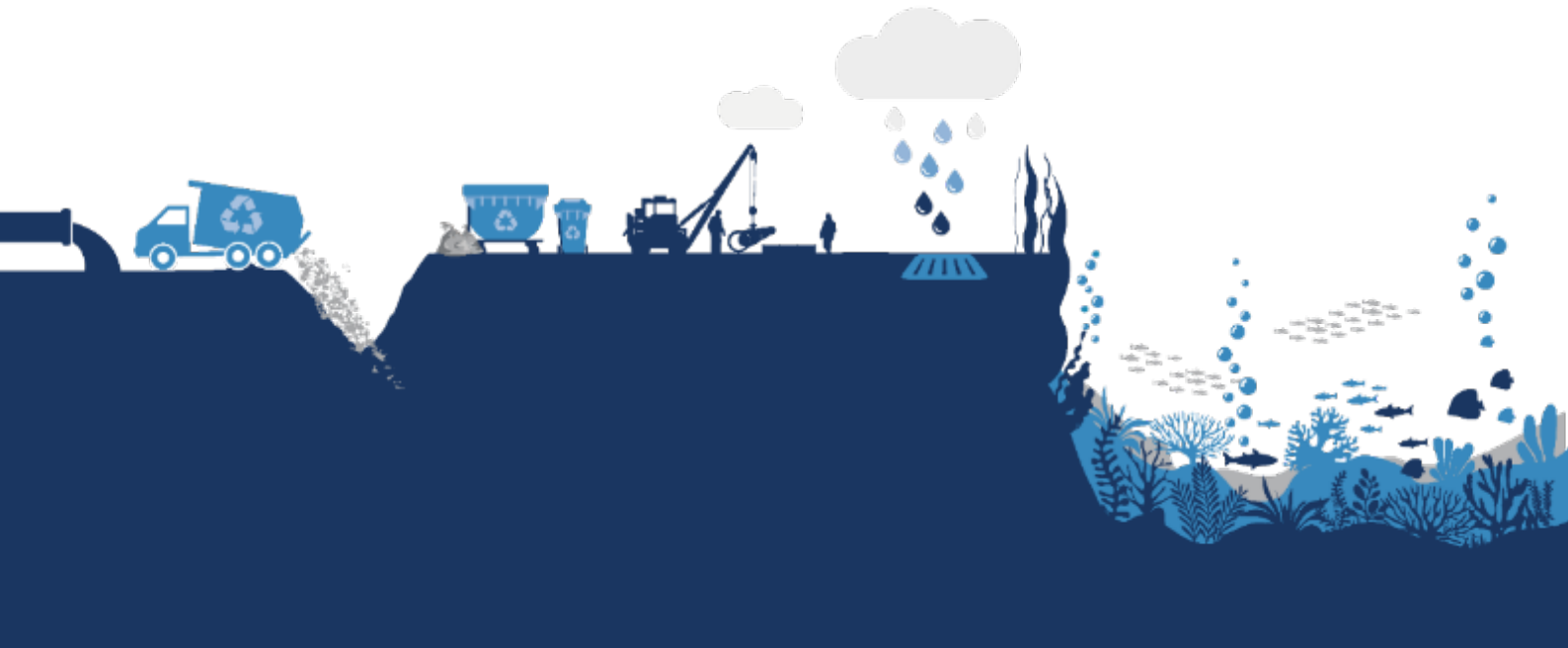
Tetra Tech International Development

TZ-01 Project Fiche Dar Es Salaam Community Based Solid Waste Management (SWM) Project-Integrated SWM (Tanzania)

Mini Fiche

March 2022



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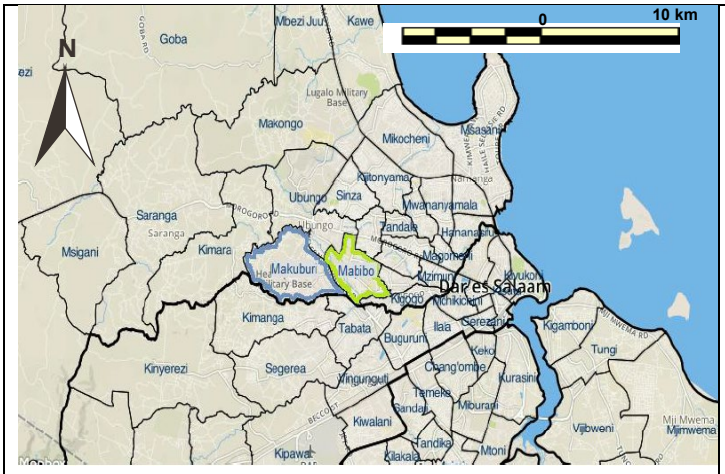
Introduction

Project summary information

Project name	Dar Es Salaam community based solid waste management (SWM) project- Integrated SWM
Location	Dar Es Salaam, Tanzania
Promoter	Dar es Salaam City Council (DCC)
Sectors covered	Solid waste management, stormwater management
Main project components	The main components will comprise (a) community approach with waste separation at source including establishment of strategic solid waste collection points, skips and side loaders, equipping community members with tools, equipment, skills and awareness to practice waste separation at the source, the (b) plastic collection in stormwater channel specifically installation of screens or interceptors in stormwater channels.
Estimated budget	101 million EUR
Population summary	The total population of Dar es Salaam is about 7.3 million people[1]. Population in the city area is about 2.6 million people, it is the third fastest-growing city in Africa and the ninth fastest-growing in the world. The city's metro population is expected to grow to over 5 million over the next decade.
Contact People	Dar es Salaam City Council

Figure 1 Project Location



Wards of the city of Dar Es Salaam

Dar es Salaam city boundary

[1] World population review (link)

2. Relevant Key Institutions and Planning Framework

Relevant Key Institutions	**The Vice President's office** is key in Solid Waste Management (**SWM**): Oversee environmental management on National SWM and Action Plan. Approves Strategic Environmental Assessment and Environmental and Social Impact Assessments (ESIA). National Environment Management Council: conduct ESIAs which includes addressing matters on solid waste ***Other Government Agencies responsible for guidance on waste legislation:*** Ministry of Health, Community Development, Gender, Elders and Children: oversee Environmental Sanitation, which includes municipal and medical waste. **National Environment Management Council (NEMC)**:
Planning Framework (Key Policies and Plans)	There are several frameworks governing the sectors of solid waste management, water management and sanitation including: • National Environment Management Act No. 20 of 2004 (EMA, 2004); • National Environmental Policy (2007); • Environmental Management (Solid Waste) Regulations, 2009; • Investment Guide on Waste Management in Tanzania, 2020; • National Environment Statistics Report 2017 – Tanzania Mainland; • Dar es Salaam City Council Recycling Policy of 2016; • Strategy of Organic Waste Management 2016 -2020.

Existing situation and needs assessment

Solid waste management	According to the National Environment Statistics Report 2017 Tanzania Mainland, the amount of solid waste generation has been steadily increasing in Dar es Salaam City from less than 2 000 tonnes per day in 1998 to more than 4 600 tonnes per day in 2017. Dar es Salaam City Council estimated that Dar es Salaam City could be generating over 12 000 tonnes per day by 2025. Approximately 3 000 tonnes of waste per day is mismanaged in Dar es Salaam. Approximately 50 to 60 % of the waste is readily biodegradable[2].
Storm water	Dar es salaam have a total of 825 km of storm water drainage network, of which 422 km (about 50%) is not in good condition[3]. The infrastructure comprises open drains along the roads for collection of storm water. Generally, stormwater collected from the urban centres do not undergo any type of treatment before being disposed into water bodies. Such stormwater is a potential source of pollution of aquatic environment.

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[2] National Environment Statistics Report 2017 Tanzania Mainland,
[3] Community Infrastructure Upgrading Program (CIUP)

Project scope and cost

4.1 Proposed project scope and estimated cost

4.1.1 Solid waste management

The project will expand and improve municipal waste management using the community approach for waste separation at source including establishment of strategic solid waste collection points, skips buckets, equipping community members with tools, equipment, skills, and awareness to practice waste separation at the source. The project is anchored on the existing and past initiatives for example, *pilot project by GIZ on separate waste collection by utilizing the community* approach and *separation, sorting and composting of municipal solid waste at the Pugu dumpsite in Dar es Salaam") by the International Solid Waste Association (ISWA) and the Netherlands* which proposed (a) Establishment of new transfer stations within the city, (b) Building a large-scale sorting and composting facility for Municipal Solid Waste (MSW) at Pugu.

Table 1 Summary of Components & estimated Costs

Ref. Number	Task
1	Awareness building campaign on segregation of waste at source/separate collection.
2	Installation of screens or interceptors on the Mbezi and Kizinga rivers and storm water drains to capture the plastics.
3	Establish a full dual separate collection system in Dar es Salaam municipalities namely Kinondoni, Ubungo, Ilala, Temeke and Kigamboni using the community approach.
4	Large scale composting facility at Pugu dumpsite area.
5	5 pcs Solar powered MRFs to serve the respective municipalities (DCC in the coordination role) and as well as charging stations for the e-trucks.
6	RDF (rehabilitation/equipping a kiln at Twiga cement).[4]
7	Rehabilitation of the 65-hectare Pugu Kinyamwezi site dumpsite and clearing illegal dumpsites (over 1000 in number). An option for the construction of a sanitary landfill will be assessed.
8	Waste management at the port – oil spills, discarded fishing nets, dry and wet waste.
9	Long term technical assistance.
10	Transition from Diesel to E-trucks (25 pcs).
11	Implementation of 5 PtF containers for non-recyclable plastics.
Total	**101 million EUR**

[4] This would need to be a separate project with a private promoter (Twiga/Tanzania Portland Cement Factory Co. Ltd). According to the RDF concept for Dar es Salaam, potential production of RDF has been discussed with Twiga cement for the Metropolitan Dar es Salaam as part of the set up of the Metropolitan solid waste management system. Twiga currently operates two kilns with an energy consumption of 12 000GJ/day. The company stated that using substitute would be feasible if the substitution is more than 10% per kiln, but this will require technical and organizational modifications for their facility.

4.1.2 Stormwater drainage

Plastic collection from stormwater channels with specifically installed screens.

4.2 Assessment of project scope and alternative/complementary options

Introduction of waste (pre-) collection in non-served peripheral area

The five municipalities of Dar es Salaam will need to be integrated into the waste collection system to increase coverage of waste collection. The community approach, already piloted by GIZ in the two wards of Kinondoni municipality namely Makuburi and Mabibo will be applied in a way that the waste value shall remain within the referring municipalities. Possible stakeholders within these municipalities shall be approached, mobilized and sensitized during the Pre-Feasibility Study and possible collection approaches and systems explored.

Transition to circular economy

To increase the contribution of the project to a circular economy, we propose the following components:

- Separate collection of waste at the source by utilizing the community approach e.g., dry and wet fractions;
- Establishing MRF's for sorting the collected dry waste or recyclable material in every municipality;
- Return processed biodegradable waste to the nearby agricultural sector by modular composting facility (small scale plants already existing in Dar es Salaam);
- Process as much plastic waste as possible in the existing privately owned recycling facilities in Dar es Salaam.

Sustainable waste handling in the Port of Dar es Salaam

The Port of Dar es Salaam is the principal port serving Tanzania. The port is one of three ocean ports in the country and handles over 90% of the country's cargo traffic and 95% of the Tanzania's international trade. The consultant proposes contributing to sustainable management of waste in this port with potential COI measures:

- Reception and transfer stations for dry & wet organic waste from the tanker/container/cruise ships;
- Construction of a sufficient number of communal toilets (latrines with urine/ faeces separation system) and connection to an aerobic co-digestion reactor for fresh latrine sludge and harbour kitchen waste;
- Establishment of an environmentally friendly spill oil disposal system;
- Acceptance station for old nets & ropes.

Project contribution to COI objectives

The waste component:	Improving and expanding separate waste collection of the dry and wet waste at the household level and subsequently preventing the discharge of plastic and other wastes to the ocean and the rivers in Dar es Salaam. Establishing and promoting existing circular approaches of sustainable waste management to: • Support transition to a green economy and post covid-19 recovery; • Create decent employment opportunities; • Promote community participation in waste management and sanitation; • Support and strengthen private initiatives to undertake recycling;

	• Reduce negative impact on climate associated with landfill emissions/improper waste disposal; • Protect natural resources and ecosystem from pollution.
The stormwater and sanitation component:	Improved public toilets in the port. Improvement of stormwater systems to reduce the discharge of plastics to rivers and ocean. Groundwater protection by reducing the illegal dumpsites and securing the landfill.

Project cost recovery and financing

6.1 Current Revenues

The DCC receives gate fees in exchange of waste transported to Pugu landfill. The fees (1500 TZS/t) are paid mostly by the private contractors and municipalities are paying on an occasional basis only. Ratio of SWM budget allocated within national budget for solid waste management in all the municipalities in Tanzania is less than 5% (recurring budget).

There is a tax on waste disposal whereby the local government authorities charge tipping fee for each incoming truck. The authorities charge a fixed rate for waste from low-income areas, but a higher rate from higher-income areas. Besides, subsidies from central government to local government are provided for the operation of the waste management services and the procurement of collection vehicles, VAT is exempted for all SWM.

The Government is encouraging various stakeholders to exploit the potential of decomposing solid waste for Climate Change Mitigation through biogas flaring and electricity generation.

A cost recovery calculation was not available and will need to be elaborated during the Pre-Feasibility Stage.

6.2 Estimated cost

Available financial means is not clear and possibly could be too low to ensure sustainable financing of the existing SWM operational costs.

Therefore, a possible grant could subsidize the initial investments for the Dar es Salaam project. This subsidy will need to be justified by additionally identified net positive quantified economic benefits together with an evaluation of other net positive externalities arising from the cost benefit analysis. This latter will comprise part of a stepwise approach to project financing provided under separate cover in the Pre-Feasibility Terms of Reference.

6.3 Potential for revenue generation

Increase of revenues from household and commerce/ industry taxes

The potential for generating revenues from sale of recovered materials, compost etc. will be investigated during pre-feasibility stage.

Given that a ceiling on revenue generating potential could be reached rather quickly it may be possible as a partial alternative to identify opportunities for improving efficiencies and reducing costs, by leveraging the competitive forces of the private sector for service provision PPP.

The project has also been interacting with the Circular Economy networks in a bid to identify additional contacts and for the purpose of exploring novel financing modalities, such as green bonds which to date have not gained much traction in Sub Saharan Africa but are increasingly being discussed at high level conferences attended by the EIB, World Bank, UN and the World Wildlife Fund.

The actual cost, affordability and pricing options require further study in the pre-feasibility phase. This study will also include commercial and industrial waste, for which other pricing options may be applicable.

In the new project, all revenues created downstream (recycling, composting, etc.) should also contribute to the financing of the activity. The authorities have not yet established a model for financing, and they indicate the need for technical assistance to develop the appropriate cost-recovery and financing mechanisms and a financing model.

Revenue Generation Potential by new Recycling Industries

The potential to create or boost the demand for compost should also be explored further.

The recovery & recycling businesses will create new employment and thus additional income for the population on one side and additional tax income for the DCC on the other side. The related financial details are difficult to estimate at this stage and need to be further investigated in the Pre-Feasibility Study.

Decrease of collection costs by community approach

If the project succeeds in its source segregation objective, and the communities will preselect at source the valuable waste streams, then the collection & transportation costs can be reduced considerably. The related financial details are difficult to estimate at this stage and need to be further investigated in a Pre-Feasibility Study.

6.4 Potential sources of financing

The potential sources of financing could include loans from the EIB and other banks and grants from the GIZ, EU, bilateral donors, and local and national authorities.

Key aspects to consider in the pre-feasibility study

Below is a bullet point summary of the methodology that will be followed, in determining the economic worth of the project and in providing a rationale for its financing, when a positive financial rate of return is not possible, and subsidies are required. Other technical aspects are also included below.

- Baseline investigation of the technical aspects of solid waste and stormwater management system, existing administration, institutional and organizational set-up on municipal waste management.
- Setting of objectives and targets for the project
- Identification, comparison and description of the project options including the cost estimates of the preferred options that allow achieving the project results.
- 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 re-cycling options, composting, biogas, potential revenue, surplus from a solar project for cross subsidy;
- 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;

- Identify needs for technical assistance to determine beneficial institutional delegations and responsibilities (O&M, financial management).

Environmental and social aspects

Key environmental and social aspects	The Dar es Salaam project requires huge efforts for public awareness and community sensibilization, which exceed the environmental technical challenge by far. The costs and benefits of environmental and social aspects (impacts) should include the following: 1. Be expressed and quantified more clearly to justify the subsidies required to bridge the funding gap as discussed in 7 above. 2. They will need to be clearly defined and by environmental and social specialists. 3. May include. improved health and productivity of affected populations (neighbours' to the newly established recycling industries), 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.
Key topics to cover in the ESIA	The standard (ESIA) aspects are covered in the Pre-feasibility ToR. Key topics for inclusion in the ESIA are as follows. 1. Environmental awareness and Safety Training for the involved Communities: The consultants will collaborate with the municipalities to train the citizens on the requirements of safe waste separation and disposal methods. 2. All environmental aspects need to be coordinated with the parallel ESIA of the Dar es Salaam port.

Recommendations

Based on the findings of the Dar Es Salaam, Tanzania fiche, the fiche has been ranked and is summarised below.

Ranking measure	COPIP ranking
EUD Priority	1
EIB Priority	2
Promoter Priority	2
Impact	2
Likelihood to proceed	1
Sub Total	**8 / 15**

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

With Sub Total A having a score of eight it is recommended this COPIP project does not progress to Pre-Feasibility Stage within the current COPIP programme as the total COPIP ranking score is 8 and the range for a Pre-Feasibility Study approval is generally between 13 to 15.