

BASELINING ON PLASTIC WASTE GENERATION AND MANAGEMENT IN PORTS AS FOUNDATION FOR PILOTING SOLUTIONS

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BRIEFER 1



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BRIEFER INTRODUCTION

Plastic pollution is an urgent environmental concern that requires collaborative efforts to protect our oceans and marine biodiversity. It is crucial to recognize that even ports can contribute to plastic waste leakage. To address this, the World Wide Fund for Nature (WWF) implemented a three-year project named **“Clean Ports, Clean Oceans: Improving Port Waste Management in the Philippines”** (hereinafter “the project”), in partnership with the Grieg Group, as part of its commitment to the No Plastic in Nature Initiative. The project was funded by the Grieg Foundation and aimed to achieve 50% plastic waste leakage reduction in three Philippine ports - Batangas, Cagayan de Oro and Manila North.

This brief, published by WWF-Philippines, aims to share the experience and lessons learned from the conduct of baseline studies to collect information on the generation and management of waste, and especially plastic waste. The data from the baseline was then used to set targets to reduce plastic waste leakage and determine appropriate actions to address this issue. Taking the Plastic Smart Cities approach, this should be considered once the commitment of the respective stakeholders has been secured.



WHAT IS BASELINING?

Baselining is simply defined as the **process of collecting and assessing scientific and high-quality data** to establish a benchmark for identifying existing problems that need solutions and current conditions that require improvement. In the sector of waste, including plastic waste, it involves collecting data on collected, recovered, disposed and uncollected waste to assess the flow and leakage within the waste management chain. It also serves as a tool to help the key stakeholders evaluate the potential impacts of waste management strategies and initiatives to be implemented such as policies, laws, technologies, and other concrete solutions.

Asking the right questions using the **5W1H approach (What, Who, When, Where, Why, and How)** is crucial for gathering relevant data and establishing an accurate baseline. The specific questions to ask will depend on the scope and objectives of the baseline study.



For the WWF baseline studies [1] conducted in 2021 at the three selected ports of Batangas, Cagayan de Oro, and Manila North, the following are some of the questions related to solid and plastic waste management that were aimed to be answered:



Waste Generation

- What is the current waste and plastic waste generation rate of the port? (can be daily, weekly, monthly, or yearly)
- What are the sources of waste and plastic waste within the port? (i.e., vessels, port facilities, communities)
- What is the composition of the waste? (i.e., biodegradable, recyclable, residual, and special)



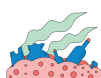
Waste Segregation and Collection

- What are the existing waste management facilities and infrastructure in the area?
- Who collects the waste including plastic waste?
- How is waste currently collected and transported?
- How much waste is being collected?
- How is the waste being segregated and in what categories?
- When is the collection?



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?
- What are the recovery activities present in the landfill?



Unmanaged Waste

- How much waste is being left uncollected and unmanaged?
- 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 are the existing policies and legislation related to waste management being implemented in the port?
- What are the environmental impacts of the existing waste management practices?

[1] WWF Philippines (2022) Solid Waste Management Baseline Study in Manila North Port, Port of Batangas, Port of Cagayan de Oro. Retrieved from [WWF-Philippines | Grieg Foundation](#)

TARGET STAKEHOLDERS

Stakeholders who play significant roles in waste management and the decision-making process are key targets for the baselining. It is important to establish partnerships, whether through a formal agreement or proper endorsement, with these target stakeholders. The project, for example, connected with the following stakeholders:

- Philippine Port Authority (PPA) and concerned Port Management Office (PMO)
- National Government Agencies i.e., Department of Natural Resources and Environment (DENR) - Environmental Management Bureau (EMB)
- Concerned local government units (LGUs)
- Adjacent communities (Households)
- Maritime Industry Authority (MARINA)
- Philippine Coast Guard (PCG)
- Terminal operators
- Shipping lines operators
- Waste management service providers i.e., collectors, recyclers, transporters, and landfill operators, informal waste sector
- Vendors operating inside the port premises
- Utility workers for port - generated waste




IMPLEMENTATION

Conducting baselining in a port setting requires a comprehensive approach to obtain reliable and accurate data. This includes the following activities. Full details on the methodology can be obtained from the baseline studies at three selected ports [2].

- **Scope setting:** the first key step in the baseline assessment process is to establish a clear and measurable scope for the baseline study. The scope should also take into account constraints in resources. The desired outcomes of the baseline assessment should be identified to provide a definitive direction for the data collection process. Specific objectives might include determining the quality and quantity of plastic waste generated, collected, recovered, disposed, and unmanaged. By setting the scope, the assessment gains a purposeful framework that guides subsequent efforts.
- **Data collection and desktop review:** gather existing data on waste generation, infrastructure, and current waste management practices from port authorities, terminal operators, local governments, and relevant agencies. A review of general information on the port and the relevant stakeholders, solid waste management plans, policies, and ordinances related to port waste management should also be done.
- **Interview with relevant stakeholders:** perform a series of interviews with relevant stakeholders, such as representatives from port management, waste collection service providers, landfill operators, shipping associations, port facilities, port janitorial services, shipping operators, recycling facilities, households, and business establishments. These interviews can be conducted using phone communication, video conferencing apps, or in-person meetings to determine the current solid waste management practices and policies being implemented, along with the amount of waste being diverted and recovered.
- **Waste analysis and characterization:** conducting waste analysis and characterization studies involves adhering to the tools recognized at the national and international levels. Generally, this aims to determine data on the quality and quantity of waste at different aspects of solid waste management particularly at the generation and disposal, and to generate the overall waste flow diagram. This is done for at least one week.

[2] WWF PHILIPPINES (2022) SOLID WASTE MANAGEMENT BASELINE STUDY IN MANILA NORTH PORT, PORT OF BATANGAS, PORT OF CAGAYAN DE ORO. RETRIEVED FROM [WWF-PHILIPPINES | GRIEG FOUNDATION](#)



In the context of the project, the Philippine Waste Analysis and Characterization Study (WACS) guidelines, which are outlined by national authorities such as the Philippine Department of Science and Technology (DOST) in partnership with the National Solid Waste Management Commission (NSWMC), and internationally recognized tools, such as the Waste Wise Cities Tool (WaCT) were used. These guidelines and tools were adjusted to suit the context of a port environment. A comprehensive breakdown of the step-by-step process can be found within the baseline studies.

The Philippines WACS guidelines provide instructions for analyzing and characterizing waste at both at-source and end-of-pipe stages [3]. The WACS results are instrumental in shaping the ten-year solid waste management plans of local government units, given that adherence to these guidelines is mandatory for these units. The WaCT complements the WACS guidelines by offering a comprehensive, detailed, and systematic guide for collecting data pertaining to municipal solid waste, including collection, recovery, disposal, and uncollected waste [4]. This holistic approach provided a comprehensive assessment of the actual state of the municipal solid waste system, addressing aspects that may not be fully covered by the WACS guidelines alone. Solid waste management infrastructure, including recovery and disposal facilities, were visited to document the existing conditions and operations of these facilities and to determine the level of control.

These guidelines and tools can be labor-intensive, often requiring at least one week, as per the experience gained in 2021. However, the investment in utilizing them proves to be valuable in the long run, considering that the data collected and analyzed holds both quality and scientific significance.

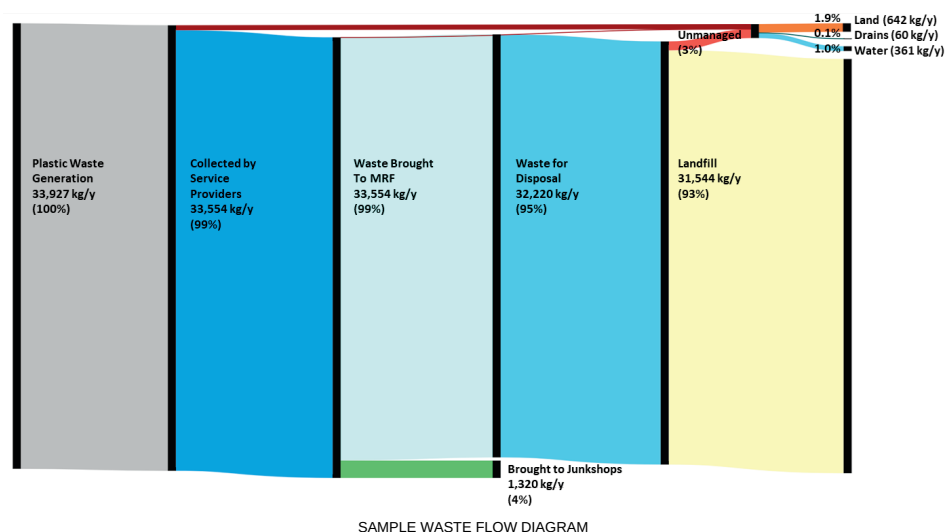
[3] DEPARTMENT OF SCIENCE AND TECHNOLOGY - INDUSTRIAL TECHNOLOGY DEVELOPMENT INSTITUTE (2021) MANDATORY GUIDELINES ON WASTE ANALYSIS AND CHARACTERIZATION STUDY.

[4] UN-HABITAT (2021) WASTE WISE CITIES TOOL MANUAL . RETRIEVED FROM [UNHABITAT.ORG/SITES/DEFAULT/FILES/2021/02/WASTE WISE CITIES TOOL - EN 3.PDF](https://unhabitat.org/sites/default/files/2021/02/waste-wise-cities-tool-en-3.pdf).

IMPLEMENTATION

- **Key informant interviews and focus group discussion:** engage with key stakeholders, such as port and vessel authorities, national agencies, local government units, waste service providers including informal waste workers, representatives from communities, and business establishments, to understand their perspectives and challenges and to gather valuable feedback regarding the baseline activities.
- **GIS mapping and flow analysis:** utilize Geographic Information System (GIS) tools and flow analysis tools, such as the Waste Flow Diagram (WFD), STAN, and Sankeymatic to map waste generation hotspots, collection points, routes, and produce waste flow diagrams.

The Waste Flow Diagram is a rapid assessment and complementary tool of WaCT [5]. It does not provide instructions for baselining, but the baseline data is necessary to utilize the tool and create plastic waste flow diagrams.



In case of conducting the baseline activities during a pandemic, such as the recent COVID-19 pandemic, a contingency plan should be developed to prioritize and ensure the safety and well-being of all participants involved. Health and safety protocols in accordance with the COVID-19 guidelines and regulations issued by the relevant health authorities should be strictly implemented particularly to areas that are considered high-risk such as waste sorting areas. These include wearing personal protective equipment (PPE) such as full body suits and face masks during fieldwork and site visits, maintaining physical distance, using hand sanitizers, and providing separate and quarantine areas for individuals with symptoms and those without.

[5] GIZ, UNIVERSITY OF THE LEEDS ET AL. (2021) WASTE FLOW DIAGRAM MANUAL. RETRIEVED FROM [GIZ.DE/EXPERTISE/DOWNLOADS/GIZ-WASTE-FLOW-DIAGRAM-USER-MANUAL.PDF](https://www.giz.de/Expertise/Downloads/GIZ-Waste-Flow-Diagram-User-Manual.pdf).

Navigating the Baseline Establishment Process: Identifying Challenges and Ensuring Accuracy

Baselining is a significant undertaking, and the process itself is susceptible to errors. Below are some common mistakes that can occur during baseline establishment. However, these errors can be corrected and prevented with careful consideration.

-  **Inadequate planning:** Inadequate planning can lead to collecting data that falls outside the scope of the assessment and inefficient use of resources during the baselining process. Therefore, conducting thorough planning and preparation before engaging in baseline activities is crucial.
-  **Insufficient data collection:** Insufficient data may result in biased or misleading results, an incomplete understanding of the overall situation, or an unreliable baseline. To address this, it is important to establish clear objectives and define limitations during the planning phase, prioritizing key data based on available resources.
-  **Ignoring local context:** Neglecting to consider the unique characteristics and challenges of the specific location or port being studied can occur when local stakeholders or authorities are not involved in the process. Coordination with relevant entities, including proper authorities and port operators, is necessary to avoid this mistake.
-  **Lack of standardization in baselining:** Without standardized methodologies, different baselining processes may occur at different time periods, making it difficult to compare data. Providing a detailed methodology in the baseline report is essential to enable future replication, consistency, and monitoring.
-  **Lack of data sources:** Citing sources is critical, especially in the baseline report. Clearly indicating the origin of the data allows readers to validate and request updated information.

CONCLUSION

The baselining process is far more than a mere data collection exercise. It is a structured approach with a wide range of activities to understand and create the overall picture of the existing port waste management. By adhering to standardized methodologies and utilizing guidelines and tools, data on waste generation, collection, recovery, disposal, and even plastic leakage can be determined. Baseline data can then be used to design relevant interventions to tackle plastic pollution and serve as a benchmark to monitor progress. Baseline studies is a powerful tool for ports to improve the management of waste, including plastic waste.