



**PLASTIC
SMARTCITIES**

Advancing circular solutions
to reduce plastic pollution



TOWARDS PLASTIC SMART ISLANDS

SCALING SOLUTIONS TO PLASTIC POLLUTION
ACROSS THE CORAL TRIANGLE

ACKNOWLEDGEMENTS

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ABOUT WWF CORAL TRIANGLE PROGRAMME

The Coral Triangle — spanning the waters of Indonesia, Malaysia, Papua New Guinea, the Philippines, Solomon Islands, and Timor-Leste — is the global centre of marine biodiversity, supporting the food security and livelihoods of over 360 million people. WWF's Coral Triangle Programme (CTP) works across this region to protect and restore marine and coastal ecosystems, reduce plastic pollution, and strengthen the resilience of coastal communities in the face of climate change and other anthropogenic threats. Operating in close partnership with governments, local communities, civil society, and the private sector, CTP advances conservation solutions that are grounded in local knowledge and designed for lasting impact. Visit: coraltriangle.panda.org

ABOUT PLASTIC SMART CITIES

Plastic Smart Cities (PSC) is a WWF-led global programme advancing circular solutions and knowledge sharing to reduce plastic pollution. Since 2018, PSC has grown from a regional initiative in Asia into a global movement — working with cities, islands, and coastal centres across Asia, Africa, Europe, and the Americas. By partnering with governments, innovators, and communities on plastic reduction, reuse, collection, and recycling, PSC aims to scale the systemic change needed to keep plastic out of nature. Visit plasticsmartcities.org.

Plastic Smart Islands is targeting island and coastal centres in and around Marine Protected Areas (MPAs) and Other Effective Area-Based Conservation Measures (OECMs), which are often most vulnerable to plastic pollution. Implemented jointly through WWF Coral Triangle Programme and Plastic Smart Cities, this approach supports local governments, communities and businesses to develop locally appropriate, scalable waste reduction and management solutions, with ambitious targets to replicate and scale plastic smart solutions to 50 islands across the Coral Triangle by 2030. For more information, visit: plasticsmartcities.org/plastic-smart-islands

ACRONYMS

ADB	Asian Development Bank
ALDFG	Abandoned, Lost, or Otherwise Discarded Fishing Gear
ASEAN	Association of Southeast Asian Nations
CHICOP	Chumbe Island Coral Park
COBSEA	Coordinating Body on the Seas of East Asia
CTI-CFF	Coral Triangle Initiative on Coral Reefs, Fisheries, & Food Security
CWMN	Caribbean Waste Management Network
EPR	Extended Producer Responsibility
GEF	Global Environment Facility
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
IEC	Information, Education and Communication
IUCN	International Union for Conservation of Nature
MCEP	Maldives Clean Environment Project
MPA	Marine Protected Area
MRF	Materials Recovery Facility
NGO	Non-Governmental Organization
OECM	Other Effective Area-based Conservation Measures
PET	Polyethylene Terephthalate
PFAS	Per- and Polyfluoroalkyl Substances
PSC	Plastic Smart Cities
SIDS	Small Island Developing States
SUP	Single-Use Plastic
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFPA	United Nations Population Fund
WWF CTP	World Wide Fund for Nature – Coral Triangle Programme

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FOREWORD

As the planet's of marine biodiversity hotspot, the Coral Triangle is home to 76% of the world's coral species, harbouring more reef fish species than any other marine region. Its extraordinary ecosystem sustains millions of livelihoods and serves as a cornerstone of global food security. Threatened by climate change and overfishing, this irreplaceable oceanic treasure now faces another escalating crisis: plastic pollution.

Across the 27,000+ islands that make up our region's archipelagic states, plastic waste is overwhelming key coastal areas with devastating consequences. Without decisive intervention, plastic volume in our oceans could outweigh fish by 2050. At least 50% of waste across the Coral Triangle remains unmanaged, under even the most optimistic scenarios.

Tourism pressures introduce massive volumes of single-use plastics exceeding local waste management capacity. Uncollected, discarded and unprocessed plastic waste is leaking into our rivers and seas. For many coastal and island communities constrained by geographic isolation, with limited infrastructure and access to finance, this trajectory represents an existential threat to both marine life and human health.

“

The need to address plastic pollution for meaningful biodiversity protection is now more urgent than ever.

This study is aimed to draw lessons from waste management initiatives in remote coastal and island locations across the globe which can serve as compelling examples for Marine Protected Areas (MPAs), Other Effective Area-based Conservation Measures (OECMs) in the Coral Triangle that have yet to integrate plastic waste management.

Through the multilateral platform of the Coral Triangle Initiative for Coral Reefs, Fisheries and Food Security (CTI-CFF), the six governments of Indonesia, Malaysia, Papua New Guinea, Philippines, Solomon Islands and Timor-Leste, are working together with partners on mitigating transboundary marine plastic pollution, especially in and around Coral Triangle's most critical and vulnerable habitats.

The lessons captured in this report are not just case studies—they are blueprints for replication and adaptation across the thousands of islands and coastal communities that form the backbone of the Coral Triangle's extraordinary biodiversity.

Every successful intervention documented here represents a seed of change that, with proper support, can grow into regional transformation. The ocean cannot wait for perfect solutions; it needs the good solutions we have today, implemented at the scale our marine ecosystems demands.



KLAAS JAN TEULE
LEADER,
WWF CORAL TRIANGLE PROGRAMME

When we first began working with island and coastal communities, we quickly learned that the challenges here are distinct from those in cities — geographic isolation, high transportation costs, seasonal tourism pressures, and limited local infrastructure create conditions that require genuinely different approaches.

Since 2019, WWF's Plastic Smart Cities programme has partnered with over 60 cities and municipalities worldwide, and it is this work on islands and coasts that has pushed us to think differently about what support communities actually need — and what it takes to make solutions last.

What began as an urban-focused initiative has now evolved into a comprehensive framework equally scalable when adapted to coastal centres, islands, and tourism hotspots.

This evolution reflects a critical understanding, that while cities generate the highest volumes of plastic waste, it is in islands and coastal areas where nature and people face the most immediate and devastating consequences.

In adapting the Plastic Smart Cities framework to islands and coasts, we have gained important insights into the realities of community-based waste management. These unique geographies offer clear opportunities for circular economy solutions — from contained systems to controlled import flows — yet progress is far from simple. The challenge of high transportation costs for plastic waste in remote areas remains unresolved, and in many cases, solutions are still difficult to scale.

What is clear, however, is the pressing need to match local innovation with enabling policy, strong partnerships, and strategic planning. Only by aligning these elements can we overcome the barriers and create pathways for a sustainable waste management system for island and coastal communities.

”

Communities possess remarkable ingenuity and commitment. Local governments show genuine willingness to act. This report serves as a call-to-action for local to regional national governments, businesses and practitioners to ensure proven solutions are supported by strong regulation, technical and financial resources required to scale from pilot projects to systemic transformation.



YUMI NISHIKAWA
LEAD FOR WWF PLASTIC SMART CITIES
PROGRAMME

EXECUTIVE SUMMARY

The Coral Triangle, the global hotspot of marine biodiversity, faces mounting challenges arising from the global plastic crisis, particularly in small islands and among coastal communities.



Figure 1. Coral Triangle Map. Image courtesy of WWF



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Geographic isolation, limited infrastructure and high logistical costs create significant obstacles to effective waste management. Many small islands, already suffering from a lack of public budget, also do not generate sufficient recyclable volumes to achieve economies of scale, giving little financial impetus for waste collection and processing systems to be further developed.

Transboundary marine debris further complicates the situation, as plastics originating from distant sources accumulate in coastal environments. Rapid coastal tourism growth contributes to these challenges by introducing large quantities of single-use plastic (SUP) that often exceed local waste management capacity. Although communities are eager to address

plastic pollution, their engagement alone could not translate to long-term solutions in the absence of structured waste management systems.

Given these challenges, upstream prevention is critical. Small Island Developing States (SIDS) continue to call for ambitious plastic reduction¹ in negotiations for the Global Plastic Pollution Treaty, emphasizing that preventing waste generation through circular economy principles and improving access to clean drinking water can significantly reduce the burden on island waste systems. For the archipelagic states of the Coral Triangle, with over 27,000 islands, upstream prevention and reduction is no less significant.

STUDY OBJECTIVE & APPROACH

The WWF Coral Triangle Programme (CTP) aims to develop and implement waste management solutions for small islands and communities in and near Marine Protected Areas (MPAs) and Other Effective Area-based Conservation Measures (OECMs) throughout the Coral Triangle. WWF CTP and PSC have implemented multiple initiatives and seek to scale these efforts and seeks to scale these efforts by building capacity, fostering partnerships, and mobilizing resources in island-based locations.

This study supports these objectives by analyzing waste management conditions in small islands and coastal communities. Focused on island-based waste management to identify the unique issues and solutions that characterize these landscapes, the study's findings aim to facilitate knowledge sharing,

strengthen capacity, and shape partnerships and fundraising efforts to scale effective waste solutions for islands, particularly for MPAs and OECMs across the region. Furthermore, it provides insights to inform a plastic pollution strategy under the Coral Triangle Initiative for Coral Reefs, Fisheries, and Food Security (CTI-CFF) Regional Plan of Action 2.0.

The research process included a literature review and in-depth interviews with stakeholders involved in plastic waste management to examine key trends, identify systemic challenges that small islands and coastal communities face, and illuminate key factors that enable or hinder effective waste management. An initial pool of 151 case studies was narrowed to 10 for further examination.

KEY FINDINGS AND RECOMMENDATIONS

The insights from this study can support governments and stakeholders in addressing the unique waste management challenges of small islands, particularly those in and around MPAs and OECMs.

The following recommendation on strategic priorities to enhance waste management in islands and coastal areas are developed based on the four critical

thematic factors identified - along with key lessons, enablers, and barriers to effective waste management in small islands and coastal communities:

GOVERNANCE AND POLICY

KEY FINDINGS

Governance and systematic policy enforcement are pivotal to establishing and sustaining the plastic value chain and waste management solutions. Weak governance and fragmented enforcement create a lack of direction and limit solutions from scaling.

RECOMMENDATION

- 1 Implement policies preventing avoidable and harmful plastics, promoting reduction and strengthening waste management regulations.
- 2 Strengthen the plastic management value chain through economic instruments, including polluter pays principle, EPR schemes, tourism levies and other mechanisms that enhances waste management systems and disincentivize SUP proliferation.
- 3 Enhance budget allocation to strengthen infrastructure and improve solid waste management service delivery.

CAPACITY, CAPABILITY, AND TECHNOLOGY

KEY FINDINGS

Capacity and capability are critical in empowering communities. Additionally, infrastructure and technical expertise are needed to ensure that general and plastic waste are processed effectively to reduce and prevent leakage.

RECOMMENDATION

- 4 Facilitate knowledge platforms and capacity-building for local organizations or decision-makers for better systems design and technical operations.
- 5 Empower local champions and community leaders to strengthen local ownership, promote waste prevention, and support the implementation of sustainable waste management solutions.

FUNDING, FINANCING, AND ACCESS TO MARKET

KEY FINDINGS

Financial viability is required to address market barriers, including ensuring regular transport, securing the value chain of recyclables, and integrating waste management into local economic drivers such as tourism and fisheries.

RECOMMENDATION

- 6 Provide financial incentives and other alternatives to lower the cost of transporting waste and recyclable plastics to offtake markets.
- 7 Engage development funds and financing to boost circularity, particularly across small islands, MPAs, and OECMs.
- 8 Boost collection volumes by partnering with waste generators, waste banks and other economic drivers in the waste pipeline.

CROSS-SECTORAL COLLABORATION & OTHER VALUE CHAIN ENABLING ACTIVITIES

KEY FINDINGS

To reduce waste generation, close gaps in waste management and strengthen the recycling value chain, a coordinated multi-stakeholder and cross-sectoral approach is needed. Comprehensive data collection and sharing, which calls for multi-sectoral collaboration, is essential for driving action on transboundary marine debris and the global trade in plastic waste.

RECOMMENDATION

- 9 Advance collaboration across networks of islands, MPAs and OECMs through transboundary Coral Triangle plastic coordination efforts, focusing on regional solutions and scalable investments.
- 10 Ensure robust monitoring and analysis & sharing of waste data to avoid any duplication of efforts and strengthen the development of a collective evidence-based waste management plan at the regional level.

**Read detailed recommendations in Chapter 4.*



CHAPTER 1

PLASTIC POLLUTION IN THE CORAL TRIANGLE

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1.1. CONTEXT

INTRODUCING THE CORAL TRIANGLE

The Coral Triangle, spanning waters of Southeast Asia and bordering the western Pacific Ocean, forms a critical marine ecosystem unlike any other on Earth. Encompassing Indonesia, Malaysia, Papua New Guinea, Philippines, Solomon Islands and Timor-Leste, (CT 6), this region boasts the world's highest concentration of marine biodiversity, home to 76% of the world's coral species and harbouring more reef fish species than any other marine region.

THE CORAL TRIANGLE INITIATIVE ON CORAL REEFS, FISHERIES AND FOOD SECURITY

Established in 2009 by the Heads of States of six nations – Indonesia, Malaysia, Papua New Guinea, Philippines, Solomon Islands, and Timor-Leste – the Coral Triangle Initiative on Coral Reefs, Fisheries and Food Security (CTI-CFF) seeks to conserve the rich biodiversity as well as address food security and livelihoods for coastal communities through the protection of species, habitats, and ecosystems.

A current comprehensive Regional Plan of Action 2.0 (2023-2030) guides the six member states in achieving two overarching goals:

- Improved ecosystem health and fisheries
- Improved resilience and socioeconomic conditions

In the RPOA 2.0, a key objective is for the CT6 to collaboratively develop and implement strategies and initiatives for addressing waste management and marine pollution in the Coral Triangle region.

The Coral Triangle serves as a nursery for global marine ecosystems and is crucial for planetary well-being. Beyond its ecological value, it also sustains millions of livelihoods as a cornerstone of regional economic prosperity and a key contributor to global food security.² However, this unique and irreplaceable biodiversity treasure is under dire threat, with plastic pollution emerging as one of the most urgent and escalating crises.



The CTI-CFF engages a broad network of stakeholders, including governments, non-governmental organizations (NGOs), industry actors such as fisheries and tourism, and civil society organizations.

By pooling resources and expertise, member states can address these challenges more effectively than unilateral efforts alone. Through collaborative research and knowledge-sharing, the initiative has led to the development and implementation of best practices for fisheries management, MPA establishment and climate change adaptation. In 2025, countries agreed on developing a coordinated response to marine pollution. CTI-CFF is now in the process of developing a Coral Triangle Waste Management Strategy.

PLASTIC POLLUTION: EXACERBATING EXISTING THREATS

As plastic production and consumption accelerates globally, waste management systems in the Coral Triangle are dangerously overwhelmed. Malaysia is the world's leading recipient of imported plastic waste, and Indonesia ranks #4.³ Much of the waste destined for recycling contains cross-contaminated materials or consists of low-quality plastic which cannot be recycled⁴ and is then discarded with unsafe disposal methods, where residual waste often accumulates and leaks into marine environments. The Philippines, Malaysia and Indonesia are ranked #1, 3 and 5 as the highest contributors of marine plastic debris globally.⁵ Waste leakage, or the loss from formal management systems into the natural environment, can be caused by spillage, wind, runoff into waterways, or intentional dumping.⁶

The Coral Triangle encompasses tens of thousands of islands and is home to over 370 million people, of which at least 130 million people's lives are directly dependent on marine and coastal resources. Some of the coastal communities are large population centres within dense archipelagos, while many small islands, defined by small land areas relative to their extensive coastlines, are isolated and far from the nearest urban centres. These varied conditions create unique conditions for managing waste.

Plastic waste is directly linked to climate change and environmental degradation. Challenges in climate change mitigation and adaptation are significantly magnified among small islands. Islands and coastal communities within the Coral Triangle face a dual crisis of being particularly vulnerable to environmental degradation and waste management challenges while being profoundly under-resourced to address these issues.⁷ Increasingly dire forecasts show catastrophic environmental degradation, escalating threats of natural disasters, human health crises, fisheries depletion, and major financial loss from global economic ripple effects.⁸

As in many low-resource contexts globally, local stakeholders in Coral Triangle communities can

rarely meet waste management needs with sustainable methods, let alone deal with the influx of imported residual waste or marine debris.¹⁶ When waste management systems are overwhelmed, debris and discarded residual waste clog waterways, contaminate watersheds, and exacerbate flooding. As climate change impacts accelerate, extreme weather events compound the strain on waste management systems by damaging infrastructure, causing more plastic to leak into the marine environment.⁹

Plastic waste is directly linked to climate change and environmental degradation.

Key coastal habitats including coral reefs, mangroves and seagrass meadows that serve as nurseries for marine life and crucial buffers against the impacts of climate change, are threatened by plastic accumulation. When ensnared by plastic debris and Abandoned, Lost, or otherwise Discarded Fishing Gear (ALDFG), otherwise known as ghost gear, coral death is 20-fold more likely, weakening reefs' ability to absorb emissions and regulate ocean acidification.¹⁰ Mangroves are observed to have become 'plastic cesspits'¹¹ - as marine debris gets trapped among tree roots. Field studies in Java, Indonesia found that complete plastic cover of mangrove root zone led to tree death.¹² Initially hailed for its ability to help remove plastic from the marine environment, further research now suggests that plastic accumulation in seagrass affects the health and survivability of an already fragile habitat and increases the likelihood of hosted marine animals getting trapped by or consuming plastic.¹³ Extreme weather events, rising seas, and storm surges continue to intensify and will damage coastal communities at even higher rates without the buffer afforded by reefs, mangroves and seagrass.



1.2.

AN URGENT NEED: PLASTIC WASTE MANAGEMENT IN THE CORAL TRIANGLE

Waste management systems across the Coral Triangle are largely insufficient. Even under the most optimistic projections, at least 50 per cent of waste remains unmanaged.¹⁴

Plastic pollution contributes to methane emissions during degradation and harms human and ecological health in the long term. Impacts are especially stark for plastic released as particulate matter via open burning or discarded as marine-bound debris.¹⁵

Waste generation patterns vary among consumers but are rising cumulatively. Compared to large urban centres, islands often have more direct

producer-to-buyer supply chains, which can reduce packaging needs and encourage reuse. Conversely, tourism-driven islands rely heavily on packaged goods transported from distant supply chains, which often arrive full of single-use plastics¹⁶, overloading local waste management systems¹⁷ and increasing the risk of plastic leakage into rivers and seas.

ACROSS SOUTHEAST ASIA, EACH PERSON GENERATES CA. 25 - 55KG OF PLASTIC WASTE



Figure 2. Waste generation varies widely across Southeast Asia.¹⁸ Total waste consists of organic waste, metal, paper, linens, glass, plastic, & other materials.

The widespread mismanagement of plastic waste in the Coral Triangle has severe public health and economic consequences, particularly for small islands and coastal communities. Open burning and unsanitary dumping are woefully commonplace,¹⁹ exposing populations to harmful pollutants.²⁰ As plastic degrades in dumpsites, it releases toxic chemicals, including volatile gases and endocrine disruptors such as per- and polyfluoroalkyl substances (PFAs).²¹ Leachate from informal dumpsites contaminates drinking

water, while microplastic accumulation in the sea resurfaces on our dining tables through salt, seafood and other aquatic products for human consumption. Communities exposed to open burning or dumping face alarmingly increased risks of respiratory illnesses, endocrine disruption, reproductive issues and cancer.²² Understanding the health impacts of plastic pollution requires a *One Health* approach, which recognises the deep interconnections between human, animal, and environmental health. Learn more from WWF's report '[Plastics, Health, and One Planet](#)'.

Beyond environmental and health risks, the economic burden of plastic waste mismanagement is set to exponentially increase. In communities that depend on fisheries for income and sustenance, the degradation of marine ecosystems and declines in fish stocks directly threaten food security and livelihoods. Loss of coral reefs due to plastic pollution undermines tourism, a key revenue source for many island economies.²³ "According to Pew's 2020 report 'Breaking the Plastic Wave', four key trends in global consumption characterize the compounding dangers of business as usual:

Small islands generate less waste than urban centres, but coastal communities bear disproportionately high costs in managing plastic waste, much of which originates from external sources. In low-income countries, the lifetime cost of a one-kilogram block of plastic is 10.6 times higher than in high-income countries.²⁵ Individuals in low- and middle-income countries generate just one-third of the waste generated by individuals in high-income countries. Yet, they are made to bear the cost of waste generated elsewhere.

Waste management can carry significant costs for municipal governments, but the cost of unmanaged waste becomes cumulatively much higher. The financial impact of plastic pollution on fisheries and property values is estimated to reach up to US\$33,000 in losses per tonne of plastic.²⁶ At the municipal level, governments struggle to keep pace with accumulating waste, which clogs waterways, exacerbates flooding and damages infrastructure.²⁷ Plastic debris also facilitates the breeding and migration of vectors of disease, which is projected to increase outbreaks of illnesses.²⁸ As plastic degrades, it breaks down into microplastics that are extremely difficult to remove from the environment and persistently impact wildlife and human health.²⁹

TRENDS IN GLOBAL WASTE GENERATION²⁴

- 1 High population growth in low-income countries where waste collection tends to be low
- 2 Disproportionate growth of plastic consumption in these markets
- 3 Rising per capita plastic consumption globally
- 4 An overall shift to low-value and hard-to-recycle plastics.

IMPACT OF UNCOLLECTED ISLAND WASTE

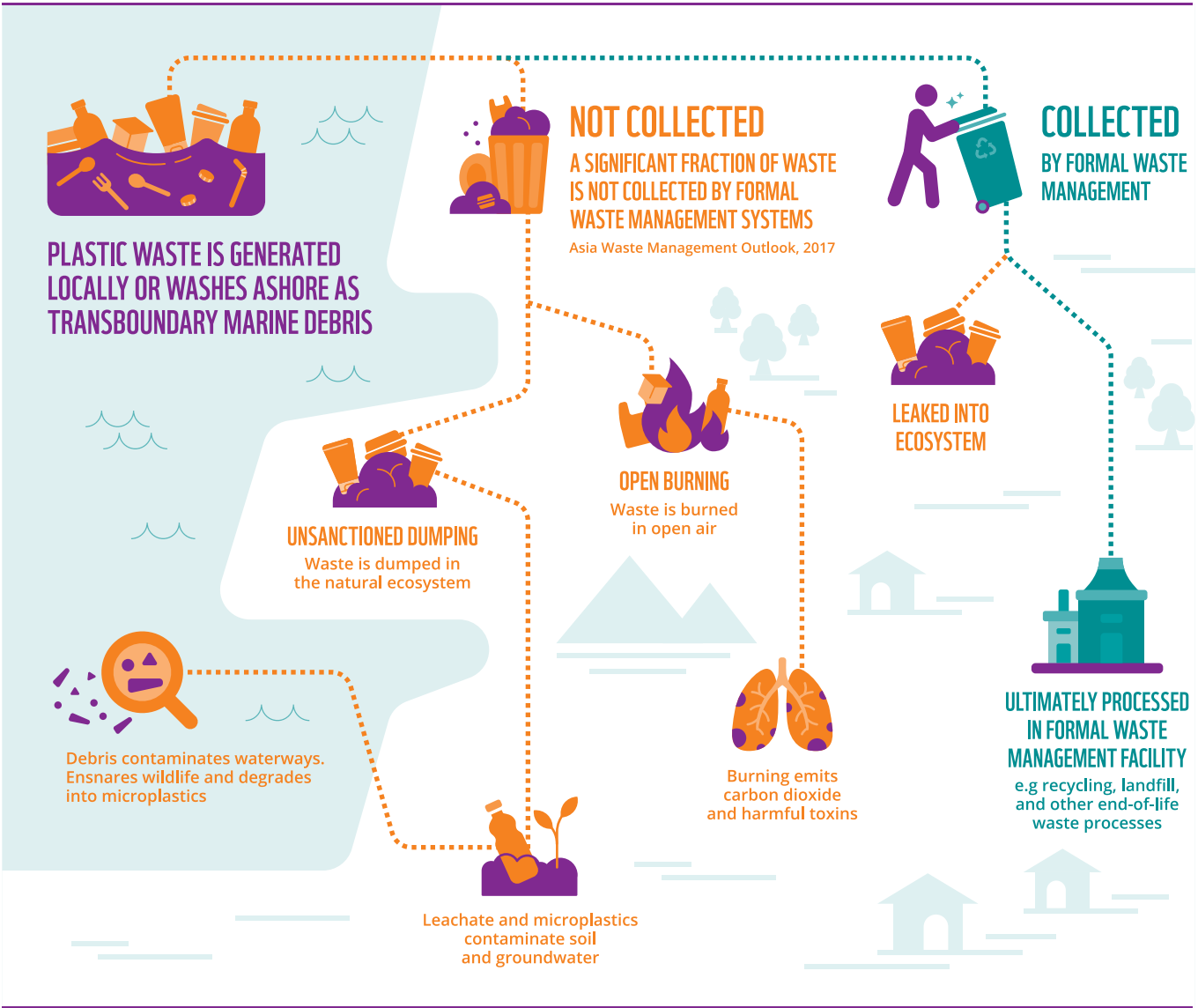


Figure 3. Waste management pathways currently fail to capture the majority of plastic waste in small islands and coastal communities of the Coral Triangle.



The maintenance of waste management systems carries initial costs, but the economic consequences of damaged ecosystems, loss of fisheries, financial instability, and healthcare burdens will be far more significant. Waste reduction is a gradual step in aligning with global sustainability goals to minimize plastic production, as in the United Nations Environment Programme (UNEP) objective of an 80% reduction in plastic pollution by 2040.³⁰ Specifically, forecasts to curtail the devastation from marine debris aim for ambitious targets of 90% waste collection in all urban areas and 50% in rural areas.³¹ Achieving these goals will require concerted action to approach the issue of waste at its systemic origins. The curtailment of detrimental environmental and health impacts requires multifaceted solutions that systemically address waste generation, leakage, and pollution precursors.

In the waste management hierarchy, upstream measures to reduce the production, importation, and consumption of plastic must be the priority.³² Reduction is profoundly significant on small

islands and remote coastal communities because it is complicated to manage once waste has been generated in these resource-limited contexts. Investments and interventions must prioritize upstream regulatory measures that phase out single-use plastics and chemicals of concern, establish safe circularity and transparency, minimize emissions, and prevent the release of macro-, micro-, and nano-plastics. However, removal of accumulated waste will remain a key element of waste management approaches for islands.

Solutions that strengthen sustainable and systemic options to disincentivize waste generation are critical. Based on the “polluter pays” principle, by allocating the responsibility of waste management to those who produce plastic, in systems such as Extended Producer Responsibility (EPR)³³ programmes, producers must first minimize waste by designing out excess consumption and subsequently take responsibility for the downstream management of the materials they generate. Such systems are profoundly relevant for the Coral Triangle.³⁴

ALIGNING WITH GLOBAL COMMITMENTS AND CIRCULAR ECONOMY GOALS

As governments strive toward fulfilling the Global Biodiversity Framework to halt and reverse nature loss by 2030, reducing pollution is key. Robust pollution mitigation is required to achieve Target 7 in the global goals for the Convention on Biological Diversity, to “Reduce pollution risks and the negative impact of pollution from all sources, by 2030, to levels that are not harmful to biodiversity and ecosystem functions and services... and working toward eliminating plastic pollution.”³⁵

Specifically, WWF has identified four actions needed to end plastic pollution:

- 1 Global bans and phase-outs of the most harmful plastics and chemicals of concern
- 2 Binding global product design requirements and systems for a non-toxic circular economy
- 3 Aligned financial flows and resources for systems change
- 4 Mechanisms to strengthen and adapt measures over time³⁶

Biodiversity is a key tenet of the upcoming Global Plastic Treaty.³⁸ With idyllic islands and coastal centres attracting an increasing volume of tourism, waste management is pivotal in the Coral Triangle, if we are to safeguard its incredible biodiversity at all. Effective systems must be implemented in resource-constrained, remote locations, and doing so presents compelling models for restructuring global waste flows and advancing a circular economy. Successful island solutions can catalyze proactive developments elsewhere, driving alignment in places most vulnerable to climate change. Because of these challenges, the study aims to provide recommendations based on an analysis of emerging solutions, thus catalyzing concerted action to systemically prevent and alleviate the challenges facing small islands and coastal communities.

Plastic Smart solutions for islands and coastal centres establish critical precedents for building a circular economy. Despite and perhaps due to their isolation, preventing waste generation can potentially be more feasible on remote islands than on connected mainland areas.³⁹ The import of goods to remote islands is often cost-prohibitive, naturally discouraging excess materials compared to mainland regions with easier land-based movement across multiple sources of trade. As a result, waste on islands could be more easily monitored, given the fewer individual sources and consumption streams.



Figure 4. The Biodiversity Plan features 23 action-oriented targets as agreed by world leaders within the Kunming-Montreal Global Biodiversity Framework.

WASTE MANAGEMENT CHALLENGES FOR ISLANDS AND COASTS

Experts predict that plastic waste leaking into the oceans will triple, reaching an annual 29 million metric tonnes by 2040.⁴⁰ For small islands already struggling with waste disposal, this challenge will be impossible to meet without concerted and systemic efforts.

Waste management follows a hierarchy of best practices whereby preventing the upstream generation of waste is the most ecologically, economically, and energetically sound. The hierarchy starts with reduction, reuse of existing products, recovery of materials via mechanical or chemical recycling, and finally, the last-resort disposal of excess, as shown in Figure 6.

HIERARCHY OF PREFERRED ACTIONS IN WASTE MANAGEMENT AND RISKS

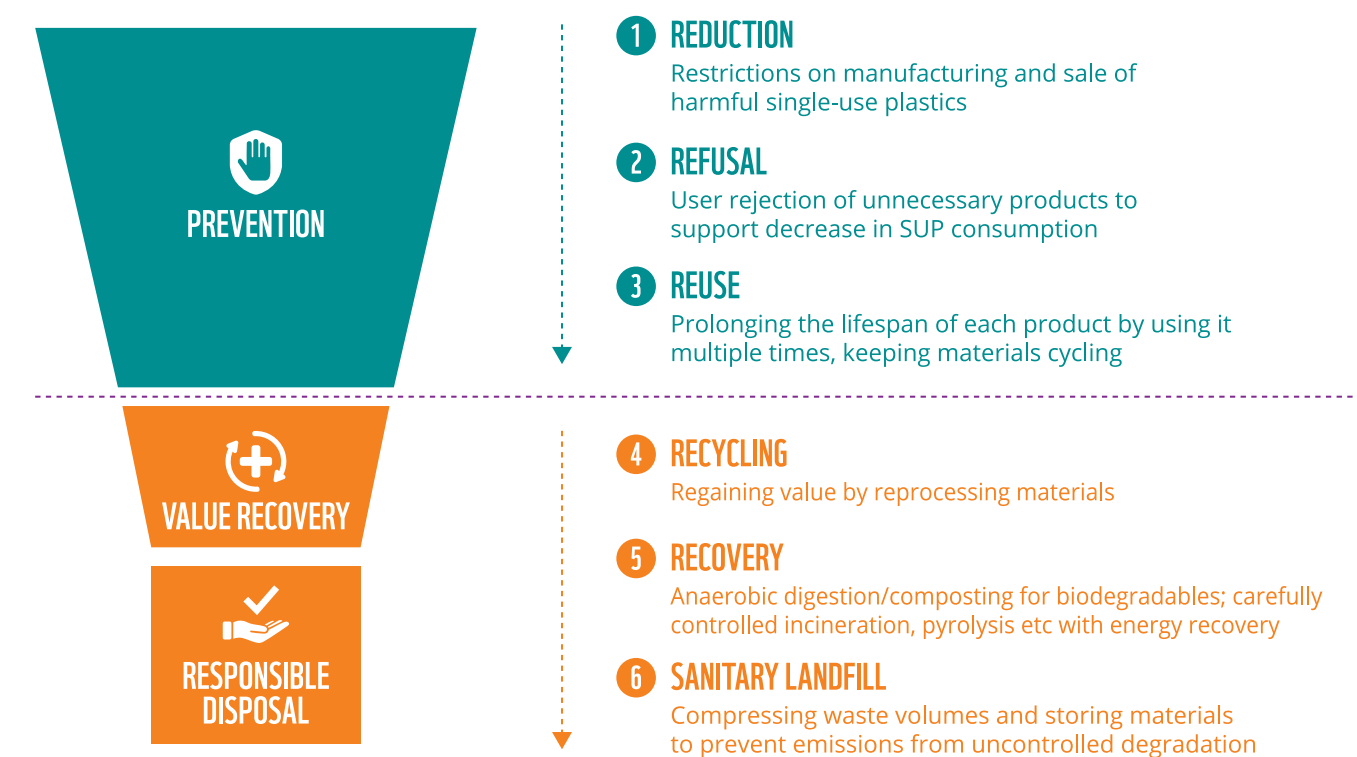


Figure 5. Plastic waste streams should be matched to the most environmentally efficient technology available. Upstream solutions proactively curtail the generation of waste in the first place, while lower-tier methodologies are fundamentally reactive and contribute more significant environmental damage.⁴¹ Additionally, it is important to note that incineration of waste requires the landfilling of non-combustible waste and bottom ash (the residue left after waste is burned).

Practices higher in the waste management hierarchy – segregation, collection, and recycling⁴² – are particularly underdeveloped across small island contexts.⁴³ Plastic waste is typically managed by independent actors who dispose of it by dumping

it in uncontrolled dumpsites or burning it at low temperatures.⁴⁴ The absence of proper infrastructure complicates adopting best practices within the waste management hierarchy. Naturally, the ability to implement the waste management hierarchy is

context-dependent. Management systems that are effective in mainland contexts often fail to account for the unique logistical, geospatial constraints, and cultural demography context of islands. These factors may include limited waste transport options, fragmented road access within the land area, and electricity or utilities prone to disruption. Existing waste management infrastructure on islands has thus been unable to keep pace with domestic waste generation or the overwhelming accumulation of transboundary marine litter. At present, communities in the Coral Triangle typically do not have access to formal management systems and instead rely on dumping or burning, both injurious to health and the environment.⁴⁵

Because of the complexity of technologically advanced waste management in remote or island contexts, including the non-viability of recycling at a small scale, sustainable waste management in these contexts must focus on preventing waste generation in the first place. The priority for action in the waste hierarchy for small islands and coastal communities is prevention (refuse, reduce, and reuse⁴⁶). When prevention is impossible, secondary priorities require responding to the massive quantity of transboundary waste. Recycling may be viable for tourism-heavy areas, producing relatively substantial high-value recyclables. Challenges encountered in small islands and coastal communities can be broken down into the following:

- 1 Inadequate waste management infrastructure**
Remote locations and a lack of on-site industrial capacity limit islands’ ability to recycle and process waste at a meaningful scale.
Limited investment and insufficient fundamental infrastructure: Gaps in waste management are not easily resolved without infrastructure, but the low-return nature and logistical complexities deter large-scale investments. Interventions that target education and behaviour change must also address this foundational lack of infrastructure.

Formal infrastructure for collection and processing is often non-existent. Any existing interventions are typically in pilot stages or are experimental projects in artisanal recycling.

Geographic isolation, natural disasters and limited road or boat access all increase vulnerability to infrastructure disruptions, which frequently impede collection, processing and transportation.

2 Inconsistent community-level engagement & regulatory environments

A gap exists between policy and the comprehensive stakeholder engagement that would bring policy to practice.

Varying degrees of participation: While many island communities are strongly willing to address plastic pollution, structured avenues for translating this interest into systematic, long-term practices are limited.

Policy gaps and enforcement issues: Inconsistent data collection, weak enforcement, and a lack of policy harmonization across jurisdictions prevent waste management from being consistently prioritized. Without vigorous enforcement and harmonized efforts across regions, operations remain small in scope, with weak enforcement generating a disparity between written policies and actual implementation.⁴⁷

Diverse regulatory environments: Each island occupies a distinct regulatory environment within a patchwork of national and/or municipal jurisdictions. In Indonesia, islands are covered by national waste management mandates in addition to local governance. On the other hand, many of Malaysia’s islands are exempted from national regulations, leaving local waste management policies to be self-determined outside of the jurisdiction of national mandates. This divergence in regulatory frameworks leads to a generally ad-hoc approach to waste management across the region.

3 Constrained funding and financing

The high transportation cost, low volumes and low-return nature of waste management on small islands deter funding and financing options.

The local economies of Coral Triangle islands and coastal communities are proportionately more reliant on fisheries and tourism than the national average and their mainland counterparts.⁴⁸ The absence of diversified, multidirectional exchanges with robust mainland economies thus makes many of these locations especially vulnerable to economic volatility, complicating the financing of waste management. Waste management carries costs for municipal governments – but if left unable to meet these costs, the cost of not managing waste becomes cumulatively higher.

High costs and low returns: Reliable offtake markets only emerge when the value of a recyclable material offsets the cost of its processing. On small islands, this balance is rarely achieved. The costs of logistics and transportation often outweigh returns on material recovery. Supporting a nascent sector may require subsidies and reducing the barrier to entry to develop recycling systems with cost-effective solutions and new employment opportunities.

4 Logistical difficulties in market access

Geographic isolation at a distance from large population centres disincentivizes waste recovery activities. To be economically viable, recycling requires intensive capital and energy investments that require inputs larger in scale than islands can supply.

Logistical and financial barriers make accessing offtake markets to sell recyclable materials challenging. While in many mainland contexts, an informal sector has emerged to collect and resell materials with recovery value, on islands,

the cost of logistics and transportation typically far exceeds the value of materials. Remote islands have few boat transfers capable of transporting waste because access boats can be deterred by the fumes and space occupied by the volume of waste.

5 Variable quantity and quality of plastics

The specific types of plastic waste accumulating in small islands and coastal communities are particularly low in recoverability.

Incoming transboundary marine debris: Recyclable plastic consumption by the permanent residents of an island or coastal community may be lower per person than in larger urban centres.

Local residents' waste generation often pales in comparison to the quantity of transboundary marine waste that accumulates on the islands' shores. Located amidst oceanic currents that direct floating debris onto coastlines, islands, and coastal communities, large quantities of marine debris washing ashore far exceed the capacity of any existing management systems on the islands. Once subjected to degradation by saltwater and sunlight, marine plastic is rarely recyclable.⁴⁹

Ghost gear – or Abandoned, Lost, or otherwise Discarded Fishing Gear (ALDFG) – accounts for approximately 10% of marine waste and contributes to biodiversity and habitat loss.⁵⁰ Recovering ALDFG from the ocean presents operational challenges, and its recyclability is often limited due to contamination risks, such as lead exposure. In cases where extensive pretreatment is required, processing can exceed the operational capacity of small island waste management facilities.⁵¹

Islands may face pressure from tourism and a proportionate swell of plastic consumption. During seasonal tourist influxes, the reliance on single-use plastics grows significantly.



KEY TAKEAWAYS

Without urgent and decisive action, plastic pollution will continue to escalate, devastating small island waste systems and threatening ecosystems, human health and well-being.

PROJECTIONS FOR A BUSINESS-AS-USUAL SCENARIO⁵²

- Global plastic consumption is projected to double by 2040.⁵³
- By 2050, plastic volume in the ocean could outweigh fish, as waste generation far exceeds the capacity of existing management systems.⁵⁴
- Pollution from external sources stretches waste management capacity and resources beyond their limits. Climate change, rising sea levels, and extreme weather events will further disrupt waste systems and worsen marine debris accumulation.

FACTORS DRIVING WASTE GENERATION ON ISLANDS

- Lack of Access to Clean Drinking Water – Reliance on bottled water increases polyethylene terephthalate (PET) plastic consumption.
- Dependence on Single-Use Products – Low-income communities rely on small, affordable sachets, leading to continuous waste accumulation.
- Tourism Pressures – Seasonal tourist influxes, and rapid coastal tourism development, drive surges in single-use plastic, straining waste systems.

CHALLENGES IN WASTE PROCESSING AND ECONOMIC VIABILITY

- Minimal processing infrastructure amplifies plastic's environmental impact.
- Limited economies of scale make recycling unfeasible in many cases.
- Fishing and tourism, key economic drivers, are severely affected by plastic pollution.
- The low recoverability of plastic waste from these industries worsens the issue.

With plastic waste generation and disposal otherwise expected to rise exponentially, curtailing waste generation is critical.



CHAPTER 2

STUDY APPROACH

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AIM OF THE STUDY

This study gathers and analyzes insights from case studies to identify common patterns, enabling factors and critically, barriers or blockers that hinder effective plastic waste management. By examining existing initiatives, it provides practical guidance on tackling systemic issues while leveraging strengths and solutions among small islands and coastal communities.

1 Identifying solutions and key challenges

Common waste management trends are analyzed to recognize opportunities and constraints that impact long-term success. The analysis focuses on the conditions of small islands and coastal communities in and around key marine areas, particularly those facing geographic isolation, limited infrastructure, economic constraints, and environmental pressures.

2 Extracting lessons learned, enablers & blockers

Case studies of plastic waste initiatives are reviewed to determine the factors that drive or hinder success. These insights help guide actions toward more effective and sustainable waste management strategies.

STUDY SCOPE & PATHWAYS FOR FURTHER RESEARCH

This study provides an assessment of waste management in small islands and coastal communities across the Coral Triangle. While it identifies overarching trends and challenges, this study does not provide in-depth, country-specific analysis, as such assessments require tailored approaches that account for local governance, infrastructure, and socioeconomic conditions. More detailed recommendations should be developed through focused studies at the country or island level to ensure and adjust recommendations to context-specific conditions.

**Kolibri for Impact is a leading impact consultancy specializing in strategy, investment advisory and knowledge development. Commissioned by WWF, this exercise was conducted with insight, data and guidance from WWF and external experts.*

Using a snowball sample recruitment approach,⁵⁵ information was gathered through expert referrals, stakeholder interviews, and practitioner insights, ensuring findings are grounded in real-world experiences. This approach captures both successes and ongoing challenges, offering a starting point for understanding waste management in small islands and coastal communities within and beyond the Coral Triangle.

Further studies could assess the long-term impact of specific waste management interventions, evaluate effectiveness over time and explore opportunities for collaboration and scaling up solutions.

By examining existing initiatives, it provides practical guidance on tackling systemic issues while leveraging strengths and solutions among small islands and coastal communities.

Building on this analysis, future efforts can support local communities, governments, and MPA/OECM authorities in utilizing the enabler-blocker framework to assess readiness for systematic waste management approaches. This can help transition ad-hoc interventions to more holistic, structured, systematic and long-term strategies. **An initial deep-dive mapping exercise* at WWF sites has already assessed the value of this framework in guiding targeted interventions, providing a foundation for further research and action at more localized levels.**

THE SCOPE

This study identified 151 case studies and further analyzed the strategies, challenges and outcomes of a subset of 10 case studies. One in five case studies focus on recycling, while 32% target responsible disposal, improving waste systems, and public awareness to prevent environmental harm.

STAKEHOLDERS INVOLVED

In the review of 151 case studies, approximately two out of five (38%) initiatives were directed by NGOs.⁵⁷ Around one-quarter (28%) were driven by companies in the private sector.

ACTIVITIES UNDERTAKEN BY CASE STUDIES

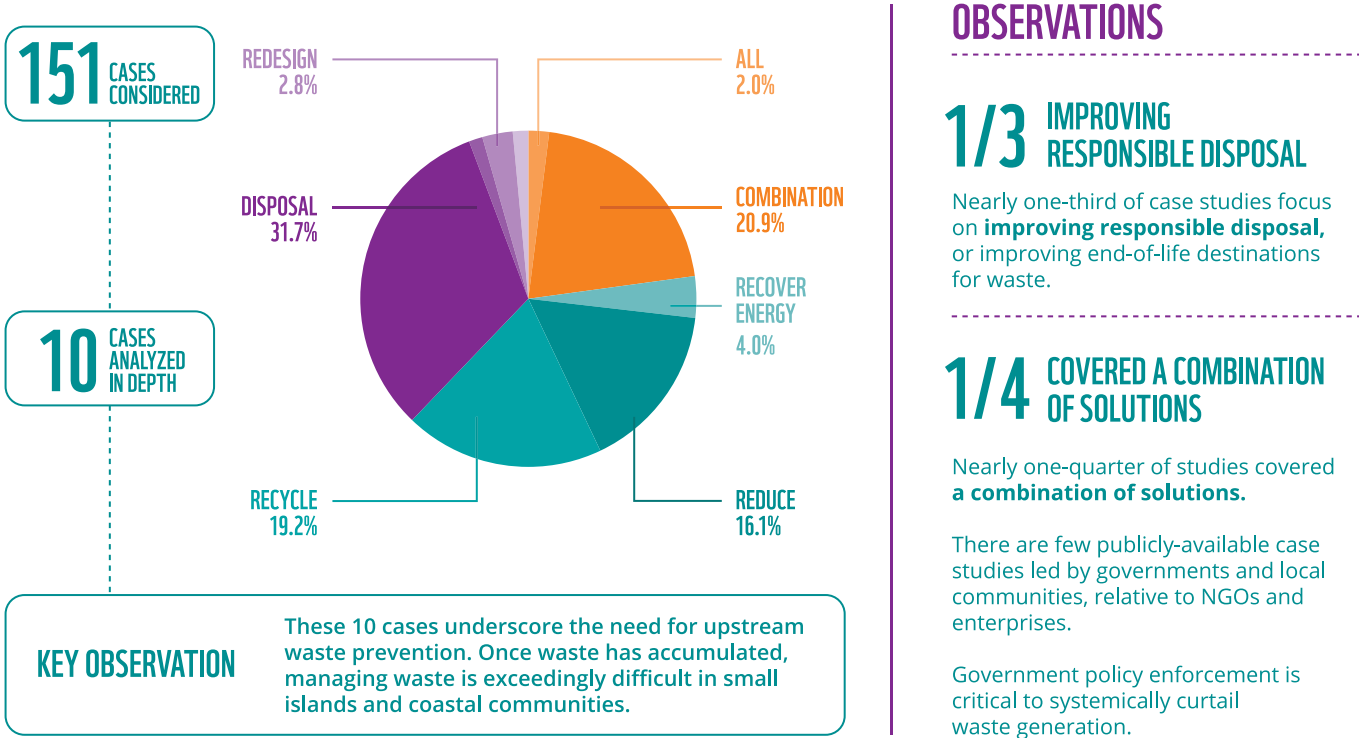


Figure 6. Distribution of activities undertaken by stakeholders.

Activities undertaken by NGOs and private enterprises were especially apparent. The visibility of NGOs and enterprises could be due to their tendency to exhibit a stronger presence in external

publications in communicating the impact of their work, as compared to routine municipal government activities.

APPROACH AND ANALYSIS

This study employs a combination of approaches to achieve three primary objectives:

- 1 Identify key challenges in plastic waste management on small islands and coastal communities in the Coral Triangle.
- 2 Extract lessons learned from existing solutions.
- 3 Synthesize practical recommendations for addressing plastic pollution.

The research process included a literature review, desk research, and stakeholder interviews, followed by an in-depth analysis of case studies.

Stakeholders provided insights into their actions, the challenges they address, the factors contributing to success and the obstacles they encounter. Findings were then organized to identify recurring patterns of enablers and blockers influencing waste management efforts.

Desk research involved in-depth analysis across multiple platforms, including existing publications, academic journals, news portals, organizational websites, supporting articles and reports from key organizations. The literature review referenced materials from sources such as WWF, CTI-CFF, the World Bank, IUCN and the PREVENT Waste Alliance. Expert recommendations emerged during stakeholder interviews, during which practitioners often directed researchers to specific contacts or organizations they knew of with successful plastic waste management initiatives.

The case studies were then analyzed based on the four categories identified in the literature review, ensuring that selected case studies were contextually relevant and founded on principles for long-term, systemic solutions.

1 DESK RESEARCH AND IDENTIFYING PATTERNS IN CHALLENGES

A comprehensive review of publications and research articles was conducted by searching for publications on the urgency of plastic pollution in the Coral Triangle region and the development of waste management in small islands and coastal communities in general. Studies published by international development institutions were examined, along with additional sources cited within them, including academic research publications.

To summarize findings, all reported challenges in waste management were listed and analyzed using deductive qualitative analysis. They were then categorized into four key areas:

- 1. Gaps in government and policy
- 2. Insufficient capacity, capability and technology
- 3. Constrained funding, financing and market access
- 4. Inconsistencies in cross-sectoral collaboration and value chain enabling activities



2 DEVELOPING A COLLECTION OF CASE STUDIES

An initial list of 151 case studies was compiled from three primary sources:

- 1. Literature review and in-depth desk research
- 2. References from researchers specializing in waste management and marine conservation in Southeast Asia
- 3. Suggestions gathered during interviews with implementing stakeholders



3 SHORTLISTING AND INTERVIEWS

From the initial 151 case studies, a subset of 10 case studies was shortlisted based on the aforementioned four key areas. This curated selection does not suggest that other interventions are ineffective or should be discontinued. Rather, these case studies were chosen to illustrate specific insights in their respective contexts and their potential to inform future interventions.

The data collection process included in-depth qualitative interviews informed by structured guidelines developed in coordination with the study task force. The interviews consisted of open-ended questions, allowing for a comprehensive exploration of stakeholder experiences. Each session lasted approximately 1 to 1.5 hours. Relevant reports and documented achievements from each case study supplemented the interviews. Subsequently, the respective stakeholders reviewed and validated interview summaries to ensure accuracy and validity.

During interviews, stakeholders provided first-hand perspectives on the following:

- The challenges they sought to address.
- The factors that enabled them to achieve impact.
- The obstacles that impeded their solutions to scale.
- The social and environmental impacts their initiatives have generated.



4 SYNTHESIZING RECOMMENDATIONS

Key insights from each case study and stakeholder interview were analyzed to extract enablers and blockers experienced, highlighting recurring patterns of challenges and opportunities. Additionally, the depiction of case studies is complemented by following a situation-complexity-resolution-impact (SCRI) analysis⁵⁶ to present holistic information regarding the context of each case study.



LOCATION & CASE STUDY	REFUSE	REDUCE	REUSE	RECYCLE	ENERGY RECOVERY*	RESPONSIBLE DISPOSAL
1 DERAWAN ISLANDS, INDONESIA Island Waste Infrastructure with Community Engagement						
2 TAYTAY, PHILIPPINES Connecting Fishing Communities to Waste Infrastructure						
3 SEMPORNA, MALAYSIA Island-based Waste Management Plans						
4 KOH TAO, KO MUK, & KO LIBONG, THAILAND Separate, Collect, Transport: Waste on Touristic Islands						
5 CON DAO & CU LAO CHAM, VIET NAM Increasing Collection via Campaigns and Policies						
6 ZANZIBAR, TANZANIA Advocating Plastic-Free Islands with Ecotourism						
7 ARUGAM BAY, SRI LANKA Financing PET & Fishing Nets Recycling						
8 MALDIVES Islands Coordinate to Centralize Waste Processing						
9 MANTANANI ISLAND, MALAYSIA Funding Waste Transport from Island to Mainland						
10 GIZO, SOLOMON ISLANDS Women-led Waste Initiative Addresses Intersectionality						

Figure 7. Activities undertaken by case studies span the upstream prevention of waste as well as the collection and processing of the waste that is ultimately generated.
** The 10 case study snapshots featured here did not have energy recovery activities present.*

Drawing on analysis and comparing experiences from across the Coral Triangle region and other similar geographies, the selected case studies contain important lessons for structuring and sustaining plastic waste management initiatives, especially in small islands and coastal areas.

The case studies encompass plastic waste challenges in fragile island ecosystems and suggest potential management solutions that holistically and preemptively reduce the burden of plastic waste in the Coral Triangle and beyond.

Addressing plastic pollution requires synergies across a variety of stakeholders. Partnerships increasingly bridge the private sector, NGOs, and governments, underscoring the importance of multi-sectoral collaboration. NGOs play a key role in the implementation of community projects focused on waste reduction, recycling, and local empowerment,

while governments develop regulatory frameworks to restrict plastic use and enhance waste management systems. Companies are increasingly taking responsibility for managing plastic waste through industrial recycling and circular economy strategies, increasingly in collaboration with local stakeholders. Addressing intertwined environmental challenges requires a comprehensive view of multisectoral synergies to amplify solutions to other geographies.

Activities undertaken by these case studies are summarized in Figure 7.



KEY TAKEAWAYS

FOUR KEY ELEMENTS INFLUENCE WASTE MANAGEMENT IN SMALL ISLANDS

This study examines plastic waste management initiatives in small islands and coastal communities. The process involved a broad literature review, desk research, and stakeholder interviews, leading to a deep-dive analysis of 10 case studies selected from an initial 151 cases.

The review categorized key challenges into four areas:

1. Gaps in governance and policy,
2. Insufficient capacity and technology,
3. Constrained funding and market access, and
4. Inconsistencies in cross-sector collaboration.

These themes emerged across different sources and helped frame the selection and analysis of case studies.

Stakeholder interviews provided firsthand perspectives on barriers, success factors, and impacts, allowing for a better understanding of how different interventions have worked in practice. Findings indicate that NGOs and private enterprises play a significant role in addressing plastic waste challenges, though stronger government coordination and cross-sector collaboration remain crucial.



CHAPTER 3

KEY FINDINGS

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3.1.

COMMON BLOCKERS & ENABLERS TOWARDS SOLUTIONS

DEFINING BLOCKERS AND ENABLERS

 BLOCKERS

Blockers are systemic barriers—weak regulatory enforcement, insufficient funding and financing, logistical constraints, and inadequate infrastructure—that hinder the implementation & scaling of solutions.

 ENABLERS

Enablers are ecosystem conditions that support effective waste management, such as strong governance, stable funding, community participation, and access to recycling markets.

Through literature review and case study analysis, four key areas were identified as **primary enablers and blockers** influencing the success of waste management efforts in small islands and coastal communities:

-  **GOVERNANCE AND POLICY**
-  **CAPACITY, CAPABILITY, AND TECHNOLOGY**
-  **FUNDING, FINANCING AND ACCESS TO MARKET**
-  **CROSS-SECTORAL COLLABORATION AND OTHER VALUE CHAIN ENABLING ACTIVITIES**



Without regular collection services, community waste is often disposed on top of waste that washes up beneath stilt homes of coastal communities in Sabah, Malaysia.
© Jonah Kayguan /WWF Coral Triangle Programme

Addressing blockers while reinforcing enabling conditions is critical to ensuring waste management efforts are effective and sustainable.

The findings from the in-depth interviews emphasized the critical role of local governance and community engagement in fostering local ownership of waste initiatives, the logistical and financial feasibility of implementing these projects, and the importance of aligning waste management efforts with local cultural practices and beliefs. Additionally, integrating waste management into broader conservation efforts, such as protecting marine ecosystems and promoting eco-tourism, is essential for creating long-term solutions.

Most of the selected case studies showcase initiatives led by NGOs and the private sector. However, their long-term success and ability to scale depend on an enabling environment fostered by government action and enforcement of relevant policies. Governments play a crucial role in creating the conditions for sustainable waste management

by harmonising measures towards plastic leakage reduction, such as investing in potable drinking water, promoting a circular economy, reducing barriers to entry, providing subsidies, supporting waste aggregators, and enforcing regulations. By actively enabling a network of waste management operators, governments can help build economically viable systems. **Without strong government involvement, efforts to address plastic waste will remain fragmented and struggle to meet the growing scale of the problem.**

Furthermore, waste management initiatives led by governments (largely local councils) on small islands and coastal communities within the Coral Triangle tend to lack systematic efforts and remain scattered and decentralized, largely due to the compartmentalized nature of local government units.

GOVERNANCE & POLICY



KEY BLOCKER WEAK ENFORCEMENT OF REGULATIONS

Even when waste management regulations exist, they are often not enforced consistently, especially in more remote or less populated areas.⁵⁸ This allows illegal dumping and improper disposal methods to continue unchecked, even when alternative waste management systems are in place.⁵⁹

 **POTENTIAL IMPLICATIONS**

EVEN WELL-DESIGNED WASTE MANAGEMENT SYSTEMS CAN FAIL
Without consistent enforcement, the display of irresponsible or harmful practices can dampen community motivation and erode a sense of accountability towards responsible and proper waste disposal methods.

 **KEY ENABLERS**

SYSTEMIC IMPROVEMENTS AND BEHAVIOUR CHANGE
Sustained waste management requires both infrastructure and public engagement. When waste reduction and collection systems are accessible and efficient, sustainable practices are easier to adopt. In order to foster long-term behavioural change in waste reduction, proper waste sorting and improved disposal, any effective external accountability mechanisms, such as sanctions and penalties, and incentives to encourage compliance to reinforce the desired change, should build upon a foundation of intrinsic motivation.^{60, 61}



KEY BLOCKERS LACK OF PUBLIC FUNDING PRIORITIZATION FOR WASTE MANAGEMENT

Without clear economic benefits, waste management is often deprioritized in favour of other pressing local needs, particularly in rural and remote areas. Budget shortfalls are common, as in one case study where waste management accounts for just 0.5% of the municipal budget.⁶² This issue is worsened by transboundary marine debris, which provides no financial return and is seen as a net loss for processing that originates elsewhere.⁶³

 **POTENTIAL IMPLICATIONS**

NECESSARY INFRASTRUCTURE AND SERVICES ARE UNDER-RESOURCED AND MAY NOT BE DEVELOPED OR MAINTAINED
When waste management is underfunded or viewed as a low priority, this can result in poor waste disposal practices, ongoing environmental damage and difficulty sustaining waste management systems in the long term.



MOU Signing between WWF -Philippines, 3 Island Barangays: Debangon, Paly, Beton & MENRO
© WWF-Philippines

 **KEY ENABLERS**

STRATEGIC RESOURCE ALLOCATION
Transparent and collaborative budgeting processes can help ensure that funds are specifically allocated for waste collection, recycling programmes and public education needed for the population to be served. An example of this is seen in small islands where governments focus on simplifying waste tariffs and taxes, ensuring that local and national governments align on key initiatives and provide sufficient budgets to meet operational needs. Where budget constraints remain, clarifying governance structures together with strong local leadership can streamline efforts, reduce inefficiencies and costs such as waste storage and transportation.⁶⁴



KEY BLOCKERS FRAGMENTED COORDINATION AND UNCLEAR GOVERNANCE

Waste management efforts often require coordination across multiple levels of government, from local to provincial to national authorities. Without alignment across governance levels, waste management systems remain disjointed, making it difficult to establish sustainable, functional solutions.

 **POTENTIAL IMPLICATIONS**

DELAYS, INEFFICIENCIES, STANDSTILLS AND INACTION
When roles and responsibilities are unclear and jurisdiction ill-defined, waste services can face delays, inefficiencies or even standstills and inaction.⁶⁵ Communities may be left without necessary infrastructure or services, perpetuating reliance on informal or harmful disposal methods, leading to unchecked dumping and degradation.

 **KEY ENABLERS**

ESTABLISHING CLEAR STRUCTURE AND CAPACITY BUILDING
Effective waste management requires strong governance, the capacity to enforce policies and systematic collaboration between government agencies, the private sector and communities. Ensuring clear mandates, defined jurisdiction and capacity-building for local authorities is key. Government agencies equipped with adequate capacity and capability improve accountability and clarity in waste management systems.⁶⁶ Furthermore, policymakers with technical support, data-driven insights and scalable models can further improve long-term waste management outcomes.

[See [Case Study 1 – Derawan](#) and [Case Study 8 – Maldives](#)]

CAPACITY, CAPABILITY & TECHNOLOGY



KEY BLOCKERS LIMITED ACCESS TO WASTE MANAGEMENT TECHNOLOGIES

Many Coral Triangle coastal communities do not have access to larger-scale waste facilities and technologies such as sanitary landfilling, mechanical or chemical recycling, due to high costs and other barriers like specialized technical requirements and safety measures.

Even when funding is available, these technologies often lack a viable and sustainable business case in remote island and coastal settings. Facilities and machinery used in urban waste management like waste sorting conveyors or reverse vending machines, tend to become non-operational due to inconsistent waste volumes, lack of operational capacity, logistical constraints and high operational costs.⁶⁷ Limited transportation networks, a lack of skilled personnel and resistance to changing existing behaviour in disposal methods further hinder adoption at scale.⁶⁸



**POTENTIAL IMPLICATIONS**

SERIOUS ENVIRONMENTAL AND PUBLIC HEALTH RISKS, DUE TO OPEN DUMPING AND BURNING OF PLASTIC

The inability to establish sustainable waste infrastructure means that islands struggle to manage both on-site waste and the influx of transboundary marine litter.

Stunted development of local recycling markets and circular economy opportunities, keeping communities dependent on external interventions rather than self-sustaining circular economies. Technology as a standalone intervention will likely fail unless accompanied by system-wide improvement and capacity-building for local operators.

**KEY ENABLERS**

SYSTEM-WIDE INFRASTRUCTURE IMPROVEMENTS & LONG-TERM MAINTENANCE

Effective waste collection and separation technologies are crucial, but the challenge of small-scale implementation underscores that there is no one-size-fits-all technology in waste management. Systems must be fit for purpose, especially in small islands and coastal communities. Recycling facilities can be viable by achieving economies of scale through collaborating across cumulatively larger populations.

Increasing the efficiency of key waste management steps can improve formal processing and disposal. To help with the limited storage and transport options, for example, islands can focus on sorting and processing as much as possible on-site and then reducing the volume of waste to be transported. Tools to separate organic and inorganic waste more efficiently can help reduce landfill use and make transportation more efficient. Technology such as baling machines, which compress recyclables such as plastics, then play a key role in reducing waste volumes and facilitating easier transportation of materials to mainland recycling facilities.⁶⁹



KEY BLOCKERS GAPS IN SUSTAINABLE WASTE PREVENTION AND MANAGEMENT PRACTICES

Island communities face significant challenges in adopting sustainable waste prevention and management practices due to limited facilities or alternatives, awareness, entrenched habits and communication barriers. Harmful disposal methods, such as open dumping or burning waste, often stem from a lack of alternative approaches and understanding of the long-term environmental and health consequences of open dumping or burning. Language and cultural differences often complicate efforts to educate populations, requiring localized messaging when communities have different dialect(s) and sometimes language(s).⁷⁰ Additionally, deeply ingrained daily habits and the absence of accessible, sustainable alternatives (e.g. refillable drinking water instead of PET bottled water) make it difficult to encourage behavioural change where social influences and choice architecture otherwise point towards the use of single-use plastic as default.⁷¹

**POTENTIAL IMPLICATIONS**

PILOT SOLUTIONS, WHILE INITIALLY SUCCESSFUL, CAN BECOME UNSUSTAINABLE

Particularly when stakeholders aren't habituated to utilizing them due to lack of awareness and socialisation. Resistance could be caused by unclear systems and a lack of awareness and incentives, which will likely slow down efforts to reduce plastic waste and increase transaction costs due to dependency on top-down oversight.

**KEY ENABLERS**

BUILDING STAKEHOLDER CAPACITY

Sustainable waste management in small islands and coastal communities requires equipping stakeholders with the necessary skills, knowledge and tools to implement long-term solutions. Developing technical expertise within communities is key. Strengthening capacity involves facilitating waste separation, enforcing penalties for illegal dumping and fostering collaboration between governments, private organizations and local residents.⁷²

FUNDING, FINANCING & ACCESS TO MARKET



KEY BLOCKERS

HIGH INITIAL CAPITAL REQUIREMENTS FOR WASTE MANAGEMENT SETUP

Due to high capital requirements, small islands and coastal communities often face substantial challenges in establishing waste management infrastructure. Setting up recycling facilities, material recovery centres and transportation systems require significant upfront investment. Geographic isolation inflates the costs, as transporting equipment and materials to and from the mainland adds logistical expenses. Additionally, expertise in operating and maintaining such infrastructure is often unavailable locally, further raising initial costs when external technical support is needed.

Municipal budgets often allocate minimal funds for waste management and waste infrastructure competes with other public services for limited resources. Private sector participation is similarly constrained by perceptions of high risk and uncertain returns, particularly in areas where waste streams and market access are inconsistent.⁷³

 **POTENTIAL IMPLICATIONS**

WASTE ACCUMULATION, ILLEGAL DUMPING AND INCREASED POLLUTION
High risks and low returns limit private sector involvement.

 **KEY ENABLERS**

EXPANDING ACCESS TO TAILORED FINANCING MECHANISMS
Development grants, subsidized loans and capital investment programmes, can help reduce the high initial costs of establishing waste management infrastructure.
In parallel, providing material support and logistical assistance—such as subsidizing waste transport or supplying adaptable equipment like three-wheel trucks and boats—can ease financial and operational barriers.
Strengthening connections to regional recycling markets is key, as access to established markets can improve the long-term viability of these investments. Encouraging consistent offtake agreements and offering financial incentives for properly sorted recyclables can shift waste management from a cost-heavy activity into a more economically viable opportunity. These measures can foster local economic resilience while addressing the persistent challenge of high initial capital requirements.⁷⁴



KEY BLOCKERS

CHALLENGING BUSINESS MODEL TO SUSTAIN AND SCALE

Waste management initiatives in small islands and coastal communities often face financial challenges, as collection, transportation and processing costs frequently outweigh the revenue if solely generated from recycling materials. Transporting recyclables from remote islands to processing centres or landfills is particularly costly⁷⁵ due to a combination of distance and lack of regular and cheap transportation.

Inconsistent market incentives and a lack of municipal oversight further limit the ability to ensure proper waste sorting and pre-treatment, with poorly sorted or low-quality recyclables resulting in low value and marketability.

 **POTENTIAL IMPLICATIONS**

MANY POLLUTERS FACE LITTLE INCENTIVE TO REDUCE WASTE GENERATION DUE TO WEAK POLICY ENFORCEMENT

Small islands and coastal communities are left to shoulder the burden of downstream waste. Unable to reach processing centres, communities often dump, burn, or bury their waste. **The high costs of waste collection, transportation and processing often outweigh revenue from sales of recyclables, making waste management financially unsustainable.** These programmes struggle to maintain operations, and even more so to scale, without additional support such as subsidies or alternative revenue streams, limiting their long-term viability, effectiveness and growth.

 **KEY ENABLERS**

INTEGRATING ACCOUNTABILITY FOR WASTE MANAGEMENT BASED ON THE POLLUTER PAYS PRINCIPLE

Implementing the polluter-pays principle can improve cost recovery and financial sustainability. Engaging with manufacturers and delegating the responsibility to manage waste is critical for developing robust waste management systems by encouraging them to design out excess waste.⁷⁶ Engaging manufacturers and assigning responsibility for waste management, such as through Extended Producer Responsibility (EPR) schemes that promote reuse and recycling, foster more robust systems.⁷⁷ Other initiatives to incentivize consumer behaviour, such as Deposit Refund Schemes that provide partial refund for returning reusable containers, can be adapted in various island contexts. **Certain industries generate particularly high amounts of waste.** Engaging stakeholders across these industries is important. Tourism businesses, such as hotels and restaurants, are often significant contributors to local waste streams, especially with single use plastic waste; but they can also spur solutions should they shift towards reuse.⁷⁸ Management of discarded fishing gear is best achieved by the fisheries sector, from loss prevention to material recovery. Collaborating with these key industries can drive financial and logistical support for waste reduction and management, while providing economic incentives for them.



KEY BLOCKERS ECONOMIC DISPARITIES ACROSS COMMUNITIES

Political deprioritization often leaves the most vulnerable communities out of waste management, and areas with gaps often remain sites of illicit waste dumping. In addition, budget allocation for waste management is often unequal across jurisdictions.⁷⁹ The ability to afford sustainable alternatives is often not accessible to lower-income communities. Gaps in the availability of alternatives thus allow SUP proliferation and improper waste disposal to continue in communities with low capacity to invest in alternatives.⁸⁰



POTENTIAL IMPLICATIONS

LIMITED ACCESS TO FORMAL WASTE MANAGEMENT FORCES COMMUNITIES TO RELY ON INFORMAL AND OFTEN HARMFUL DISPOSAL METHODS.

In subsistence-driven communities, immediate survival needs take priority over long-term waste management planning, making it difficult to foster systemic improvements.



KEY ENABLERS

INTEGRATION OF PLASTIC RECOVERY AND WASTE MANAGEMENT WITH EXISTING INCOME-GENERATING STREAMS

Economic efficiency and sustainable alternatives are sometimes perceived as antagonistic to each other when single-use plastics are the lowest-price options. In reality, the damage caused by pollution has substantial negative effects across all sectors, and the effects are often most severe in low-income communities.⁸¹ Decentralizing the activities of waste management creates new opportunities for livelihoods and entrepreneurship. Incentivizing reuse, collection and recycling across sectors can provide supplementary income for local communities. This alternative source of income may be particularly compelling for communities experiencing income inconsistency in sectors such as fisheries and tourism, which are also affected by plastic debris.⁸²

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CROSS-SECTORAL COLLABORATION & OTHER VALUE CHAIN ENABLING ACTIVITIES



KEY BLOCKERS LIMITED CROSS-SECTORAL AND MULTI-STAKEHOLDER COLLABORATION ADDRESSING TRANSBOUNDARY WASTE CHALLENGES

Globally, small islands and coastal communities are burdened by immense quantities of waste originating up to thousands of kilometres away. However, individually, they often have few resources to mitigate the damage.⁸³ On its own, each island's waste volume is often seen as too low to rationalise a suite of solutions due to lack of an economy of scale.



POTENTIAL IMPLICATIONS

AN ISLAND ON ITS OWN ALONE MAY NOT BE ABLE TO AFFORD THE HIGH COSTS OF WASTE MANAGEMENT

Small islands and coastal communities tend to have low to medium population sizes, lower economic activities and lesser waste volume. Meanwhile, marine plastic waste that washes upon shores tend to be degraded, low-value, and hard to recycle, making waste management more costly per tonne.



KEY ENABLERS

REGIONAL AND MULTISTAKEHOLDER PARTNERSHIPS FOR COLLECTIVE WASTE MANAGEMENT

Collaborative approaches among small islands can improve waste collection, processing and recycling efficiency. Shared infrastructure, such as regional waste transfer stations, can reduce transportation costs and improve economies of scale. Coordinated efforts across jurisdictions, including policy alignment and joint investment in waste processing, can help mitigate the challenges posed by transboundary marine debris.⁸⁴ Strengthening regional networks among businesses with shared interests, among coastal communities facing similar challenges and government bodies from local to national levels, can help ensure that island and coastal communities are able to benefit from collective action and not left to manage waste in isolation.



KEY BLOCKERS

OPERATIONAL VULNERABILITIES IN INFORMAL WASTE MANAGEMENT

Informal waste collection and disposal systems often emerge where formal waste management is absent. While these systems provide income opportunities, they lack regulations, safety measures and environmental oversight. Informal waste pickers typically work under hazardous conditions without protection or stable earnings. In tourism-heavy areas, a lack of clear regulations on business waste disposal results in unmonitored accumulation of plastics. Without municipal oversight, ad hoc waste management fails to prevent pollution and exacerbates health and environmental risks.⁸⁵



POTENTIAL IMPLICATIONS

UNCLEAR ENFORCEMENT AND LACK OF FORMALIZATION IN THE WASTE SECTOR POSE RISKS

This results in inefficient waste management operation. Ethical misconduct may occur especially in areas lacking formal oversight and structured waste handling systems.



KEY ENABLERS

INTEGRATION OF SUSTAINABLE ALTERNATIVES AND LIVELIHOOD OPPORTUNITIES

Waste management systems can create significant job opportunities which overlap with and extend beyond individual sectors. By formalizing the system and employing residents and integrating waste management into the local economy, these programmes reduce pollution and provide economic benefits, often creating new opportunities, especially for women and informal waste collectors.⁸⁶



KEY BLOCKERS

OVER-DEPENDENCY ON NON-GOVERNMENT ACTORS IS UNSUSTAINABLE

Many waste management projects are initiated by external actors such as NGOs or private organizations, and does not guarantee long-term sustainability. When local governments are not tied to the ownership of these projects, operators become reliant on external funding and support. Projects catalyzed enthusiastically by external actors often wane over time due to competing commitments, fluctuations in funding⁸⁷ and shifts in interest. Without local ownership and accountability, these initiatives often struggle to continue once external involvement ends.



POTENTIAL IMPLICATIONS

PROGRESS MADE COULD MEET POTENTIAL BACKSLIDE

Without strong government leadership and community ownership, waste management projects may fail to sustain themselves once external support phases out. Leaving communities without effective and sustainable systems can reverse any progress made during the project's active phase. Over time, disappointment can lead to demotivation or even reluctance to start again.



Malaysia delegation consisting of policy-makers, community champions and NGO representatives learning about Derawan Island's new MRF and waste management system
© Nurhadi Pratama / WWF-Indonesia



KEY ENABLERS

LOCAL OWNERSHIP AND WASTE MANAGEMENT PRACTICES EMBEDDED IN CULTURAL ELEMENTS

Aligning waste reduction efforts with cultural values encourages local ownership and sustainability. Pilot efforts developed by or co-developed with local communities with clear ownership transference, experience an ability to achieve greater community support and long-term success than those that did not. Integrating waste management initiatives with local cultural or religious practices also benefits widespread uptake.



KEY BLOCKERS

LIMITED TRANSPARENCY AND DATA AVAILABILITY

The absence of coordinated efforts for data collection in small islands and coastal communities results in sporadic, inconsistent information. Varying methodologies and a lack of standardization make it difficult to compare waste management outcomes across regions or track progress effectively.⁸⁸ The absence of transparent monitoring hinders informed policymaking and access to funding, as decision-makers lack comprehensive data to justify investments.



POTENTIAL IMPLICATIONS

Without coordinated data collection and transparent monitoring, waste management efforts remain fragmented and reactive. The lack of reliable, comparable data prevents stakeholders from accurately assessing waste trends, identifying effective interventions and measuring progress. This information gap complicates policy development, resource allocation and cross-regional collaboration, ultimately



KEY ENABLERS

COLLABORATION FOR COMPREHENSIVE DATA COLLECTION AND MONITORING

Addressing transboundary marine debris requires regional coordination and standardized waste monitoring. Initiatives led by ASEAN and COBSEA illustrate the value of regional task forces in aligning priorities and facilitating data sharing.⁸⁹ A key step in building just and equitable responses to plastic pollution is understanding waste flow for a clear understanding of the scale of the problem. Delineating standard, normalized metrics on a regional level can allow for uniform methods of comprehensive data collection. For example, standard operating procedures for waste audits in islands and transparency in waste audit methodology could assist in normalizing waste generation data across island contexts. Consistency in monitoring is essential for the efficient development of systemic, long-lasting solutions.

3.2.

CASE STUDIES

Selected from an initial 151 cases, identified through expert recommendations, network referrals and literature reviews.

This study compiles 10 case studies, categorized into WWF-led initiatives and externally sourced case studies.

To examine waste management efforts both within and beyond WWF’s direct engagement, this approach allows for a broader perspective on how different actors — including civil society, local governments and private enterprises — are addressing plastic waste challenges in small islands and coastal communities.

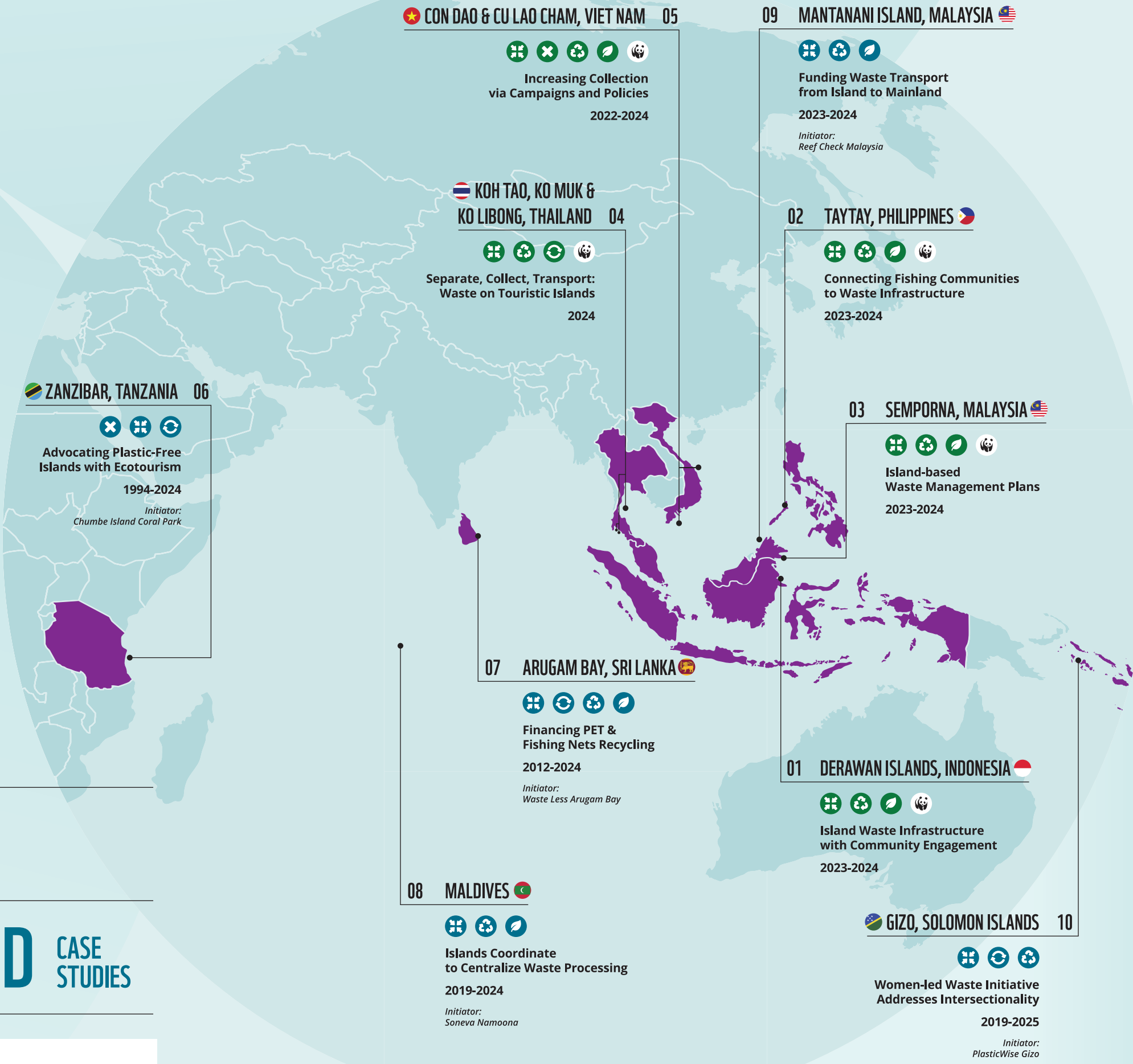
Selection criteria focused on initiatives addressing plastic waste challenges through waste reduction, responsible disposal, recycling and circular economy approaches in either a small island or coastal context. This compilation aims to identify and exhibit the key patterns, recurring enablers and persistent challenges in waste management for small islands and coastal communities.

5 WWF-LED CASE STUDIES

5 EXTERNALLY SOURCED CASE STUDIES

ACTIVITIES UNDERTAKEN

- REFUSE
- REDUCE
- REUSE
- RECYCLE
- RESPONSIBLE DISPOSAL





© WWF / Yunaidi Joepoet

CASE STUDIES WITH WWF INVOLVEMENT

WWF has implemented and supported initiatives across marine and terrestrial environments worldwide as part of its commitment to environmental conservation and plastic waste management. This section provides an overview of selected WWF project sites—Derawan Islands (Indonesia), Taytay (Philippines), Semporna (Malaysia), Con Dao and Cu Lao Cham (Viet Nam), Koh Tao, Ko Muk and Ko Libong (Thailand)—which demonstrate WWF's integrated efforts in waste management, policy engagement and ecosystem protection.

01 ISLAND WASTE INFRASTRUCTURE MEETS COMMUNITY ENGAGEMENT

DERAWAN ISLANDS, INDONESIA



ACTIVITIES UNDERTAKEN

-  REDUCE
-  RECYCLE
-  RESPONSIBLE DISPOSAL

INITIATOR

 WWF-INDONESIA

YEAR

 2023 ONWARD



KEY TAKEAWAYS

- **Demonstrating tangible infrastructure improvement** is key for community (user) participation and commitment. Education, behaviour change and regulations hinge on availability of waste infrastructure.
- **Developing waste management facilities can encounter practical challenges.** Limited land availability and governance coordination affect land acquisition, permitting process, and timelines.
- **Embedding operational budget within regulations is essential** to ensure that ongoing operational and technical costs are clearly mandated and sustainably covered by the designated management authority. Long-term sustainability depends on government ownership and integration of waste management into local regulations and planning



SITUATION

Located off the coast of East Kalimantan and known for their rich biodiversity, the Derawan Islands are the gateway to an MPA. Relying heavily on fisheries and tourism, plastic pollution, especially soft plastics, is ubiquitous and poses a threat. The nearest landfill (Tanjung Batu) and recycling facilities (Tanjung Redeb) are on mainland East Kalimantan, located inland along a river accessible by boat from the islands. Waste aggregators in Tanjung Redeb accept recyclable plastic, which are sold on to processors in Surabaya. With a lack of waste infrastructure, local policies have not been stringent. Households generate a significant share of daily waste, with an estimated 43% reportedly dumped into the sea due to limited waste management services (Derawan TPS 3R Feasibility Study, 2023).. However, the tourism and hospitality sectors also contribute substantially to plastic waste generation due to visitor activity.

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COMPLICATIONS

- **Geographical access to recycling:** Access to buyers of recyclable materials exists, but transportation and logistics remain a significant challenge due to limited accessibility of the Derawan Islands.
- **Uncertain long-term sustainability:** Institutionalizing NGO-led projects is difficult without government ownership.
- **Evolving Multi-Level Governance Processes:** Government processes are still being harmonized, while roles across administrative levels continue to evolve. Multi-step land permit procedures and cross-authority approvals lead to extended timelines (such as the TPS3R development), contributing to occasional fragmentation in waste management.
- **Limited community and sector awareness:** Civic and business engagement is in early stages, necessitating a broader community buy-in and long-term commitment for sustainability.
- **Marine plastic pollution:** Ocean currents bring in discarded and unmanaged waste from neighbouring shores and the sea, mostly consisting of degraded soft plastics.



RESOLUTION

- **With support from WWF-Indonesia**, a waste management masterplan has been officially adopted by the local government. This enabled a plot of land to be allocated for establishing a TPS3R facility, a decree by the Head of Derawan Village legalizing 10 waste workers for operations, and the drafting of waste regulations in consultation with village, district and MPA authorities.
- Waste collection and transport systems were strengthened through provision of three-wheeled vehicles for local collection and a regular boat service to shuttle waste to mainland landfill.
- Operational capacity for the TPS3R facility has been developed through training of local waste workers and procurement of supporting equipment, including a baling machine for plastic waste processing.
- Waste monitoring and data collection systems were established with participation from local youth groups, universities and the tourism sector. These efforts support evidence-based management decisions and help assess environmental and economic impacts.



IMPACT

- Village leadership and local waste governance were strengthened through the development of waste regulations based on public consultation and agreement.
- Over 700 people have participated in campaigns and clean-up events, contributing to increased awareness regarding coastal waste issues.
- A pilot material recovery facility (MRF) was developed through a participatory co-creation process involving multiple stakeholders and rights-holders across different governance levels.
- Improved waste management supports efforts to reduce ecological pressures and contributes to the long-term effectiveness of MPA zoning, conservation targets, and sustainable marine tourism management.



GOVERNANCE AND POLICY

BLOCKERS

- Limited waste infrastructure made it difficult to introduce and enforce waste management regulations.
- Gaps in roles and responsibilities across administrative levels resulted in coordination challenges among authorities.

ENABLERS

- Strong community engagement through outreach, training and clean-up initiatives increased awareness and strengthened local commitment to improved waste management.
- Adoption of a waste management masterplan strengthened coordination and commitment among village, district and provincial authorities.



CAPACITY, CAPABILITY & TECHNOLOGY

BLOCKERS

- Derawan's island geography limits waste collection and transport logistics, increasing operational costs.
- Limited waste management awareness among residents, visitors, tour operators and hospitality businesses contributes to higher plastic waste generation.

ENABLERS

- Improved waste collection and transport capacity (including three-wheeled carts and boat services) strengthened waste handling and reduced leakage into the environment.
- Engagement of the Tourism Awareness Group (Pokdarwis) and tourism businesses promoted responsible marine tourism practices, including reducing SUPs and improving waste management.



FUNDING, FINANCING AND ACCESS TO MARKET

BLOCKERS

- Limited public funding, combined with high transport costs, make waste management prohibitively costly.
- Limited clear economic incentives reduce motivation for authorities, businesses, and communities.

ENABLERS

- Derawan's current waste regulation (pending approval) states that public incentives and funding should be provided for the TPS3R. This can be partially funded by monthly waste collection fees, once the TPS3R is operational.



CROSS-SECTORAL COLLABORATION & OTHER VALUE CHAIN ENABLING ACTIVITIES

BLOCKERS

- Limited coordination and leadership across key sectors (households, fisheries, tourism etc) slows collective action.
- Limited participation from recycling partners slow progress towards circularity.

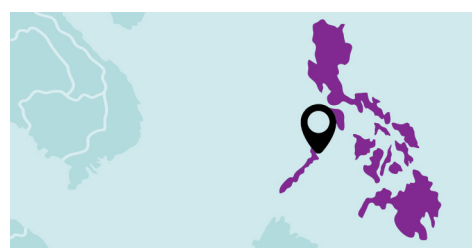
ENABLERS

- Active stakeholder engagement facilitated strong local leadership, which helped to fast-track regulatory progress despite limited centralized regulation.
- Engaging the tourism authority for destinations, industry, and community actors in monitoring processes, using the sustainability of marine tourism destinations approach within the MPA as a key reference.



02 CONNECTING FISHING COMMUNITIES TO WASTE INFRASTRUCTURE

TAYTAY, PHILIPPINES



ACTIVITIES UNDERTAKEN

-  REDUCE
-  RECYCLE
-  RESPONSIBLE DISPOSAL

INITIATOR

 WWF-PHILIPPINES

YEAR

 2023 ONWARD

KEY TAKEAWAYS

- **Local government commitment:** Partnering with enthusiastic local government officials is central to driving the successful development of policies and their enforcement.
- **Strong community support** is necessary to ensure that official waste management plans are well implemented, helping to reduce costs when household separation and collection are well practised and composting supports waste reduction.
- Progress can be stalled by bureaucratic hurdles and leadership changes. There is a need to develop clear action plans with multiple key stakeholders that take ownership and are committed.

SITUATION

Palawan represents Philippines' leading source of fisheries and seaweed —the latter being the country's top fishery export. As a premier nature tourism destination, it attracts over 1 million visitors annually. Located in the north of Palawan Island, Taytay grapples with increasing plastic pollution. Due to its rising population (3rd most populous in Palawan) and tourism arrivals, both highly reliant on SUPs, and the absence of recycling facilities, waste management capacity has become critically strained. Seaweed farmers use PET bottles, Styrofoam pieces and plastic strings to keep lines afloat. These are often lost as debris, and once degraded by saltwater and sunlight, cannot be recycled. Income disparities between tourism-rich islands and fishing-reliant islands create imbalance in municipal budget and resources, with inadequate provision of waste management capacity across coastal communities most in need.

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COMPLICATIONS

- **Marine debris accumulation:** Ocean currents especially in the monsoon bring large influx of marine plastic debris to the shores. Irregular waste collection and lack of infrastructure lead to accumulated waste with high risk of plastic leaking into nature.
- **Marine debris accumulation:** Ocean currents especially in the monsoon bring large influx of marine plastic debris to the shores. Irregular waste collection and lack of infrastructure lead to accumulated waste with high risk of plastic leaking into nature.
- **Remote location challenges enforcement:** Implementing and monitoring waste management regulations is challenging due to the remote nature of the islands. Local waste regulations like plastic bag bans exist but are not socialised nor well enforced.
- **Competing use of PET bottles:** Seaweed farmers buy used PET bottles to use as buoys or floaters, paying better prices and directly competing with waste aggregators. Bottles are often lost in the sea or degrade quickly, contributing to marine plastic pollution.
- **Leadership changes shift priorities:** Change of local government leadership shifts priorities and increases project uncertainty.



RESOLUTION

- **Three island barangays (Beton, Debangon and Paly) officially adopted Barangay Ecological Solid Waste Management Action Plans (BESWMAP),** in collaboration with the Municipal Environment and Natural Resources Office (MENRO), revitalising existing BESWM Councils that were not functioning optimally.
- **Establishment of collection and transportation systems:** Small collection points (local MRFs) are established at the barangay level, with waste segregation policies implemented and contributing waste data to authorities. Further development of transportation for recyclables is required with stronger connections to recycling value-chains.
- **Regular coastal cleanups** helped mitigate large influx of marine debris. A total of 1.74 metric tons of segregated waste was collected and transported to the mainland for proper processing. In addition, 59 coastal clean-up activities and 8 marine debris operations engaged over 3,200 participants and removed more than 5 metric tons of waste from coastal and marine environments.
- **Awareness and capacity building** for barangay and other officials, community representatives, teachers and students, via initiatives like Train of Trainers, aim to build local leadership and ownership in proper waste management practices.



IMPACT

- **Decreased waste generation:** Total household waste generation decreased significantly (between 40-62% across the 3 island barangays), with notable reductions in biodegradable waste, indicating improved composting and waste minimization practices at the household level.
- **Waste data for management decisions:** Beyond managing perpetual influx of marine debris, regular clean-ups with clear intention to provide data support waste monitoring for management decisions and incentivize local governments to earn recognition.
- **Improved waste separation and collection:** Since the start of household collection and MRF operations, a total of 1.74 metric tons of segregated waste has been collected and transported to the mainland for further processing and management. Next steps are to engage seaweed farmers to practise proper recovery of the used PET bottles which are used 1 - 2 years.
- **Community-inclusive waste management:** Strong government and community participation through public engagement and revitalisation of barangay waste management plans help ensure that plans are in action. With waste transportation piloted, future plans to expand collection to more barangays and develop municipal baling operation is expected to improve the economy of scale for waste transportation.



GOVERNANCE AND POLICY

BLOCKERS

- Insufficient allocated municipal budget and human resources for waste management.

ENABLERS

- Solid waste management action plans with official committees formed help to support awareness campaigns, promote household waste segregation and host clean-up drives and data collection.
- Strong support from municipal and local governance units (LGUs), including the Municipal Environment and Natural Resources Office, plays a critical role in developing localized regulations and budgets and encouraging community engagement.

The Taytay municipal government views plastics and waste management as a major issue across the board now, with work and budgets to be included in government projects.



CAPACITY, CAPABILITY & TECHNOLOGY

BLOCKERS

- Enforcing regulations in remote locations where government presence is low is challenging.
- Low level of waste management awareness is complicated by language, dialect and cultural differences.
- Lack of a recycling factory in Palawan increases costs, as recyclables need to be transported to Manila or other large cities.

ENABLERS

- Critical waste infrastructure (MRFs) provide space for safe collection, sorting and storage while key technology (baling machines) can help reduce plastic waste volume, enabling easier transportation to potential recyclers and saving costs.
- Simple equipment suited to the local context, such as bins and pushcarts, improve waste collection in islands.
- Designating and training waste workers in recording waste data enables wider collection and better waste monitoring.



FUNDING, FINANCING AND ACCESS TO MARKET

BLOCKERS

- Price competition between seaweed farmers and junkshop aggregators create disparities, as seaweed farmers use PET bottles and pay more than junkshops.
- High cost of transporting waste from islands to the mainland limit frequency, while low returns for selling recyclables create little incentives.

ENABLERS

- Connecting recyclables to local markets through MRFs can create livelihood opportunities.
- Linking local government and private operators to potential recycling partners increases plastic waste recovery.
- User fees administered through local ordinances help to pay for waste collection services.



CROSS-SECTORAL COLLABORATION & OTHER VALUE CHAIN ENABLING ACTIVITIES

BLOCKERS

- High demand for reusing SUPs in fisheries complicate the recycling value-chain.

ENABLERS

- Effective SWM prevents water pollution and the spread of diseases, building momentum in the public health sector.
- Collaboration with the Municipal Tourism Office improves project success.
- Continuous evaluation of economic factors informs project planning and execution.

Left: Provision of push carts to enhance waste collection in Barangay Debang; **Middle:** Small collection centre (MRF) on the island enables safe storage before forwarding on to mainland Taytay; **Right:** Waste separation & data collection after coastal clean-up in Barangay Debang
© WWF-Philippines



Waste Analysis and Characterization Study is done in collaboration with households on Beton Island in Taytay, Palawan
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03 ISLAND-BASED WASTE MANAGEMENT PLANS

SEMPORNA, MALAYSIA



ACTIVITIES UNDERTAKEN

-  REDUCE
-  RECYCLE
-  RESPONSIBLE DISPOSAL

INITIATOR

 WWF-MALAYSIA

YEAR

 2023 ONWARD



KEY TAKEAWAYS

- **Co-developing waste management plans** with communities, tourism operator, local authorities and key stakeholders foster local ownership, and helps establish more effective and reliable waste collection, segregation, and transportation systems, particularly on islands where waste processing infrastructure is limited.
- **Community-based organisations and local stakeholders play a vital role in implementing waste management activities on the islands**, including Mabul Eco Youth, SJ SEAS, Mabul Cleanliness Committee, Iskul Sama Dilaut Omdal, Community Action Group (CAG) in Larapan, Omdal and Mabul and Wanita Pulau Omdal. However, these efforts continue to face challenges such as limited financial resources, increasing transportation and fuel costs, weather-related disruptions, and varying levels of community participation.
- The long-term success of island waste management initiatives depends on sustained collaboration among communities, government agencies, tourism operators, and supporting organizations. Clear roles, coordinated planning, and resource sharing are essential to maintaining operations and addressing logistical constraints.
- Circular economy opportunities are emerging through recycling, upcycling, and community-led enterprises. However, these initiatives remain dependent on external buyers and mainland processing facilities, highlighting the need to strengthen local markets and create greater value from recyclable materials within the region.



SITUATION

Island communities in Semporna face increasing waste generation from households, tourism, and fisheries activities. Limited land availability, inadequate waste management infrastructure and high dependency on the mainland facilities for processing contribute to waste accumulation and marine pollution. To address these challenges, WWF-Malaysia has supported community-led waste management systems, including Rumah Kitar Semula (RKS) and plastic upcycling initiatives to improve waste recovery, encourage behavioural change and reduce plastic leakage into the marine environment.



COMPLICATIONS

- **Lack of recycling markets:** Recycling markets for island-based plastics are still small, inconsistent, and dependent on mainland buyers such as Malaysia Recycling Alliance (MAREA). Prices fluctuate, and transportation cost often outweighs revenue.
- **Inconsistent waste collection and segregation practices:** While regular clean-up activities help remove waste from the environment, they do not fully address the root causes of pollution. Key challenges such as vary community participation, limited collection services, weak enforcement, and improper waste handling by some tourism and business operators continue to contribute to waste leakage into the environment.
- **Underdeveloped local waste governance frameworks:** Policies on waste segregation, household responsibilities, tourism operator compliance, and waste transport at the island level remain largely informal, non-binding, and in some cases outdated. Implementation relies heavily on voluntary action, while mechanisms to translate field experience and research into formal policy are still limited.
- **Transportation challenges:** Transportation of recyclables remains a key operational challenge, constrained by weather conditions, fuel costs, limited boat availability, and the long distance to mainland. This limits the frequency of buyback and creates storage constraints at RKS.



RESOLUTION

- Development of Rumah Kitar Semula in three islands (Larapan, Omdal, Mabul) as centralized hubs for segregation and storage. In Mabul the RKS also function as an upcycling facility.
- Creation and Implementation of Waste Management Plans for each island, co-created with communities and tourism stakeholders.
- Introduction of plastic upcycling technology in Mabul to transform plastic waste into value-added products, creating local income streams.
- Strengthened partnerships with Malaysia Recycling Alliance (MAREA) and Malaysia Plastics Recyclers Association (MPRA) for buyback and tracking of recyclable throughput.
- Integration of monitoring systems for monthly data collection, zoning systems, and stakeholder reporting.



IMPACT

- Significant progress in reducing plastic leakage into Semporna's nearshore marine ecosystems has been achieved through the collection of 12,432.3 kg of plastic waste and recycling of 1,857.95 kg via community-led initiatives from January 2024 – May 2026.
- Community participation has steadily expanded since the initiative began, with the number of participating households increasing from 30 to 105 in Larapan and from 34 to 66 in Omdal by 2026.
- Plastic upcycling project have transformed plastic waste into marketable handicraft products, generating RM58,123.00 in sales revenue between April 2025 and May 2026.
- The socialisation of the Community Waste Management Plan with the Semporna District Council and Semporna District Office has strengthened institutional collaboration and support.



GOVERNANCE AND POLICY

BLOCKERS

- Absence of clear island-level waste policies or enforcement mechanisms.
- Slow integration of EPR principles into local contexts; producers' involvement still minimal on the ground.
- Fragmented roles between district offices, tourism authorities, and village leadership.

ENABLERS

- Growing recognition of community-led waste management initiatives by local authorities.
- Partnering with Semporna District Council and tourism operators helps address logistical issues.



CAPACITY, CAPABILITY & TECHNOLOGY

BLOCKERS

- Limited technical skills on machinery operation, maintenance, and quality control for upcycled products.
- Inconsistent data capturing due to limited digital tools and manpower.
- Weather-dependent transportation and logistics disrupt the consistent collection and transfer of waste.
- Reliance on basic infrastructure constrains the efficiency of field implementation and limits operational capacity on the islands.

ENABLERS

- Hands-on training from WWF-Malaysia and partners on segregation, data collection, and monitoring.
- Youth groups (Mabul Eco Youth), Waste Coordinators, and part-time collectors actively supporting field operations.
- Introduction of upcycling technology catalyses local interest and innovation.
- Development of clear Standard Operating Procedures and zoning systems (e.g., Larapan A/B/C) standardises operations.



FUNDING, FINANCING AND ACCESS TO MARKET

BLOCKERS

- Limited budget allocation for small islands under district waste management planning.
- Recycling markets still rely on external buyers; island-based volume too small to attract stable contracts.
- Community groups require consistent funding for fuel, equipment maintenance, and manpower allowances.
- Sustained implementation of activities remains highly dependent on external funding support.

ENABLERS

- Partnerships with MAREA and other recyclers provide multiple buyer options, improving access to markets and enabling better sales value for collected recyclable materials.
- Subgrant mechanisms to CBOs with strong local presence, such as Scuba Junkie SEAS, support operational continuity.
- Growing interest in CSR opportunities related to circular economy and plastic reduction.
- The upcycling machine in Mabul create an opportunity for long term sustainable financing.



CROSS-SECTORAL COLLABORATION & OTHER VALUE CHAIN ENABLING ACTIVITIES

BLOCKERS

- Different interest and priorities of tourism operators, communities, and agencies.
- Limited long-term commitments from some private operators after initial engagements.
- Data-sharing between stakeholders is irregular, making joint decision-making slower.
- Fragmented coordination and unclear roles and responsibilities across the plastic waste management value chain.

ENABLERS

- Partnership models with tourism operators (e.g., Scuba Junkie SEAS) strengthen coordination and support the sustainability of waste management efforts.
- Community organisations (Community Action Groups (CAG)) act as operational anchors.
- Multi-stakeholder focus group discussions and meetings promote transparency and trust.
- Engagement with research partners supports evidence-based planning.



04 SEPARATE, COLLECT, TRANSPORT: WASTE ON TOURISTIC ISLANDS

KOH TAO, KOH MOOK & KOH LIBONG, THAILAND



ACTIVITIES UNDERTAKEN

-  REFUSE
-  REDUCE
-  REUSE
-  RECYCLE
-  RESPONSIBLE DISPOSAL

INITIATOR

 WWF-THAILAND

YEAR

 2022 ONWARD

KEY TAKEAWAYS

- Basic infrastructure and systems for waste separation, collection and transportation is fundamental for meeting the demands of waste management in island contexts with significant waste quantities.
- Municipal budget allocation for waste management is typically insufficient. However, waste management financing could explore large influxes of visiting tourists as potential sources of financing.
- Reuse systems can be scaled with local leadership and economic viability, bolstered by cross-sectoral collaboration and support.

SITUATION

As a major island tourism destination in the gulf of Thailand with over 700,000 arrivals annually, Koh Tao's only landfill has become overwhelmed – compounded by an incinerator that has not functioned for over 10 years. Tourism-related activities (from hotels, restaurants, entertainment, dive/snorkel trips, etc.) account for 18% of total waste generated on the island, encompassing 439 to 525 tonnes of plastic waste per year. Facing the Andaman seas, the Koh Mook and Koh Libong in Trang Province are part of Thailand's western coastal region, home to the country's largest seagrass meadow and most of its surviving dugongs – a rare marine mammal drawing ecotourism crowds. Without systematic and regular collection, separation/sorting and safe transportation of waste, however, open burning and dumping have become widely observed.

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COMPLICATIONS

- **Lack of public waste management infrastructure and systems:** With only 2 junk shops on Koh Mook and 1 junk shop on Koh Libong, waste collection is not systematic and waste transportation similarly inconsistent. Despite some public bins, needs supersede available facilities, resulting in waste overflow in many high-traffic areas. Hard to reach areas and lack of suitable vehicles lead to irregular collection, contributing to accumulation of unattended waste.

- **Administration issues in municipal waste management:** Public budget allocation is based on residential population count and does not take into account high tourism arrivals and waste contribution in contexts such as Koh Tao's, while sub-district administration of islands like Koh Mook and Koh Libong complicate implementation of waste management strategies with infrequent transport and enforcement.
- **High reliance on single-use plastics (SUP):** Despite early efforts to reduce SUP (e.g using refillable water stations, providing reusable or biodegradable packaging and utensils), islands experience high reliance on SUP due to logistical constraints, tourist expectations, preference for convenience, and the lack of affordable alternatives.
- **Accumulated low-value plastics not being recycled:** Lower value plastics such as plastic bags, multilayer packaging and other mixed-material waste are not consistently segregated or connected to markets, resulting in substantial volumes of potential recyclables being disposed of as general waste.

RESOLUTION

- Projects in Koh Tao, Koh Mook and Koh Libong started with **baseline assessments of plastic consumption and waste management practices in the tourism and municipal sectors, engaging key stakeholders**, including local governments, communities and businesses, to help determine gaps in hard and soft infrastructure, including the waste value chain. [See [plastic waste flow baseline here](#).] This process facilitated important collective dialogues on 'plastic waste scenarios' and proposed solutions, which was key in strengthening engagement and commitment among stakeholders.
- **Provision of basic facilities and cross-sector collaboration support waste segregation, collection, and transportation** of recyclables to mainland recycling facilities. On Koh Tao, 4-wheel drive trucks are used to access steep hillsides and narrow lanes, supporting waste collection across the challenging island terrain, while informal waste workers contribute significantly through collecting and sorting recyclables.
- **Locally-driven action can improve segregation and reduce SUP consumption** in tourism-related activities and events. Through Trash Treasure Tao Community Enterprise on Koh Tao and through hospitality engagement on Koh Mook and Koh Libong, local leadership is key for replicating and scaling solutions in reducing avoidable plastic waste through refill and reuse initiatives, and maintaining segregation and collection for junk shops. Engagement with schools and students allows for education and increased public awareness as well as long-term behavioural change.

IMPACT

- **Community Enterprise Waste Bank:** Projected to be capable of receiving ~ 3 to 5 tonnes of recyclable materials per day, amounting to ~ 14% of the total waste stream in Koh Tao, a newly established waste bank to be run by the local community enterprise Trash Treasure Tao will also act as a learning centre on proper waste segregation for local residents and business operators. Four waste banks in schools and communities were also established in Trang to actively promote waste separation and collection strategies.
- **Reuse models:** After learning from EcoCrew who was contracted to supply the Koh Tao Spotlight 2025 event, Trash Treasure Tao started operations in time for Spotlight 2026 where reusable bowls, plates, and cups could be rented with a refundable deposit of 20 THB. In just 3 events across May - June 2026, around 11,931 pieces of SUP were avoided. In Trang, hospitality businesses including hotels and restaurants also piloted glass bottle reuse models for water refill.
- **Education while providing alternatives improves capacity for behaviour change:** Engagement with local CSOs, businesses, schools and communities support ongoing education and capacity-building on proper segregation to improve recycling rates, while the provision and uptake of SUP alternatives signals potential for scaling of reuse models. [Educational materials](#) were also developed for use by schools.



GOVERNANCE AND POLICY

BLOCKERS

- Sub-district administrations in Koh Mook and Koh Libong complicate enforcement, as they lack direct municipal governance.
- Jurisdictional challenges weaken policy enforcement in remote and decentralized areas.
- Delays exist in receiving government approval for initiatives like waste transport to mainland facilities.
- Low community engagement in waste segregation exists, particularly among households and migrant workers.

ENABLERS

- Some local authorities, such as in Koh Tao, are motivated to pursue greener island initiatives.
- Stakeholders, including communities and businesses, show interest in tackling waste management issues.



CAPACITY, CAPABILITY & TECHNOLOGY

BLOCKERS

- Lack of functioning incinerators and landfill management infrastructure in Koh Tao.
- The number of trash trucks for waste collection is insufficient across all islands.
- Local workers and sub-district administrators have limited technical capacity to implement advanced waste management practices.

ENABLERS

- Local stakeholders express interest in capacity-building initiatives and waste management training.
- Koh Tao's tourism sector and businesses, particularly dive shops, have adopted waste separation practices.



Mae Haad Pier is Koh Tao's primary logistics gateway, where passengers, goods, recyclables, and waste move between the island and mainland Thailand.

© WWF-Thailand



FUNDING, FINANCING AND ACCESS TO MARKET

BLOCKERS

- Budget allocations are based on underestimated official population counts (Koh Tao), limiting available funding.
- Dependence on transporting recyclables to larger islands increases costs due to a lack of local recycling infrastructure.

ENABLERS

- Junk shops in Koh Mook and Koh Libong provide basic recycling pathways.
- A proposed recovery bond system is recommended to incentivize more robust waste segregation and recycling.



CROSS-SECTORAL COLLABORATION & OTHER VALUE CHAIN ENABLING ACTIVITIES

BLOCKERS

- Despite awareness campaigns, tourists in Koh Tao exhibit behavioural resistance.
- The implementation of segregation bins is ineffective due to perceived inconvenience and inconsistent local collection and processing infrastructure.

ENABLERS

- Schools are identified as critical platforms for promoting environmental awareness and fostering long-term behavioural change.
- Clean-up efforts and net collection initiatives contribute to reducing waste leakage.



“ลด-แยก-เก็บ-เพื่อ-เต่า”
วันที่ ๑๑ มีนาคม ๒๕๖๔ ณ ลาน จปร. ตำบลเกาะเต่า

The MOU Signing Ceremony for the “Say No to Single-Use Plastic” initiative, in collaboration with Koh Tao Subdistrict Municipality and local businesses

© WWF-Thailand

05 INCREASING COLLECTION VIA CAMPAIGNS AND POLICIES

★ CON DAO & CU LAO CHAM, VIET NAM



ACTIVITIES UNDERTAKEN

- REDUCE
- RECYCLE
- RESPONSIBLE DISPOSAL

INITIATOR

WWF-VIET NAM

YEAR

2022-2024

★ KEY TAKEAWAYS

- **Waste treatment facilities must be developed** to cope with unmanaged dumping and burning, both extremely harmful to nearby communities. Improved segregation and collection are critical but infrastructure for waste recovery must be developed to ensure long-term viability.
- **Co-developing policies** with strategically targeted sectors is important for scaling ad-hoc waste reduction efforts.
- **Enforcement should be matched with community engagement** to drive awareness and uptake of incentives to reduce plastic use or increase circularity.

🔍 SITUATION

In Con Dao and Cu Lao Cham, two popular groups of islands in Viet Nam, PSC has introduced key interventions including waste separation and collection, community-led cleanups, engaging schools and businesses to improve waste management, and supporting local authorities in regulations such as single-use plastic bans. Highly dependent on fishing and tourism, commercial activities account for a large part of plastic waste -- over 50% for Con Dao which received more than 500,000 visitors in 2023. Local authorities, including local government and MPA officials, have organized regular cleanup projects to address waste management challenges. However, the absence of adequate waste management facilities has resulted in over reliance on open landfills that have reached overcapacity, posing significant environmental and health risks. Despite this, the initiative has significantly improved waste collection rates, strengthened local policies on plastic reduction and integrated sustainability practices within markets, tourism and community activities, fostering a long-term commitment to improved waste management.

! COMPLICATIONS

- **Limited stakeholder buy-in:** Due to initial limited stakeholder buy-in among local authorities, communities, businesses, implementing action plans took longer.
- **Limited market access:** Recycling markets are inaccessible due to high transport costs while local recycling value-chains and infrastructure remain underdeveloped, with limited connectivity between local MRFs (Cu Lao Cham) or junk shops (Con Dao) and broader recycling systems.
- **Uneven coordination capacity:** Focal points of action plans play a critical role but their coordination capacity vary, e.g. Cu Lao Cham MPA focal point's proactiveness made a strong difference in coordinating stakeholders but this is not across the board.

🧩 RESOLUTION

- Con Dao expanded public collection services, installed more trash bins, conducted regular cleanup drives on public and MPA beaches, while organising community events that encouraged segregation (e.g exchanging plastic for gifts) and training in composting to reduce waste volumes. [By engaging the public and stall vendors to replace SUPs](#) with organic vessels at the highly popular Hàng Dương Memorial, Con Dao reduced 85% in SUP use and ~40% in styrofoam bricks (used as flower holders in worship ceremonies).
- In Cu Lao Cham, a World Biosphere Reserve site, banning SUP bags, improving household waste segregation and establishing an MRF (2021) helped divert 50% of landfill-bound waste. Diverted organic waste was converted to 500KG of compost and 150L of bio-detergent, while 280kg of low-value plastics were sent to a recycling social enterprise to make school benches. Further, applying the [Plastic Free School](#) and Green Hospitality models in both island groups have proved successful pilots that can be replicated. [See Cu Lao Cham's case study here.](#)

🎯 IMPACT

Improvements to separation, collection and recycling in Con Dao:

- Expanded public collection services now aim to cover a larger area, including installing trash bins in rural areas to enhance waste collection accessibility.
- Improved waste segregation helps facilitate the recycling process. A decentralized composting facility now converts 3-5 tonnes of organic waste per month. By March 2025, 50 tonnes of organic waste had been composted and diverted from landfills.

Improvements to separation, collection and recycling in Cu Lao Cham:

- A high formal collection rate of 73.4% was achieved, and an additional 25.12% was captured through informal systems transporting waste to the mainland. Rate of uncollected waste was reduced to only 1.48%.
- Over 200 fishing vessels were equipped with waste collection tools.
- Plastic Free Schools, which reached 242 students, and focusing on SUP reduction helped push for upstream solutions and reduce pressure on downstream, but necessary, waste management and treatment.



GOVERNANCE AND POLICY



BLOCKERS

- Where there is no clear focal point in coordinating across various government units, this can lead to inaction or delays



ENABLERS

- Top-down engagement and approval by the governments in Con Dao and Cu Lao Cham are essential for mobilising regulatory resources.



CAPACITY, CAPABILITY & TECHNOLOGY



BLOCKERS

- Without established recycling infrastructure, islands face high costs and logistical challenges in safely transporting recyclable materials.



ENABLERS

- New collection routes, providing additional bins and replicable home composting programmes can improve quality of segregated waste and collection, which helps reduce costs.



FUNDING, FINANCING AND ACCESS TO MARKET



BLOCKERS

- Limited connectivity between local junk shops in Con Dao or Cu Lao Cham's new MRF and more mature recycling markets on the mainland hinders processing and sale of recyclables.



ENABLERS

- Public campaigns can increase capacity for reducing SUP (e.g. bags, foam bricks, bottles) use while strong involvement of women, youth and fisherfolk in hands-on segregation, collection and cleanups prove helpful in shifting social norms and behaviours.



CROSS-SECTORAL COLLABORATION & OTHER VALUE CHAIN ENABLING ACTIVITIES



BLOCKERS

- Lack of a focal point or clear leader in coordination



ENABLERS

- Concerted focus on baseline data for waste management has enabled robust impact assessment.
- Applying the Plastic Smart Cities framework consistently across various municipalities supports multistakeholder action plans for waste management

Waste generated in the Hang Duong cemetery
© WWF-Viet Nam



'Green Offering Basket' — a campaign to encourage visitors to opt for reusable materials in their choice of ritual offerings while paying their respects inside the cemetery
© WWF-Viet Nam



Composting facilities in Cu Lao Cham helped reduce organic waste, some of which (with fruit peels) were made into multi-purpose cleaning detergent.
© WWF-Viet Nam





CASE STUDIES FROM OTHER REFERENCES

In addition to WWF-led initiatives, this study includes case studies from external sources to provide a broader view of waste management efforts in small islands and coastal communities. These case studies highlight approaches implemented by local governments, private enterprises and community-led organizations. The selected examples—from Zanzibar (Tanzania), Arugam Bay (Sri Lanka), the Maldives, Mantanani Island (Malaysia) and Gizo (Solomon Islands)—offer diverse strategies that address plastic waste challenges through innovative practices in reduction, collection and recycling. Their inclusion helps identify common patterns, enablers and blockers across different contexts, providing valuable insights into scalable solutions beyond WWF's direct engagement.

06 ADVOCATING PLASTIC-FREE ISLANDS WITH ECOTOURISM

ZANZIBAR, TANZANIA

ACTIVITIES UNDERTAKEN

-  REFUSE
-  REDUCE
-  REUSE

INITIATOR

CHUMBE ISLAND CORAL PARK



YEAR

 1994 ONWARD



KEY TAKEAWAYS

- **Avoiding plastic waste is superior to downstream waste processing**, especially on island contexts where accumulated plastic pollution poses serious health threats to humans and habitats.
- To prevent one of the top sources of plastic waste generated on islands and for public health reasons, **safe drinking water on islands must be made mainstream** by investing in the provision and maintenance of public supply systems.
- **Regulatory policies on waste management should be holistic** and span all economic sectors rather than leaving gaps and loopholes.



SITUATION

Dar es Salaam and Zanzibar together lose an estimated \$28 million annually due to marine plastic pollution, two-thirds of which falls on the tourism sector.⁹⁰ Part of Zanzibar, Chumbe Island encompasses a private marine park and forest reserve recognized by the IUCN since 1995, which is developed, funded and managed by not-for-profit Chumbe Island Coral Park Ltd (CHICOP). Its resort operations run on a zero single-use plastic policy, sourcing building materials and food from local producers and farmers. In Zanzibar and Tanzania, potable water is mainly supplied by piped and pumping schemes and shallow wells, but Chumbe Island lacks natural freshwater sources. Drinking water is thus sourced from a borehole at the office building in Zanzibar and transported to the island in containers, while all other water needs are provided for by rainwater catchment. However, as climate change renders the rainy season less reliable, CHICOP has begun installing a desalination system to complement existing solutions.



COMPLICATIONS

- **Government Impediments and Policy Gaps:** The Zanzibar archipelago faces worsening plastic waste generation and pollution, particularly from single-use bottled water. While plastic bags have been banned since 2019, advocacy by the tourism sector for more plastic-free supply chains is hampered the lobby power of the plastics industry pushing to grow single-use plastics in the market.
- **Tourism Dependency:** Chumbe Island's reliance on tourism makes its operations vulnerable to visitor fluctuations. During COVID-19, this impacted CHICOP's funding capacity for its conservation and educational programmes. In other Zanzibar islands without zero SUP policies, while tourism is a vital source of livelihood, it also generates rising volumes of accumulated plastic waste.



RESOLUTION

- **With strict policies against single-use plastics (SUPs)**, CHICOP offers reusable alternatives to guests and staff. Organic waste is composted on-site and re-used in its composting toilets, reducing water consumption with a no-flush system, while all recyclables are transported to Zanzibar.
- **Advocacy, Education, Conservation:** Aiming to promote circularity and sustainability, CHICOP's profit supports conservation and educational programmes for tourists and local communities, including on avoiding plastic waste with traditional practices and reusable alternatives. CHICOP also advocates stronger government policies, including bans on SUPs beyond carrier bags and proper maintenance of public water supply systems to minimize the need for bottled water. During COVID-19, funding loss was bridged with funding from the German government (GIZ) and IUCN (through a Rapid Response Grant).⁹¹



IMPACT

- **By 2026**, CHICOP has hosted over **160,000 visitors to the island and engaged more than 13,000 school children and community members** in educational programmes about nature conservation and plastic pollution, showcasing how nature conservation and a zero-waste approach can be self-financed through sustainable tourism. Winning many international awards, CHICOP's influence has extended beyond its operations, lobbying for policy change in Zanzibar and offering a model for other small resort islands facing similar challenges of worsening pollution related to SUPs that come with importing processed food and the privatization of drinking water by PET bottlers.



© Chumbe Island Coral Park



GOVERNANCE AND POLICY

BLOCKERS

- Tanzania's 2019 SUP ban targets carrier bags only and does not cover other critical SUPs like bottled water.
- Limited policies and regulatory support for developing waste avoidance and management in Tanzania mainland and the isles

ENABLERS

- CHICOP's operations cover all of Chumbe Island, creating clear authority on environmental guidelines which are well followed by its visitors who tend to support ecotourism.
- Long-term collaboration between CHICOP and fisheries, forestry and education authorities supports alignment in environmental management.



CAPACITY, CAPABILITY & TECHNOLOGY

BLOCKERS

- High dependency on NGOs or other external actors to implement waste management strategies on Zanzibar's islands can be unsustainable.

ENABLERS

- Waste reduction, conservation and education are integrated and self-funded by eco-tourism, supporting the local economy and creating employment.
- CHICOP's integrated approach with solar energy, rainwater catchment, composting toilets and greywater filtration provides a scalable showcase on reducing plastic reliance, particularly for bottled water.

Chumbe Island's buildings have been designed with large roofs to maximize rainwater catchment channelled into natural sand and gravel filters, where clean water is stored in cisterns underneath each of the bungalows
© Chumbe Island Coral Park



FUNDING, FINANCING AND ACCESS TO MARKET

BLOCKERS

- High dependence on eco-tourism revenues, which may fluctuate due to external factors, can be limiting.
- Limited financing mechanisms to support transitions away from SUPs, render reusable or lower-waste alternatives less popular among tourism businesses due to higher operational costs.

ENABLERS

- Development funds, whether public (e.g European Union) or private (e.g. corporates or foundations) sources, can act as emergency funding to continue conservation management.³



CROSS-SECTORAL COLLABORATION & OTHER VALUE CHAIN ENABLING ACTIVITIES

BLOCKERS

- Continued gaps in public awareness raise costs in waste management practices.
- High availability of bottled water and other plastic-packaged products in nearby markets acts against a broader transition away from SUPs, especially in areas not influenced by eco-tourism principles.

ENABLERS

- Long-term trust and support garnered from key stakeholders, including authorities and also local communities, is vital for CHICOP's successful delivery.
- A strong integrated operation cutting across eco-tourism, conservation, community livelihoods and education prove to be a replicable case for island-wide waste reduction and management.



07 FINANCING PET & FISHING NETS RECYCLING

ARUGAM BAY, SRI LANKA

ACTIVITIES UNDERTAKEN

-  REDUCE
-  REUSE
-  RECYCLE
-  RESPONSIBLE DISPOSAL

INITIATOR

WASTE LESS ARUGAM BAY



YEAR

 2012 ONWARD



KEY TAKEAWAYS

- **Developing a viable business case for plastic recovery** can be difficult where transport costs exceed the market value of recovered materials.
- **Combining plastic recovery with value-added products**, alternative revenue streams and higher-value materials can improve the economic viability of recycling initiatives.
- **Tourism-dependent destinations generate large seasonal fluctuations in waste volumes**, requiring flexible collection systems and partnerships with local businesses.



SITUATION

- As a popular surf destination on the coast of Sri Lanka, Arugam Bay experiences disproportionately high volumes of tourism-related plastic waste relative to its resident population. Waste management services have struggled to keep pace with seasonal visitor numbers, and open burning and informal disposal practices have historically been common.
- Although PET recycling markets exist in Sri Lanka, recycling operations in remote coastal locations face significant challenges due to transportation costs and limited local processing infrastructure. Recovered materials often need to be transported long distances to recycling facilities, reducing financial returns.
- Discarded fishing gear is also prevalent along the coast, creating opportunities to recover higher-value materials while addressing marine pollution.

SCAN THIS TO
WATCH VIDEO



COMPLICATIONS

- **Seasonal tourism:** Waste generation increases significantly during peak tourism periods, creating operational pressures for collection and processing systems. Lower waste volumes during off-peak periods can make recovery operations less economically efficient.
- **Transportation costs:** The distance between sites of generation and recycling plants presents a significant challenge.
- **Behavior change challenges:** Waste segregation and recovery systems require sustained participation from households, businesses and visitors. Existing disposal practices can make adoption of new systems difficult.
- **Institutional constraints:** Local authorities often face resource and capacity limitations that affect the consistency and scale of waste management services.



RESOLUTION

- Plastic credits partially fund operations.
- Waste materials, especially PET lids, are used to create products for sale. PET lids, rather than whole bottles, offer higher margins and lower transportation costs, and nylon fishing net recycling confers higher market value.
- Water filtration systems reduce plastic bottle waste.
- Collaboration with hotels and restaurants for refill stations reduces waste generation.
- Baling machines were adopted to compress plastic waste for more efficient transportation to landfills, to prevent leakage into the marine environment.



IMPACT

- Plastic recovery and upcycling: More than 120,000 plastic bottles and 60,000 rice bags and spice sacks are recovered and upcycled annually into new products.
- Waste reduction and management efficiencies: Plastic waste has been reduced by providing water filtration, and baling machines reduced the burden of materials transportation.
- Livelihoods: More than 60 women have been engaged in upcycling and production activities, creating additional income opportunities in rural communities.
- Focus on tourism sector: Hotels, restaurants and tourism operators are engaged to focus specifically on waste generated by tourists.
- Diversifying material streams: Pilot initiatives have demonstrated the feasibility of recovering and recycling discarded fishing nets, creating opportunities to address ghost gear while generating additional value from recovered materials.

The data for this case study is dated to Feb 2025. For more information, please visit: lankaupcycles.com/wastelessarugambay or [@wastelessabay](https://www.instagram.com/wastelessabay) on Instagram.



GOVERNANCE AND POLICY

BLOCKERS

- Limited local government resources and operational capacity for waste management services.
- Challenges in enforcing and monitoring waste management regulations.

ENABLERS

- National waste management and plastic reduction policies provide an enabling framework for local action.
- Growing recognition among public, private and community stakeholders of tourism-related waste challenges.
- Emerging partnerships between local authorities, businesses and civil society organizations.



CAPACITY, CAPABILITY & TECHNOLOGY

BLOCKERS

- Logistical challenges associated with transporting recyclable materials to processing facilities.
- Limited local recycling and waste processing infrastructure capacity.
- Seasonal fluctuations in tourism-generated waste volumes create operational pressures.

ENABLERS

- Availability of baling and compacting technologies to improve storage and transportation efficiency.
- Development of localized recycling and reprocessing approaches for PET materials and fishing nets.
- Water filtration and refill systems help reduce dependence on bottled water consumption.
- Emerging systems for recovering fishing gear create opportunities to expand material recovery.



FUNDING, FINANCING AND ACCESS TO MARKET

BLOCKERS

- Low commodity values for many plastic materials reduce the financial viability of recycling.
- Transportation and operational costs may exceed the market value of recovered materials.
- Upfront investment requirements create barriers for scaling recycling operations.

ENABLERS

- Plastic credits provide supplementary financing for waste recovery activities.
- Value-added products created from recovered materials generate additional revenue streams.
- Higher-value materials such as fishing nets can improve recovery economics.
- Partnerships with downstream recyclers provide market access for collected materials.



CROSS-SECTORAL COLLABORATION & OTHER VALUE CHAIN ENABLING ACTIVITIES

BLOCKERS

- Limited participation from households and other local actors in waste segregation and collection practices.
- Continued reliance on disposable and packaged products within tourism supply chains.
- Challenges in coordinating waste reduction efforts across tourism, households, and local businesses.

ENABLERS

- Partnerships with hotels, restaurants, and tourism operators support waste reduction, collection and refill initiatives.
- Collaboration between recyclers, tourism businesses, community organizations and development partners enables coordinated action.
- Community engagement and awareness programs encourage participation in waste reduction and recovery efforts.



© Waste Less Arugam Bay



© Waste Less Arugam Bay

08 ISLANDS COORDINATE TO CENTRALIZE WASTE PROCESSING

MALDIVES

ACTIVITIES UNDERTAKEN

-  REDUCE
-  RESPONSIBLE DISPOSAL

INITIATOR

SONEVA NAMOONA



YEAR

 2019 ONWARD



KEY TAKEAWAYS

- **Collaborating across islands** can improve the viability of waste management systems by sharing infrastructure, logistics and technical resources that may be difficult for individual islands to sustain independently.
- **Locally owned solutions** that are adapted to island-specific contexts and governance structures are more likely to be sustained over the long term.



SITUATION

- Each island council in the Maldives operates independently under their Local Governance Authority. Councils make decisions autonomously for specific needs, but must operate within the constraints of budget allocations that are made at the national level.
- The Maldives has introduced national waste management policies and measure to reduce single-use plastics, but implementation and enforcement remain challenging across dispersed island communities.
- Influxes of tourists overstrain municipal waste management systems.
- Geographic dispersion, limited land availability and constrained access to waste processing technologies make advanced waste management systems difficult and costly to implement.



COMPLICATIONS

- **Insufficient budget allocation:** There is often a disconnect between the budgetary resources allocated by the central government and the on-the-ground needs for actual implementation. Budget is allocated based on permanent population size but does not account for fluctuating tourist populations and thus leaves waste management underfunded in areas that require more resources.
- **Implementation and enforcement challenges:** Monitoring and enforcing waste management requirements across geographically dispersed islands remains resource-intensive.



RESOLUTION

- Island waste management centres (“Eco Centros”) were established, providing locally managed waste segregation, storage and processing systems tailored to individual island contexts.
- Shared logistics and transportation systems were introduced to improve waste collection and movement between islands and processing facilities.
- Refillable water systems and household water filtration initiatives were introduced to reduce reliance on single-use plastic water bottles.
- Reusable products, including menstrual products and alternatives to disposable household items, were promoted through partnerships with local organizations.
- The Alun Balun Resale Market Initiative promotes second-hand consumption, reuse and upcycling.
- Home composting programmes reduce waste burdens.
- The program uses the “Namoona Model”, a stepwise framework that enables island councils to progressively improve waste management through locally owned actions, shared resources and peer learning.



IMPACT

- **Collaboration across communities:** Multiple islands across Baa and Noonu Atolls have participated in shared waste management initiatives and knowledge exchange activities.
- **Preventing waste:** 1,000,000 plastic water bottles have been averted by producing 500,000 litres of desalinated water. Eliminated single-use diapers in pilot areas.
- **Waste diversion:** More than 800+ tonnes of waste have been diverted from open burning or environmental leakage, with substantial volumes sent for recycling through coordinated collection and processing systems. Infrastructure across islands: Island waste management centers and Eco Centros have been established across partner islands, improving segregation, storage and processing capacity.
- **Holistic community engagement:** Environmental stewardship was taught alongside swimming lessons for 6,000 children and adults.
- **Reduced open burning:** The Namoona model provides a structured approach for island councils to improve waste management practices, with some islands successfully eliminating open burning.



GOVERNANCE AND POLICY

BLOCKERS

- Gaps in enforcement and compliance mechanisms for national waste management policies
- Insufficient budget allocation for waste management implementation across islands.
- Variations in local capacity and resources can lead to inconsistent implementation across decentralized island governance systems.

ENABLERS

- Strong engagement with island councils and community leaders has enabled locally appropriate implementation approaches.
- Existing national waste management policies provide a framework for island-level implementation.



CAPACITY, CAPABILITY & TECHNOLOGY

BLOCKERS

- Limited local technical support, suppliers, and infrastructure for advanced waste processing.
- Geographic dispersion and transportation challenges complicate waste collection and processing.
- Tourism-related population fluctuations place additional pressure on waste management systems.

ENABLERS

- Shared infrastructure, logistics and waste management services improve operational efficiency across participating islands.
- Existing household-level alternatives that support waste reduction, including composting and refill systems.



FUNDING, FINANCING AND ACCESS TO MARKET

BLOCKERS

- Initial costs associated with reusable products and household filtration systems may limit uptake.
- Budget allocations may not fully reflect fluctuating tourism-related waste volumes.
- Continued reliance on external funding sources for implementation support.

ENABLERS

- Availability of concessional financing mechanisms to support household adoption of reusable alternatives.
- Diverse funding sources, including donor and private-sector contributions, support implementation efforts.
- Shared waste management systems can improve operational efficiency and reduce per-island costs.



CROSS-SECTORAL COLLABORATION & OTHER VALUE CHAIN ENABLING ACTIVITIES

BLOCKERS

- Initial community resistance affected adoption of waste management practices.
- Inconsistent implementation of waste collection systems across islands.
- Limited availability of materials needed to scale reuse initiatives.

ENABLERS

- Collaboration among island councils, communities, NGOs, resorts and development partners has enabled resource sharing, knowledge exchange and coordinated implementation.
- Community-based organizational structures supporting local participation and implementation.
- Cross-island coordination and knowledge-sharing mechanisms supporting collective action.



© Soneva Namoon



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09 FUNDING WASTE TRANSPORT FROM ISLAND TO MAINLAND

MANTANANI ISLAND, MALAYSIA

ACTIVITIES UNDERTAKEN

-  REDUCE
-  RECYCLE
-  RESPONSIBLE DISPOSAL

INITIATOR

REEF CHECK MALAYSIA



YEAR

 2023 ONWARD



KEY TAKEAWAYS

- Small islands can establish functional waste segregation and collection systems when **supported by community participation, locally managed operations, and appropriate sustainable financing mechanisms.**
- Robust segregation and collection systems are needed to allow recyclable materials to be exported to larger recycling markets and **generate revenue to offset transportation costs.**
- **Initial subsidies may be necessary to facilitate waste transportation,** as well as consistent monitoring to cultivate widespread participation in waste segregation.



SITUATION

Mantanani Islands, with a population of about 1,000 Bajau Ubian Tribe community members spread across two villages, are located off the west coast of Sabah, Malaysia. Increasingly popular with divers and tourists, the islands went from hosting 50 day-trippers in 2011 to over 3,000 at its peak pre-COVID. Over 80% of the islanders derive part of their income from providing tourism services such as homestay, snorkelling and selling seafood or other local produce. Reef Check Malaysia operates conservation programmes across multiple locations throughout Malaysia, and on Mantanani Island which does not have waste concessionaires delegated for the handling of general waste, its efforts include improving waste management.



COMPLICATIONS

- **Limited municipal presence and financing:** Lacking in municipal governance presence, much of the housing is informal and untaxed. Residents do not pay “*cukai pintu*” (public amenities tax) that covers waste collection services usually provided by local councils in Malaysia – a service not available on the island like Mantanani and many remote islands in Sabah.
- **Low returns due to low volumes:** Recyclables must be transported to the mainland at a cost of RM 1,000 per trip (1-2 hours by speedboat), but sales of the recyclables do not generate enough value to offset this cost. The current collection and transportation system relies on external funding, while more resources are needed to incentivize community participation in waste segregation.



RESOLUTION

- **Community-based waste management** in Mantanani combines waste segregation, collection, transportation and community participation. The system was codesigned by Reef Check Malaysia with local communities, enabling waste segregation at household level with waste collected being transferred to Waste Storage Facilities (general trash) or the Mantanani Plastic Recycling Centre MPRC (recyclables). Sorted waste is then shipped to the mainland and onwards to a recycling facility or landfill.
- **Corporate sponsorships fund operations,** specifically for high transportation costs and community outreach programmes.
- Regular performance reviews of participating communities support compliance of waste segregation for house-to-house collection.



IMPACT

- Across various island/coastal locations where Reef Check Malaysia operates, over 45,000 kilograms of waste have been collected by 2024. In a one-year pilot waste management programme on Mantanani Island, regular collection and transportation to the mainland reduces the burden of plastic waste on Mantanani Island by 62 tonnes/year.
- 60-70% of the local community actively participated in waste segregation, collection and recycling initiatives, where outreach programmes and compliance checks helped improve waste segregation.
- Lessons from Mantanani have been applied to establish similar waste management systems in other Semporna islands, including Selakan Island (Tun Sekaran Marine Park) and one of the coastal villages in Semporna (Kampung Sri Aman). Efforts kickstarted in Laraman Island was transferred to a local NGO (see Case Study 3), demonstrating potential for local ownership and continuation.



GOVERNANCE AND POLICY

BLOCKERS

- Limited governance presence and budget allocation for waste management services on the island.
- Limited institutional mechanisms to sustain long-term compliance and participation in waste segregation practices.

ENABLERS

- Highly engaged village leaders and local governance structures provide key support for community participation.
- Community-based approaches strengthen local ownership of waste management activities over time.
- 'Tried and tested' models provide practical evidence that supports replication and potential policy adoption.



FUNDING, FINANCING AND ACCESS TO MARKET

BLOCKERS

- Informal and untaxed housing arrangements do not provide public revenue streams, weakening calls for municipal waste services.
- High transportation costs reduce the economic viability of recycling for small islands, while recycling revenues are often insufficient to offset operational and transport expenses.
- Continued dependence on external funding and sponsorships may affect long-term financial sustainability.

ENABLERS

- Employment opportunities linked to collection and recycling activities provide local economic benefits.
- Access to mainland recycling markets enables recovery pathways for segregated recyclable materials.



CAPACITY, CAPABILITY & TECHNOLOGY

BLOCKERS

- Low waste volumes limit the operational viability of localized recycling systems, while the lack of local recycling and processing capacity requires recyclable materials to be transported to mainland facilities.

ENABLERS

- Establishment of local sorting centres (Rumah Hijau) and trash bins systems supports household waste segregation and collection.
- Availability of solar-powered sorting, storage and small-scale recycling facilities (Mantanani Plastic Recycling Centre) supports waste collection.



CROSS-SECTORAL COLLABORATION & OTHER VALUE CHAIN ENABLING ACTIVITIES

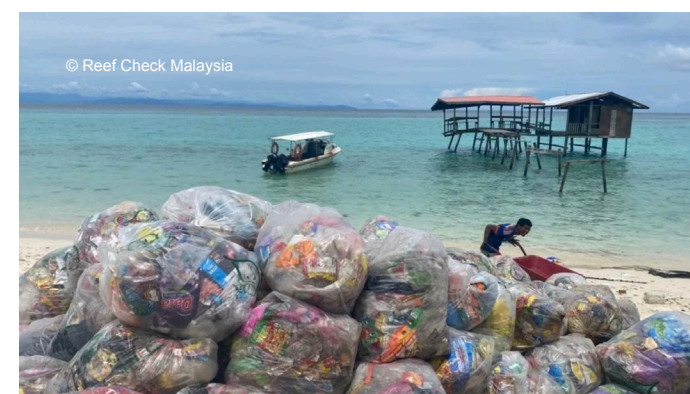
BLOCKERS

- Variability in participation and responsibility-sharing across households, businesses, and tourism actors.
- Sustaining long-term community participation requires continuous outreach and engagement efforts.
- Coordination challenges may arise across having multiple stakeholders in waste collection and transport systems.

ENABLERS

Collaboration among communities, NGOs, village leaders, and tourism stakeholders (i.e homestay operators) supports programme implementation.

Community outreach and education activities strengthen awareness and improves waste segregation.



10 WOMEN-LED WASTE INITIATIVE ADDRESSES INTERSECTIONALITY

SOLOMON ISLANDS

ACTIVITIES UNDERTAKEN

-  REDUCE
-  REUSE
-  RECYCLE

INITIATOR

PLASTICWISE GIZO



YEAR

 2017 ONWARD



KEY TAKEAWAYS

- **Intersectionality in environmental action:** PlasticWiseGizo demonstrates how women-led initiatives can address plastic pollution while creating opportunities for community participation, leadership and livelihood development.
- **Centering local communities:** This program emerged organically through existing cultural institutions such as churches. Their multidisciplinary programs demonstrate the centrality of having local leaders at the helm for building lasting programs. Partnerships with schools and religious institutions illustrate avenues for building waste management programs with local communities centered.



SITUATION

- **Waste management:** The Solomon Islands lacks a management system to capture and process plastic waste but receives a growing quantity of imported goods and packaging waste. Informal dumping of plastic waste creates habitats for pests and vectors of disease, which have been exacerbated. Any efforts to recover plastic materials for recycling struggle to access international recycling.
- **Social:** PlasticWise Gizo was founded by women across churches in Gizo who were concerned about increasing plastic pollution in their communities. Existing awareness programs have limited reach in rural areas, and awareness of pollution and waste management remains low (less than 50%) in many communities.
- Operating largely on a voluntary basis, the initiative has mobilized local women to lead awareness, clean-up, and recycling activities. While environmental awareness remains limited in many communities, existing social networks through churches and community groups provide a foundation for collective action and outreach.



COMPLICATIONS

- **Lack of policy enforcement:** There is limited government commitment, and financial resources prioritize large-scale economic projects rather than waste management.
- **Rising packaging waste burden:** Imported goods contribute a large amount of waste.
- **Logistical difficulties in access:** Facilities include shredding machines, but there is no international market for PET bottles, with high costs and logistical challenges transporting across islands, even domestically.
- **Low economic returns:** Community awareness and training activities depend largely on external project funding, making it difficult to maintain programs consistently between funding cycles.



RESOLUTION

- **PlasticWise Gizo** has begun developing market-based recycling activities, including a buyback program for aluminium cans. Collected cans are aggregated in Gizo and transported to Honiara for onward sale, and some are exported to international markets such as Thailand and South Korea, creating an emerging revenue stream to support waste recovery efforts.
- **Community-based training:** Women are trained in practical skills such as traditional weaving with recycled materials, and these recycled crafts are then sold locally to generate income and foster recognition.
- **Western Province Network for Sustainable Environment:** Local NGOs, community groups, churches and government stakeholders collaborate through environmental networks and awareness campaigns to strengthen collective action on waste management issues.
- **Schools, cultural events, and community outreach activities** are used to raise awareness of waste management and encourage community participation.



IMPACT

- **Aluminum can collection project:** A buyback programme was established for cans and plastic bottles. Aluminum cans have been exported to international off-takers, generating approximately US\$3,800 in revenue.
- **Engagement programmes:** The 3R's Initiative engagement programme has reached at least 150 members in the Western Province, including women's groups, members of the Provincial Government, church representatives and other community residents. Outreach programmes in schools focus on plastic waste and environmental stewardship.
- **Town cleanups:** Multiple cleanups have been hosted in Gizo town, generating engagement and awareness.
- **Plastic Wise** has begun exploring market opportunities for recovered materials and recycled products, representing a shift from awareness-focused activities toward market-linked waste recovery.



GOVERNANCE AND POLICY

BLOCKERS

- Policies and strategies related to waste management exist but implementation and enforcement remain limited.
- Limited government prioritization and financial allocation for waste management initiatives.
- Limited monitoring and coordination mechanisms affect consistency of policy implementation.

ENABLERS

- Existing policy frameworks provide an entry points for civil society organizations to advocate for improved waste management implementation.



CAPACITY, CAPABILITY & TECHNOLOGY

BLOCKERS

- Limited waste management infrastructure and operational capacity across islands.
- Existing processing technologies, such as shredding equipment, are underutilized due to limited market access for recovered materials.

ENABLERS

- Women-led training programs build community skills in recycling, reuse and environmental stewardship.
- Existing community networks through churches and local organizations support knowledge sharing and capacity building.

Gizo market in the Solomon Islands provides traditional coconut baskets for shoppers as part of its initiative to reduce plastic waste
© Jürgen Freund / WWF



FUNDING, FINANCING AND ACCESS TO MARKET

BLOCKERS

- Geographic dispersion and high transportation costs constrain access to recycling markets and reduce the profitability of material recovery activities.
- Limited financial returns from recyclable materials reduce the economic viability of recycling activities.
- Dependence on external organizational funding may affect long-term financial sustainability.

ENABLERS

- Emerging revenue from aluminium can recovery demonstrates potential for market-based recycling solutions.
- Growing efforts to identify local and external buyers for recyclable materials create opportunities to strengthen recycling value chains.



CROSS-SECTORAL COLLABORATION & OTHER VALUE CHAIN ENABLING ACTIVITIES

BLOCKERS

- Limited public awareness and uneven outreach efforts on waste management and plastic pollution issues, particularly in rural and remote communities.
- Reliance on volunteer participation can affect the continuity of outreach and communication activities.

ENABLERS

- Existing community and church leadership structures support local engagement and programme participation.
- Collaboration among NGOs, religious institutions, local governments, schools, and community groups strengthens environmental awareness and participation.
- Women-led community networks strengthen participation and locally grounded waste management approaches.



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CHAPTER 4

RECOMMENDATIONS



4.0

RECOMMENDATIONS

Scaling local solutions to fight plastic pollution is now more urgent than ever, as global plastic production continues rising. A key priority is preventing plastic waste at its source, reducing reliance on downstream interventions by embedding circular economy principles and regulatory measures that limit plastic production.

The insights from case studies in small islands and coastal communities can help inform government and other stakeholder efforts to address the distinct challenges these areas face, particularly in Marine Protected Areas (MPAs) and Other Effective area-based Conservation Measures (OECMs).

Building on the recurring patterns observed across the selected case studies, the following strategic focus areas are recommended for consideration to enhance waste management, emphasizing upstream prevention of waste generation as a critical first step.

GOVERNANCE AND POLICY

- 1 Implement policies preventing avoidable and harmful plastics, promote plastic reduction and strengthen waste management regulations.** Prevention must be at the forefront of policy interventions, with regulatory measures phasing out unnecessary single-use plastics, chemicals of concern, and non-recyclable materials.
- 2 Strengthen the plastic management value chain through economic instruments, including polluter pays principle, EPR schemes, tourism levies** and other mechanisms that enhances waste management systems and disincentivize SUP proliferation.
- 3 Enhance budget allocation to strengthen infrastructure and improve solid waste management service delivery.** Ensuring sustained funding supports both preventive and downstream interventions (including transport), particularly in remote island contexts.



CAPACITY, CAPABILITY, AND TECHNOLOGY

- 4 Facilitate knowledge platforms and capacity-building for local organizations or decision-makers for better systems design and technical operations.** Training on waste prevention, eco-friendly alternatives, and behavioural shifts is critical for long-term sustainability. Conduct feasibility assessments to determine viability of installing technological solutions such as bailers, MRFs, water filtration systems, etc
- 5 Empower local champions and community leaders to strengthen local ownership, promote waste prevention, and support the implementation of sustainable waste management solutions** through local governance structures and culturally appropriate approaches. Community-led initiatives must include reducing plastic consumption at its source, ensuring waste prevention is embedded in everyday practices.



FUNDING, FINANCING AND ACCESS TO MARKET

- 6 Provide financial incentives and other alternatives to lower the cost of transporting waste and recyclable plastics to offtake markets.** Economic support can help transition away from high-waste models toward circular, reusable alternatives.
- 7 Engage development funds and financing to boost circularity, particularly across small islands, MPAs, and OECMs.** Investments in waste reduction strategies, such as refill stations, alternative materials, and local production models, can reduce dependence on single-use plastics.
- 8 Boost collection volumes by partnering with waste generators, waste banks and other economic drivers in the waste pipeline.** Engaging tourism and fisheries industries in reducing and redesigning plastic use is a crucial preventive measure.



CROSS-SECTORAL COLLABORATION AND OTHER VALUE CHAIN ENABLING ACTIVITIES

- 9 Advance collaboration across networks of islands, MPAs and OECMs** through transboundary Coral Triangle plastic coordination efforts, focusing on regional solutions and scalable investments.
- 10 Ensure robust monitoring and analysis as well as sharing of waste data among stakeholders** (e.g. various levels of governments, MPA/OECM, tourism and health authorities, community groups and business associations etc) to avoid any duplication of efforts and strengthen the development of a collective evidence-based waste management plan at the regional level.



10 KEY INTERVENTIONS & RECOMMENDATIONS FOR THE CORAL TRIANGLE REGION

1



GOVERNANCE & POLICY

Implement policies preventing avoidable and harmful plastics; promote plastic reduction and strengthen waste regulations

LEVERS

 **Government**

Enact policies to ban or disincentivize the use of non-essential plastics in order to decrease plastic production and reduce waste. Enforce policies and sanctions for non-compliance comprehensively across jurisdictions.

 **Private Sector**

Adapt operations to source locally and comply with plastic bans by designing out the need for plastic or adopting alternative systems based on reuse.

 **NGOs**

Monitor implementation and advocate for stronger policies.

 **Communities**

Adopt behaviour changes to comply with new regulations and adhere to environmentally sustainable actions.

EXAMPLES

 **Single-Use Plastic Ban in Bali, Indonesia**

In 2018, Bali introduced a ban on plastic bags, Styrofoam and plastic straws, prohibiting their manufacturing, distribution, sale, or use.⁹² This is followed by a regulation effective April 2025, which similarly banned single-use plastic water bottles smaller than one litre on the island – a first of its kind in Indonesia.

 **Advocating for Single-Use Plastic Ban Policies in Zanzibar and Tanzania (See Case Study 6)**

As a board member of several tourism associations and in cooperation with local NGOs, Chumbe Island Coral Park (CHICOP) Ltd lobbies the national and regional governments to systematically ban the production and use of single-use plastics in food and other supply chains, as a precondition for the upstream prevention of waste generation and the development of a circular zero-waste ecosystem across the country, both in mainland Tanzania and the semi-autonomous Zanzibar islands. The not-for-profit company CHICOP has developed Chumbe Island into a marine and forest-protected area. It has effectively implemented a zero SUP policy since 1994, with comprehensive avoidance of SUP packaging, including PET bottles, in its supply chains for the island. In support of this policy, CHICOP emphasizes the key importance of ensuring sustainable and affordable access to safe public drinking water supply systems that prevent demand for plastic-packaged drinking water, not least also for the threats that plastics pose to human health. Rigorous bans of plastic bottles are feasible in Tanzania, as demonstrated by the availability of reusable glass bottles for soda and soft drinks in the market which need to be retained and promoted with regulatory policies by the government.

2



GOVERNANCE & POLICY

Strengthen the plastic management value chain through economic instruments including polluter pays principle, EPR schemes, tourism levies

LEVERS

 **Government**

Establish mechanisms based on the polluter pays principle, enforce mandatory Extended Producer Responsibility programmes, collect tariffs and allocate revenue specifically to waste management initiatives. In regions highly dependent on tourism, introduce tourism-based taxes, tariffs or other means of economic integration to create a sustainable revenue stream dedicated to improving waste management infrastructure. Read more about [“How to Implement EPR - A Briefing for Governments and Businesses”](#).

 **Private Sector**

Design out waste, implement Extended Producer Responsibility programmes and adhere to policies mandating waste prevention and management.

 **Tourism Sector**

Reduce waste generation, integrate and enforce waste tax into tourism services such as hotels and flights, and monitor the funds specifically earmarked for waste management.

EXAMPLES

 **Extended Producer Responsibility Law in practice in the Philippines**

The Philippines has enacted one of the most ambitious Extended Producer Responsibility laws globally. Companies with assets above a threshold are required to take responsibility for their plastic waste, calculated based on the weight of waste generated, and held accountable for an increasing percentage annually.⁹³

 **Tourism Tax in Bali, Indonesia**

In February 2024, the governor of Bali launched a tourism tax, equivalent to US\$10, to be paid by each international visitor upon entry. This fee is specifically earmarked for waste management and programmes in cultural preservation. Though the tax is not yet systematically implemented or monitored, the initiative pilots a model through which tourists can contribute to the management of their outsized waste generation.⁹⁴



GOVERNANCE & POLICY

Enhance budget allocation to strengthen infrastructure, and improve solid waste management service delivery

LEVERS



Government

Prioritize increased funding for waste management, focusing on building or upgrading hard and soft infrastructure, including recycling facilities and waste collection systems.



Private Sector

Engage in public-private partnerships to develop infrastructure & maintain its consistent use.



Communities

Support waste management services by improving household segregation and paying for service fees.



NGOs

Advocate for sustainable waste management enforcement and the availability of technical expertise.

EXAMPLES



Increasing National Budget for Waste Management (See Case Study 8)

The Government of the Maldives launched the Maldives Clean Environment Project (MCEP) in 2017, backed by the World Bank. A key focus was to increase the national budget for waste management and improve infrastructure for waste collection, transport, and disposal. The Maldives' government allocated additional funds specifically for solid waste management, focusing on improving waste disposal infrastructure, introducing recycling programmes, and addressing hazardous waste. Investments were also made to upgrade waste collection services, particularly in small, remote islands.



CAPACITY, CAPABILITY & TECHNOLOGY

Facilitate knowledge platforms and capacity building for local organizations or decision-makers for better systems design and technical operations

LEVERS



Government

Share lessons learned, apply best practices and streamline systems for engagement in waste management.



Private Sector

Invest in the development of technology fit for purpose for small islands and coastal communities. Collaborate across sectors to share and gain knowledge in waste management innovation.



NGOs

Facilitate platforms for capacity-building and provide training in integrated waste management technology.



Communities

Participate in capacity-building programmes to enhance local management practices. Allocate roles and responsibility to maintain integrated waste management technologies.

EXAMPLES



Knowledge-sharing platforms and capacity-building programmes help local governments, NGOs and businesses exchange best practices and implement effective waste management strategies, particularly in small islands and coastal communities. These knowledge platforms must emerge in parallel with integrating waste management technology to coordinate the adoption of new waste infrastructure.



Women-led Waste Initiative Addresses Intersectionality (See Case Study 10)

PlasticWise Gizo, Solomon Islands, is focused on bringing together local women and developing a community for stronger momentum towards plastic waste management. The organization was founded through a network of churches and regional leaders, showing how existing cultural institutions can be leveraged as central spaces for community organization and momentum towards environmental sustainability.



CAPACITY, CAPABILITY & TECHNOLOGY

Empower local champions and community leaders to strengthen local ownership, promote waste prevention, And support sustainable waste management solutions

LEVERS



Governments

Align waste reduction with local values and political priorities, and provide stable employment opportunities for local communities to operate integrated waste management systems.



Institutions such as schools and small-to-medium enterprises

Embed waste management in everyday practices and decision-making processes.



Communities

Incorporate plastic reduction, reuse, collection and recycling efforts into cultural and political activities. Participate in activities for curtailing waste leakage.



Cultural Leaders

Cultural leaders play a critically important role in leveraging religious/cultural platforms to advocate for and normalize sustainable practices.

EXAMPLES



Leveraging cultural events to promote plastic waste reduction

The War On Waste campaign leveraged local festivals, community gatherings and cultural events to promote plastic waste reduction. Environmental advocates collaborated with barangay (village) leaders to spread messages about reducing plastic use, reusing materials and responsibly disposing of waste.



Securing Buy-in from Local Leaders

In Derawan, the enthusiastic commitment of local leaders to collaborate in developing waste collection and sorting facilities has driven faster-than-expected progress in gathering permits and approvals for the development of waste processing facilities. This support was a prerequisite to the adoption of integrated waste management technologies. [See Case Study 1.](#)



FUNDING, FINANCING AND ACCESS TO MARKET

Provide financial incentives and other alternatives to lower the cost of transporting waste and recyclable plastic to offtake markets

LEVERS



Government

Develop and implement cost-lowering mechanisms, and policies that provide tax cuts or subsidies to reduce costs associated with reusing or recycling materials. Establish a regulatory framework that encourages waste management by making the recovery and recycling of materials more financially compelling than unsanctioned burning or dumping.



Private Sector

Operate a system of circularity according to Extended Producer Responsibility (EPR) laws, whereby producers and importers are responsible for designing out waste and orchestrating the reuse or recycling of the items they sell.



Waste Management Companies

Collaborate with local communities to implement waste management practices and collect recyclables effectively.



Recycling Processors and Aggregators

Partner with waste management companies to process recyclable materials.



Communities

Refuse the use of unnecessary single-use plastics. Segregate waste and work with collection efforts to ensure that recyclable materials are able to be reprocessed.

EXAMPLES



Island waste processing technologies in Sri Lanka (See Case Study 7)

Waste Less Arugam Bay, Sri Lanka, uses tools for upcycling materials and integrates infrastructure such as baling machines to make the transportation of recyclable materials more efficient and cost-effective. Integrating this technology enables access to markets and prevents waste leakage.



Fuel subsidy for waste management companies in remote islands, Maldives

With the Maldives Waste to Wealth Project under the Global Environment Facility (GEF) with UNDP, the government introduced a fuel subsidy programme for waste management companies operating in remote islands. By subsidizing gasoline costs for the transportation of waste, local recyclers were able to transport plastics and other recyclable materials more affordably. As a result, the volume of recyclables collected from these islands increased by 40% within two years.⁹⁵



FUNDING, FINANCING AND ACCESS TO MARKET

Engage development funds and financing to boost circularity, particularly across small islands, MPAs, and OECMs

LEVERS



Governments

Advocate for the receipt and transparent allocation of funds. Establish mechanisms, collect and allocate revenue to waste management initiatives. Share experiences and apply best practices.



NGOs/International Organizations

Catalyze investment in waste prevention, circularity and waste management systems through grants, technical assistance and capacity building. Support pilot projects, infrastructure development and the establishment of partnerships that can sustain and scale successful approaches



Communities

Participate in capacity-building programmes to receive funding and enhance local management practices.

EXAMPLES



Grants and corporate sponsorships kick started island-based waste management

In the Mantanani Islands, Malaysia, initial waste management activities were supported through grants and corporate sponsorships, demonstrating how external financing can help establish waste services and pilot new approaches in remote island contexts.



National public funding for waste management

The Government of the Maldives launched the Maldives Clean Environment Project (MCEP) in 2017, backed by the World Bank. A key focus of the project was to increase the national budget for waste management and improve infrastructure. The Maldives' government allocated additional funds specifically for solid waste management, focusing on improving waste disposal infrastructure for waste collection, transport and disposal; introducing recycling programmes; and addressing hazardous waste. Investments were made to upgrade waste collection services, particularly in small, remote islands.



FUNDING, FINANCING AND ACCESS TO MARKET

Boost collection volumes by engaging with waste generators, waste banks and other economic drivers in the waste pipeline

LEVERS



Governments

Provide regulations, incentives, and enforcement for waste collection from major waste generators.



Tourism Industry (Hotels, Resorts, Restaurants and Associations)

Reduce quantities of waste generation and adhere to robust systems of waste segregation and collection.



Fishing Industry

Safely dispose of unwanted fishing gear on land in controlled environments. Avoid destructive fishing practices at all costs, avoid the loss of fishing gear and participate in buy-back programmes for the recovery of discarded fishing gear.



Waste Management and Recycling Companies

Process the collected waste and provide a market for the materials.



Transport and Logistics Providers

Facilitate the movement of waste materials to recycling centres.

EXAMPLES



Partnerships with tourism industry

Stakeholders in Arugam Bay, Sri Lanka, partner with hotels, restaurants and tourism operators to address the high waste production caused by tourism and mitigate the effects of waste generation.



As a popular tourist destination, Boracay generates significant amounts of waste. Through partnerships with local hotels, the government enforced stricter waste segregation rules, which increased the collection and recycling volumes. This initiative helped to improve waste management while also supporting the island's sustainable tourism efforts. Seaweed farmers were incentivized to collaborate in the recovery of plastic debris, thus creating income streams and reducing the amount of plastic debris. Plastic debris has been repurposed into installations for seaweed growth, rather than requiring new plastic installations.

CROSS-SECTORAL COLLABORATION AND OTHER VALUE CHAIN ENABLING ACTIVITIES

Advance collaboration across networks of islands, MPAs and OECMs through transboundary Coral Triangle plastic coordination efforts, focusing on regional solutions and scalable investments

LEVERS

-  **International Organizations and Development Partners**
Entities like UNEP, UNDP and the Asian Development Bank (ADB) can provide critical technical support and funding for transboundary efforts.
-  **Coral Triangle Member Countries**
Coordinate policies, strengthen information sharing, support regional collaboration platforms that enable joint action, knowledge exchange and investment in solutions for island and coastal communities
-  **Governments**
Facilitate coordination among islands and coastal communities, enforce holistic regulations and allocate funding.
-  **Private Sector Investors**
Adhere to the polluter pays principle in all activities and operate based on circular economy systems. Support nascent enterprises dealing in recycling, waste management technologies and infrastructure development to scale throughout the region.
-  **Transport and Logistics Providers**
Collaborate regionally for the efficient movement of recyclables between islands and mainland recycling facilities.
-  **Local Communities and NGOs**
Advocate for community involvement, ensure transparency and drive grassroots participation in waste management efforts.

EXAMPLES

- ★ **Regional Cooperation for Combating Marine Debris**
The ASEAN Regional Action Plan for Combating Marine Debris in the ASEAN Member States (2021-2025) focuses on tackling marine plastic debris regionally. This initiative demonstrates how a multi-country, transboundary approach can be used to address the plastic pollution issue. While not specifically part of the Coral Triangle, this initiative highlights the importance of regional cooperation and could serve as a model for a dedicated Coral Triangle task force.
- ★ **Island waste management network**
Indonesia’s Thousand Islands (Kepulauan Seribu) have piloted a waste management programme that connects the islands’ waste systems with mainland Jakarta. The Caribbean Waste Management Network (CWMN) was established to bring together government agencies, NGOs and private sector actors across Caribbean nations. Such platforms facilitates the sharing of resources and expertise on waste management, allowing small islands to learn from each other’s experiences.⁹⁶

CROSS-SECTORAL COLLABORATION AND OTHER VALUE CHAIN ENABLING ACTIVITIES

Ensure robust monitoring and analysis as well as sharing of waste data among stakeholders data to avoid any duplication

LEVERS

-  **International Organizations**
Provide technical assistance and funding for capacity-building efforts.
-  **Governments**
Implement robust monitoring programmes, provide funding and ensure that comprehensive data collection informs waste management policy.
-  **Research Institutions and Universities**
Support data collection, analysis and reporting and provide expertise in environmental monitoring.
-  **NGOs and Local Environmental Groups**
Aid in community-level data collection and ensure local participation in monitoring activities.
-  **Technology Providers**
Offer drones, satellite imagery and other technologies for data collection and environmental monitoring.
-  **Tourism Sector**
Contribute data on waste generated by tourists and help monitori waste flow in tourist-heavy areas.

EXAMPLES

- ★ **Conducting Baseline Study for Waste Generation and Leakage to inform program design**
WWF-Thailand and WWF-Viet Nam first prioritized the collection of baseline data in order to establish their programmes’ scope and core focus. To develop improved systems, it is necessary to understand the volume and characteristics of waste generation and the paths of disposal in the status quo. Quantifying waste generation and marine debris is challenging, and comprehensive data collection requires regional collaboration, but doing so across multiple islands would allow local governments to better monitor plastic waste trends and adjust waste management strategies accordingly. This could involve establishing rigorous and uniform waste audit protocols and setting up a central database where different islands report their plastic waste data for collective analysis.

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2 TAYTAY, PHILIPPINES Connecting Fishing Communities to Waste Infrastructure	WWF Philippines wwf.org.ph	Chrisma Salao Director for Programs Julius Guirjen No Plastics in Nature Manager Geofrey Aludia Northeast Palawan Project Manager
3 SEMPORNA, MALAYSIA Island-based Waste Management Plans	WWF Malaysia wwf.org.my	Aarston Friend Dickson Senior Marine Conservation Officer, Interim Team Leader Zaidah Moh Darwis Marine Conservation Officer, Plastic Initiatives Mariam Syarmilah Musa Community Engagement and Education Officer
4 KOH TAO, KO MUK, & KO LIBONG, THAILAND Separate, Collect, Transport: Waste on Touristic Islands	WWF Thailand wwffoundation.org	Eknarin Ariyavongvivat Program Manager - Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) Tika Kimkue WWF Thailand Team Aim-on Piriyanpanish Field Coordinator - Koh Tao
5 CON DAO & CU LAO CHAM, VIET NAM Increasing Collection via Campaigns and Policies	WWF-Viet Nam vietnam.panda.org	Quynh Nguyen My Project Manager at WWF-Viet Nam Trang Nguyen Thu WWF-Viet Nam
6 ZANZIBAR, TANZANIA Advocating Plastic-Free Islands with Ecotourism	Chumbe Island Coral Park Ltd. chumbeisland.com	Sibylle Riedmiller Director of Chumbe Island Coral Park Ltd.
7 ARUGAM BAY, SRI LANKA Plastic Credits: Financing PET & Fishing Nets Recycling	Waste Less Arugam Bay lankaupcycles.com	Sulfi Waste Less Arugam Bay (WLAB) Team Henry Waste Less Arugam Bay (WLAB) Team
8 MALDIVES Islands Coordinate to Centralize Waste Processing	Soneva Namoon soneva.com/namoon/	Avinash Singh Director of Soneva Namoon Operations and Community Engagement, Maldives
9 MANTANANI ISLAND, MALAYSIA Funding Waste Transport from Island to Mainland	ReefCheck Malaysia reefcheck.org.my	Theresa Ng COO ReefCheck Malaysia Adzmin Fatta Snr Programme Manager, Reef Check Malaysia
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- 57 The inclusion of these case studies relied heavily on publicly available data and likely underrepresents routine municipal waste management activities. This should not suggest that other stakeholders are inactive, but instead are less visible due to limited reporting as there is limited publicly accessible information about programmes led by other stakeholders. This caveat represents a limitation of waste management assessments, as it becomes difficult to compare routine municipal management activities with the concerted efforts of NGOs that rely directly on public relations for funding.
- 58 Case Study 2 in Taytay, Philippines. In regions such as Palawan, solid waste management faces significant challenges due to weak regulatory enforcement. Although regulations exist, their implementation is often inconsistent, particularly in remote and less accessible areas. These regions struggle with limited infrastructure and the difficulty of monitoring compliance. Relaxed policies and logistical challenges further exacerbate the problem, allowing illegal dumping to persist in areas where accessible waste management systems are lacking.
- 59 In Case Study 6 in Chumbe Island, Tanzania, inconsistencies in government policies undermine these efforts, as the ban of plastic carrier bags has not been sufficient to stem the growing penetration of supply chains of food and drinks with plastic packaging, in particular PET bottles. As a result, marine plastic pollution accumulates. The lack of cohesive national regulations highlights the critical need for stronger and more consistent government action to support waste avoidance initiatives.
- 60 Appleby et al. 2024. Economic Research Institute for ASEAN and East Asia. [Breaking the Plastic Habit: Lessons from Behavioural Insight Applications in Indonesia, the Philippines, Thailand, and Viet Nam](#).
- 61 In Case Study 3 in Semporna, Malaysia, an emphasis on education and the co-development of waste management systems improves community engagement and participation in programming. Collaboration with the local council is promising for the development of enforcement mechanisms.
- 62 The team of Case Study 1 reported that in Derawan, only 0.5% of the municipal budget is allocated for waste services, which hampers the long-term development of sustainable waste solutions. Local stakeholders described the need for increases in the allocated budget.
- 63 A large number of NGOs have emerged to collect marine debris and beach litter. Although some effectively recover waste from a large catchment area, the systemic implications of these interventions are limited because they are fundamentally reactive rather than preventative. The majority of stakeholders expressed difficulties in keeping pace with marine debris on top of limited resources to meet even waste generated locally.
- 64 Case Study 8 in Maldives adopted a holistic approach to increasing community engagement by coupling waste management education with swimming lessons for over 6,000 children and adults. This cross-cutting activity served to improve community buy-in by simultaneously enhancing ocean safety by integrating education with environmental stewardship. The programme also empowered local women entrepreneurs through upcycling initiatives to transform waste into marketable products. This approach reduces waste and creates new economic opportunities for local communities.
- 65 Case Study 1 in Derawan Islands, Indonesia, and Case Study 8 in Maldives. Both cases highlighted shared challenges. Efforts often remain fragmented due to a lack of alignment across multiple government bodies. Government-driven solutions struggle with operational efficiency, especially in remote areas, due to their limited capacity to prioritize waste management. Additionally, complex processes such as obtaining land and permits for waste infrastructure development, can stall progress. While strong governance is essential for long-term sustainability, addressing these systemic barriers is critical to achieving more comprehensive and scalable waste management outcomes. Additionally, Case Study 9 in Mantanani Island, Malaysia, illustrates how loopholes can interrupt waste management. On this island, the local government is not engaged in waste management.
- 66 Case Study 1 in Derawan Islands, Indonesia, and Case Study 8 in Maldives. Derawan Islands, Indonesia, and the Maldives demonstrate how coherent governance models can streamline efforts to overcome challenges in waste management. In Derawan Islands, strong local leadership and a clear governance structure have enabled faster-than-expected progress. Similarly, in the Maldives, centralized governance has effectively aligned efforts across regions to drive sustainable solutions.
- 67 Case Study 7 in Arugam Bay, Sri Lanka, illustrates that it is difficult to sustain operations of the site in low periods when facilities cannot remain functional because of the high operating expenses in periods when low volumes of feedstock are available and low revenue is earned.
- 68 Case Study 9 in Mantanani Island, Malaysia, exemplifies the challenges of establishing advanced waste management infrastructure in remote island contexts. Due to its location and small size, the island lacks domestic waste processing facilities, requiring all collected waste to be transported to the mainland for treatment. This adds logistical complexities and costs, highlighting the barriers to sustainable waste management in isolated regions.
- 69 Case Study 8 in Maldives: A boat service collects waste from multiple islands, optimizing logistics and transportation costs, orchestrated by Soneva Fushi. Case Study 7 in Arugam Bay, Sri Lanka, integrated technologies enable waste management through baling machines which compress plastic waste, improving transportation efficiency for disposal. The integration of upcycling has also allowed the recovery of more than 60,000 rice bags and spice sacks and 120,000 plastic bottles annually.
- 70 Case Study 2 in the Philippines; regions like Palawan face challenges in communicating waste management practices because of linguistic differences, requiring the use of translators to engage the local population.
- 71 Appleby et al. 2024. Op. cit.
- 72 Case Study 8 in Maldives: Initiatives focused on capacity-building for local governance, training the leaders of atolls in the administrative skills needed for waste management.
- 73 Case Study 7 in Arugam Bay, Sri Lanka, described the challenges of developing and maintaining systems of waste reprocessing facilities.
- 74 Case Study 8 in Maldives collaborated with UNFPA and other local nonprofits to introduce reusable products, provide zero-interest loans to households for purchasing water filters, and educate the community. Case Study 1 in Derawan Islands, Indonesia, WWF Indonesia established three MRFs in Tanjung Redeb to process plastic waste locally, with further transport to Surabaya. These facilities support recycling efforts and demonstrate how localized infrastructure can address waste management in remote areas. Case Study 9 in Mantanani Island, Malaysia, ReefCheck Malaysia partnered with corporate sponsors to fund transportation costs and community outreach programmes. These initiatives aim to overcome logistical challenges and strengthen waste management efforts on the island.
- 75 Case Study 9 in Mantanani Island, Malaysia; high transportation costs to the mainland for recyclables challenge financial sustainability. The programme relies heavily on external funding and corporate partnerships to manage these costs, making long-term viability dependent on continued support. Case Study 7 in Arugam Bay, Sri Lanka; low financial returns from PET and glass recycling due to low market prices and high transportation costs led to a shift in focus toward nylon fishing nets, which offer better value and are more financially viable for the community.
- 76 GIZ. 2023. [Extended Producer Responsibility schemes in Small Island Developing States](#).
- 77 PREVENT Waste Alliance. [EPR Toolbox](#).
- 78 Case Study 3 in Mabul Island, Malaysia; WWF Malaysia collaborated with local tourism operators to integrate waste management practices into tourism operations. This partnership highlights the potential for aligning tourism activities with environmental sustainability efforts. Additionally, Case Study 6 in Chumbe Island, Tanzania, has enforced a single-use plastic ban since 1994, ensuring no single-use plastic enters the island. Its eco-lodge operates on an eco-tourism funding model, generating all income necessary for conservation and education while adhering to strict environmental guidelines for visitors.
- 79 Case Study 2 in Philippines: WWF Philippines observes disparities between tourism-rich islands and lower-income fishing communities, which limits the consistency of resource allocation and waste management systems.
- 80 Douglas. 2006. [Small island states and territories: sustainable development issues and strategies – challenges for changing islands in a changing world](#).
- 81 World Bank Group. 2020. [Revised Estimates of the Impact of Climate Change on Extreme Poverty by 2030](#).
- 82 For Case Study 2 in Palawan, Philippines, WWF Philippines connects waste reduction with local industries by engaging seaweed producers in plastic buyback programmes. This approach integrates waste management into the existing economic framework, promoting environmental sustainability alongside livelihood strengthening.
- 83 PREVENT Waste Alliance. N.D. [Ending Plastic Pollution in Small Islands and Remote Coastal Areas In Pursuit of Circularity](#).
- 84 In Case Study 8 in Maldives, over 800+ tonnes of waste have been recycled using a centralized system that improves cost-efficiency and coordination of waste collection by offering a boat service to collect waste from multiple islands, optimizing logistics and transportation costs.
- 85 The informal sector and waste pickers play a critical role in waste management, responsible for 59% of plastic recycled globally. (The Pew Charitable Trusts and Systemiq. Op. cit.) However, the informal sector is less prevalent in island contexts where the logistical barriers and transportation costs exceed returns on materials recovery. For avoiding plastic waste generation, creating markets for other waste and offering economic returns on materials in new contexts, a variety of implications must be considered, including competing forces while a nascent informal sector begins to emerge. In Case Study 2, WWF Philippines' efforts to integrate fishermen and seaweed farmers into a systemic recycling market revealed that informal aggregators and seaweed farmers emerged as competitors, disrupting the planned offtake system. This challenge highlights the complexities of establishing sustainable recycling markets in communities where informal systems may undercut formal initiatives.
- 86 Case Study 2 in Palawan, Philippines; waste collection systems linked to markets intentionally provide job opportunities for women, helping to integrate waste management into the local economy. Connecting waste management to local markets through MRFs and creating livelihood opportunities for women. Case Study 10 in the Solomon Islands is led by female community members, and specifically trains women in income-generating crafts in order to empower them financially and socially.
- 87 Case Study 6 in Chumbe Island, Tanzania. Chumbe Island Coral Park's reliance on tourism for funding revealed the

ENDNOTES

vulnerabilities of depending on tourism income alone, which stalled during the Covid-19 pandemic. This highlights the challenges of sustaining initiatives without diversified funding sources when tourism-based revenue is disrupted.

88 This was a recurring observation across case studies, few of which had quantitative data to present. Even when available, the meaning and uniformity of data on waste generation and collection was uncertain, such that it could not be assumed uniform or compared across contexts.

89 COBSEA. 2022. Op. cit.

90 Alistair McIlgorm and Jian Xie. 2023. The Costs of Environmental Degradation from Plastic Pollution in Selected Coastal Areas in the United Republic of Tanzania. Washington, DC: The World Bank.

91 Salim, Salim, and Chumbe Island Coral Park Ltd (CHICOP). “Protecting Chumbe Island Nature Reserve from increased poaching threats due to COVID-19 pandemic, through re-assignment of local rangers, skills development of youth fishers, and sustaining its conservation activities.” Panorama: Solutions for a Healthy Planet, 30 09 2025, <https://panorama.solutions/en/solution/protecting-chumbe-island-nature-reserve-increased-poaching-threats-due-covid-19-pandemic>

92 2018. Mayor’s Regulation Number 97 of 2018 on Limiting Single-Use Plastic Waste

93 PCX Solutions. 2024. Extended Producer Responsibility in the Philippines: Early Learnings and Insights for Emerging Markets Battling Plastic Pollution.

94 The Jakarta Post. 2023. Bali to use tourist tax for waste management, cultural preservation.

95 World Bank. 2022. Maldives Is Turning Waste to Wealth, Energizing Youth, to Safeguard its Future.

96 UNEP. 2018. Caribbean Waste Management Regional Action Plan.





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