PROVEN PRACTICE GUIDE

to Improve Waste Management and Address Plastic Pollution in Southeast Asia

EPA BATTELLE UN environment programme COBSEA COORDINATING BODY ON THE SEAS OF EAST ASIA

Credit: PZC for Clean Cities, Blue Ocean

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CONTENTS

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ACRONYMS

3R	Reduce, Reuse, Recycle
4P	Public-Private-People Partnership
ASEAN	Association of Southeast Asian Nations
ASPPIRe	Advancing Solutions to Plastic Pollution through Inclusive Recycling
BBMP	Bengaluru Municipality
BMZ	Government of Germany's Ministry of Economic Cooperation and Development
CBPR	Community-Based Participatory Research
CCBO	Clean Cities, Blue Ocean
CECR	Center for Environment and Community Research
COBSEA	Coordinating Body on the Seas of East Asia
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DOI	Diffusion of Innovation Theory
DONRE	Department of Natural Resources (Vietnam)
EU	European Union
GDPR	General Data Protection Regulation
GIZ	The German Agency for International Cooperation
GPML	Global Partnership on Marine Litter
IGES	Institute for Good Environmental Strategies
IRB	Institutional Review Board
KASA	Ministry of Environment and Water (Malaysia)
MCD	Centre for Marinelife Conservation and Community Development
MIMA	Maritime Institute of Malaysia
MONRE	Ministry of Natural Resources and the Environment (Vietnam)
MOU	Memorandum of Understanding
MRF	Materials Recovery Facility
MUIC	Mahidol University International College
NAP	National Action Plan
NGO	Non-governmental Organization
OECD	Organization for Economic Cooperation and Development
PPE	Personal Protective Equipment
PVC	Polyvinyl Chloride
SBC	Social and Behavior Change
SCIL	Solid Waste Index for Local Governments
SCT	Social Cognitive Theory
SMART	Specific, Measurable, Attainable, Relevant, Time-based
SPLASH	Strategic Plastic Litter Abatement in Song Hong
SWM	Solid Waste Management
TESDA	Technical Education and Skills Development Authority
ToT	Training of Trainers
UN	United Nations
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNEP	United Nations Environment Programme
URENCO	Urban Environment Company
US	United States
USAID	United States Agency for International Development
US EPA	United States Environmental Protection Agency
WIEGO	Women in Informal Employment: Globalizing and Organizing
WMS	Waste Management System
WWF	World Wide Fund for Nature Vietnam

Credit: NOAA

INTRODUCTION

Credit: Guilia Erika Soria / Clean Cities, Blue Ocean

Definitions

Plastic Pollution	Accumulation of plastic waste that adversely affects wildlife, humans, and the environment; originates from land-based sources and may end up in the ocean
Ocean Plastic Pollution	Plastic waste in waterways from land-based sources that accumulates in the ocean; includes plastic waste from shipping and fishing industries

The terms 'plastic pollution,' 'marine debris,' and 'marine litter' are often used interchangeably. Because this guide focuses on plastic pollution more broadly, the term 'plastic pollution' is used throughout. The term 'ocean plastic pollution' is used when referring to plastic pollution in the marine environment.

Credit Martine Perret / UN

INTRODUCTION

PURPOSE OF THIS GUIDE

The purpose of this guide is to share "proven practices"—good practices with demonstrated effectiveness—that facilitate achievement of improved waste collection, waste management, and reduction of plastic pollution in Southeast Asia. The guide aims to holistically examine aspects of plastic pollution mitigation projects across a spectrum of implementation areas, which are detailed in the proven practice modules and include: **stakeholder engagement**, **capacity building, implementation**, **social and behavior change**, **data and evaluation**, and **financing**. Many of the proven practices explained in this guide are applicable to other contexts and geographies; however, each project location will require a customized approach based on various social, political, cultural, and economic factors.

The proven practices documented in this guide were collected from interviews with a subset of organizations and programs working to mitigate plastic pollution in Southeast Asia, ranging from multi-national environmental conservation or advocacy groups to local non-governmental organizations (NGOs). (For more information on the methods used to collect and analyze interview data, see ***Appendix B***.) The practices included in this guide are considered essential by the majority of interviewees and have been proven to positively contribute to the projects highlighted in

For background context on the issue of plastic pollution in Southeast Asia and beyond, see ***Appendix A***.

Organizations and programs that were interviewed to develop the guide and the locations where they work	
Alliance to End Plastic Waste	International
Centre for Marinelife Conservation and Community Development (MCD)	Vietnam
Clean Cities, Blue Ocean (CCBO)	International
Closing the Loop	International
German Agency for International Cooperation (GIZ)	International
Hasiru Dala	India
Ocean Conservancy	International
Plastic Collective	International
Precious Plastic Bangkok	Thailand
SEA circular	International
World Wide Fund for Nature (WWF) Vietnam	Vietnam

this document. This guide will be useful for waste practitioners at the city or provincial level, city managers, policy advocates, project implementors, and more. Readers of this guide will better understand the landscape of plastic pollution mitigation projects in Southeast Asia, including challenges that may arise, opportunities that can be leveraged, and suggestions for how to navigate these challenges and opportunities (i.e., the proven practices). Case studies are provided to demonstrate how organizations used the proven practices. This guide also serves as a starting place for those looking to learn more about plastic pollution mitigation, providing links to additional resources and suggestions for project-related activities. Additionally, this guide provides details about the various types of stakeholders involved in and critical to the successful planning and implementation of the proven practices presented. As exemplified throughout the guide, thoughtful stakeholder identification and engagement are central to addressing ocean plastic pollution as well as plastic pollution and waste management more generally. As such, in ***Appendix D***, we analyze the data gathered through key informant interviews to categorize and map stakeholder organizations that led activities related to the proven practice module topics in plastic pollution prevention activities in the Southeast Asia region.

HOW TO USE THIS GUIDE

This guide is divided into six proven practice modules. Information on how these modules were developed can be found ***here***. Each module opens with context about the topic overall, which provides definitions and examples of how each topic can be applied to solutions for ocean plastic pollution. For ease of use, the proven practices have been organized under various topical sub-headings so readers can more easily navigate to topics that are most of interest. The sub-headings identify challenges or opportunities gleaned during the interviews. After providing more context on the specific challenges and opportunities, proven practices are presented to describe how the challenge can be addressed and how the opportunities can be put into practice. A case study follows, detailing how the proven practices were implemented by one of our interviewees. This is where videos, images, and other resources from the organization are provided so the reader can seek out more information, if desired. Lastly, call-out boxes throughout the guide provide links to tools and resources from credible organizations that can help with implementing the proven practices.

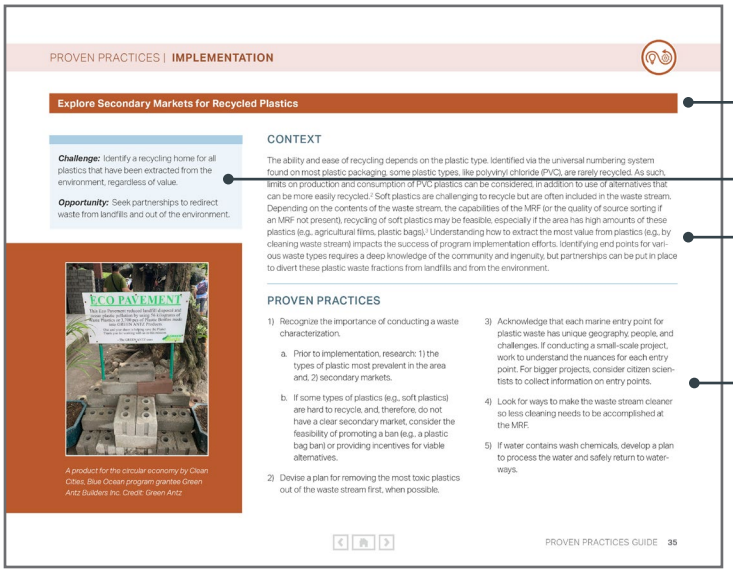
Several organizations are profiled more than once in the case studies and some of the content presented in the modules may overlap with other modules. Capacity building, for instance, is applicable in all modules – strengthening skills, knowledge, and processes is beneficial regardless of where an organization falls in the plastics value chain. The overlapping nature of many of the proven practices results in repetition in some areas, but module-specific context has been added in these instances to tailor the proven practice to the module in which it resides. Limitations of this guide can be found in ***Appendix C***.

Proven practice module title

Introduction and context of the proven practice module content

Quick links to case studies providing details on projects that demonstrate the proven practices in action

Navigation buttons



Topical sub-heading

Common challenges and opportunities identified across projects

Additional context on the challenge and opportunities

Proven practices identified by interviewees to overcome challenges and leverage opportunities

Credit : NOAA

US EPA AND COBSEA

Given the growing concern over plastic pollution, particularly in the Southeast Asia region, US EPA and COBSEA are collaborating to build capacity to mitigate land-based sources of ocean plastic pollution. US EPA is working to address plastic pollution globally through international policy engagement and bilateral and multilateral activities to reduce and prevent land-based sources of ocean plastic pollution. This includes promoting multi-stakeholder approaches and capacity building efforts centered on addressing plastic pollution and improving solid waste management (SWM).

The Coordinating Body on the Seas of East Asia (COBSEA) is a regional intergovernmental mechanism and one of 18 Regional Seas programs. It is the decision-making body for the East Asian Seas Action Plan, bringing together nine countries – Cambodia, China, Indonesia, Republic of Korea, Malaysia, the Philippines, Thailand, Singapore and Vietnam – in protection and sustainable development of the marine and coastal environment.[1] COBSEA focuses on marine pollution, ecosystem-based marine and coastal planning and management, and ocean governance.

The COBSEA Secretariat is hosted by Thailand in Bangkok and administered by the United Nations Environment Programme's (UNEP) Ecosystems Division. Activities on marine litter are guided by the COBSEA Regional Action Plan on Marine Litter adopted by countries in 2019. With funding from US EPA and in coordination with Battelle and regional partners, COBSEA implemented good practice pilots in the Mersing Islands in Malaysia and in Untia in Indonesia. All proven practices, including this guidance document, will be shared with countries and stakeholders in the region through the East Asian Seas Regional Node of the Global Partnership on Marine Litter (GPML).

[1] *The United Nations (UN) defines Southeast Asian countries as: Brunei, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, the Philippines, Singapore, Thailand, Timor Leste, and Vietnam. For the purposes of this guide, we have focused primarily on COBSEA countries and not Southeast Asian countries as defined by the UN.*

COBSEA's Pilot Projects in the Mersing Islands, Malaysia and Untia in Indonesia

COBSEA conducted pilot projects in the Mersing Islands in Malaysia and in the fishing village of Untia in Indonesia to implement good practices to prevent plastic pollution. Explore the content on this page to learn more about COBSEA's pilot projects.

In **Untia, Makassar, Indonesia**, women were trained to convert low-value plastics into consumer goods for resale. Partnering with WWF Indonesia and social enterprise Rappo, women were provided with an income-generating opportunity using plastic that would otherwise be difficult to recycle.

Additionally, COBSEA and WWF Indonesia supported an NGO, YPN, to implement segregated collection of recyclables and food waste in an Indonesian fishing village. As in many Indonesian cities, this town had a materials recovery facility (MRF) and waste banks, but they were unused. This project enhanced the productivity of the MRF, doubling the processed amount from one to two tons of plastic recyclables per month, by establishing waste banks and providing the necessary education and infrastructure to feed into the MRF.

https://youtu.be/7sHEdsCYAYw

https://youtu.be/hlVCm7HFi9Q

In the **Mersing Islands**, COBSEA partnered with Reef Check Malaysia to implement integrated waste management. This involved education on reducing plastic consumption and training on waste segregation. Investments in disposal and sorting infrastructure, including purchase of a plastic compactor, enable transport of recycled plastic back to the mainland.

https://youtu.be/eFxHcKVAhqU

PROVEN PRACTICE MODULES

This guide is divided into six proven practice modules:

- stakeholder engagement,
- social and behavior change,
- capacity building,
- data and evaluation, and
- implementation,
- financing.

In every interview, the research team asked organizations what aspects of their projects they considered to be proven practice, meaning practices that were replicable, socio-economically inclusive, market viable, and sustainable over time. Additionally, the team used good practice criteria developed by COBSEA to guide the discussions with organizations (see ***Appendix B***). The team noted commonalities across the proven practices mentioned and categorized them into the six proven practice modules. To provide more context and framing of the proven practices, the team sub-categorized the practices by challenges and opportunities that the proven practices aim to address or leverage. These challenges and opportunities were derived from the interviewees and through desk research. Following the proven practices, case studies demonstrate the practices in action. Lastly, key resources are presented for further exploration.

A consolidated list of proven practices for all modules can be found in ***Appendix E***.

Credit: Giulia Erika Soria / Clean Cities, Blue Ocean

PROVEN PRACTICES

STAKEHOLDER ENGAGEMENT

Credit: Giulia Erika Soria / Clean Cities, Blue Ocean

INTRODUCTION

Credit: PZC for Clean Cities, Blue Ocean

Identifying and engaging key stakeholders is an important aspect for environmental decision-making, with the UN citing such engagement as crucial to achieving its Sustainable Development Goals.[1] For plastic pollution specifically, solutions that integrate a circular economy approach require increased collaboration between individuals and groups along the entire plastic value chain, including producers, consumers, waste management entities, waste pickers, and regulators.[2] At a global level, several platforms have been created for stakeholder engagement that have brought together national government entities, NGOs, and the private sector. The Global Digital Platform of the GPML brings together data, resources, and stakeholders across existing platforms, as mandated by the United Nations Environment Assembly. The East Asian Seas Regional Node of the GPML provides regional access to resources and data from the region, linked to the Global Digital Platform. However, significant challenges for collaboration still exist at the project and policy implementation level.

Stakeholder engagement is the process of involving individuals or groups who are affected by a project, those who have an interest or "stake," or those who can influence outcomes.[3] Not all stakeholder engagement practices are the same and the approach usually depends on the goals of policymakers or implementors. For example, an implementor may choose to "collaborate" with stakeholders when the goal is to reach consensus and be inclusive in the decision-making process. However, this requires time and resources that may not be mutually available. Other forms of engagement, like providing information on project details, require minimal effort, but allow stakeholders to understand the project and make their own conclusions.[4] The person or group engaging stakeholders should understand the capabilities of stakeholders, their knowledge, attitudes, and practices, and should be clear about the desired role for each stakeholder.

Jump to Case Study ▼

CASE STUDY
Closing the Loop

Addressing plastic pollution presents unique challenges for identifying and engaging stakeholders. In Association of Southeast Asian Nations (ASEAN) countries, some waste management activities are carried out by the private or public sector, while in other contexts, SWM is handled exclusively by waste pickers. Additionally, the lack of data on sources of plastic leakage makes it difficult for project implementors to know how to prioritize stakeholder engagement.[5]

CASE STUDY
The German Agency for International Cooperation

CASE STUDY
Ocean Conservancy

Identify and Engage with the Appropriate Range of Stakeholders

Challenge: There may be a lack of awareness of all relevant stakeholders, and among these stakeholders, a lack of coordination and communication.

Opportunity: Encourage intersectoral collaboration among stakeholders.

Credit: Giulia Erika Soria / Clean Cities Blue Ocean

CONTEXT

Solutions for integrated waste management require identifying and appropriately engaging with stakeholders across the value chain, including waste pickers, public sector, private sector, civil society organizations, and policymakers. However, there is often a lack of clarity on roles and responsibilities across levels of government and across diverse sectors. For example, within government, those who regulate the environment may not regulate things such as trade and manufacturing. There may also be fragmented coordination between business activity along the value chain.[6] Stakeholder mapping is a useful tool that can help project implementors identify and analyze relevant stakeholders throughout the project lifecycle. For additional information about stakeholder mapping and an illustrative stakeholder analysis conducted based on the data gleaned from informant interviews, see ***Appendix D***.

For waste management solutions to be effective, there should be a clear delineation of roles for regulators across governance levels, designated groups to engage with businesses on environmentally friendly practices, and engagement with non-traditional stakeholders—such as schools and unions—to encourage improved waste practices at the household and community levels. To address plastic pollution, there should be planned and purposeful engagement with diverse stakeholders.[7]

PROVEN PRACTICES

1) Conduct ***stakeholder mapping*** or another form of stakeholder analysis to understand which players should be invited to the table, as well as when and how to appropriately engage them during the project.
2) If there are knowledge gaps, conduct training on how to do stakeholder mapping or other forms of stakeholder analysis, fundamentals of stakeholder engagement, conflict resolution, and consensus-based decision-making for more meaningful engagement.
3) Engage stakeholders early and throughout the project.
4) Identify and leverage partners who have established and trusted relationships with the community.
5) Gather stakeholders from across governance levels and sectors (e.g., waste management responsibilities may be spread across ministries) and consider establishing interagency partnerships or councils for long-term collaboration.
6) Ensure diversity, equity, and social inclusion in stakeholder engagement efforts (e.g., engage the informal sector, indigenous groups, and women) and allow for representation from all groups affected by changes to waste management policies and practices.
7) Ensure the project plan allows sufficient time and resources to delineate and achieve consensus around each stakeholder's role and responsibilities.
8) Allocate funds and trained staff for stakeholder coordination.
9) Consider public-private partnerships to support projects.

Closing the Loop

Closing the Loop began in 2017 as a collaboration between the Stockholm Environment Institute and Women in Informal Employment: Globalizing and Organizing (WIEGO) to highlight the informal sector's critical role in the plastic waste value chain. Currently, the project is led by the United Nations Economic and Social Commission for Asia and the Pacific and is supported by the Government of Japan. The aim of the project is to reduce environmental impacts of plastic in ASEAN cities using circular economy approaches to manage waste. Closing the Loop's main activities include developing a digital mapping tool to identify and calculate the sources and impact of ocean plastic pollution in four ASEAN cities (Da Nang, Vietnam; Kuala Lumpur, Malaysia; Nakhon Si Thammarat, Thailand; Surabaya, Indonesia) and developing policy interventions and roadmaps for local government action in each city.

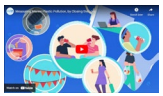
Prior to using the digital mapping tool and making policy recommendations, Closing the Loop conducted baseline reports to assess the physical state of waste management (i.e., waste generation, collection, recycling, and treatment). Additionally, Closing the Loop conducts a governance assessment of city and national policy, as well as stakeholder participation status, financial stability, and digital readiness for managing waste.[8] To develop the baseline reports for the digital mapping tool, Closing the Loop collaborated with in-country governmental and non-governmental partners, in addition to international contributors such as Institute for Good Environmental Strategies (IGES) and the University of Leeds. The result was a comprehensive mapping of all stakeholders across the plastic value chain and their responsibilities, including non-traditional stakeholders such as waste pickers, schools, and unions. After development of the baseline report and input of data into the Plastic Pollution Calculator (see Key Resources), the program produces an action plan that establishes clear roles for national government ministries, city-level committees, and other stakeholders, including timelines for when activities should take place, and criteria to measure success.[9] As a result of this process, implementors had a clear list of which stakeholders to involve and what role each would play in project implementation.

Proven Practice in Action

Closing the Loop conducted stakeholder analysis to promote coordination prior to project implementation. This analysis and subsequent engagement ensured clear mandates and delineation of responsibilities among government agencies and ministries, the private sector, and civil society.

→ KEY RESOURCES

Closing the Loop's Monitoring Resources



The Plastic Pollution Calculator

Closing the Loop's Plastic Pollution Calculator aims to model plastic sources, sinks, pathways, and hotspots in four ASEAN cities. The Calculator is used in baseline assessments to understand what type of plastic is entering waterways, where in the waste management process plastic leaks, and where leakage hotspots are located.

https://youtu.be/rDsZRi7W5Uk

eLearning Course: Cities and Marine Plastic Pollution – Building a Circular Economy

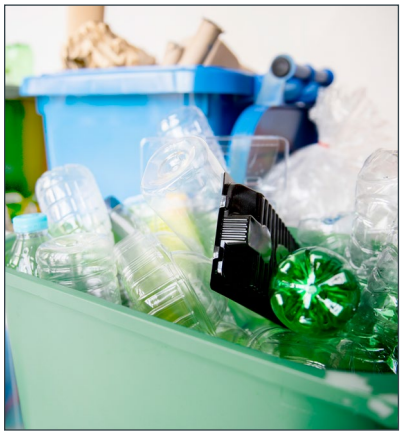
This course introduces users to plastic pollution issues facing the Asia-Pacific region. In the course, users can learn how to measure and monitor marine and land-based plastic pollution remotely using mapping tools like geographic information systems. The course was developed with a range of partners, including UNEP and COBSEA.

https://www.unescap.org/projects/ctl/elearning

The German Agency for International Cooperation

The GIZ is a federal enterprise of the German government that works to improve economic development and employment, promote clean energy and care for the environment, and foster peace and security.[10] For its project Rethinking Plastics, GIZ partnered with seven countries in Southeast Asia to promote and improve the circularity of plastics. The project goals are three-fold: 1) to improve management of plastic waste, 2) to promote sustainable use and creation of plastics, and 3) to reduce ocean plastic pollution.[11] GIZ has funded 20 pilot projects that support the goals of Rethinking Plastics and facilitate information sharing to make progress towards goals. GIZ works with national governments to implement these projects and stakeholder engagement was a large part of its work in Thailand. To conduct fruitful stakeholder engagement, GIZ needed to bring all relevant ministry representatives together, including those from the Ministries of the Environment, Finance, and Education. Additionally, GIZ ensured other stakeholders, like plastics and packaging associations, the waste management sector, waste pickers, and other civil society organizations were included. These stakeholders made up a steering committee which provided input at decision points along the way. The result was the Bio-Circular-Green Economic Model, which pairs Thailand's strength in the agriculture sector, biological diversity, and natural resources with technology and innovation to promote circular economy principles.[12] GIZ also stresses the importance of allowing enough time to engage with stakeholders—it can take years of coordination and cooperation to bring all relevant stakeholders together and to reach consensus for decisions.

https://youtu.be/avatwT5q8cU



Credit: by Rawpixel.com on Freepik

Rethinking Plastics
Circular Economy Solutions to Marine Litter

Proven Practice in Action

GIZ secured buy-in by working with top levels of government, served as a coordinator between various ministries, and included wide-ranging stakeholders in their engagement efforts.

Establish Meaningful and Lasting Engagement

Challenge: It may be difficult to recognize the benefits of stakeholder engagement and to keep stakeholders engaged over the life of the project.

Opportunity: Increase awareness of the benefits of stakeholder engagement, build capacity to implement and institutionalize a meaningful stakeholder engagement process, and intentionally cultivate relationships for mutual benefit.

Clean Cities, Blue Ocean conducts mid-term review with Eco Warriors in Puerto Princesa City. Credit: Giulia Erika Soria

CONTEXT

Engaging with stakeholders has benefits beyond informing the public or including them in aspects of project implementation. Meaningful and lasting engagement across diverse sectors can strengthen the likelihood of project success by creating buy-in and minimizing potential conflict or pushback by building relationships that extend beyond the life of the project. To ensure stakeholder engagement is effective, project and policy implementors should determine the appropriate level and type of stakeholder engagement through a process of assessing capacities, limitations, and interests of stakeholders and the project itself. For example, government stakeholders could be engaged for the creation of action plans and policy implementation, while civil society organizations can serve as mediators or gatekeepers for public-facing activities such as trainings and awareness building.

PROVEN PRACTICES

1) Delineate roles and responsibilities of each stakeholder based on their relevance to various activities or phases of the project.

2) Determine what level and type of engagement is appropriate for each stakeholder based on their anticipated roles and responsibilities and ensure that aligns with stakeholders' desired level of effort.

3) Communicate expectations and requests clearly.

4) Follow up with stakeholders to share how their input was used; if it wasn't used, explain why. Don't overcommit to incorporating stakeholder input.

5) Strive to convene stakeholders around action-oriented activities that move the project forward (e.g., data review, policy change). If more passive engagement is appropriate, consider a newsletter to provide updates.

6) Consider establishing an external advisory group to provide unbiased feedback. An advisory group has no stake in project outcomes and serves on a volunteer basis. These stakeholders are a step removed from the daily goings-on of the project and can lend a macro-level perspective to the project.

7) Form stakeholder groups around tasks or topic areas to distribute leadership and promote ownership of activities (e.g., a training group, a group that liaises with the informal sector).

8) Identify gatekeepers, champions, or influencers who can serve as public-facing ambassadors or project spokespeople.

Ocean Conservancy

https://youtu.be/jB2cjnAKZKo

Ocean Conservancy is an environmental nonprofit organization working to create a healthy ocean that supports the wildlife and communities that depend on it. Ocean Conservancy has partnered with other organizations such as Resilient Cities Network to support and implement policies to improve waste management and reduce plastic pollution. In Vietnam, it has worked closely with a network of in-country, regional, and global stakeholders to implement plastic pollution solutions through policy, innovative technology and research, advocacy, and awareness raising.

Currently, Ocean Conservancy is engaged in four efforts to address plastic pollution and waste management in Vietnam: 1) accelerating the implementation of Vietnam's National Action Plan (NAP) on Marine Plastic Waste Management, 2) Strategic Plastic Litter Abatement in Song Hong – "SPLASH", 3) the Urban Ocean initiative in Can Tho, and 4) the Advancing Solutions to Plastic Pollution through Inclusive Recycling Initiative (ASPPIRe). For both initiatives 1 and 2, Ocean Conservancy has worked collaboratively with in-country partners to bring expertise in research and project implementation as well as social capital for addressing plastic pollution in Vietnam. For the SPLASH initiative, the partners designed and built a trash trapper tool to collect marine debris from the Song Hong River and participated in quantifying the debris for further processing. For Vietnam's NAP, Ocean Conservancy and its partners not only contributed to the development of the Plan, but also hosted a workshop with representatives from government ministries, universities, businesses, and NGOs to strengthen connections and provide updated information for implementation. Lastly, for the ASPPIRe project, Ocean Conservancy convened an advisory council of outside experts to provide input as the project progresses. Ocean Conservancy shared the learnings from the ASPPIRe model with local, regional, national, and international policymakers, particularly emphasizing the need for informal sector waste pickers to be included in all waste management policies in countries where they are on the frontlines of collection and recycling.

Proven Practice in Action

Ocean Conservancy engaged with partners across sectors with help from several in-country partners in Vietnam and invested in different interventions including the informal sector, city-level collaboration, national policy development, and technology deployment.

→ KEY RESOURCES

Resources for Public Participation

US EPA's public participation resources provide tools on how to do public outreach for environmental decision-making.

https://www.epa.gov/international-cooperation/public-participation-guide

US EPA created the **Trash Free Waters** guide to describe EPA's approach to reducing land-based sources of plastic pollution. This guide is available in English, Spanish, Vietnamese, Indonesian, and Thai.

US EPA – Trash Free Waters International Implementation Guide

The United States Agency for International Development (USAID) developed the **Collaborating, Learning, and Adapting framework** to improve development outcomes.
https://usaidlearninglab.org/cla/cla-toolkit

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PROVEN PRACTICES

CAPACITY BUILDING

Credit: PZC for Clean Cities, Blue Ocean

INTRODUCTION

Credit: Melinda Donnelly / Clean Cities, Blue Ocean

Capacity building is the process in which skills, abilities, processes, and resources are developed and/or strengthened to ensure organizations and communities can survive, adapt, and thrive to evolving circumstances.[1] The act of building capacity ensures all stakeholders and organizations have the means to fulfill a mission or achieve a goal.[2] From an organizational standpoint, effective organizations build capacity to ensure adequate resources, technical tools, and legal authority.[2] These resources can vary from technical assistance or training, scientific and engineering solutions, information technology, project management, and outreach and planning support. From an individual standpoint, capacity building helps raise awareness of an issue and provides adaptable and implementable solutions.

Capacity building plays an important role in SWM and plastic pollution prevention through the development and sharing of technical knowledge, access to useful equipment and systems, and development and application of effective and innovative solutions. Providing training to community members, waste pickers, government, or other sector-specific stakeholders can increase awareness and understanding of the impacts of plastic pollution on human and environmental health. Training can also be a form of workforce development, encouraging entrepreneurship by exploring financial benefits of plastic reuse and recycling and shifting cultural norms that are detrimental for waste management.[3] Further, providing waste management systems with adequate infrastructure, human resources, program management, and technology will help prevent plastic leakage and provide more effective sorting and management of post-use plastics.[4] Ultimately, building capacity among organizations and individuals will improve management of waste and contribute to a more circular economy.[5]

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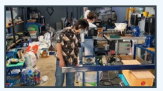
CASE STUDY
SEA circular

CASE STUDY
Centre for Marinelife Conservation and Community Development

CASE STUDY
Alliance to End Plastic Waste

CASE STUDY
World Wide Fund for Nature Vietnam

CASE STUDY
Precious Plastic Bangkok



Acknowledge Gaps May Exist in Waste Management Infrastructure

Challenge: Waste management infrastructure does not support all parts of the circular economy lifecycle.

Opportunity: Expand and adapt existing waste management infrastructure.

CONTEXT

Waste management systems often have high operational costs and low revenue margins. As such, municipalities have difficulty funding these systems to maintain sustainable waste management operations, so these systems tend to be under-funded and under-resourced at community and waste processing facility levels.[3] In many areas, there is no waste collection system in place, instead, informal dump sites serve as the primary means for waste disposal.[3] Under resourcing may result in a lack of household trash bins and collection trucks for proper disposal and may have negative consequences to human health and safety, the environment, and socioeconomic outcomes for individuals and communities. This under resourcing may result in negative consequences to human health and safety, the environment, and socioeconomic outcomes for individuals and communities. A comprehensive operating model is required to close system gaps that stem from insufficient investments, low profitability, lack of technical capacity and capability, and inadequate governance, all of which facilitate non-compliance at an individual- and community-level.[6,7] Waste management systems need to adapt to ensure high-value recyclable materials are separated from household waste and transported to the appropriate recycling facilities. Further, communities can benefit from the value of these materials by ensuring recyclables are leveraged for reuse in other products, and, therefore, creating new markets and revenue streams.

PROVEN PRACTICES

1) Research and understand the existing regulatory requirements/policy landscape regarding SWM.

2) Consider making site visits across the waste management chain (e.g., landfills, MRFs) to understand existing workflows and needs regarding how waste is collected, sorted and cleaned. This may include addressing other higher priority needs such as electricity provision, reliability of electricity, water infrastructure, and sanitation prior to improving MRFs.

3) Improving MRFs should include a mixture of updating technology as well as increasing capacity and types of materials able to be processed while still maintaining a hand-sorting component.

4) If interest and workforce are strong, but infrastructure is lacking, consider investing in equipment and conducting training on proper use and maintenance.

5) If household sorting is part of the project, consider purchasing buckets, carts, bins, or other materials needed by households, collectors, and transporters that are appropriate for the task and culturally relevant to the local community.

6) Consider investments in SWM infrastructure outside of recycling (e.g., waste transfer stations, appropriate bins and trucks, landfills, composting).

7) Identify needs and opportunities for improvement of the current SWM infrastructure (e.g., conduct waste characterization to better understand gaps in sorting and collection).

8) Consider the human-centric element of SWM infrastructure when determining funding levels and sources (e.g., some funders may be more interested in funding equipment rather than training, or vice versa).

9) Incorporate pay-as-you-throw programs or taxes, bundling waste management fees into utility services, or partner with international investment organizations to sustainably fund SWM operations.

SEA circular

SEA circular is an initiative that works to develop market-based solutions and promote science-based decision-making to prevent plastic pollution at its source. Supported by the Government of Sweden and coordinated by UNEP and COBSEA, SEA circular focuses on 1) reducing production of plastic products, 2) reducing plastic use, and 3) improving collection, sorting, and recycling in Cambodia, Indonesia, Malaysia, the Philippines, Thailand, and Vietnam.[8]

In an effort to reduce the negative impacts of plastic pollution, a partnership between the Malaysian Green Technology and Climate Change Corporation, The Ministry of Environment and Water, and SEA circular formed to implement a number of project activities, including two pilot projects in Malaysia. These pilot projects included consumer behavior change efforts to achieve higher recycling rates at the household level. The project had four main objectives. First, identify and develop market-based solutions to reduce single-use and hard-to-recycle plastics, promote recycling, and increase plastic recovery. Second, strengthen the evidence base for informed decision making to address plastic pollution by building national capacities to monitor plastic material flows and assess waste leakage hotspots in line with global best practices. Third, create widespread outreach to promote behavioral change among consumers and the plastics industry while enabling space for policy development, building on existing campaigns. And fourth, targeted technical support to develop regionally coherent national marine litter planning with harmonized methodologies, indicator frameworks and reporting processes and systems.[9]

Based on outcomes from key stakeholder meetings, a pilot project emerged titled **Waste Segregation at Source: Solving Plastic Pollution in Penang.** Several initiatives have been carried out through this program that improve recycling activities and enable or enhance current waste management infrastructure to support the circular economy. Through this effort, a waste separation structure was established in a centrally located area of the city, where residents could easily access the facility and sort/dispose of their waste. In addition, new tools, like a 4-in-1 recycling machine (shredder, extruder, filament winder, and 3D printer) were recommended to create new, income-generating products, such as alphabet blocks, keychains, and screws. In addition, the Environmental Resource Center and Seberang

Credit: SEA circular

Perai City Council organized an Environmental and Entrepreneurship Workshop which focused on reusing cleaned post-consumer plastic packaging to create carrier bags, baskets, and purses.[10]

Proven Practice in Action

Via stakeholder input, SEA circular identified a need for waste management infrastructure and improved capacity by providing equipment that enabled plastic processing for secondary markets.

Alliance to End Plastic Waste

Alliance to End Plastic Waste (The Alliance) is a group of over 90 members that aims to stop plastic waste from entering the environment. Members include multinational corporations, government agencies, and management consulting firms. All members are united in their desire to see innovative solutions that mitigate plastic pollution.[11] The Alliance's flagship project in Malang, Indonesia is called ***Bersih Indonesia: Eliminasi Sampah Plastik***, meaning ***Clean Indonesia: Eliminating Plastic Waste***. The Alliance is working with local leaders and the Indonesian government to support Indonesia's goal to be plastic-free by 2040.

The main activity of this project is to enhance waste management capacity in Malang. The Alliance plans to build several MRFs and transfer stations in the Regency.[12] One of the reasons Malang was selected as the project site was because the region had existing waste management infrastructure. Rather than building capacity from scratch, the Alliance could support expansion of infrastructure that was already in place. When planning a capacity building project, it's important to conduct baseline assessments to understand existing capacity to identify opportunities to expand that capacity.

Credit: Alliance to End Plastic Waste

Credit: Alliance to End Plastic Waste

Proven Practice in Action

Alliance to End Plastic Waste sought partnerships in all levels of government and the process of capacity building was locally driven and informed by present infrastructure.

> ***"I genuinely believe that with the Alliance supporting us, we will be able to achieve 100% coverage of our waste management services. We will move away from landfills and instead have waste that is properly managed. Whether it is turning it into refuse-derived fuel or recycling plastic waste. This is all part of the national waste management strategy set by the federal government."***
>
> *-Mr. Renung Rubiyatadji, Head of the Waste Management Division of the Malang Regency Environmental Service*

Recognize Knowledge Gaps May Exist in Waste Management Subject Matter Expertise

Challenge: There may be a lack of SWM subject matter expertise or knowledge gaps in the community regarding SWM.

Opportunity Fund or organize workforce development/training in SWM and support forums for peer-to-peer sharing of SWM practices.

Opportunity: Harness and bolster existing local skills, adding to the knowledge base for a sustainable project future. Recognize the informal sector for the essential services they perform.

Clean Cities, Blue Ocean Grantee, Project Zacchaeus, interviews community members to inform its local approach. Credit: PZC for Clean Cities, Blue Ocean

CONTEXT

Waste picker education and outreach. Credit: PZC for Clean Cities, Blue Ocean

Much of plastic pollution is caused by insufficient waste management systems, compounded by increasing sales and circulation of single-use plastic products that often have low recyclability potential. At the household level, organic waste and recyclable material may not be separated, and this mixed waste is often placed in open dump sites or incinerated.[13] At the municipal level, waste management programs may lack the program management or financial expertise needed to maintain waste disposal facilities and equipment.[3] For the latter, local governments often lack knowledge required to evaluate the myriad of available waste management solutions, making it difficult to determine the most appropriate solution for managing waste disposal processes and facilities. In addition, many of these programs lack dedicated program management staff that can focus on long-term strategic planning that would address recurring waste management issues.[3]

To ensure that the project is sustainable, local staff should be trained in principles of SWM to build local capacity and knowledge. This knowledge sharing can happen via training, collaborative meetings, shadowing, and/or by sponsoring a staff member to take relevant classes at a university or participate in study tours. Sharing knowledge should be intentional and formalized, and spaces should be provided for established and emerging professionals to learn from each other.

Lastly, the informal sector (e.g., waste pickers, merchants, transporters) should be recognized for the critical and unique role they serve in communities. This recognition includes fair pay, but could also include representation in local government, standard uniform and ownership over its design, and health and safety training. These workers are essential not only to SWM projects, but to many other facets of the community and economy.

Recognize Knowledge Gaps May Exist in Waste Management Subject Matter Expertise *(continued)*

PROVEN PRACTICES

1) Ensure waste pickers are paid a fair wage, and provide means for savings (e.g., facilitating the establishment of bank accounts). Ensure children are not used for labor.

2) Safety and wellbeing of pickers is paramount—waste pickers should receive proper health and safety training and personal protective equipment (PPE) and if waste is unsafe to sort/recycle (e.g., anything with potential pathogens), it should go to a landfill or proper disposal site.

3) Any equipment purchases should be combined with training for staff on the proper use, maintenance, and repair of equipment as well as guidance on where to find replacement parts or professional servicing, if needed.

4) Waste pickers may not have bandwidth to participate in clean-up activities; utilize volunteers or hire more pickers for sustained activities that require skilled, trained staff.

5) Provide entrepreneurship training for local artisans and vendors on how to work with, acquire, and market goods made from recycled plastics.

6) Use local engineers and designers to tailor interventions to meet local needs and enable easier maintenance.

A group of waste pickers, known as Eco-Warriors, received uniforms designed in collaboration with the group. The uniforms increase health and safety and promote trust and a sense of pride. Credit: PZC for Clean Cities, Blue Ocean

7) Use local residents for as many parts of the project as possible (project management roles, stakeholder engagement experts, evaluators).

8) Establish permanent classes/accreditation that can continue to be sought after the project ends.

9) Gauge capacity along the plastics value chain and design the project to improve and build capacity where it is most needed.

10) Involve provincial and city level officials charged with SWM into capacity building activities for their expertise.

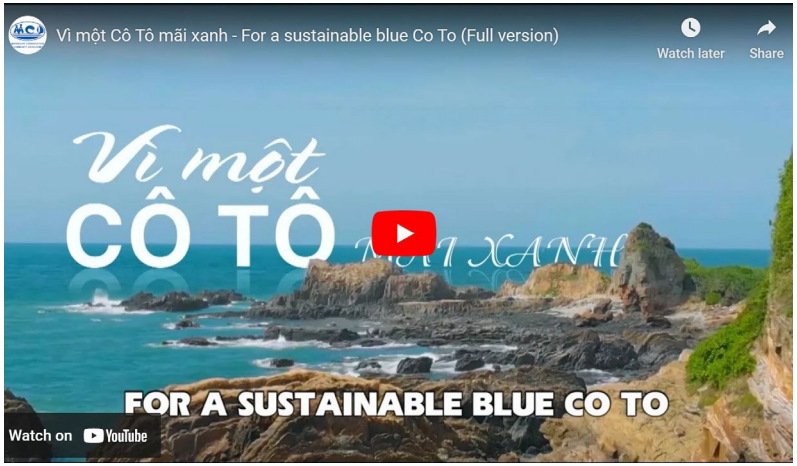
11) Modify capacity building activities to fit the baseline knowledge of SWM in a particular project site.

Centre for Marinelife Conservation and Community Development

Credit: MCD

MCD was established in 2003 as a non-state organization in Vietnam (i.e., a Vietnamese NGO). It is under the administration of the Vietnam Union of Science and Technology Associations and licensed by the Ministry of Science and Technology. MCD applies integrated coastal zone management for interventions that focus on harmony between the use of natural resources and empowerment of local institutions and community groups.

In June and July 2022, MCD collaborated with Ocean Conservancy, the Vietnam Institute of Seas and Islands, and the Department of Natural Resources and Environment (DONRE) of Nam Dinh province to provide a series of three-day training courses on Vietnamese and international methods, processes, and practices in marine plastic waste assessment and monitoring. In addition, the training included content on soft skills development, including community consultations and communications. The trainings promoted cooperation among stakeholders, as well as linked stakeholders with technical assistance.[14] Methods taught at the trainings served to further Vietnam's progress on their National and Provincial Action Plans for marine plastic waste management.[15] The training improved stakeholders' understanding of contextual factors that contribute to plastic waste, current status of plastic waste in Vietnam, and trends in plastic waste. Participants stated they would apply learnings to their local environmental protection and waste management efforts and felt the training improved their environmental communication skills.



https://youtu.be/2pQaflw-LNQ

Proven Practice in Action

The purpose of the training series was to build capacity of technical officials and local leaders to address solid waste issues in coastal areas. The training courses were led by Vietnamese professionals and served to advance the goals of Vietnam's National and Provincial Action Plan, therefore contributing to and aligning with the country's goals.

Develop and Hold Trainings to Share Knowledge and Facilitate Project Sustainability

Opportunity: Training and education programming contribute to more sustainable outcomes.

CONTEXT

Ensuring all stakeholders are equipped with the technical knowledge needed to manage the use, disposal, and recirculation of plastics is important for building capacity and knowledge around plastic use and waste management. Regional training targeting different groups and sectors can enhance understanding of plastic pollution pathways and impacts, while demonstrating preventive and implementable actions.[16] Training courses and workshops provided to sector-specific end-users, like municipal governments, port authorities, and the shipping industry, can promote prevention and reduction of plastic use,[16] and providing technical training to individuals that work in waste management can enhance their understanding of the plastic supply chain, environmental impacts, and techniques used to properly dispose of waste.[4]

Credit: WWF Vietnam

PROVEN PRACTICES

PRE-TRAINING

1) Conduct a needs assessment to determine what topics should be covered in trainings.

2) Define the learning goals and objectives clearly before the training and share these with trainees at the opening of the training. For example, the goals of trainings may be to build skills, build awareness, or both.

3) Make sure to include the "why" in training materials. The "why" should answer the question, "why is this important?"

4) Design trainings with learning styles in mind, incorporating applied, interactive methods to keep participants engaged and increase recall of training concepts. For example, if participants are being trained on equipment, they will need to become acquainted with and practice with the actual equipment being used.

5) Acknowledge that in-person trainings can be more valuable than virtual (e.g., communities might not have access to technology for virtual trainings like virtual meeting platforms or stable wi-fi).

6) Create an evaluation plan for trainings with performance metrics.

Develop and Hold Trainings to Share Knowledge and Facilitate Project Sustainability *(continued)*

GOOD TRAINING EXPERIENCE

7) Ensure trainings are available in languages and dialects spoken in the community, beyond the predominant language, as well as varying literacy levels, if needed.

8) Offer trainings at times that are convenient for those attending (e.g., evening or weekends). Consider offering childcare, if needed.

9) Provide food and refreshments at training.

10) Provide a certificate to trainees.

Women working in Metro Manila's waste and recycling sectors train with Women in Waste's Economic Empowerment (WWEE) Activity's Basic Business and Empowerment Skills Training (BBEST). Credit: USAID

MATERIALS

11) Develop materials that attendees can take with them and refer to later (e.g., materials that attendees can access online or on their phones).

12) Consider short video trainings that can be rewatched and shared, especially on social media.

13) Incorporate polling or check-ins throughout training to gauge knowledge levels and drive engagement.

POST-TRAINING

14) Evaluate training for future improvements.

15) Train trainers to ultimately step-down training and become local experts and leaders. Build a network of trainers to learn from each other.

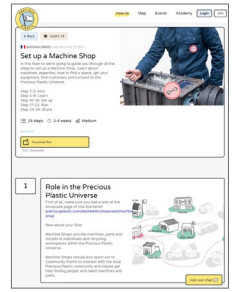
16) Consider follow-up activities and monitoring to ensure trainees are using concepts learned during trainings. There may be opportunities to do re-trainings or re-certifications.

17) Collect contact information of the training class and create a WhatsApp group to keep communication open and share learnings.

→ KEY RESOURCES

Key resources for capacity building to prevent plastic pollution and improve SWM

Precious Plastic has extensive resources on how to build and run upcycling facilities. All resources are open-source. Starterkits are provided for various recycling projects.

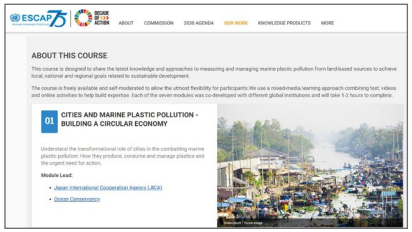


https://preciousplastic.com/

https://preciousplastic.com/starterkits/overview.html

Closing the Loop's eLearning course, Cities and Marine Plastic Pollution, teaches users how to measure and manage plastic pollution from land-based sources.

https://www.unescap.org/projects/ctl/elearning



World Wide Fund for Nature Vietnam

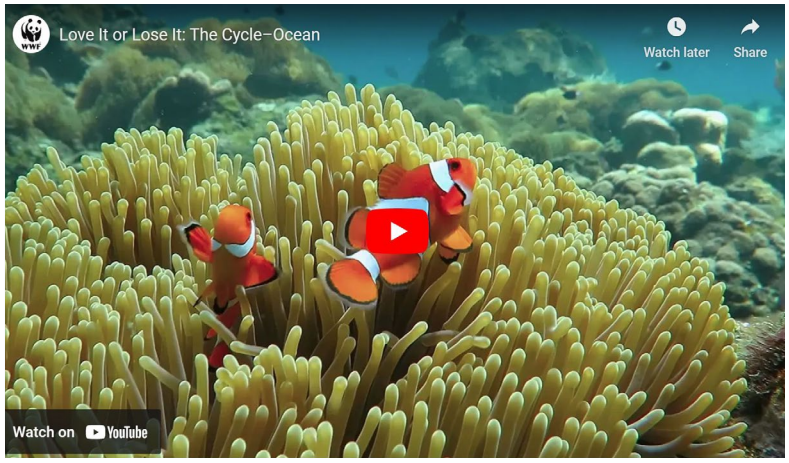
WWF Vietnam supports the Greater Mekong region, one of the most biodiverse areas on the planet. To protect regional waterways and coastal biodiversity, WWF Vietnam aims to reduce plastic pollution, with projects ongoing in Phu Quoc, Ha Noi, Ho Chi Minh City and Long An province. In 2019, WWF launched the "Plastic Smart Cities" program, committing $40M USD to circular economy projects in cities in Thailand, Vietnam, Indonesia, China and the Philippines. In 2020, WWF Vietnam piloted a project focused on new household waste collection methods to strengthen the financial sustainability of waste management practices in Vietnam.

In order to implement and expand successful waste collection, separation at source, and recycling of waste in the Mekong River Delta, WWF Vietnam provides capacity building services to aid stakeholders in the collection, separation, and recycling of land-based waste. WWF Vietnam works with local stakeholders, such as the local authorities at provincial, city, and commune level, communal garbage collectors, and mass organizations (Women's Union, Neighborhood Association) to conduct a training of trainers (ToT) on household waste separation and to raise awareness about ocean plastic pollution. Additionally, WWF Vietnam trains waste pickers to monitor waste post-sorting and to promote public awareness of the health and environmental impacts of plastic waste. For their training program in Long An, WWF Vietnam realized that getting people together for an all-day training was inconvenient. Instead, trainings were often hosted in the evening to accommodate trainees' schedules.

Proven Practice in Action

WWF Vietnam understood that trainings needed to be convenient for people to attend. Additionally, a ToT approach builds a network of trainers that can attain greater reach and allows professionals to learn from each other.

A worker separates domestic waste in Tân An City, Long An Province. Credit: WWF Vietnam



https://youtu.be/Nv-TSLiVeOY

Precious Plastic Bangkok

Precious Plastic Bangkok is an open-source project that aims to reduce plastic pollution by using technology and community action to transform plastic waste into high-value products and materials that can be reused and sold. The organization encourages individuals to contribute to the circular economy at various points: as a recycler, collector, or re-tooler of recycled plastic goods. Precious Plastic Bangkok utilizes free Starter kits available on Precious Plastic's central website to teach individuals how to make items from recycled plastic and to build community engagement around recycling.[17]

Precious Plastic Bangkok's main activity is the establishment of community-based recycling networks that actively engage in the collection, sorting, cleaning, and recycling of plastic into new products using Precious Plastic machines. The community workspaces serve as education and training spaces for local people, schools, and business owners to learn about plastic re-purposing. By providing a homebase for education and training, offering face-to-face instruction, and introducing recycling infrastructure that meets the needs of communities, Precious Plastic Bangkok has increased capacity for recovery and recycling of plastic over the long term.

Precious Plastic Bangkok also hosts regular educational workshops at several international schools and local Thai schools across Bangkok. The purpose of the school workshops is to build awareness of plastic recycling and reuse among young people.[10] Behavior change approaches targeted to students may also influence parents, relatives, and friends to shift their views of plastic waste (see information about conducting ***social and behavior change*** around waste disposal practices).

Credit: Precious Plastic Bangkok

Credit: Precious Plastic Bangkok

Proven Practice in Action

Precious Plastic Bangkok sought partnerships with schools, individual community members, and business owners to provide learning opportunities for the community, including how to reprocess post-consumer material into new items that could be re-sold.

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PROVEN PRACTICES

IMPLEMENTATION

Wasteworker in Vietnam. Credit USAID

Phillipines Eco Warrior waste picker. Credit: USAID

INTRODUCTION

Implementation is the set of activities executed to fulfill project goals and objectives. During the implementation phase, the project team engages in planned activities and addresses problems that arise. Implementation consists of the day-to-day tasks of the project. When implementation is poorly managed or tracked, the program may have less impactful outcomes that can jeopardize achievement of goals, which can be costly in terms of time and resources.

Barriers to successful implementation include insufficient financial support, lack of human resources, incomplete reporting, poor stakeholder coordination, and insufficient training of environmental health staff. Consider an array of modalities to gather data including on-site observations, water conditions, heat maps, remote tools, and existing datasets to aid in monitoring and evaluation.[1]

Additionally, implementation of waste management and plastic pollution mitigation projects should be a collaboration between local and international entities. Working together, stakeholders can ensure the value of waste collected is maintained, integrate technology where feasible, and deploy diverse monitoring and evaluation methods.

Continual monitoring of waste management operations, processes, and outcomes is integral to creating and maintaining an effective system. Similarly, conducting monitoring over the entire plastic value chain is an important part of understanding the mechanisms for ocean plastic pollution. Monitoring (and later evaluation) begins by establishing metrics and performance indicators to measure a system's efficacy and ensure program objectives are being met. Metrics used to monitor the operational efficacy of the system should be measured using appropriate data.

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Precious Plastic Bangkok

CASE STUDY
Clean Cities, Blue Ocean

CASE STUDY
Plastic Collective

CASE STUDY
Closing the Loop

Explore Secondary Markets for Recycled Plastics

Challenge: Identify a way to recycle or reuse each type of plastic extracted from the environment, regardless of value.

Opportunity: Seek partnerships to redirect waste, especially plastics, from landfills and out of the environment..

Bricks created from plastic waste by CCBO program grantee Green Antz Builders Inc. Credit: Green Antz

CONTEXT

The ability and ease of recycling depends on the plastic type. Identified via the universal numbering system found on most plastic packaging, some plastic types, like polyvinyl chloride (PVC), are rarely recycled. As such, limits on production and consumption of PVC plastics can be considered, in addition to use of alternatives that can be more easily recycled.[2] Soft plastics are challenging to recycle but are often included in the waste stream. Depending on the contents of the waste stream and the capabilities of the MRF (or the quality of source sorting if an MRF not present), recycling of soft plastics may be feasible, especially if the area has high amounts of these plastics (e.g., agricultural films, plastic bags).[3] Understanding how to extract the most value from plastics (e.g., by cleaning waste stream) impacts the success of program implementation efforts. Identifying end points for various waste types requires a deep knowledge of the community and ingenuity, but partnerships can be put in place to divert these plastic waste fractions from landfills and from the environment.

PROVEN PRACTICES

1) Recognize the importance of conducting a waste characterization.
    a. Prior to implementation, research: 1) the types of plastic most prevalent in the area and, 2) secondary markets.
    b. If some types of plastics (e.g., plastic bags) are hard to recycle, and, therefore, do not have a clear secondary market, consider the feasibility of promoting a ban (e.g., a plastic bag ban) or providing incentives for viable alternatives.
2) Devise a plan for removing the most toxic plastics out of the waste stream first, when possible.
3) Acknowledge that each marine entry point for plastic waste has unique geography, people, and challenges. If conducting a small-scale project, work to understand the nuances for each entry point. For bigger projects, consider using citizen scientists to collect information on entry points.
4) Look for ways to make the waste stream cleaner so less cleaning needs to be accomplished at the MRF.
5) If water contains cleaning chemicals, develop a plan to process the water and safely return to waterways.

Precious Plastic Bangkok

Credit: Precious Plastic Bangkok

Credit: Precious Plastic Bangkok

The **Precious Plastic** movement began in 2012 as a graduation project of Dutch design student Dave Hakkens. Since then, the design concept has grown into a global network of over 500 recycling and education workspaces. Precious Plastic is an open-source platform that aims to teach people around the world how they can become recyclers and how to market goods created from recycled plastic. Additionally, free to download blueprints and resources on Precious Plastic's web page teach people how to build plastic recycling machines and how to make goods. In spaces where there may be less of a secondary market for recycled plastics, Precious Plastic makes its own market.

Precious Plastic Bangkok, started in 2018, aims to establish community networks, workspaces, and educational programs so people can learn about plastics recycling. Members of the community drop plastics off at 60 drop-off locations in and around Bangkok. Bottle caps, microwavable food containers, and plastic drinking cups are turned into plant pots, bowls, and figurines that are sold online via Facebook, at events, and at local shops in Bangkok. More recently, Precious Plastic Bangkok has expanded its collections to include negative COVID antigen tests – a new kind of single-use plastic that has proliferated across Thailand since the pandemic started. These tests are sanitized by both senders and Precious Plastic before they are melted down and made into new products.

Proven Practice in Action

Precious Plastic Bangkok makes its own secondary market for recycled plastic goods. Its team of event managers, product designers, and marketers ensures that goods made from recycled plastic are available at shops in the community. Money raised from sales of these goods goes toward developing new machine technologies, equipment purchase and maintenance, educational programs, and project implementation.

Harness Technology

Opportunity: Support the use of innovative technology and fund research to create locally-appropriate and accessible solutions.

A QR code system to track plastic is currently in development.. Credit: Plastic Collective

CONTEXT

There are many ways that technology can support efforts to prevent plastic pollution. Start-ups across the globe are developing innovative solutions to address plastic pollution, including solutions that incorporate drone technology, high-resolution cameras, and automated collection methods housed on ships.[4] While these technologies can be used in a variety of different contexts, locally designed solutions can often be tailored to suit the exact context in which they will serve. Technology should be inexpensive and easy to use, or "cheap and cheerful," as one interviewee described. Additionally, local universities or research centers can be leveraged to spur innovation. In the project planning phase, it can be helpful to scope what kind of technology is available to support project goals.

PROVEN PRACTICES

1) Collaborate with universities and research institutes to leverage their expertise.
2) Build additional capacity in plastics science, monitoring and evaluation, chemistry, SWM, data analysis, modeling, and more at local universities and, when possible, prioritize collaboration with local entities as there is a co-benefit of understanding local context.
3) Allow for funding mechanisms to support innovative technology and riskier ventures that have shown valid proof-of-concept.
4) Consider allocating funds to local start-ups with innovative ideas, if funding mechanisms can tolerate more risk.

Plastic Collective

In 2016, Louise Hardman started **Plastic Collective** to focus on plastic pollution on remote island nations. Plastic Collective encourages communities to think of plastic not as waste, but as a resource that can be recirculated. Plastic Collective developed The Shruder—a waste plastics shredding and extrusion machine— and an educational training package for remote communities. The Shruder served as a stepping stone to a more holistic solution, the Containerised Recycling Station. The station contains three-phase equipment for concentration and recycling and can be delivered to island nations via ship. Plastic Collective also focuses on providing technical support, education, and a marketplace for the re-sale of recovered plastic to global brands for use in their products. As part of the Certified Ethical Plastic Program, communities can sell upcycled materials that come with a certification of provenance showing where the plastic was recovered from. A system using QR codes on bags of recycled plastic is currently in development. When scanned, these codes will show the entire supply chain—from where the material was picked up and shredded, to what product it was made into.[5] This program has enhanced pride in communities where plastic was collected from beaches and provides an avenue for individuals to sell plastic—creating income for individuals and extending the value chain of discarded plastic.

Plastic Collective provides communities with an innovative package of technologies, machinery, training, and support that enables them to establish a plastic recycling micro-enterprise.. Credit: Plastic Collective

Proven Practice in Action

Plastic Collective used a range of activities, including initiating development of QR code technology to track recovered plastics. The goal of the QR code is to provide an interactive story about a particular product originating from discarded material.

https://wwwyoutube.com/watch?v=CN6A5PnkoMM

Leverage Government Involvement to Drive Momentum

Opportunity: Projects can leverage the momentum and networks spurred by national action plans (NAPs) or other regulatory or policy changes.

The Hon. Gina Montilla Lizares, Vice Mayor of the City of Sipalay, Philippines, signs a commitment to reduce plastic pollution with support from USAID Municipal Waste Recycling Program grantee Philippine Reef and Rainforest Conservation Foundation, Inc. Credit: USAID

CONTEXT

In the preliminary planning phases of the project (perhaps even before stakeholder engagement activities), it is beneficial to conduct a policy analysis on environmental and solid waste activities in the country of interest. One goal of this analysis is to identify national-level frameworks that demonstrate a commitment to addressing plastic pollution. In this way, implementors and funders can ensure that projects align with national goals. Additionally, passage of legislation to improve SWM can serve as a catalyst for projects that support a nation in achieving their goals.

PROVEN PRACTICES

1) Conduct a policy analysis to understand the existing regulatory landscape. Additionally, identify legislation or national priorities that could support or hinder progress toward preventing plastic pollution.

2) If a NAP is in existence or under development, project goals and objectives should adhere to or otherwise complement the NAP. If no NAP exists, consider focusing project efforts on seeking partnerships and buy-in to encourage the development of a NAP.

3) In general, projects should align with broader sustainable development goals and objectives, or other sectoral policies and regulations at the appropriate scale of governance.

4) Consider a demonstrated commitment to reducing plastic pollution on the national level as part of evaluation criteria for funding. If the government does not have any policies or plans in development or in place to address plastic pollution, it may not be ready for intervention-style projects. If a plan is in place, consider whether the country has taken steps toward implementing the plan. Other capacity building work, such as creating a NAP or conducting a baseline assessment of plastic pollution may be more appropriate for countries that do not have national-level policies in place.

Clean Cities, Blue Ocean

In Vietnam on January 12, CCBO successfully launched their program through an in-person and online event. The hybrid format led to a global audience of ~150 participants from Vietnam government agencies, the USAID Mission and Embassy, international organizations and NGOs, and businesses and waste management experts, most notably the leaders and officials of CCBO's four engagement cities: Hue, Da Nang, Bien Hoa, and Phu Quoc. Credit: USAID

USAID's Clean Cities, Blue Ocean program is piloting solutions in Indonesia to build coordinated solid waste systems with increased local government capacity. Credit: CCBO

Clean Cities, Blue Ocean (CCBO) was launched in 2019 and is USAID's flagship program to address plastic pollution. Most ocean plastic pollution originates in cities, and CCBO aims to enhance circularity in rapidly urbanizing areas. CCBO works with and funds grantees to design and implement SWM interventions, in partnership with locally-led organizations in 10 countries: Papua New Guinea, Micronesia, Fiji, Indonesia, the Maldives, the Philippines, Sri Lanka, Vietnam, the Dominican Republic, and Peru. CCBO's global grants program leverages local knowledge to build capacity and implement locally relevant, sustainable solutions, which are complemented by CCBO's technical assistance to strengthen SWM systems. Because the interventions are implemented throughout multiple countries, CCBO assesses each area individually, considering national-level plans and strategies to ensure activities further countries' progress toward established goals and targets. For those that have NAPs, CCBO determines whether the needs and objectives are a good match for CCBO, working with government entities to become more aligned. Government priorities are used to identify implementation strategies and CCBO demonstrates flexibility by working with each government to achieve a common goal.

Proven Practice in Action

CCBO program planned its projects around existing NAPs, ensuring that project outputs served the country's stated SWM goals.

Deploy Diverse Project Monitoring Methods

Opportunity: Utilize different forms of project monitoring to continuously improve the project.

CONTEXT

Monitoring establishes project performance indicators, which can be used for benchmarking and replicability. Robust project monitoring improves the reliability and value of outcome evaluation and will better help funders and implementors describe the impact of their project. Relying on multiple data collection sources such as observational satellite imagery, amount of waste collected, sorted, or processed, number of people trained, and number of policies created or implemented, will support justification for follow-on work or future opportunities. During this stage, flexibility and in-country partner support is useful for collecting and analyzing data. Monitoring ensures that the project is making progress towards its stated goals and allows for course correction if implementation is not proceeding as outlined during the project design phase. The ***data and evaluation module*** explains in more depth proven practices for collecting data to evaluate whether the project was successful.

PROVEN PRACTICES

1) Identify the theory of change for the project. The theory of change states the desired outcomes of the project and the pathways to achieve them.[6]

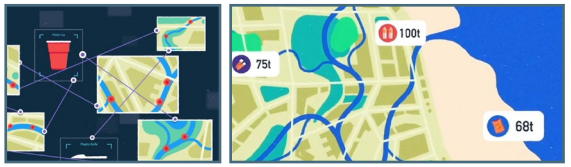
2) Conduct a literature review or other research to ascertain proven practices for monitoring and evaluation of activities/actions of SWM projects.

3) Establish performance indicators and a plan for monitoring prior to project start. Ensure the project team is accountable for collecting monitoring data.

4) Monitoring objectives should be SMART (specific, measurable, attainable, relevant, time-based), as relevant.

5) Funders should allocate sufficient resources for monitoring activities.

6) Harness citizen science to collect monitoring data. For example, use anecdotal evidence of hotspots and recruit community members to photograph these hotspots before, during, and after the project. Hotspots can be formally mapped for tracking over time. GoPros on cars can be used to efficiently map neighborhoods or regions of a city. Mapping needs to be high-quality and consistent, so training should be provided.



Digital waste tracking. Credit: Closing the Loop

7) Consider which data sources are needed to monitor the project. Data that are low-burden and high-frequency are better than data that are high-burden, low-frequency. For example, photographs of hotspots taken by citizen scientists on their walk to work are better monitoring data than once-yearly community hotspot mapping.

8) Conduct field observations to ensure monitoring data are being collected accurately or that project activities are being carried out as intended. If not, consider re-training (see ***capacity building module***).

9) Perform quality control on sorted materials to ensure waste is sorted properly. Observe MRF staff and/or waste collectors to determine if re-training is needed.

10) Encourage community members to participate in data collection by conducting training on the importance of citizen science approaches.

Closing the Loop

Closing the Loop is led by the United Nations Economic and Social Commission for Asia and the Pacific and is supported by the government of Japan. Its aim is to prevent plastic leakage into Asia-Pacific waters. Current projects include sites in Malaysia, Indonesia, Thailand, and Vietnam. Closing the Loop works to improve plastic pollution monitoring with technological solutions by using digital mapping to identify and calculate the sources and impacts of ocean plastic pollution. In addition, a Plastic Pollution Calculator is used to model waste sources, sinks, hotspots, and pathways.[7] After these steps are completed, Closing the Loop works with policymakers to develop interventions and roadmaps for local government action. Closing the Loop has also utilized satellite imaging and GoPros placed on waste collection trucks to identify potential waste hotspots, integrating data into a digital tool for data collection. Students downloaded an application to their phone and used the app to take pictures of plastic pollution hotspots which were geotagged and measured. Multiple data collection efforts gave clear insight into the effect of their project efforts.

https://youtu.be/Hie3voACLQ0

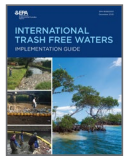
Proven Practice in Action

Closing the Loop enlisted students and waste collection trucks to crowdsource information about where plastic pollution hotspots were located. This citizen science approach enabled the community to participate in data collection, increasing awareness of the issue while providing environmental education.

→ KEY RESOURCES

Key resources related to implementation of plastic pollution mitigation projects

US EPA's Best Practices for Solid Waste Management is a guide for solid waste decision-makers in developing countries. https://www.epa.gov/international-cooperation/solid-waste-management-guide-developing-countries



US EPA created the Trash Free Waters guide to describe EPA's approach to reducing land-based sources of plastic pollution. This guide is available in English, Spanish, Indonesian, Thai, and Vietnamese. https://www.epa.gov/international-cooperation/trash-free-waters-tfw-international-implementation-guide#:~:text=The%20Trash%20Free%20Waters%20(TFW)%20International%20Implementation%20Guide%20is%20a,based%20sources%20of%20marine%20litter

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7. United Nations Economic and Social Commission for Asia and the Pacific (UN ESCAP). Closing the Loop: Our Approach [Internet]. Bangkok (TH): UN ESCAP; [cited 2022 Sep 20]. Available from: https://www.unescap.org/projects/ctl/our-approach

Credit: Green Antz

PROVEN PRACTICES

SOCIAL AND BEHAVIOR CHANGE

INTRODUCTION

Behaviors around waste management are closely linked to knowledge, attitudes, and sociocultural norms.[1] To improve waste management practices, social and behavior change (SBC) may be needed to mitigate leakage of plastic into the marine and aquatic environment. The scientific literature shows that awareness, attitudes, and behaviors related to waste management are influenced by economic incentives, public participation in decision-making, convenience, education, and regulations.[2] As such, interventions should take into account the landscape of factors that influence behavior, rather than focusing on just the behavior itself.

Broadly, SBC is a set of strategies or interventions that aim to influence drivers of change with the goal of improving outcomes, in this case, in the realm of waste management.[3] The theoretical models underpinning SBC are important to consider when designing programs with SBC components. Theory provides insight into factors that influence behavior, the relationships between factors, and nuance and context of each factor.[4]

Before beginning a project with SBC components, it is important to conduct formative research to identify and understand behaviors related to SWM, and barriers and facilitators of those behaviors. Formative research can encompass a variety of activities, including literature reviews or environmental scans of government reports and grey literature, policy analysis, community assessments, barrier analysis, and complementary research.[5] Part of the formative research process may include identifying key local individuals who could assist with crafting or implementing the SBC strategy, since local staff and skills should be used at every opportunity.

Many interventions to prevent plastic pollution involve SBC methodologies, because often individuals are being encouraged to change something about the way they are using, collecting, sorting, or disposing of plastic.[6,7] As such, this module contains proven practices for conducting social and behavior change on projects that aim to mitigate plastic pollution.

Credit: USAID

Jump to Case Study ▼

CASE STUDY
Centre for Marinelife Conservation and Community Development

CASE STUDY
World Wide Fund for Nature Vietnam

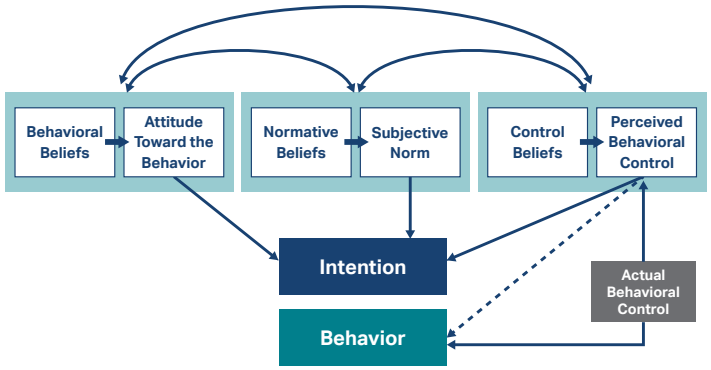
CASE STUDY
Clean Cities, Blue Ocean

CASE STUDY
Hasiru Dala

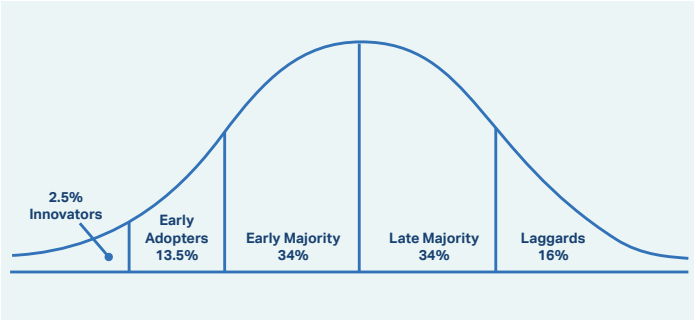
Behavior Change Theories

Behavior change theories work to explain the processes, relationships, and complexities of how people adjust habitual day-to-day practices for the better.[8] While these theories are most often used in health education and promotion, they can be applied to many situations in which behavior change is included in project design and implementation.[9] These are some of the more common theories that could inform interventions that seek to change behavior around disposal of plastic waste.

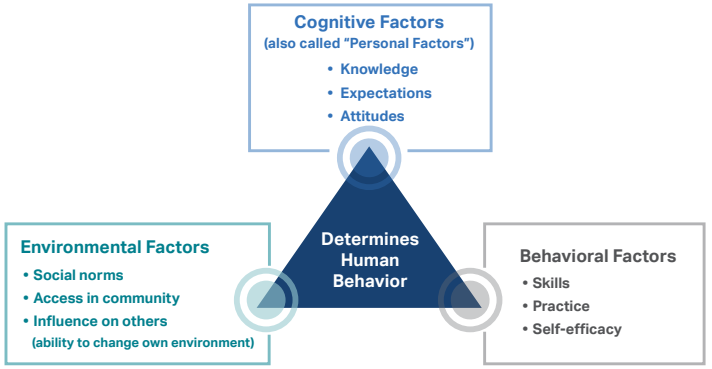
The Theory of Planned Behavior: This theory posts that behavioral achievement depends largely on a person's motivation (behavioral intention) and perceived ability to change the behavior. Behavioral intentions are influenced by the perceived likelihood that the action will have the desired outcome and the risks and benefits of that outcome.[8]



Diffusion of Innovation Theory (DOI): This theory describes how a new idea spreads through a population and gains widespread acceptance over time. The key to having a given idea spread is that it is perceived as new or innovative. DOI places people into five categories based on when they are likely to adopt a new idea.[10]



The Social Cognitive Theory (SCT): This theory takes into account the social influences and past experiences that impact our behavior. SCT also attempts to explain how people maintain behavior change over time, rather than the preceding two theories, which only explore initiation of a behavior.[11]



Consider Sociocultural Waste Disposal Practices

Challenge: There may be a lack of understanding among implementors and funders of cultural practices around waste disposal.

Opportunity: Tailor social and behavior change approach to align with cultural context.

The Mother Earth Foundation project team, in coordination with the Barangay Santa Clara, Malitam, and Bolbok councils, distributed flyers on solid waste management to households. Credit: Mother Earth Foundation

CONTEXT

Before implementing social and behavior change interventions for waste management, it is important to understand how waste is currently disposed of and why waste is disposed of in that manner. There may be sociocultural reasons for waste disposal practices and understanding the beliefs that underpin these practices is important for SBC. For example, in some cultures, disposing of soiled diapers in the trash or via incineration is thought to be harmful to babies' and toddlers' wellbeing, so diapers are often thrown in ravines, rivers, or are buried.[12,13] An SBC intervention seeking to change diaper disposal practices must not only propose alternate, acceptable solutions for disposal, but must also address the root causes of the behavior. Otherwise, the behavior change will be unsuccessful, as the beliefs underpinning them remain unchanged.

For SBC interventions to be successful, they must be tailored to the context in which they will be implemented. Any proposed behavior change must be culturally acceptable and feasible, and funders and implementers are encouraged to consider ways in which cultural practices can be leveraged for positive behavior change.[14]

PROVEN PRACTICES

1) Consider anthropological approaches to learn about waste management practices in the community.
2) Have someone who is knowledgeable about cultural practices around SWM on your team to ensure all steps in the project cycle are appropriate for the context.
3) Project activities should also be culturally tailored to subpopulations, ethnic minorities, or other populations of interest in the project area.
4) Ensure materials used in engagement are tailored to community literacy level, relevant languages are used, and images are thoughtfully selected.

Centre for Marinelife Conservation and Community Development

MCD is a non-state organization based out of Hanoi that has worked with international, national, and local partners to implement projects to mitigate plastic waste. MCD brings local perspective to the projects they support, an important contributor to project success. They have been working to manage plastic waste in Ha Long Bay, a United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage site.[15] MCD has designed and implemented models that integrate technical support and social solutions to improve the management of solid waste and ocean plastic pollution. As part of their baseline mapping of plastic pollution entry points, fisherman were identified as a group that needed training to change behavior around disposal of waste directly into bodies of water. MCD worked with stakeholders through the Public-Private-People Partnership (4P) initiative to create communications and hold training sessions and dialogues to raise awareness and change behavior for target groups, including fishermen. MCD tailored communication and training specifically to this population, including instructions for how to sort and classify waste on a boat. One lesson learned was the need to conduct stakeholder assessments thoroughly before reaching out to a target group. For example, the fisherman did not usually anchor in one place, so finding a location and time for land-based training sessions was difficult. Materials should also be tailored to the literacy level of the population. The impact of these activities was that a core group of 20 fisherman was trained and engaged in project activities. This group became agents of change that spread knowledge and awareness to 301 boat households who learned to collect waste while operating at sea, sort waste, and transfer non-recyclable waste to the appropriate bins on land.

Credit: MCD

Tam Tien village community, Nui Thanh district, Quang Nam unanimously and determined to protect local aquatic resources Credit: MCD

Proven Practice in Action

MCD considered the sociocultural nuances of the fisherman population and adjusted its approach and materials to the needs of this specific population to change behavior.

Address Barriers to Women's Participation

Challenge: There may be barriers to women's ability to generate income.

Opportunity: Conduct SBC interventions, hold entrepreneurship training, and explore income-generating opportunities for women and other populations.

Women waste pickers in the Maldives. Credit: Soneva Namoona / USAID

CONTEXT

Giving women opportunities to participate in all facets of waste management is integral to achieving sustainable project outcomes. More broadly, empowering women via gainful economic employment improves human rights for all, as gender equality is associated with stability and security of states.[16] In addition, engaging men and boys on the topic of women's empowerment enables them to be allies to women in times of social change.[17]

USAID, the UN, and other global development organizations agree that investments in economic opportunities for women translate to investment in community and country.[18] Providing economic opportunities for women promotes autonomy, access to resources, and greater economic stimulus to the economy. Additionally, researchers estimate the gender gaps can result in income loss of 15% among countries in the Organization for Economic Cooperation and Development (OECD).[19] Removing barriers to entry for women in the economic system has benefits that extend far beyond individual households, and when social change occurs on a large scale, it can have benefits for nations at large.

Women should be included in all levels of project staffing. Organizations should consider ways to engage and build capacity and skills for women in areas of project design, implementation activities, and evaluation. Intentional integration of project elements that consider impacts to and benefits for women increase the likelihood that project activities will be sustainable over time. Providing economic opportunities for women may require SBC approaches if women are not widely participating in income-generating activities.

COBSEA's ***activities in Untia*** in Indonesia are an example of how plastic pollution can be upcycled as a means to generate income for women.

PROVEN PRACTICES

1) Consider conducting formative research to understand the role of women and other subpopulations of interest in the SWM sector, and more broadly in the sociocultural context.
2) Provide women with economic opportunities and training to encourage participation in the circular economy (e.g., training women to be upcyclers).
3) Ensure women are in leadership and decision-making positions at all levels of the project.
4) Funders should consider including criteria to promote diversity, equity, and inclusion across projects.

Clean Cities, Blue Ocean

CCBO is USAID's flagship program to address plastic pollution. The program aims to advance circular economies in rapidly developing urban environments across Latin America, the Caribbean, Asia, and the Pacific Islands. Gender equality and women's economic empowerment is a cross-cutting goal of CCBO's programs.[20] In the Philippines, CCBO worked with its grantee, Project Zacchaeus, and local waste pickers to design uniforms that, for the first time, provided critical personal protection, as well as built confidence and pride, while reducing the stigma waste pickers faced in their community. CCBO also supports workforce development for women, including through its Women in Waste's Economic Empowerment activity in the Philippines and Indonesia. This activity provides business and empowerment training to local women working in waste collection, which includes mentorship opportunities in which women learn how to create and pitch business plans to establish or expand waste and recycling micro-enterprises. Successful pitches receive seed funding for women to grow their micro-enterprise. To ensure a long-term enabling environment for gender equality and women's empowerment, CCBO also works with local governments to incorporate these principles into local SWM plans and policies.

Proven Practice in Action

CCBO supports projects that promote circularity as an opportunity to foster economic empowerment among women.

Jailyn, an Eco-Warrior in Puerto Princesa City, poses with her fellow waste pickers. USAID funding has provided new, custom-designed uniforms for Jailyn and her co-workers, raising their status and providing protection from the dangers of the job. Credit: Project Zacchaeus, USAID Clean Cities, Blue Ocean

Conduct SBC Around Waste Disposal Practices

Challenge: Households may be inexperienced in sorting waste, unaccustomed to paying for collection, or used to more frequent collection by waste pickers.

Opportunity: Recognize the value and benefit in paying for waste collection services and explore other mechanisms to incentivize improved SWM practices.

Credit: Giulia Erika Soria / Clean Cities, Blue Ocean

CONTEXT

Many waste management interventions require a change in the status quo—a different waste collection schedule, sorting waste into more categories for disposal, or paying for collection when open dumping is free. SBC approaches are needed to market this change to communities. Social marketing approaches can be used to educate the community on the benefits of the change and increase buy-in and acceptance of the idea.

If communities can see the impact of positive changes to the status quo, this can increase the acceptability of the changes. These changes might include cleaner public areas, compost for agricultural lands and gardens, or jobs for community members. Additionally, using social pressure to encourage late adopters to implement change has been effective in some contexts, especially those with collectivist cultures.

PROVEN PRACTICES

1) Conduct formative research to understand how the community disposes of waste and perceptions, behaviors, knowledge, and attitudes around waste disposal. Incorporate behavior change theory into project design, implementation, and evaluation.

2) Ensure the project and intervention design have theoretical grounding and the theory of change is communicated to and understood by all project staff.

3) Conduct pilot testing to ensure feasibility of SBC interventions and to understand nuances of suggested behavior change approach in context.

4) Frame waste collection as resource recovery via education and awareness-building—always answer 'why' the behavior change is needed.

5) Consider putting in place social or financial penalties for improper sorting (e.g., fee or red button on door). SBC interventions need to be enforced by the community to be successful.

6) Consider environmental education in schools as an approach to SBC and teach citizen science approaches to foster a sense of stewardship of the environment. Children may talk to their parents about what they learned in school.

World Wide Fund for Nature Vietnam

Weighing garbage after collection. Credit: Ngo Minh Hang / WWF Vietnam

Credit: WWF Vietnam

To scale-up its waste collection and sorting intervention in Vietnam's Long An Province, **WWF Vietnam** needed to increase fees for waste collection to improve cash flow. Waste collection and sorting interventions typically require large investments in labor and materials. As such, WWF Vietnam developed various scenarios of investment and revenue for an improved waste management model. Fees can offset some of the cost of collection, but alternate funding sources may still be required, since fees need to be relatively low per household. The fee amount may be dictated by the volume and quality of the waste stream. If high-quality recyclable waste or other potentially valuable material (e.g., organic waste for compost, tins, card boxes) can be diverted from the landfill, processed, and resold, this would decrease the need for fees. Additionally, if households are not used to paying for waste collection, a social marketing approach could be used to increase acceptability of fees or fee increases.

Manual sorting of household packaging waste. Credit: WWF Vietnam

Proven Practice in Action

WWF Vietnam's assessment of a fee increase for waste collection exemplifies flexibility in funding sources. A thorough independent assessment of the costs and expected revenue of different waste management scenarios might help policy makers decide which scenario would be most appropriate to scale up an intervention and increase impact.

Build Momentum

Opportunity: Use momentum from catalyzing events to raise awareness of plastic pollution and to ultimately change behavior.

Credit: Mantanani Plastic Recycling Centre Sabah (Borneo), Malaysia. Credit: Plastic Collective

CONTEXT

Notable events, such as the passage of a NAP, can and should spur momentum toward addressing plastic pollution. But viral photos/videos, passionate spokespeople, and shared successes can also catalyze momentum toward changes in SWM. Momentum and hunger for change must be coupled with organized action, otherwise there is little potential for real-world impact.

PROVEN PRACTICES

1) Create a communications plan that incorporates traditional media and other partners who could spread the message and disseminate information. Additionally, create a specific strategy for social media to maximize project exposure.

2) Use social media to spread awareness of plastic pollution, advertise events, communicate about litter hotspots, highlight global news regarding plastic pollution, and more. This helps to keep plastic pollution (and your organization's work to mitigate it) at the front of people's minds.

3) To magnify impact, proactively establish relationships with other organizations working in similar realms (environmental NGOs, waste management organizations, etc.) or in media (radio DJs, artists, journalists, TV stations) to collectively engage the public.

4) Incorporate funding criteria that require the development and dissemination of case studies and stories of successful behavior change activities for the benefit of future projects.

5) Consider having a trusted spokesperson, community leader, or public figure be an ambassador of your message.

6) Allocate funding toward organizations that support youth and underrepresented groups in environmental education and environmental action.

7) If you make a request in your social media posts, write clearly and directly what you are asking for (e.g., volunteers, monetary donations, food).

8) Beach clean-ups raise awareness of plastic pollution but should be accompanied by interventions that lead to sustainable, lasting change through mitigation efforts.

9) Use behavior change theory to craft messages, e.g., connect the broader issue of plastic pollution to individuals' personal waste disposal practices.

10) Consider including partners in the arts and informal education venues (e.g., museums, libraries) as an opportunity to understand and influence local culture.

Hasiru Dala

Hasiru Dala is a social impact organization that works with waste pickers to ensure a life of dignity. Based in Bengaluru, Karnataka, India, Hasiru Dala led a campaign called 'Namma Netravati, Namma Javabdari' (Our Netravati, Our Responsibility), which cleaned 33 tons of waste from the Netravati River.[21] The campaign harnessed the power of social media to spread awareness about the campaign, with several posts related to collection going viral. A local chef posted a photo of a fish caught in the Netravati whose belly was filled with plastic. A coordinator at Hasiru Dala stood on a bridge above the Netraviti for several hours each day for months holding signs encouraging people not to throw their trash in the river. He garnered local media attention and talked with passersby about properly disposing of trash.[22] Lastly, a viral video circulated of two women throwing bags of trash over the fence that had been installed on the bridge to prevent littering. The women were identified and tried in court. The use of social media, and the organization of volunteers through WhatsApp groups, brought attention to the campaign and much of Mangaluru assisted in some way. The mayor of Mangaluru noted in June 2022 that security cameras will soon be installed to monitor the bridge for littering.[23]

Installing signs by the Netravati River to discourage littering. Credit: APD Foundation

https://youtu.be/xf-B-mN9_bo

Proven Practice in Action

Hasiru Dala included partners across sectors including the Mayor and city government, police commissioners, local artists, radio stations, volunteers, the surfing community, the local university, border patrol reservists, and journalists. While the campaign started as a cleanup and awareness building activity, Hasiru Dala's activities led to sustained community change that continues at present.

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→ KEY RESOURCES

Social Marketing Resources

This guide from the US Centers for Disease Control explains how to do social marketing with small budgets.

https://www.cdc.gov/nccdphp/dch/programs/healthycommunitiesprogram/tools/pdf/social_marketing.pdf

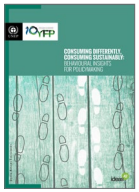
The Community Toolbox is an extensive resource with information on how to build healthier communities and bring about social change. They have a chapter on social marketing that provides an overview of the concept.

https://ctb.ku.edu/en/sustain/social-marketing/overview/main

SBC Resources for Environmental Change

This guide describes SBC in the context of environmental change.

https://behavior.rare.org/wp-content/uploads/2020/12/Rare-GEF_Science-of-changing-behavior-introduction.pdf



This guide, developed by UNEP, describes five behavioral barriers to sustainable consumption.

https://sustainabledevelopment.un.org/content/documents/2404Behavioral%20Insights.pdf

PROVEN PRACTICES

DATA AND EVALUATION

Credit: USAID

INTRODUCTION

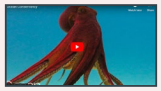
Data collection and analysis are essential for characterizing types of waste, assessing collection activities, monitoring the outcomes of pilot programs, and ensuring that this characterization is unbiased and accurate.

Evaluation should occur after the project concludes to demonstrate impact and inform future improvements.[1] Outcome evaluation, as opposed to impact evaluation, is more common among projects that address plastic pollution as it can be difficult to see long-term, downstream impacts of the project. Results of the evaluation can be shared with stakeholders to demonstrate the successes of the programs, acknowledge any shortcomings, and justify future plans for improvement, all of which provide more cost-effective management of waste disposal systems, which may lead to an overall reduction of ocean plastic pollution.

Managing, minimizing, and eliminating plastic pollution requires data collection and measurement of multiple pathways and the activities associated with these pathways. Findings of these measurement efforts will help to inform an evidence-based, data-driven solution and drive limited resources to where they are most beneficial.

Jump to Case Study ▾

CASE STUDY
Ocean Conservancy



CASE STUDY
Clean Cities, Blue Ocean

Credit: MCD

Measure Project Efficacy

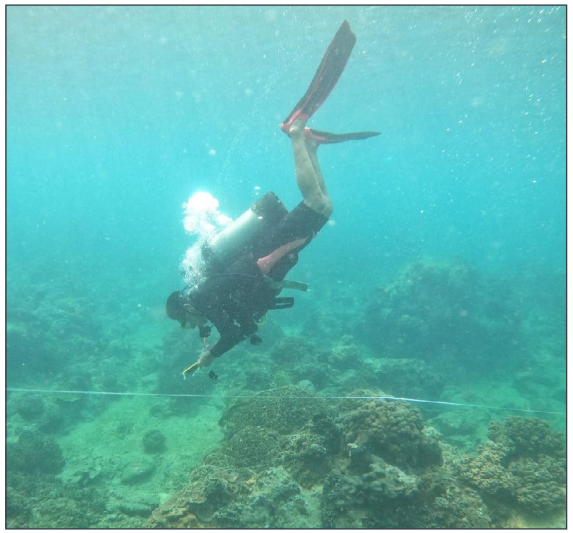
Challenge: Measuring the long-term impact of the project on plastic waste in the marine environment is difficult; however, other metrics can be collected to assess project outputs.

Opportunity: There is an opportunity to contribute to public data sharing and to harmonize methodologies for measuring plastic pollution.

Credit: COBSEA

CONTEXT

Understanding waste flow, identifying critical points of accumulation, and determining requirements for resources, such as equipment and people necessary to provide quality services, are important aspects of measuring the impacts of projects intended to address ocean plastic pollution. Often, measuring these impacts can present challenges given the number of upstream factors contributing to ocean plastic pollution. To effectively inform decision making and track the effectiveness of policies and initiatives, it is crucial to move from ad hoc and one-off measurements and fragmented use of methods to national source inventories and monitoring programs that track the sources, flows, and impacts of plastic pollution over time. To make data collection more robust and enable data comparability across countries, harmonization of monitoring methodologies following established guidelines is key. COBSEA countries adopted Regional Guidance on Harmonized National Marine Litter Monitoring Programmes, developed in partnership with Commonwealth Scientific and Industrial Research Organisation (CSIRO) to guide capacity building and strengthening of monitoring efforts in the region. This approach can be expanded and applied in other regions.



Credit: MCD

Measure Project Efficacy *(continued)*

PROVEN PRACTICES

1) Explore case studies and methodologies for measuring impacts for projects designed to divert waste.

2) Measure the amount of plastic waste diverted from a landfill (kilotons), not plastic waste in waterways. Measuring plastic in waterways may not be the best reflection of the project's impact. Depending on the region, its topography, flow of waterways, etc., there may not be large reductions in plastic in waterways (e.g., if there is a large city upstream that is not participating in plastic waste reduction).

3) Include human-based metrics (e.g., number of waste collectors trained, number of households sorting waste at 95% accuracy) in addition to material metrics.

4) Use in-country experts to ground-truth measurement planning.

5) Draft a data management plan that details how data will be stored and analyzed prior to collection.

6) A measurement that solely focuses on collection indicators is not sufficient for funders—identify performance indicators during project design, since long-term impacts are difficult to capture.

7) Support intergovernmental efforts to establish and promote internationally recognized methods for measuring plastic waste in the environment, including data harmonization and standardization.

8) Use a citizen science approach to train community members to collect data on waste in their environment (e.g., data on waste hotspots, neighborhood mapping, household waste sorting practices). Community leaders can encourage households to participate in surveys and workshops.

Credit: USAID

Ocean Conservancy

Founded in 1972, **Ocean Conservancy** works across the world on several global challenges that impact ocean health, including overfishing, climate change, and plastic pollution. In an effort to generate an actionable response to plastic pollution, Ocean Conservancy developed a framework in its Plastics Policy Playbook for measuring systemic challenges contributing to plastic pollution in marine environments. Ocean Conservancy created a list of 43 public- and private-sector measures associated with reduced ocean plastic to serve as the methodological basis of the framework. These measures were created by conducting a series of interviews and through desk-based research. The goal was to create a data-driven and evidence-based process that accounted for factors across the plastic value chain contributing to marine litter. The framework is intended to be used by national and local government, corporations, and NGOs and generates outcomes that are relevant to all global contributors of ocean plastic pollution.[2]

Proven Practice in Action

Seeing a dearth of measurement indicators for plastic waste, Ocean Conservancy created measures for use by a variety of stakeholders in its Plastics Policy Playbook. One of the key takeaways from the Playbook was that measures must be combined – there is not a single policy or action that will solve the ocean plastic pollution crisis.

https://youtu.be/fTfxDgOvphw

Understand the Scope of the Problem

Challenge: Before beginning a project, funders and implementors need to understand the plastic waste stream, waste management capacity, and community resources.

Opportunity: Build capacity around the baselining process and explore creative ways to capture baseline data.

The Solid Waste Index for Local Governments (SCIL) enables local governments to self-assess their current capabilities alongside key criteria needed to develop and maintain a sustainable solid waste management system.

Jump to ***Key Resources*** for more Data and Evaluation Tools.

CONTEXT

Understanding the scope of plastic pollution requires taking a whole-of-system approach to assessing the numerous sectors and factors that contribute to pollution, be it waste management systems, community practices, or consumer impacts. To create this holistic picture, large data gathering efforts may be required to characterize waste, analyze human resources, study waste collection efficiency, and evaluate the efficacy of solutions, such as policies, training, and SBC initiatives. These efforts require tools for capturing, managing, and analyzing data to ensure meaningful and accurate interpretation and application. Creating a baseline understanding of current operations will help decision makers assess efficacy of changes to the system, identify gaps, and determine where to best apply resources.

PROVEN PRACTICES

1) Use a tool like the Solid Waste Index for Local Governments (SCIL) or UN Habitat's Waste Wise Cities Tool to complete a baseline assessment of current SWM capabilities within a community. The process should be completely driven by local stakeholders to build capacity for conducting baseline assessments.

2) Tailor projects based on results of baseline assessments.

3) Use creative methods to gather data for the baseline assessments, including attaching GoPros on cars to perform community scans, mapping exercises, using citizen scientists to collect data, and integrating satellite data where possible.

4) Consider using community-based participatory research (CBPR) approaches to hear directly from the community about their perceptions of plastic pollution and what they would like to see as an outcome.

5) Identify leaders in communities that can facilitate collaboration between community members and project implementors. Leaders can encourage the community to engage in plastic pollution mitigation projects and advocate for changes to local government.

Clean Cities, Blue Ocean

https://youtu.be/XaWxQ-Uhi8I

Credit: Giulia Erika Soria / Clean Cities, Blue Ocean

Since 2019, **CCBO**, USAID's global flagship program focusing on plastic pollution, has worked to address and improve the livelihoods of individuals working in SWM and recycling sectors through testing, scaling, and sharing sustainable SWM and recycling solutions. The program focuses on preventing ocean plastics at their source by advancing waste management in urban areas. CCBO works within 10 countries in Asia, Latin America, the Caribbean, and the Pacific Islands. In order for CCBO to build capacity and improve SWM with partnering countries, the organization developed the SCIL assessment. The SCIL assessment serves as a collaborative, locally driven baselining tool that provides a framework to assess local SWM system implementation and management. The assessment process has six steps: 1) assign coordinator, 2) develop committee, 3) survey staff, 4) gather evidence, 5) compile data, and 6) report results. Assessment coordinators compile data related to six core components: robust and sustainable SWM, planning, policy and legal framework, financial management, service delivery, human resources, and community engagement.[3] The assessment provides a score, or capacity rating, that helps determine priorities for investment in 3R (Reduce, Reuse, Recycle) and SWM practices and identifies areas where capacity needs to be developed. Completing the SCIL assessment itself is also a form of capacity building. Local government officials are brought together from across agencies to complete the SCIL. Through this process, stakeholders see the role their agencies play in SWM, all while building awareness around prerequisites of a strong SWM system.

Proven Practice in Action

CCBO's SCIL assessment empowers local governments to self assess their capacity to implement robust SWM systems, building internal capacity through the assessment process itself and empowering local committees to develop their own recommendations to move forward.

→ KEY RESOURCES

Key resources on data and evaluation topics relevant to plastic pollution

EPA's Waste Reduction Model (WARM) provides estimates on impacts to greenhouse gas emission reduction, energy savings, and economic impacts of several waste management practices.

https://www.epa.gov/warm

The Waste Wise Cities tool, produced by UN Habitat, walks readers through a 7-step process for collecting data on waste management activities in controlled facilities.

https://unhabitat.org/wwc-tool

The Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection (GESAMP) promotes multi-disciplinary, scientific understanding of marine ecosystems and human activities that affect these ecosystems. The group works to ensure policies related to the marine environment are science-based.

http://www.gesamp.org/

COBSEA, in partnership with CSIRO, has prepared guidance on harmonizing marine litter monitoring strategies.

https://www.unep.org/cobsea/resources/toolkits-manuals-and-guides/regional-guidance-harmonized-national-marine-litter

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PROVEN PRACTICES

FINANCING

Credit: Melinda Donnelly / Clean Cities, Blue Ocean

INTRODUCTION

USAID and the Government of Indonesia organized the Road to G20 event in July 2022 focused on making blended finance work in the 3R/Solid Waste Management sector. Credit: Giulia Erika Soria / Clean Cities, Blue Ocean

The push for circularity is increasing in many sectors, including fashion and consumer goods, as climate change continues to accelerate and consumers demand environmentally conscious products. To scale up circularity-related projects and innovation, investors are seeking opportunities to fund projects that recirculate waste as materials back into the economy. Over two years, 10 investment firms that are partially or solely investing in circular economy have been launched, with many supported by asset managers like Goldman Sachs, BlackRock, and Credit Suisse.[4] In order for projects addressing plastic pollution to be sustainable long term, they must be financially self-sustaining. Investors are looking for modest returns and projects that are scalable and replicable.[5] Implementors should think about secondary markets for recycled plastic and determine what volume of material is needed for recycled plastic to be profitable.

When evaluating funding opportunities, investors look for a strong in-country presence from the implementors and partners. Additionally, having evidence and data to support planned approaches helps funders see the theory of change proposed. Lastly, policies and potential in-country implementors need to be aligned on plastic reduction goals. Investors are looking to see that local, provincial/state, and national level stakeholders are committed to plastic waste reduction.[6]

Jump to Case Study ▾

CASE STUDY
SEA circular

CASE STUDY
World Wide Fund for Nature Vietnam

Identify Secondary Markets and Obtain Sufficient Volume of Material

Challenge: There must be sufficient volume of recyclables and secondary markets for recycled plastic to generate income to cover costs of activities earlier in the value chain.

Opportunity: Build capacity around finding funding sources, developing secondary markets, or exploring fees for SWM.

Credit: Jon Angin and Clean Cities, Blue Ocean

CONTEXT

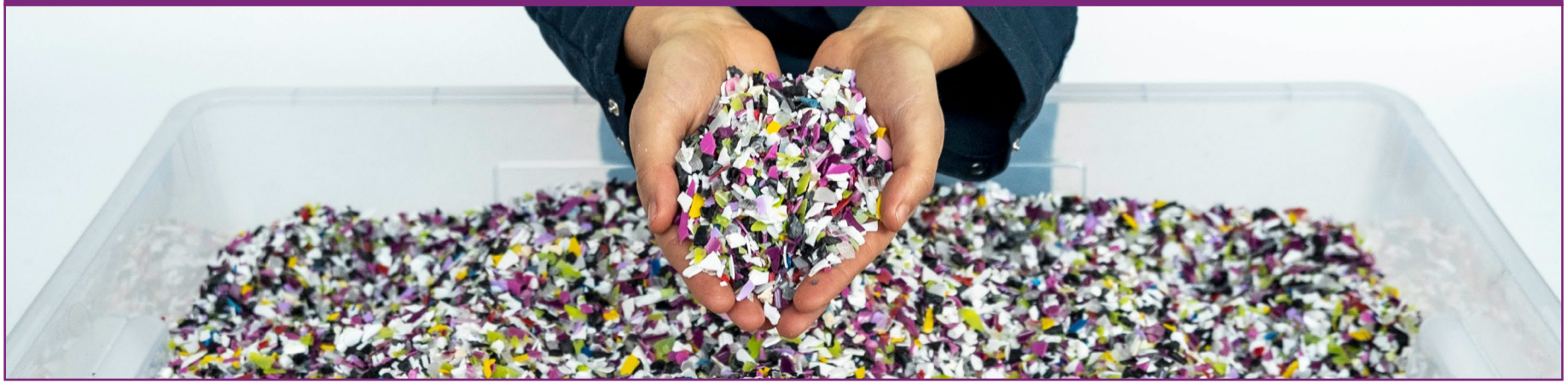
After plastic is processed in an MRF, the resulting plastic pellets can be resold, although some MRFs produce ribbons or baled plastic.[7] These pellets can be sold to local vendors who use them to make a variety of products, including films, shampoo bottles, kitchenware, and building materials. The price resellers can get for plastic pellets varies widely depending on the type of plastic and how it's processed. Prices can range from a hundred dollars to several thousand dollars per ton.[8,9] Prices for recycled plastics are affected by oil prices; as oil prices drop, virgin plastic may become more cost-effective than recycled plastic.[10] For a project to be self-sustaining, implementors need to collect enough high-quality, sorted plastic waste to cover costs incurred earlier in the value chain and make a modest profit. Costs include wages for waste pickers, fees charged by the MRF, materials (e.g., carts, trucks, buckets, PPE, uniforms, gasoline), and more. Some projects charge households a fee for waste collection which can help offset costs. In addition, there should be local secondary markets for the plastic pellets created by the MRF. This can include the industrial and manufacturing sectors, but projects can also support micro-enterprises that upcycle goods created from recycled plastic, creating secondary markets. Other types of waste (e.g., compost, metals) can also be used to generate income. Understanding

Clean Cities, Blue Ocean grantee, Soneva Namoona, collects recycleables for the secondary market in the Maldives. Credit Soneva Namoona / USAID.

secondary markets, projected volume of plastic collected, and local prices for plastic pellets are key considerations when determining whether a project will be financially feasible.

Because there are many nuances and contextual factors that need to be considered for financial assessments, there are opportunities to build and improve capacity around these financial considerations. Implementors can work with in-country partners to identify funding sources, develop secondary markets, or gauge the acceptability of a fee-for-service model of waste collection. Additionally, implementors can work with partners to create business plans and financial models.

Identify Secondary Markets and Obtain Sufficient Volume of Material *(continued)*



Credit: Precious Plastic

PROVEN PRACTICES

1) Map the local/regional value chain, including stakeholders along the chain, funding sources at each step, and metrics to be collected. Ensure a secondary market exists for recycled plastic. If there is no viable secondary market, consider projects that would create this market.

2) Develop relationships with local plastics consumers and ask what they need, what types of plastics they use, and whether they could use recycled plastics. Serve as a connection point between consumers and the plastics they need for their businesses.

3) Frame waste collection and recycling as resource recovery.

4) Conduct capacity building related to creating a business plan, conducting market analysis or financial modeling, or entrepreneurship.

5) Consider upcycling plastic into desirable goods, especially to sell in areas with a strong tourism industry (e.g., art, keychains, bags, jewelry, bricks). Instill a sense of pride and ownership in products made with recycled goods to appeal to local consumers – by buying upcycled products, individuals are supporting their community.

6) Establish material marketplaces where businesses and organizations can develop and scale reuse, recycling, and secondary market opportunities.

7) Diversify end market buyers to better navigate price volatility for plastic pellets, including buyers who are more and less sensitive to fluctuating prices.

8) Share success stories when funding is acquired so other organizations see what makes a successful proposal.

9) Conduct a cost analysis to determine prices of various types of materials and what secondary markets exist for each. Build a financial model based on this analysis that also considers fluctuations in oil prices and other potentially impactful events.

SEA circular

Credit: SEA circular

SEA circular is an initiative supported by the Government of Sweden and coordinated by UNEP and COBSEA which focuses on market-based solutions and science-based decision making for eliminating plastic pollution at the source. Specifically, SEA circular's activities focus on the lifecycle stages of 1) production of plastic products, 2) plastic use, and 3) collection and sorting of recycling to ensure that less plastic is wasted and to strategically prevent plastic litter from entering the ocean.

For its projects in Malaysia, SEA circular mapped the plastics value chain and stakeholders along the chain as part of its baselining activities.[11]

Mapping the value chain involves identifying inputs and outputs of materials and funds. Via value chain mapping, SEA circular learned that managing solid waste is subsidized by the Malaysian government. However, the financial structure of SWM is being transitioned from a publicly subsidized system to one that is more holistic (public-private partnerships, tax breaks, cross-concession trading, tipping fees, direct billing, licensing fees, and fines).[12] Additionally, Malaysia plans to give incentives and tax breaks to practitioners of 3R (reduce, reuse, and recycle) and to companies that are creating high-value solutions with high levels of technology.[13]

Credit: SEA circular

Malaysia's tax structure will reduce input costs – mapping activities, including understanding national level policies that may help or hinder plastic pollution prevention, are important to consider when assessing market viability.

Proven Practice in Action

SEA circular's mapping activities ensured the project solutions were based on real-world market conditions.

Seek Out Varied Funding Sources

Challenge: Funding is time-bound.

Opportunity: Seek opportunities to increase the longevity and sustainability of funding streams.

CCBO grantee, Plastic Credit Exchange (PCX), is empowering women in Metro Manila through their Aling Tindera pilot. Through this initiative, sari sari store owners can expand their service offerings and economic opportunities as "waste-to-cash" providers and partners in the recycling supply chain. Credit: PCX for Clean Cities, Blue Ocean

CONTEXT

Once the period of performance for a project concludes, funding resources for projects may no longer be available. For this reason, it is important that projects are designed to be self-sustaining after the funder exits, or that sustainability plans are included to identify additional funding sources for longer-term success. Ideally, the project can support its costs with income generated from resale of recycled plastic or sale of goods made with recycled plastic. However, if the project shows the potential to be profitable, but needs more time to generate a profit, other strategies can be used to acquire funds. Ideally, additional funding is not tied to government or outside investors, but rather, the process pays for itself.

PROVEN PRACTICES

1) Foster public-private partnerships to increase potential for impact and raise more capital.
2) Implement a fee-for-service model for collection of household waste. Fees will not be high enough to cover the costs of all inputs, so collection must be funded through multiple streams.
3) Develop project goals and objectives alongside funders' requirements and priorities.
4) Build capacity around grant development and proposal writing for increased likelihood of funding or to scale up or replicate projects.
5) Develop a sustainability plan that includes transition planning prior to the end of the project's current funding source.
6) Diversify funding sources to include those that have longer periods of performance, or more sustainable funding mechanisms.
7) Consider plastic credits as a source of funding.
8) Determine whether profit is sufficient to cover costs past initial period of performance. If not, seek additional funding sources.
9) Build relationships, networks, and stay connected with various stakeholders, including funders.

World Wide Fund for Nature Vietnam

To scale-up its collection and sorting intervention in Vietnam's Long An Province, **WWF Vietnam** assessed the need for a fee increase to generate cash flow. Fees can offset some of the cost of collection, but alternate funding sources may still be required, since fees need to remain affordable per household. The need for fees may be dictated by the amount and quality of the waste stream. If high-quality plastic can be diverted from the landfill, processed, and resold, this would decrease the need for fees. Additionally, if households are not used to paying for waste collection, a social marketing approach could be used to increase acceptability of fees.

Credit: Joerg Wagner / WWF Vietnam

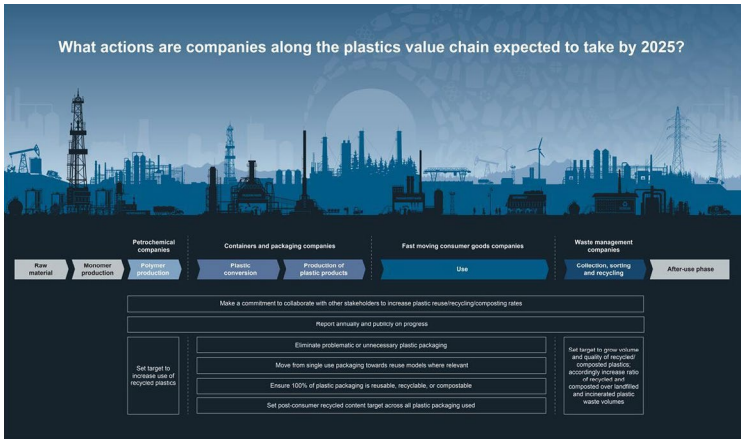
Proven Practice in Action

WWF Vietnam's assessment of a fee increase exemplifies flexibility in finding funding sources. The organization needed to adjust its business model in order to scale up the intervention and increase impact.

→ KEY RESOURCES

Plastic Pollution Prevention Financing Resource

UN Principles of for Responsible Investment, Circularity
https://www.unpri.org/sustainability-issues/environmental-social-and-governance-issues/environmental-issues/circular-economy



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CONCLUSION

Credit: WWF Vietnam

CONCLUSION

In the coming decades, circularity will be essential to restoring and maintaining a healthy balance between people and the planet. Circularity for plastics involves redesign of plastic packaging, rethinking our manufacturing systems, building recycling infrastructure and collection systems, and reducing our use of virgin plastics.[1]

Before plastic packaging is produced, packaging designers should consider ways that use of plastic can be reduced. Even better, reusable and refillable packaging, like bulk bins or metal canisters, can be used to cut down on single-use plastics.[2,3] Bio-based plastics can be made from renewable materials and designed to be composted by commercial composting facilities.[4] Single-use plastics should be reused for as long as is feasible and should then be recycled. Plastic bags can be woven into bags or mats, or recycled if infrastructure exists for recycling of soft plastics. For plastics that have reached their end of life, processing at an MRF to prepare plastic for resale and reuse will also contribute to circularity. More broadly, attitudes and behaviors around waste collection and disposal must change.

The majority of projects discussed in this guide contain SBC elements. The first step in creating a circular economy for plastics is to dispose of waste in the right place. Polices and laws to prevent littering should be implemented and enforced. In places where infrastructure necessitates multi-stream recycling, waste should be sorted to a high degree of accuracy. To support disposal, collection infrastructure must be in place to ensure plastic makes it to an MRF. Waste other than plastics (e.g., compost) that can be recirculated should also be diverted from the waste stream. Lastly, secondary markets for the reprocessed plastic must be available so the recycled plastic can reenter the market.

This guide presented proven practices for projects that aim to prevent plastic pollution. The practices detailed in this guide included how and when to engage stakeholders, how to build capacity to support SWM, how to conduct SBC around SWM, and challenges and opportunities related to implementation, collecting data on plastic diverted from the waste stream and measuring impacts, and financing. This guide should assist implementors in identifying common challenges faced by organizations working to prevent plastic pollution but should also shed light on opportunities that can be leveraged to contribute to project success.

→ CALL TO ACTION

While investment in projects that address plastic pollution have increased in the past five years with the advent of investment funds like Circulate Capital and Closed Loop Partners, additional investment is needed to keep pace with the increasing production and use of plastics in today's society.[5] Innovative funding mechanisms and partnerships can off-set the risk of investing in projects that may take more time to generate returns.[6] For stakeholders who have yet to wade into plastic pollution prevention, this guide can serve as a primer for good practices when implementing and funding projects in Southeast Asia and beyond.

In addition, this guide shows that no organization can achieve significant reductions in plastic pollution by working alone. Each project contained in this guide is a result of networks working collaboratively toward a common goal. Each stakeholder, from macro- to micro-level, has a key role to play in keeping plastics out of the environment. Including stakeholders at many levels (e.g., international to community level) also increases the likelihood that the project can be transferred to local authorities after the funding period ends, leading to sustainable change.

Without improvements to SWM and integration of circular economy approaches to reduce plastic production and prolong use, plastic waste will continue to leak into the environment. Collaboration and relationship-building are essential to successful project implementation. On a higher-level, multi-lateral, innovative approaches are needed to unite stakeholders around the globe. While this guide focused on Southeast Asia, plastic pollution is a global problem, initiated by higher-income nations. Therefore, global solutions are needed to eliminate plastic pollution.

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APPENDICES

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APPENDIX A: BACKGROUND

GLOBAL AND SOUTHEAST ASIAN CONTEXT OF PLASTIC POLLUTION AND OCEAN PLASTIC POLLUTION

Definitions:

Plastic Pollution	Accumulation of plastic waste that adversely affects wildlife, humans, and the environment; originates from land-based sources and may end up in the ocean
Ocean Plastic Pollution	Plastic waste in waterways from land-based sources that accumulates in the ocean; includes plastic waste from shipping and fishing industries

Plastics are ubiquitous in our daily lives—we eat and drink from plastic containers, live in homes built with plastics, and use them to keep us safe as we travel in cars, bikes and motorcycles.[1] The ubiquity of plastics translated into 367 million metric tons of plastic produced globally in 2020.[2] But the pervasiveness of plastic, especially the production and proliferation of single-use products, and inadequate collection and disposal have led to a build-up of plastic waste that persists in the environment.[3] Plastic disposed of on land often makes its way to the marine environment with an estimated 80% of ocean plastic pollution stemming from land-based sources, largely as a result of insufficient SWM via dump sites, polluted beaches, ship yards, and recreational and commercial use of coasts.[4] The remaining 20% of ocean plastic pollution originates from sea-based sources, such as fishing gear, shipping activities, and dumping.[5]

Plastics in the environment threaten not only ecological systems, but also human health, community wellbeing, and the environment's intrinsic right to be free of human-produced waste. In addition, ocean plastic pollution impacts local economies that rely on aquatic ecosystems for livelihood, either through fisheries or tourism. UNEP estimated that in 2014, the overall economic costs of ocean plastic pollution are around $13 billion US dollars per year.[6] More recent reports estimate that damage to marine economies from ocean plastic pollution is $10.8 billion in the Asia-Pacific region alone.[7]

Leakage of plastic from land into the marine environment occurs most commonly via uncontrolled landfills, informal waste dumps, open burning, littering, and leakage during collection.[8] This plastic waste enters rivers and waterways flowing to the ocean, carried by runoff, winds, and gravity.[5] Intense storms can exacerbate leakage of waste into the environment and will increase in frequency and severity as a result of climate change.[9] This, coupled with high amounts of inadequately disposed plastic waste, has resulted in a proliferation of plastic pollution in Southeast Asia.

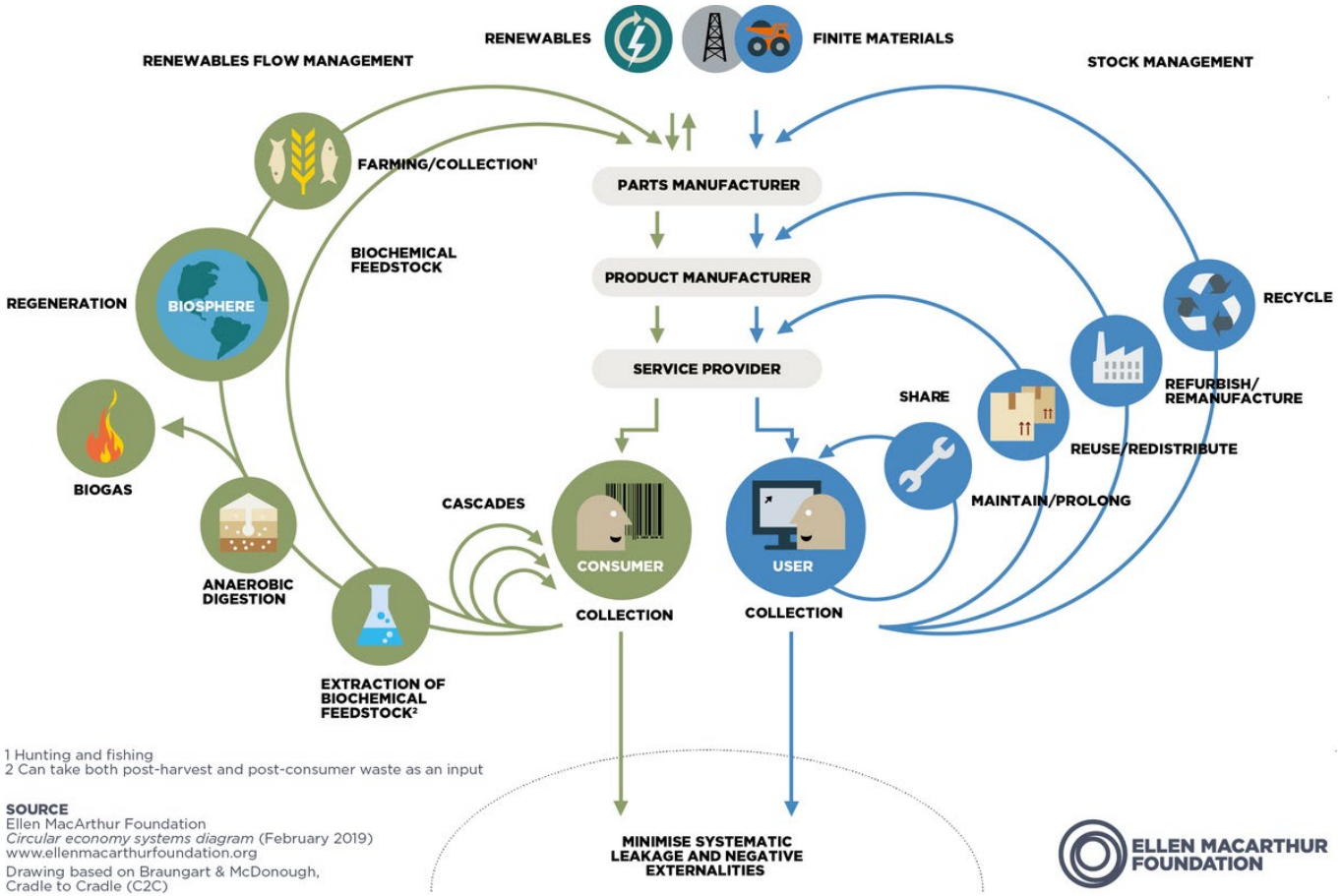
While the Asia-Pacific region bears the brunt of economic damage due to ocean plastic pollution, the US was the top generator of plastic waste in 2016 and is the second largest exporter of plastic scrap. In addition to leakage from domestic waste mismanagement, between 0.14 and 0.41 metric tons of plastic waste in the US are illegally dumped and another 0.15 to 0.99 metric tons of waste is inadequately managed in countries that imported US waste for recycling.[10]

Plastic waste is a resource that can be re-circulated into the economy, generating more value from material that would otherwise be landfilled or released into the environment. The principles of circular economy, as stated by the Ellen MacArthur Foundation, are to 1) eliminate waste and pollution, 2) circulate products and materials, and 3) regenerate nature.[11] A circular economy approach aims to move away from the linear model of "take-make-waste" to a systems-focused approach which reduces material use, redesigns materials to be less resource intensive, and recaptures waste as a resource to manufacture new materials and products. Not only does this circularity facilitate reuse of end-of-life plastic products and reduce waste, but it also generates secondary markets for these materials.

The circular economy encourages intentional design to eliminate pollution and plastic waste. Companies have begun selling items without packaging (e.g., soaps and bath products) or have developed innovative ways to reduce the amount of plastic used.[12,13] To achieve the second principle of circular economy, the lifespan of materials is extended via maintenance, reuse, refurbishment, or recycling.

Recycling is used as a last resort if materials cannot be recirculated at a higher value (e.g., reusing a large rice container to store other items, rather than tossing it in the recycling bin).[14] Lastly, circular economy stresses the importance of regenerative practices to enable movement toward a waste-free environment by returning biological capital (e.g., compost, manure) back to the food and agricultural system, rather than sending it to a landfill.[15,16] To achieve the first objective of circular economy, individuals and communities must improve their stewardship of the local environment and recognize resources as valuable beyond a single use.

THE BIOLOGICAL AND TECHNICAL CYCLES OF THE CIRCULAR ECONOMY.



IMPACTS OF PLASTIC POLLUTION

Ocean plastic pollution ranges in size and scope and can include everything from barrels, bottles, and bags, to tiny micro- and nano-plastic particles. Larger plastic litter poses risks to marine life through entanglement, ingestion, and interaction, or contact with plastic that can result in abrasions. Ocean plastic pollution also damages physical marine ecosystems, such as coral colonies, which can be smothered by plastic bags.[17,18] Smaller plastics, called microplastics, can be ingested by marine life, accumulating in the aquatic food web over time.[1,18] This bioaccumulation of plastic has the potential to impact human health. Researchers have identified consumption of microplastics via food "unavoidable" and health impacts may be increased in fishing communities and coastal areas that regularly consume seafood and marine mammals.[19,20] Despite the high prevalence of plastic in the food we eat and water we drink, links to adverse health effects are largely unknown.

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Credit: Martine Perret / UN

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APPENDIX B: METHODS

KEY INFORMANT INTERVIEWS

The research team conducted a series of key informant interviews with a subset of organizations and programs working to mitigate plastic pollution in Southeast Asia, ranging from multi-national environmental conservation or advocacy groups to local NGOs. US EPA and COBSEA provided and prioritized an initial list of potential stakeholder organizations. From this list, the research team began recruiting interviewees to inform the guide. In early 2022, US EPA, COBSEA, and Battelle's Institutional Review Board (IRB) began initiating recruitment to select stakeholders. Researchers utilized a snowball recruitment process, where initial interviewees were asked to refer organizations that could speak to plastic pollution mitigation projects in Southeast Asia and offer additional input on potential good practices. A total of 11 organizations and programs participated in this information gathering stage.

In preparation for the interviews, the research team conducted desk research on each stakeholder to inform the development of tailored interview guides. In addition, COBSEA's and US EPA's previously compiled good practice criteria for activities that mitigate plastic pollution served as the foundation of the interview. The criteria were used to identify projects aiming to mitigate plastic pollution and should be replicable, socio-economically inclusive, market viable, and sustainable over time.

GOOD PRACTICE CRITERIA FOR PROJECTS THAT MITIGATE MARINE LITTER, DEVELOPED BY US EPA AND COBSEA

** The term "marine litter" is used in COBSEA's original criteria. Often used interchangeably with "marine debris" or "ocean plastic pollution," addressing marine litter includes prevention and reduction of plastic pollution upstream, in addition to removing litter from marine environments.*

1	Country and locally driven process, linked to existing processes and national, municipal, city strategies and measures (e.g., inclusion of priority sectors and social, environmental, and economic development goals)
2	Commitment among political leadership (e.g., mayors)
3	Coordination across different key ministries and agencies (e.g., finance, environment) with clear mandates and dedicated resources available and mobilized
4	Involvement of stakeholders and partners across sectors (e.g., the private sector and civil society) and an aim to build consensus amongst them
5	Long-term vision combined with clear definition of short and medium-term policy goals, targets, and underlying measures, which are documented in an implementation strategy or plan
6	Aims to achieve significant environmental impact toward reduction and prevention of marine litter;* includes prioritizing solutions at the top of the waste hierarchy, consideration of risks and adverse effects, and clear tracking and quantification of impacts against a baseline
7	Consideration of economic viability based on sound business models (including consideration of an exit strategy), clear indications of cost, and identification of sustainable funding sources, long-term funding, or incentives for investments
8	Consideration of social and economic impacts, risks and benefits, including consideration of human rights of vulnerable groups, potential livelihood opportunities, and effective participation mechanisms
9	Balance of different interventions as needed, such as economic incentives, capacity building measures, information systems and technology development and use
10	Evidence-based action, using reliable data and information (e.g., waste or material flow analyses, assessment of waste leakage hotspots, marine litter monitoring) and feasibility analysis based on local context, impact potential, costs and benefits, gaps and needs
11	Dynamic process, including mechanisms for periodic review, stakeholder feedback, adjustment and reporting
12	Evidence of peer-to-peer knowledge exchange and learning

KEY INFORMANT INTERVIEWS *(CONTINUED)*

During the interviews, the research team asked participants to provide information on:

- Background on their organization or program
- Specific projects identified during initial desk research
- Stakeholders involved in each project
- Activities perceived as good practice that contributed to successful implementation
- Barriers interviewees may have encountered during their projects
- Impacts of projects
- Additional resources relevant to their project
- Other organizations they recommended that could speak to good practices for plastic pollution mitigation in Southeast Asia

In addition to formal interviews, the research team held a series of informal conversations with other selected organizations. The purpose of these conversations was to learn more about the activities of the organization and to gain context about plastic pollution in the region.[1]

STAKEHOLDER MAPPING

To conduct the mapping exercise (see ***Appendix D***), the research team used data from interviews to make a comprehensive list of individuals and groups who participated in activities highlighted by interviewees. The research team conducted desk research to collect details on projects, and followed up with interviewees for additional information. Once the list was populated with stakeholder names and their contributions, these stakeholders were grouped by programming level (e.g., international, national, city) and categories (e.g., private sector, academia). Finally, the activities undertaken by each stakeholder were categorized using the proven practice areas—stakeholder engagement, capacity building, implementation, social and behavior change, data and evaluation, and financing. After completing the stakeholder list, the research team identified overarching trends and gaps and discussed using the lens of the proven practice areas.

DATA ANALYSIS

Following completion of the majority of interviews, the research team commenced analysis of the qualitative data gathered and continued analysis beyond the completion of all interviews. The research team followed an iterative approach to data gathering and analysis, synthesizing data as the interviews progressed and identifying gaps and areas for further exploration. Analysis included individual review and color-coding of interview notes into broad codes, with each interview coded for potential good practices for consideration, stakeholders, challenges, areas of future growth, and other notable highlights from the interview results. After completing individual coding, the research team utilized a collaborative mapping technique via virtual white board to organize, categorize, and visualize information across interviews into emerging themes. The research team conducted additional desk research to fill in any remaining gaps from the interviews and to provide broader context regarding the themes and resultant good practices.

[1] Battelle's IRB reviewed all interview guides to ensure that the rights of the interviewees were protected. For participants based in the EU, the research team ensured interview guides complied with the General Data Protection Regulation (GDPR). The key informant interviews were designated as exempt from federal regulation for the protection of human subjects by Battelle IRB because they posed minimal risk to interviewees.

APPENDIX C: LIMITATIONS

While the development of this guide is based on evidence gleaned from key informant interviews and supplemental desk research, there are limitations to the information presented in this guide. Firstly, while ocean plastic pollution is a global issue, the geographic focus of this guide is the Southeast Asia region, with the exception of one interviewee whose activities were based in India. The developers of this guide chose to focus on Southeast Asia because it has been identified as a hot spot for plastic pollution, specifically, and significant investment and activity has taken place throughout the region to address this issue.[1] Given this, the good practices described in this guide build upon the lessons learned from select implementors in the region, which can also be applied to other regions and contexts. While interviewees overwhelmingly expressed the need to tailor projects to local conditions, the proven practices provided here are sufficiently broad to be applied across various sites and countries.

Secondly, while the approach utilized in the development of this guide allowed for a series of key informant interviews, the number and breadth of organizations included was limited due to various factors. Therefore, this guide focused primarily on project implementation and does not include the perspective of all stakeholder categories critical to the successful planning, implementation and funding for the projects described in this guide. While interviews did not include the perspective of large, multinational corporations, informational conversations did provide insight on private funding mechanisms and models. Other programs, like CCBO and GIZ, receive government funding, and these perspectives showed that governments vary in the flexibility of their funding mechanisms. The team did aim to interview a plastic producer for this guide; however, this was not completed due to time and schedule constraints. Additionally, individuals representing the private sector were not interviewed, which is another gap in the institutional breadth of this guide.

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APPENDIX D: STAKEHOLDER ACTIVITIES CONDUCTED ACROSS THE SIX PROVEN PRACTICE MODULES

STAKEHOLDER MAPPING

As emphasized in the ***Stakeholder Engagement proven practice module***, collaboration with and across diverse groups of stakeholders is essential for implementing successful solutions to address plastic pollution. However, it may be difficult to identify these groups or to gauge their levels of influence or interest in participating in a project. Additionally, the diversity of regulatory frameworks across countries and unique cultural contexts require each project to apply a thoughtful approach for identifying and engaging stakeholders, as there is no "one size fits all" approach. Importantly, non-traditional stakeholders like the informal waste sector and civil society organizations cannot be treated as a monolith, as each group within these sectors has varying interests and influences and each should be included in stakeholder engagement activities.

Stakeholder mapping involves identifying organizations or individuals who may be interested in or affected by a project or policy, describing their level of interest and potential to influence project or policy outcomes. In some instances, additional steps may be taken to "map" relationships between various stakeholder groups. There are several benefits to conducting stakeholder mapping or another form of analysis prior to project implementation. These benefits include 1) creating a list of collaborators or influencers who may contribute to project success or may inhibit project progress, 2) understanding the appropriate level of involvement for each stakeholder, and 3) identifying strengths and capacities across stakeholders to determine who and how to engage for successful project implementation.

There are multiple ways to conduct a stakeholder mapping exercise.[1] Before conducting stakeholder mapping, project implementors should keep in mind the resources available to them, the cultural context of where the project will be executed, and most importantly, the goals or metrics for successful project implementation. Questions to consider may include:

- Which aspect of the plastic value chain will the solution aim to address?
- Who are the key individuals and groups that are responsible for, affected by, or interested in the issue of plastic pollution?
  - Are they in a regulatory position (e.g., government)?
  - Does their business stand to benefit from the project (e.g., private sector)?
- How can the current work of these groups be leveraged for or benefit from the project's goals?
- What is the right level of engagement for each of the groups?
- What resources will be needed for meaningful engagement?

By asking these questions, implementors can have a better understanding of the stakeholders who they may want to involve, at what stage or level of the project, and what resources are needed to begin coordinating engagement. The results of this exercise may vary depending on project resources and needs. Mapping could be as simple as a list of interested organizations or individuals, or a more comprehensive matrix of what strengths each stakeholder could bring to the project.

[1] *For a description of how the stakeholder mapping was conducted for this guide, see* ***Appendix B: Methods***.

Credit: PZC for Clean Cities Blue Ocean

ILLUSTRATIVE EXAMPLE: MAPPING ACTIVITIES CONDUCTED

Ideally, stakeholder mapping is accomplished before project implementation. However, the mapping exercise in this section was done after the interviews conducted by the research team. For this exercise, stakeholders were identified during interviews, grouped into categories, and their contributions and activities were described using the lens of the six proven practice areas. The ***resulting map*** provides a summarized snapshot of this exercise, and the following section provides names for those stakeholders and details about their specific contributions to each project.

In this map, the stakeholders are grouped into categories (e.g., national government, private sector, NGOs, informal sector) and the colored dots across the six implementation areas depict which stakeholders led which activities. For example, academia and research institutions oversaw implementation as well as data and measurement activities while nonprofits led stakeholder engagement and capacity building activities. Other stakeholders mentioned by interviewees included country governments at various levels, foreign national-level governments, the private sector, NGOs, unions, the informal sector, and individuals.[2]

→ KEY RESOURCES

Collaboration mapping, developed by USAID is another approach to stakeholder mapping.

https://usaidlearninglab.org/resources/collaboration-mapping

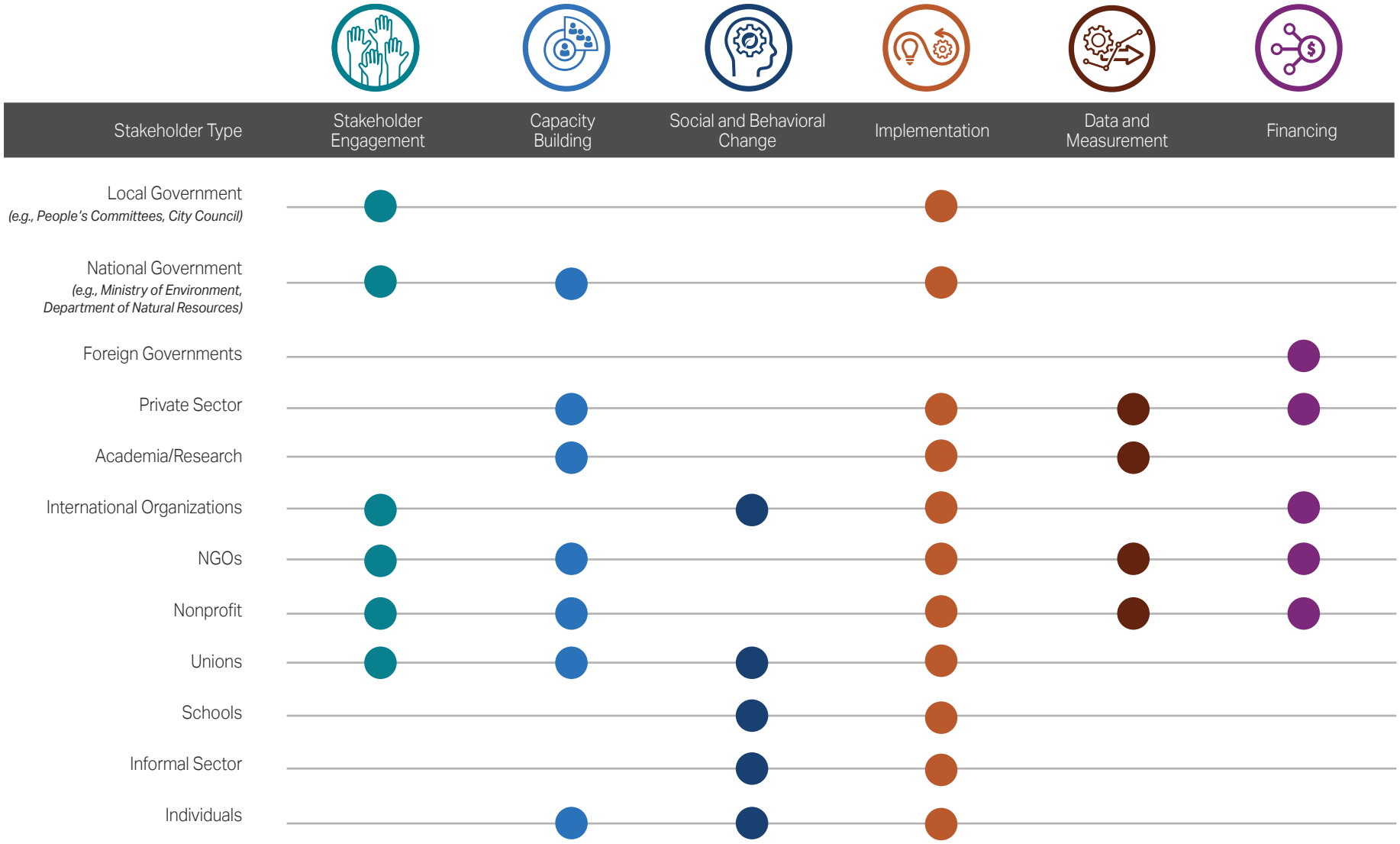
The Practical Guide for Stakeholder's Mapping explains the process of stakeholder mapping and provides examples of chain map diagrams.

http://www.interreg-danube.eu/uploads/media/approved_project_public/0001/44/51de32f74aec5465eb6a9d44b845250282a29a0a.pdf

The Public-Private Dialogue Stakeholder Mapping Toolkit from the World Bank uses net-map diagrams to show stakeholder relationships.

https://documents1.worldbank.org/curated/en/842721467995900796/pdf/106395-WP-PUBLIC-PPD-Stakeholder-Mapping-Toolkit-2016.pdf

MAP OF STAKEHOLDER ACTIVITIES CONDUCTED



For stakeholder names that were collected for the mapping exercise and their contributions across the six implementation areas, see page 87 of the Appendix.

STAKEHOLDER ACTIVITIES ACROSS THE SIX PROVEN PRACTICE MODULES

STAKEHOLDER ENGAGEMENT

Government entities, NGOs, and nonprofit organizations connected project implementors to networks of interested stakeholders within countries, at the regional level, and across the globe. National government entities such as the Ministry of Environment and Water (KASA) of Malaysia served as a connection to other relevant government stakeholders, such as the Maritime Institute of Malaysia (MIMA) which collaborated during project implementation. Non-governmental entities and nonprofits served as connectors to larger stakeholder networks like USAID, Resilient Cities Network, and WIEGO. Locally, NGOs like MCD in Vietnam allocated funding and assisted with project implementation on behalf of Ocean Conservancy. In the Philippines, Catholic Relief Services were gatekeepers to community-level stakeholders and were already trusted in the country for their work.

CAPACITY BUILDING

Project implementors collaborated with government and NGOs to conduct capacity building activities focused on training and building awareness for improved waste management. In other cases, capacity building focused on providing or strengthening physical waste management infrastructure. For example WWF Vietnam, Ocean Conservancy, MCD, and Alliance to End Plastic Waste purchased waste collection materials and equipment, improved capacity of waste processing facilities, and developed recovery technology for river waste across their projects. To do this, WWF Vietnam partnered with the Urban Environment Company (URENCO), who was responsible for waste management at the city level. Ocean Conservancy partnered with MCD, who oversaw the installation and monitoring of trash traps used to collect waste in rivers. CCBO gained support from the Philippines Technical Education and Skills Development Authority (TESDA), who institutionalized SWM trainings and other curriculum for the Women in Waste's Economic Empowerment program.

IMPLEMENTATION

Government stakeholders at the national, provincial, and city levels played an important role in successful project and policy implementation. For example, in Vietnam, the Ministry of Natural Resources and the Environment (MONRE) develops national waste management policy, which the provincial Department of Natural Resources (DONRE) are tasked with implementing and enforcing at the sub-national level. MONRE and DONRE worked with WWF Vietnam, and People Committees at the ward and district levels to support training for household waste separation to support stated policies. In the Philippines, CCBO also funds activities that support national policy and plans through grants to locally-led NGOs, such as the Plastic Credit Exchange and EcoWaste Coalition. SEA circular conducted two pilot projects in Malaysia in collaboration with the Penang Green Council, the Petaling Jaya City Council, and the private sector. With support from Nestle Malaysia, the projects sought to improve source waste segregation and door-to-door collection of recyclables.

SOCIAL AND BEHAVIOR CHANGE

Nearly all stakeholders incorporated social and behavior change approaches in their implementation plans, as described in the illustrative examples in this section. These approaches included awareness building and influencing perceptions and actions around waste management. Some project implementors used gender-specific interventions to affect social and cultural norms around who collects and recycles waste. Local and international NGOs collaborated with civil society organizations like the Vietnam Women's Union to reach and engage women waste pickers, who represent a significant percentage of independent waste collectors and street waste pickers.[1] Ocean Conservancy partnered with the Center for Environment and Community Research (CECR), a women-led network of NGOs in Vietnam, to highlight the role of women in the plastic value chain as part of the ASPIRe Project.[2] In the Philippines, CCBO works with grantee, Project Zacchaeus, to equip waste pickers with uniforms that provide personal protection, reduce stigma faced by community members, and position them as community leaders that can promote more sustainable waste practices amongst households. In India, Hasiru Dala worked with the Bengaluru Municipality (BBMP) to issue occupational identity cards for waste pickers.[3]

STAKEHOLDER ACTIVITIES ACROSS THE SIX PROVEN PRACTICE MODULES *(CONTINUED)*

DATA AND EVALUATION

Research networks, academic institutions, and nonprofits provided project implementors with data and tools for monitoring waste leakage, and some contributed to data collection activities. Closing the Loop collaborated with several research entities within and external to project countries to conduct their baseline assessments. These research entities included the Institute for Good Environmental Strategies (IGES), the International Union for Conservation of Nature, Japan Space Systems, University of Leeds, who provided a Plastic Pollution Calculator, and Mahidol University International College (MUIC), which helped with data collection in Thailand.[4] The SEA circular project leveraged the Waste Wise Cities Tool—created by UN Habitat and the Global Partnership on Marine Litter (GPML)—and were able to secure UN Habitat's support for conducting waste leakage and city-level surveys. Alliance to End Plastic Waste collaborated with SYSTEMIQ to scale up Project STOP, an initiative to scale up circular economy solutions in Southeast Asia.

FINANCING

Funding for projects came from a mixture of private sector, government, and NGO stakeholders. Corporate funders, like Nestle and the Coca-Cola Foundation, signed memoranda of understanding (MOUs) with CCBO to support SWM efforts through in-kind and capital investments in the Philippines. In Indonesia, TK Maxx funded two Shruder Machines for Plastic Collective's 'Shruder workshop'. More commonly, the project implementors had access to funding through financial networks like the ASEAN Fund and World Bank Group. Additionally, international government entities funded projects. Most notably, USAID supports the CCBO program, and the Government of Sweden has supported SEA circular's work. GIZ's Rethinking Plastics project is supported by Germany's Ministry of Economic Cooperation and Development (BMZ) and Plastic Collective's activities in Indonesia were supported by the Australian Consulate.

WASTE PICKERS AND OTHER NON-TRADITIONAL STAKEHOLDERS

Waste pickers make up a large portion of the waste economy in Southeast Asia, and therefore played a significant role in all of the highlighted projects. Waste pickers participated in baseline studies for Closing the Loop, which helped implementors understand the extent of waste management services and where to focus project interventions. Other projects engaged with waste pickers to conduct educational training to implement new waste segregation at source practices. Other organizations, such as Hasiru Dala, explicitly made recognition of waste pickers as contributors to the SWM system an objective of their activities. Waste pickers and informal junk shops play critical roles in the plastics value chain. Without inclusion of these stakeholders, projects aiming to implement circular economy approaches would likely be unsuccessful. Key district and ward officers, youth unions, women unions, other mass organizations, and individual community members also participated in projects by completing educational workshops, volunteering for awareness building campaigns, and participating in pilot projects such as WWF Vietnam's household waste segregation project. These stakeholders were important for mobilizing project participation within their communities and will be important for project sustainability over the long-term.

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Credit: MCD Vietnam

APPENDIX E: PROVEN PRACTICES AT A GLANCE

PROVEN PRACTICES AT A GLANCE

STAKEHOLDER ENGAGEMENT

Identify and engage with the appropriate range of stakeholders

- Conduct stakeholder mapping or another form of stakeholder analysis to understand which players should be invited to the table, as well as when and how to appropriately engage them during the project.
- If there are knowledge gaps, conduct training on how to do stakeholder mapping or other forms of stakeholder analysis, fundamentals of stakeholder engagement, conflict resolution, and consensus-based decision-making for more meaningful engagement.
- Engage stakeholders early and throughout the project.
- Identify and leverage partners who have established and trusted relationships with the community.
- Gather stakeholders from across governance levels and sectors (e.g., waste management responsibilities may be spread across ministries) and consider establishing interagency partnerships or councils for long-term collaboration.
- Ensure diversity, equity, and social inclusion in stakeholder engagement efforts (e.g., engage the informal sector, indigenous groups, and women) and allow for representation from all groups affected by changes to waste management policies and practices.
- Ensure the project plan allows sufficient time and resources to delineate and achieve consensus around each stakeholder's role and responsibilities.
- Allocate funds and trained staff for stakeholder coordination.
- Consider public-private partnerships to support projects.

Establish meaningful and lasting engagement

- Delineate roles and responsibilities of each stakeholder based on their relevance to various activities or phases of the project.
- Determine what level and type of engagement is appropriate for each stakeholder based on their anticipated roles and responsibilities and ensure that aligns with stakeholders' desired level of effort.
- Communicate expectations and requests clearly.
- Follow up with stakeholders to share how their input was used; if it wasn't used, explain why. Don't overcommit to incorporating stakeholder input.
- Strive to convene stakeholders around action-oriented activities that move the project forward (e.g., data review, policy change). If more passive engagement is appropriate, consider a newsletter to provide updates.
- Consider establishing an external advisory group to provide unbiased feedback.
- Form stakeholder groups around tasks or topic areas to distribute leadership and promote ownership of activities (e.g., a training group, a group that liaises with the informal sector).
- Identify gatekeepers, champions, or influencers who can serve as public-facing ambassadors or project spokespeople.

PROVEN PRACTICES AT A GLANCE

CAPACITY BUILDING

Acknowledge gaps may exist in waste management infrastructure

- Research and understand the existing regulatory requirements/policy landscape regarding SWM.
- Consider making site visits across the waste management chain (e.g., landfills, MRFs) to understand existing workflows and needs regarding how waste is collected, sorted and cleaned. This may include addressing other higher priority needs such as electricity provision, reliability of electricity, water infrastructure, and sanitation prior to improving MRFs.
- Improving MRFs should include a mixture of updating technology as well as increasing capacity and types of materials able to be processed while still maintaining a hand-sorting component.
- If interest and workforce are strong, but infrastructure is lacking, consider investing in equipment and conducting training on proper use and maintenance.
- If household sorting is part of the project, consider purchasing buckets, carts, bins, or other materials needed by households, collectors, and transporters that are appropriate for the task and culturally relevant to the local community.
- Consider investments in SWM infrastructure outside of recycling (e.g., waste transfer stations, appropriate bins and trucks, landfills, composting).
- Identify needs and opportunities for improvement of the current SWM infrastructure (e.g., conduct waste characterization to better understand gaps in sorting and collection).
- Consider the human-centric element of SWM infrastructure when determining funding levels and sources (e.g., some funders may be more interested in funding equipment rather than training, or vice versa).
- Incorporate pay-as-you-throw programs or taxes, bundling waste management fees into utility services, or partner with international investment organizations to sustainably fund SWM operations.

Recognize knowledge gaps may exist in waste management subject matter expertise

- Ensure waste pickers are paid a fair wage, and provide means for savings (e.g., facilitating the establishment of bank accounts). Ensure children are not used for labor.
- Safety and wellbeing of pickers is paramount—waste pickers should receive proper health and safety training and personal protective equipment (PPE) and if waste is unsafe to sort/recycle (e.g., anything with potential pathogens), it should go to a landfill or proper disposal site.
- Any equipment purchases should be combined with training for staff on the proper use, maintenance, and repair of equipment as well as guidance on where to find replacement parts or professional servicing, if needed.
- Waste pickers may not have bandwidth to participate in clean-up activities; utilize volunteers or hire more pickers for sustained activities that require skilled, trained staff.
- Provide entrepreneurship training for local artisans and vendors on how to work with, acquire, and market goods made from recycled plastics.
- Use local engineers and designers to tailor interventions to meet local needs and enable easier maintenance.
- Use local residents for as many parts of the project as possible (project management roles, stakeholder engagement experts, evaluators).
- Establish permanent classes/accreditation that can continue to be sought after the project ends.
- Gauge capacity along the plastics value chain and design the project to improve and build capacity where it is most needed.
- Involve provincial and city level officials charged with SWM into capacity building activities for their expertise.
- Modify capacity building activities to fit the baseline knowledge of SWM in a particular project site.

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CAPACITY BUILDING

Develop and hold trainings to share knowledge and facilitate project sustainability

Pre-training

- Conduct a needs assessment to determine what topics should be covered in trainings.
- Define the learning goals and objectives clearly before the training and share these with trainees at the opening of the training.
- Make sure to include the "why" in training materials. The "why" should answer the question, "why is this important?"
- Design trainings with learning styles in mind, incorporating applied, interactive methods to keep participants engaged and increase recall of training concepts.
- Acknowledge that in-person trainings can be more valuable than virtual (e.g., communities might not have access to technology for virtual trainings like virtual meeting platforms or stable wi-fi).
- Create an evaluation plan for trainings with performance metrics.

Good Training Experience

- Ensure trainings are available in languages and dialects spoken in the community, beyond the predominant language, as well as varying literacy levels, if needed.
- Offer trainings at times that are convenient for those attending (e.g., evening or weekends). Consider offering childcare, if needed.
- Provide food and refreshments at training.
- Provide a certificate to trainees.

Materials

- Develop materials that attendees can take with them and refer to later (e.g., materials that attendees can access online or on their phones).
- Consider short video trainings that can be rewatched and shared, especially on social media.
- Incorporate polling or check-ins throughout training to gauge knowledge levels and drive engagement.

Post-Training

- Evaluate training for future improvements.
- Train trainers to ultimately step-down training and become local experts and leaders. Build a network of trainers to learn from each other.
- Consider follow-up activities and monitoring to ensure trainees are using concepts learned during trainings. There may be opportunities to do re-trainings or re-certifications.
- Collect contact information of the training class and create a WhatsApp group to keep communication open and share learnings.

PROVEN PRACTICES AT A GLANCE

IMPLEMENTATION

Explore secondary markets for recycled plastics

- Recognize the importance of conducting a waste characterization.
  a. Prior to implementation, research: 1) the types of plastic most prevalent in the area and, 2) secondary markets.
  b. If some types of plastics (e.g., plastic bags) are hard to recycle, and, therefore, do not have a clear secondary market, consider the feasibility of promoting a ban (e.g., a plastic bag ban) or providing incentives for viable alternatives.
- Devise a plan for removing the most toxic plastics out of the waste stream first, when possible.
- Acknowledge that each marine entry point for plastic waste has unique geography, people, and challenges. If conducting a small-scale project, work to understand the nuances for each entry point. For bigger projects, consider using citizen scientists to collect information on entry points.
- Look for ways to make the waste stream cleaner so less cleaning needs to be accomplished at the MRF.
- If water contains cleaning chemicals, develop a plan to process the water and safely return to waterways.

Harness technology

- Collaborate with universities and research institutes to leverage their expertise.
- Build additional capacity in plastics science, monitoring and evaluation, chemistry, SWM, data analysis, modeling, and more at local universities and, when possible, prioritize collaboration with local entities as there is a co-benefit of understanding local context.
- Allow for funding mechanisms to support innovative technology and riskier ventures that have shown valid proof-of-concept.
- Consider allocating funds to local start-ups with innovative ideas, if funding mechanisms can tolerate more risk.

Leverage government involvement to drive momentum

- Conduct a policy analysis to understand the existing regulatory landscape. Additionally, identify legislation or national priorities that could support or hinder progress toward preventing plastic pollution.
- If a NAP is in existence or under development, project goals and objectives should adhere to or otherwise complement the NAP. If no NAP exists, consider focusing project efforts on seeking partnerships and buy-in to encourage the development of a NAP.
- In general, projects should align with broader sustainable development goals and objectives, or other sectoral policies and regulations at the appropriate scale of governance.
- Consider a demonstrated commitment to reducing plastic pollution on the national level as part of evaluation criteria for funding.

Deploy diverse project monitoring methods

- Identify the theory of change for the project. The theory of change states the desired outcomes of the project and the pathways to achieve them.
- Conduct a literature review or other research to ascertain proven practices for monitoring and evaluation of activities/actions of SWM projects.
- Establish performance indicators and a plan for monitoring prior to project start. Ensure the project team is accountable for collecting monitoring data.
- Monitoring objectives should be SMART (specific, measurable, attainable, relevant, time-based), as relevant.
- Funders should allocate sufficient resources for monitoring activities.
- Harness citizen science to collect monitoring data.
- Consider which data sources are needed to monitor the project.
- Conduct field observations to ensure monitoring data are being collected accurately or that project activities are being carried out as intended.
- Perform quality control on sorted materials to ensure waste is sorted properly. Observe MRF staff and/or waste collectors to determine if re-training is needed.
- Encourage community members to participate in data collection by conducting training on the importance of citizen science approaches.

PROVEN PRACTICES AT A GLANCE

SOCIAL AND BEHAVIOR CHANGE

Consider sociocultural waste disposal practices

- Consider anthropological approaches to learn about waste management practices in the community.
- Have someone who is knowledgeable about cultural practices around SWM on your team to ensure all steps in the project cycle are appropriate for the context.
- Project activities should also be culturally tailored to subpopulations, ethnic minorities, or other populations of interest in the project area.
- Ensure materials used in engagement are tailored to community literacy level, relevant languages are used, and images are thoughtfully selected.

Address barriers to women's participation

- Consider conducting formative research to understand the role of women and other subpopulations of interest in the SWM sector, and more broadly in the sociocultural context.
- Provide women with economic opportunities and training to encourage participation in the circular economy.
- Ensure women are in leadership and decision-making positions at all levels of the project.
- Funders should consider including criteria to promote diversity, equity, and inclusion across projects.

Conduct SBC around waste disposal practices

- Conduct formative research to understand how the community disposes of waste and perceptions, behaviors, knowledge, and attitudes around waste disposal. Incorporate behavior change theory into project design, implementation, and evaluation.
- Ensure the project and intervention design have theoretical grounding and the theory of change is communicated to and understood by all project staff.
- Conduct pilot testing to ensure feasibility of SBC interventions and to understand nuances of suggested behavior change approach in context.
- Frame waste collection as resource recovery via education and awareness-building—always answer 'why' the behavior change is needed.
- Consider putting in place social or financial penalties for improper sorting (e.g., fee or red button on door). SBC interventions need to be enforced by the community to be successful.
- Consider environmental education in schools as an approach to SBC and teach citizen science approaches to foster a sense of stewardship of the environment. Children may talk to their parents about what they learned in school.

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PROVEN PRACTICES AT A GLANCE

SOCIAL AND BEHAVIOR CHANGE

Build momentum

- Create a communications plan that incorporates traditional media and other partners who could spread the message and disseminate information. Additionally, create a specific strategy for social media to maximize project exposure.
- Use social media to spread awareness of plastic pollution, advertise events, communicate about litter hotspots, highlight global news regarding plastic pollution, and more.
- To magnify impact, proactively establish relationships with other organizations working in similar realms (environmental NGOs, waste management organizations, etc.) or in media (radio DJs, artists, journalists, TV stations) to collectively engage the public.
- Incorporate funding criteria that require the development and dissemination of case studies and stories of successful behavior change activities for the benefit of future projects.
- Consider having a trusted spokesperson, community leader, or public figure be an ambassador of your message.
- Allocate funding toward organizations that support youth and underrepresented groups in environmental education and environmental action.
- If you make a request in your social media posts, write clearly and directly what you are asking for (e.g., volunteers, monetary donations, food).
- Beach clean-ups raise awareness of plastic pollution but should be accompanied by interventions that lead to sustainable, lasting change through mitigation efforts.
- Use behavior change theory to craft messages, e.g., connect the broader issue of plastic pollution to individuals' personal waste disposal practices.
- Consider including partners in the arts and informal education venues (e.g., museums, libraries) as an opportunity to understand and influence local culture.

Credit: Giulia Erika Soria / Clean Cities, Blue Ocean

PROVEN PRACTICES AT A GLANCE

DATA AND EVALUATION

Measure project efficacy

- Explore case studies and methodologies for measuring impacts for projects designed to divert waste.
- Measure the amount of plastic waste diverted from a landfill (kilotons), not plastic waste in waterways. Measuring plastic in waterways may not be the best reflection of the project's impact.
- Include human-based metrics (e.g., number of waste collectors trained, number of households sorting waste at 95% accuracy) in addition to material metrics.
- Use in-country experts to ground-truth measurement planning.
- Draft a data management plan that details how data will be stored and analyzed prior to collection.
- A measurement that solely focuses on collection indicators is not sufficient for funders—identify performance indicators during project design, since long-term impacts are difficult to capture.
- Support intergovernmental efforts to establish and promote internationally recognized methods for measuring plastic waste in the environment, including data harmonization and standardization.
- Use a citizen science approach to train community members to collect data on waste in their environment (e.g., data on waste hotspots, neighborhood mapping, household waste sorting practices). Community leaders can encourage households to participate in surveys and workshops.

Understand the scope of the problem

- Use a tool like the Solid Waste Index for Local Governments (SCIL) or UN Habitat's Waste Wise Cities Tool to complete a baseline assessment of current SWM capabilities within a community. The process should be completely driven by local stakeholders to build capacity for conducting baseline assessments.
- Tailor projects based on results of baseline assessments.
- Use creative methods to gather data for the baseline assessments, including attaching GoPros on cars to perform community scans, mapping exercises, using citizen scientists to collect data, and integrating satellite data where possible.
- Consider using community-based participatory research (CBPR) approaches to hear directly from the community about their perceptions of plastic pollution and what they would like to see as an outcome.
- Identify leaders in communities that can facilitate collaboration between community members and project implementors. Leaders can encourage the community to engage in plastic pollution mitigation projects and advocate for changes to local government.

PROVEN PRACTICES AT A GLANCE

FINANCING

Identify secondary markets and obtain sufficient volume of material

- Map the local/regional value chain, including stakeholders along the chain, funding sources at each step, and metrics to be collected. Ensure a secondary market exists for recycled plastic. If there is no viable secondary market, consider projects that would create this market.
- Develop relationships with local plastics consumers and ask what they need, what types of plastics they use, and whether they could use recycled plastics. Serve as a connection point between consumers and the plastics they need for their businesses.
- Frame waste collection and recycling as resource recovery.
- Conduct capacity building related to creating a business plan, conducting market analysis or financial modeling, or entrepreneurship.
- Consider upcycling plastic into desirable goods, especially to sell in areas with a strong tourism industry (e.g., art, keychains, bags, jewelry, bricks).
- Establish material marketplaces where businesses and organizations can develop and scale reuse, recycling, and secondary market opportunities.
- Diversify end market buyers to better navigate price volatility for plastic pellets, including buyers who are more and less sensitive to fluctuating prices.
- Share success stories when funding is acquired so other organizations see what makes a successful proposal.
- Conduct a cost analysis to determine prices of various types of materials and what secondary markets exist for each. Build a financial model based on this analysis that also considers fluctuations in oil prices and other potentially impactful events.

Seek out varied funding sources

- Foster public-private partnerships to increase potential for impact and raise more capital.
- Implement a fee-for-service model for collection of household waste. Fees will not be high enough to cover the costs of all inputs, so collection must be funded through multiple streams.
- Develop project goals and objectives alongside funders' requirements and priorities.
- Build capacity around grant development and proposal writing for increased likelihood of funding or to scale up or replicate projects.
- Develop a sustainability plan that includes transition planning prior to the end of the project's current funding source.
- Diversify funding sources to include those that have longer periods of performance, or more sustainable funding mechanisms.
- Consider plastic credits as a source of funding.
- Determine whether profit is sufficient to cover costs past initial period of performance. If not, seek additional funding sources.
- Build relationships, networks, and stay connected with various stakeholders, including funders.

EPA BATTELLE UN environment programme COBSEA COORDINATING BODY ON THE SEAS OF EAST ASIA

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