Reducing Marine Plastics in the East Asian Seas Region Project
funded by the
Ministry of Oceans and Fisheries (MOF) of the Republic of Korea

PROPOSED PILOT PROJECT IN
DAANBANTAYAN, CEBU

Scaling Up Plastic Waste Processing to Combat Marine Pollution in Daanbantayan Coastal Areas

PROJECT PROPOSAL SUMMARY

PROJECT TITLE	**Scaling Up Plastic Waste Processing to Combat Marine Pollution in Daanbantayan Coastal Areas** (Establishment of a Plastic Waste Processing Facility)	
SUBMITTED BY	LGU of Daanbantayan	November 2024

Location	Municipal CMRF, Barangay Pajo, Daanbantayan
Background	Uncontrolled garbage disposal has led to a significant buildup of waste in most of the rivers in Daanbantayan, particularly the San Pedro River. While the LGU has begun efforts to collect these waste, the current equipment of the LGU is inadequate for processing the accumulated debris and managing marine plastic waste from other coastal areas.
Objectives	Strengthen plastic waste processing to prevent ocean-bound plastics and fight marine pollution. ○ Putting up and installation of a Complete Plastic Waste Processing Facility
Resources	The installation and procurement shall be financed from the ODA project, but the maintenance, operations, and sustainability of the project shall come from the LGU of Daanbantayan.
Budgetary Requirement	The pilot project is estimated to be around 15M PhP (including the construction, installation, and procurement)
Timeline	The project intervention is aimed to be implemented and installed within two years, including the conduct of a Feasibility Study.
Monitoring and Reporting	As one of the Project Sites of the ODA-PEMSEA project in the Philippines on Reducing Marine Plastics in the East Asian Seas Region, regular reporting and updates shall be provided to the Project Team, Funding Agency and to the Philippine Government.

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I. INTRODUCTION

Daanbantayan is a first-class municipality located in the province of Cebu, within the Central Visayas Region (Region VII) of the Philippines. The municipality consists of 20 barangays, including 15 coastal barangays and two island barangays. Seven barangays are classified as urban, while the remaining 13 are rural. According to the 2023 data, approximately 85% of the population is living in coastal barangays.

The economy of Daanbantayan is shaped by three primary industries: farming, fishing, and tourism. These industries leverage the municipality's rich natural and cultural resources, with its coastal geography playing a central role in economic activities. The abundance of marine and coastal resources underscores the importance of effective coastal and waterway management.

San Pedro River is a critical natural resource in the municipality that traverses 10 barangays in Daanbantayan, serving as a natural drainage system and a vital source of potable water and irrigation. Its watershed is the largest in the municipality, supporting local communities through its water resources.

The San Pedro River faces significant environmental challenges due to uncontrolled waste disposal. The river has increasingly been used as a dumping site, leading to substantial waste accumulation, primarily plastics. This issue is exacerbated by limited waste management equipment, inadequate recycling facilities, and challenges in addressing marine plastic waste from surrounding coastal areas.

The local government unit (LGU) has initiated efforts to mitigate waste-related challenges, including waste collection and issuance of ordinances. However, these efforts remain insufficient to handle the growing waste problem effectively. Thus, there is a need for a more effective and sustainable measure such as the establishment of a processing facility specifically for plastics. Addressing waste management issues is essential for ensuring the municipality’s long-term environmental and economic viability.

This intervention for Daanbantayan is being proposed as part of the Official Development Assistance (ODA) project for the Philippines, by the Partnerships in Environmental Management for the Seas of East Asia (PEMSEA) on Reducing Marine Plastics in the East Asian Seas Region.

II. PROJECT DESCRIPTION

A. Project Background

The Municipality of Daanbantayan has enacted key environmental ordinances, including Ordinance No. 18-2020, aligned with the ESWM Act (RA 9003). This ordinance outlines the roles

of offices and committees in solid waste management (SWM), tasks the Municipal Ecological Solid Waste Management Board (MESWMB) with implementing SWM policies, and establishes the Solid Waste Management Division under MENRO. It also creates Barangay SWM Committees (BSWMCs) to oversee waste practices at the barangay level. In addition, the ordinance allows the LGU to implement the law specifically to complement the city's requirements, like specifically putting their penalties as an example, based on the existing situation in their localities. Also, they can easily implement it by specifying the roles of each of the present stakeholders, they can easily look for partners and ask for funding support from different groups, etc. In short, the ESWM Act is localized and customized through these ordinances.

The ordinance enforces waste segregation, regulates junk shop operations, and promotes public awareness through education programs. It requires businesses to adopt eco-friendly practices and products to obtain an Environmental Certificate of Inspection, essential for renewing business permits.

1. Issued Ordinances Related to Waste Management

Ordinance	Short Title	Main Provision
MO No. 12-97	Protection of Sandy Beaches	Prohibit activities that could harm the environmental conditions of the sandy beaches, such as littering
MO No. 2005-07	Sanitation Code	Sets standards for sanitation practices to safeguard public health
No. 18-2020	Ecological Solid Waste Management Ordinance	Establishes or reconstitutes the organization of offices responsible for solid waste management

Source: Local Baseline Assessment Report on Marine Plastics Daanbantayan City, Philippines by AMH Philippines, November 2024

2. Available Facilities for Waste Management

The Solid Waste Management (SWM) component facilities and equipment in Daanbantayan include collection tools such as a 1.5-ton capacity garbage compactor, a 1.0-ton capacity dump truck, and a motorcycle. For recovery and diversion, the municipality operates a central Materials Recovery Facility (MRF), with additional MRFs established in all 20 barangays. It also utilizes two biodegradable shredders, two non-biodegradable shredders, and five sewing machines to enhance waste processing. For disposal, a residual containment area is in place to manage residual waste effectively.

3. Current Projects/Activities

Stakeholder groups in Daanbantayan play crucial roles in waste management. Municipal and barangay local governments lead by establishing regulatory frameworks, providing waste collection services, and promoting public education. Local businesses and establishments comply with regulations and support sustainability by encouraging reusable products. Junk shop businesses contribute by purchasing and processing recyclables to minimize residual waste. People's organizations and NGOs engage communities through educational campaigns, clean-up drives, and recycling initiatives. Educational institutions teach sustainable waste practices and participate in environmental activities, while the general public actively supports municipal waste management programs.

The municipality, through MENRO and the Office of Municipal Social and Welfare Development, has implemented innovative waste reduction and diversion projects like "Basura Mo, Bigas Ko," which incentivizes community participation by exchanging 3 kg of eco-bricks for a food pack containing 6 kg of rice and groceries. This initiative not only supports construction projects but also provides an alternative to paying waste collection fees. At the community level, ambulant scrap buyers and two registered junk shops play a key role in recycling, and purchasing recyclables such as PET bottles, metals, and e-waste from households and barangays. These recyclables are aggregated and transported to facilities in Bogo City and Lapu-Lapu City for further processing, contributing to the municipality's recycling ecosystem.

Another scheme that has been introduced in the Municipality of Daanbantayan is the environmental fees. The ordinance specifies fees to the public for the solid waste management services of the municipality to ensure the financial sustainability of its waste management programs. Households are required to pay every month, the amount depends on the type of house. The Industrial and manufacturing firms have annual fees for waste collection services, while the commercial establishments and institutions, must pay monthly fees.

B. The Proposed Pilot Project

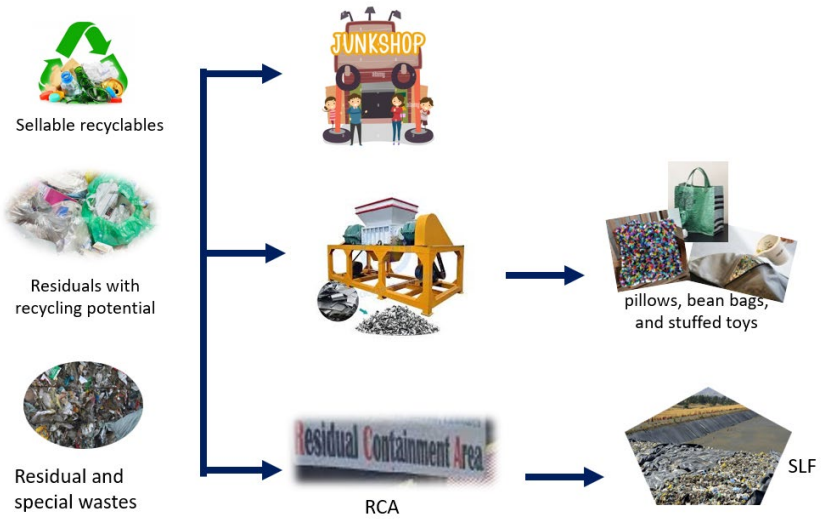
In Daanbantayan, waste recovery and diversion efforts aim to optimize resource use and promote sustainability. Segregated waste is transported to the Central Materials Recovery Facility (CMRF) and Residual Containment Area (RCA), both managed by MENRO. At the CMRF, biodegradable waste is shredded and used in composting activities, while recyclables are sorted and sold to local junk shops. Residuals with recycling potential, such as single-use plastics, are shredded and repurposed into livelihood products like pillows, bean bags, and stuffed toys, which are often marketed to tourists. Residual and special wastes designated for disposal are temporarily stored at the RCA pending the construction of an engineered sanitary landfill (ESLF). These efforts would

become more meaningful and impactful with the establishment of a complete plastic recycling facility, enhancing the municipality's ability to process plastics effectively and sustainably.

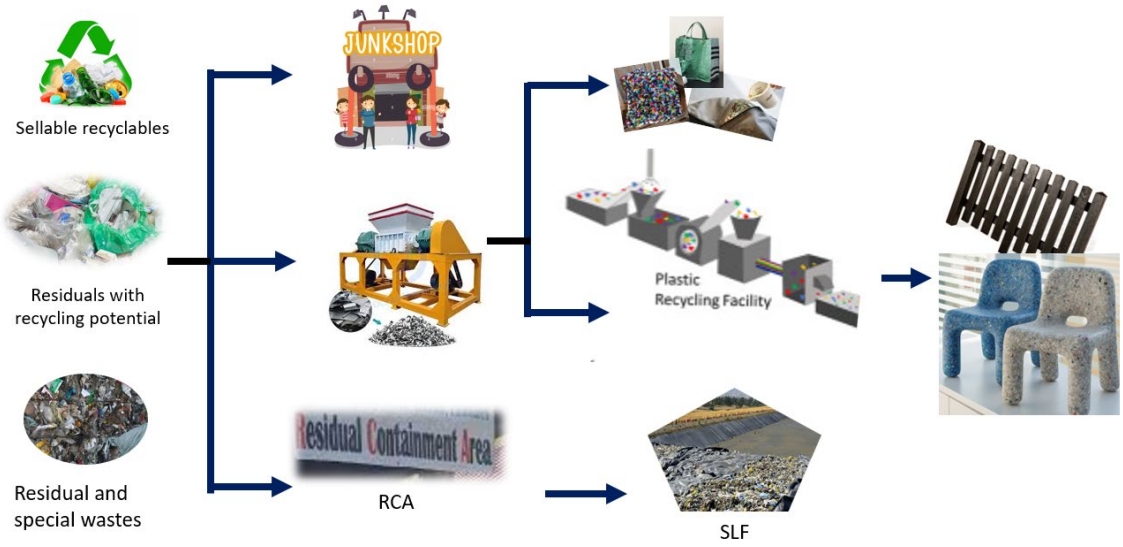
1. *Budgetary Requirement:* PhP 15M

Based on existing facilities in the country, a complete set of Plastic Recycling Facilities is estimated at around 15M PhP (may increase or decrease once the capacities and type of equipment are finalized). This excludes the area/lot and the building that shall house the facility. It will be installed in the Municipal CMRF, Barangay Pajo, Daanbantayan. This facility will focus on retrieving plastic waste and converting it into reusable and marketable products, such as chairs, eco-bricks, or other innovative materials. Possible equipment may include, a waste segregator, plastic crusher and shredding machines, compactor and pelletizing, washer, dryer, extruders, molders, pressing machine, tubs, etc. The method to be employed will highly depend on the type of plastic that will be fed into the machine.

2. *Current Flow of Recyclable waste*



3. *Foreseen Flow of Recyclable waste once the Projet is Implemented*



C. Timeline and Proposed Pre-implementation Activities

It is expected that the project will take around two years before the actual implementation or operation. This shall include the conduct of a feasibility study up to the development of IEC plans, conduct of pieces of training, and the establishment of a project team/coordinating team. Pre-implementation activities may include the following:

1. Feasibility Study and Design:
Conducting a feasibility study is essential for this type of project. The study will also determine whether the LGU-designated location is suitable for the project. The design should also be optimized and the layout should be well-planned to streamline processing operations.

2. Training and Capacity Building:
Providing local workers with the necessary skills to operate and maintain the facility is crucial. Training programs will include workshops on using technology and equipment troubleshooting, as well as proper segregation and those that relate to waste management, benefiting both staff and community stakeholders.

3. Public Engagement and Awareness:
Before implementation, public awareness campaigns are necessary to educate the community about the importance of proper plastic segregation. Collaborations with schools, local

organizations, and barangay councils can support waste collection drives and increase community involvement.

The feasibility study is expected to be completed during the first six months only until then the procurement and installation of the equipment could follow.

D. Co-Financing Arrangements

The LGU is willing to co-finance the project by providing the area/lot and the building for the facility. It is also committed to maintaining, operating, and sustaining the facility.

1. Co-Financing Arrangements:

Source of Funds	Program/Activity	Amount Allotted /annum
LGU (one-time source)	Provision of building for the facility	PHP 10M
LGU Annual Allotment for the MENRO Activities	Manpower for the operation of the facility	(from the 20% development fund)
	Technical Support in the maintenance of the equipment	
LGU (one-time source but the budget has already been allotted)	Provision of power/solar energy for the site	12.5M
In-kind contribution of barangay dwellers and Other Civil Society Organizations	Regular clean-ups	------

Note: The maintenance and operationalization of the facility shall be included in the annual fund allotted by the LGU for the MENRO-SWM activities.

III. BENEFITS OF THE PROPOSED PROJECT

The introduction of a plastic recycling process in Daanbantayan can significantly impact environmental, economic, and social dimensions. Below are the likely benefits and impacts of the project:

1. Improvement and increase in Plastic Waste Collection: With an established plastic recycling process, individuals and businesses will be more motivated and can actively participate in the process. Waste collection efforts will become more organized and efficient, thus reducing littering, and ensuring more plastics are diverted from the waterways for the facility.

2. Increase in Plastic Waste Diversion (Approximately 80 %): By creating a streamlined process for managing plastic waste, the volume of plastics diverted from landfills and waterways can more than double, reducing environmental pollution.

The current and estimated waste diversion of the city/municipality is shown in the table below

	Tons/day	**Tons/Year**
a. Total Mixed Waste Generation	36.70 T/day (0.37 x 99,179)	13,394.12 T/yr (36,696.23 kg x 365)
b. Total Plastic Waste Generation	9.92 T/day (0.10 x 99,179)	3,620.03 T/yr (9,917.9 kg x 365)
c. **Current Amount of Plastic** Waste Diverted (Through the existing facilities and other initiatives)	0.024 T/day (just the average per day)	8.76 T/yr
d. **Target/Estimated Additional** Amount of plastic waste to be diverted through the project (meaning once the project is implemented or operationalized)	7.93 T/day	28.960.27 T/yr
e. **Total Amount** of plastic to be diverted once the project is implemented	7.954 T/day	28, 969.03 T/yr

Therefore:

f. Current Plastic Waste Diversion = 0.24 %
g. Target Plastic Waste Diversion = 79.94 %

Total Percentage of Plastic Waste Diversion after the project implementation = 80.18 %

3. Creation of Green Jobs: The facility and associated activities will create employment opportunities, particularly in sorting, processing, and manufacturing recycled products. These "green jobs" contribute to local economic growth and foster skills development in the community.

4. Involvement of Stakeholders: The facility will encourage the community to adopt positive behaviors, such as waste segregation and sustainable practices, building more responsible and environmentally conscious communities.

5. Conservation of Resources and Enhanced Plastic Recycling: Recycling reduces the demand for raw materials, conserving finite natural resources and reducing the energy required for

production. This leads to lower carbon emissions and supports global efforts to combat climate change.

*6. Pollution Prevention and Public Health Improvemen*t**:** Proper recycling prevents plastics from ending up in landfills, oceans, and waterways, reducing soil, air, and marine pollution. This benefit also mitigates the adverse effects of microplastics on humans and the environment.

9. Product Diversification: Recycled plastics open opportunities for innovative products, such as eco-friendly construction materials, packaging, and everyday items.

IV. BARRIER ANALYSIS

The establishment of a plastic recycling facility requires careful consideration of potential barriers that may impede its success. These barriers can be grouped into technical, financial, management, social, and environmental categories.

Technical Barriers	*Mitigating Measure*
Operators may lack the technical knowledge to operate the recycling machinery, leading to operational inefficiencies. Also, Poor segregation of waste at the source can reduce the quality of recyclables and the facility's overall efficiency.	Provide training programs, invest in appropriate infrastructure, and standardize waste processing protocols.
Financial Barriers	*Mitigating Measure*
Limited market demand for recycled products and high recurring costs for maintenance, utilities, and workforce salaries may strain municipal resources.	Seek diverse funding sources, including public-private partnerships, and develop market strategies for recycled products.
Management Barriers	*Mitigating Measure*
Ineffective coordination between and among team members, other organizations e.g. barangay councils, and other stakeholders can hinder progress.	Enhance inter-department coordination and establish systematic reporting.
Social Barriers	*Mitigating Measure*
Community members may resist stricter waste management practices due to limited understanding and a lack of trust in the project. Failure to involve local businesses, organizations, and NGOs in planning and decision-making can reduce overall community buy-in.	Launch awareness campaigns, engage stakeholders early, and foster a sense of community ownership.
Environmental Barriers	*Mitigating Measure*
The proposed site for the facility may not be suitable or appropriate. Challenges in managing non-recyclable	Conduct detailed site assessments and ensure

residues or process by-products can contribute to environmental risks.	compliance with environmental regulations.

Addressing these barriers through strategic planning and collaborative efforts can ensure the successful establishment and long-term sustainability of a plastic recycling facility.

V. PROJECT MONITORING

Aside from the activities above, the implementation of the proposed intervention needs to be monitored including the evaluation of the intended impact, thus the need for the establishment of a localized project management team or structure. This may involve representatives from the different departments of the LGU as well as non-government partners from the locality.

VI. SUSTAINABILITY AND CONCLUSION

The introduction of a plastic recycling process is a transformative step toward sustainable waste management. It not only addresses environmental challenges but also fosters community involvement, stimulates the economy, and improves public health and resource efficiency. This proposal outlines the economic viability, environmental benefits, and how it is aligned with the existing regulatory frameworks and partnerships. The proposed facility not only offers a practical solution to plastic waste management but also creates job opportunities and promotes community awareness about sustainable practices.

This project represents a forward-thinking investment in environmental stewardship and sustainable development. With political will, a dedicated project team, and adequate support and collaboration from stakeholders, this plastic recycling facility will serve as a model for innovative waste management.