

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
BULAN, SORSOGON**



**Scaling Waste Solutions: Upgrading MRF for
Improved Waste Management and Recycling**

PROJECT PROPOSAL SUMMARY

PROJECT TITLE	Scaling Waste Solutions: Upgrading MRF for Improved Waste Management and Recycling (Expansion of the CMRF and Procurement of Equipment)	
SUBMITTED BY	Municipality of Bulan	November 2024

Location	Barangay Calomagon, Bulan, Sorsogon
Background	The LGU of Bulan is actively reducing waste through recovery activities, clean-up drives, and information campaigns backed by local ordinances. However, to boost waste diversion, improved facilities and equipment are needed. A larger workspace and additional equipment are essential for greater efficiency and impact on marine plastic waste reduction. Currently, the municipality generates more recyclable waste than the CMRF can store and process, leaving some uncollected at transfer stations until space is available. Having no other means to process the increasing amount of recycled waste, it is essential to improve the CMRF storage area and recycling capacity.
Objectives	To expand the MRF to increase its processing capacity <ul style="list-style-type: none"> • Expand the facility by 400m² • Purchase other equipment necessary to enhance the CMRF (e.g. shredder, tools, etc.)
Resources	The construction and procurement shall be financed from the ODA project, but the maintenance, operations, and sustainability of the project shall come from the LGU of Bulan. The LGU has the personnel, and assigned office (MENRO) that can maintain and operate the proposed project intervention. The LGU is committed to allotting an estimated budget of Php 6.4 M annually to operate and support the project activities.
Budgetary Requirement	The pilot project is estimated to be around 8M PhP (including the construction, installation, and procurement of equipment)
Timeline	The project intervention is aimed to be implemented and installed, including a feasibility study, within two years.
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 the Philippine Government

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I. INTRODUCTION

The Municipality of Bulan is a first-class Municipality set in the southwestern part of Luzon Island, in the Province of Sorsogon. According to the 2020 census, it has a population of 105,190 people, making it the most populated town in the province and one of Bicol's fastest-growing economies, primed to be the next city of Sorsogon. Bulan is subdivided into 63 Barangays, having 20 coastal barangays, where 42% or 45,648 of the population reside in these coastal barangays.

The municipality is estimated to generate 8,489.677.35 tons/yr of mixed waste annually, with a projected population of 109,199 and a per capita waste generation of 0.213 kg per day. Of this total, the estimated plastic waste generation is 5,459T each year.¹ The current and target waste diversion of the Bulan MRF is shown in the table below.

Total Mixed Waste Generation	23.259T/day	8,489.67 T/yr
Total Plastic Waste Generation	5.459T/day	1,992.88 T/yr
Total Current Amount of Plastic Waste Diverted (Through the existing facilities)	.1875/day (directly sellable plastics)	49.5 T/yr (computed at 22D/mo x 12)
Target Additional Amount of plastic waste to be diverted through the Intervention	1.5T/day (to include plastics as residuals with potential for recycling)	396 T/yr (computed at 22D/mo x 12)
Types of diversion process (e.g. waste to energy, as new products – chair, co-processing, etc.)	As new products (various products such as chairs, fences, MRF, shelters, bricks, poles, lumbers, etc)	For fillers (pillows, mattresses, stuffed toys, etc.) For pellets For RDF

Note: The waste diversion was computed only for the waste being processed in Bulan MRF, this does not include other waste diversions happening outside of the MRF e.g. sold in junkshops and other private sector initiatives.

Therefore:

Current Plastic Waste Diversion in the MRF– 2.48% (49.5/1,992.88 x 100)

Target Plastic Waste Diversion in the MRF – 19.87% (396/1,992.88 x 100)

Total = 22.35% Plastic Waste Diversion after the project implementation.

¹ A detailed discussion of the latest waste generation of Bulan can be found in the PEMSEA PACS conducted in 2023.

Various initiatives have already been made by the LGU to address its problems with plastics. Through the Municipal Solid Waste Management Program, headed by the Municipal Environment and Natural Resources Office (MENRO), the LGU has introduced waste recovery activities, clean-up drives, and information campaigns including the issuance of an ordinance (Bulan Anti-Plastic Ordinance in 2012) to address plastic waste. The funds for waste management of the LGU generally come from the Office of the Mayor. The municipality has also been a recipient of some national government grants, like the Department of Agriculture (DA) which provided mobile shredders for biodegradable and the Department of Environment and Natural Resources – Environmental Management Bureau (DENR-EMB), which provided mobile shredders and a set of plastic recycling facility.

However, despite all the effort, much remains to be done since plastics have already taken the limelight in the municipality. Being a coastal community, many plastics in the Municipality find their way into the ocean. Political hurdles, proper implementation of RA 9003, sanitation issues, and the lack of funds and resources are just among the challenges that need to be addressed.

This intervention for Bulan 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 Bulan has made waste management a top priority, demonstrating significant progress through the issuance of ordinances and the effective implementation of various waste management activities. To further support these efforts, the municipality has consistently allocated a dedicated portion of its annual budget, ensuring sustained commitment to address waste management and environmental sustainability in general.

1. Issued Ordinances Related to Waste Management

MO 037-1996	Requiring Receptacles in PUVs	<ul style="list-style-type: none"> Requires owners and operators of public utility vehicles (PUVs) to provide receptacles inside their vehicles for waste disposal of commuting public
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MO. 008 - 2005	“Comprehensive Ecological Solid Waste Management Ordinance of the Municipality of Bulan”	- Emphasized the “no segregation, no collection” policy • Established the Municipal Solid Waste Management Board (MSWMB)
MO. 013 - 2012	Requiring all Businesses to Display in their Stores the Environmental Friendly Notice	All Business Establishments Using Plastic Bags in their Business Transaction to display “Zero Wastes – Zero Plastics, Bring your Own Recyclable/Reusable Bags”
MO. 020 - 2012	Prohibition and Limited Use of Plastics	“The Bulan Anti-Plastic Ordinance of 2012”
MO. 024 - 2012	Prohibiting Open Burning of Trash and Other Refuse Material of 2012”	- Prohibits open burning of trash and other refuse material in the municipality
MO. 014 - 2012	The Bulan Coastal Clean-Up Day Ordinance	- Conduct of regular clean-up activities in coastal areas

Municipal Ordinance No. 020 specifically addresses the prohibition and regulation of the use of plastics. It prohibits businesses from using plastic bags for dry goods and secondary packaging materials for wet goods. It also excludes or is not allowed to use styrofoam or other similar materials as containers for food and food products. Under this regulation, businesses are prohibited from selling and using plastic bags and styrofoam as their packaging material.

Despite the issuance of these ordinances even as early as 2005, their implementation is still weak and there is still a need for the LGU to strengthen its enforcement. Assigned personnel, if not an office, to monitor its execution is still lacking. The dissemination of these ordinances may have also been weak resulting in little awareness of the stakeholders.

2. Existing Facilities for Waste Management

The LGU of Bulan is armed with the necessary equipment to address proper waste collection and segregation and other various issues related to waste management. They have different types of vehicles, ranging from pushcarts and tricycles to garbage compactor trucks to collect waste from the different areas of the Municipality. These vehicles are used during scheduled waste collection set by the LGU. They have also acquired heavy equipment to properly maintain their eco park such as a bulldozer, backhoe, loader, etc.

Necessary equipment needed for the IECs is also available in the LGU including a generator set, mobile speaker, amplifier, and different tools used for small-scale but regular clean-up drives. For waste processing, the LGU is a recipient of a plastic waste recycling facility from the Department of Environment and Natural Resources (DENR) consisting of several machines such as a shredder, extruder, hydraulic press, and chair molder. Admittedly, plastic recycling in Bulan

is still in its experimental stage and they still need proper training and know-how to come up with a good product.

There is a Central Materials Recovery Facility in Bulan where the majority of the processing of wastes is taking place. It also serves as temporary storage of recyclables that caters to the (57) Barangay MRFs. Though simple waste recovery and processing are going on in the Barangay MRFs, they largely remain as collection points of the segregated waste.

3. Existing SWM Projects

The Office of the Municipal and Environment and Natural Resources (MENRO), has implemented several initiatives to address not only plastics but waste in general. To specifically tackle plastic pollution, the local government unit (LGU) of Bulan launched various programs such as the Donation Drive for Plastic Bottles and Other Plastics; a Tarpaulin Recycling initiative, and collaborations with junkshops for the collection and sale of recyclable plastics. They have also initiated livelihood activity under the ENR Livelihood program by providing pedicabs to waste collectors. In return for the use of the pedicab, collectors are obliged to submit receipts of their sales.

A key initiative that is beginning to show promising results, is the utilization of the set of equipment for plastic recycling that was provided by the DENR-EMB. Once properly trained and capacitated, the LGU will be able to produce new products such as chairs, fences, and benches from shredded plastics, contributing to both waste reduction and the creation of useful items for the community.

While the LGU of Bulan is eager to enhance its waste diversion efforts, the current facilities and equipment limit their capacity. To further increase diversion rates, there is a pressing need for a more spacious and well-organized working area. Additionally, acquiring equipment such as shredder with higher capacity would significantly boost their ability to process more waste efficiently, allowing them to make a greater impact on plastic waste reduction in the community.

4. Existing Partnerships

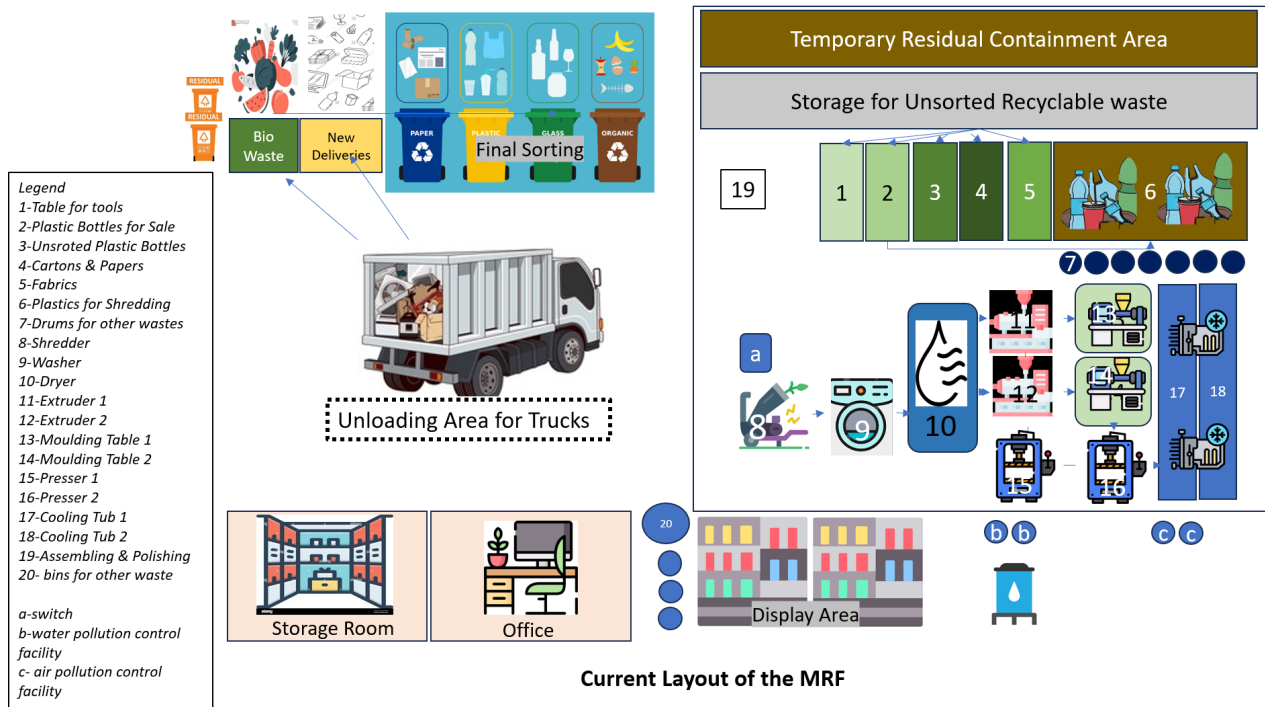
The Solid Waste Management Boards and Committees have been reorganized and their active participation in various waste management programs and initiatives can already be assured. The presence of some Civil Society Organizations (CSO) such as the Sorsogon 7K Kalikasan Program provides extra manpower during clean-up activities and other events. Other CSOs are also being mobilized for plastic waste recovery and the IEC such as the Kalipunan ng Liping Pilipina (Kalipi), Magic 5 Organization, DSWD 4Ps Beneficiaries, Agap Buhay Organization, Protec DAMAYAN, 22nd IB & 9ID Philippine Army, Philippine National Police, Bagong Silang Tarhan Sigad Daraga Sultero Youth Organization (BSTSDSYO), Manghod Organization as well as from the academe like

the Bulan National High School Youth for Environment in Schools Organization (BNHS YES O) and Faustino G. Glua High School.

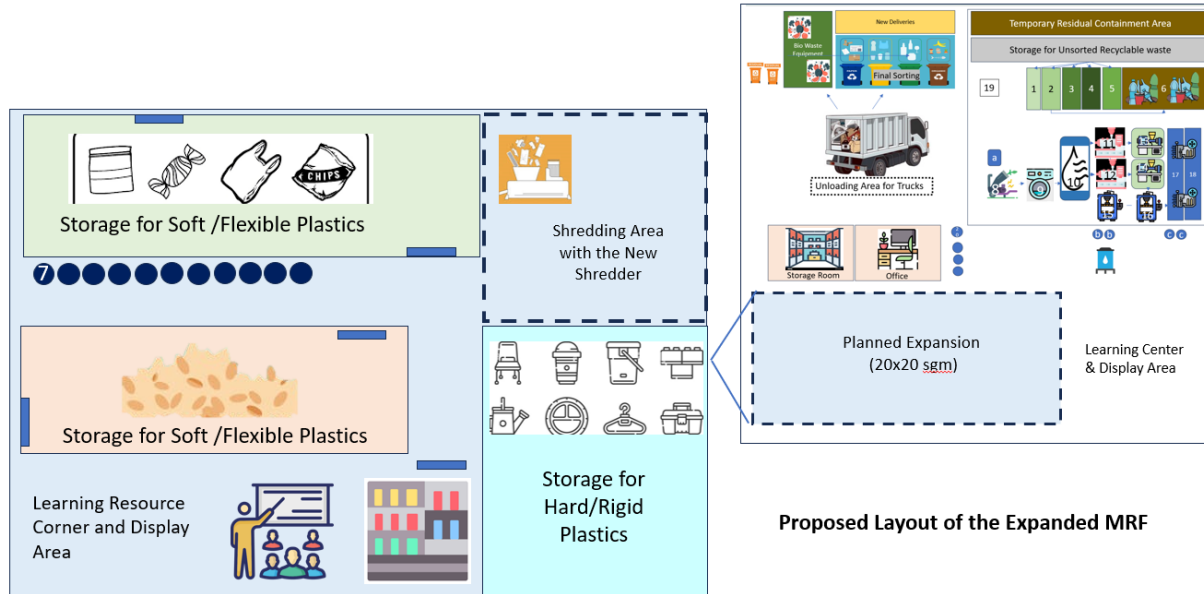
B. The Proposed Pilot Project

The existing Plastic Recycling Facility of Bulan, which is located in Barangay Calomagon, Bulan, Sorsogon, is in its early stages of operation, exploring the production of benches, fences, and tables, all made out of plastic waste. However, the area is becoming congested, with an area of 420 square meters only, due to the presence of numerous pieces of equipment utilized for waste materials processing, as well as becoming temporary storage for materials that are yet to be processed, thus limiting operational efficiency.

1. Current Lay-Out of the MRF



2. Proposed Layout of the expanded MRF



The Proposed Intervention mainly consists of constructing a dedicated walled building to expand the current facility for processing plastic waste.

3. Budgetary Requirement: PhP 8M

- Facility Expansion: (400 sq m @ PhP 15,000/sqm)	PhP6M
- Other Improvements e.g. Additional Multi-purpose Shredder with higher capacity, additional molders, tools, etc.	PhP2M

4. Equipment capacity and amount of plastic waste processed

Equipment Used	Type of Plastic Processed	Kg/Day	Kg/Mo (@22D/mo)	Kg/Yr
Current Shredder	Hard/Rigid	150	3,300	39,600
	Soft/Flexible	37.5	825	9,900
Current Total Plastic Waste Shredded (wt)				49,500

Proposed Shredder	Soft/Flexibles	1,500 (300 kg/hr @5hrs/day)	33,000	396,000
Target Total Shredded Plastic Waste (after project intervention)				445,500

5. Estimated Revenue Generation

Upon implementation of the project, it is estimated that the revenue generation of the MRF shall be increased.

	Estimated Revenue (Php)	
	Current	After
Weekly revenue from PET and PP sales	4,000	8,000 - 10,000
Monthly Revenue	16,000	32,000 - 40,000
Annual Revenue	192,000	384,000 – 480,000

The revenue generation is currently computed based on the storage and processing capacity of the MRF, once expanded it is foreseen that the revenue shall increase.

C. Timeline

The activities involved prior to implementation include conducting the feasibility study, procurement (including identification of the contractor), and installation plus the initial testing of the equipment. Initially, the Municipal Environment and Natural Resources Office (MENRO) will oversee the installation process. Once the Local Project Team is organized and established, together, they will do the monitoring responsibilities.

The feasibility study and initial procurement are expected to be completed during the first half of the first year, with installation and initial operation scheduled for the latter part of the year. This timeline ensures that the entire pre-implementation process is covered within a year.

D. Co-Financing Arrangements

Bulan's LGU is ready to finance all maintenance and operations expenses.

Source of Funds	Program/Activity	Amount Allotted /yr
LGU 20% Community Development Fund for Solid Waste Management and Clean and Green Program (implementation of programs,	Facility operations including acquisition of other equipment, etc.	3M/yr

projects, and other environmental activities)		
LGU General Fund for “7K Kalinigan and 7K Kalikasan Programs	Provision of manpower at the MRF cum RCA	2M/yr
LGU Executive Services Funds	Operational and administrative expenses (e.g. wages and salaries of staff assigned to manage the MRF, maintenance of equipment, IEC activities, & provisions of uniforms, tools, etc.	1M/yr
LGU Office of the MENRO for SWM Operations (staff salaries and operations)		200K/yr
In-Kind Contribution - plastic waste recovery i.e. Kalipunan ng Liping Pilipina (Kalipi), Magic 5 Organization, etc.	Extra manpower activities during clean-up drives and other waste-collection activities	200K/yr
Total		6.4M/yr

III. BENEFITS OF THE PROPOSED INTERVENTION

A. Project Impacts

1. *Waste Diversion*: The proposed project will not only reduce the waste that ends up in water bodies but also help increase the diversion rates of Bulan. A total of **800% increase** in waste diversion is foreseen once the proposed project is fully implemented.
2. *Resource Conservation*: Waste materials can be turned into useful products that help minimize the use of virgin materials in plastic production. The LGU can produce new products such as chairs, fences, benches, bed mattresses, etc. from shredded plastics, that can be donated to indigent communities or sold to the public in general. It is estimated that around **65.5T/yr of plastic raw materials** shall be conserved once the site is operationalized.
3. *Creation of Green Jobs*: In plastic waste recycling, more green jobs are created starting from the collection, sorting, cleaning, and manufacturing of recycled products. In Bulan, the workforce has grown from 8 individuals (handling collection and temporary storage) to 16 since the commencement of recycling operations at the CMRF. It is anticipated that an additional 11 people will be employed, bringing the total to 27, which represents an **approximate 68 % increase** in the workforce once the facility is fully operational.
4. *Involvement of Stakeholders*: Recycling initiatives often lead to increased involvement in communities as well as encouraging positive behaviors. Communities tend to be more responsible once they are made aware of environmental issues.

5. *Aid in Disaster Relief*: The recycled products that will be produced in the CMRF can aid during disasters. The products can be used in evacuation areas, especially in Bulan being known for having large flood-prone areas.

B. Additional Benefits of the Project:

1. *Ample Space for Processing*: The new facility will provide a spacious area for the efficient processing of plastic waste, allowing for smoother operations.
2. *Enhanced Safety*: The design of the building shall ensure the safe movement of materials and shall contribute to the overall safety of workers.
3. *Additional Storage Area*: The facility will also expand the Temporary Containment Area (RCA), which will serve as extra storage space for waste that still needs to undergo final sorting.
4. *Additional Working Area*: It is planned that the shredder that will be procured shall be put up in this area for further processing and production of other products.
5. *Preservation of Quality of Materials*: By housing segregated waste in a controlled environment, the building helps maintain the safety and quality of the materials.
6. *Learning Center*: The planned expansion will include a Learning and Display Area, where visitors can receive briefings and view the finished products as well as observe and experience making the recycled products. The space shall provide both resources and a showcase for the facility.

IV. BARRIER ANALYSIS

- *Lack/weak enforcement of Ordinances* - lack of incentives and alternatives hinders the successful implementation of these ordinances. The quantity and quality of materials brought to the facility heavily rely on the compliance of the local community. Thus, it is evident that the LGU strengthen its efforts and seek solutions to improve compliance

Mitigating Measures: Disseminate information about the existing ordinances through memorandum circulars; Additional issuances of Practical Ordinances such as:

- a. Ban on single-use plastics in school canteens and stores
- b. Establish a Municipal Plastic Free Day
- c. Ban on plastic straws throughout the Municipality

- d. Introduce a “School Plastic Free Day” to be observed monthly or weekly.
 - e. Incorporate a program in plastic waste management into the school curriculum
- *Inadequate financing mechanism support* – The continuous operations and maintenance of the facility may somehow stress the funds of the LGU,

Mitigating Measure: Ensure that the facility can sustain its operations through its products and other sellable materials. The LGU should also encourage more investors and partnerships.

- *Inadequate knowledge and know-how of the operators in the maintenance and repair of the equipment*

Mitigating Measure: Capabilities and staffing requirements shall be included in the FS, and proper and sufficient training will also be provided Getting the commitment of the supplier to provide services and repairs as necessary.

- *Lack of support from stakeholders* - due to lack of awareness about the advantages of the intervention.

Mitigating Measure: Representatives of various groups/stakeholders will be kept updated by involving them in project activities. MOA shall also be undertaken to solicit not only individual but institutional support from these organizations..

- *Identified capacity may not be sufficient to address the targeted outputs*

Mitigating Measure: A feasibility study will be done to evaluate the viability of the project intervention including the technical, financial, legal, and market considerations.

- *Changes in the political climate may affect the operations*

Mitigating Measure: Long-term plans shall be put in place including budgetary allocations and possibly be supported by SB Resolutions or the like.

VI. 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. Such structure shall ensure proper installation, implementation/operationalization, and performance evaluation of the proposed intervention.

VII. SUSTAINABILITY AND CONCLUSION

The sustainability of the intervention will be ensured by the following:

- Setting up the conditions to strengthen and adapt the new ordinances shall ensure the sustainability and operation of the proposed intervention. Creating a practical and reasonable regulatory environment will also result in easy enforcement and compliance.
- The significance of the intervention in terms of the environmental and public health issues will guarantee support and sustainability. Thus, the implementation of the intervention should also be supported by the Project's Component 4 (Capacity, Awareness, and Communication on Marine Plastics Management) and the LGU IEC Programs.
- The experience gained and the success of the various projects implemented by the LGU, provide a solid ground that the LGU can sustain its initiatives as well as in providing funds for their continuity.

The proposed interventions are expected to significantly improve not only the coastal community's environmental conditions but also the Municipality of Bulan in general. This will lead to cleaner and safer water bodies for both human and marine life.

The project will open new economic opportunities, such as the creation of green jobs through the produced recycled products, thereby stimulating local economic growth. Public awareness and engagement in environmental conservation efforts will be heightened, fostering a culture of sustainability and responsibility within the community.

Enhanced waste management practices, such as waste avoidance, segregation, reuse, and recycling, along with changes in consumer behavior regarding plastic use, will contribute to a reduction in marine and aquatic pollution. This will relieve pressure on marine resources and ecosystems. Additionally, the initiative will improve public health and safety, minimize waste disposal costs, and generate additional revenue for the municipality. The potential emergence of program tourism and the shift toward environmentally conscious lifestyles further underscore the long-term benefits of the project.