PHILIPPINES

NATIONAL PLAN OF ACTION FOR THE PREVENTION, REDUCTION AND MANAGEMENT OF MARINE LITTER

May 2021

This document has been developed through a multi-stakeholder consultative process led by the Government of Philippines' Department of Environmental and Natural Resources (DENR) through its Environmental Management Bureau (EMB), in close cooperation with Biodiversity Management Bureau (BMB) and other government agencies, partners from the business sector, nongovernment organizations and other stakeholders, and carried out with support from the United Nations Development Programme (UNDP).

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ABBREVIATIONS

3Rs	reduce, reuse, recycle
ALDFG	abandoned, lost or otherwise discarded fishing gear
ASEAN	Association of Southeast Asian Nations
BAR	Bangsamoro Autonomous Region
BAU	business as usual
BFAR	Bureau of Fisheries and Aquatic Resources
BMB	Biodiversity Management Bureau
BOC	Bureau of Customs
BOI	Board of Investments
BOL	Bangsamoro Organic Law
CEC	Circular Economy Club
CMEMP	Coastal and Marine Ecosystems Management Program
COBSEA	Coordinating Body on the Seas of East Asia
CTI-CFF	Coral Triangle Initiative on Coral Reefs, Fisheries, and Food Security
DA	Department of Agriculture
DBM	Department of Budget and Management
DENR	Department of Environment and Natural Resources
DepEd	Department of Education
DILG	Department of the Interior and Local Government
DOF	Department of Finance
DOH	Department of Health
DOST	Department of Science and Technology
DOTr	Department of Transportation
DPWH	Department of Public Works and Highways
DTI	Department of Trade and Industry
EMB	Environmental Management Bureau
EO	Executive Order
EPR	Extended Producer Responsibility
ERDB	Ecosystems Research and Development Bureau
ESR	Extended Stakeholder Responsibility
ESWM	Ecological Solid Waste Management
EWG	estimated waste generation
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GPA	Global Programme of Action
GPP	Green Public Procurement
HDPE	high density polyethylene

ICC	International Coastal Cleanup
ICM	Integrated Coastal Management
IEC	information, education, and communication
IGES	Institute for Global Environmental Strategies
IRR	implementing rules and regulations
ITDI	Industrial Technology Development Institute
IWS	informal waste sector
kg	kilogram(s)
LCA	life cycle analysis
LGU	Local Government Unit
MARINA	Maritime Industry Authority
MARPOL	'Marine Pollution' or International Convention for the Prevention of Pollution from Ships
MERRAC	Marine Environmental Emergency Preparedness and Response Regional Activity Centre
MERV	monitoring, evaluation, reporting, and verification
MMDA	Metropolitan Manila Development Authority
MRF	materials recovery facility
MSC	multi-stakeholder consultation
MSW	municipal solid waste
MT	metric ton(s)
NCWC	National Coast Watch Council
NEDA	National Economic Development Authority
NGO	nongovernmental organization
NIPAS	National Integrated Protected Areas System
NPOA-ML	National Plan of Action for the Prevention, Reduction and Management of Marine Litter
NSWMC	National Solid Waste Management Commission
NSWMF	National Solid Waste Management Framework
NSWMS	National Solid Waste Management Strategy
OC	Ocean Conservancy
PA	protected area
PAP4SCP	Philippine Action Plan for Sustainable Consumption and Production
PBSAP	Philippine Biodiversity Strategy and Action Plan
PCG	Philippine Coast Guard
PD	Presidential Decree
PDP	Philippine Development Plan
PET	polyethylene terephthalate
PhP	Philippine peso(s)
PNP	Philippine National Police

PPA	Philippine Ports Authority
PPIA	Philippine Plastic Industry Association
PP	Presidential Proclamation
PPP	public-private partnership
PR	[Global] Producer Responsibility
R&D	research and development
RA	Republic Act
RAP MALI	Regional Action Plan on Marine Litter
RO	regional office
RPOA	Regional Plan of Action
SCP	sustainable consumption and production
SDG	Sustainable Development Goal
SLCP	short-lived climate pollutants
SLF	sanitary landfill
SMSMEs	startup, micro-, small, and medium enterprises
SWDS	solid waste disposal sites
SWM	solid waste management
SWMD	Solid Waste Management Division
TWG	Technical Working Group
UNDP	United Nations Development Programme
UNEA	United Nations Environment Assembly
UNEP	United Nations Environment Programme
WACS	Waste Analysis and Characterization Study

EXECUTIVE SUMMARY

The National Plan of Action for the Prevention, Reduction and Management of Marine Litter (NPOA-ML) has been developed to provide a blueprint to enhance the current efforts of the country in resource and waste management and to bring additional lens to marine litter issues and the control of additional leakage of waste into bodies of water.

The global transboundary nature of marine litter has been emphasized with the presence of floating debris in oceanic gyres and had been put to light with secondary studies that rank the Philippines as the third largest contributor to ocean plastic litter. While such findings need country validation, the Department of Environment and Natural Resources (DENR), through its Environmental Management Bureau (EMB) and Biodiversity Management Bureau (BMB), set out to bring experts and actors together to examine the issues, policies, ongoing initiatives, and remaining gaps with the goal of developing the NPOA-ML through a multi-stakeholder participatory process.

The processes involved in developing the NPOA-ML consist of a series of DENR core group meetings, levelling meetings, and multi-stakeholder, multi-sectoral workshops as detailed in Annex A. Ideas have been continuously solicited from key actors to reflect various perspectives.

With a vision of having "A Philippines free of marine litter through shared responsibility, accountability and participatory governance" and an overarching goal of "Zero waste to Philippine waters by 2040", marine litter prevention, reduction and management measures have been clustered into programmatic cluster (consisting of six strategies) and enabling or cross-cutting cluster (consisting of four strategies) of actions, as enumerated below. Each strategy is further defined by its main activities – mostly with suggested sub-activities as future guide for the lead and cooperating agencies that tasked to implement each strategy.

I. Programmatic Cluster of Actions

Strategy 1: Establish science- and evidence-based baseline information on marine litter
Strategy 2: Mainstream circular economy (CE) and sustainable consumption and production (SCP) initiatives
Strategy 3: Enhance recovery and recycling coverage and markets
Strategy 4: Prevent leakage from collected or disposed waste
Strategy 5: Reduce maritime sources of marine litter
Strategy 6: Manage litter that is already existing in the riverine and marine environments

II. Enabling/Cross-cutting Cluster of Actions

Strategy 7: Enhance policy support and enforcement for marine litter prevention and management
Strategy 8: Develop and implement strategic and targeted social marketing and communications campaigns using various media
Strategy 9: Enable sufficient and cost-effective financing and other institutional resource requirements for the implementation of the NPOA-ML
Strategy 10: Strengthen local government unit (LGU) capacities and local level implementation of NPOA-ML

NPOA-ML strategies and activities were proposed and screened in due consideration of specific guiding principles wherein marine litter stakeholders identified certain merits to place strategies and actions high on the agenda. To ensure success of NPOA-ML implementation, strategies and actions should be: doable, applicable, and appropriate; science and knowledge-based; progressive or phased implementation; operationally supported; and continuously funded. Additional considerations likewise observe integration, prevention, precautionary, SCP, polluters-pay, and public participation and stakeholder involvement principles; as well as ecosystem- and science- based approaches.

1. CONTEXT

Marine litter, sometimes referred to as marine debris, is defined as "any persistent, manufactured or processed solid material discarded, disposed of or abandoned in the marine and coastal environment". It consists of items that have been made or used by people and deliberately discarded into the sea or rivers or on beaches; brought indirectly to the sea with rivers, sewage, storm water or winds; or accidentally lost, including material lost at sea in bad weather [United Nations Environment Programme (UNEP), 2009].

1.1 KEY CHALLENGES

The global transboundary nature of marine litter has been emphasized with the gyres—large systems of circulating ocean currents in the world's oceans—and the presence of floating debris, notably plastics and other non-degradable materials. Public awareness on its impacts on marine life have been raised with the growing number of whales and fishes washing up ashore with autopsy reports of gastric shocks from ingesting the litter, including the cases similarly suffered by migratory birds. Mangrove forests and coral reefs have also found to be negatively affected.

It is premised that majority of the uncollected waste is burned, buried, self-managed, and littered or illegally dumped with high potential for leaking into the marine environment. Waste collection also does not mean no leakage at all. Some end up in waterways during the process of collection and transport. Many illegal dumpsites also have not followed proper site identification procedures and their proximity to bodies of water or flood-prone areas may render its waste bodies vulnerable to waste leakage into the marine environment.

Despite the *International Convention for the Prevention of Pollution from Ships (MARPOL),* some sea- based sources of waste could be caused by operational or accidental causes of direct waste dumping or discharge. Even abandoned, lost or otherwise discarded fishing gear (ALDFG) from commercial fishing vessels and to a certain extent, from fisher folk, are causes of concern due to entanglement of marine animals such as turtles and dolphins.

There are also domestic and international market and economic forces, legislations, design of products and services, urbanization and consumerism patterns, regional cooperation, and human behavior and convenience factors that affect sustainable consumption and production (SCP).

Considering that marine litter is a complex and multi-dimensional problem with significant implications for the environment, economy, and human health and safety, there is no single solution to the marine litter problem. Marine litter is a complex issue that requires actions at many levels and places as it covers the whole chain in which waste is produced, used, managed, and ending up in the marine environment. Cooperation is needed to address this; Sustainability of actions depend on the capacity and will to veer away from the traditional practice of take- make-use-dispose (linear economy) to getting everybody to fully appreciate the value of every resource and create systems-wide approaches across value chains to let that value (resources) stay in the economy for the longest possible time and not end up as waste in disposal sites or seas.

1.2 OPPORTUNITIES AND BENEFITS

Solid waste from land- and at-sea sources, including ALDFG, directly and negatively impact coastal and marine species and habitats, economic health, human health and safety, and social values. Preventing, reducing and managing existing and additional marine litter will minimize these ecological, economic, and social impacts.

On the economic side, the negative effects of marine litter across value chains and throughout the local economy can be abated. The economic benefits derived from marine and coastal activities can be protected and maximized, specifically in the shipping, fisheries, aquaculture and tourism industries. The environmental costs for cleanups and the decline in ecosystem services can be reversed.

At the upstream, marine litter is a manifestation of a substantial resource inefficiency. Reducing waste at source, resource efficiency and circular economy policies and practices aim at doing more and better with less and encourage higher resource productivity. These systematic shifts generate new and expanded business and economic opportunities and provide environmental and social benefits, such as social equity, resource security, cleaner production and job creation. Individual communities likewise benefit from durable products arising from product redesigns.

In terms of waste management, LGUs can realize tipping fee savings out of diverting mixed waste away from disposal facilities. Marine litter reduction measures will also create a level playing field wherein recycled or secondary raw materials are not disadvantaged vis-à-vis virgin material use. An economy of scale will in turn be influenced by cooperation of users and the existence of material recovery systems and infrastructure for recycling and processing.

Marine litter poses serious threats to marine wildlife through entanglement causing limited mobility for such animals, which can lead to starvation, suffocation, laceration, subsequent infection, and possible mortality. Degraded and micro-plastics likewise cause physical obstruction of the mouth, digestive tract, and stomach lining of various species, causing eventual starvation among marine animals. The seafood industry could also undergo long-term effects due to ingestion and bioaccumulation, which can result in public health risks if contaminated fish are eaten. Additional ecological impacts of habitat destruction and transport of chemicals along with marine litter likewise need to be addressed [UNEP/NOAA, 2011].

Intrinsic and social values associated with coastal and marine environments are likewise diminished by marine litter. Awareness and concern for the sustainability of the environment has increased in recent times yet non-use value (knowledge that quality coastal ecosystems exist) and option value (ability to use the coastal environments) are two principal intrinsic values decreased by marine debris. Another social value affected is the aesthetic value. Debris is an eyesore, and it reduces the attractiveness of coastal areas and of near-shore and open water areas. This leads to lower beach user enjoyment and lower surrounding property values. These socioeconomic impacts provide helpful insight into the public's concern and should not be ignored. [UNEP/NOAA, 2011].

Sensitizing stakeholders to time and space incongruity requires perspectives from different sectors to align their values and interests to the common goal of preventing and managing marine litter. This NPOA-ML is expected to catalyze multi-pronged and holistic solutions.

1.3 VISION AND GOAL

The overarching goal of the NPOA-ML is *"Zero waste to Philippine waters by 2040"* to support the vision of *"A Philippines free of marine litter through shared responsibility, accountability and participatory governance"*.

1.4 GUIDING PRINCIPLES

Marine litter stakeholders identified certain merits to place strategies and actions high on the agenda. Some guiding principles have been adopted from the *Coordinating Body on the Seas of East Asia* (COBSEA) *Regional Action Plan on Marine Litter* (RAP MALI) while others have been identified during national workshops. To ensure success of NPOA-ML implementation, strategies and actions should be guided by:

- *Doability, applicability and appropriateness to the Philippine setting* whereby actions should be adapted to local situations and capabilities to ensure sustainability. The Philippines has had best practices and learnings from implementing rehabilitation programs in Boracay and Manila Bay, which could serve as take off point for national, regional and plans.
- The *prevention principle* by virtue of which measures should prioritize addressing the prevention of marine litter generation at source. This is complemented by the SCP principle by virtue of which current unsustainable practices must be transformed to life cycle models that decouple human development from environmental degradation.
- *Science and knowledge-based approaches* by virtue of which measures should be based on the best available scientific evidence. Drawing from the experiences and lessons learned from local initiatives, procedural guidelines need to be developed to serve as reference for LGUs and other stakeholders. NPOA-ML review and updating should also be based on sound baselines and monitoring reports.
- The *precautionary principle* by virtue of which where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.
- The *polluter-pays principle* by virtue of which the costs of pollution prevention, control and reduction measures are to be borne by the polluter, with due regard to public interest.
- The *ecosystem-based approach* by virtue of which the cumulative effects of marine litter and other contaminants on biodiversity, riverine and marine ecosystems, habitats and species should be fully considered.
- The *whole-of-economy approach* wherein *public participation and stakeholder involvement* by virtue of which the general public, including local communities, private sector, civil society organizations, and local authorities will be involved in the development and implementation of efforts. This also covers the integration and cohesion principles by virtue of which marine litter prevention, reduction and management are addressed across relevant sectors and in a coordinated manner.
- *Phased approach to implementation* starts with low hanging fruits and then gradually develops in stages or with targets in progression.
- *Operational support and continuous funding* of activities influence the success of NPOA-ML implementation. Technology and resource requirements for each action should be analyzed and considered in the planning process. Effective operational structure should also be designed for streamlined oversight and implementation. Lead and cooperating

agencies with relevant mandates should embed actions in their annual budget requests, which can be complemented by resources from non-government entities.

2. BASELINE INFORMATION

Baselines are important pre-requisites for having a sound plan, i.e., to ensure that identified actions are grounded, realistic, and doable. It serves as a reference for identifying appropriate measures and to compare performance indicators with to evaluate progress and corrective actions during implementation. In lieu of a definitive and comprehensively carried out baselining of the amount and impacts of marine litter already in the seas as well as the additional leakage from land- and sea-based sources each year, this first version of the NPOA-ML may be based on existing secondary studies that are available. Future baselining initiatives would be carried out to validate this as featured in the identified strategies and actions elaborated in Section 5.

2.1 STATUS OF REDUCING LAND-BASED SOURCES OF WASTE IN THE PHILIPPINES

Republic Act (RA) 9003, otherwise known as the *Philippine Ecological Solid Waste Management Act of 2000*, was signed into law. This law provides for the necessary institutional support mechanisms and instructs all LGUs to establish solid waste management (SWM) programs within their jurisdictions. In 2004, the National Solid Waste Management Commission (NSWMC) released the *National Solid Waste Management Framework (NSWMF),* which puts emphasis on measures to encourage waste avoidance, reduction and recycling as highlighted by RA 9003 provisions on mandatory segregation at source and waste diversion targets of initially at least 25 percent (%), which should be increased thereafter. RA 9003 assigns barangays to establish materials recovery facilities (MRFs) to improve resource recovery, whereas collection and management of residual and special wastes are assigned to city and municipal LGUs. According to RA 9003, all dumpsites should have been closed by 2006 and residual waste should be managed at sanitary landfills (SLFs) or integrated eco-centers for final processing and safe disposal. LGUs are also required by law to submit their 10-year SWM plans for approval of NSWMC [Philippine Congress, 2000].

In 2014, DENR-EMB, through the NSWMC Secretariat and the Environmental Education and Information Division, compiled the available information on SWM compliance through the *National State-of-the-Brown Environment Report (NSOBER) 2008-2014* following a previous effort on presenting the NSOBER for 2004-2007. Data revealed that the Philippines' average MSW generation rate at base year 2010 was 0.40 kilograms (kg) per capita per day with LGU-reported values ranging from 0.10 to 0.79. In 2010, the country's population of 92.3 million generated about 13.48 million metric tons (MT), or 36,935 MT of MSW on a daily basis, of which Metro Manila contributed around 22.2%. Actual figures from the Metropolitan Manila Development Authority (MMDA) revealed that the estimated waste generation (EWG) from the 17 LGUs in Metro Manila amount to 9,871.54 MT or 56,052.38 cubic meters per day [MMDA, 2018]. It was projected that by 2020, daily waste generation would be 45,556 MT and Metro Manila would contribute to around a quarter of the total [DENR-EMB, 2015].

From 2008-2014, households across the country generated the bulk of MSW, comprising 56.7% of waste tonnage. Commercial sources such as general merchandise stores and restaurants contributed 27.1%, of which public or private markets accounted for two-thirds of this share. About 12.1% of waste originated from institutions while the remaining 4.1% represents MSW

from industrial sources. As shown in Figure 1, about half (52.31%) of MSW generated in the country is biodegradable in nature although primary data suggest that figures can range from 30% to as much as 78%. Typical bio-waste consists of kitchen or food waste and yard or garden waste. From the available information, it could be estimated that 86.2% of compostable waste comes from food scraps while 13.8% are yard wastes. About 27.78% of the waste is classified by LGUs as recyclable materials and this rate can range between 4.1% and 53.3% depending on the city or municipality. Plastics comprise around 38% of recyclables, followed by paper and cardboard waste (31%). The remaining 31% comprises metals, glass, textile, leather and rubber. Residuals make up 17.98% of generated MSW, which often comprise of low-value 'potentially recyclable' materials, inerts, and other disposable wastes.

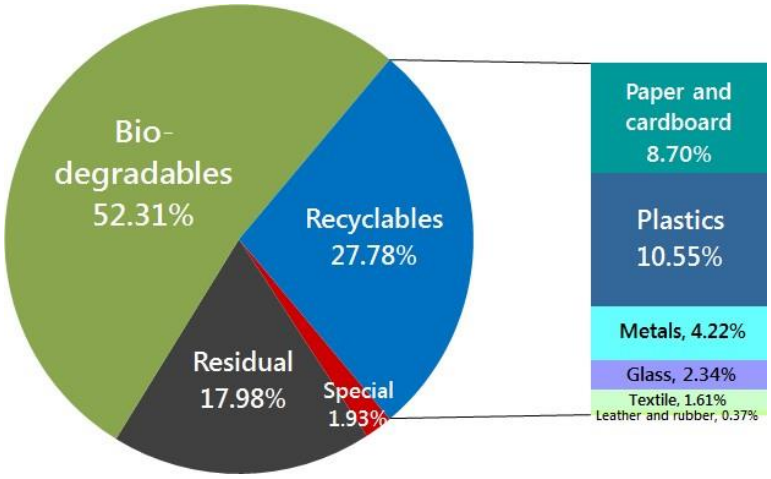


Figure 1. Composition of MSW in the Philippines by weight [DENR-EMB, 2015]

As a sub-set of the national waste composition, Metro Manila's average waste composition in 2018 was 44.32% biodegradables, 31.64% recyclables, 23.68% residuals and 0.36% special waste [MMDA, 2018]. In an effort to standardize the conduct of Waste Analysis and Characterization Studies (WACS), the NSWMC releases in 2020 the country's WACS Manual, which standardizes the sampling and methodologies. Key features of the new guidelines include the re-classification of residuals with recycling potential and the further disaggregation of material or waste types.

To better understand the status of SWM implementation in the country, the succeeding section looks at (a) the progress of SWM infrastructure and the effectivity of its coverage, and (b) how current programs currently address linkages between the different aspects of waste management.

Recyclables Collection and Waste Disposal

The DENR-EMB/NSWMC Secretariat continues to track the implementation of RA 9003 through its monitoring database, which consolidates information from EMB regional offices. As of June 2020, 55.4% of the 1,715 provinces, cities and municipalities in the Philippines have 10-year SWM plans approved in compliance with Section 16 of RA 9003. Another 39.3% had reached the evaluation stage while the remaining 5.3% or 91 LGUs had yet to submit [DENR-EMB/NSWMC, 2019].

For the individual or shared facilities that receive or process biodegradable or recyclable materials as mandated by Section 32 of RA 9003, about 10,722 MRFs have been established, with an expanded service coverage reaching 33% of the 42,036 barangays in the country as of October 2019. Recyclables are typically sold to junk dealers, consolidators and recyclers.In many

cases, the informal waste sector (IWS) brings the sellable materials to junkshops or waste generators bring materials to designated collection points, recyclables collection events or waste market fairs. The potential role of the IWS still needs to be recognized and integrated into the formal SWM system. In addition, the impact of the Chinese ban on raw scrap imports in January 2018 has yet to be assessed vis-à-vis market for recyclables and its effects on waste diversion rates.

Meanwhile, waste disposal remains a challenge since a total of 336 illegal dumpsites have to be closed and rehabilitated in accordance with Section 37 of RA 9003. It should be noted however, that this figure is only 61% of the total number of dumpsites in 2010 (553 recorded open dumpsites), pointing to a decreasing trend in the total number of dumpsites. The DENR-EMB has also adopted proactive measures to resolving this issue by supporting the development of safe closure and rehabilitation plans for 231 LGUs with active open dumpsites.

There has been a steady increase in the number of established SLFs and service coverage area; from 33 SLFs that cater to the residual waste of 78 LGUs in 2010, figures by June 2020 show that there are now 185 SLFs servicing almost 378 LGUs. In the case of Metro Manila, which is composed of 17 LGUs, around 53.82% of the EWG by volume had been disposed at the Rizal Provincial, Navotas, and New San Mateo SLFs wherein MMDA's Solid Waste Management Office spent over PhP 1.77 billion on solid waste collection in 2018 [MMDA, 2018].

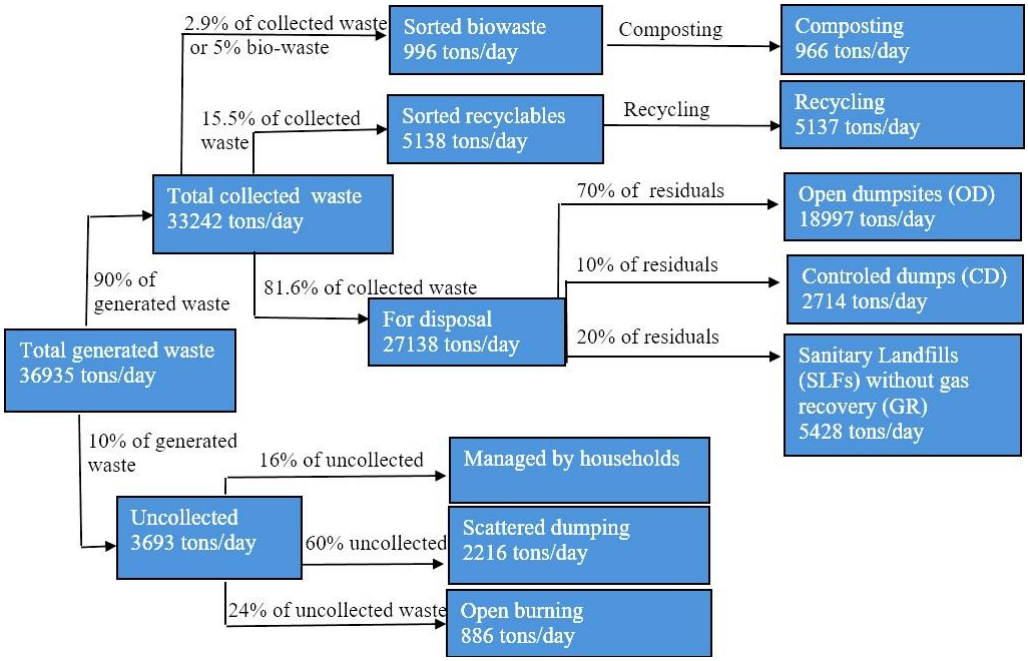


Figure 2. Waste flow and mass balance from 2010 BAU [NSWMC, DENR and IGES, 2019]

During the preparation of the National Strategy to Reduce Short-Lived Climate Pollutants from the MSW Sector in the Philippines, a national waste stream analysis was established for the reference year 2010. Facts and figures were largely based on national publications while experts vetting was employed to fill in the data gaps in the business-as-usual (BAU) scenario [NSWMC,

DENR and IGES, 2019]. Although the document examined MSW through the climate lens, the SWM system in the Philippines has yet to be analyzed using the "marine litter lens".

Initiatives on SCP and Circular Economy

Even though the Philippines does not have a specific circular economy law, it has a foundation of existing policies to accelerate the transition as demonstrated by the provisions embedded in its environmental laws and other policies that foster transition to green economic development. The formulation of a Philippine SCP Strategic Framework and Action Plan is led by the National Economic and Development Authority (NEDA). The plan aims to guide and facilitate the implementation of SCP across sectors in the country and to lay down the priority strategies and activities per core SCP thematic areas to support and advance SCP implementation. Proposed interventions in three thematic areas include sustainable business and lifestyles; resource conservation, efficiency, and cleaner production; and recycling and waste and chemicals management.

Nevertheless, national support for LGU waste programs lean towards incentives-based mechanisms that encourage advancements in SWM systems. In terms of preparing and updating 10-year SWM plans, the Department of Science and Technology through its Industrial Technology Development Institute (DOST-ITDI) has been providing trainings on WACS, which will help LGUs identify the specific types of waste being generated. Enabling LGUs to conduct WACS improves understanding and ownership of local waste management strategies.

Cities and municipalities have also taken the lead in promoting segregation at the household level under the National Ecosavers Program. Part Information Education Campaign (IEC) and part waste segregation and recycling, the program encourages children to bring their recyclables to school in exchange for incentives such as school materials. Similar programs have likewise been made in partnership with private organizations and with different targets (e.g. collection of soft plastics, bottles, etc.) and institutions (e.g. barangays, schools). Despite banking on financial incentives to drive participation, it has a strong potential for scaling up to a larger population and scaling out to other institutions if properly linked to local recycling industries.

Bulk of the efforts to 'close the loop' are observed at the end-pipe of the waste stream. In particular, innovations on waste disposal such as biogas technology and using soft plastics as fillers for cement hollow blocks or recycled plastic furniture, are becoming more popular across many LGUs as a strategy for diverting waste from ending up in landfills. On this note, the DOST-ITDI provides support through (a) certification of local inventions to ensure its design and operation are environmentally sound, and (b) dissemination of other alternative technologies (e.g. plastic densifiers) for waste management. In terms of quantity, however, these efforts are few and far between. Because these technologies are often adopted to the local context, a successful technology transfer requires not just the financial capacity to sustain the alternative waste disposal method but also the compatibility of the technology with the waste characteristics in the area. Similar initiatives are being undertaken by the private sector and NGOs.

RA 9003 mandates the NSWMC to list down non-environmentally acceptable products and packaging. Through NSWMC Resolution No. 238 series of 2015, the NSWMC adopted the Life Cycle Analysis (LCA) Study, which found that non-woven reusable polypropylene bags have the least environmental impact compared to single-use plastic or paper bags. A follow-up study in Metro Manila found comparable results, as shown in Figure 3 [Biona, 2017].

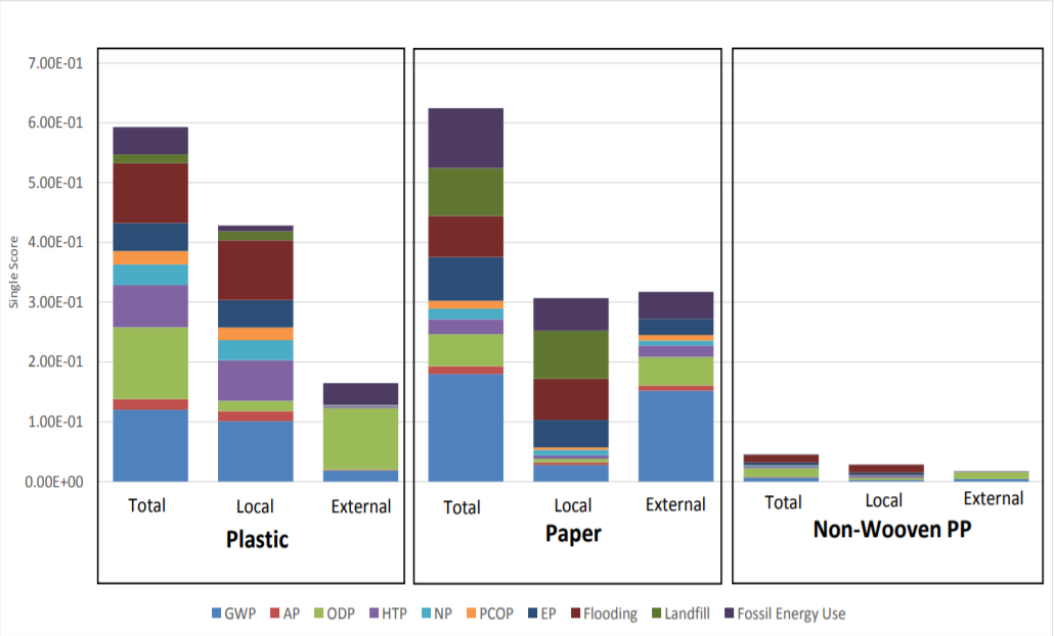


Figure 3. LCA Study of Carrying Bags Materials in the Metro Manila [Biona, 2017]

One of the solutions that is currently being considered is about placing the responsibility for the post-consumer phase of certain goods on producers. Extended Producer Responsibility (EPR) is a policy approach under which producers are given a significant responsibility – financial and/or physical – for the end of life management of their used (or post-consumer) products. This is as opposed to the less broad concept of global producer responsibility (PR) wherein producers or importers are responsible for their products regarding aspects of safety, health, and environmental impacts. EPR can include collection, sorting and treating post-consumer waste for their recycling and recovery. It is important to note that there is no single EPR setup and in Europe alone, there are at least nine documented models [EXPRA, 2016]. There have likewise been suggestions to use Extended Stakeholder Responsibility (ESR) instead to cover not only the role of manufacturers but also the responsibilities of consumers and LGUs in line with the RA 9003 national policy. Moreover, some sectors propose that a waste credit or exchange system could be a starting point for designing an EPR/ESR system that is locally designed.

To date, there have been initiatives from different sectors to contribute to waste avoidance and reduction. In a study commissioned by the United Nations Development Programme (UNDP), existing waste management and circular economy initiatives in the Philippines were compiled and analyzed. The study's database recorded 138 proponents and 208 initiatives. Several themes and trends emerged. It was found that 63% of the gathered initiatives were private sector-led, 23% by civil society, and 14% were government-initiated [UNDP, 2020]. Table 1 provides a breakdown of projects by proponent.

The study found that majority of waste management and circular economy initiatives are being led by the private sector (63%) and followed by civil society, mostly composed of NGOs (23%). Within the private sector, small and medium enterprises are leading (21%); they are a powerful force in the Philippine economy that make up 99.6% of all registered businesses in the Philippines and employ up to 70% of the working population. NGOs followed closely (20%), then multinational corporations. In the database, only four educational institutions were

recorded to have CE initiatives. The four organizations under "Support" were four consultancy firms offering waste-related or design services. The results are consistent with the global Circular Economy Club (CEC) mapping database [CEC, 2020], where the private sector is leading (71% of initiatives recorded), with SMEs running the majority (35%), followed by non-profit organizations (12%).

Table 1. Stakeholders in waste management and circular economy [UNDP, 2020]

Proponent/Convenor	Percentage
SME	21%
NGO	20%
Multinational Corporation	18%
National Corporate	10%
Startup	10%
LGU	10%
NGA	7%
Education	3%
Support (investment, consulting, media, etc.)	3%

The UNDP study likewise explored the types of industries or strategies employed in the 208 initiatives. Table 2 provides the breakdown.

Table 2. Industries in waste management and circular economy [UNDP, 2020]

Primary Strategy	Percentage
Waste as a Resource	31%
Other	22%
Resources	19%
Product Life Extension	14%
Design	8%
Business Models	7%

The most common strategy being employed is Waste as a Resource (31%), followed by Other (22%), and Resources (19%). Majority of initiatives under "Waste as a Resource" fall under co-processing, processing, or upcycling. "Other" is largely based on behavior change and awareness raising programs, policy advocacy efforts, and governance projects by non-profit organizations, while "Resources" focuses on resource reduction and efficiency. Global companies such as Unilever, P&G, H&M, L'Oréal, and Mondelez have ambitious targets to reduce carbon footprint, water usage, energy consumption, and plastic waste in their operations. "Product life extension" primarily promotes reusing and refilling, while "Design" mostly falls under large companies (e.g., Coca-Cola, Unilever, Nestlé, Adidas, Lush) transitioning to make their packaging more sustainable with keywords such as recyclable, refillable, reusable, or reducing the use of virgin plastics. "Business Models" are based on a sharing economy.

The CEC global database has the same top primary strategy, with Waste as a Resource at 25%. The second ranked strategy is Product Life Extension at 20%, then Design landing third at 17%.

2.2 STATUS OF REDUCING SEA-BASED SOURCES OF WASTE IN THE PHILIPPINES

Whereas policies for land-based sources of waste are supported by RA 9003, policy support for implementing sea-based waste management strategies is provided by *Presidential Decree (PD) 979* or the *Marine Pollution decree of 1976*. Under PD 979, the National Pollution Control Commission (now the EMB) and the Philippine Coast Guard (PCG) are empowered to promulgate national rules and policies governing marine pollution. However, marine pollution policies that followed thereafter are only included as excerpts or sections of a larger national policies pertaining to either marine or waste management. Similar to RA 9003's Section 48 prohibition on littering, throwing, dumping of waste matters in public places and canals, the *Philippine Clean Water Act of 2004* or *RA 9275* has a similar stipulation under Section 27 prohibiting unauthorized transport or dumping into sea waters of sewage sludge or solid waste.

Marine Pollution Control and Enforcement

Without new developments on PD 979, other policies pertaining to sea-based waste management were anchored instead on international agreements, particularly the MARPOL. To this extent, regulation of ship waste disposal by the Philippine Ports Authority (PPA), the PCG, and the Maritime Industry Authority (MARINA) of the Department of Transportation (DOTr) are implemented through executive and administrative orders patterned after Annex IV (Prevention of Pollution by Sewage from Ships) and Annex V (Prevention of Pollution by Garbage from Ships) of MARPOL. The trade off with such an arrangement is that most of the activities surrounding sea-based waste management in the Philippines focus on garbage disposal from ships. Regulation of other sea-based waste from other maritime activities including ALDFG from fishing and aquaculture have yet to reach critical mass support from agencies who have the capacity to implement its regulation.

Interestingly, the institutional structure used to coordinate sea-based sources of waste is well organized despite limited policy support. Through *Executive Order (EO) 57 series of 2011*, the National Coast Watch Council was established to improve the synergy across different agencies that are mandated to protect the country's coastline. Although council seats are assigned to the heads of the national government agencies, implementation of their provisions were specifically assigned to offices that directly enforce maritime safety such as the Philippine Navy of the Armed Forces of the Philippines, PCG, Philippine National Police Maritime Group (PNP-MG), Bureau of Customs (BOC) of the Department of Finance (DOF), and the Bureau of Fisheries and Aquatic Resources (BFAR) of the Department of Agriculture (DA), among others.

Discarded Fishing Nets

While BFAR regulates the use of fine meshed nets in fishing, e.g., prohibiting the use of nets with mesh size less than three centimeters, the management of discarded fishing nets mirrors that of the prevailing SWM system in LGUs. Generally speaking, small fisher folk do practice manual repair of partially damaged fishing nets due to cost implications, studies have to analyze the disposal practices of commercial trawlers.

Nevertheless, discarded fishing nets, among others, are increasingly becoming raw material for clothing, accessories, and other fabric-based products. Examples of upcycling are for rubber shoes and synthetic apparels and reuse as carpet tiles [UNDP, 2020]. Details are in Annex C.

2.3 STATUS OF MANAGING EXISTING MARINE LITTER IN THE PHILIPPINES

The country has made strides in the management of the amount and impact of accumulated marine litter on shorelines, in benthic habitats, and within the national territory of the Philippines and its exclusive economic zones and areas of responsibility. It took political will and inter-agency and multi-sectoral collaboration to address the issue of marine litter that is already existing in the marine environment. Impacts and lessons learned have been established to serve as guide for future efforts.

Flagship Cleanup and Rehabilitation Initiatives

In February 2018, the island of Boracay was declared a "cesspool" and announced plans to close the island to tourists to facilitate rehabilitation and re-development initiatives to be led by DENR. Despite being one of the country's top tourist destinations, Boracay was temporarily closed commencing on April 26, 2018, to immediately address the environmental concerns, which include the wetlands, terrestrial habitats, coastal and marine and their ecosystems services.

The island of Boracay has nine priority wetlands composed of marshes, swamps, ponds and lagoons. Wastes have been dumped on the wetlands and was reclaimed with illegal structures. Cleanup drives have been carried out along with sewage management and biodiversity conservation. Detailed work plans have been implemented and partnerships with the private sector were forged. Despite Boracay's soft opening to tourism on October 26, 2018, rehabilitation works continue to be implemented on the island. Under the new rules, the number of tourists were limited to 19,200 per day as compared to peaks of up to 70,000 [DENR, 2019a].

DENR also started implementing the "Manila Bay Coastal Strategy 2017–2022" in cooperation with other Mandamus agencies. The Writ of Continuing Mandamus was issued by the Supreme Court on December 18, 2008, directing 13 government agencies to clean up, rehabilitate, and preserve Manila Bay, and restore and maintain its waters to levels fit for swimming, skin-diving, and other forms of contact recreation. The agencies include DENR, Department of the Interior and Local Government (DILG), Department of Education (DepEd), Department of Health (DOH), DA, Department of Public Works and Highways (DPWH), Department of Budget and Management (DBM), PCG, PNP-MG, PPA, MMDA, Metropolitan Waterworks and Sewerage System, and Local Water Utilities Administration.

The Manila Bay area covers 8 provinces and 187 cities and municipalities in the National Capital Region (NCR), Region III, and Region IV-A. Its drainage area covers 1,994 square kilometers and its coastline measures some 190 kilometers. There are 17 principal river systems draining to Manila Bay and almost 233,000 informal settler families are residing along the waterways. In accordance with the Writ of Continuing Mandamus, the DENR-led Manila Bay Cleanup Program implements the following activities: clean-up for water quality improvement, rehabilitation and resettlement, and education and sustainment [DENR, 2019a]. For first quarter of 2020 alone, DENR has carried out 2,025 clean up drives participated by 25,595 volunteers, which managed to collect and dispose 1,406 tons of waste, which is on top of efforts by PNP- MG, MMDA and LGUs. The program also addresses informal settlements. [DENR, 2020].

The country's experiences and lessons learned in Boracay, Manila Bay and other water bodies demonstrate that NPOA-ML could be designed to consider local circumstances, capabilities and case benchmarks in implementing marine litter management programs in the Philippines. [DENR, 2019b].

Participation in International Coastal Cleanups

Ocean Conservancy's flagship International Coastal Cleanup (ICC) events have been mobilizing volunteers to remove trash from beaches and waterways worldwide while fostering awareness of the marine debris issue and a sense of stewardship for natural resources. In 2017, nearly 800,000 volunteers collectively removed more than 20 million pieces of trash from beaches and waterways around the world [OC, 2018]. In terms of the number of items collected worldwide, i.e. by count, the top 10 items collected were cigarette butts (2.41 million), food wrappers (1.74 million), plastic beverage bottles (1.57 million), plastic bottle caps (1.09 million), plastic grocery bags (0.76 million), other plastic bags (0.75 million), straws and stirrers (0.64 million), plastic takeout/takeaway containers (0.63 million), plastic lids (0.62 million), and foam takeout/takeaway containers (0.58 million).

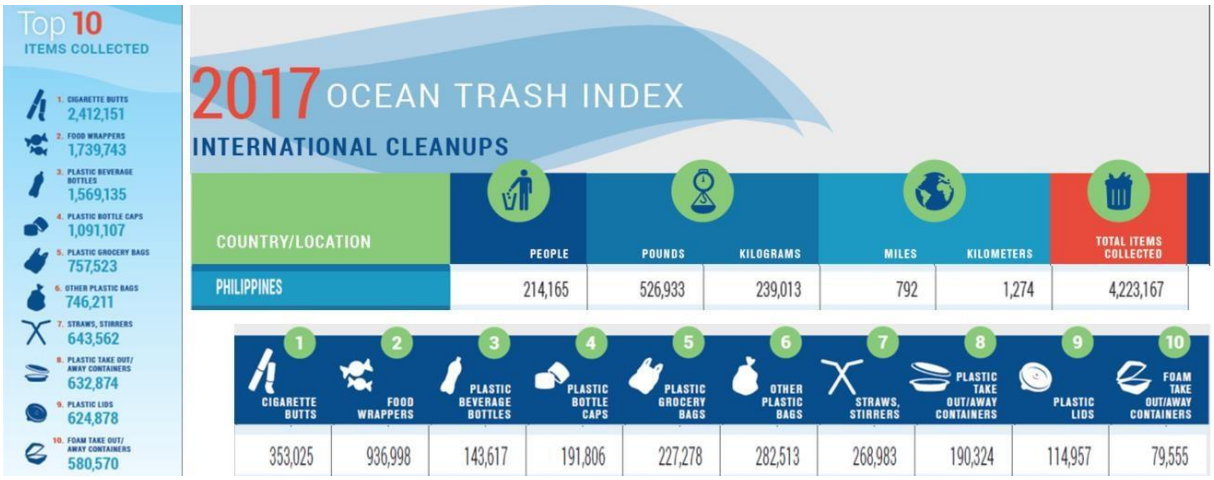


Figure 4. Top 10 items collected from ICCs worldwide and in the Philippines [OC, 2018]

As shown in Figure 4, 214,165 volunteers yielded 239 MT, or 4.2 million items, of collected waste during the ICC events in the Philippines in 2017. The top items found were food wrappers (0.94 million), cigarette butts (0.35 million), other plastic bags (0.28 million), straws and stirrers (0.27 million), and plastic grocery bags (0.23 million) [OC, 2018].

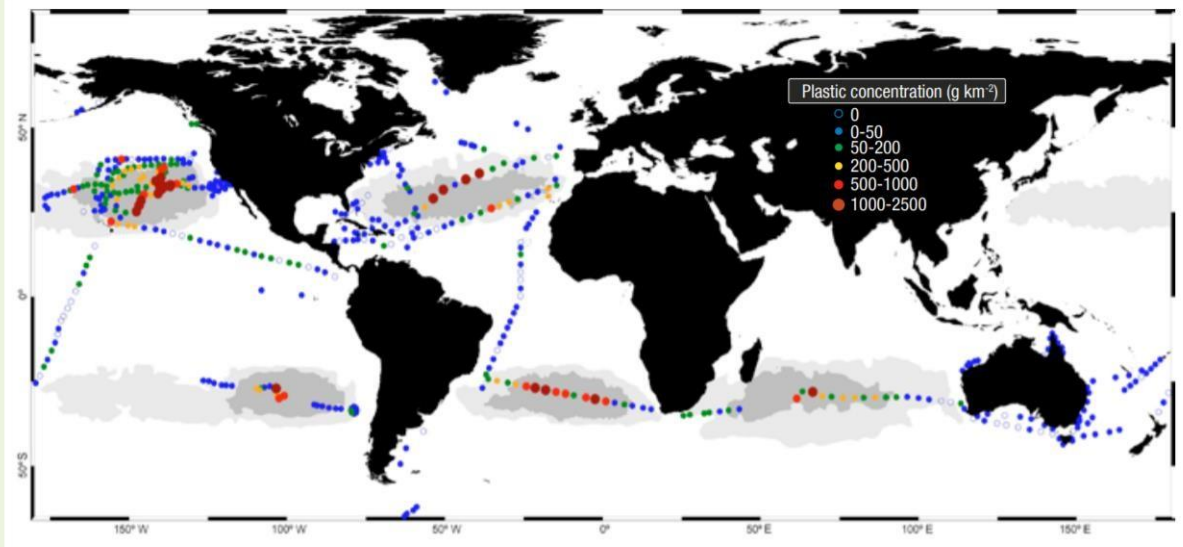
2.4 REVIEW OF AVAILABLE STUDIES ON WASTE LEAKAGE INTO THE MARINE ENVIRONMENT

While the Philippines has yet to carry out a definitive and comprehensive baseline study on the amount, extent, and impacts of waste leakage into the marine environment, various efforts have been made to estimate the country's contribution to the global marine litter problem. It should be noted, however, that presenting the information sourced from secondary sources does not imply the country's acceptance of the assumptions used as well as the results. For the purposes of preparing the first version of the NPOA-ML, such literature have been compiled to provide an initial picture of the baseline sans future validation efforts.

International Studies

The transboundary and global nature of marine litter was raised with the presence of gyres in, among others, the northern Pacific Ocean. For example, the most prominent flow is the Kuroshio Current dominantly moving clockwise along the western boundary of the North Pacific from the east coasts of Philippines to East Asia, specifically Japan [MERRAC, 2017]. Using data from the Malaspina 2010 circumnavigation, regional surveys, and previously published reports, a worldwide distribution of plastic on the surface of the open ocean, mostly accumulating in the convergence zones of each of the five subtropical gyres with comparable density has been analyzed. The global load of plastic on the open ocean surface was estimated to be on the order of tens of thousands of tons, far less than expected [Cózar et al., 2015]. Figure 5 shows the results of the study.

Figure 1 Concentrations of plastic debris in surface waters of the global ocean[9]

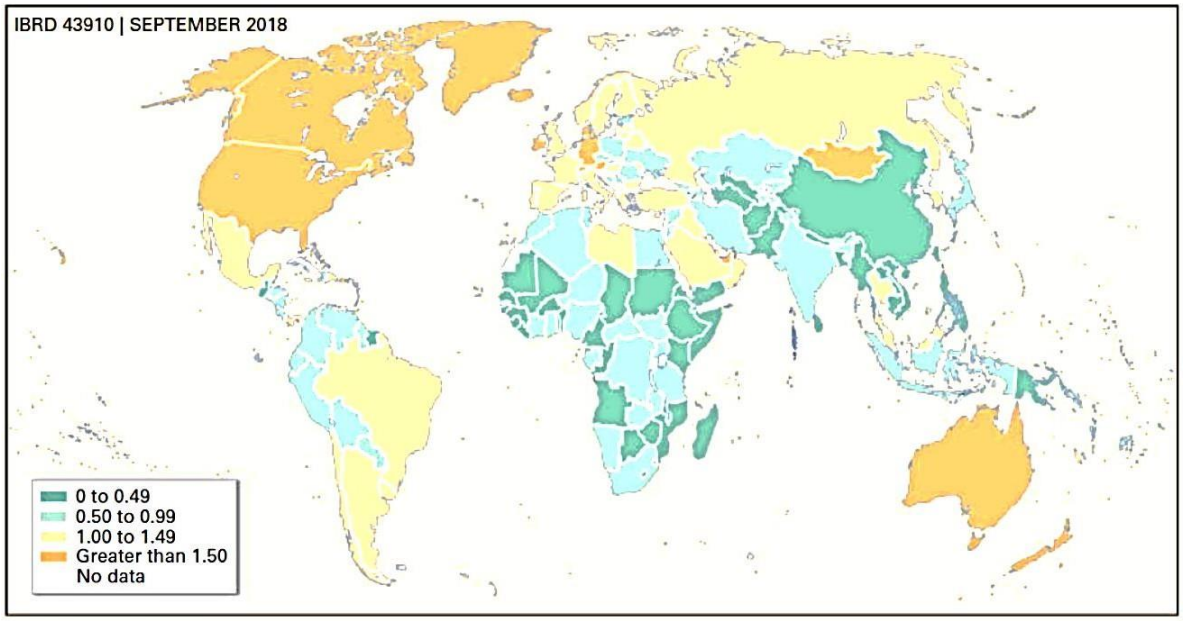


Source: Cózar et al. (2015) Plastic debris in the open ocean. PNAS Vol. 111(28), 10239-10244 http://www.pnas.org/content/111/28/10239.full.pdf

Figure 5. Concentrations of plastic debris in surface waters of the global oceans [Cózar et al., 2015]

The world generates 2.01 billion MT of MSW annually, with at least 33% of that—extremely conservatively—not managed in an environmentally safe manner. Worldwide, waste generated per person per day averages 0.74 kg but ranges widely, from 0.11 to 4.54 kg as shown in Figure

6. Global waste is expected to grow to 3.40 billion MT by 2050. In 2016, the world generated 242 million MT of plastic waste—12% of all MSW [Kaza et al., 2018].



Note: kg = kilogram.

Figure 6. Per capita MSW generation rate per country [Kaza et al., 2018]

Between 2012 and 2018, there had also been trends with changes in the composition of waste in low-income countries, i.e., the share of organic waste fell from 64 to 56%, which reflects changes in consumption patterns. Similarly, the collection of waste in low-income countries significantly increased from about 22% to 39%, reflecting the prioritization of adequate waste collection in cities and countries. SWM can be the single highest budget item for many LGUs. Municipalities in low-income countries are spending about 20% of their budgets on waste management, on average—yet over 90% of waste in low-income countries is still openly dumped or burned [Kaza et al., 2018].

There had been an attempt to estimate the amount of marine litter, specifically plastic waste, entering the world's oceans [Jambeck et al, 2015]—a study that sparked international and local discussions and debates on the impact of marine plastic litter. It was calculated that in 2010, around 275 million MT of plastic waste was generated in 192 coastal countries, with 4.8 to 12.7 million MT entering the ocean. The Philippines ranked 3rd on the list and was estimated to contribute 0.28 to 0.75 million MT of plastic marine debris per year (Figure 7). Solid waste generation and management, population density, coastline length, and economic status were among the basis for the study's calculations, including assumptions such as: 83% of solid waste is 'mismanaged', of which 2% is littered, a general statistical value applied for all 192 countries, while the remaining 81% relate to inadequate waste management practices, based on a model developed for this study.

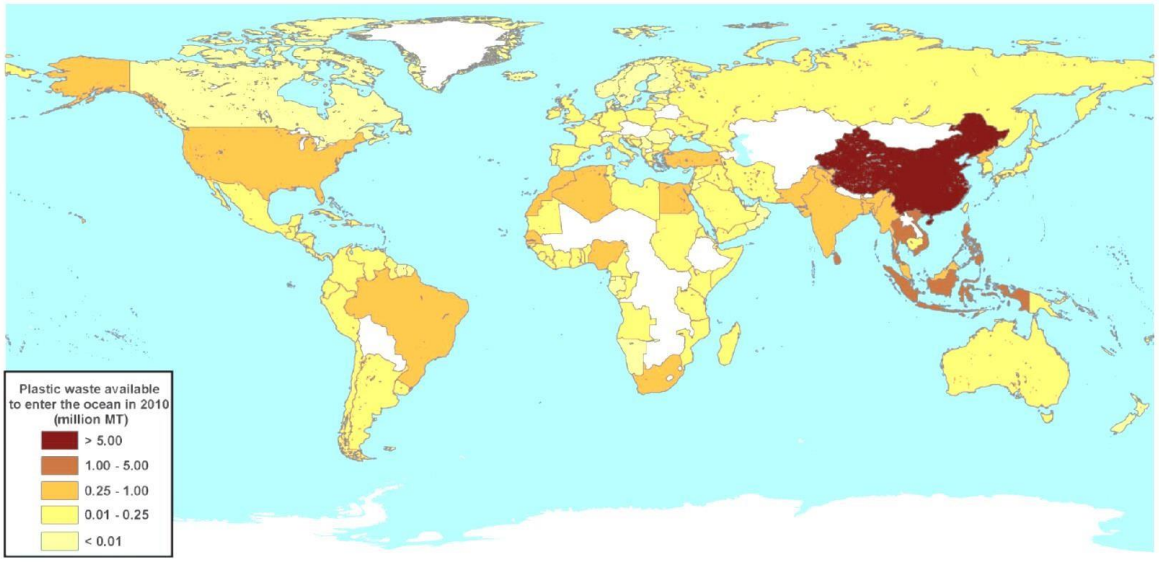


Fig. 1. Global map with each country shaded according to the estimated mass of mismanaged plastic waste [millions of metric tons (MT)] generated in 2010 by populations living within 50 km of the coast. We considered 192 countries. Countries not included in the study are shaded white.

Figure 7. Generated plastic waste with potential to leak into oceans [Jambeck et al., 2015]

There are two drivers of plastic leakage: waste that remains uncollected and low residual value of some plastic waste. In a study conducted for five focus countries: China, Indonesia, Philippines, Thailand, and Vietnam, it was found that less than 20% of leakage originates from ocean-based sources like fisheries and fishing vessels while over 80% of ocean plastic comes from land-based sources. Of the leakage that comes from land-based sources, around 75% comes from uncollected waste, while the remaining 25% leaks from within the waste management system itself. Post-collection leakage can be caused by improper dumping, as well as formal and informal dumpsites that are poorly located or lack proper controls [Ocean Conservancy (OC) and McKinsey, 2017].

The Philippines has remarkably high collection rates; the nationwide average is roughly 85%—and near 90% in some dense urban areas. In Quezon City in Metro Manila, values even approach full coverage. Rates are 80% or lower in less dense areas, yet even some very rural areas have collection rates above 40%. Waste pickers sometimes recover elements of the waste stream that have high residual value (such as metals) at rates close to 100%. The plastic component of the Philippines' waste stream has a recovery rate of only about 25%. But within this number, a distinction can be made between high-residual-value plastics, such as polyethylene terephthalate (PET) bottles (90% recovery) and some high density polyethylene (HDPE) products (40% recovery), and low-residual value plastics, such as composite materials, plastic bags, and most thin films (less than 5% recovery). The residual value is a function of product homogeneity, time to collect, and resale price. For example, PET bottles are easy to recognize, can be physically picked up quickly, and are easy to sell at numerous local junk shops [OC and McKinsey, 2017].

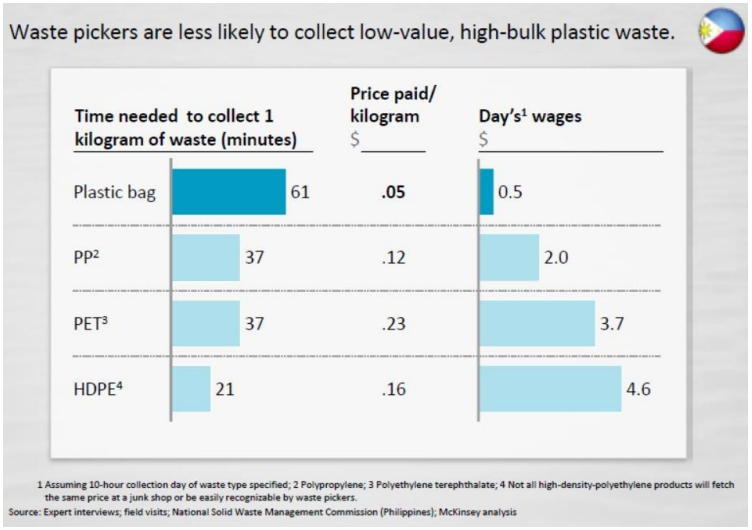


Figure 8. Valuation of recyclables by waste pickers [OC and McKinsey, 2017]

The Philippines is surrounded by water and also has an extensive network of rivers and tributaries. OC and McKinsey (2017) found that over half of open dumpsites in the country are located within a kilometer of a waterway and estimated that between 70 and 90% of the waste dumped illegally in the Philippines ultimately ends up in waterways.

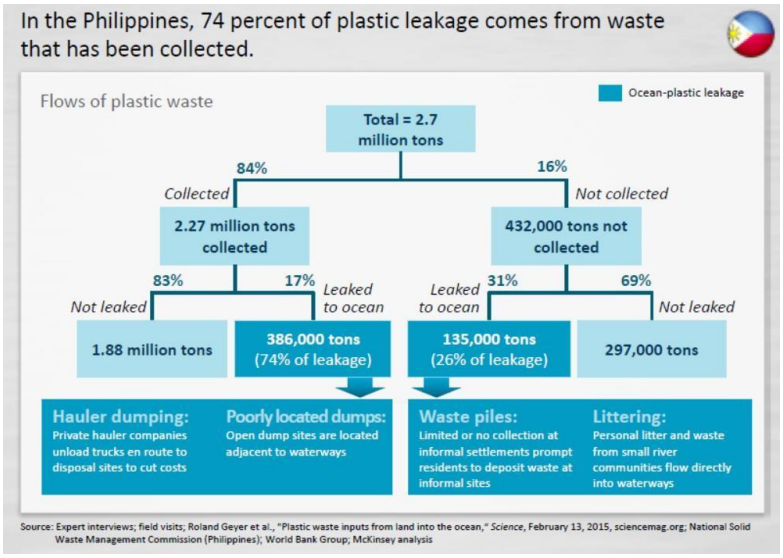


Figure 9. Leakage points of plastic waste in the Philippines [OC and McKinsey, 2017]

In a follow up study carried out by Lavender-Law, et al (2020) for baseline 2016, plastic waste that have been exported to, and inadequately managed in, importing countries have likewise been taken into account albeit generally employing similar methodology and assumptions as those made by Jambeck et al. (2015). Accounting for these contributions, the Philippines came in 7th in terms of mismanaged plastic waste at 1.01 MT for the year 2016, after Indonesia (4.28 MT), India (3.16 MT), United States (upper bound estimates of 1.45 MT), Thailand, China and Brazil.

In its literature review, Krushelnytska (2018) compared recent studies looking at plastic pathways indicate that 10 rivers basins are responsible for 90% of land-based leakages to the ocean [Lebreton et al., 2017; Schmidt et al., 2017]. Both studies from Schmidt (2017) and Lebreton (2017) show the Yangtze river basin as the main contributor (Figure 10). The ranks for other polluted rivers differ due to the entry data used in two studies: Lebreton used the global river plastics input model for estimation whereas Schmidt's made calculations as a product of mismanaged plastic waste generated per capita and population size in the catchment. Pasig River was ranked 8th in the Lebreton et al (2017) study.

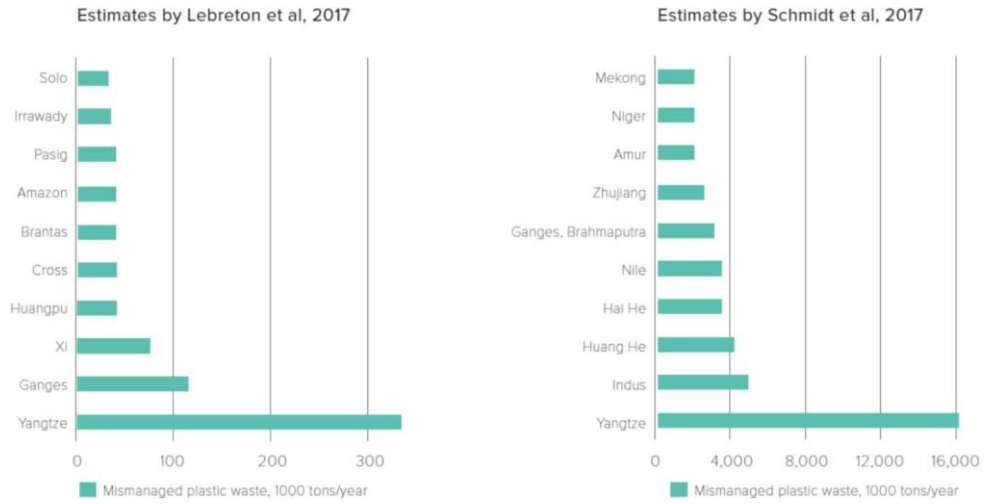


Figure 10. Top 10 rivers contributing to marine litter [Krushelnytska, 2018]

National Studies

The country plans to eventually carry out a definitive and comprehensive study to establish national baselines on the leakage and impacts of marine litter from all waste sources in the Philippines. Nevertheless, current references on the domestic consumption and disposal of waste in the Philippines with particular emphasis on plastics and packaging waste as shown in Table 3.

Table 3. Marine litter estimates in the Philippines by various groups

Data Criteria	Estimates	Base Year	Reference
Single-use plastic shopping bags consumed in PH	17.5 billion pieces/yr ~48 million pieces/day	2019	GAIA, 2019
Sachets usage in PH	164 million pieces/day ~1.64 pieces/capita/day	2019	GAIA, 2019
Packaging usage in PH	65.78 billion pieces/yr (forecasted)	2018	Statista, 2018
Diaper waste usage in PH	1.1 billion pieces /yr ~3 million pieces /day	2019	E-READI, 2019
Plastic scrap/waste exports	65,000 tons /yr ~2.5% of plastic waste generation	2018 2019	UN Comtrade, 2018 E-READI, 2019
Plastic scrap imports	11,800 tons /yr	2018	UN Comtrade, 2018

Single-use plastic shopping bags consumed in PH	17.5 billion pieces/yr ~48 million pieces/day	2019	GAIA, 2019

Meanwhile, the Ecosystems Research and Development Bureau (ERDB), which is the principal research and development (R&D) unit of the DENR, has been conducting a study since 2018 to determine the extent of microplastic waste and contamination in the selected major water bodies of the Philippines. The study is carried out through ERDB's Coastal Resources and Ecotourism Research, Development, and Extension Center and is expected to be completed by 2021.

To determine the extent of microplastic pollution in Philippine marine waters, water samples were collected at shorelines at less than 1 meter, and at the subsurface about 5, 15 and 30 meters below and 1.5 and 3 km from the shoreline. At the laboratory, samples were subjected to filtration and microscopic analysis. Initial findings from the nine study sites, collecting more than 50,000 pieces of microplastics, are shown in Figures 11 and 12 [DENR-ERDB, 2020].

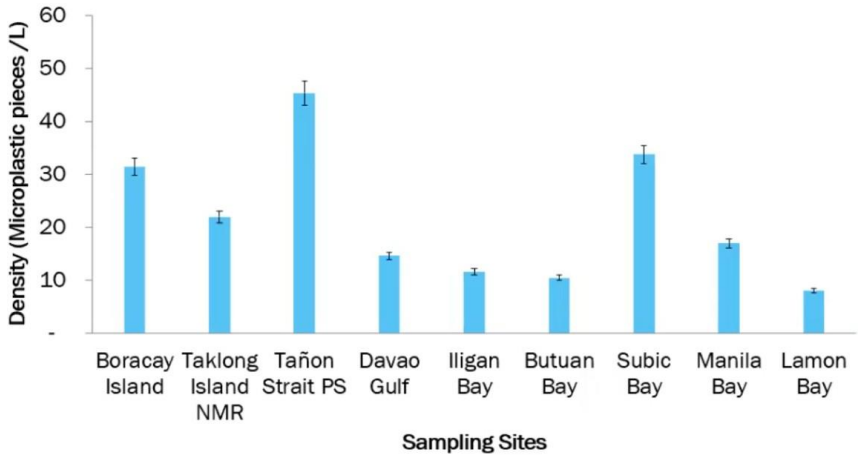


Figure 11. Microplastic density in selected Philippine marine waters [DENR-ERDB, 2020]

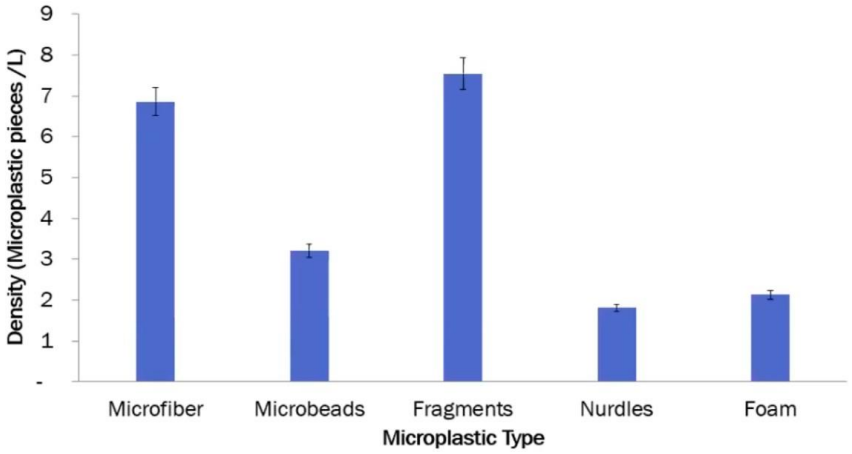


Figure 12. Microplastic types found in selected Philippine marine waters [DENR-ERDB, 2020]

The study found that on average, 22 pieces of assorted microplastics are present for every liter of marine water sampled; the Cebu side of Tañon Strait registers the highest density at 45 pieces per liter. In terms of stratification along the water column, majority or 20 pieces per liter have been found along the shorelines at less than 1 meter depth but are still present at 5, 10 and 15 meters below the surface with values between 6 and 9 pieces per liter. Microfibers and microfragments represent the most prevalent microplastic types [DENR-ERDB, 2020].

3. NATIONAL/LOCAL AND INTERNATIONAL POLICY FRAMEWORKS

The international community has made headways to find a common ground to identify solutions to the growing marine litter issue. It should be noted that there are distinctions among global and regional policy frameworks ranging from mere guidance for countries, ministerial declarations, and binding agreements, which differentiate the level of commitment of the Philippines.

3.1 INTERNATIONAL AGREEMENTS AND DECLARATIONS

In 2011, the *Honolulu Strategy* became one of the key outcomes during the Fifth International Marine Debris Conference; it provides a *global framework for the prevention and management of marine debris*. Its three main goals include: Reduced amount and impact of land-based sources of marine debris introduced into the sea; (b) Reduced amount and impact of sea-based sources of marine debris including solid waste; lost cargo; ALDFG; and abandoned vessels introduced into the sea; and (c) Reduced amount and impact of accumulated marine debris on shorelines, in benthic habitats, and in pelagic waters.

The *Strategic Plan for Biodiversity 2011-2020* and its *Aichi Biodiversity Targets* also have two out of five strategic goals that are relevant to marine litter. Strategic Goal A addresses the underlying causes of biodiversity loss with 2020 targets for governments, business, and stakeholders at all levels to take steps to achieve or have implemented plans for SCP (Target 4) and for pollution to be brought to levels that are not detrimental to ecosystem function and biodiversity (Target 8).Strategic Goal E aims to enhance implementation through participatory planning, knowledge management, and capacity building with a target for countries to adapt a national biodiversity strategy and action plan (Target 17).

The *Manila Declaration on Furthering the Implementation of the Global Programme of Action (GPA) for the Protection of the Marine Environment from Land-based Activities*, which was adopted in 2012, contains 16 provisions centering on programs to be undertaken for the period 2012-2016 at the international, regional and national levels, and within the framework of integrated coastal management, on the GPA's priority areas such as marine litter, wastewater, pollution from fertilizer and biodiversity loss. On the occasion of the 13th *East Asia Summit* in November 2018, EAS leaders issued a statement on combatting marine plastic debris.

All 17 Sustainable Development Goals (SDGs) contribute to measures that prevent, reduce or manage the amount and impacts of marine litter and are targeted to be achieved by 2030. Of particular interest are SDG 14: Life below water, SDG 12: SCP, SDG 9: Industry, innovation and infrastructure, and SDG 11: Sustainable cities and communities.

Recently at the global level, the G20 Hamburg Summit in July 2017 adopted the *"G20 Action Plan on Marine Litter"* which laid out the foundation for the G20 members to address marine litter. At the Fourth United Nations Environment Assembly (UNEA) meeting in Nairobi on March 11-15, 2019, UN member states agreed to "significantly reduce" single-use plastics.

Countries pledged to "address the damage to our ecosystems ... including by significantly reducing single-use plastic products by 2030." The move will seek to curb the use of disposable plastic products such as plastic bags, cups, cutlery and drinking straws. The *UNEA-4 Ministerial Declaration* also contained texts to support a global environmental data strategy by 2025 [UNEA, 2019].

Following these international commitments, the most recent G20 Osaka Summit in June 2019 endorsed the *"G20 Implementation Framework for Actions on Marine Plastic Litter"* which builds on the G20 Action Plan on Marine Litter and aims to facilitate further actions on marine litter while taking into account national policies, approaches and circumstances. At the G20 Osaka Summit, the government of Japan as the host country also shared the global *"Osaka Blue Ocean Vision"* to reduce additional pollution by marine plastic litter to zero by 2050.

The *Iloilo Ministerial Declaration:* East Asian Region Moving as One to Secure Healthy Oceans, People and Economies, was adopted at the 6th Ministerial Forum, East Asian Seas Congress 2018, convened by the Partnerships in Environmental Management for the Seas of East Asia (PEMSEA) and held November 29, 2018 in Iloilo City, Philippines. Among the stated "Commitments to A Sustainable Future", include item 5: "We acknowledge the current strong momentum to tackle marine debris globally. We commit to significantly reducing or preventing marine pollution of all kinds, in particular from land-based and sea-based activities, including marine litter and nutrient pollution."

The Association of Southeast Asian Nations (ASEAN) also put marine litter high on the regional agenda when, on June 22, 2019, ASEAN heads of states adopted *the Bangkok Declaration on Combating Marine Debris in ASEAN Region*. The declaration include, among others, (a) strengthening of actions at the national level as well as through collaborative actions among the ASEAN Member States and partners to prevent and significantly reduce marine debris, particularly from land-based activities, including environmentally sound management; and (b) welcoming the *ASEAN Framework of Action on Marine Debris* and encourage the ASEAN Member States to timely implement the Framework [ASEAN, 2019a]. The ASEAN Framework has the following main actions each with corresponding specific activities: (1) policy support and planning, (2) research, innovation, and capacity building, (3) public awareness, education, and outreach, and (4) private sector engagement [ASEAN, 2019b].

The COBSEA RAP MALI, which was originally adopted by the 19th Intergovernmental Meeting of the COBSEA held in Cambodia in January 2008, was further revised and was adopted by the 24th Intergovernmental Meeting of the COBSEA held in Bali, Indonesia on June 19-20, 2019. The four main actions in the 2019 version include: (1) preventing and reducing marine litter from land-based sources, (2) preventing and reducing marine litter from sea-based sources, (3) monitoring and assessment of marine litter, and (4) activities supporting the implementation of COBSEA RAP MALI [COBSEA, 2019]. The meeting further called for synergy to be established between the *COBSEA RAP MALI* and the *ASEAN Framework of Action on Marine Debris* in order to promote coherence and avoid duplication of efforts.

There is also an ongoing initiative for the renewal of the *Coral Triangle Initiative on Coral Reefs, Fisheries, and Food Security's* (CTI-CFF) *10-Year Regional Plan of Action (RPOA).* CTI-CFF is a multilateral partnership of six countries: Indonesia, Malaysia, Papua New Guinea, the Philippines, Solomon Islands, and Timor-Leste. The RPOA's 2009 version indirectly addresses threats to the coral triangle through Goal 1: Designation of effectively managed seascapes. Among the decisions during the 13th Senior Officials Meeting in 2017 (and adopted in Dec

2018), it "…acknowledged the important issues of marine debris in the coral triangle region that need to be pursued at regional and national levels …"Aside from global and regional frameworks/plans to address marine debris or marine plastic debris, other countries have already formulated actions/strategies. Examples of initiatives to strategize actions include the European Union's *Circular Economy Action Plan and its European Strategy for Plastics in a Circular Economy, Indonesia's Plan of Action on Marine Plastic Debris 2017-2025*, Malaysia's *Roadmap Towards Zero Single-Use Plastics 2018-2030,* and California's 2018 *Ocean Litter Prevention Strategy: Addressing Marine Debris from Source to Sea.*

In 2018, more than 290 of the world's leading packaging brands have committed to ensure that 100 percent of plastic packaging can be reused, recycled or composted by 2025. The *New Plastics Economy Global Commitment* focuses on three actions to achieve a circular economy for plastics. The targets will be reviewed every 18 months, with the goal of making them increasingly ambitious in future years [IISD, 2018].

3.2 NATIONAL AND LOCAL POLICIES, PLANS, AND PROGRAMS

Many policies and initiatives related to, or at least contributing to, the prevention and management of marine litter as well as reduction of threats to marine environment and biodiversity are existing in the Philippines.

Philippine Constitution

Foremost is the *Constitution*, which is the supreme law of the Republic of the Philippines and was ratified in February 2, 1987. Section 15 under Article II declares that "the State shall protect and promote the right to health of the people …", while Section 16 states that "the State shall protect and advance the right of the people to a balanced and healthful ecology in accord with the rhythm and harmony of nature." In Section 17, the constitution also provides "priority to education, science and technology to … accelerate social progress, and promote total human liberation and development."

Philippine Development Plan (PDP)

The Philippines has released its medium-term plan with sub-sector outcomes that are aligned with the goals of reducing marine litter. Approved by the NEDA Board, *PDP 2017–2022* was the first medium-term plan to be anchored on the 0–10 point Socioeconomic Agenda. It is geared towards the AmBisyon Natin 2040 national long-term vision, which lays down the foundation for more inclusive growth, a high-trust and resilient society, and a globally competitive knowledge economy. Many SWM- and biodiversity-relevant measures are embedded in the sub-sector outcomes under Chapter 19 (Accelerating Infrastructure Development) and Chapter 20 (Ensuring Ecological Integrity, Clean and Healthy Environment) of the PDP.

Strategies and initiatives mentioned in PDP Chapter 19's sub-sector outcome 2 include those intended to improve social infrastructure, including SWM infrastructure, which would provide conducive access to basic social services necessary for human capital development. LGUs will be provided assistance in complying with the requirements of RA 9003. There will also be public awareness programs to promote proper waste management and investments in relevant technologies will be undertaken to improve SWM throughout the country. DENR-EMB, in coordination with NSWMC and relevant stakeholders, will implement strategies in support of RA 9003, such as promote clustering of LGUs for common SWM facilities and services to take

advantage of economies of scale; fully utilize the national and regional ecology centers as possible venues for trainings or education in integrated SWM; provide an incentive mechanism to local recycling industries; adopt alternative technologies as SWM solutions; intensify the promotion of segregation-at-source by engaging local communities to participate in "learning by doing" programs, IEC campaigns, and social marketing programs on SWM; and operationalize the SWM fund and assess the re-institutionalization of the national government-LGU cost sharing scheme for SWM.

Initiatives under "social infrastructure" are complemented by strategies identified in Chapter 20's sub-sector outcome 2, which espouses the enforcement of environmental laws, including those related to land quality management. Compliance of LGUs to RA 9003 will be enforced particularly on the establishment of MRFs and treatment facilities; closure and rehabilitation of remaining dumpsites; formulation of local SWM plans; and promoting the practice of 3Rs and proper waste management. This sub-sector outcome reiterates the strategic clustering of SLFs and SWM technologies and mentions the need to provide alternative livelihood activities for waste pickers in the remaining dumpsites identified for closure.

Furthermore, the government will develop and implement SCP policies and initiatives including: the formulation of a "polluters pay" policy; establishment of a sustainable market for recyclables and recycled products; strengthening of the certification and information systems for green products and services; strengthening the implementation of Philippine Green Jobs Act; promotion of green procurement in the public and private sectors; promotion, development, transfer, and adoption of eco-friendly technologies, systems, and practices in the public and private sectors by increasing access to incentives and facilitating ease of doing business and other related transactions.

The intensification of infrastructure-related R&D is espoused by Chapter 19's subsector outcome 4, which aims to institutionalize R&D expertise and facilities. The government will pursue programs to develop R&D on, among others, cost-efficient technologies for wastewater and solid, hazardous, and health care waste management; climate change- and disaster resilient infrastructure designs; emerging information and communication technology applications or platforms; and new methodologies for gathering and managing science-based data. Subsector outcome 1 of Chapter 20 highlights the mainstreaming accounting and valuation in the development planning to ensure that due importance and appropriate management will be given to these finite ecosystem resources. It also encourages the development of a policy for payments for ecosystem services, which will provide an alternative source of income to the local communities [NEDA, 2017].

Chapter 20 of the PDP plans to intensify research on coastal and marine habitats and resources as there is a need to enhance data availability and accessibility to monitor the status and productivity of coastal and marine resources. This would include improved and regular data collection, scientific assessment, and identification of spawning areas for priority fish species. It also espouses the inclusion of an ICM policy in the legislative agenda of the country. Targets have been set to improve the quality of coastal and marine habitats, in terms of hectares.

RA 9003, RA 9275, and related Waste Management Policies

This action plan's contribution to the full realization of *RA 9003 and its implementing rules and regulations (IRRs)* have already been mentioned under the "Context" section of this document. Marine litter prevention and management are consistent with RA 9003's provisions on the

mandatory segregation (Sections 21 and 22), segregated collection, transfer and transport of waste (Sections 23 to 25), and mandatory solid waste diversion starting at 25% (Section 20). Segregation and collection of solid waste shall be conducted at the barangay level specifically for biodegradable and recyclable wastes, provided that the collection of non-recyclable materials and special wastes shall be the responsibility of the municipality or city.

The establishment of MRFs and markets for recyclables and compost products are elaborated in Sections 26 through 35. The closure and rehabilitation of dumpsites and the establishment of properly managed SLFs have potential to further mitigate potential for waste leakage and these actions are provided for from Sections 37 to 44 of RA 9003. Moreover, the penal provisions under Sections 48 and 49 of the law prohibit acts such as littering, collection of unsegregated waste, mixing of source-separated MSW, and misrepresentation of toxic waste as recyclables. These sections are complemented by Chapter XVIII of PD 856 or the *Code on Sanitation of the Philippines.*

Echoing RA 9003's Section 48 prohibition on littering, throwing, dumping of waste matters in public places, such as roads, sidewalks, canals, esteros or parks, and establishment, or causing or permitting the same, *RA 9275* has a similar stipulation under Section 27 prohibiting unauthorized transport or dumping into sea waters of sewage sludge or solid waste.

RA 9003 likewise identifies business and industry roles in SWM. Section 57 of the law states that the NSWMC shall encourage commercial and industrial establishments, through appropriate incentives, to initiate, participate and invest in integrated ecological SWM projects; to manufacture environment-friendly products; to introduce, develop and adopt innovative processes that shall recycle and re-use materials, conserve raw materials and energy, reduce waste, and prevent pollution; and to undertake community activities to promote and propagate effective SWM practices.

In 2004, NSWMC released the *NSWMF*, which outlined the preferred course of action or approach to support the national policy of adopting 'a systematic, comprehensive and SWM program', with emphasis on 3Rs as the preferred options. In recognition of the contribution and needs of the IWS, the *National Framework Plan for the IWS* was issued in 2009 with the mission to integrate IWS in the SWM system by providing a favorable policy environment, skills development and access to a secured livelihood, employment and social services.

The state of compliance and progress of SWM implementation was evaluated a decade after RA 9003 was passed. A comprehensive analysis of issues and gaps was undertaken to formulate the *NSWMS for 2012-2016* [Acosta et al., 2012]. The NSWMS consists of ten components: Bridging policy gaps and harmonizing policies, Capacity development, Social marketing and advocacy, Sustainable financing, Creating economic opportunities, Knowledge management on technologies and innovation, Organizational development and enhancing inter-agency cooperation, Compliance monitoring, enforcement and recognition, Good governance, Caring for vulnerable groups, and Reducing disaster and climate change risks [NSWMC, 2012]. The NSWMS is currently being updated.

Since 2004, the Philippines have enacted a *Green Procurement Program* through EO No. 301. However there can be a conflict between sustainability ambitions and public procurement rules that still require selection and awarding to lowest bids (E-READI, 2019).

The compilation of the *National State-of-the-Brown Environment Report for 2008-2014* was commissioned by DENR-EMB to consolidate LGU reports through EMB Regional Offices

(ROs) on the status of RA 9003 implementation and to generate representative facts and figures on waste generation and characteristics. In March 2019, DENR-EMB and NSWMC released the *National Strategy to Reduce Short-Lived Climate Pollutants from the MSW Sector in the Philippines* to look at the climate lens of SWM and how it can reduce greenhouse gases when compared to alternative or mitigation scenarios.

RA 9729, otherwise known as the Climate Change Act of 2009, as amended by RA 10174 also known as the People's Survival Fund Act of 2011, and its IRRs, form the backbone of the country's policy on climate change adaptation and mitigation. Litter and other uncollected waste may affect time to subside flooding incidences usually due to clogged canals.

RA 7586, RA 11038, and other related Coastal/Marine and BiodiversityManagement Policies

RA 7586, otherwise known as the *National Integrated Protected Areas System (NIPAS) Act of 1992*, as amended by RA 11038, also known as the *Expanded NIPAS Act of 2018*, provides for the management of all designated protected areas (PAs), in order to maintain essential ecological processes and life support systems and maintain their natural conditions to the greatest extent possible. Both RAs prohibit dumping of any waste products and leaving refuse or debris or depositing in ground or in bodies of water. RA 11038 additionally provides for deputation of support for enforcement and its Section 9 stipulates the inclusion of waste, sewerage and septage management in PA management plans.

EO 533 series of 2006's *Integrated Coastal Management (ICM) Policy* promotes the application of best practices such as basin-wide management approaches, integrated waste management, environmental protection measures at ports, involvement of the private sector in ICM, adaption of user-fee schemes for waste management, and inter-LGU cooperation. In addition, the Philippines' *Coastal and Marine Ecosystems Management Program (CMEMP)* is a national program which aims to comprehensively manage, address and effectively reduce the drivers and threats of degradation of the coastal and marine ecosystems. CMEMP focuses on effectively reducing threats and factors of degradation on coastal and marine ecosystems and in the enhancement of the formation of positive values among all stakeholders including the youth through shared responsibilities in sustainable management of coastal and marine resources and habitats.

In support to the Aichi Biodiversity Targets, the country also released the *Philippine Biodiversity Strategy and Action Plan (PBSAP) 2015-2028* wherein direct and enabling interventions were identified to reduce the five major pressures of biodiversity loss, which include habitat loss and degradation, and pollution. PBSAP targets by 2028 include: (1) the key threats to biodiversity will be reduced, controlled or managed; (2) a 10% annual increase from the 2015 baseline on the number of schools, people's organizations, media, LGUs, private companies, etc. that are aware and supportive of biodiversity, its importance, threats and benefits of protecting it; and (3) reduce sedimentation from poorly-planned land-based activities, e.g., dumping of solid waste and infrastructure development.

By virtue of *EO 57, series of 2011*, the *National Coast Watch System* was established for a coordinated inter-agency maritime concerns. In relation to this, a National Coast Watch Council (NCWC) was established and tasked to provide strategic and policy directions, which shall be carried out by the National Coast Watch Center. Among the support agencies to the center include PCG, PNP-MG, BOC and BFAR. Aside from maritime security, the NCWC also addresses marine environment degradation.

Local Government Policies and Initiatives

RA 7160 or the *Local Government Code of 1991* stipulates that basic services and facilities shall be provided by the LGUs. Under Section 17, municipal governments are responsible for the "solid waste disposal system or environmental management system and services or facilities related to general hygiene and sanitation," "infrastructure facilities," and "tourism facilities.

On April 10, 2019, the Supreme Court of the Philippines ruled for a just share of Internal Revenue Allotment of the LGUs to now include other national taxes in computation. The ruling on the case of Mandanas versus Ochoa, G.R. No. 199802 Case, also known as the *Mandanas Ruling*, will now increase the share of LGUs from the national budget. This budget increase translates to higher capacities of LGUs to finance projects while at the same time serving as the basis for discussions on the devolved functions through the National Devolution Transition Plan.

In the case of the Bangsamoro Autonomous Region in Muslim Mindanao (BARMM), management of resources and environment falls under the authority of the Bangsamoro Government. The *Bangsamoro Organic Law (BOL)* gives the Bangsamoro Government an exercise of authority on, among others, ecological SWM and pollution control; economic zones, industrial centers, and free ports; environment and nature reserves conservation; fishery, marine, and aquatic resources; inland waters; science, technology, and research; and urban and rural development planning. Section 8 of the BOL stipulates that the protection, conservation, rehabilitation, and development of forests, coastal, and marine resources, including the adoption of programs and projects, to ensure the maintenance of ecological balance and biodiversity shall be given priority. As far as practicable, the Bangsamoro Government shall also be represented in the departments, offices, commissions, agencies and bureaus of the national government that implement and enforce policies, programs, and projects in Bangsamoro Autonomous Region.

At the municipal and city levels, many governments have taken steps to reduce or disincentivize the use of single-use plastic items. There are 168 recorded LGU-level policies related to regulating single-use plastics, polystyrene, and non-biodegradable packaging. The first local ordinance passed was in 2003 by Makati City, and the most recent one was in Kapangan, Benguet in 2020. The implementation and compliance varies considerably [UNDP, 2020]. Tables 4 and 5 elaborate on these local ordinances.

Table 4. Nature of plastic-related local ordinances in the Philippines [UNDP, 2020]

Coverage	Number of ordinances	Percentage
Ban	78	46%
Regulation	58	35%
Ban (Dry goods) / Regulation (Wet goods)	32	19%

Majority of the local ordinances enforce a ban, followed by a regulation, and a combination of a ban of plastic bags and other non-biodegradable materials for dry goods, and regulation for wet goods.

Table 5. Regulated items under local ordinances in the Philippines [UNDP, 2020]

Coverage	Number of ordinances	Percentage

Single-use plastics	16	10%
Single-use plastics and polystyrene products	17	10%
Plastic bag	57	34%
Plastic bag, polystyrene	66	39%
Plastic bag, styrofoam and other kinds of packaging materials	3	2%
Plastic, polystyrene, and other non-biodegradable materials	1	1%
Polystyrene food packaging	1	1%
Plastic bag, styrofoam, and other synthetic materials	4	2%
Plastic straws and stirrers	1	1%
Plastic straw	2	1%

The most common items banned or regulated were a combination of plastic bags and polystyrene, followed by only plastic bags. The least common items banned or regulated were plastic straws and stirrers.

Consumer and Business Regulatory Frameworks, Incentives and Initiatives

The *Consumer Act of the Philippines*, or *RA 7394*, was passed in 1992 to "protect the interest of the consumer, promote his general welfare, and to establish standards of conduct for business and industry." It mandates a consumer education program that includes environmental awareness, described as "the responsibility to understand the environmental consequences of [the consumer's] consumption" and "recognizing his individual and social responsibility to conserve natural resources for future generations."

The *Philippine Green Jobs Act of 2016 or RA 10771* is a framework to promote the creation of "green jobs" to enable and sustain a low-carbon and resilient sustainable growth. The Act defines a "green job" as "employment that contributes to preserving or restoring the quality of the environment." The Act offers the following incentives to self-employed or own-account workers; micro, small, and medium enterprises; and community-based business enterprises: (i) special deduction from the taxable income equivalent to 50% of the total expenses for skills training and research development expenses; and (ii) tax- and duty-free importation of capital equipment, provided that the capital equipment is directly and exclusively used in the promotion of green jobs of the business enterprise.

The Philippines likewise has a *Green Public Procurement (GPP) Roadmap*. GPP is a "process whereby public authorities seek to procure goods, services and works with a reduced environmental impact throughout their life cycle when compared to goods, services and works with the same primary function that would otherwise be procured." Executive Order 301, s. 2004: Establishing a green procurement program for all departments, bureaus, offices and agencies of the Executive Branch of Government was issued in 2004. The Philippine GPP Roadmap was released in 2017. The guidelines cover common-use supplies and equipment (e.g., multi-copy paper, toilet paper, trash bags) and prioritized non-common-use supplies and equipment (e.g., computer monitors, desktop computers and laptops; air conditioners, and LED light/bulbs).

The *Innovative Startup Act* or *RA 11337* recognizes the value advancing innovation and trade in the country through startups. A startup is "any person or registered entity in the Philippines which aims to develop an innovative product, process or business model." The Act provides incentives, removes constraints, and encourages the entrepreneurial attitude to stimulate growth of local businesses. It creates the Philippine Startup Development Program to support the research and development of startups and startup enablers in the Philippines, and the Startup Grant Fund and Startup Venture Fund to support startups with funding requirements. The relevant agencies are tasked to develop and maintain a website as the main source of information for the country's startups, startup enablers, and related enterprises. Its IRR was signed in November 2019.

The *Philippine Innovation Act* or *RA 11293* was passed in July 2019 and its IRR was signed in February 2020. The Act aims to "harness innovation efforts to help the poor and the marginalized," "remove obstacles to innovation by suppressing bureaucratic hurdles," and "encourage entrepreneurial attitude in order to stimulate growth ambitions in business" especially the micro, small and medium enterprises. The Act, validated by its IRR, states prioritizing the several industries that are related to a circular economy: secure, clean and reliable energy; climate change and disaster resilience; resource efficiencies; national and community- based comparative advantages in the context of global value chains; infrastructure needs; digital economy; food security and sustainable agriculture; the "blue economy" or ocean resources; and

transportation services. The government allocated PhP 1 billion for its first year of implementation.

Meanwhile, the Department of Trade and Industry's (DTI) Bureau of Philippine Standards lists certain plastic products as among the products for mandatory certification under mechanical/building and construction materials and chemicals and other consumer products. There is also a *Philippine National Standard* for plastics, plastic and plastic products, specifications for compostable plastics, monobloc chair, stool, and plastic table, and polyvinyl chloride resin.

As part of the *Industry Development Program* of the Board of Investments (BOI) and local industry associations, the Technical Working Group (TWG) for the Chemicals Industry Cluster, which includes plastics, serves as the coordinating mechanism through which industry concerns are addressed. The TWG's four action tasks are: (1) Trade & Investment Matters; (2) Talent Development & Innovation; (3) Ease of Doing Business; and (4) Environmental Practices, which cover issues on plastic banning, life cycle assessment (LCA) and it use as basis of scientific and technological studies in crafting laws that would affect the industries [BOI, 2016].

Through the NSWMC and together with the Philippine Plastic Industry Association (PPIA), an LCA for plastic bags and its alternatives was conducted in 2014 pursuant to RA 9003's mandate for DTI to come up with a non-environmentally acceptable products list. Results found that brown paper bags are more environmentally detrimental than plastic grocery bags although non-woven reusable bags are still the most environment-friendly option. The TWG was also involved in the development of the *Greening the Industry Roadmap*. In the 2nd Scoping Mission for Greening the Industry Roadmaps project conducted by Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), the Plastics Industry was identified as a priority sector. Following this, BOI and PPIA collaborated in conducting a workshop on ISO 14000-Environmental Management and ISO 50001-Energy Management System Standard for PPIA-member companies in February 2015 [BOI, 2016].

Businesses and NGOs have also stepped in, albeit individually, to design and implement projects that contribute to the reduction of wastes, some of which eventually end up as marine litter.
Some multinational corporations have set targets to avoid or reduce single-use packaging materials. Others have designed take-back schemes as part of the system while some have been involved in awareness-raising campaigns and partners in river and beach cleanups.

SCP and Circular Economy

NEDA leads the development of the *Philippine Action Plan for Sustainable Consumption and Production (PAP4SCP).* The overall framework is shown in Figure 13.

The PAP4SCP will serve as a guide to influence and steer sustainable behavior and practices across sectors and levels of government, contributing to the targets identified in the PDP. The framework lays out implementing programmatic policy reforms and a set of actions over the short- (2020-2022), medium- (2022-2030), and long-term (2030-2040) in four nodes: (i) policy and regulation; (ii) research and development, innovation, and technology; (iii) infrastructure, and
promotion and education. It has also identified partners and resources needed to address the challenges in the SCP implementation. The PAP4SCP recommends prioritizing legislation in (i) food waste management, (ii) electronic waste management, (iii) extended producer responsibility (EPR), and (iv) green public procurement. The PAP4SCP Framework has been presented to the Senate Committee on SDGs, Innovations, and Futures Thinking on January 22, 2020.

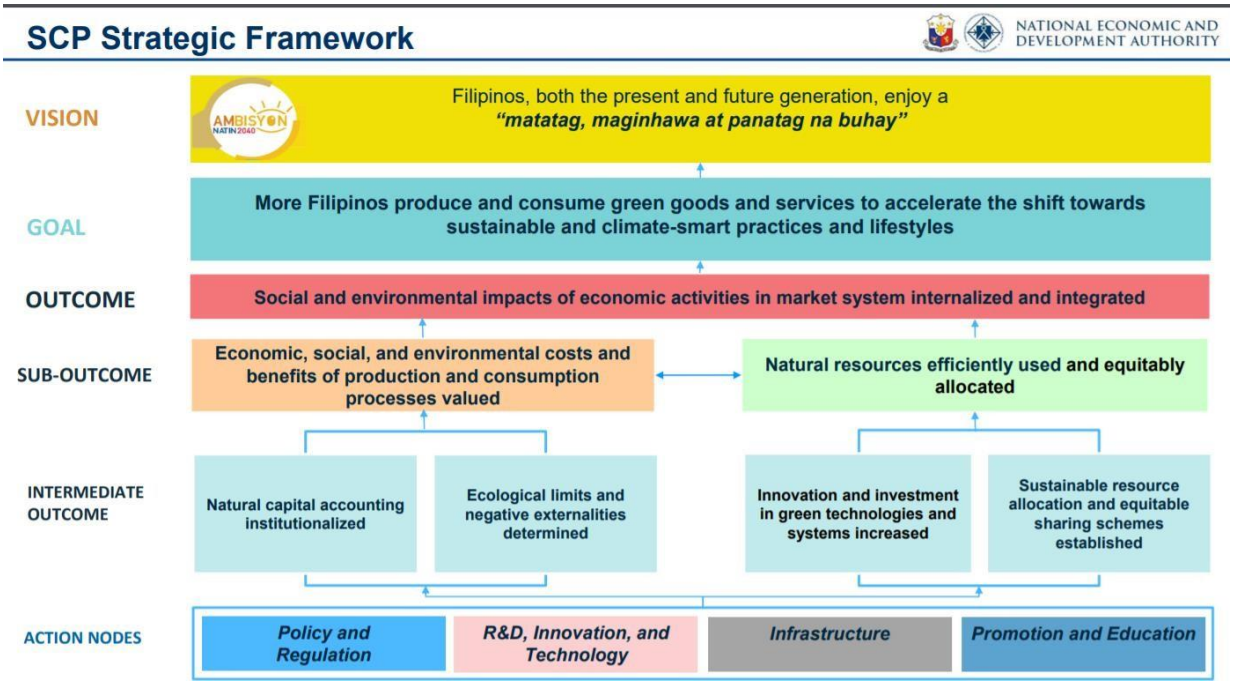


Figure 13. Philippines SCP Strategic Framework [NEDA, 2020]

Awareness Raising and Environmental Education

The *Environmental Awareness and Education Act of 2008* or *RA 9512* mandates the integration of science-based quality information for environmental education in the school curricula. The law covers all levels in public or private institutions, including in barangay daycare, preschool, technical vocational, and out-of-school youth courses or programs. The modules should include environmental concepts and principles, environmental laws, the state of international and local environment, and the responsibility of the citizenry to the environment. The Act also mandates practical activities, projects, and programs such as waste minimization, segregation, recycling, and composting. Relevant livelihood opportunities and economic benefits must also be taught.

The declaration of themed weeks or months through a Presidential Proclamation (PP) offers an opportunity to raise awareness and build constituency for a circular economy [UNDP, 2020]. The notable ones are:

- PP No. 237, s. 1988, declaring the month of June of every year as Philippine Environment Month;
- PP No. 57, s. 1998, declaring the month of May of every year as the Month of the Ocean;
- PP No. 1667, s. 2008, declaring November 19-25 and every year thereafter as "Global Warming and Climate Change Consciousness Week"; and
- PP No. 760, s. 2014 declaring the month of January of every year as Zero Waste Month.
- PP No. 595, s. 2018 adopting September 25 of every year as the observance of the World Environment Health Day to protect environmental health.

4. ISSUES, GAINS, AND REMAINING GAPS

Key stakeholders working on marine litter generally share common ideals in reducing waste leakage but naturally have some differences in perspectives and solutions. The multi-stakeholder workshops were designed to bring together actors from different sectors by first acknowledging the problem, assess current realities and roles, empathize with other sectors, identify both gains and gaps, and propose solutions. Figure 14 shows the framework and flow for the process.

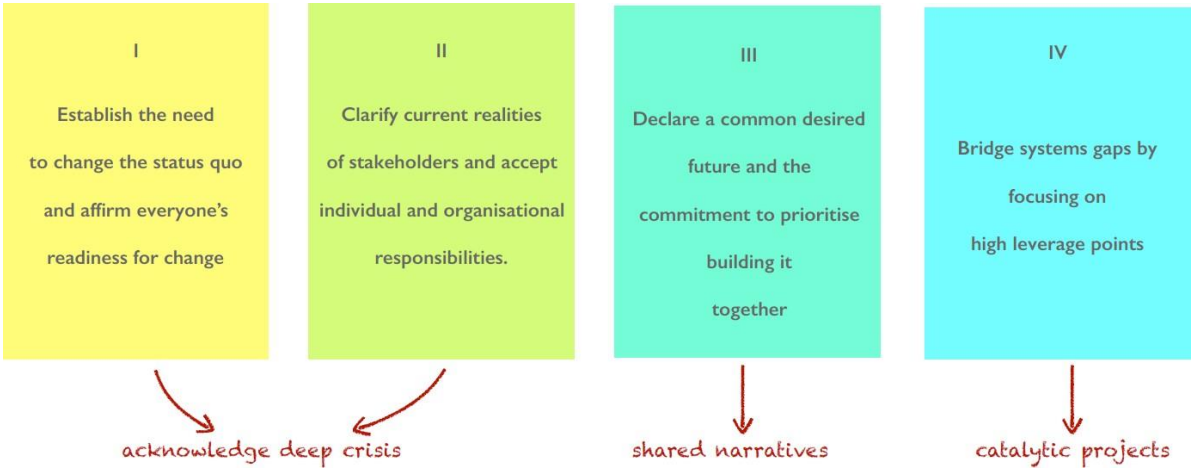


Figure 14. NPOA-ML development framework [UNDP, 2019]

Through participatory workshops, various stakeholders got to know each other on a deeper level – a process that brought out insights on everyone's roles, purpose, priorities and pressures. Together, they created "Our Commons", which is a space where the shared sentiments could be freely expressed. Through the "Desired Future" exercise, initial ideas and aspirations of a desired future in the context of marine litter problem were solicited. Subsequently, "Empathizing with Stakeholders" created a safe space to discuss and achieve understanding amidst differences. This step likewise developed well-informed awareness and deep understanding of stakeholder realities, views, values, beliefs, and general mental models in their understanding and appreciation of the problem space [DENR/UNDP, 2019b].

4.1 SYSTEMS MAP

A systems map was developed by generating an exhaustive listing of the elements in the social, industrial and ecological systems, and then establishing the relationships of the various elements of the three systems at play in the problem space.

Five sub-groups built their own systems map based on their understanding of the current state in relation to marine litter. Participants had the opportunity to further build on it based on the empathy exercise and input sessions [DENR/UNDP, 2019a; DENR/UNDP, 2019b]. A consolidated version of the systems map is shown in Figure 15.

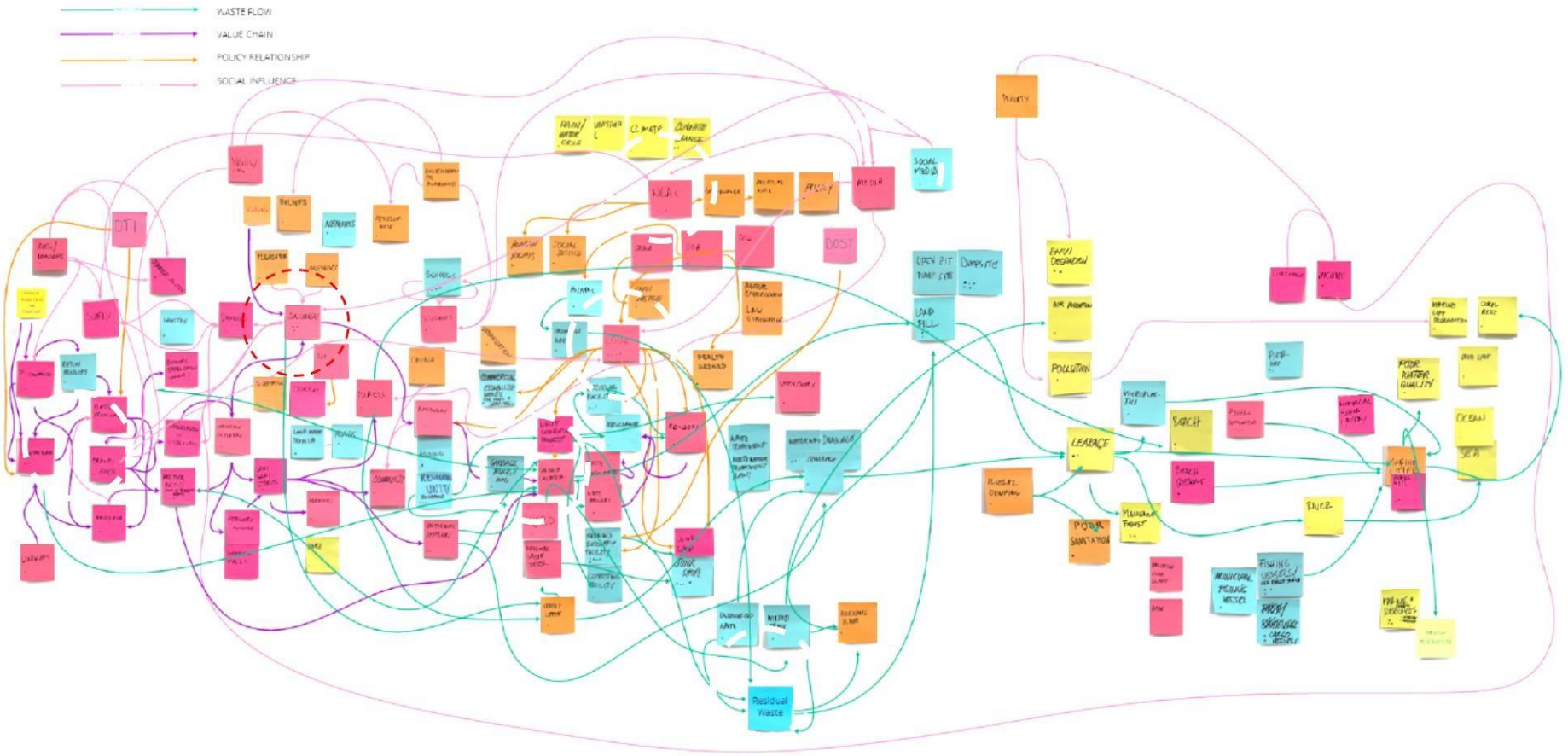


Figure 15. Consolidated Systems Map

The consolidated systems map provided a good starting point in identifying points in the system where key actors can intervene in a systematic manner. The figure also shows how complex the current system affecting marine litter is, with many actors and elements involved. The key points in the system where many elements are connecting to (circled nodes in Figure 15) indicate the needed focus in identifying interventions in order to transform the system. Key findings include:

- The key role of LGUs in the system, particularly in reducing and preventing land-based sources of marine litter: LGUs have the primary mandate in implementing RA 9003 as well as in influencing behaviors of various actors, including the private sector, communities, schools, IWS and other local stakeholders.

- The influence of the production of goods and packaging materials: Manufacturing companies, including distributors, retailers and commercial establishments, can affect product and packaging choices, prices and modes of deliveries.

- Consumers, particularly households, have different levels of awareness, income ranges, practices and driving forces in the consumption of goods. Consumers are also active players in waste management, whether through littering, burning and open dumping, or through positive practices such as reducing consumption, reuse, segregation at source and recycling.

- National government agencies influence planning, policy development, implementation, monitoring and regulations or enforcement. This includes the areas of SCP, land-based waste management, marine pollution control, biodiversity conservation, and trade and investments.

- Additionally, waste segregation and collection dictate how waste would be managed and consequently, how some could leak into riverine and marine environments. Residual waste reduction targets are usually at the receiving end of how resources and waste are managed in the early steps of the value chain.

Insights: Influencers and Mental Models

The systems map likewise provided specific insights on the identified influencers and mental models. People from different sectors, with varying mental models that influence thinking processes, decisions and behavior, are at the core of the marine litter issue.

National and local governments, through effective enforcement of policies, can greatly influence actions of multiple stakeholders such as the private sector or business establishments, consumers, and waste management actors.

The media influences consumer behavior because it can either drive unsustainable consumption or raise awareness and drive action towards sustainable behaviors such as reducing consumption, shifting to sustainable products and services and participating in sustainable waste management. Social media in particular has significant influence on the youth. The media also plays a role at how the private sector does business as it provides negative or positive messaging about brands or companies, which affects reputation thereby influencing action. NGOs, media and public sentiments can also put pressure on national and local governments to take action, whether through policies or programs.

Chief executive officers and shareholders of corporations can also drive the shift to sustainability and circularity in business operations. The private sector can also influence national and local policies, work with policy makers and seek support.

Schools play a role in raising environmental awareness and influencing behavior of students, who in turn can influence household and community members. Religious institutions have some level of influence over their members and communities when it comes to protecting the environment. Values and belief systems largely influence consumer behavior and attitude towards the environment.

Convenience is driving the demand for non-recyclable single-use products and improper disposal practices. The disposable incomes of households likewise play a role in consumerism, particularly the proliferation of retail or sachet economy.

Insights: Waste Flow and Market

Waste generation starts from the extraction of raw materials to production to consumption and other human activities that have the potential to eventually leak into receiving bodies of water, resulting in marine litter. It involves multiple stakeholders, with impact encompassing environmental, health, social, and economic aspects.

Leakage that causes marine litter can be managed with proper waste segregation at source, collection, recovery, and processing. Mixed waste decreases the value of recyclables.

The low cost of producing plastics and other packaging materials is usually compounded by the current high cost and limited knowledge on life cycles of alternative materials. Consumer demand often, but not solely, drives market shift; consumers are more environmentally aware, but have limited access to more sustainable options.

The private sector has intent to pursue a circular economy as demonstrated by business-led initiatives to support materials recovery and recycling efforts. Nevertheless, there are remaining barriers that need to be addressed, which include enabling environment, capacity, technology, and cost. In this case, startup, micro-, small, and medium enterprises (SMSMEs) would require more support to transition.

4.2 KEY ISSUES AND CHALLENGES

Marine litter issues surfaced with the analysis of the systems map. Issues and gaps can be categorized according to policy and implementation; environmental; economic and market; and education, awareness, beliefs, values, norms, and mental models [DENR/UNDP, 2019b].

Policy and implementation

Full LGU compliance to RA 9003 is hindered primarily due to lack of capacity in terms of technical, financial and human resource requirements and the political will of national and local leaders is necessary to implement policies and drive change. It was also found that no definitive baseline data on marine litter exists to inform strategic and targeted actions.

The lack of coordination and reporting mechanism of implementing agencies and the roles of government agencies need to well-defined to overcome siloed implementation of policies. Mandates and key performance indicators of government institutions limit involvement in addressing the marine litter problem but may provide opportunities to piggy back marine litter

prevention, reduction and management initiatives. There needs to have transparency in the policy and programming processes.

Households are likewise not fully complying with waste management policies, which may be partly attributed to lack of available infrastructure and consistent systems for waste segregation, collection and processing. All stakeholders also face challenges on the increasing residual and healthcare waste generation and open dumping. The role of the informal waste sector needs to be highlighted more and support to their formalization or partnerships should be extended.

There is also a need to build the capacity of authorities in environmental policing both from land- and sea-based sources of litter. The role of fisher folk associations and compliance of commercial shipping and fishing vessels can be optimized to support addressing marine litter since marine litter is a transboundary issue. An institutionalized platform for coordination among stakeholders can be established and solid waste management policies can be updated to mainstream marine litter and circular economy lenses and other emerging issues.

Environmental

Secondary studies tags the Philippines as third largest source of plastic waste leakage. Typhoons and extreme weather events contribute to the marine debris problem and the ultimate recipients of unmanaged marine litter are the marine animals and biodiversity in general.

Socio-economic

Key brands are tagged as biggest plastic polluters in the Philippines. Poverty tends to drive the "tingi" or sachet economy while high population and economic growth and urbanization drive unsustainable consumption and demand for plastics. There are currently limited technical or innovative solutions and cost-effective alternative materials for products and packaging. R&D is needed to find sustainable solutions and market barriers should be addressed to scale up the use of recycled products.

Enabling environment is lacking to drive shift and pursue circularity. Local economic development needs to be linked with environmental conservation, e.g., decreased volume of fish push fisher folk to go to farther fishing grounds. In addition, there needs to have an extended producer and consumer responsibility policy that works in the local context. Incentives are lacking to drive market shift and the private sector is faced with challenges on the availability and location of needed recycling infrastructure.

Education, awareness, beliefs, values, norms, and mental models

Plastics were a solution to prevent problems. It has provided solutions and conveniences for society to keep up with urbanization and modern times. During the mid-20th century, plastics were even seen as the savior to rampant deforestation to produce paper-based packaging materials. The marine litter issue has raised public consciousness on how to sustainably consume it and properly manage post-consumer waste.

Coastal clean-ups are reactive solutions, albeit a necessity considering the complexity of the problem in Manila Bay. While "everybody is focused" on the area home to almost 30% of the country's population, preventive efforts should also commence in other areas of the country. Each stakeholder should acknowledge his/her role in contributing to and addressing the problem and the sectors' lack awareness of existing government initiatives and programs should likewise be bridged.

4.3 LEVERAGE POINTS

Identifying leverage points are guided by its power to transcend paradigms, the goal of the system and areas with opportunities to add, change, evolve, or self-organize system structure. For marine litter, category clusters for leverage points include waste management (39 nodes in the systems map), behavior (16 nodes), consumption (13 nodes), policies (11 nodes), research (5 nodes), and production/manufacture (5 nodes) [DENR/UNDP, 2019b].

Waste management

(a) Increase of recycling facilities
- Due to limited or non-compliance to segregation at source
- Due to the delay in the influx of more recyclers
- By developing more robust recycling infrastructure and facilities
- Provision of recycling facilities
- Establishment of complementary facilities for waste management

(b) Incentives for community waste management
- Inventory of domestic recyclers and their capacities
- Provision of recycling facilities
- Changes/enhancements in traditional solid waste management practices

(c) Strengthen domestic recycling industry
- Full segregation at source
- Segregated waste collection system
- Inventory of domestic recyclers and their capacities
- Recycling of plastics domestically to safeguard broken value chains
- Provision of waste treatment facility
- Identify and close disposal sites that contribute to leakage

(d) Segregated waste collection system
- Provision of recycling facilities
- Changes/enhancements in traditional solid waste management practices
- Inventory of domestic recyclers and their capacities

(e) Full segregation of waste
- Through change in solid waste management habits
- Port waste reception facilities
- Due to dumpsite near coastal waters or water bodies
- Due to haulers dumping in water bodies
- Due to lack of information on existing recyclers

(f) Proper marine vessel waste disposal
- Due to dumpsite near coastal waters or water bodies
- Digital ship-to-port hauler waste tracking system
- Status information on landfill near coast
- Conflicts in or uncoordinated implementation of maritime policies
- Waste leakage from ships to ports

(g) Learning exchange and knowledge sharing of LGUs

Behavior

(a) Change in consumer behavior
- Consumer behavior and education for marine litter
- Avoid ningas cogon
- Enhancement of educational signages in public spaces
- Increase penalties

- Use of social media for awareness of waste management

(b) Use of media, including social media, for awareness on clean environment, sustainable consumption, and waste management
- Information on the value of recyclable materials
- Coordination for communications
- Role of media to influence unsustainable consumption
- Focus on change in solid waste management habits

(c) Inclusion in school curriculum
- Updated data made available by government
- Baseline information on waste leakage to water bodies
- Awareness of long-term effects of pollution
- Information on the value of recyclable materials
- Enhancement of educational signages in public spaces
- Will cause change in consumer behavior

Consumption

(a) Sustainable and mindful consumption
- Education and awareness at the community level
- Change in consumer behavior
- Availability of alternative packaging materials
- Incentivizing the use and production of recycled products
- Market development
- Increase in penalties
- Sustainable production

(b) Adaption of new greener alternatives
- Market incentives for recycling and recyclable materials
- Market development for low value recyclables
- Green specification system in green public procurement

(c) Laws & policies to support development of alternatives
- Support to waste to fuel innovation
- Market development for low value recyclables
- Adaption of new greener alternatives
- Market incentives for recycling & recyclable materials
- Ecolabeling and certification of hotels, restaurants and establishments

Policies

(a) Enacting & adopting national to local laws
- Find middle ground for clashing goals of stakeholders
- Revisit conflicting laws
- Compliance to RA 9003
- Create a national research framework on marine litter

(b) LGU compliance to RA 9003 and implementation of local ordinances
- Avoid political intervention
- Avoid delay in project implementation due to litigation
- Avoid poor enforcement of policies
- Quick preparation of implementing rules & regulations
- Monitoring & implementation of penalties in the ordinances
- Harmonization of the segregation scheme

(c) Recognition of LGUs with good initiatives

Research

(a) Create a National Research Framework on Marine Litter
- Multi-sectoral collaboration among NGAs, LGUs, CSOs and private sector
- Life-cycle analysis
- Enacting & adopting national to local laws
- Baseline information on waste leakage to water bodies

(b) Inclusion in the school curriculum
- To change consumer behavior
- Updated data made available by government
- Baseline information on waste leakage to water bodies
- Awareness on the long-term effects of pollution
- Information on the value of recyclable materials
- Enhancement of educational signages in public spaces

Production

(a) Sustainable production
- EPR system that works in the Philippines context
- Recycling of plastics that produce resin
- Tax incentives for private companies & institutions
- This will lead to sustainable and mindful consumption

5. ACTION PLAN: PROGRAMMATIC CLUSTER

Programmatic actions have been clustered together to align with existing collective sectoral approaches of public and private sectors. Through a programmatic approach, government agencies and corresponding stakeholders can maximize the common implementation of sectoral policies, mandates and initiatives. Strategies, main actions and sub-activities are elaborated in Table 6.

Strategy 1: NATIONAL MARINE LITTER BASELINING

Establish science- and evidence-based baseline information on marine litter. Baseline data provides implementers and decision-makers information from which interventions can subsequently be compared. While there exist various international, local and sectoral studies that have generated useful initial findings, research methodologies and analytical tools within an overarching research framework need to be reviewed for the country to come up with a common definitive baseline on waste leakage and accumulation in the marine environment. In close cooperation with the international community and local experts, the issues of data sources, comparability, transparency and ease of data gathering can be addressed. The process is also envisioned to pave the way for the establishment of a robust monitoring, evaluation, reporting, verification (MERV), updating, and information dissemination system for the NPOA-ML.

Strategy 2: CIRCULAR ECONOMY AND SCP MAINSTREAMING

Mainstream circular economy (CE) and sustainable consumption and production (SCP) initiatives. The country already has programs and policies on SCP and cleaner production, which provide a strong foundation for the prevention of waste generation in the first place. Focusing on the design, raw material extraction, manufacture, and the technologies used to produce products and packaging materials, the phase-wise shift to inclusive circularity in public and private sectors will minimize resource consumption and waste generation. As CE mainstreaming addresses the upstream components of the marine litter issue, consistent support to research and innovation and close collaboration with SMSMEs and multinational companies will make cost-effective and environmentally friendly products, packaging materials and services available in the Philippines. To facilitate this, enabling policies and systems for CE and SCP in the context of marine litter prevention and reduction should be in place. In addition, it is necessary to develop and implement an ESR/EPR system along the manufacture-distribution-retail value chain that applies sustainably in the Philippine context, and adopt a model that ensures socio-economic safeguards for the informal and semi-formal waste sector as well as for the consumers and communities.

Strategy 3: RECOVERY AND RECYCLING ENHANCEMENT

Enhance recovery and recycling coverage and markets. While CE promotes the avoidance and minimization of waste, the management of post-consumer goods and packaging materials should be further enhanced as already mandated by RA 9003. For a time, bulk of the recyclable materials from the Philippines is exported to other countries for recycling yet global trade and policy trends revealed that over-reliance on exports make recyclable prices and markets

vulnerable to external factors. It is thus necessary to strengthen the domestic recycling industry, create local jobs, and establish or link markets for locally generated recyclable materials. Maintaining the recyclables supply chain involves the support of waste generators such as households, commercial, institutional and non-hazardous industrial waste sources particularly on segregation-at-source. The value chain can be further enhanced by supporting the LGUs, which are mandated to implement segregated collection, materials recovery and processing.

Strategy 4: COLLECTION AND DISPOSAL SAFEGUARDS

Prevent leakage from collected or disposed waste. Contrary to the popular belief that only uncollected waste ends up in the marine environment, various existing studies found that the majority of marine litter supposedly comes from waste that has already been collected or disposed. Waste leakage from these land-based sources can be prevented with proper monitoring and enforcement of waste collectors and operators of waste management infrastructure. It will also be strategic to prioritize the safe closure and rehabilitation of dumpsites, improperly managed waste processing facilities, and other waste infrastructure such as sanitary landfills that are located in unsuitable sites such as environmentally critical and flood-prone areas. Nevertheless, safeguards need to be in place when closing processing and disposal facilities in consideration of the new incoming waste that still needs to be managed. New environmentally sound waste management infrastructure need to be funded, established and properly operated.

Strategy 5: SHIPPING AND FISHERIES WASTE CONTROL

Reduce maritime sources of marine litter. Aside from land-based sources of marine litter, waste leakage from ships, fishing boats and aquaculture activities have to be addressed. There are existing maritime, fisheries, aquaculture, and biodiversity conservation policies that are already in place and these have to be reviewed with the marine litter lens. Information sharing, policy harmonization, inter-agency cooperation, and the presence of systems and facilities at national and municipal ports need to be enhanced to ensure ship waste management, transport, recovery, processing and disposal. In the fisheries sector, focus would be on the management of ALDFG, seaweed-growing media and aquaculture floaters.

Strategy 6: CLEANUP OF RIVERINE AND MARINE ENVIRONMENTS

Manage litter that is already existing in the riverine and marine environments. While stakeholders should focus their efforts on marine litter prevention and reduction, it remains a reality that there are accumulated litter still existing in creeks, tributaries, rivers, bays, seas and oceans that need to be managed. The current efforts of the DENR and other stakeholders to clean up water bodies can be further replicated throughout the country especially in biodiversity, tourism and other marine litter hotspots. Clean-up drives should be designed consistently and sustainably through a programmatic approach and with the integration of awareness raising alongside clean-up activities to capitalize on the pyscho-social impacts of the reverse Broken Windows theory. Furthermore, a wide range of technology-based solutions to collect and capture marine litter could be explored to maximize debris recovery.

Table 6. NPOA-ML Programmatic Cluster of Strategies and Actions

ACTIONS		EXPECTED OUTCOMES	TIMELINE	LEAD AND COOPERATING AGENCIES / SOURCES OF FUNDING	RESOURCE REQUIREMENTS
1	***Establish science- and evidence-based baseline information on marine litter***				
1.1	Develop the National Research Framework and Program for the Monitoring and Assessment of Marine Litter	National program on monitoring and assessment of marine litter and micro-plastics	2021-2022	**DENR-EMB/ERDB; DOST Research Councils;** SUCs and other R&D institutes; Development cooperation agencies	Technical experts; Researchers; Funding for calls for proposals
1.2	Standardize methodology and appropriate data collection system for marine litter information in the Philippines	Nationally standardized methodology and information system for the baselining of marine litter leakage and accumulation from all sources	2021-2022	**DENR-EMB/BMB**; **NSWMC; DICT**; **DOST;** DILG; MBCC, LLDA, SUCs/HEIs, DA-BFAR, DENR-FASPS; Development cooperation agencies	Technical and administrative coordinator
	1.2.1 Create an inventory of all known methodologies for collecting baseline data on marine litter, e.g., material balance, remote sensing, etc. 1.2.2 Coordinate with global and international bodies, (e.g. UNEA Ad Hoc Experts Group (AHEG) on Marine Litter and Microplastics, UN Environment/COBSEA, International Maritime Organization (IMO), UNESCO Intergovernmental Oceanographic Commission (IOC) for the tools/methods (e.g. Japan Osaka Blue, et al.) 1.2.3 Develop, validate and adopt a standardized methodology for baseline data gathering				
1.3	Carry out a national baseline assessment on waste leakage and accumulation of litter in the marine environment including, but not limited to:	National definitive marine litter baseline assessed, compiled and published	2021-2022	**DENR-EMB/BMB/ERDB**; **DOST Research Councils**; NSWMC; DOST; DILG; LGUs; BOC; LLDA; NAMRIA; DICT; DTI; SUCs/HEIs; Development cooperation agencies	Technical experts; Research; I.T.-based data management system; Proposal funding; Information provided by NGOs/CSOs/private sector

	1.3.1 Compile and evaluate existing data and analyses related to marine litter (from manufacture to seas). Include various sources, flows, and pathways and take into account land-, water-, and air-based litter. 1.3.2 Collect and consolidate waste stream analysis information from all sources, i.e., residential, commercial, institutional, and industrial 1.3.3 Collect information on the status of disposal facilities near bodies of water, in flood-prone areas, or at other unsuitable sites 1.3.4 Collect information on the status of all waste disposal, recycling and treatment facilities 1.3.5 Collect information on occurrence of ALDFG (or ghost fishing nets) and waste disposals in merchant vessels including fishing vessels 1.3.6 Collect information on Philippine import and export data on waste/recyclables 1.3.7 Collect information on microplastics 1.3.8 Consolidate information from the rehabilitation initiatives in Boracay, Manila Bay, and other areas 1.3.9 Conduct the national baseline assessment on waste leakage and accumulation in the Philippines, including highlights on the amounts and impacts of marine litter and specific data on critical hotspots such as illegal dumpsites, scattered dumps and waste collection points, ports and piers, areas not covered by waste collection, waste accumulation hotspots due to topographic and man-made barriers, impacting biodiversity, fisheries, and tourism sites.				
1.4	Make science- and evidence-based and vetted information on national marine litter baselines available and accessible, including spatial visualization and building networks for dissemination	Clearinghouse and data management system for national baseline information, including validation, reporting and dissemination; Networks for information dissemination.	2023 onwards	**DENR**; DOST Research Councils; Academe/SUCs/HEIs; Research institutes; DILG; DA-BFAR; NAMRIA; NGOs; Development cooperation agencies	Information hub with focal office/coordinators and I.T.-based data management system
	1.4.1 Establish data ecosystem platform for marine litter 1.4.2 Build a network for continuous discourse about latest databases, researches, initiatives, and critical hotspots by various stakeholders and conduct academic infusion/fora on marine litter 1.4.3 Inform policy makers and decision-makers and encourage them to be more collaborative with the use of data 1.4.4 Mainstream the data for public consumption through the establishment of data management system, clearinghouse, and synthesis reporting, and creation of a dedicated website/portal				
2	***Mainstream circular economy (CE) and sustainable consumption and production (SCP) initiatives***				
2.1	Map out existing and support research and innovation for CE/SCP in the context of marine litter prevention and reduction	Innovation centers and network established for CE/SCP; Prototypes based on existing LCSA studies, tested, incubated and made accessible to all sectors	2021 onwards	**NEDA; DOST; Academe; R&D Institutes; Private Sector** (Business incubators, investors, inventors, scientists); DTI; DENR; DOF;	CE/SCP hub/facility; Study on priority research, Studies; Trainings; LCSA studies

				NSWMC; National Innovation Council	
	2.1.1 Define and develop a framework on circular economy and SCP vis-à-vis marine litter prevention in accordance with the national context 2.1.2 Provide resources and incentives for research and development (R&D) on circular economy and SCP 2.1.3 Create a Research and Innovation Hub, including development of compact technologies and building a network of entrepreneurs and innovators				
2.2	Develop stakeholder and industry-led marine litter strategy roadmaps, including SMSMEs, with participation from stakeholders and value chain actors to reduce marine litter with set targets within a prescribed timeframe	Industry (material-specific) and SMSME roadmap developed, with set targets within agreed upon time frame developed with stakeholders and value-chain actors	2021 - 2022	**Private Sector; Companies along the value chain; Marine-based industries;** DTI; DENR; NSWMC; DILG; LGUs; DOST; Development cooperation agencies	Pre-requisite studies and researches; Cost-benefit analysis; Technical experts/facilitators; Administrative support; Consultations
2.3	Develop and implement an Extended Stakeholder Responsibility (ESR) system, including producers' responsibility, which applies in the Philippine context, along the manufacturing-retail value chain and ensuring to integrate the informal and semi-formal waste sector (waste pickers, paleros, junkshops, dealers/haulers, waste consolidators, recyclers, etc.) as well as communities	National definition and framework for ESR; ESR readiness and policy studies for packaging; Legislation initiated for a phased-wise approach to implementation	2021-2025	**Congress/Policy-makers; DENR; DTI;** Private Sector; NSWMC; NGOs/CSOs; DOF; DILG; DOST; DOH; SUCs	Pre-requisite technical and policy studies and researches; Workshops and consultations
	2.3,1 Develop a nationally accepted definition of ESR and framework 2.3.2 Pilot-testing of ESR mechanisms/measures 2.3.3 Multi-stakeholder process for the design of options and the initiation of a policy formulation process 2.3.4 Legislative review of the country-specific ESR system				
2.4	Develop and implement a plan for a phase-wise shift to inclusive circularity	Action plans and complementary policies/actions on CE/SCP implemented	2021 onwards	**DTI-BOI/BPS; DENR; Private Sector;** NSWMC; NGOs/CSOs; DOF; DILG; DOST and its Research Councils; DOH; DICT; DOT; NAMRIA; MMDA; Waste management contractors;	Data gathering and processing; Online database; Pre-requisite studies and researches; Business model development; Funds to support development of standards and pilot testing of innovative

				Development cooperation agencies	technologies and approaches
	2.4.1 Study, develop and promote the use of sustainable packaging and other business models, which are environmentally sound and economically viable, including alternative product delivery systems, e.g. refill models 2.4.2 Promote research and enhance product/packaging re-design for improved reusability and recyclability 2.4.3 Promote innovative and sustainable ways to a shift to avoid or reduce disposables consumption in establishments and institutions, including hotels, restaurants, delivery services, and healthcare facilities, 2.4.4 Conduct, geomap, and make accessible to the public, an inventory of waste consolidators, recyclers, and waste treatment facilities and their respective capacities				
2.5	Provide other enabling policies and systems for CE/SCP	Strengthened enabling environment for sustainable products/services	2021 onwards	**Congress/Policy-makers; DENR; DTI;** NELG-GCP; PCEPSDI; NEDA; NSWMC; NGOs/CSOs; DOF; DILG; DOST and its Research Councils; DOH; GPPB Board; NELP; DOLE, CCC Private Sector; Development cooperation agencies	Pre-requisite technical and policy studies and researches; Workshops and consultations
	2.5.1 Conduct science and life cycle sustainability assessment (LCSA) based policy studies for national and local policy makers 2.5.2 Address barriers and review and resolve outdated or conflicting policies on CE or SCP 2.5.3 Provide incentives to support the shift to circular economy (e.g., use of alternative materials, reduction in the consumption of disposables) both at the national and local levels 2.5.4 Strengthen eco-labelling policies (based on LCSA) on products and services and improve consumer green choice awareness/uptake of the policy 2.5.5 Make green products mandatorily specified in the bid documents in Green Public Procurement (GPP) and under Flag Law, e.g. explore setting minimum criteria or price advantage				
3	***Enhance recovery and recycling coverage and markets***				
3.1	Strengthen the domestic recycling industry for all types of materials and enable mechanisms for recyclables market creation and scaling with the	Updated study, framework and masterplan on recycling system; Updated	2021 onwards	**DTI; DBM; Recycling industry and value chain actors including IWS; LGUs;** DENR;	Baseline information/studies per material type; Technical and policy studies and

	involvement of all stakeholders along the value chain	standards for products and procurement		DOST; NSWMC; CCC; DPWH; Research/Academe; PCEPSDI; DOLE; DOF; NEDA; PSA; SUCs/HEIs; Development cooperation agencies	researches for roadmap development; Policy recommendations; Funds to support recycling infrastructure projects; ; Workshops and consultations
	3.1.1 Update study, framework and masterplan on Recycling Industry Development in the Philippines, including the recyclables value chain and fiscal and non-fiscal incentive mechanisms 3.1.2 Establish standards for recycled products and recyclates 3.1.3 Develop mandatory minimum requirements for use of materials with recycled content, e.g. percentage of recycled content in building materials or in blended cement to create market for alternative construction materials. 3.1.4 Integrate informal waste sector as stakeholders in recycling system				
3.2	Establish and link markets for recyclables and recycled materials, with priority on locally recovered materials.	Inventory of markets including prices; Improved logistics for LGUs nationwide; Stable prices for recyclables	2021 onwards	**DTI; NSWMC; DENR;** DOLE; LGUs; Private Sector; Informal Waste Sector; Women's Groups; Development cooperation agencies	Baseline information/studies; Publication on market database for recyclables and its markets; Value chain analysis; Policy recommendations; Funds to support pilot testing of innovative technologies, logistics and approaches
	3.2.1 Develop, promote and link markets for recyclables, including low value recyclables 3.2.2 Develop, promote and link markets for the use of upcycled or recycled products or materials with recycled content				
3.3	Support LGU efforts on segregated collection, materials recovery and processing	Increased capacities (in tons) of segregated, collected and processed recyclable and potentially recyclable materials	2021 onwards	**DENR; DILG; NSWMC; LGUs;** DOST and its Research Councils; MMDA; Private Sector; IWS; Development cooperation agencies	Baseline information/studies per material type; Online database; Policy recommendations; Funds to support LGU

					collection and recycling infrastructure projects
	3.3.1 Baselining and collection of data from the LGUs' materials recovery facilities (MRFs) with emphasis on capacities 3.3.2 Provide support to LGUs on standard color-coded segregation-at-source, provision of bins in public areas, segregated collection, and the establishment and proper operation of MRFs				
3.4	Explore options for management of residual waste, including waste-to-energy	Reduction in the land disposal of biodegradable or low-value residuals	2021 onwards	**DENR;** DOST; DILG; DOH; NSWMC; DOE; Congress	Pre-requisite technical and policy studies and researches; Workshops and consultations
	3.4.1 Conduct study on residual waste management options 3.4.2 Develop guidelines for residual waste management options, taking into account environmental and social safeguards				
4	***Prevent leakage from collected or disposed waste***				
4.1	Enforce appropriate monitoring measures and regulations (e.g. tracking or manifest system) on waste collection practices and equipment and against illegal dumping of waste that is collected by any entity, e.g. LGU, private waste haulers, informal collectors, establishments and communities along waterways.	Leakage of collected waste into the riverine and marine environment reduced; Proper waste collection monitored and enforced	2021 onwards	**DENR-EMB; DILG; MMDA; LGUs; NSWMC;** PNP; PCG; DENR-RBCO; NGOs/CSOs; Development cooperation agencies	Enforcement authority (manpower); Training of formal and informal waste collectors; LGU ordinances; Review of contracts vs penalties for waste haulers
4.2	Prioritize the safe closure and rehabilitation of dumpsites whether active or abandoned, waste processing or disposal facilities that are located in unsuitable sites, (e.g., open/scattered dumps, salvage zones, near environmentally critical areas, rivers and coasts, highly susceptible to geohazards, or in flood-prone areas).	Closure of 100% of dumpsites; Rehabilitation of waste processing facilities operating as dumpsites	2021-2025	**DENR-EMB; DILG; NSWMC**; MMDA; LGUs; Development cooperation agencies	NSWMC monitoring capacity; Fund to support LGUs in dumpsite closure; Online database and feedback system
4.3	Establish environmentally sound infrastructure (e.g., sanitary landfills and storage/ processing/recycling facilities), identify gaps, and provide funding for solid waste treatment and disposal	Standards for SWM facilities revisited in light of marine litter; Begin construction of sanitary landfills servicing 100% of total residual waste generation; Waste treatment/diversion	Phase 1: 2021-2025	**DENR-EMB; DILG; NEDA; NSWMC**; DBM; MMDA; LGUs; Development cooperation agencies	Baseline studies on infrastructure gaps and resource requirements; Funding allocation; Online database on the proper management, operation and maintenance of

		facilities to cater to at least 25% of total or with targets set in the PDP	Phase 2: 2026-2030		recycling and sanitary landfill facilities
	4.3.1 Ensure that LGUs and/or concessionaires have proper sewage, municipal and healthcare waste treatment facilities and trash traps 4.3.2 Ensure staging areas, MRFs, transfer stations and sanitary landfills are secured to avoid leakage 4.3.3 Provide technical assistance to LGUs in the proper site identification of new sanitary landfills and other waste management infrastructure. 4.3.4 Explore the use of GIS/Remote sensing integration tools for location optimization of new facilities.				
5	***Reduce maritime sources of marine litter***				
5.1	Mainstream marine litter lens in national marine and maritime policies, which are informed by, and for eventual customization, to local needs.	In support to Actions 8.1 and 8.2, national policies reviewed, issued/enacted, or amended as necessary, and localized, in view of marine litter prevention and management, including PD 979, RA 8550 as amended by RA 10654, RA 10863, and BOC-EPCD policies	2021-2024	**NCWC (Center and Council); DOTr; DENR-EMB/BMB**; DOST NRCP and other relevant research councils; PPA and Special Ports; PCG; MARINA; DA-BFAR; NAMRIA; PNP-Maritime Group; BOC; PPA; POs; NGOs; LGUs; Development cooperation agencies	Policy studies (background research and recommendations); Consultation-workshops; Dissemination/capacity building of regulated community; Delineation of municipal waters; Capacity building of LGUs and its Bantay Dagat Units
	5.1.1 Remove conflicts in maritime policies (MARPOL vs national policies) and [revisit PD 979 (MarPol Decree of 1976) to harmonize with Intl MARPOL policies] 5.1.2 Localize or standardize inter-island maritime waste management policies, specifically in line with PD 979 (Marine Pollution Decree of 1976) and BOC policies Garbage Management Plan and SHEA 5.1.3 Strict enforcement of policies, including: 1. RA 8550, as amended by RA 10654 (Fisheries Law), especially Section 107 (Aquatic Pollution) 2. RA 10863 (CMTA) Sec. 1429 Section (b, c, f) on inspection and disposal of hazardous wastes 3. BOC-EPCD "No Loading, No Permit Policy				
5.2	Ensure effective and efficient ship waste management, transport, treatment, recovery and disposal at national and municipal ports.	Ships and ports have access to waste management services and facilities; Inter-agency monitoring and	2021 onwards	**PCG; MARINA; PPA; NCWC; DENR; DILG;** DOTR-OTS; DA-BFAR; PNP-MG; BOC; DILG; LGUs; HEIs (e.g.,	Port Waste reception facilities (e.g., MRF, mobile facilities)

		data sharing systems agreed upon; Digital waste tracking system established; Port waste reception facilities established in accordance with standards; Ships and ports capacitated with waste management procedures		maritime colleges); Other special ports; Development cooperation agencies	Feasibility Study on suitability of waste facilities
	5.2.1 Capacitate shipping lines to implement waste management program through proper segregation per waste type or classification, e.g., domestic waste, hazardous wastes and health care wastes. 5.2.2 Strengthen the monitoring and reporting of waste disposal and sewage discharges of ships and other marine vessels at sea and coastal areas 5.2.3 Coordinate across BOC- PCG- PPA-DENR/EMB-LGU and create a program to consolidate existing efforts on the management of waste resources from marine vessels 5.2.4 Capacitate the aforementioned task force/group with: a) total waste generation; b) waste classification; c) waste handling; d) transport/treatment of hazardous waste; e) monitoring and reporting 5.2.5 Build communication and coordination flow in the tracking of ship waste management up to ultimate recycling, treatment and disposal. 5.2.6 Implement ship-port digitized waste tracking system 5.2.7 Build/establish waste reception/containment/MRF facilities at ports 5.2.8 Ensure that port reception facilities have access to proper treatment/disposal sites through an issuance of a legal instrument regarding contracting with waste providers.				
5.3	Implement prevention, recovery and management of abandoned, lost and otherwise discarded fishing gear (ALDFG), seaweed-growing media, and aquaculture floaters.	Reductions in observed ALDFG/aquaculture gears disposed/abandoned; Fished-out litter increased	2021 onwards	**DA-BFAR; DILG; NCWC;** DENR, LGUs, PNP-MG, FARMCs (aquaculture/fishfarmers' associations), CBIN; SEAFDEC; Local fishermen, fishing ports and fishery associations.	Trainings; Consultations; IEC materials; Business models and logistics; ALDFG recovery and recycling infrastructure; Rewards/incentives for fisher folk

	5.3.1 Incentivize ALDFG management and fishing-for-litter schemes, including collection and retrieval 5.3.2 Capacity building (training) of fisher folk or community members in the coastal communities for recycling initiative 5.3.3 Link/develop the market for recovered nylon ALDFG, e.g., carpets for export 5.3.4 Establish waste reception facilities for ALDFG 5.3.5 Carry out R&D and scaled-up manufacturing of alternatives to plastic fish nets 5.3.6 Subject to the availability of cost-effective alternatives, plan/implement measures on reporting and recovery of ALDFG, seaweed-growing paraphernalia/implements (e.g., soft-tie/plastic straw, Styrofoam, tie-ties) and aquaculture floaters				
6	***Manage litter that is already existing in the riverine and marine environments***				
6.1	Develop sustainable clean-up program and schemes, prioritizing hotspots for existing marine litter	Riverine and coastal cleanup regularly conducted, monitored, evaluated and reported (In tandem with social marketing and wide-scale awareness campaigns as elaborated in Section 9)	2021 onwards	**DENR; Other Mandamus Agencies**; **LGUs;** RBCOs; DILG; DOT; DPWH; MMDA; HLURB; LLDA; DOT-PCSSD; DepEd; SUCs/HEIs through NSTP/ROTC; others	Dredging, hauling and tipping fees; Meals for volunteers; Studies; Field sampling equipment and data analysis including GIS-based and field validation)
	6.1.1 Conduct regular clean-up and coordinate proper disposal systems 6.1.2 Conduct regular monitoring, evaluation, and reporting of cleanup initiatives in marine litter hotspots and intervention mechanisms 6.1.3 Incorporate waste characterization survey and plastic waste audit in clean-up activities, with a disclaimer on wastes that cannot be recovered e.g., far from the shore, sunk waste materials. 6.1.4 Support for underwater coastal clean-up drives, e.g., SCUBA gears for LGUs 6.1.5 Develop incentive system for barangays with successful and sustainable clean up initiatives				
6.2	Employ technology-based solutions to collect and capture marine litter as support measures in the implementation of local SWM programs	Existing and innovative solutions and engineering intervention measures (e.g., trash traps, booms and boats) adopted	2020 onwards	**DENR; DOST;** PPA; Manila Bay Agencies; HEIs/SUCs and engineering schools	Technology purchase or rental; O&M fund allocation
	6.2.1 Use existing intervention measures (e.g. series of trash traps, trash booms and trash boats) to capture marine litter in all river/drainage systems near the coastal areas 6.2.2 Explore innovative solutions and engineering interventions to capture and collect marine litter 6.2.3 Consolidate potential funding support to research and development activities geared towards developing technology-based solutions				

6. ACTION PLAN: ENABLING AND CROSSCUTTING CLUSTER

Actions that cut across or support different programmatic activities have been grouped together. The enabling or crosscutting cluster of strategies and actions are elaborated in Table 7.

Strategy 7: POLICY AND ENFORCEMENT

Enhance policy support and enforcement for marine litter prevention and management. A number of national laws and plans already contribute, directly or indirectly, to the prevention, reduction and management of marine litter specifically those that are related to SCP, waste management, marine pollution control, fisheries, protected area management, biodiversity conservation, coastal resource management, trade and innovation. In this case, implementers and policy makers just have to look at the marine litter lens of the existing laws of the land and refine as needed. The same marine litter lens may likewise be applied to local development and sectoral plans, ordinances, and local budgeting. There are also cases when certain NPOA-ML actions would require congressional action to provide the legal backbone for implementation. It should also be highlighted that policies are only as effective as the level of monitoring and enforcement and this should be carried on ideally through already existing law enforcement agencies and bodies.

Strategy 8: SOCIAL MARKETING AND COMMUNICATION

Develop and implement strategic and targeted social marketing and communications campaigns using various media. Raising awareness and getting all stakeholders to take action do not just depend on simple dissemination of information materials. The formulation and packaging of key messages require a deeper understanding of the behavioral change needs of different influencers and target groups. There should be an overarching national social marketing and strategic communication plan to effectively convey the message to stakeholders. From this, massive campaigns and outreach programs could be strategically conducted to help people and organizations connect their daily actions and decisions to the marine litter issue. To reach a wider audience, information officers from national agencies, LGUs, civil society, private sector and communities will be trained. The concept of shared responsibility and measures to reduce marine litter can also be mainstreamed in the school curriculum by building on the provisions of RA 9512.

Strategy 9: SUSTAINABLE FINANCING AND RESOURCE ALLOCATION

Enable sufficient and cost-effective financing and other institutional resource requirements for the implementation of the NPOA-ML. Resources made available and accessible to implementers will ensure that actions in the NPOA-ML are turned into reality. The plan includes provision of sufficient human resources, technical capability, financing and other resources through regular national and local budget programming and supplemented by cost-

recovery mechanisms and other resources from partnerships and cooperation projects. Aside from government funding, marine litter-relevant programs can also be initiated by the SMSMEs and multinational corporations, academe and civil society thus it is necessary to identify and address barriers to private sector investments or PPPs.

Strategy 10: STRENGTHENING LOCAL ACTIONS

Strengthen LGU capacities and local level implementation of NPOA-ML. LGUs are at the frontlines of the delivery of basic public services, have local autonomy, can marshal local stakeholder cooperation, and develop plans and policies that are consistent with local circumstances and capabilities. For years, LGUs have crafted plans and ordinances to address the various environmental, livelihood and business concerns of the community, which make it easier to implement these with the marine lens. To support LGUs, NPOA-ML actions include the development of a roadmap or framework to localize the actions. The awareness and technical competencies of local authorities to address marine litter will be strengthened through capacity building and best practice sharing. Existing local structures such as the SWM boards and protected area management boards can be used as channels for marine litter-relevant programs. The longstanding issue of the continuity and sustainability of local environmental initiatives amidst political transitions can be addressed by strengthening local structures, budgets, policies and expressed expectations from communities. Third-party monitoring, recognition and incentives systems, and penalty mechanisms also reinforce sustained political will.

Table 7. NPOA-ML Enabling and Crosscutting Cluster of Strategies and Actions

ACTIONS		EXPECTED OUTCOMES	TIMELINE	LEAD AND COOPERATING AGENCIES / SOURCES OF FUNDING	RESOURCE REQUIREMENTS
7	***Enhance policy support and enforcement for marine litter prevention and management***				
7.1	Mainstream marine litter lens in national policies and programs	Marine litter management mainstreamed into national policies and programs, including SCP, waste management, protected area, marine pollution, fisheries, biodiversity and coastal resource management	2021 onwards	**NEDA; DENR; DILG; DA-BFAR; NSWMC; DTI; Congress; NCWC (Center and Council); DOTr; DOST;** NRCP and other relevant research councils; PPA and Special Ports; PCG; MARINA; DA-BFAR; NAMRIA; PNP-Maritime Group; BOC; PPA; LGUs; Other relevant mandated government agencies; Development cooperation agencies	Technical expertise and manpower; Pre-requisite technical and policy studies and baseline researches
	7.1.1 Map out and review existing policies, including enabling and conflicting policies, agency mandates and policy gaps to serve as basis for necessary actions, including particular emphasis on sectoral, material-specific, and emerging policy needs 7.1.2 Develop and strictly enforce and implement incentives and penalty mechanisms for all stakeholders (national and local government, private sector, communities, etc.) 7.1.3 Develop measurable indicators pursuant to the mandatory Seal of Good Local Governance (SGLG), Malinis at Masaganang Karagatan (MMK), marine litter as a parameter in ambient water quality monitoring, and others 7.1.4 Review, and amend as necessary, prohibited acts to increase penalties for non-compliance 7.1.5 Formulate policy on mandatory allocation for Marine Litter Fund, defining its purpose, sources and allowed use				
7.2	Mainstream marine litter lens in local development, sectoral and investment plans, policies, and budgeting	Marine litter mirrored in local environmental ordinances, programs and budgets	2021 onwards	**DILG; LGU Associations; DENR; Congress;** LGUs; DA-BFAR; NSWMC; Other relevant mandated	Technical expertise and manpower; Pre-requisite technical and policy studies and researches;

ACTIONS		EXPECTED OUTCOMES	TIMELINE	LEAD AND COOPERATING AGENCIES / SOURCES OF FUNDING	RESOURCE REQUIREMENTS
				government agencies; Development cooperation agencies	Funding support for LGUs
	7.2.1 Mandatory creation of local environment and natural resources office (amendment of RA 7160) 7.2.2 Review successes and failures in ordinance passage and implementation, e.g., regulation of products and packaging, as basis for amendment and replication by other LGUs, and made accessible to the public 7.2.3 Develop LGU capacities in mainstreaming ad harmonizing marine litter-relevant ordinances, including enforcement by cities/municipalities and barangays				
7.3	Enhance the monitoring and enforcement of marine litter-relevant laws, specifically through existing law enforcement bodies	Enforcement mechanisms viewed with a marine litter lens and strengthened	2021 onwards	**DENR;** DOTr-led task force; DILG; PCG; PNP-Maritime Group; DOJ; LGUs and its Bantay Dagat and SWM Units; PAMB/PASus	Support to embedding the marine litter lens in policies, programs and in mandates of existing national and local law enforcement bodies
	7.3.1 Create/Embed marine litter in specialized law enforcement offices 7.3.2 Deputize enforcers at the national and local levels and provide the necessary equipment/tools to enforcers 7.3.3 Strengthen existing enforcement mechanisms on community reporting and the use of available technology. 7.3.4 Regular compliance monitoring (LGPMS and SGLG by DILG; RA 9003 by DENR-EMB; ICM by DENR-BMB) as well as contributions to PDP and SDGs 7.3.5 Coordinate with National Prosecution Service and environmental ombudsman/courts for better case build up, evidence gathering, resulting in improved prosecution of cases.				
7.4	Participate in other venues of influence towards a global and regional governance and information sharing framework for across-the-board actions by nation-states, business, scientific community, and the general public	Archipelagic and developing country perspective shared in inter-governmental processes towards international cooperation	2021 onwards	**Country representatives**	Forum participation; Position papers; Best practices sharing
8	***Develop and implement strategic and targeted social marketing and communications campaigns using various media***				

ACTIONS		EXPECTED OUTCOMES	TIMELINE	LEAD AND COOPERATING AGENCIES / SOURCES OF FUNDING	RESOURCE REQUIREMENTS
8.1	Formulate an effective national social marketing and strategic communication plan for marine litter prevention and management, including relevant environmental laws.	National social marketing and strategic communication plan for marine litter prevention and management, including relevant environmental laws formulated and implemented	2021 onwards	**DENR;** PCOO/PIA; DA-BFAR; DILG; DepEd; CHED; TESDA; PAMB/PASus; DOT, DOH; NSWMC; Other relevant NGAs; Private sector; LGUs; Development cooperation agencies	Technical expertise and manpower; Support to plan formulation
	8.1.1 Conduct capacity mapping of institutions and knowledge and perception gap assessment for the general public in terms of the critical behaviors such as, but not limited to, littering, excessive use of single-use materials, and segregation-at-source and recycling 8.1.2 Establish baseline capacities, knowledge, and perceptions vis-à-vis behavioral and infrastructural barriers				
8.2	Implement massive campaigns and outreach programs that target specific stakeholders to take interest in connecting their day-to-day actions with marine litter impacts and do their share.	Massive social marketing campaigns implemented with links to infrastructures or systems	2021 onwards	**LGUs; DENR; DepEd; CHED; TESDA; DSWD;** Other relevant NGAs; LGU Leagues; PAMB/PASus; Youth organizations; Tour operators; Commercial establishments; Development cooperation agencies; Media partners	Technical expertise and manpower; Support to developing social marketing materials and dissemination

ACTIONS		EXPECTED OUTCOMES	TIMELINE	LEAD AND COOPERATING AGENCIES / SOURCES OF FUNDING	RESOURCE REQUIREMENTS
	8.2.1 In coordination with LGUs, establish link between individual actions with marine litter problems, taking into account the strategies and best practices of LGUs, NGOs and CSOs 8.2.2 Utilize mass media to disseminate information and how to implement actions, including enhancement of media understanding and public discourse on marine litter 8.3.3 Implement multi-level social marketing campaigns using creative IEC materials, human-interest stories, and social media, preferably in local Philippine languages 8.2.4 In coordination with LGUs, empower communities on the ground by doing IEC at the barangay level, e.g., SCP, proper segregation and disposal 8.2.5 Conduct specialized learning by doing campaigns on waste identification, segregation and management especially in marine litter "critical areas" or "hotspots", e.g. marine protected areas and critical habitats, tourism areas, rehabilitation focus of DENR, etc. 8.2.6 Align communication plan with local-level infrastructures and systems 8.2.7 Develop and implement campaigns to complement the shift to circular economy and SCP				
8.3	Capacitate national agencies and LGUs on relevant laws and measures for the prevention and management of marine litter, including strategic training rollout	NGAs, LGUs and other implementers/message conduits are capacitated	2022 onwards	**DENR; PCOO/PIA; DILG;** Other relevant NGAs; PAMB/PASus; Development cooperation agencies; Media partners	Technical expertise and manpower; Support to developing training materials; Conduct of training-workshops
8.4	Incorporate marine litter issues, SCP, waste management, environmental concerns and shared responsibility in the school curriculum by building on the provisions of RA 9512 of 2008 and RA 9003.	Marine litter lens is reflected in the National Environmental Education Action Plan and academic and vocational curricula	2022 onwards	**DepEd; CHED, TESDA; DENR; SUCs/HEIs;** Other relevant NGAs; LGUs; Development cooperation agencies; Media partners	Technical expertise and manpower; Support to developing training materials and curriculum modules
	8.4.1 Bring back practical arts/application, e.g., composting, recycling, etc. 8.4.2 Integration of values in school curriculum especially that of reducing marine litter and protecting the environment 8.4.3 Institutionalize the delivery of Sustainable Greening Program across K to 12 curriculum in accordance to RA 10533, RA 9003, RA 9512, SDGs and RA10771				

ACTIONS		EXPECTED OUTCOMES	TIMELINE	LEAD AND COOPERATING AGENCIES / SOURCES OF FUNDING	RESOURCE REQUIREMENTS
9	***Enable sufficient and cost-effective financing and other institutional resource requirements for the implementation of the NPOA-ML***				
9.1	Identify and address barriers to private sector investments or public-private partnerships (PPPs) aimed at reducing marine litter	Baseline and policy analysis and recommendations to address the barriers to private sector investment	2022	**DOF; NEDA; DTI; DENR; NSWMC; PPP Center;** Other NGAs, private sector, LGUs, Financial institutions, Development cooperation agencies	Pre-requisite technical and policy studies and baseline researches
	9.1.1 Provide and promote incentive packages, e.g. tax incentives, to encourage private investment and co-training 9.1.2 Explore and establish a PPP mechanism/modality for "green" infrastructure 9.1.3 Streamline processes and ensure ease at doing business for public and private investment (ARTA) 9.1.4 Support startup, micro- and small enterprises that develop and produce long-term sustainable products and services				
9.2	Provide sufficient national government budget for NPOA-ML implementation*	National budget, through annual budget appropriations, proposed and approved	2022	**DBM; NEDA; Congress;**NGAs, private sector, LGUs, Financial institutions, Development cooperation agencies	National funding support, e.g., GAA viz. DBM's National Budget Memorandum No. 138-National Budget Call for FY 2022, and other fund sources
	9.2.1 Ensure sufficient human resource, capability, financing and other resources needed to implement policies 9.2.2 Explore supplementary sources of funding through, among others, partnership-building and cooperation projects				
9.3	Ensure LGUs have adequate resources (i.e., infrastructure, personnel, technical competencies and other resources)*	Local budget is supplemented by national; Resources made available and accessible by LGUs	2022	**DBM; DILG;** NGAs, private sector, LGUs, Financial institutions, Development cooperation agencies	National funding support; Innovative financing and cost-recovery mechanisms

ACTIONS		EXPECTED OUTCOMES	TIMELINE	LEAD AND COOPERATING AGENCIES / SOURCES OF FUNDING	RESOURCE REQUIREMENTS
	9.3.1 Engage LGUs to allot or prioritize funds for marine litter prevention and management 9.3.2 Engage NGAs and private sector to leverage resources (e.g., recycling facility, recyclables collection) with LGUs 9.3.3 Capacitate LGUs on sustainable financing and cost-recovery and further improve local revenue generation and resource mobilization of LGUs 9.3.4 Capacitate the LGUs to access relevant and available national and international funding/grant facilities and incentives 9.3.5 Promote existing systems, policies and best practices to make generators pay (polluters pay principle), especially at manufacturing, commercial, barangay and household levels, taking into account shared responsibility				
10	***Strengthen LGU capacities and local level implementation of NPOA-ML***				
10.1	Develop a roadmap for the local-level implementation of the NPOA-ML.*	In support to Action 8.2: Roadmap for NPOA-ML localization, in consideration of gender and development, climate change, livelihood lens and care for the informal sector and vulnerable groups	2020-2021	**DILG; DENR; LGU Leagues;** NGAs; Private sector; LGUs; Development cooperation agencies	Technical expertise; Pre-requisite technical and policy studies and baseline researches
10.2	Conduct capacity building and support best practice sharing/learning to enhance technical competencies of LGUs and cluster of LGUs, including barangays and local boards on SCP, proper waste management/diversion, and marine litter management)*	Capacity of LGUs on marine litter prevention and management enhanced	2021 onwards	**DILG; DENR; LGU Leagues;** LGUs; PCG; PNP-Maritime Group; other NGAs; NGOs; private sector; Development cooperation agencies	Trainers; Technical expertise and training materials; Social marketing experts; Operationalfunding support; Funding requirement provided by NGAs for the capacity building of the LGUs
	10.2.1 Provide advisory support to existing relevant local boards/committees working on marine litter prevention, reduction and management 10.2.2 Capacitate LGUs and local stakeholders, including park superintendents and business sector, on the basics of marine litter, relevant policies, and good local practices				

	ACTIONS	EXPECTED OUTCOMES	TIMELINE	LEAD AND COOPERATING AGENCIES / SOURCES OF FUNDING	RESOURCE REQUIREMENTS
	10.2.3 Capacitate LGUs on effective social marketing 10.2.4 Capacity building of LGU personnel on each specific skill (e.g., recycling system, collection, waste identification with knowledge from IWS, etc.)				
10.3	Ensure continuity of good local marine litter-relevant programs amidst local political transition/turnovers, including appropriate incentive and penalty mechanisms (carrot-and-stick approach) with LGUs	Long-term sustainability criteria and reinforcement mechanisms institutionalized with organizational structure and annual budget; Political will enhanced; Rewards and penalty systems for LGUs formulated and implemented	2021 onwards	**DILG; DENR; NSWMC** DHSUD; other NGAs; private sector; LGUs; Development cooperation agencies	Technical expertise and training materials; Operational funding support; Safeguards; Pre-requisite technical and policy studies and baselineresearches; Funding requirement provided by NGAs for the capacity building of the LGUs
	10.3.1 General support to LGUs on waste prevention-related capacity building, assistance in policy formulation, planning, assistance in developing incentive programs and enforcement mechanisms, monitoring and evaluation. 10.3.2 Based on ecological profiling, other baseline information, existing programs of the LGUs and local stakeholders, among others, revisit and reflect the marine litter lens across local 10-year SWM Plans, Integrated Coastal Management Plans (ICMPs), localized fisheries laws, land use and development plans, and other local plans 10.3.3 Strengthen the role of local ENROs, SWM Boards, "Bantay-Dagat", Coastal Barangay Intelligence Network (CBIN), inter-LGU alliances, and other local multi-stakeholder bodies. 10.3.4 Develop and promote best practice guidance document for LGUs to ensure meaningful multi-stakeholder consultation process when formulating ordinances specific to marine litter 10.3.5 Support LGUs and local stakeholders in conceptualizing and implementing pilot projects that reduce marine litter 10.3.6 Integrate the achievement of related NPOA-ML action/outcome on parameters/indicators used by the DILG in assessing LGU performance; Incentives for LGUs (e.g. Plastic Free City), or awards/recognition program for cities and barangays with best programs and performance (based on assessments, community participation, etc.)				

* Note: Taking into consideration the National Devolution Transition Plan viz. the Mandanas ruling.

7. IMPLEMENTATION FRAMEWORK

For NPOA-ML to be implemented in a cohesive manner, clear institutional arrangements, monitoring and reporting systems have to be in place.

Lead agencies shall coordinate with the cooperating agencies within their respective clusters and mobilize work to review and refine the work plans for each strategy; ensure that specific targets are set; and that activities and work programs are agreed upon, implemented and monitored. Appropriate legal instruments, e.g. administrative orders, memorandum circulars or joint issuances may be issued to support the implementation of the strategies.

For strategies and actions that entail local level implementation, all national and local stakeholders should take into consideration the National Devolution Transition Plan in light of the Supreme Court ruling in the case of Mandanas v. Ochoa, G.R. No. 199802 Case. Lead and cooperating agencies per strategy shall ensure the alignment of any action in the NPOA-ML with the devolution of functions and resources to LGUs.

7.1 INSTITUTIONAL ARRANGEMENTS

Marine litter is a complex issue that requires actions at many levels and places. Cooperation is needed to address this; hence, all stakeholders and sectors are enjoined to implement, influence, support, and monitor the implementation and eventual achievement of the goal of NPOA-ML. Lead and cooperating agencies and organizations have already been proposed for each main action in Tables 6 and 7 in line with their mandates, missions and structures. They can address the marine litter issue through existing inter-agency bodies to efficiently anchor initiatives within such commissions, committees, councils or convergence forums. Lead agencies may also organize themselves and invite other stakeholders as necessary to carry out the specific actions in the plan.

On top of these, an overarching higher-level multi-stakeholder body should be created, which will be composed of strategic cluster leads, to provide oversight and steer implementation on a regular basis, as shown in Figure 16.

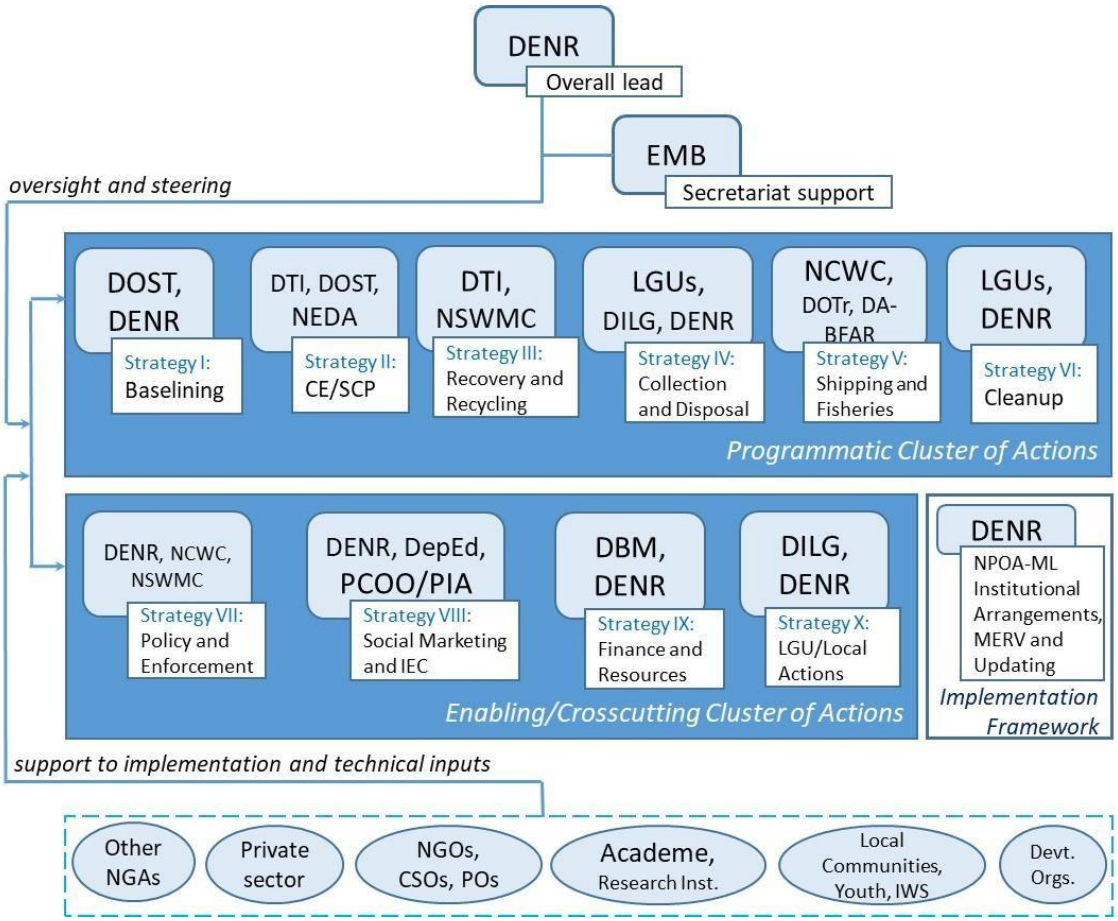


Figure 16. National Marine Litter Prevention, Reduction and Management Council or Convergence Forum

7.2 PILOT DEMONSTRATION AND BENCHMARKING

Actual implementation will be facilitated and expedited with the identification of projects and programs, fund matching and piloting of initiatives at both the national and local levels, learning from lessons and innovations, and the subsequent upscaling and replication of good practices.

As the field of marine litter is rapidly evolving, the Philippines should likewise participate in other venues of influence and cooperation towards a global or regional governance and information sharing framework for across-the-board actions by nation-states, business, scientific community, and the general public. Benchmarking of actions should also take into account the archipelagic and developing country perspective shared in inter-governmental processes towards international cooperation.

7.3 MONITORING, EVALUATION, REPORTING, AND VERIFICATION (MERV) SYSTEM FOR NPOA-ML

A MERV system shall be developed by the lead and cooperating agencies, including an elaboration on a results matrix with specific short-, medium and long-term targets; key performance indicators; means of verification, and performance-based evaluation and reporting of actual results. Ideally information technology-based and linked to data ecosystem platform,

the MERV system should be integrated and systematic to readily generate synthesized results at any given time for reference of implementers and decision-makers. Lead and cooperating agencies as well as relevant stakeholders should be involved in the MERV process to promote inclusivity and provide accurate information that will feed into the review and updating process of NPOA-ML.

Reporting and feedback mechanisms include the documentation of successes, failures and lessons learned from reports that are submitted periodically. The frequency of reporting shall be determined by the Marine Litter Prevention, Reduction and Management Council or Convergence Forum.

7.4 NPOA-ML UPDATING CYCLES

The NPOA-ML shall be reviewed and updated at least every five (5) years. The plan can likewise be revisited and amended or modified even earlier under the following conditions:

(a) A definitive country-level baseline information on marine litter leakage, accumulation and impacts have been established and formally adopted;
(b) New national laws have been passed by Philippine Congress, new international agreements are ratified by the country, or other legal instruments have been issued by national government agencies on actions relevant to the NPOA-ML; or
(c) Upon the decision of the overarching Marine Litter Prevention, Reduction and Management Council or Convergence Forum based on the release of the results of a participatory results-based monitoring and evaluation system or as the marine litter discourse continue to evolve.

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ANNEXES

Annex A.

List of Participants to Writeshops and Consultations

To be filled out.

Annex B.

Process for Developing the NPOA-ML

The process for developing the NPOA-ML was a multi-stakeholder participatory process lead by the DENR. The process commenced with a series of internal discussions within the DENR core group throughout June and July 2019. The team got together weekly to gather preliminary information and analyze marine litter issues, implications and policies.

The first meeting was carried out on August 6-7, 2019, in Quezon City for DENR bureaus and offices to level off on the different considerations in preparing the NPOA-ML. BMB, in close coordination with EMB, organized the workshop to lead to a common understanding on marine litter issues, consider the various international agreements and declarations where DENR is Philippine government representative to, compare baseline studies and possible outlines for the NPOA-ML, and seek top management guidance on the scope, baselines, targets, and process in developing the NPOA-ML. Personnel from EMB, BMB, Foreign-Assisted and Special Projects Service (FASPS), DENR Central Office, and DENR National Capital Region (NCR) participated in the workshop.

Photo: DENR Assistant Secretary (ASec) for Policy and Planning Services, Corazon C. Davis, and ASec for South Luzon Operations, Gilbert C. Gonzales, provide guidance to DENR staff, Aug 7, 2019

Baseline information continued to be gathered and core group meetings were held until the first multi-stakeholder workshop was carried out on October 28-29, 2019. Around 50 representatives from national government agencies (NGAs), private sector (manufacturing, recycling and waste management), nongovernmental organizations (NGOs), local government units (LGUs), and people's organizations from fishing communities participated in empathy mapping of marine litter-relevant issues and perspectives, defining of a systems map, identifying leverage points, and brainstorming on the long list of proposed actions.

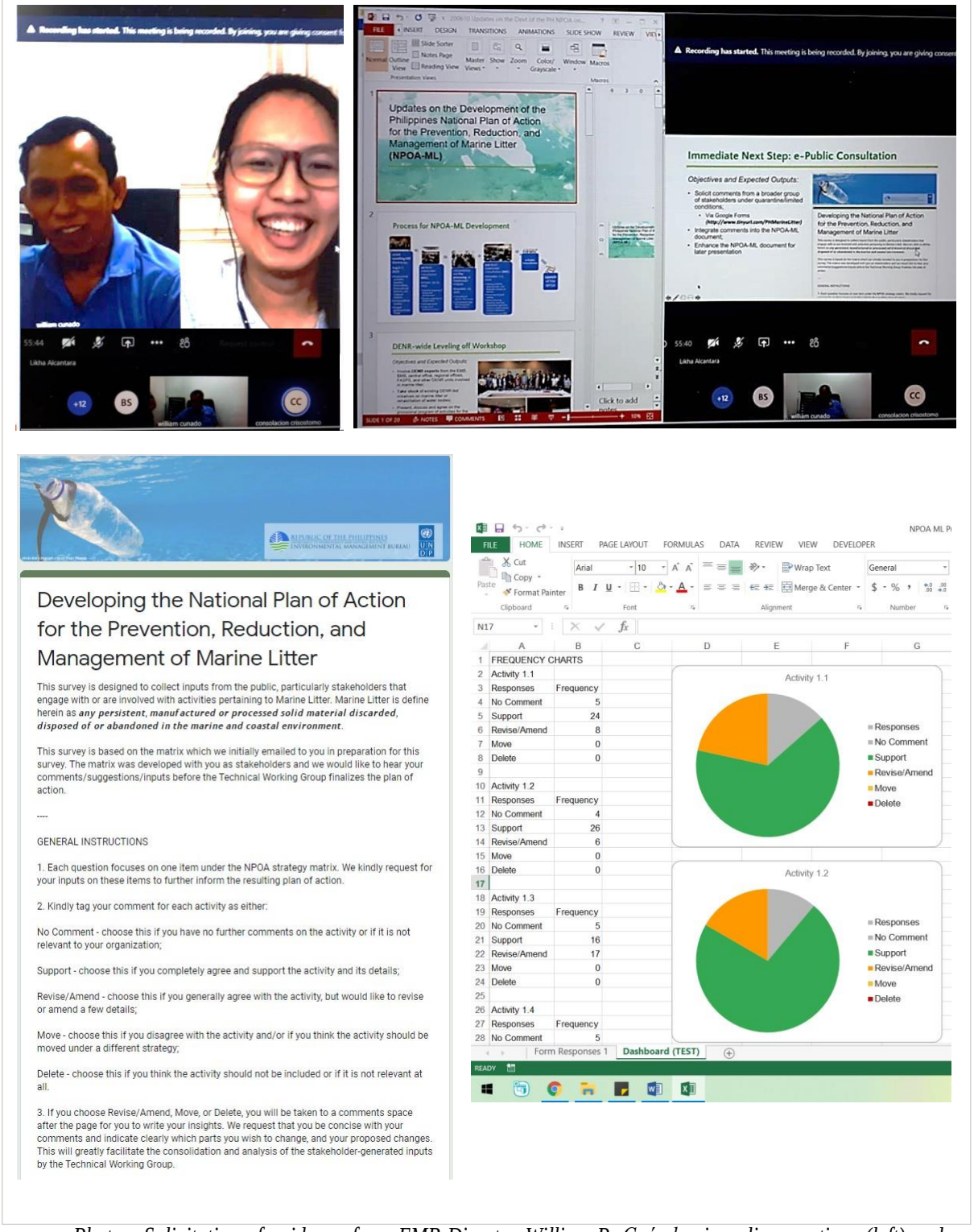
Photos: First multi-stakeholder workshop, October 28-29, 2019

DENR core group meetings were continued to synthesize and refine the proposed ideas prior to the conduct of the second multi-stakeholder workshop on December 2 to 4, 2019. The second multi-stakeholder workshop, which was provided a venue for stakeholders to vet on the NPOA-ML programmatic and enabling/cross-cutting clusters of actions, set the vision and goals, elaborate on the action plan (timeline, lead and cooperating agencies, resource requirements, success indicators), and identify institutional and monitoring and evaluation M&E arrangements for latter implementation.

Photos: Second multi-stakeholder workshop, December 2-4, 2019

Throughout the months of January to June 2020, the DENR CG continued to consolidate the results of the workshops and prepare for the public consultation despite the limitations brought about by COVID-19 quarantine measures.

A virtual public consultation was subsequently carried out to solicit comments from a broader group of stakeholders via online forms and presentation. On July 9, 2020, EMB sent out online survey forms to gather comments from concerned organizations. Consolidated comments as of July 25 were subsequently reviewed by the DENR Core Group from July 30 to August 13, 2020.



Photos: Solicitation of guidance from EMB Director William P. Cuñado via online meetings (left) and administration of the virtual public consultation and synthesis of consolidated comments (right) from July to August 2020