

KEEPING MARINE LIFE SAFE THROUGH

ZERO WASTE

APO ISLAND, DAUIN, NEGROS ORIENTAL



ZERO WASTE CITIES ASIA SERIES

Apo Island, Dauin, Negros Oriental



Segregated waste from Apo Island being loaded onto a boat to be brought to mainland Dauin.

Apo Island, home to over 615 documented fish species and an estimated 400 of the 421 species of corals in the Philippines¹, is a marine sanctuary under the jurisdiction of the municipality of mainland Dauin in Negros Oriental. Located about a 30-minute boat ride from the mainland, it is renowned for its stunning dive sites and breathtaking marine gardens teeming with fish and turtles. In 2022, it achieved a historic milestone when it was declared as the Philippines' first Zero Waste island barangay, following its adoption of Zero Waste practices which began just two years prior.

MARINE SANCTUARY

In addition to its exquisite beauty, Apo Island is also known for being a success story in marine conservation that began over 40 years ago — in 1982 — when the marine biologist, the late Dr. Angel Alcala, established a marine laboratory in the island's waters. At the time, the island was devastated by overfishing and muro-ami, an unsustainable fishing practice that involves destruction of coral reefs. Dr. Alcala, named National Scientist of the Philippines in 2014, worked on the island to become the country's second marine sanctuary² to allow the fish population to recover.

On August 9, 1994, the island was declared a NIPAS [National Integrated Protected Area System] site.³ What was initially an informal and unplanned "natural laboratory" has evolved into a globally recognized model for community-

based coastal resources management, benefiting the scientific community.⁴

STAGE 1. LAYING THE GROUNDWORK FOR ZERO WASTE

In 2018, a local survey conducted by community leaders revealed that Apo Island residents viewed waste as a major problem that needed urgent attention. At the time, the island's solid waste management system was severely lacking. Accumulated waste on the island had become visible, and it was taking increasing numbers of boat trips to transport mixed waste to the mainland landfill. In response, the local officials decided to implement a Zero Waste program on the island — home to three species of sea turtles: Green Sea Turtle, Hawksbill, and Loggerhead — a decision that would protect both the environment and its unique biodiversity.

The barangay council passed Barangay Ordinance 03 series of 2019, "An Ordinance Providing for an Ecological Solid Waste Management and Declaring Some Acts Prohibited and Providing Penalties Hereof," which required, among others, residents and tourists to segregate their waste, and mandated the creation of a barangay solid waste management plan to address their waste problem.

Just as the local leadership started to take steps to address their waste issues, help arrived in the form of four women from nearby Dumaguete. It was the height

¹Marine Conservation Philippines. N.d. <https://www.marineconservationphilippines.org/location/apo-island/> Accessed: July 18, 2024

²The first was Sumilon Island in Cebu, which was also an initiative of Dr. Alcala. Marine sanctuaries are marine protected areas designated as "no-take zones," meaning, fishermen are prohibited from fishing in the area to let the coral reefs recuperate.

³Proclamation No. 428 https://lawphil.net/executive/proc/proc1994/proc_438_1994.html

⁴Raymundo, Laurie J. & Allan T. White. Fifty Years of Scientific Contributions of the Apo Island Experience: A review. Silliman Journal. Vol. 25. No. 2. 2004. <https://sillimanjournal.su.edu.ph/index.php/sj/article/view/286/277>



Population	920 (2020 Census)
Estimated Elevation Above Sea Level	16.5 meters
Municipality	Dauin
Area	74 hectares
Location	7 kilometers off the southern tip of Dumaguete City, capital of Negros Oriental
Diversion Rate (2021)	50-53%
Number of MRFs	4
Waste Workers Engaged	7 (5 collectors, 1 shredder/helper, and 1 monitoring officer)
Compliance rate to waste segregation	99%

With funding support from the Plastics Solutions Fund, the WoW-BFFP-NegOr team which was working under the Zero Waste Cities Program coordinated by GAIA Asia Pacific, spent two months on the island during the lockdowns laying the groundwork for Zero Waste program implementation. The range of initiatives include the following:

1. **Baseline Survey.** As an initial step, the WoW-BFFP-NegOr team talked with barangay leaders and community members to understand the waste situation in the locality. They learned that no waste segregation was taking place. Waste collection occurred only twice a month, during which around 60 sacks of unsegregated waste were hauled to the mainland each time for disposal, totalling

of the pandemic. Elsewhere in the country, lockdowns had been imposed months prior. Nearby Dumaguete and Siquijor Island had started having COVID-19 cases, and had implemented lockdowns as well. Keen on ensuring that they would be spared, the local leaders decided to also close off travel to and from the island.

Among those who were able to board the last boat going to Apo Island was Merci Ferrer, co-convenor of War on Waste-Break Free From Plastic Negros Oriental (WoW-BFFP-NegOr), a collective of NGOs, academics, and individuals brought together by their passion to help solve waste management challenges in Negros Oriental. Accompanying Ferrer to Apo Island were Cheryl Rosales, a community worker; and Aloja Santos and Goldie Bansi, waste workers from Barangay Looc and Barangay Bantayan, respectively. The WoW-BFFP-NegOr is credited for the successful pilot implementation of Zero Waste programs by three barangays in Dumaguete City – Bantayan, Looc, and Piapi. Their Zero Waste program is anchored on Republic Act (RA) 9003 or the Ecological Solid Waste Management Act of 2000,^{5,6} which decentralizes waste management of household solid waste down to the barangay level and mandates commercial establishments to engage with accredited private haulers to collect their waste. It follows the 10-Steps to Implementing a Community Zero Waste Program developed by Mother Earth Foundation (MEF).



Waste Assessment and Brand Audit

⁵Republic Act 9003 or Ecological Solid Waste Management Act of 2000. https://lawphil.net/statutes/repacts/ra2001/ra_9003_2001.html

⁶Implementing Rules and Regulations. RA 9003. <https://emb.gov.ph/wp-content/uploads/2015/12/DAO-2001-34.pdf>

⁷Baseline data mentioned are estimates as waste data were not gathered prior to Zero Waste program implementation.



approximately 1,140 sacks annually). Collection only covered some parts of the island, leaving other areas to manage their waste on their own. Consequently, large amounts of trash was dumped in areas not frequented by tourists, remaining largely unaccounted.

2. **Education and Information Campaign (IEC).** The local officials, together with WoW-BFFP-NegOr, conducted cluster awareness campaigns to educate the households explaining the principles and rationale of proper waste segregation at-source. The IEC was originally designed for door-to-door implementation. However, in light of COVID-19 restrictions, implementers had to pivot to a cluster-based model to ensure the community still received essential information while minimizing person-to-person contact.
3. **Capacity Building.** Capacity-building sessions were conducted for waste workers, barangay leaders, and households, focusing on waste segregation and composting. In addition, local leaders and waste workers were taught how to carry out Waste Assessment and Brand Audits (WABAs). WABA is a critical component of Zero Waste program implementation. Results of the WABA allowed the program implementers to understand the volume and composition of waste produced by the barangay, and thus design effective waste management systems that are tailored to the needs of the community.

4. **Door-to-door Segregated Waste Collection.**

Every collection day, five waste workers — four female and one male — would go around their designated routes to collect segregated waste. Following the barangay ESWM ordinance, households are required to segregate their waste into several categories: leftover food, garden waste, dry paper and cartons, other recyclable waste, special waste such as used diapers and sanitary napkins, and residual waste. They are likewise mandated to manage their leftover food and special waste, hence these were no longer collected by the waste collectors — except in pre-identified cases where there is no space for composting. Leftover food is fed to animals or composted. Used diapers and sanitary pads are buried.

Schedule of collection:

- Monday: Plastic bottles and plastic bags
- Wednesday: Tin cans (aluminum/metal) and glass bottles
- Friday: Hazardous waste, rubber, cloth

Households maintain different sacks for each type of waste. They are required to pay a minimal amount (Php 1.00-3.00 or USD .035-.052) for each sack of residual waste that they dispose of, the amount depending on the size of the sack. Each sack of residual waste must be labeled using a barangay-issued sticker bearing the amount that the household must pay.



Mixed wastes are not collected, and households not following the segregation ordinance are reported to the barangay council, which then penalizes the violators. Penalties are as follows: first offense, Php 200 (USD 3.64) and reprimand; second offense, Php 500 (USD 9) and community service; and third offense, Php 1,000 (USD 18). Since the start of program implementation, there have been no repeat violators.

- 5. Establishment of MRFs.** While the national ESWM law requires barangays to have one MRF, the island went beyond this requirement by establishing four. Two are located in the lowland, one sits uphill near the lighthouse, and another is positioned uphill, on the other side of the island. The island's rugged terrain makes a single central MRF not feasible.

Collected wastes are brought to the MRFs for management. Biodegradable wastes that cannot be managed by the households are composted. Recyclable plastics and tin cans are rinsed and dried to prevent odors and then flattened for temporary storage, until they are transported to the mainland either to be landfilled (in the case of residual waste) or sold to junk shops (in the case of recyclable waste).

According to Ferrer, it helped that waste issues were already identified as a problem prior to their coming to the island. They no longer had to convince the barangay leaders to implement a Zero Waste program, one of the most challenging steps in Zero Waste program implementation elsewhere. For MEF and WoW-BFFP-NegOr, government

leaders having ownership of the program is already half of the battle won.

"Since an ordinance was already in place when we touched base with the barangay officials, one of the questions we were asked was if our proposed initiatives did not duplicate theirs. We said that ours were more comprehensive," Ferrer said.

One issue that arose towards the end of program implementation supported by PSF, however, was the honorarium for waste workers. Under the national law, barangays are mandated to manage waste, and thus costs associated with waste management are shouldered by the barangay. The context of Apo Island, being a protected area, was different. Waste disposal falls under the Protected Area Management Board (PAMB). This meant that the honoraria of the waste collectors had to come from PAMB. During the Zero Waste program implementation with WoW-BFFP-NegOr, honorarium for the waste workers was shouldered by the program. When the project ended, it was not clear where the honorarium should come from. The issue was resolved much later, in 2023, when Apo Island Protected Landscape and Seascape (AIPLS)/PAMB included waste workers' monthly allowance in their 2023-2027 budget and work plan.

By the time WoW-BFFP-NegOr turned over the waste management to the local leaders in 2022, waste diversion on the island had improved by approximately 50-53%. Following the program's implementation, the volume of waste transported to the mainland landfill was significantly



Waste Assessment and Brand Audit. In island settings, technically recyclable materials are too costly to collect and transport for recycling.

reduced even as the coverage of waste collection increased to 100%. Furthermore, proper segregation became the norm: recyclables were recovered and sold to junk shops, while residual and low-value recyclable wastes⁸ were sent to the landfill. Households took responsibility for managing their own biodegradable waste.

In 2022, just one year after the Zero Waste interventions, Apo Island was proclaimed the Philippines' first Zero Waste island barangay.

STAGE 2. STRENGTHENING THE ISLAND'S ZERO WASTE SYSTEMS

In 2023, with funding support from Blue Partnership Action Fund (BPAF), MEF partnered with Apo Island to strengthen the groundwork laid by Wow-BFFP-NegOr through another set of interventions. These interventions include baseline studies to understand the community's awareness of waste issues and their perception of how their barangay fared in waste management, as well as various iterations of WABA.

1. **Baseline Studies.** In October 2023, MEF conducted baseline surveys or 'green profiling' which consisted of (1) the Solid Waste APP (Awareness, Perception, and Practices) Baseline Survey, (2) Barangay Profiling, and (3) the WABA.

The Solid Waste Awareness, Perception, and Practices or APP Baseline Survey is a research methodology used to assess and examine the target households' awareness, perceptions, and practices on waste management before implementing an ESWM project. The results serve as a benchmark for measuring the project's impact over time.

For this study, a sample size of 100 respondents (10.8% of the total population) was determined through random sampling. Findings of the baseline survey indicate the successful program implementation by WoW-BFFP Negros Oriental. Respondents of the survey showed high awareness of issues around waste. All respondents said they knew how to segregate their waste, with 99% saying they actually practiced waste segregation. Seventy-five percent (75%) of the respondents likewise composted their biodegradable waste. Moreover, 99% had a good understanding of residual wastes, and 98% are familiar with MRFs and are aware of what they are for. In addition to their high awareness of waste issues, the respondents also indicated a high likelihood of



Waste collection

⁸ In island settings, technically recyclable wastes are not collected because the high cost of collection and transportation to collection facilities make it not economically feasible.

supporting good waste management policies. Ninety-five percent (95%) said they would support a waste segregation policy, and the same percentage said they would support the implementation of a single-use plastic bag ban.

But while these findings demonstrated the success of the stage 1 of program implementation, some findings showed that there are areas where residents needed to improve on. One of these areas was on waste burning. Ninety-three percent (93%) admitted to burning dry leaves and biodegradable wastes. On bringing reusable bags, only 65% said they always brought reusables bags, while 32% said they occasionally did so. Another round of IEC may be able to sway more people against burning waste, and encourage them to be more religious in bringing reusable bags.⁹

2. **WABAs.** For the stage 2 of the Zero Waste program implementation, MEF conducted four types of WABAs: (1) household WABA-dry season, (2) household WABA-wet season, (3) coastal WABA-dry season, and (4) coastal WABA-wet season. It was found that:

a. Household WABAs. Compostables make up the highest waste stream for both wet and dry season household WABAs, followed by recyclables, and then by residuals.

TABLE 1. HOUSEHOLD WASTE ASSESSMENT AND CHARACTERIZATION SURVEY, APO ISLAND: DRY AND WET SEASONS.

WASTE STREAMS OR CATEGORIES	DRY SEASON		WET SEASON	
	RANK	PERCENTAGE	RANK	PERCENTAGE
Compostables	1	48.21%	1	58.30%
Residuals	3	20.9%	3	13.12%
Residual-Special	4	2.79%	4	5.52%
Recyclables	2	27.21%	2	22.69%
Hazardous	5	0.89%	5	0.37%

Source: Figueroa and Rivera. 2024. Mother Earth Foundation WABA Report - Siquijor and Apo Island.



Typically, compostables/biodegradables make up the highest waste stream nearly in all MEF Zero Waste sites followed by recyclables and residuals.

b. Coastal WABAs. As expected, there were no compostables collected in the coastal WABAs, both during the wet and dry seasons. Interestingly, recyclable wastes made up the highest percentage of waste collected both during wet and dry season at 92.97% and 55.44%, respectively. Residual waste comes in second at 44.28% during the dry season and 7.03% during the wet season. The report authors explain this is very telling of the island context where even technically recyclable materials which have high value elsewhere are nearly worthless on the islands since transporting these materials to the recycling facilities in the mainland is very costly.

TABLE 2. COASTAL WASTE ASSESSMENT AND CHARACTERIZATION SURVEY, APO ISLAND: DRY AND WET SEASONS.

WASTE STREAMS OR CATEGORIES	DRY SEASON		WET SEASON	
	RANK	PERCENTAGE	RANK	PERCENTAGE
Compostables		0.00%		0.00%
Residuals	2	44.28%	2	7.03%
Residual-Special		0.00%		0.00%
Recyclables	1	55.44%	1	92.97%
Hazardous	3	0.28%	3	0.00%

Source: Figueroa and Rivera. 2024. Mother Earth Foundation WABA Report - Siquijor and Apo Island.

⁹See the baseline report here: <http://docs.google.com/document/d/1Wm4xJv0caMgxtVK0vFixaTqvxe598BGdk7LbEyl0PD0/edit?tab=t.0>

BEST PRACTICES

Program implementers from MEF and WoW-BFFP-NegOr and the waste workers involved indicated that implementing waste management in Apo Island was generally unproblematic. As mentioned, waste management had previously been identified as a major problem and the barangay was already gearing up to implement ESWM when WoW-BFFP-NegOr entered the picture. In other project sites, encouraging local leaders to implement Zero Waste solutions is typically a major hurdle.

In addition to community awareness of the issue and the local leaders' ownership of the problem, the following are best practices in the Apo Island Zero Waste program implementation:

- 1. Collaboration of several organizations.** Apo Island greatly benefited from the technical assistance provided by WoW-BFFP-NegOr and MEF. Because these organizations are aligned and have worked together in Zero Waste program implementation, interventions for the island were designed such that MEF's initiatives built on the successes of the previous program supported by WoW-BFFP-NegOr. PAMB and Bantay Dagat (sea patrol), a community-based volunteer organization working with local and national government officials to protect the marine environment, especially in patrolling against illegal fishing and providing assistance in rescue operations, extended the program to areas that were inaccessible to typical locals. Bantay Dagat collected waste from the waters surrounding the island. PAMB, meanwhile, shouldered the salaries of the waste workers. Other organizations that provided support include Friends of the Environment Negros Oriental (FENOR), BPI Bayan Dumaguete, and the local government of Dauin.



The women waste workers in Apo Island with Aloja Santos (second from left), waste worker from Dumaguete and President of the Philippine National Waste Workers Alliance. (L-R) Rebecca Sumagang Allarcis, Rinalyn Sumagang, Marilyn Estrallado, Rowena Lumanog, and Elizabeth Vale.



WABA participants

2. **Conduct of Multiple WABAs covering different contexts.** On the implementation with MEF, the barangay conducted different types of WABA: household WABA during dry season and during wet season, and coastal WABA during dry and wet season. With these WABAs, program implementers had richer insights into the waste generation of the barangay. Household WABA focuses on analyzing the types and amounts of waste generated by households, which then informs the initiatives to be implemented in improving waste management practices, recycling rates, and reducing overall waste generation at the household level. Household WABA is a crucial step of the Zero Waste program implementation. In contrast, coastal WABA is conducted to evaluate the types, quantities, and sources of waste found along coastlines and in marine environments. This helps to understand the impact of waste on marine ecosystems, wildlife, and coastal communities.
3. **Baselining.** It is crucial for program implementers to conduct their own baselining before they implement a Zero Waste program. Local governments usually do not have complete data to paint a clear picture of a community's waste situation. Having their own baseline data not only ensures that the design of interventions is customized according to the context of the community, it also warrants that there is baseline information against which the success of implementation is measured.



Zero Waste
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4. Hands-on Participation of Barangay Council, Including the Barangay Captain. Fully understanding the need to implement ESWM in their community, the local leaders were very much involved in the implementation of the program, thus ensuring the participation of the members of the community. In Apo Island, every member of the barangay council was assigned with a purok or zone to oversee. Their role is to ensure that households are complying with the segregation and composting policy.

5. Construction of Multiple MRFs. The construction of MRFs in different parts of the island is one manifestation of how knowledge of the local context informs program design. Two of the MRFs are located atop the island. That way, the waste collector assigned in the area does not have to bring waste down the hill everyday as biodegradable waste is already managed uphill and the non-biodegradables can be temporarily stored in the uphill MRFs until they need to be brought to the mainland.

6. Biodegradable Waste Management: Household Composting and Using Food Waste as Animal Feeds.

One of the hallmarks of program implementation in Apo Island is household composting. At the program's culmination, over 57% of the households were composting their own biodegradable waste — a significant milestone as in some Zero Waste locales, composting occurs at the barangay level, handled by waste workers at the MRF. Moreover, a substantial portion of food waste is fed to animals, closing the loop on sustainable waste

2022

GAIA Asia Pacific named Apo Island as the Philippines' first Zero Waste island barangay

2020

The barangay partnered with War on Waste - Break Free From Plastic Negros Oriental (WoW-BFFP-NegOr) to implement a community Zero Waste program under the Zero Waste Cities project

2019

The barangay passed an ordinance mandating the implementation of ecological solid waste management program

2018

Waste was identified as a major issue in a survey conducted by the barangay council

practices. In the Zero Waste hierarchy for food waste, utilizing leftovers as animal feed takes precedence over composting.

7. **Strict Monitoring and Program Implementation.**

Strict monitoring is an important component of Zero Waste program implementation. In Apo Island, monitoring is being done by a Dumaguete-based waste worker, Santos. The monitoring ensures compliance of the community to the Zero Waste program, and prevents the program from backsliding.

Today, Apo Island stands as a model community, achieving an impressive 99% compliance rate in waste segregation. This success has inspired local leaders to pursue even more ambitious goals, including the establishment of a Zero Waste store for the community, the formation of a cooperative, and the integration of Zero Waste principles into local schools. Building on this momentum, they have formally proposed to the Dauin local government unit (LGU) the expansion of these initiatives municipality-wide for a broader impact.

While implementation is great, certain challenges persist. Open burning is still an issue, although it is no longer as pervasive as before. Burning leaves is prevalent in rural areas to fumigate their surroundings or to stimulate fruit production in mango trees. Furthermore, marine debris from other islands are still ending up on their shores. In a previous interview with GAIA Asia Pacific, Barangay Captain Mario Pascobello emphasized the connectedness of the islands and the importance of everyone doing their part especially when it comes to waste management. "Even if we keep the surroundings clean, because we live on an island, there are times when the strong winds and waves bring the trash from neighboring communities and islands to our shores," he said. "We hope other islands would also implement a Zero Waste program."

Apo Island's journey is a compelling testament to the power of community-driven environmental action. Yet it also underscores an essential truth: sustainable progress cannot occur in isolation. It requires collective responsibility, shared commitment, and unified action across communities and regions, especially in an archipelago like the Philippines.

2022

WOW-BFFP-NegOr submitted a section on Ecological Solid Waste Management, Zero Waste and Plastic Pollution Prevention for the Apo Island Protected Landscape and Seascape (AIPLS) Workplan for 2023-2027

2023

AIPLS included waste workers' monthly allowance in their 2023-2027 budget and work plan

2023

The barangay partnered with Mother Earth Foundation (MEF) to strengthen the island's Zero Waste system



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AUTHOR: SHERMA BENOSA

©2025 Global Alliance for Incinerator Alternatives
Unit 330, Eagle Court Condominium 26 Matalino Street,
Barangay Central, Quezon City, Philippines

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