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Thematic Report: Study on Baseline of Plastic waste management for Marine Protection in Vietnam

"Reduce, Reuse, Recycle to Protect the Marine Environment and Coral Reefs in Southeast Asia" (3RproMar)

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THEMATIC REPORT

Study on Baseline of Plastic waste management for Marine Protection in Vietnam

"Reduce, Reuse, Recycle to Protect the Marine Environment and Coral Reefs in Southeast Asia" (3RproMar)

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Abbreviations

Acronym	Meaning
3Rs	Reduce, reuse, and recycle
EPR	Extended Producer Responsibility
IUCN	International Union for Conservation of Nature
LEP	Law on Environmental Protection
MONRE	Ministry of Natural Resources and Environment
MSW	Municipal Solid Waste
NAP	National Action Plan on Marine Plastic Debris Management until 2030
SDG	Sustainable Development Goals
UN	United Nations
UNEP	United Nations Environment Programme
VASI	Vietnam Administration of Seas and Islands

Chapter 1: Overview

As one of the pillars of sustainability, environment protection is a priority task for achieving sustainable development targets. Together with air, water, and land pollution, climate change, deforestation, and a number of hot environmental issues, plastic waste pollution also known as white pollution has caused great attention due to its severity and urgency. Due to its cheap, versatile and reliable characteristics, plastics is being used widely in almost all domestic and industrial activities; and plastics can be found on every corner of the world. In estimation, about 353Mt of plastic waste was released in 2019 with only 15% of them was collected, and 9% was recycled[1]; and through various sources and leakages, the accumulated plastic waste in the ocean was more than 30Mt[2] all over the world.

In the most recent annual report on National State of Environment 2019 on Solid Waste management, data show that the solid waste generation was almost doubled in Vietnam in 2019 compared to 2010[3]. Accordingly, plastic waste proportion is on the rise from 5.5% (2005) to 13.9% (2019), and annual plastic consumption per capita increases from 33kg (2014) to 41kg (2015). Plastics and nylon bags accounts for a large proportion in municipal solid waste (MSW), especially in urban areas, i.e: 3% in Hanoi, 12.2-14.2% in Hai Phong, and from 3.4-10.6% in other urban areas. In Vietnam, major plastic waste sources are domestic activities and consumption, land-based production activities, and marine activities (transportation, aquaculture, environmental incidents). Unfortunately, up to 50% of plastic products are designed for single-use only. A huge volume of plastic wastes is leaked to the ocean through river and lake systems; the discharge and loss of fishing tools and plastic discharge from other marine activities are not properly controlled which exacerbates the issue.

According to the International Union for Conservation of Nature (IUCN), Vietnam ranked fourth among the largest marine plastics polluter globally [4]. The country generates more than 3.7 million tons of plastic waste each year, the amount is forecasted to increase in the coming years, however, only 10-15% of the discharged plastics is currently collected for recycling [5]. As a result, 730,000 tonnes of plastic wastes are leaked into the ocean every year [6].

Though it takes a very long time for plastics to be decomposed, the break down of plastics in the ocean leads to the rise of microplastics and eventually nanoplastics, making it almost impossible to remove it from the ocean [7]. A great number of studies on the impacts of marine plastics have been carried out, and it is found that plastic harms marine life, is polluting the food chain, and is threatening the key marine ecosystems, like coral reefs or mangrove, just to name a few [7]. Marine plastic pollution has caused adverse impacts on the human health and environment; in estimation, almost 1.5 million of marine species are died of plastic pollution [8].

At such alarming situation, effort and progress on plastic waste in general and marine plastic waste in specific are strongly promoted by the nation. This report brings in a brief overview on the baseline of marine plastic management in Vietnam, and proposes some suggestions for improvement of the current effort on marine plastic management for a healthy and sustainable marine environment.

Chapter 2: Baseline study on plastic waste management

2.1.Study on the Stakeholders

Concerning plastic waste management, there needs a comprehensive assessment on all related stakeholders involving in the process from waste generation, classification, collection, to waste treatment so as to optimize their roles as well as to synchronize the whole process for highest efficiency.

In this report, related stakeholders contributing to plastic waste management consists of waste generators, plastic manufacturers/importers, the formal sector, the informal sector, private sector, and the governing body. These stakeholders are participating in different stages of plastic waste management in Vietnam. Baseline study on the stakeholders engaging in plastic waste management is presented in details in Table *1* as below

Table 1: The stakeholders of plastic waste management in Vietnam

Stakeholder	Descriptions & Situation	Role in plastic waste management chain	Possible contribution	Disadvantage	Challenge	Entry points
Waste generators • The ones who directly use and discharge plastic wastes. • Participating in plastic usage and collection	• Wastes are not compulsorily classified but can be discharged at the same collection points; (Photo) • Domestic wastes of all kinds are collecting using the same containers; (Photo) • In some shopping malls and public areas, bins for different types of wastes (i.e: organic waste, PET bottle, can & glass...) are provided (Photo). However, generators are still confused and/or do not follow the instructions	• Control the volume of waste discharged; • Dispose garbage at specified time and place; • Pay environmental service fee	• Implement 3Rs to reduce the volume of plastic waste; • Waste classification from source; including classifying recyclable wastes; • Oversee the conformity to waste management.	• Limited knowledge on waste classification; • Poor or no facility for waste classification;	• Habits and awareness; • Availability and convenience of plastic products, especially nylon bags and single use plastic products; • No strict supervision on the type and volume of waste discharged.	• Awareness enhancement and behavior change; • Instructions/ guidance and regulations on waste classification; • Reward-penalty mechanism; • Facilities
Plastic suppliers/ manufacturers/ importers • The ones who supply/ produce/ import plastic products/ scraps • Participating in plastic production and treatment	• There are 2,000 enterprises working in plastic industry, with 450 are packaging manufacturers[3]; • The plastic industry is one of the top growing industries in Vietnam with an annual growth rate of 16 - 18%/year[3]; • Prohibition of single use plastics will come to full force from 2025.	• Restrict production and prohibit promotion of single use plastic products; • Provide its users and related stakeholders with information on 3Rs, collection, and treatment of their products; • Comply with the EPR mechanisms and tax regulation for plastic producers/ importers.	• Research and implement circular technology/ practice; • Provide supports on collection/ classification/ treatment of their products.	• Increased product's cost and price; • Increased finance budget; • Require invest in circular technology/ model.	• Limited capacity and resource	• Government supports and instructions in term of policy, technology, and finance; • Platforms for plastic suppliers/ manufacturers/ importers • Technical instructions for customers regarding the plastic product waste's collection, classification, and treatment.
The informal sector (including the informal recycling industry) • Consisting of informal waste worker, collection center, consolidation center, and recycler & end-buyer (Photo) • Participating in plastic collection and treatment.	• The informal sector plays as the key actor in the waste recycling market in Vietnam[9]. In addition, the informal sector in plastic waste creates incomes for its workers, mostly women. • In Vietnam, The CFR rates for PET, PP, HDPE, and LDPE/LLDPE are estimated to be higher than rates in Malaysia, the Philippines, and Thai; the average collected-for-recycling rate of PET bottles is 27%,and up to 97.2% of them are contributed by the informal sector[10]. • Due to poor working conditions, the informal sector workers are facing a number of environmental and health problems[9].	• Collection and sorting of recyclable plastic waste; • Minimize the leakage of recyclable plastics into the environment through recovery of plastics in strained municipal waste management systems	• Partnership and collaboration with other stakeholders; • Promotion of the secondary markets for plastic materials.	• Substandard working conditions; • Lack of supporting policy; • Mostly implementing manual waste classification/ collection; • Not recognized by society as an important actor in the plastic waste management chain.	• Limited capacity and resource; • Technology and infrastructure; • Only collect plastic waste with high economic values (not including nylon bags, single use plastics...) • High volatility in the volume and pricing; • Improved working conditions, occupational recognition, respect, and dignity, fair business models for the informal workers[11].	• Capacity building; • Mechanism and policies; • Inclusion of the informal sector in the formalized waste management systems.

Stakeholder	Descriptions & Situation	Role in plastic waste management chain	Possible contribution	Disadvantage	Challenge	Entry points
The formal sector (Waste collectors/ workers) • The ones who are formal waste collectors/ workers, responsible for waste collection, transportation, and treatment (Photo) • Participating in plastic collection and treatment	• Recognized as the official force involved in the waste management train; • Act as the key actors for waste management in Vietnam; • Poor working conditions.	• Collection and treatment of wastes of all types; • Key player for recycle of the imported plastic scraps; • Key player in the waste management system.	• Promote waste classification	• Poor waste management facilities, especially at waste collection/ classification stage	• Technology and infrastructure; • Improved working conditions, occupational recognition, respect, and dignity	• Capacity building • Improvement of the waste collection and treatment system;
Private sector • Including the participation of NGOs, organizations, alliances, funds/ aids, associations...	• The private sector is increasingly active in addressing plastic waste.	• Develop the waste classification, collection, and recycling system; • Promote green, circular economy model; • Provide technical and financial support	• Socialization of investment in solid waste collection, transportation and operation of treatment facilities	• Lack of clear, consistent guidelines on the public - private partnership procedures and policies;	• Access to stable and sufficient feedstock; • Loan deployment procedure	• Public-private partnership enhancement; • Supporting policies; • Mechanism promoting socialization of solid waste collection, transportation and operation of treatment facilities; • Mechanism and platforms for private stakeholders
Governing body • The body that is responsible for waste management; • Participating in plastic management	• Pursuant to the Law on Environmental Protection (LEP) 2020, the Ministry of Natural Resources and Environment (MONRE) is the highest governing body responsible for solid waste (including plastic waste) management; and the People's Committee at provincial, district, and commune level is responsible for solid waste (including plastic waste) management in their respective localities.	• Overall responsibility for plastic waste management; • Formulation of related regulations and guidance on plastic waste management.	• Laws, bi-law, and other policy documents on plastic waste management; • Preferential and supportive mechanism for plastic waste management.		• Capacity; • Finance	• Capacity building

Figure 1: The informal waste sector in Vietnam [8]

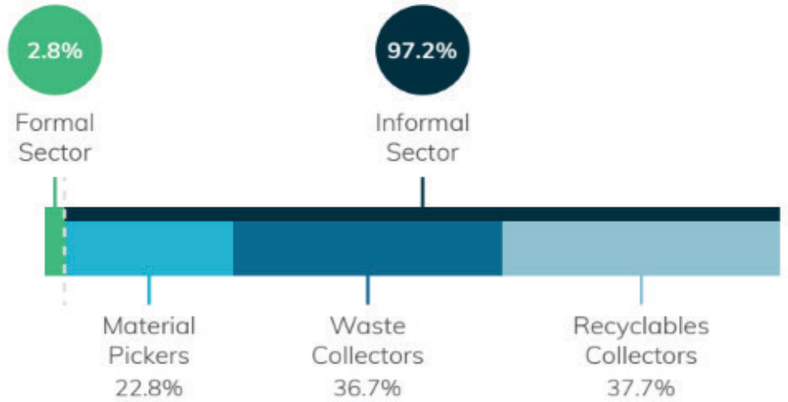

Figure 2: Breakdown of PET collected for recycling by the formal and informal sectors [6]

2.2. Plastic waste management system

In general, the lifespan of plastic wastes goes through the following 5 processes: plastic production, usage, waste collection, waste treatment, and secondary market (Figure *3)*. Understanding the operation and the possible contribution of each process is of great importance to identify the entry points for improvement of the plastic waste management system.

Figure 3: Plastic waste management process

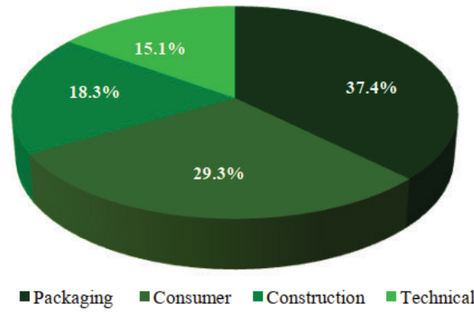

Figure 4: Vietnam plastic industry structure by sector in 2015

Details of the baseline study on the plastic management system through its processes are presented in the Table *2* below.

Table 2: The plastic waste management process in Vietnam

Process	Descriptions & Situation	Role in plastic waste management chain	Possible contribution	Disadvantage	Challenge	Entry points
Plastic production	• Plastic production grows quickly in Vietnam, with annual growth of 16-18%; led by packaging (37%), household appliances (29%), construction (18%) and technical products (15%)[12], [13] (Figure 4). • >50% of plastic are designed and produced for single use purpose[3]; • Vietnam benefits from the EU-Vietnam Free Trade Agreement (EVFTA). Its export turnover of plastic products increased up to 34.9% compared to 2020. However, the Vietnamese plastic producers still have limited experience and resources in sustainable development and environmental protection [11], [14]; • Vietnam has to import about 80% of raw materials for plastic production [13]; • The producers of non-biodegradable plastics have not clearly shown their roles and responsibilities in reducing generation and implementing reuse as well as promoting recycling of plastic products [3]; • Severe environmental pollutions occurs in plastic craft villages [8].	• Production of plastic products for both domestic and industrial purpose; • Control of plastic waste leakage during production and distribution process; • Promotion of sustainable production and consumption; • EPR implementer.	• Research and promotion of environmental-friendly plastic products; • Support and guidance on classification, collection, and treatment of plastic products; • Circular production; sustainable production models.	• Limited experience and resources in sustainable development and environmental protection [14], [10]; • Finance	• Reliance on the imported raw materials; • Production technology; • Import of impure plastic scraps.	• Control the import of plastic scraps; • Production technology transfer and support; • Policy and mechanism.
Plastic usage	• Plastic consumption in Vietnam is at high rate and tends to increase over the years with up to 41kg (2015) [12]; • Plastic wastes are generated from various sources: domestic use, commercial areas, offices, public places… • Plastic packaging (dominated by nylon bags) is dominant in the markets, followed by building & construction, housewares, and electrical & electronics [12], [15]. • Take-away food packaging waste, SUPs, Fishing gears are the most popular plastic waste found along the river and coastal site [16]. [17]; • PE and PP are the most common plastic types; • Plastic waste occupies 6-8% of total domestic solid waste in Vietnam.	• Plastic waste control; • Promotion of sustainable production and consumption.	• 3R implementation; • Ban of SUPs; • Recycle rate; • Promote sustainable consumption	• Public awareness and conformity; • Limited knowledge; • Lack of substitute products.	• Product price; • Habits and behaviors.	• Awareness raising and behavioral change; • Code of conducts; • Law reinforcement; • 3R promotion.

Process	Descriptions & Situation	Role in plastic waste management chain	Possible contribution	Disadvantage	Challenge	Entry points
Plastic waste collection	• There is still a lack of database on plastic waste collection and documents or guidelines relating to rural solid waste management; • Solid wastes are collected at (i) public collection points, (ii), specified collection points, and (3) at household level [3] (Photo) • The average collection rate of solid wastes is 92%, higher rate in urban and lower rate at rural area [3]. (A report by the World Bank reveals that the collection is only 85% in the urban and 40% in the rural area, the data might be lower in fact[18]). • Waste classification at source are promoted and plotted in some selected sites only (i.e: some residential area in Hanoi, HCMC, Hoi An (Quang Nam), Tan An (Long An)...); • Domestic wastes contain several types of plastic wastes, namely: nylon bag, food container, PET bottle, straw... In the most common way, wastes are collected/stored in a shared container/ bin/ bag disregards of its type before they are transferred to the collection systems (Photo)	• Control and prevent plastic waste leakage from source.	• Circular model of plastics.	• Waste leakage rate remains high (8% on average or higher); • Waste collection facilities; • Facilities and guidelines concerning waste classification at source; • Environmental hygiene.	• Habits and behaviors; • Financial budget for renovating the current system/ technology	• Awareness raising and behavioral change; • Technical support; • Socialization of investment in waste collection and transportation.
Plastic waste treatment	• The recycle rate of plastics in Vietnam remains low. In 2019, only 33% of the key plastic resins are recycled and the country losses 75 percent of the material value of plastics as 2.62 million tonnes of plastics are disposed per year [11]. • Plastic wastes are treated in incinerators or landfills [8]; • 71% of the collected solid waste are treated in incinerators [8]. • There are 1.322 waste treatment facilities in the countries, including 381 incinerators and 904 landfills, many of them do not meet hygiene standards [8]; • The uncollected plastic wastes are leaked into the river and lake systems then into the ocean. • Plastic wastes are also discharged directly into the sea in coastal region.	• Control and prevent plastic waste leakage into the environment in general and into the sea in specific; • Prevent loss of recyclable plastic wastes; • Additional resources for plastic production	• Increase recycle rate; • Limit use and production of new materials/ resources; • Additional resources for plastic production.	• Environmental issues; • Capacity; • Technology; • Finance.	• Capacity; • Technology; • Finance.	• Technical/ financial support/ assistance; • Capacity building; • Technology research and renovation for waste treatment.
Secondary market	• Vietnam's plastic industry needs on average 3.5 million tonnes of PE, PP, PS...raw materials whereas the domestic capacity can supply 900 thousands tonnes only [12]. • The sorting and collection of recyclable plastic waste for secondary markets is usually spontaneous at the household scale, and by waste workers/ pickers; • Vietnam is lack of a strong secondary market for recycled plastics. At present, the informal sector is the main actor performing waste recycling, accounting for more than 90% of the activities, mostly in craft villages [9]	• Maximize the life cycle of plastics; • Limit import of plastic scraps; • Promote sustainable production, circular model of plastics.	• Prevent plastic leakage to the environment; • Release the reliance on imported raw materials.	• High cost for secondary treatment [19]; • Low recycled plastic price; • Risks of secondary environmental pollution due to old-fashioned technology, machinery and equipment of the recycle facilities; • Human health risks.	• Technology • Finance • Supporting mechanism	• Design-for-recycling standards; • Priority mechanism for recyclable products; • Technology investment; • Improvement the current waste management system.

2.3.Network of plastic waste management

In general, plastic wastes are managed following the procedure for municipal solid waste (MSW) (Figure 5: Municipal solid waste management in Vietnam). This procedure forms a network of plastic waste management, consisting of collection facilities/points, transfer stations, recycle facilities, treatment facilities (incinerators, composting facilities, and landfills).

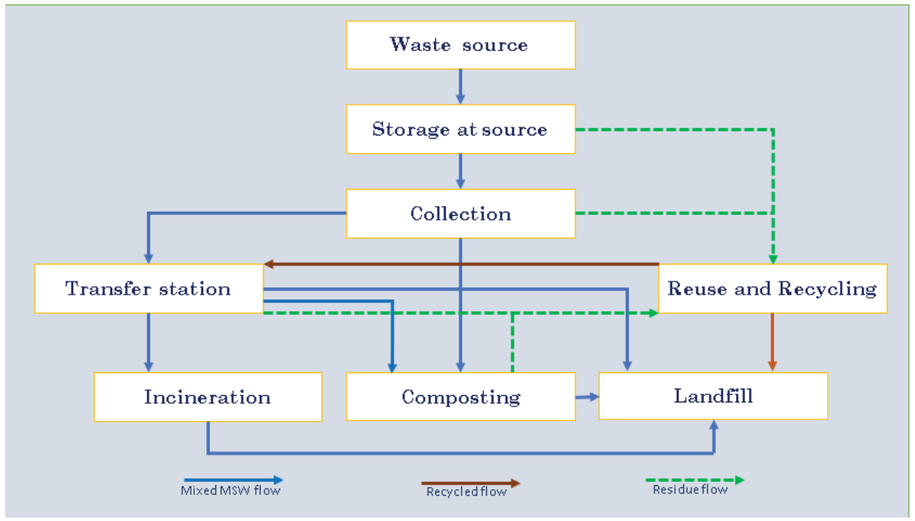

Figure 5: Municipal solid waste management in Vietnam

Details of baseline study on the network is present in Table 3 below.

Table 3: Plastic waste management network in Vietnam

Network component	Description and situation	Disadvantages	Possible entry point
Collection facilities /points	• Currently, there is no regulation on designated system for plastic waste collection in Vietnam; plastic wastes are collected and stored with other solid wastes; • Waste containers are allocated in public places; both public garbage bins (shared bin for all wastes) and recycle bins (separate bins for different types of waste) are provided; • Collection points are distributed subject to the circular 02/2022/TT-BTNMT (10 Jan 2022); • Trolley is the main vehicle used to collect waste from households to collection stations or transfer stations. • After being collected, designed trucks are used to transfer wastes from collection points to treatment facilities.	• Bad behaviors and low sense of responsibility; • Prolonged standing of wastes in some collection points due to large amount of waste in urban area; • Lack of collection points and gathering points leads to formation of spontaneous dump site or indiscriminate disposal; • Configuration and signage for waste classification are ineffective.	• Planning; • Providing adequate facilities for the collection network; • Reinforce use of configuration and signage for waste classification, including configuration and signage plastic wastes; • Awareness raising for conformity • Reinforce regulations/ policies on waste management engaging participation of the whole society.
Transfer station	• Transfer stations are located to transfer wastes from collection vehicles and small truck to larger trucks • The formation of transfer station is subject to Clause 1 Article 75 of LEP 2020; • Only a small number of transfer stations are operating meeting the national regulations (QCVN 01:2019/BXD).	• Environmental hygiene; • Infrastructure of the station; • Capacity of the stations, especially in urban areas.	• Planning; • Renovation of the transfer station facilities.

Network component	Description and situation	Disadvantages	Possible entry point
Recycle facilities	• Recycling and MSW management are implementing separately, and the recycling facilities/networks are mainly performed by the informal sector [11], [20]; • Recycling activities are being implemented mostly at small scale in craft villages; • Primary recycling is more popular than secondary recycling; and the leakage rate is higher in primary recycling (0.172/tonne) compare to secondary recycling (0.104/ tonne) [21].	• Environmental issues from recycle activities; • Lack of connection between collection network and recycle network leading to leakage of plastic waste from collection; • The majority of recycling actors are at small-scale with low-grade technology and substandard waste treatment processes [20].	• Recycle technology, technical assistance; • Platforms and partnerships; • Formalize the participation of the informal sector in the plastic waste management.
Treatment facilities	• Nationwide, there are 1.322 waste treatment facilities in the countries, including 37 composting plants, 381 incinerators, and 904 landfills with a large number of them (80%) are non-sanitary dumpsites [3]; • There has less than 5 formal plastics recyclers in Vietnam, larger than 90% of plastic recycle are being performed by the informal sector [20]. • Plastic wastes are being treated in the same way with other solid wastes.	• No specific network for treatment of plastic waste; • Limited number of treatment facilities; • Low technology; • Lack of connection among facilities in the network.	• Increase number of qualified treatment facilities in the network; • Enhance partnership among facilities in the network; • Financial and technical support; • Mechanism.

Overall, plastic waste management network remains limited in quantity and quality in Vietnam.

- Firstly, there is no designated network of facilities for plastic waste treatment, plastic wastes are being treated in the same way with other types of wastes.
- Secondly, the technology being applied in the network are low-grade, implying the risks of leakage and environmental pollution.
- Thirdly, as a major actor of the network, the involvement of the informal sector is not properly recognized and assessed.
- More importantly, there is still lack of the connection and a sharing platform among the network components.

For improvement of these issues, the government's intervention through its policies and mechanism is of great importance.

2.4.Current effort and best practice on plastic waste management

2.4.1. Policy and Institution

Recognizing the seriousness of marine plastic waste issue, the Vietnamese government has made improvements and adjustments in its national strategy, orientation, and policy. These improvements and justifications are increasingly presented through legal/policy documents related to plastic waste management.

Vietnam has made strong political commitments and has carried out practical activities to manage and reduce plastic waste, including ocean plastic waste. Basically, the policy instruments for plastic and plastic waste can be divided into 3 categories: regulatory, market-based, and non-regulatory tools (Figure *6*).

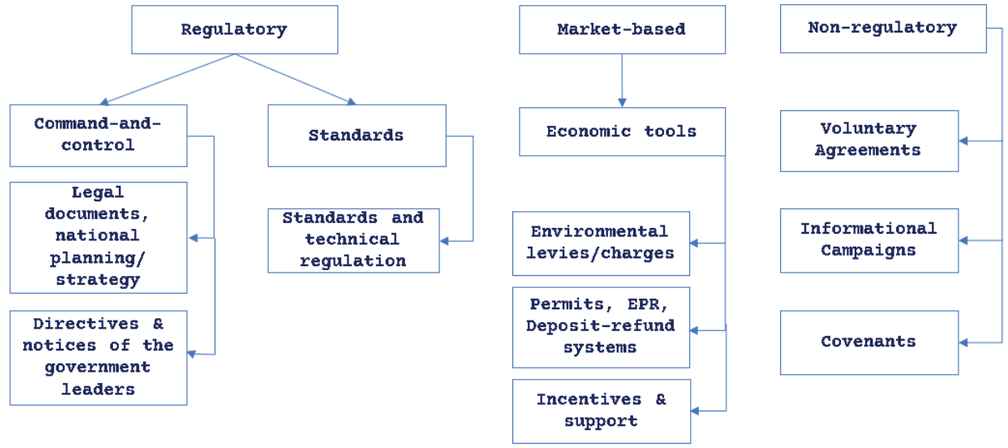

Figure 6: Policy instrument framework for plastics and plastics waste management in Vietnam

Overall, Vietnam government has issued various law and policy documents demonstrating the country's commitment and determination to combat marine plastic waste. These documents lead by the LEP 2020 and the NAP provide legal framework and basis for plastic waste management with very clear objectives and roadmap. That is by 2030, plastic debris discharged into the sea and ocean will be reduced by 75%; 100% lost or discarded fishing tackle will be collected and the discharge of fishing tackle directly into the sea will be terminated; 100% tourist attractions and sites, and establishments providing tourist accommodation services and other coastal tourism services will refrain from using disposable plastic products or non-biodegradable plastic bags; and 100% marine reserves will be free from plastic debris.

Apart from the regulatory instrument, non-regulatory instruments also play an important role in combating marine plastic litter in Vietnam, the country promotes voluntary agreement, informational campaigns, and covenants for collective strength in taking action.

- Re. *political commitments*: Vietnam has shown the strong and consistent commitments on plastic waste management through declarations, speeches, resolutions, and directions of the government at different levels, from regional, national, to local level.

- Re. *overall orientation and strategy*: Vietnam sets clear targets and roadmap for plastic waste reduction, the orientation and strategy focus mostly on public awareness enhancement, reduction and restriction of plastic bags and SUPs, restriction of scrap imports, promotion of circular economy model, implementation of EPR, sustainable production and consumption. In addition, Vietnam actively participates in regional and global cooperation and fora, the nation also promotes and creates favorable conditions for cooperation with the private sector, NGOs, and international agencies to tackle plastic waste pollution.

- Re. *legal/policy document system*: in general, the attempt to manage marine plastic waste has been reflected in various legal/policy documents, these efforts have been contributing significantly to the current progress. Among these, the progress on public awareness raising has been achieving initial results with great contribution from non-government organizations through projects and campaigns on the marine plastic pollution. In general, people are aware of the abundance of plasticwares in life and its impacts on the environment; and a large number of the population are changing their attitude, behaviours, and lifestyle toward plasticwares. Unfortunately, the system remains a number of limitations and rooms for improvement.

2.4.2. Waste classification at source

Waste classification in general and plastic waste classification from source has been endorsed as an effective way for plastic waste management. Through waste classification, we reduce the amount of plastic waste that reaches landfills and prevent plastic waste leakage to the environment, waste classification also helps to reduce time for waste collectors to classify wastes by its types.

Figure 7: Model of waste separation at source in wards in Tân An City

The model of waste separation at source was successfully implemented in in Tân An City, Long An province from August 2020 under the sponsorship of WWF. According to the model, in each family, wastes are classified into 3 types: organic waste, recyclable waste, and other (non-hazardous) wastes. Accordingly, organic waste is collected on Monday – Wednesday, Friday - Saturday for compost; recyclable waste (for selling to scrap collectors) and other wastes (to be processed by the garbage truck at the collection point for further processing) are collected on Thursday and Sunday. As a result of the project, the local people form the habit of waste classification, supporting waste management process; accordingly, in ward 3, about 4000.000 tonnes of waste are collected every month, including 90 tonnes of organic waste. More

than 95% of households participate actively in classification, and 86% of households well perform waste classification. The model is now being multiplied in other wards of Tan An city.

2.4.3. Ending plastic bags and single use plastics

Due to its availability and convenience, plastic bags and single-use plastic products are being overused, posing serious danger to human health and environment. Recent communication programs target at raising people's awareness on the negative impacts of plastics and behavioral change toward no nylon bags and single use plastic society.

Since 2009, after being recognized as a world biosphere reserve by UNESCO, Cu Lao Cham has started the motto "Say no to plastic bags". Through intensive communication on the impacts of nylon bags on the environment and support from the local authority, the local people start to change their behaviors toward use of nylon bags. The local authority also controls use of plastic bags by the tourists. An interdisciplinary inspection team for monitoring plastic bag violations was officially established. As a result, for more than 10 years of implementation of the campaign, nylon bags are being replaced by degradable package, like paper bags, banana leaves...

The campaign has set a good example for the island to start a new campaign on "say no to plastic straw, single-use bottle" as well as to the "Say no to plastic bags "campaign in Hoi An and other region of Vietnam.

From the successful story of Cu Lao Cham, it is clear that communication is a key in the battle to fight marine plastics.

Chapter 3: Conclusion and Recommendation

Plastic pollution is challenging the sustainable development of the human being, and Vietnam is not an exception. Facts show that marine plastic pollution from various sources, significantly land-based sources, is on the rise. Unfortunately, the system on plastic waste management for marine protection needs a lot of improvements, from the institutional and legal/policy document system to the infrastructure on waste management.

- Stakeholders: consisting of waste generators, plastic manufacturers/importers, the formal sector, the informal sector, private sector, and the governing body.
- System: covering the following processes plastic production, usage, waste collection, waste treatment, and secondary market.
- Network: covering collection facilities/points, transfer stations, recycle facilities, treatment facilities (incinerators, composting facilities, and landfills).
- Current efforts and best practices:

Recognizing the importance and urgency of plastic waste management for marine protection, more attempts should be promoted at different levels and sectors. At the same time, it is needed to:

- Reduce the volume of plastic waste generated by banning plastic bags, single-use plastic products, promoting environmental-friendly products, promoting circular economy in plastics;
- Prevent leakage through improvement of waste collection and treatment system;
- Increase lifespan of plastic products through innovation and technology.

In order to do so, it requires the synergy, contribution, and cooperation of all stakeholders and network, the improvement of the system, and the promotion and dissemination of good models and practices.

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