CLEAN PORTS, CLEAN OCEANS:

LESSONS LEARNED FROM ADDRESSING PLASTIC POLLUTION IN THE PHILIPPINES


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World Wide Fund for Nature (WWF):
One of the world's largest independent conservation organizations, with over 5 million supporters and a global network active in more than 100 countries. WWF's mission is to stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature by conserving the world's biological diversity, ensuring the sustainable use of renewable natural resources, and promoting the reduction of pollution and wasteful consumption.

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The information is based on the implementation of the 'Clean Ports Clean Oceans Improving Port Management in the Philippines' project implemented in partnership with the Grieg Group and funded by the Grieg Foundation.

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INTRODUCTION

THE MARITIME SECTOR AND THE PLASTIC POLLUTION CRISIS

Plastic pollution is one of the fastest-growing global environmental problems. It is generally estimated that 80% of marine plastic litter comes from land-based activities and 20% from sea-based activities, such as fishing, aquaculture and shipping.

Plastic pollution has severe impacts on marine species and ecosystems, public health and sustainable development, as well as economic impacts on activities such as fisheries and shipping.1 Efforts to tackle plastic pollution have been growing over the last few years. Actions to reduce plastic pollution have increased significantly in the maritime industry and, recently, the international community has also made important progress in this area.[2]

The maritime sector is an essential element of global trade and the economy. It includes activities at sea but also at the interface between sea and land, which represents some of the key sources of plastic pollution. Examples of marine plastic litter attributable to the maritime sector include plastic waste from ports, vessel activities, crew members and passengers, as well as items from shipping operations, such as lost containers. Microplastics generated from paints and marine coatings, for example, are also an issue.[3]

Despite the threats to the marine environment posed by the maritime sector, the industry has the opportunity to be at the forefront of finding solutions to the plastic pollution crisis.

'CLEAN PORTS, CLEAN OCEANS: IMPROVING PORT WASTE MANAGEMENT IN THE PHILIPPINES'

In 2020, the World Wide Fund for Nature–Philippines and the World Wide Fund for Nature–Norway (hereinafter 'WWF') started the project 'Clean Ports, Clean Oceans: Improving Port Waste Management in the Philippines' (hereinafter 'the project'), under the No Plastic in Nature initiative, which aims to stop the flow of plastic entering nature by 2030 by working with businesses, policymakers, cities, communities and other relevant stakeholders.

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[1] Kuhn and van Franeker, "Quantitative overview of marine debris ingested by marine megafauna", Marine pollution bulletin, vol. 151, 2020; Convention on Biological Diversity, "Marine debris: understanding, preventing and mitigating the significant adverse impact on marine and costal biodiversity", Technical Series No.83, 2016; Center for International Environmental Law, "Plastic and Health: The Hidden Costs of a Plastic Planet", 2019; N. J. Beaumont and others, "Global ecological, social and economic impacts of marine plastic" ScienceDirect, 2019

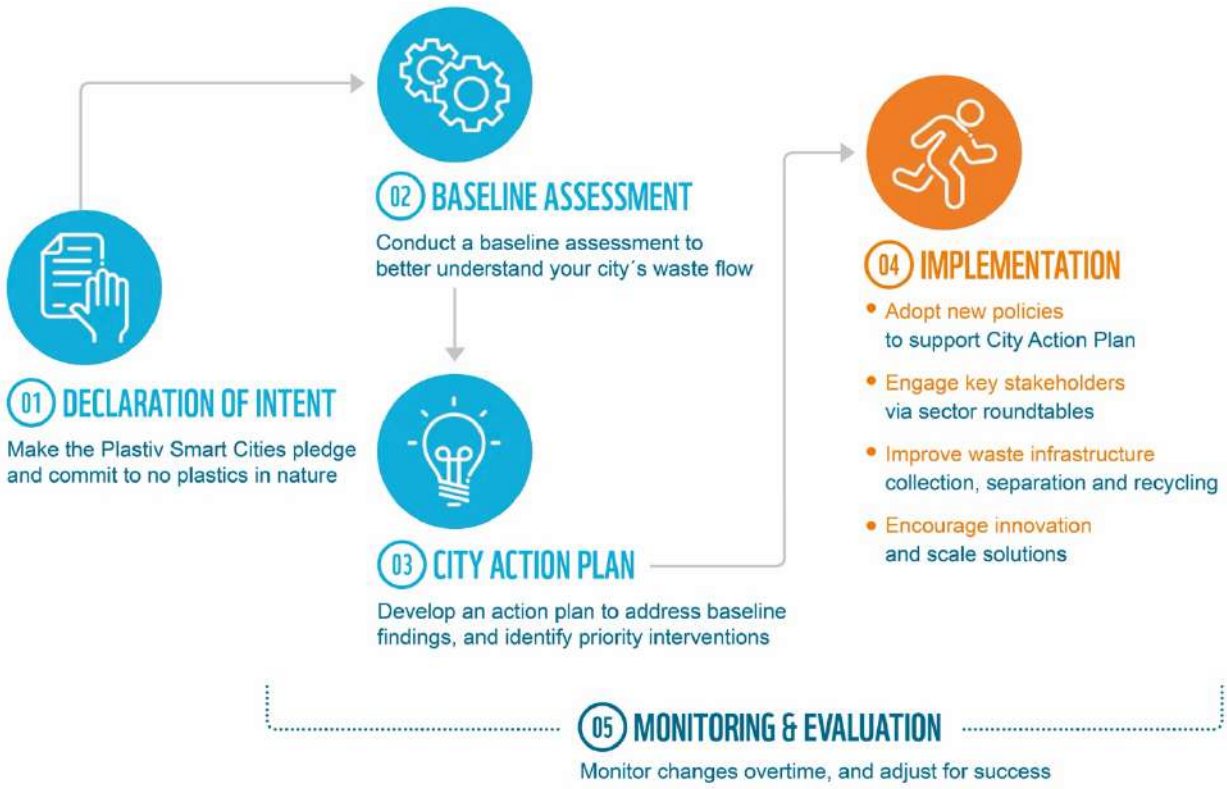
[2] IMO. 2018. Resolution MEPC.310(73), Action plan to address marine plastic litter from ships. MEPC 73/19/Add.1; IMO. 2021. Resolution MEPC.341(77), Strategy to address marine plastic litter from ships. MEPC 77/16/Add.1; United Nations Environment Assembly of the United Nations Environment Programme, Resolution 5/14 'End plastic pollution: towards an international legally binding instrument', Fifth session, 7 March 2022, UNEP/EA.5/Res.14

[3] GESAMP (2021). "Sea-based sources of marine litter", (Gilardi, K., ed.) (IMO/FAO/UNESCO-IOC/UNIDO/ WMO/IAEA/UN/UNEP/UNDP/ISA Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection). Rep. Stud. GESAMP No. 108,

The project, funded by the Grieg Foundation, was implemented by WWF in partnership with the Grieg Group, from 2020 to 2023. It aimed to achieve at least a 50% reduction in plastic waste leakage in three Philippine ports – Batangas, Cagayan de Oro and Manila North – and develop models that could be scaled up in other ports in the Philippines and around the world. The project was run in collaboration with the Philippine Ports Authority (PPA), the Maritime Industry Authority (MARINA), the Philippine Coast Guard, local authorities, communities and other relevant stakeholders.

The project aligned with the Plastic Smart Cities framework set out below. Plastic Smart Cities is part of the No Plastic in Nature initiative and supports cities and coastal centres to take action to stop plastic pollution. It takes a twofold approach. First, Plastic Smart Cities aims to pilot solutions on the ground in partnership with cities, businesses and communities. Secondly, Plastic Smart Cities strives to develop and collect the learnings from these pilot projects to help cities worldwide to tackle plastic pollution by sharing lessons learned.

Figure 1 *- WWF's Plastic Smart Cities framework*

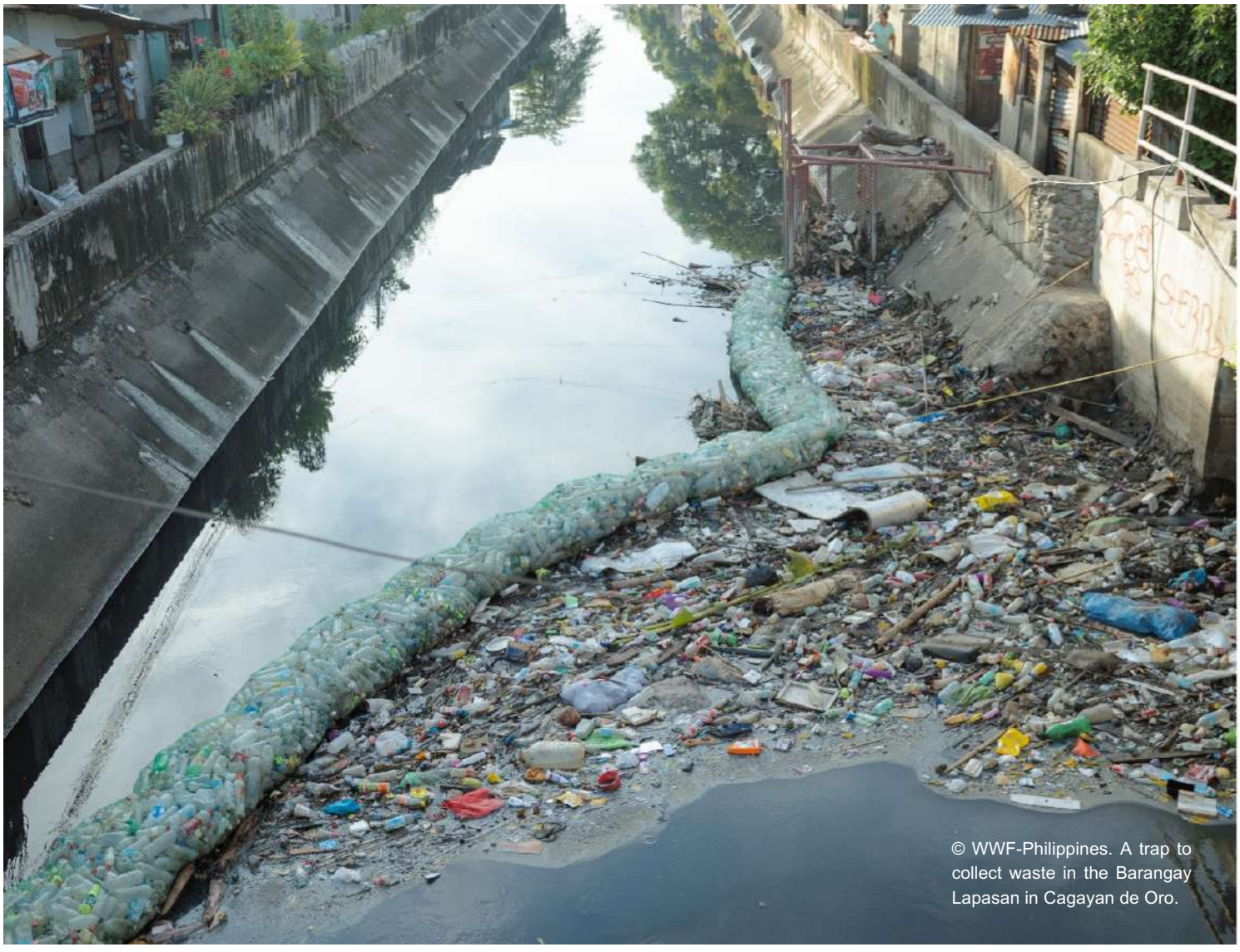


OBJECTIVE OF THE REPORT

This document is a compilation of case studies and lessons learned in implementing the WWF's 'Clean Ports, Clean Oceans: Improving Port Waste Management in the Philippines' project.

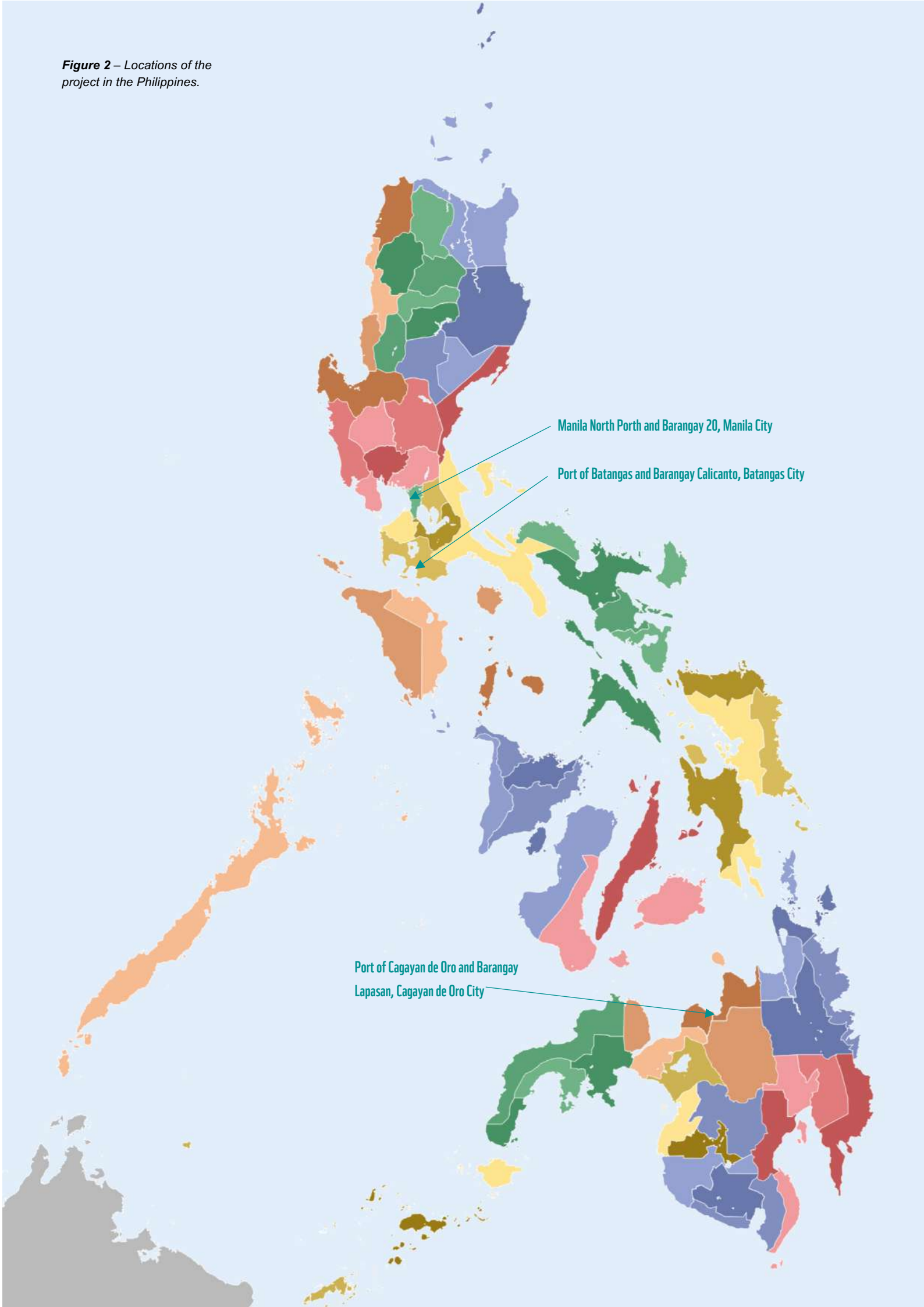
The main objective of this report is to share the lessons learned from implementation of the project, and particularly the solutions piloted to address plastic pollution in the maritime industry and communities, with anyone seeking to reduce plastic pollution.

The project included activities at both the national level, involving the formulation of a strategic approach for the maritime industry (Chapter I), and at the local level, spanning from the baselining of plastic waste generation and management in ports (Chapter II) to the implementation of solutions. These solutions encompassed providing support for the implementation of the ban on single-use plastic products (Chapter III), promoting behavioural changes (Chapter IV), encouraging initiatives to enhance the collection and recycling of plastic waste (Chapter V and Chapter VI), and empowering waste workers to improve waste management systems (Chapter VI). They were implemented in the ports covered by the project and the neighbouring communities – Barangay (a small administrative district in the Philippines) 20 in Manila city, Barangay Calicanto in Batangas and Barangay Lapasan in Cagayan de Oro.



© WWF-Philippines. A trap to collect waste in the Barangay Lapasan in Cagayan de Oro.

Figure 2 *– Locations of the project in the Philippines.*



CHAPTER I
THE ROLE OF NATIONAL STRATEGY DEVELOPMENT

Adopting sectoral approaches could help to focus attention on the specific challenges and needs of a sector when addressing a broad issue such as plastic pollution. This chapter aims to share further information about the strategic approach taken by the national authorities in the Philippines to address plastic pollution in the maritime sector and, in particular, provides insights into the support the project has provided for development of the Strategic Action Plan for Port and Ship Waste Management and Marine Litter as well as lessons learned from this process.

BACKGROUND TO THE STRATEGIC ACTION PLAN FOR PORT AND SHIP WASTE MANAGEMENT AND MARINE LITTER

A national strategy can be an effective way to comprehensively address all aspects of the marine litter problem. The Philippines Department of Environment and Natural Resources (DENR) officially adopted the National Plan of Action on the Prevention, Reduction, and Management of Marine Litter (NPOA—ML) in 2021. This provides guidance to enhance the country's current efforts in resource and waste management, and to bring an additional perspective to marine litter issues and the control of additional leakage of waste into bodies of water.[4] The plan has an overarching goal of 'Zero Waste to Philippine Waters by 2040'.

The plan includes 10 marine litter prevention, reduction and management strategies. The fifth strategy includes interventions to reduce maritime sources of marine litter, which refers to waste leakage from ships, fishing boats and aquaculture activities.

To support the implementation of this strategy, the Maritime Industry Authority (MARINA) developed a Strategic Action Plan for Port and Ship Waste Management and Marine Litter. This action plan ensures a comprehensive approach to tackling the issue, and encourages collaboration and partnership among different stakeholders within the maritime sector, such as shipping companies, port authorities, cruise lines and even fishing fleets.

DEVELOPMENT OF THE STRATEGIC ACTION PLAN FOR PORT AND SHIP WASTE MANAGEMENT AND MARINE LITTER

The steps taken to develop the Strategic Action Plan for Port and Ship Waste Management and Marine Litter in the Philippines were as follows.

[4] Republic of the Philippines, Department of Environment and Natural Resources, National Plan of Action on the Prevention, Reduction and Management of Marine Litter, Memorandum Circular No. 2021-10

First, recognising that the strategic action plan has far-reaching repercussions for a wide range of entities, extensive consultations were carried out with various stakeholders to gather their expertise and perspective. The entities consulted were, among others, the Philippine Ports Authority, Port Management Offices, national government agencies such as the Department of Environment and Natural Resources, shipping companies, businesses, city authorities, terminal operators, and non-governmental organisations.

To make sure that all the entities involved in developing the strategy possess the relevant knowledge and are aligned, MARINA, in collaboration with WWF–Philippines, conducted a series of webinars focused on plastic pollution, to raise awareness about the issue of plastic pollution and ongoing initiatives within the maritime industry. The webinars covered international and local policies for ship and port waste management, and marine plastic litter.

There were also focus group discussions and consultations with entities, such as shipping companies, shipyards and other relevant organisations. These discussions concentrated on critical questions such as ‘What factors contribute to the challenge of addressing plastic pollution or establishing effective solid waste management systems in ships and shipyards?’ and ‘How can we enhance the solid waste management systems in these settings?’

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The project supported a pre-forum event aimed at reviewing all the concepts taught and highlighting activities that needed to be included in the plan. The maritime industry players then started to draft the strategic action plan for marine plastic litter. MARINA led the drafting process, and the draft was subsequently circulated for further comments and finalised. The national strategic action plan includes the following key priority areas: legislation; institutional arrangements; capacity development; stakeholders' awareness and involvement; research, technology and infrastructure development; information and resource sharing; monitoring and evaluation mechanisms; and sustainable financing mechanisms.

The Strategic Action Plan for Port and Ship Waste Management and Marine Litter was launched at the Marine Environmental Protection Forum in September 2022.

LESSONS LEARNED

An adequate multistakeholder forum with national and local stakeholders has been key to ensure the development of a relevant strategic action plan for the maritime sector on plastic pollution. The involvement of various stakeholders, from port management offices to businesses, has been very helpful to increase knowledge of existing initiatives on plastic pollution in the maritime sector, create synergies and avoid overlap. The inputs on specific challenges faced by the different entities within the maritime sector also enabled the Strategic Action Plan for Port and Ship Waste Management and Marine Litter to have realistic actions, allowing concrete implementation of the NPOA–ML, specifically for the fifth strategy focused on mitigating maritime sources of marine litter.

© WWF-Philippines. WWF-Philippines, the Maritime Industry Authority and the Philippine Ports Authority at the 2nd Marine Environment Forum.

WWF observed that capacity building with the active participation and the closed collaboration between project implementing entities and beneficiaries was key. It has enabled the entities involved in the development of the plan to develop it in an effective way and take ownership of the plan. Having a government agency as champion, ready to take the lead in developing a strategic plan of this nature, and to spend time and resources doing so, was also beneficial.

This process has also showed that environmental non-governmental organisations can play a role in the development of national strategies by facilitating the coordination between the different stakeholders, collecting data, and raising awareness about environmental issues.

CONCLUSION

The maritime sector in the Philippines is now in the implementation phase of the Strategic Action on Port and Ship Waste Management and Marine Litter. Monitoring the implementation of the plan is a key element. MARINA is responsible for this task and reports to DENR, which is responsible for the NPOA-ML, to ensure that progress at the national level is tracked and monitored.

CHAPTER II
PLASTIC WASTE BASELINES AS A FOUNDATION FOR ACTION

Understanding the scope of plastic pollution and having accurate environmental data are key factors in taking relevant actions to tackle plastic pollution and protect the environment. A priority for the project was obtaining information and figures about how much waste, including plastic waste, had been generated and managed. To obtain relevant and up-to-date data, the project conducted baseline studies at the local level in the three ports covered by the project and at the national level.

This chapter aims to share the experience and lessons learned from conducting baseline studies to collect information on the generation and management of waste, especially plastic, in ports in the Philippines.

WHAT IS BASELINING AND HOW SHOULD IT BE DONE?

Baselining is defined as the process of collecting and assessing high-quality, scientific data to establish a benchmark for identifying existing problems that need solutions and current conditions that require improvement. In the context of waste, including plastic waste, it involves collecting data on waste that has been collected, recycled and disposed of as well as uncollected waste, together with observations and analysis of the various steps in waste management, to assess flow and leakage within the waste management chain.

© AMH-Philippines. Collection of data for the baseline studies.

The project team used the 5W1H approach (What, Who, When, Where, Why, and How) to gather relevant data and establish an accurate baseline. The specific questions asked depend on the scope and objectives of the baseline study. Here are some of the questions that were used:

Waste generation

- What is the port's current waste and plastic waste generation rate?
- What are the sources of waste and plastic waste within the port?

Waste segregation and collection

- What are the existing waste management facilities and infrastructure in the area?
- How is waste currently collected and transported?
- How is the waste being segregated and in what categories?

Waste recovery and recycling

- What are the existing recycling and recovery facilities and the current recycling initiatives within the area where the port is located?
- What are the recovery and recycling rates for different types of waste materials, including plastics?
- How much waste is being diverted through recycling or composting?

Waste disposal

- Where is the waste disposed of, and what recovery activities are present at the landfill site?

Unmanaged waste

- How much waste is being left uncollected and unmanaged, and how much plastic is leaking into the environment?

Overall solid waste management

- Who are the relevant actors involved in the value chain?
- What are the main challenges or barriers in the current waste management system?
- What existing waste management policies and legislation are being implemented in the port?
- What are the environmental impacts of the existing waste management practices?

To conduct the baseline studies, the team followed the steps outlined below. Comprehensive details on the methodology used can be found in the baseline studies for the three selected ports, which are available online.[5]

The first key step in the baseline assessment process was to establish a clear and measurable scope for the baseline study. The desired outcomes of the baseline assessment were identified to provide a direction for the data collection process.

[5] WWF-Philippines, Clean Ports, Clean Oceans: Improving Port Waste Management in the Philippines, website: https://wwf.org.ph/what-we-do/plastics/cleanportscleanoceans/

The second step entailed collecting existing data on waste generation, infrastructure and current waste management practices from the different stakeholders, such as port authorities, waste management service providers, city authorities and local communities. A review of general information on the port and the relevant stakeholders, solid waste management plans, policies and legislation related to port waste management was also conducted.

The third step was to carry out interviews with relevant stakeholders. These interviews aimed to determine the current solid waste management practices and policies being implemented, and to gather information on their perspectives and challenges.

The fourth step involved conducting waste analysis and characterisation studies using nationally and internationally recognised tools and methodologies. In the context of the project, this involved the Philippine Waste Analysis and Characterisation Studies (WACS) guidelines recognised by the Philippine National Solid Waste Management Commission and the internationally recognised Waste Wise Cities Tool (WaCT).

The WACS guidelines provided instructions for analysing and characterising waste at both at-source and end-of-pipe stages. The WaCT complemented the WACS guidelines by offering a comprehensive, detailed and systematic guide to collecting data pertaining to municipal solid waste, including collection, recycling, disposal and uncollected waste. These guidelines and tools were adjusted to suit the context of a port environment. Sampling was conducted for both port facilities and vessels. This holistic approach provided a comprehensive assessment of the actual state of the municipal solid waste system.

The fifth step was to visit solid waste management infrastructure, including recycling and disposal facilities, to document existing conditions and operations at these facilities and to determine the level of control.

The final step was to utilise Geographic Information System (GIS) and flow analysis tools, such as the Waste Flow Diagram (WFD), STAN and SankeyMATIC to map waste generation hotspots, collection points and routes, and to produce waste flow diagrams. The WFD is a rapid assessment tool complementary to the WaCT. It does not provide instructions for baselining, but the baseline data is necessary to utilise the tool and create plastic waste flow diagrams.

LESSONS LEARNED

The project team learned that baselining is a significant undertaking and that the process itself is susceptible to errors. It has been recognised that collecting the relevant data falling within the scope of the assessment and using resources efficiently during the baselining process requires adequate planning. Conducting thorough planning and preparation before engaging in baseline activities was therefore crucial. Collecting sufficient data was another key element to ensure that the results were not biased or misleading, and to gain a complete understanding of the overall situation.

Obtaining information from a wide range of stakeholders, including port operators, vendors, waste workers and communities, was crucial in order to understand the unique characteristics and challenges of the specific locations. Engaging with community leaders helped the process in communities, as leaders were able to encourage the community to engage with the topic.

WWF learned that using tools that are recognised both nationally and internationally was essential to ensure that data could be easily understood and used by the stakeholders. Ensuring that the tools and process are well understood by stakeholders was also important, to ensure that data could be updated.

Working with experts on waste management was also necessary to ensure that none of the elements related to the waste management system were overlooked. WWF worked with various waste management experts under the project, and this has been helpful to better understand how waste were generated and managed in the settings of the ports and communities.

Developing baseline studies has been a helpful tool to engage with different stakeholders on the new topic of plastic pollution. Data has also played a crucial role in supporting stakeholders to identify the necessary interventions for significantly reducing plastic waste leakage and has provided a robust basis for developing actions plans for each port to tackle plastic pollution. The lack of comprehensive data on plastic pollution poses a significant challenge in understanding and addressing this issue effectively. Adequate data is then crucial for developing informed interventions.

CONCLUSION

The baselining process goes far beyond a mere data collection exercise. It is a structured approach with a wide range of activities to understand and create an overall picture of the existing waste management situation in ports. Baseline data can then be used to design relevant interventions to tackle plastic pollution and serve as a benchmark to monitor progress. In the context of the project, the data serves as a foundation to develop strategic action plans for each port to tackle plastic pollution.

CHAPTER III
IMPLEMENTATION OF THE SINGLE-USE PLASTIC BAN IN PORTS

Unnecessary and avoidable plastics, particularly single-use packaging and disposable items are polluting our planet at an alarming rate. To address this issue, an increasing number of countries and entities have adopted bans on single-use plastic products. Among them, the Philippine Ports Authority (PPA) banned single-use plastic products in ports under its jurisdiction in 2019. The project provided support for implementing the ban. This chapter aims to share the project's learnings regarding this activity.

THE SINGLE-USE PLASTIC BAN IN PORTS IN THE PHILIPPINES

The PPA established a ban on the unnecessary use of single-use plastic products in all ports and port facilities under its jurisdiction, including all offices and establishments inside the ports.[6] The list of banned plastic items includes plastic cups, drinking straws, coffee stirrers, spoons, forks, knives, and thin-filmed sando bags. In addition to the list, another memorandum prohibits a further array of single-use plastic products, including PET bottles, PS containers, doypack (stand-up) or Tetra Pak containers, and balloons in the port vicinity.[7]

PROVIDING SUPPORT FOR THE IMPLEMENTATION OF THE BAN

WWF first identified the challenges related to the ban on single-use plastic in ports in the Philippines in order to develop relevant activities to support its implementation. The following challenges were identified:

- the limited understanding and lack of awareness about the issue of plastic pollution and the existence of a ban among port passengers, employees, utility workers, vendors and other businesses;
- the consumer preference for single-use plastic products, which are often seen as more convenient and affordable, and the limited availability of alternatives;
- the lack of regulations or differences in regulations between countries, cities and ports, which can lead to confusion among passengers and users of the ports;
- the lack of the necessary power for port authorities and operators to enforce the implementation of the policy; and
- the lack of human and financial resources to monitor the implementation of the ban.

Based on these challenges, WWF-Philippines worked closely with PPA to support the implementation of the ban by:

[6] Philippine Ports Authority, 2021, Memorandum Circular No. 11-2021
[7] Memorandum Order No. 001-19

- raising awareness about plastic pollution and the ban: a large-scale information, education and communication campaign was launched. Information, education and communication materials were strategically posted around the ports, including at passenger terminal entrances and business outlets. Videos were shown at various strategic locations in the port facilities to capture the public's attention. Roll-up banners and waste bin labels were also used to encourage stakeholders to reduce waste and conscientiously segregate their waste.

- strengthening the capacity of port employees, including janitorial services: several workshops were held focusing on waste reduction initiatives and rules regarding the ban.

- conducting monitoring activities: WWF-Philippines also provided support for monitoring the implementation of the ban. Monitoring methodology included a combination of on-site observations, structured interviews and cross-referencing of data sources to establish a comprehensive overview of the ban's progress. The assessment form that was drawn up aided data collection, offering a standardised framework that facilitated consistent data capture.

These activities helped the three ports to implement the ban on single-use plastics. It was observed, at the end of the project, that the three ports had reduced the generation of plastic waste by an average of 34%. The decrease of the use of other items such as PET bottles, not banned by the policy, was also observed. In Batangas, the ban on single-use plastics enacted by the city also helped greatly in implementation of the ban in the port.

LESSONS LEARNED

Through the support provided to PPA for the implementation of the ban, WWF was able to identify a number of factors that are crucial for the implementation of this kind of policy.

Promoting viable alternatives, including reuse and refill solutions, to replace banned single-use plastics, for example eating utensils made from eco-friendly materials, reusable containers and water-refilling stations, was one of the factors seen as significant in the transition to an environment without single-use plastics. WWF noticed that by emphasising the environmental benefits and long-term cost savings of these alternatives, individuals and businesses were more motivated to change their practices.

Information, education and communication campaigns were an important step to encourage the implementation of the ban. The results at the end of the project shows a higher level of awareness of the ban among stakeholders.

The alignment of policies between the ports and the cities, in term of banned items and rules, is an important factor. In Batangas, the high alignment of the ban on single-use plastics enacted by the city has helped for the implementation of the ban in the port.

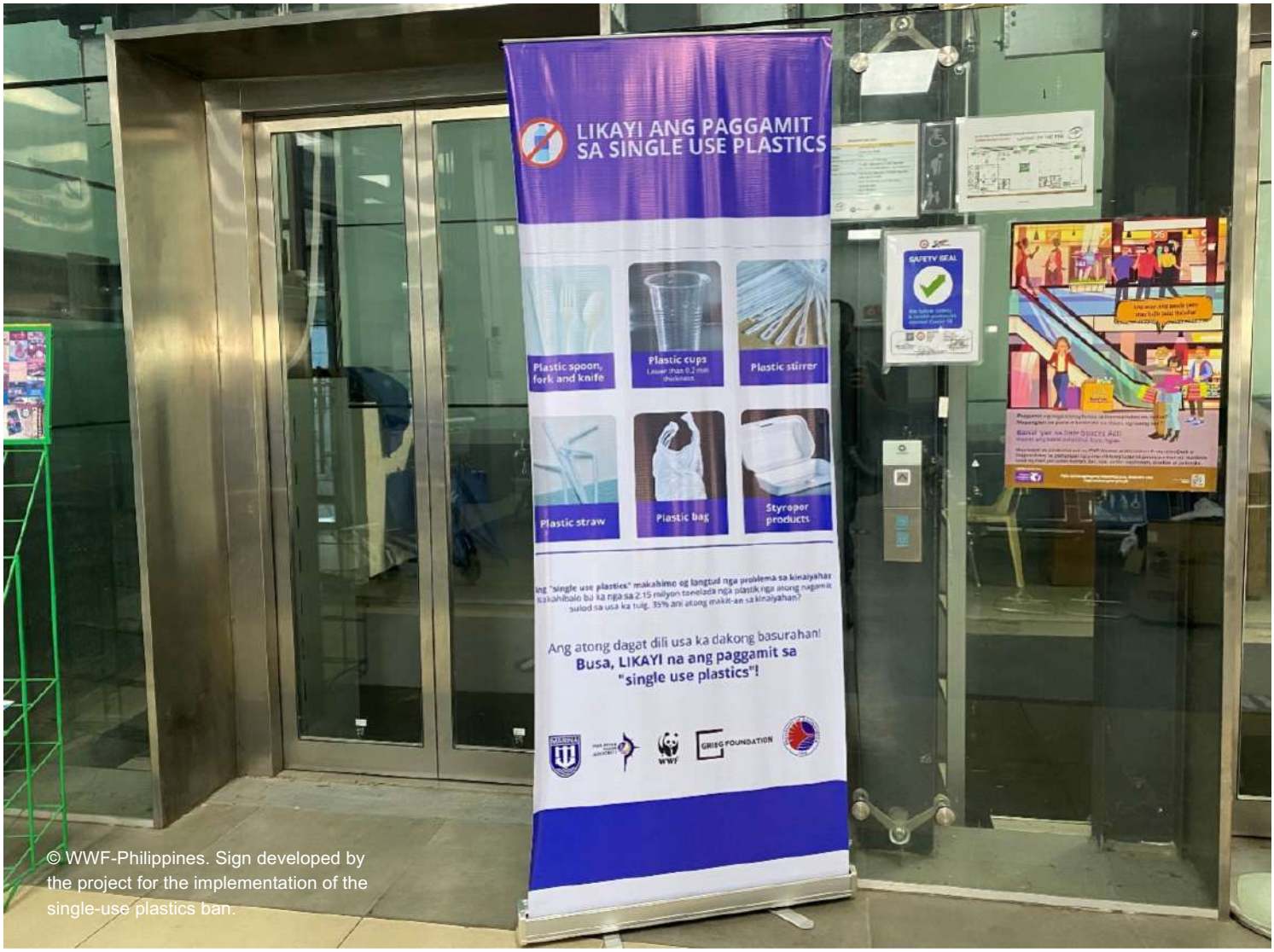
WWF found that developing comprehensive training programmes to increase port employees' understanding of the rationale for the ban and its specifics was also helpful. This training has given

the employees the knowledge needed to address enquiries from passengers, vendors and other stakeholders, and empowered them to communicate effectively about the policy.

WWF also noted that developing an adequately funded monitoring and reporting system could help the port authority to easily track and visualise progress related to implementation of the ban. With enforcement being a challenge, WWF recommended that maritime stakeholders and relevant government agencies work together to explore feasible incentives or penalty frameworks.

CONCLUSION

While policies and laws are crucial in tackling any environmental issue, implementing them is often a challenge. The activities conducted in the three ports covered by the project – Batangas, Cagayan de Oro and Manila North – led to significant progress in reducing the amount of single-use plastic used, as well as in raising awareness of the issue of plastic pollution.



© WWF-Philippines. Sign developed by the project for the implementation of the single-use plastics ban.

CHAPTER IV
SOCIAL AND BEHAVIOURAL CHANGE TO ADDRESS PLASTIC POLLUTION

People's behaviour plays an important role in plastic production, consumption and segregation. Consumers' demand for convenience has contributed to a significant increase in the consumption of single-use products. In addition, the absence of waste separation makes it difficult to reuse, recycle and properly dispose of plastic products. Waste prevention and better reuse, recycling and disposal depend fundamentally on changes in the attitudes and behaviour of individuals and businesses. The aim of this chapter is to share the experience and lessons learned from the project in promoting social and behavioural change to address plastic pollution in ports.

SOCIAL AND BEHAVIOURAL CHANGE IN THE WASTE MANAGEMENT SECTOR

Social and behavioural change can be defined as a set of processes, approaches, tools, strategies and tactics that promote positive and measurable changes in people's environments, societies and behaviours.[8]

Social and behavioural change has been identified as a significant approach to promoting more environmentally friendly behaviour in the area of waste.[9] As mentioned in the report *Proven Practices to Improve Waste Management and Address Plastic Pollution in Southeast Asia*, when implementing social and behavioural change interventions, it is important to consider anthropological approaches in order to learn about waste management practices in the project location, to have project activities that are culturally tailored to the population of interest in the project area, and to ensure that materials used in engagement fit the community literacy level and the language of daily use.[10]

IMPLEMENTING THE SOCIAL AND BEHAVIOURAL CHANGE APPROACH IN PORTS AND COMMUNITIES IN THE PHILIPPINES

WWF implemented several social and behavioural activities as part of the project. The first stage in these activities was to develop a social and behavioural change strategy. This strategy created a framework for how to encourage social and behavioural change in the specific project locations. To design the strategy, WWF-Philippines analysed the existing waste management practices in the

[8] United Nations Children's Fund (UNICEF), Vincent Petit, Social and Behaviour Change (SBC) Theory and Practice, Global Course, https://agora.unicef.org/course/info.php?id=35185#:~:text=SBC%20is%20defined%20as%20a,environments%2C%20societies%2C%20and%20behaviours.
Nordic Council of Ministers, 2016, Nudging and pro-environmental behaviour, https://norden.diva-portal.org/smash/get/diva2:1065958/FULLTEXT01.pdf

[10] Battelle, the Coordinating Body on the Seas of East Asia, & United States Environmental Protection Agency, 2022, Proven Practice Guide to Improve Waste Management and Address Plastic Pollution in Southeast Asia, Global Partnership on Marine Litter. https://indd.adobe.com/view/b2674ed5-c398-48a6-9faf-bab78f6059d2

© WWF-Philippines. Segregation bins made by Plastic Flamingo in the one of the ports.

ports and communities, the data related to the generation and management of waste, as well the causes and effects. The strategy included different approaches depending on the location.

In the community located in Barangay Calicanto, in Batangas, the approach included activities related to communications, linking the barangays (districts) with the junk shops and putting an economic value on the waste collected by the community. For this community located near the Port of Batangas, the lack of waste segregation was one of the challenges. Despite constant reminders from local authorities, people did not segregate their waste correctly. This may have been because people could not see the reasons why they should segregate waste and the economic value linked to it.

Based on this information, the project drafted a social and behavioural plan that included raising awareness about waste segregation, segregated waste collection and plastic pollution, while establishing a materials recovery facility (MRF) that could help the community to obtain financial benefits from the recyclable materials, compost their organic waste and grow vegetables. The objective was to make the community aware of the importance of waste segregation and segregated collection for recycling plastic waste, show the economic value of segregation, and have a system in place to ensure that the economic value of recyclables is recovered.

At the port level, WWF developed communication materials, such as roll-up banners and a video for passengers, to raise awareness about plastic pollution, the single-use plastics ban and proper

waste segregation. It was important to explain to people the reasons why a specific behaviour was positive for the environment.

Training for port employees was also organised to strengthen their ability to segregate waste properly. Physical changes in the environment were made too: separate bins with labels for different waste types were set up to encourage people to segregate their waste and water-refilling stations provided to encourage the use of reusable drinking containers.

In addition, the project provided support for infrastructure, such as the collection bins, improvement of the MRF to store recyclable plastic waste and the segregated collection of waste, to ensure that the system in place facilitates behavioural change.

LESSONS LEARNED

In implementing social and behavioural change activities, WWF observed that this approach was crucial to achieve changes. While infrastructure and technical solutions are essential components of the waste management system, human behaviour has been seen as key in driving environmental outcomes. As a result, it has been decided to support both the improvement of infrastructure, such as the bins, MRF and segregated collection of waste, as well as behavioural change. There needs to be a system in place to support behavioural change. Taking a holistic approach and instigating a shift in behaviours and attitudes appeared essential in order to move to sustainable practices in ports and the communities beyond.

WWF considered engaging with all stakeholders, from port employees and passengers to the informal waste sector, as well as learning about the waste management practices and habits in each specific location, to be essential elements in developing activities tailored to the specific contexts and cultures. Based on this experience, WWF believes that the approach used to promote behavioural changes should consider the unique needs and characteristics of each port and community, particularly to ensure that they are well accepted by the stakeholders.

Social and behavioural change activities implemented in ports can potentially have an effect beyond the specific location where they are implemented. For instance, some port employees reported that they became more aware of how waste was segregated at home and in their communities. Passengers from the ports who travel from city to city can also bring better practices in other locations.

Finally, WWF concluded that insufficient monitoring and evaluation can impede progress related to social and behavioural change. Regular evaluation is essential to collect data and make improvements.

CONCLUSION

Social and behavioural change could be a useful approach in ports and communities to reduce the generation of waste and improve the waste management system. At the port level, the ports' interconnectedness with various stakeholders and locations means social and behavioural change can have a ripple effect and extend beyond the location of the activities, becoming a strong tool in the fight against plastic pollution.

© WWF-Philippines. The materials recovery facility in Barangay Calicanto, Batangas city.

CHAPTER V
CREATING A CIRCULAR ECONOMY IN PORTS AND COMMUNITIES: A FOCUS ON PLASTIC RECYCLING MARKETS

Plastic pollution is a pressing global challenge, and addressing it requires a comprehensive approach. To avoid plastic becoming waste or pollution, circular approaches that recycle or reuse plastic are used. This chapter shares the experience and lessons learned from the project in piloting financially sustainable solutions that aim to recycle plastic waste.

RECYCLING PLASTIC WASTE

The literature shows there are many factors in the success of any interventions that aim to recycle plastic waste.

The ability to recycle plastics depends on the type of plastic. Some plastics, such as polyethylene terephthalate (PET), are more commonly recycled than others, such as polyvinyl chloride (PVC). The cleanliness of the plastics, as well as the availability of recycling infrastructure and access to markets, also influences its recyclability.

Other important factors to take into consideration to ensure that plastic is recycled include conducting a waste characterisation, developing a plan to remove the most toxic plastics from the waste stream and make the waste stream cleaner, and recognising that each entry point for plastic is different.[11]

In addition, a good understanding of how to extract the maximum value from plastics and ensure long-term sustainability are essential. Understanding the recycling markets and prices for secondary material are key considerations when developing a financially self-sustaining project.

Investment decisions should consider the costs incurred along the value chain. Usually, plastic waste is collected and processed in materials recovery facilities. The plastic resulting from this process is often in the form of bales or pellets. These products are then usually sold to local vendors, which often resell the plastics to other, larger vendors. The price that the local vendors can command for plastic items varies depending on the type of plastic, cleanliness and how it has been processed. Prices are also affected by oil prices: if oil prices drop, the prices of secondary plastic can drop as well. For a project to be financially self-sustaining, the costs incurred at the start of the value chain need to be covered and a small profit made.[12]

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[11] Batelle, the Coordinating Body on the Seas of East Asia, & United States Environmental Protection Agency. 2022. Proven Practice Guide to Improve Waste Management and Address Plastic Pollution in Southeast Asia. Global Partnership on Marine Litter, page 35

[12] *Ibid*. page 67

© WWF-Philippines. Plastic waste shredded and ready to be recycled.

IMPLEMENTATION OF FINANCIALLY SUSTAINABLE SOLUTIONS TO RECYCLE PLASTIC WASTE IN COMMUNITIES AND PORTS IN THE PHILIPPINES

As part of the project, WWF worked with both ports and communities neighbouring the ports to pilot sustainable solutions to recycle plastic waste.

At the port level, support was provided to improve the recycling of plastic waste in the three ports. The baseline study indicated that in Batangas, plastics represented around 28% of the generated waste from the port and vessels, with 88% of the total plastic waste generated being sent to the landfills.[13] In Manila North, the baseline study revealed that 36% of the waste generated from the port and adjacent communities was composed of plastics and 64% of these ended up in landfills.[14] Based on this, the two ports, with support from WWF, decided to partner with Plastic Flamingo, a social enterprise that collects segregated plastic waste and recycles it. An additional waste audit was conducted to estimate the specific types of waste generated by the port.

The baseline study and the waste audit helped the project team to estimate the volume and type of waste generated. Subsequently, Plastic Flamingo provided bins in the ports where recyclable plastic could be deposited, collected the plastic waste and ensured that it was recycled. Following the implementation of these activities and additional interventions, the project was able to increase the recycling of plastic waste by 38% in the port of Manila North, and 28% in the port of Batangas.

[13] WWF, 2021, Clean Ports, Cleans Oceans: Improving Port Waste Management in the Philippines – Solid Waste Management Baseline Study Port of Batangas, pages 81 and 82

[14] WWF, 2021, Clean Ports, Cleans Oceans: Improving Port Waste Management in the Philippines – Solid Waste Management Baseline Study Port of Manila North Port, pages 85-87

In the port of Cagayan de Oro, the baseline assessment indicated that approximately 10% of the generated waste from the port and vessels was comprised of plastics, and about 93% of these were disposed of in landfills.[15] Accordingly, it was decided to build a materials recovery facility (MRF) that could be easily assembled and disassembled to meet the needs of the port, aggregate recyclable materials and organise collection events with a local social enterprise called BEST Inc. For every kilo of recyclables delivered, BEST Inc. provides incentives that can be used to buy products.

At the community level, WWF worked with Barangay Calicanto, a community located next to the port of Batangas, as well as Barangay Lapasan, situated next to the port of Cagayan de Oro. Prior to starting the community activities in Batangas, the project conducted a waste characterisation study to identify what kind of recyclable materials were generated by the community and their waste management practices. It then mapped the secondary markets, including the junk shops in the vicinity, to better understand what kind of materials they collected, the minimum volume of material that could be collected by these entities and prices paid for each material. This assessment showed that the collection of recyclable materials should be done in a location that is close to the households, that the community needed a MRF to be able to aggregate recyclable materials and that they should sell their recyclables to aggregators or directly to recyclers.

Based on this information, the community, with support from WWF, decided to build an MRF, organise recyclables collection events during the construction of the facility and partner with the San Jose Sico Landfill Multi-Purpose Cooperative, which buys recyclable materials at a better price than junk shops. By establishing the link between the collected high value plastic waste and other materials and the market, the project aimed to ensure the sustainability of recycling efforts.

The project conducted similar activities related to the waste characterisation study and mapping of markets in Cagayan de Oro. The support for the community in the Barangay Lapasan included the improvement of the existing MRF and a training programme for the community for the effective processing of recyclables, including the development of business models for selling recyclable materials.

LESSONS LEARNED

The project team learned that a thorough review of waste generation and composition, existing secondary markets, manpower, materials and transportation costs should be carried out to lay the groundwork for informed decision-making. Visual inspections and direct engagement with waste collection activities also provide insights into waste flow dynamics.

Furthermore, a specific market study could help to understand the needs of industries that require recyclable materials, pricing dynamics and potential buyers, and ensure that supply matches demand, creating a smooth flow of recyclables from the ports and communities to manufacturers and recycling businesses. Without adequate market research, it might be difficult to find suitable buyers for recyclable materials.

[15] WWF, 2021, Clean Ports, Cleans Oceans: Improving Port Waste Management in the Philippines – Solid Waste Management Baseline Study Port of Cagayan de Oro, pages 81 and 82

It was also recognised that implementing fragmented interventions at different stages of the solid waste management system, without considering the entire waste management cycle, can lead to inefficiencies and limited impact. To overcome this, ports and communities should invest resources in developing a comprehensive solid waste management system. In particular, overlooking the specific step related to the segregation of waste can hinder the recycling process. Extracting recyclable materials effectively becomes challenging if different waste streams are mixed.

There must also be sufficient volume of recyclables and secondary markets for recycled plastic to generate income to cover the costs of activities earlier in the value chain. Developing infrastructure to stock recyclable materials is often a necessary step, as it facilitates the recycling process and optimises the value of recyclable materials.

It was also observed that the sustainability of operations depends on individuals responsible for handling recyclable materials. Offering training programmes to community members for the efficient processing of recyclables was identified as a crucial factor to ensure the long-term viability of operations.

CONCLUSION

In order for projects addressing plastic pollution to be sustainable in the long term, they must be financially self-sustaining. Looking at secondary markets for recyclables, and ensuring that the volume and content of the plastic is sufficient to generate income to cover the costs of the activities earlier in the value chain, is crucial and should be taken into account by ports and communities.

© WWF-Philippines. The materials recovery facility supported by the project in the Barangay Lapasan in Cagayan de Oro.

CHAPTER VI
INCENTIVES FOR PLASTIC COLLECTION AND RECYCLING IN PORTS AND COMMUNITIES

Plastic recycling rates remain low and stagnant across the world, with large volumes of recyclable plastic being disposed of and leaking into nature. Incentives designed to persuade households and businesses to segregate, reuse and recycle more could help prevent the generation of waste and contribute to improvement of the waste management system. This chapter shares the experience and lessons learned from the project in piloting solutions that provide incentives for plastic collection and recycling in ports and communities.

INCENTIVES AND THEIR BENEFITS FOR SOLID WASTE MANAGEMENT SYSTEMS

'Incentives', in the context of this waste management project, refers to rewards or benefits provided to individuals or entities in exchange for their active involvement in recyclables collection and recycling. These incentives, monetary or non-monetary, aim to motivate port offices, partner communities and other stakeholders to proactively participate in sustainable waste management practices.

The literature shows that introducing incentives can have a positive impact on the overall solid waste management system by raising awareness about plastic pollution and recycling, increasing the tonnage of recyclables collected and enhancing the performance of waste collection services. Incentives and rewards have been shown to be highly effective and are more politically acceptable than penalties.[16]

INCENTIVE-BASED INITIATIVES IN PORTS AND COMMUNITIES IN THE PHILIPPINES

The project implemented incentive-based initiatives in partner ports and communities, with the aim of encouraging active stakeholder participation in solid waste management. Exploring possible incentives, examining their economic feasibility and evaluating their impact on the waste management system shed light on their effectiveness and sustainability.

WWF actively involved stakeholders in the project. Collaborative discussions served to identify the most suitable incentives that align with the interests and needs of each stakeholder group. Next, WWF designed a plan outlining the specific actions that warranted incentives in order to ensure clarity, fairness and inclusivity. Clear criteria, thresholds and eligibility rules served as guideposts to foster transparency and motivation for participants. Various incentive options were piloted in the project:

[16] Gibovic D., Bikfalvi A., 2021, Incentives for Plastic Recycling: How to Engage Citizens in Active Collection, https://www.mdpi.com/2313-4321/6/2/29

Monetary rewards:

- Cash incentives: WWF piloted a three-month ‘Basura 2 Barya’ (trash to cash) project in the partner community of Barangay Calicanto in Batangas. WWF served as a medium to connect the community to the junk shops because of the identified lack of recovery facilities in the area. The community’s collected recyclables were bought using the same price list used by the partner junk shops. The initiative boosted collection and recycling rates in the community, while providing economic opportunities to the participating residents.
- Non-cash incentives: An environmental points system was piloted in the Port of Cagayan de Oro. This involved trading collected recyclables for corresponding environmental points at a designated collection booth every month. Each point was equivalent to Php 1, which could be used to buy items from partners, e.g. in e-commerce and local grocery stores.

Non-monetary rewards: A local social enterprise, Plastic Flamingo, was engaged to conduct recyclable plastic collection events in the Port of Batangas and Manila North Port, leading to an improvement in recycling rates and enhanced stakeholder awareness about correct waste management practices. The plastic waste collected was transformed into pellets or new products such as eco-boards, eco-lumber, tables and chairs.

© WWF-Philippines. The truck of BEST Inc. that provided environmental points for the collection of recyclable materials in the port of Cagayan de Oro.

Plastic collection through different incentive-based programmes

A summary of incentive-based programmes and their advantages and disadvantages identified by WWF is shown below.

Incentive options	Location	Advantages	Disadvantages
Monetary rewards - Cash incentives	Barangay Calicanto, Batangas City	Provide **immediate and tangible benefits** to motivate individuals to participate in recycling efforts. Create **economic opportunities**, especially in areas with limited employment options.	Can be **financially burdensome**, especially for long-term programmes or in areas with high participation. Subject to market fluctuations or **cost volatility**, which can affect the stability and sustainability of the programme.
Monetary rewards - Non-cash incentives	Port of Cagayan de Oro	Offer a **variety of rewards** beyond just cash, allowing participants to choose items that align with their preferences. Foster **involvement of partner businesses** in environmental initiatives to promote a sense of social responsibility and expand the reach of sustainability efforts.	Evaluating the value of non-cash incentives can be **subjective** and they may not hold the same appeal as cash. Require **logistical efforts**, including procurement and distribution, which can add complexity to programme administration.
Non-monetary rewards	Port of Batangas Manila North Port	Make a **direct contribution** to environmental conservation by recycling collected materials into useful products. Raise **awareness** and educate participants about recycling and its potential to create valuable resources from waste.	May have **limited appeal** to participants who prioritise immediate and monetary benefits. Participants may perceive an **effort–reward imbalance** where the effort required to attain non-monetary rewards outweighs their perceived value.

In addition, WWF developed a communication strategy to publicise the incentive programmes, their details and benefits. WWF decided to emphasise the broader environmental significance of the programmes by underscoring how individual actions help to mitigate plastic pollution and promote sustainable waste management practices.

LESSONS LEARNED

WWF observed that they are various types of incentives. Selecting the most appropriate one depends on the context of the specific localities. The project learned that active stakeholder involvement is the cornerstone of implementing a successful incentive-based programme. Involving stakeholders in the decision-making process from the outset ensures effective design of incentives.

WWF also observed that incentives should be implemented on a long-term basis to promote a shift towards sustainable waste management practices. Securing funding for a long-term period, either through the development of a sustainable business model where incomes received for recyclable

waste could cover all costs, economic instruments, or specific funding allocated by a private or public partner, is thus essential to sustain the incentives.

Adopting a holistic approach is crucial for making significant progress. It involves addressing not only high value plastic waste, such as PET, PP and HDPE, but also other materials, such as used papers, cardboard boxes, metal cans and glass bottles. It also encompasses improving the entire waste management system, and especially infrastructure, such as segregation bins. In the Port of Cagayan de Oro, the implementation of the environmental points system with BEST, along with the installation of segregation bins and associated signs, has considerably improved source segregation in the port from port offices and terminal buildings.

Investing in training and capacity-building activities for local communities and waste management partners to ensure that they have the appropriate skills and knowledge to sustain waste management practices has been another key element in ensuring the sustainability of the initiatives.

Finally, implementing a robust system for monitoring and evaluating waste management efforts to track progress and identify areas that require improvement has been identified as crucial, together with obtaining feedback from the entities and employees implementing the programmes on the ground.

CONCLUSION

Incorporating incentives for plastic collection and recycling into waste management strategies demonstrated their potential to empower sustainable waste management practices in ports and communities. A large amount of recyclable plastic waste and other materials has been collected in just a few months.

CHAPTER VII
EMPOWERING WASTE WORKERS WITHIN AND OUTSIDE THE PORT PREMISES TO IMPROVE WASTE MANAGEMENT SYSTEMS

Solutions for integrated waste management involve identifying and engaging with relevant stakeholders, including port employees and the informal waste sector. This chapter aims to share the experience and lessons learned from the project in working with informal and formal waste workers in ports and communities neighbouring the ports on the topic of plastic waste reduction and management.

WHO ARE THE WASTE WORKERS?

Waste workers, both in the formal and informal sectors, play a significant societal, environmental and economic role.[17] Studies show that they contribute greatly to the collection, sorting and recycling rate of plastics.[18] As plastic waste generation is expected to continue to grow,[19] their role will increase.

In this chapter, the term 'waste worker' includes utility workers and informal waste workers.

Utility workers, in the ports, have primary responsibility for handling and transferring waste from bins to collection trucks and are part of the janitorial services. They also actively contribute to the recycling process by sorting and collecting high-value recyclables such as paper, glass, metal and plastics separately, sometimes selling their high-quality recyclables to junk shops to earn an additional income.

Informal waste workers are usually involved in solid waste collection and recovery activities that are not covered by formal arrangements. Some studies estimate that the informal waste sector consists of around 15 million people worldwide,[20] recovering a high proportion of the waste that could be recycled at the global level.[21] Where the project on ports is concerned, they are usually working in the communities within and outside the ports and are also often residents of these areas.

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[17] Spotlight on Sustainable Development 2018, To ensure sustainable waste services, we must value waste workers and make sure they are in decent jobs, https://www.2030spotlight.org/en/book/1730/chapter/sdg-11-ensure-sustainable-waste-services-we-must-value-waste-workers-and-make

[18] Ibid. and United Nations Human Settlements Programme (UN Habitat), Norwegian Institute for Water Research (NIVA), 2022, Leaving no one behind - How a global instrument to end plastic pollution can enable a just transition for the people informally collecting and recovering waste, https://unhabitat.org/sites/default/files/2023/04/en_2503_leaving_no_one_behind.pdf

[19] Organisation for Economic Co-operation and Development (OECD), Toward Eliminating Plastic Pollution by 2040, A Policy Scenario Analysis – Interim Findings, November 2023

[20] International Labour Organisation, 2018, Women and Men in the Informal Economy: A Statistical Picture. Third edition, International Labour Office – Geneva.

[21] UN Habitat, NIVA, 2022, Leaving no one behind - How a global instrument to end plastic pollution can enable a just transition for the people informally collecting and recovering waste, https://unhabitat.org/sites/default/files/2023/04/en_2503_leaving_no_one_behind.pdf

These individuals are actively involved in the collection of items and materials from both households and non-households. They collect waste from bags and bins, or from the streets, especially from areas that are not regularly serviced by the collection trucks because of narrow streets and limited access. They usually segregate the waste and sell the recyclables to intermediates.

WASTE WORKERS: KEY ACTORS FOR THE PROJECT ACTIVITIES

Under the project, WWF started by identifying waste workers, their knowledge, expertise and challenges. This was done through organised groups and relevant entities, such as Plastic Bank for informal waste workers and the port management offices for formal waste workers.

WWF observed that both formal and informal waste workers in the three ports covered by the project possessed an in-depth understanding of the current waste management practices within the port and its surroundings, as they were directly involved in the collection and recovery of waste. For instance, utility workers in Batangas had a very good knowledge of the type and volume of waste generated.

Regarding the challenges, informal waste workers shared that they are often undervalued and overlooked. They have little access to basic personal protective equipment and tools, such as protective clothing, masks, boots and gloves, which increases the health and safety risks that they face. They also face economic and social barriers to obtaining new income opportunities. Gendered structural barriers such as lower earnings for females, discrimination and violence are also common. The lack of storage space and precarious livelihoods also mean they have to sell materials on a daily basis and cannot wait for advantageous prices. Utility workers also highlighted low wages with few benefits such as health care and insurance among their challenges.

© WWF-Philippines. An informal waste worker collecting plastic waste next to Manila North Port.

Based on their mapped skills and challenges, the project developed solutions to support waste workers. WWF actively involved utility workers in solutions to improve waste segregation, collection and recycling. Waste bins were strategically deployed within the port facilities to enhance waste segregation. WWF has worked closely with the utility workers to involve them in the setting up of these bins, providing training and equipping them with the relevant knowledge to guide passengers and port employees.

WWF also actively engaged utility workers in Port of Cagayan de Oro in collection events organised by BEST Inc, a local social enterprise that provides financial incentives for every kilo of recyclables, which can be used to buy products. It has been stated that these activities have significantly improved the skills of utility workers in waste sorting, making them more efficient in their waste management duties.

The project also engaged informal waste workers through a partnership with Plastic Bank, a social enterprise that provides social and economic support to waste workers and junk shops. Waste collectors who bring recyclable plastic waste to junk shops that partner with Plastic Bank receive an additional amount of money on top of the market price for the materials, as well as health and education benefits. WWF provided support through Plastic Bank for protective items such as masks, boots, gloves and push carts to help waste workers in their work.

The project also engaged with waste workers in Barangay Lapasan in Cagayan de Oro. The project provided them with protective equipment for the collection of waste from the creek Bitan-ag that goes through the community and ends in the port and is known as the one of most heavily polluted creeks in Cagayan de Oro. The project also improved the materials recovery facility, especially the segregation and the storage areas, and helped the workers to develop a business model to connect with the market to ensure that they obtain financial benefits from the recyclable waste collected.

Finally, WWF has involved waste workers through diverse activities, such as informal, education and communication training and events, and highlighted their crucial role in waste management systems to increase awareness about their role among the other stakeholders.

LESSONS LEARNED

The infrastructure for waste management relies on human labour, and waste workers play a vital function in the waste management systems. One of the learning of the project is that ensuring diversity and social inclusion in stakeholder engagement, is crucial to ensure that new policies and activities do not affect any groups negatively, particularly informal waste workers, who earn their living from waste-picking and collection activities. They should be involved in planning to ensure that their contribution is recognized and that they get the support they need to carry out their activities. Sufficient time and resources should also be allocated to this.

Drawing on entities' and organisations' expertise and experience in the formal and informal waste sectors is important. During the project, the team observed the complexity of the formal and informal waste landscape. There is a high number of actors in the formal and informal waste systems and the actors of these two systems are closely interlinked and evolve in parallel or coordination. WWF decided to partner with Plastic Bank for example for the work with the informal

© WWF-Philippines. Children looking at workers collecting waste in the Bitan-ag creek in Barangay Lapasan in Cagayan de Oro.

waste workers, and building on existing activities has been shown to be very helpful in making progress.

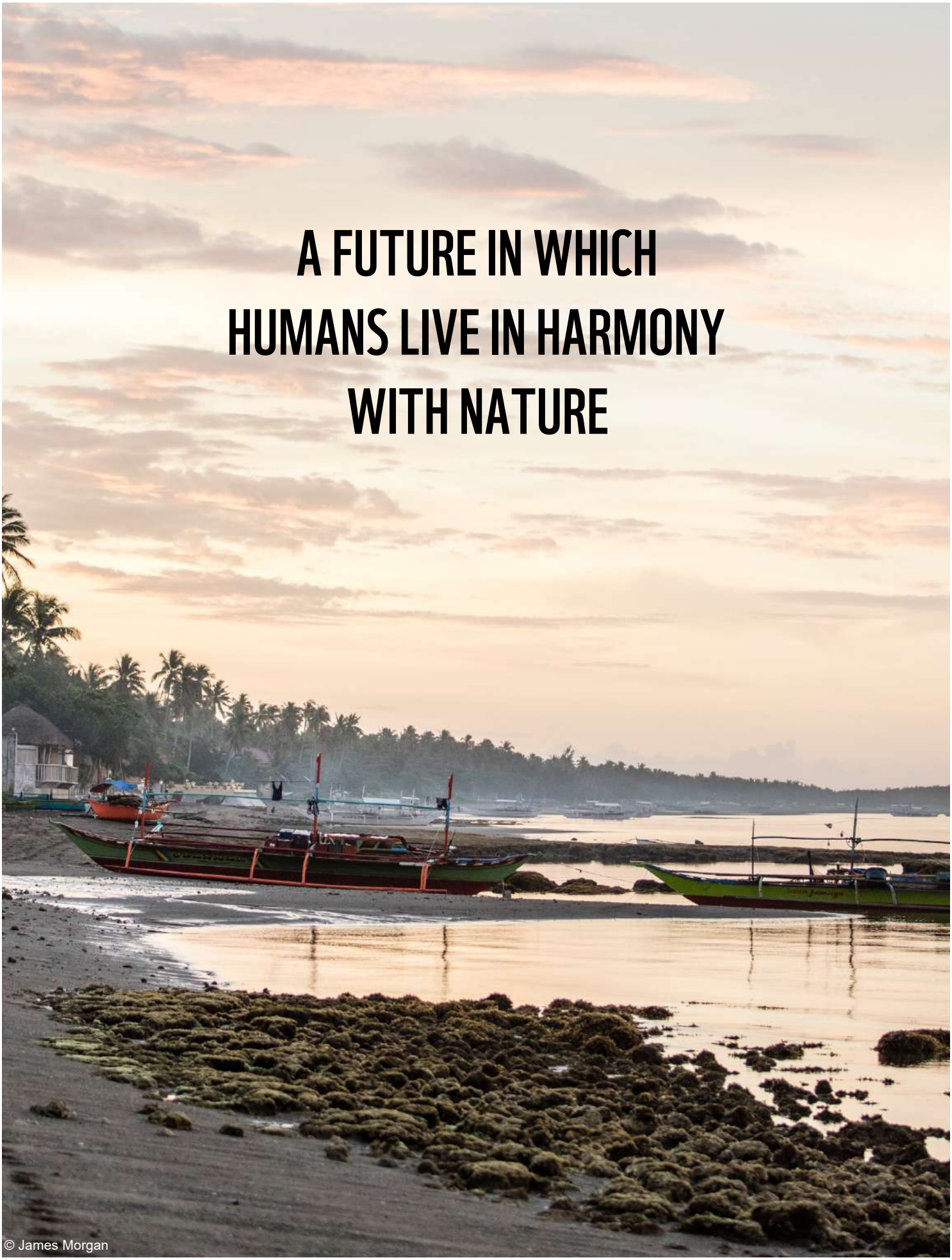
Through the project, WWF noticed the lack of respect that most waste workers face. WWF learned that ensuring waste workers are recognised, by means of training to enhance their skills or providing protective equipment, is crucial to ensuring the efficiency of the waste management process and improving their work and living conditions. WWF has also found it crucial to involve them, and recognise their role in any events and activities, to ensure that other stakeholders are encouraged to do the same.

Finally, the lack of storage space has been seen as one of the factors that limits how informal waste workers collect, aggregate and process waste and get benefits from it, especially in Manila. When informal waste workers do not have enough space to store waste, they must sell waste directly and could not benefit from the fluctuation of the prices. Improving storage and segregation areas have been seen as crucial components to improve their livelihoods.

CONCLUSION

Supporting and empowering waste workers is crucial to ensure a strong circular economy and mitigate the impacts of plastic pollution. The project has successfully engaged with waste workers, leading to important results, such as the collection of around 18 metric tons of recyclables in a period of six months in Manila. WWF urges ports, communities and other entities to recognise and include waste workers in any activities that aim to improve waste management systems.

A FUTURE IN WHICH HUMANS LIVE IN HARMONY WITH NATURE



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