings of the fiche, the fiche has been ranked and is summarised below.

Ranking measure	COPIP ranking
EUD Priority	2
EIB Priority	3
Promoter Priority	3
Impact	3
Likelihood to proceed	3
Sub Total	14

Note priority ranking scale 1 = low ranking 2 = medium ranking 3 = high ranking

With Sub Total A having a score of 14 it is recommended that this COPIP project could progress to Pre-Feasibility Stage within the current COPIP programme.