



# CLEAN CITIES, BLUE OCEAN

## 3R/SWM and Marine Debris Reduction Strategy Alignment Assessment | Vietnam



PHOTO: Jennifer Mathis, University of Georgia

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## Acronyms and Abbreviations

|         |  |
|---------|--|
| 3Rs     | Reduce, reuse, recycle                                     |
| CCBO    | Clean Cities, Blue Ocean                                   |
| CE      | Circular Economy   |
| DARD    | Department of Agriculture and Rural Development            |
| DH      | Department of Health                                       |
| DOC     | Department of Construction                                 |
| DONRE   | Department of the Environment and Natural Resources        |
| DPI     | Department of Planning and Investment                      |
| EPL     | Vietnam's Environmental Protection                         |
| GDP     | Gross Domestic Product                                     |
| HCMC    | Ho Chi Minh City   |
| IWC     | Independent Waste Collector                                |
| MARD    | Ministry of Agriculture and Rural Development              |
| MoC     | Ministry of Construction                                   |
| MoH     | Ministry of Health   |
| MoIT    | Ministry of Industry and Trade                             |
| MONRE   | Ministry of Natural Resources and Environment              |
| MoT     | Ministry of Transport                                      |
| MPI     | Ministry of Planning and Investment                        |
| MPs     | Microplastics  |
| MSW     | Municipal Solid Waste                                      |
| MSWM    | Municipal Solid Waste Management                           |
| MWRP    | USAID Municipal Waste Recycling Program                    |
| NAPMPDM | National Action Plan on Marine Plastic Debris Management   |
| NSGMSW  | The National Strategy on Integrated Solid Waste Management |
| OMSW    | Ordinary Municipal Solid Waste                             |
| PPPs    | Public Private Partnerships                                |
| SBC     | Social and Behavior Change                                 |
| SWM     | Solid Waste Management                                     |
| TIPs    | Trials of Improved Practices                               |
| UDW     | Urban Domestic Waste                                       |
| USAID   | United States Agency for International Development         |
| VEA     | Vietnam Environmental Administration                       |
| WEPA    | The Waste Management and Environment Promotion Agency      |

## Executive Summary

A significant fraction of the input of plastic into the ocean emanates from middle-income countries with rapidly expanding economies that have thus far lacked the resources to develop adequate infrastructure for waste management; of these countries, Vietnam falls fourth on this list behind China, Indonesia, and the Philippines.<sup>1</sup> Vietnam is defined by its over 2,100-mile coastline including two massive rivers, the Mekong River (the world's largest freshwater fishery) and the Red River, which can both act as conduits for mismanaged waste to enter the ocean. Based upon updated World Bank data and a similar approach to Jambeck et al. (2015), an estimated 0.9 million metric tons of plastic waste will be mismanaged in Vietnam in 2020. Some portion of that will enter aquatic systems and subsequently the ocean. A recent Duke Policy Report estimates 0.28 to 0.73 million metric tons of that mismanaged plastic waste will become marine debris in Vietnam, highly influenced by the nation's vast coastline and two major rivers. As municipalities are faced with this growing challenge, locally appropriate solutions, designed along with community stakeholders, will be necessary to turn the tide against ocean bound plastic.

Legislation to create solid waste management systems that are protective of the environment has existed since 1999 when Vietnam's Environmental Protection Law (EPL) was first introduced. It has been revised numerous times thereafter, but implementation has been challenging due to lack of mobilization among some social groups to participate, limited sense of responsibility and commitment in some communities, insufficient financial resources and labor forces, as well as a lack of governance and oversight broadly involving key stakeholders. The Government of Vietnam recognizes the importance of the 3R initiative and considers it to play a key role in developing a successful and sustainable solid waste management system. In 2018, the Prime Minister approved The National Strategy on Integrated Solid Waste Management until 2025, with a Vision up to the Year 2050 (NSGMSW), and later introduced a National Action Plan on Marine Plastic Debris Management until 2030 (NAPMPDM).

In August 2019, Tetra Tech was awarded the Clean Cities, Blue Ocean (CCBO) Program, a five-year, \$48 million contract from the U.S. Agency for International Development Bureau of Economic Growth, Education, and Environment. CCBO is the Agency's flagship program to respond to the global crisis of marine plastic pollution and includes Vietnam as one of its seven focal countries. CCBO's objectives share alignment with Vietnam's recent commitments, including the NSGMSW and NAPMPDM. To inform CCBO's approach, the program has produced this 3R/SWM and Marine Debris Reduction Strategy for Vietnam to highlight the ways in which CCBO can support existing marine debris strategies and to provide recommendations for increased impact.

Common themes between CCBO activities, the NSGMSW, and the NAPMPDM include the following:

- Enhancing solid waste management and reduce, reuse, recycle practices;
- Building social and behavioral change through educational and community efforts;
- Facilitating the development of suitable and safe solid waste storage facilities and collection sites; enabling policies for circular economy; mobilizing international and private sector partnerships to produce alternative products; and
- Researching, developing, and applying technologies and techniques to treat and reduce ocean plastics.

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<sup>1</sup> Jambeck et. al 2015.

CCBO's Year One Work Plan for Vietnam supports the NAPMPDM in CCBO's engagement sites of Bien Hoa, Da Nang, Hue City, and Phú Quốc and the program's support will continue to evolve over its tenure (through August of 2024) with influence from policy developments, local priorities, and best available science.

Integration of marine debris issues into sound solid waste management strategies, schemes, and plans right at the design stage, as well as into projects at the investment stage, can help minimize and mitigate mismanaged plastic. The recent NAPMPDM is a good initial step, but it will require effort and resources to successfully implement its goals sustainably as Vietnam develops. CCBO can facilitate these goals through linking and integrating its solid waste management action plans with Vietnam's NAPMPDM in terms of institutional frameworks, education, policy, organization, management, mobilization of social participation, and international collaboration. Furthermore, it is critical that both CCBO and NAPMPDM objectives are integrated into the national and local socioeconomic development strategies to ensure they are complementary in terms of solid waste management and marine debris reduction.

## I. Introduction

On August 28, 2019, Tetra Tech was awarded the Clean Cities, Blue Ocean (CCBO) Program, a five-year, \$48 million contract from the U.S. Agency for International Development's Bureau of Economic Growth, Education, and Environment. CCBO is the Agency's flagship program to respond to the global crisis of marine plastic pollution. The objectives of CCBO are to:

**Objective 1:** Promote reduce, reuse, recycle (3Rs) and strengthen local and regional markets for recycled plastics;

**Objective 2:** Build social and behavior change (SBC) for 3Rs and sustainable solid waste management (SWM);

**Objective 3:** Increase capacity and effective governance of SWM and recycling systems; and

**Objective 4:** Support international fora, public-private partnerships (PPPs), and multi-stakeholder alliances.

As a cross-cutting objective, CCBO also works to support and enhance the livelihoods of those working in the waste and recycling sectors, particularly women, as well as advance gender equality within the sector and opportunities for women's economic empowerment.

Over the next five years, CCBO will collaborate with local USAID missions and key stakeholders to test and scale 3R/SWM solutions with an initial focus in seven focal countries: Indonesia, the Philippines, Sri Lanka, the Maldives, Vietnam, the Dominican Republic, and Peru. To inform CCBO's approach, the program is producing 3R/SWM and Marine Debris Reduction Strategy Alignment Assessments in each of the focal countries to highlight the ways in which CCBO can support existing marine debris strategies and provide recommendations for increased impact. The Jambeck Research Group at the University of Georgia was selected to produce Reduction Strategies for the Philippines, Vietnam, Sri Lanka, the Maldives, and Indonesia. These Reduction Strategies were generated through literature review of existing marine litter plans and strategies, review of CCBO Work Plans, interviews with CCBO staff, and additional desktop research.

While the focus of CCBO is on waste management, there are also a range of intersectional issues and

USAID initiatives in the Southeast Asia region that are complementary to the work of CCBO. These include programs related to biodiversity conservation and the reduction of illegal fishing activity, such as USAID Wildlife Asia, the recently completed USAID Oceans and Fisheries Partnership, as well as programs related to gender equality and female empowerment. Issues of waste management are often closely tied to issues of environmental and social justice and there may be opportunities for CCBO to build upon existing work and partnerships of USAID in the region.

## 2. Scope and Background

The amount of plastic estimated to enter the ocean annually from mismanaged waste is 4.8 to 12.7 million metric tons.<sup>2</sup> This figure is projected to increase as plastic production grows. Plastic is a relatively new (~last 30 years) material used in Southeast Asia and its mismanagement has the potential to create significant economic and ecological impacts. The United Nations Environmental Program estimates the financial damage of plastics to marine ecosystems globally is \$13 billion each year.<sup>3</sup> Studies show chemicals from plastics transfer to fish in a laboratory setting, and plastic particles and fibers can be found in fish and bivalves sold for human consumption, presenting a potential human health risk.<sup>4</sup> The impacts of plastic marine debris are particularly relevant to Vietnam, which relies on the natural beauty and health of its vast shoreline to fuel its expanding aquaculture and tourism industry.

### 2.1 Context of Plastic Waste in Vietnam

Solid waste generation is often directly related to population and economic development. Due to rapid economic growth rates coupled with a youthful population yearning for modernization and higher standards of living, Vietnam is experiencing municipal solid waste generation at rates faster than it can adequately manage. Vietnam's General Statistics Office estimates the country's population will reach 100 million by 2024, making Vietnam the fourteenth most densely populated country in the world. The country has a prominent young population with 42% of its citizens under the age of 24 and 45% between the ages of 25 and 54.<sup>5</sup> Related to the country's economic development, Vietnam has become popular for foreign investors since the Doi Moi Reforms were introduced and the country experienced a transition from a centralized economy to a socialist-oriented open-market economy. This led to Vietnam earning one of Asia's highest economic growth rates; in 2006, Vietnam's GDP growth rate was second to the People's Republic of China.<sup>6</sup> As a result of rapid economic growth, urbanization, and migration from rural to urban areas, more pressure is being placed on the environment as urban inhabitants consume two to three times more natural resources than their rural counterparts.<sup>7</sup>

Inadequate SWM in Vietnam is characterized by limited waste collection, treatment, disposal, management, and organization, which remains a primary source of marine debris. This is largely due to increased quantity, composition, and toxicity of waste, limited managerial and regulatory oversight, lack of funding for

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<sup>2</sup> Jambeck et al., 2015.

<sup>3</sup> Raynaud et al., 2014.

<sup>4</sup> Rochman et al., 2013, 2015.

<sup>5</sup> GOS, 2014.

<sup>6</sup> Storey, I., 2007.

<sup>7</sup> Schneider et al., 2017.

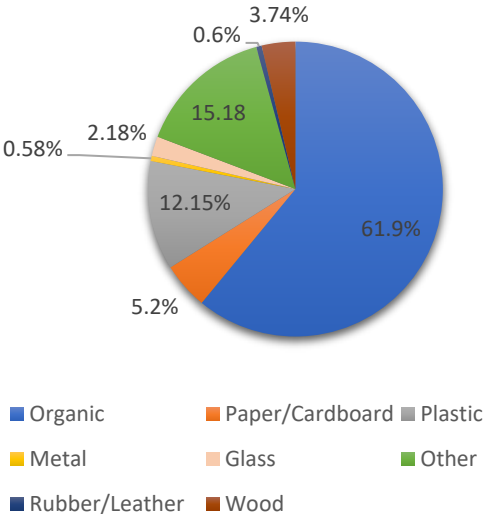
investments and operations, and low awareness and accountability from communities on waste reduction, reuse, and recycling. While systems for waste collection do exist, a large portion (over 60%) of the waste stream is not properly treated and disposed of in a controlled environment. This leads to leakage of municipal solid waste (MSW), creating the potential for marine debris, wildlife impacts, and can contribute to public health issues with the potential for polluted groundwater, contaminated and clogged waterways, soil pollution, spreading of disease and exposure to heavy air pollution from waste burning.<sup>8</sup>

## 2.2 Generation and Characterization of MSW and Plastic Waste in Vietnam

The daily average per capita waste generation in Vietnam is estimated to be 0.33 kg/person/day.<sup>9</sup> With a population of over 97 million,<sup>10</sup> we estimate total waste generation in Vietnam to be over 11 million metric tons annually. There is regional variation in waste generation throughout the country, and Ho Chi Minh City, Hanoi, Haiphong, Da Nang, and Can Tho account for 22% of the country’s total population in 2017,<sup>11</sup> but generate about 70% of the nation’s total waste.<sup>12</sup> Solid waste is collected mainly in urban areas, but in rural areas it is still very limited. The average collection rate in urban areas is around 84%, which drops quickly as rural areas are considered with an average collection rate around 40-55%. In mountainous areas, collection rates can drop below 10%.<sup>13</sup>

The National State of Environment published in 2011 estimates that of the total waste generated in Vietnam, 45% is urban, 17% is industrial, 34% is rural, 3% is waste from craft villages, and less than 1% is medical and other residuals. Plastic is estimated to comprise 12.15% of the total waste generated (Figure 1),<sup>14</sup> and while limited data exists on recycling waste at national level, it is estimated the recycling rate of MSW is around 8-12% by volume, with significant involvement by the informal sector.

Figure 1. Waste Composition in the Vietnam (Source: Kaza et al., 2018)



<sup>8</sup> Kaza et al., 2018.

<sup>9</sup> Ibid.

<sup>10</sup> CIA Factbook, 2020.

<sup>11</sup> World Bank Open Data, 2019.

<sup>12</sup> Schneider et al., 2017.

<sup>13</sup> United Nations Centre for Regional Development, 2017.

<sup>14</sup> Kaza et al., 2018.



## 2.3 Systematic Framework of the Municipal Solid Waste Collection Scheme

A general overview of the waste management system in Vietnam is shown in Figure 2 according to onsite research performed by the Jambeck Research Group during a U.S. Department of State Fulbright Grant. It is important to note that this illustration may not apply to every community in Vietnam but was found to be the most common system throughout the country.

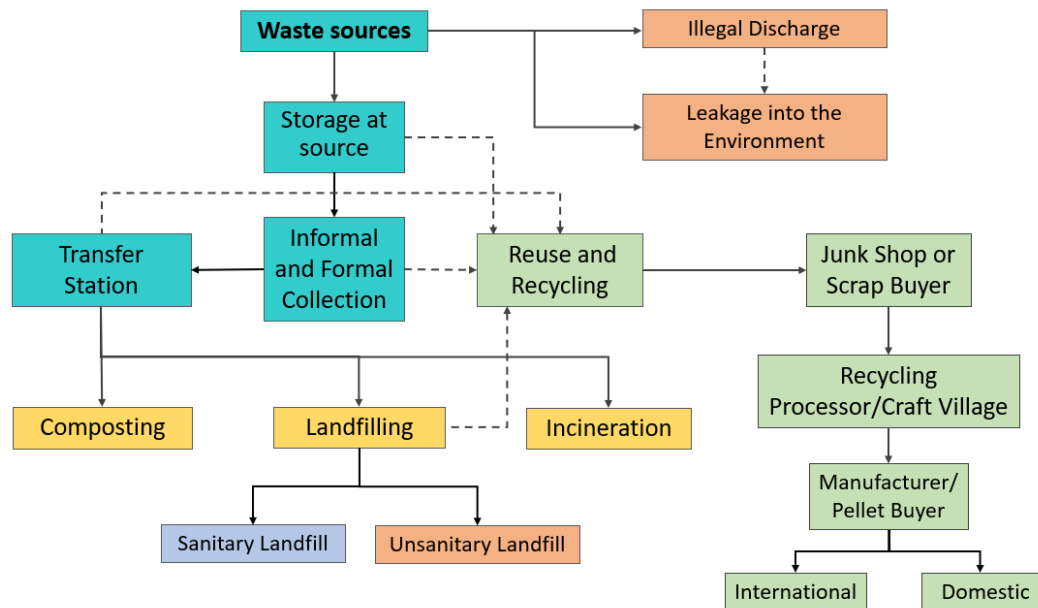


Figure 2. General organization of the waste management system in Vietnam (Source: Information compiled from Schneider et. al. 2017 and fieldwork in Vietnam conducted under a U.S. Department of State Fulbright Grant)

There are numerous components and steps involved in the flow of waste from the time of its disposal to its end of life. Although Figure 2 shows a relatively concise path of waste flow, this system is inherently complex with intertwined components and numerous stakeholders involved at each stage. The first step in the SWM scheme is household waste management. Community members either leave their waste on the sidewalk in front of their home or business in a personal bin, plastic bag, or basket, or drop it in a communal bin for pick up. In places where there is not at-home collection, residents are provided with a communal container of non-uniform size and are responsible for disposing their waste into the containers. A URENCO, CITENCO, or private company truck comes by daily to unload the communal container and transports it to a dumpsite.<sup>15</sup> Households who do not have access to either of these services use their own means of waste disposal; this often results in waste dumped in nearby rivers or lakes or discarded at sites near their home or treated by open burning.<sup>16</sup>

Collection is carried out by one, or a combination of, the formal and informal sector. Although the combination is not always consistent, their operations are carried out in sync with several SWM companies in Vietnam. The equipment used are typically pushcarts, wheeled bins attached to the back of motorbikes or trucks. Pushcarts are typically used in narrow alleyways where waste trucks cannot fit.

<sup>15</sup> Nguyen, 2005.

<sup>16</sup> Tanh et al., 2012.

Currently, single stream waste is the main method of disposal. A few pilot programs have deployed waste separation at source but have generally not been replicable. In small communities around Hanoi for example, pilots experienced difficulties in gaining household participation and establishing sufficient funding.<sup>17</sup> Vietnam recognizes, however, that waste segregation at source is a fundamental step towards closing the loop and thus issued the National Strategy for Integrated Management of Solid Waste Until 2025 and Vision Towards 2050 that stipulates that waste separation at source is one of the most important tasks to improve waste management and reversing its negative impacts on the environment.

Waste collection in urban areas typically occurs at least once a day, seven days a week. The daily collection of waste also helps to minimize home pest invasion. As soon as the waste collector's cart is full, they then transport it to a transfer station to be emptied into a compaction truck and transported to a waste treatment facility thereafter. Transfer stations are often located along the streets, sidewalks, or medians which can cause traffic jams or further leakage of residual waste into streets. More often than not, the location of the transfer station is only temporary, and they are forced to move from one location to another if residents or businesses complain about leakage, odor, or traffic which could cause customer deterrence from their business.

## 2.4 The Role of the Informal Sector

The informal sector is a significant contributor to municipal SWM and recycling in Vietnam.<sup>18</sup> For example, in Ho Chi Minh City, around 70% of the MSW tasks are carried out by the informal sector (e.g. independent waste collectors (IWCs), street sweeper, pickers, cooperatives, etc.). The cost of waste collection is relatively low compared to other commodities that citizens pay for; the collection fee is usually negotiated between the IWC and the household or business where it is being collected. According to interviews conducted by the Jambeck Research Group with international NGO Environmental Development Action in the Third World (ENDA) in Ho Chi Minh City (HCMC), residents typically pay IWCs a fee of approximately 2 USD/month for waste collection (which includes any recyclables discarded by residents); however, this figure may vary depending on the number of members in a household or the district in which they reside, and a flat rate fee based on waste volume may be negotiated for larger institutions such as schools. Cities are still faced, however, with the challenge of covering cost for waste collection with the small amount received from fees. The average income in Vietnam is still low which makes it difficult, or nearly impossible, to increase collection fees. One study showed that the total collected charges cover less than 60% of the total waste management cost and in some localities, it covers only 20-30% of the cost.<sup>19</sup> In cases where collection fees increased, some habitants chose to opt out of collection services and instead dispose of their waste illegally in the environment or a waterway. Thus, cost is a major driving factor for the improvement of the waste management system.

Recycling practices are highly variable across Vietnam and, as illustrated by Figure 2, recycling may occur at any node along the waste value chain. Recyclables are often manually sorted from other MSW and collected using handcarts, mini trucks, compression trucks, and specialized trucks. In some instances, recyclables are collected through single and source separated waste streams, though due to the informal and decentralized nature of collection, collection in rural areas in particular is largely dependent on the

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<sup>17</sup> Nguyen, 2015.

<sup>18</sup> Tanh and Mastsui, 2011.

<sup>19</sup> Thang, 2019.

presence and ability of waste pickers to earn viable incomes.<sup>20</sup> Recycling rates across Vietnam are driven by the informal sector and vary by city based on community engagement and support. For example, in Hanoi, most households were found to be active in recycling activities while in HCMC, recycling lacked support from citizens reportedly coming from misguidance by the authorities.<sup>21</sup> A listing of some of the major plastic recycling plants in Vietnam can be found at <https://www.enfreycling.com/directory/plastic-plant/Vietnam>.

## 2.5 Solid Waste Disposal and Mismanagement

In 2013, Vietnam reported to have approximately 98 open dumping sites and landfills, of which, 16 landfills were considered to be sanitary.<sup>22</sup> The majority of these sites were uncontrolled landfills or open dumping sites with poor oversight. Compaction, leveling of waste volumes, final cover, protective landfill liners, and collection of leachates is rarely practiced. The country only has a few small-scale incinerators with an operating capacity on average of 300 ton/day, but this type of treatment is limited due to high investment cost required for operation and maintenance of the facility.

Approximately 62% of waste generated in Vietnam is reported as “unaccounted for” (and for the purposes of this report is assumed to be inadequately managed); 15% is reported to be composted but because waste is not separated at the source, composting efficacy is low in Vietnam; and 23% is reported to be recycled.<sup>23</sup> However, Vietnam’s General Statistics Office and the MONRE National Report in 2011 cite a 76-83% diversion rate of the total collected solid waste treated for the whole country, although detailed data on the alternative SWM processes remains incomplete.

Using similar methods to Jambeck et al. (2015), but with updated data on waste generation, composition, and mismanagement from Kaza et al. (2018), The Jambeck Research Group estimates the total mismanaged plastic waste in Vietnam to be 0.9 million metric tons/year in 2020. Because Vietnam is a country with a coastline over 2,100 miles and mega cities such as HCMC are located in the Mekong basin and Hanoi along the Red River, it is likely that a significant fraction of the mismanaged plastic in Vietnam may enter the ocean.

## 2.6 Waste Management in CCBO Priority Cities

**Bien Hoa** - The city of Bien Hoa is a rapidly growing industrial and commercial zone located along the Dong Nai River that flows to the South China Sea. It is the largest city in Dong Nai province and its location along a major river makes it a prime hot spot for final catchment before mismanaged waste reaches the ocean. The city’s industrial zone was established in 1963, as one of Vietnam’s first industrial zones. It contains 88 enterprises from 8 industrial sectors, and 14 of these enterprises report using their own solid waste by-products (e.g. metal shavings, glass, and plastic containers) in their manufacturing lines, five enterprises exchange their waste with other factories in the industrial zone, and many factories sell their waste to recycling operations outside the industrial zone.<sup>24</sup> In 2004, efforts were made to establish a waste exchange database of the industrial solid waste by-products available, but it is unclear as to whether

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<sup>20</sup> Phu et al., 2018.

<sup>21</sup> Omran and Gavrilescu, 2008.

<sup>22</sup> Luong et al., 2013.

<sup>23</sup> Kaza et al., 2018.

<sup>24</sup> Environmental Protection Magazine, 2004.

or not this exchange center is still in use. In 2008, the total volume of Urban Domestic Waste (UDW) generated in Dong Nai was 1,167 to 1,200 tons per day (Green Field compost plant receives 400 tons per day), 97.5% of which is waste from outside the industrial zones and 2.5% is from inside industrial zones. The household waste collection rate in Dong Nai has reached only 71%. Bien Hoa URENCO, together with eight other enterprises, is responsible for waste collection, transport, and handling. In total, 456,484 tons per year of industrial waste was generated by Industrial Parks (IPs) of which 108,000 - 132,388 tons were from 730 hazardous waste generators and only 40%–54% of that waste (51,000 tons of hazardous solid waste) was collected.<sup>25</sup> Sonadezi Waste Treatment Co. (equipped with one incinerator able to handle 200 kg per h), Tan Phat Tai Co. Ltd., and twenty other interprovince waste collection companies are participating in waste services in Dong Nai. Although limited literature on case studies were found for the city of Bien Hoa, we have referenced projects implemented in HCMC through this report, a nearby megacity just southwest of Bien Hoa.

**Da Nang** - Da Nang City has a population of 1.06 million people with a population density of 828 people/km<sup>2</sup>. The city generates around 365,000 tons of MSW per year with a collection rate ranging from 82-85% and municipal solid waste increasing at a rate of 8-9% per year.<sup>26</sup>

The relatively high collection rates in Da Nang must be supported by efforts to engage community members. There may be an opportunity to improve knowledge and awareness among students. A case study by Hoang et al. (2016) surveying 247 students in two elementary schools in Da Nang showed that students had basic knowledge about the environment and that their knowledge on waste was limited with regard to SWM. An environmental education workshop was conducted proceeding the survey which resulted in a strengthened interest in SWM activities and students had gained a significant amount of knowledge on SWM.

Community engagement also extends beyond households and students. Traditional organized bazaars' waste management practices have unique challenges and opportunities around waste segregation. A study by Kato et. al in 2017 found that fish and vegetable vendors and food stalls in the area are major sources of organic waste that can be used for local swine feed. The researchers discovered that offering a small reduction in collection fees for separated waste was enough to get vendors to start setting organics aside for the swine farmers. Distributing cost savings across stakeholder has provided the motivation and market-based incentives to segregating waste. Another study conducted by Tran et. al in 2019 assessed existing separation behavior in Da Nang City and showed that the separation rate of leftover food was 77.3%, and plastic bottles and metal cans were the most popular recycled items among 13 examined items with recycling rates of 72% and 63%, respectively. Positive influencing factors of waste segregation included behavior intention to continue separating waste, sympathy and understanding for the collector's work, incentives brought by the money earned from recycling, general attitude toward the waste problem, normative conscious and responsibility for waste problems, as well as perception of environmental risks and responsibility for recycling. The only negative influencing factor was evaluation of effort it takes to complete waste separation.

There have also been local improvements around waste collection. A study in Da Nang City resulted in the development of an optimized collection routing model that reduced both total traveling distances and

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<sup>25</sup> Chi et al., 2011.

<sup>26</sup> Tsai et al., 2020.

operational hours of vehicles in comparison to previous practices.<sup>27</sup> While it is unclear if this optimized model was adopted, it provides insight into collection for the context of Da Nang.

**Hue** - Hue City is the capital of Thua Thien Hue Province located in central Vietnam. The city is made of 27 wards with a population of 354,124 and population density of 4,779 persons per km<sup>2</sup>.<sup>28</sup> Around 210 tons of MSW per a day is collected in the city and the general collection rates for the city and entire urban areas are 89% and 90%, respectively.<sup>29</sup> The city is a prominent tourism location for both national and international travelers, and houses a UNESCO World Heritage Site, the Complex of Hue Monuments. In 2012 the city accommodated around 2.5 million visitors with an increasing annual growth rate of 10%. The Vietnamese government approved Decision No. 649/QĐ-TTg Approval for adjustments to General Planning for Hue City to 2030 with a Vision to 2050 which called for Hue to become environmentally sustainable.

Matsui et al. (2015) researched the impacts of a 3R program in the hotel sector in Hue City. A waste characterization study was conducted on 45 hotels from 6 different classes: 1,3,4, and 5-star hotels and a guest house. Via extrapolation to all hotel accommodations in the city, they estimated the total waste generation amount was 6,750 kg per a day, in which the 4-star hotel accounted for largest amount (1,845 kg/day), followed by 3-star hotel (1,103 kg), 5-star hotel (1,031 kg), 1-star hotel (869 kg/day), 2-star hotel (826 kg/day) and guest house accounted for smallest part with 516 (kg/day). The total waste generation amount of 269 hotels in Hue was 6,750 kg/day of which 12.6% was recyclable and 32.2% was compostable, resulting in high potential for composting and recycling diversion.

Composting and recycling opportunities have high potential in other sectors as well. A waste characterization of 309 vendors of 17 business categories from traditional markets in Hue City was conducted by Matsui et al. (2015). Waste was categorized into 3 categories and further sub-categorized. Food waste accounted for the largest part of the general waste category, followed by plastic and glass. The authors extrapolated their waste generation rate results across all markets in Hue and were able to produce estimates of the total amounts of general waste, recyclable, food residue and total waste by business category. The total waste generated from market was 17.0 tons/day, of which 4.6 tons (27.1%) were collected by pig farmers for feeding livestock and 0.6 tons (3.6%) were sold to the recycling market. The composting potential accounted for 55.2% of total waste generation from the traditional market in Hue. The recycling potential accounted for 5.1%. The total disposal amount sent to the landfill site would be reduced from 69.2% to 8.8% of the total.

**Phú Quốc** - Phú Quốc is the largest island district in Vietnam. It is famously known for its vast beautiful beaches and crystal-clear water, making it a top tourist destination. The District falls within the Kien Giang Province which has a permanent population of around 1.7 million and a population density of 272 people per square kilometer.<sup>30</sup> Phú Quốc has a large and rapidly growing tourism industry, receiving over 4 million tourists in 2018 – a 36% increase from the previous year – and aiming to receive over 5 million tourists annually in the coming years.<sup>31</sup> The island's government aims to promote sustainable economic development with expansion of environmental protection as a driving factor. Phú Quốc Island currently

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<sup>27</sup> Louati et al, 2016.

<sup>28</sup> GSO, 2015.

<sup>29</sup> Matsui et al., 2015.

<sup>30</sup> GSO, 2019.

<sup>31</sup> Vietnam News, 2019.

has two landfills that receive around 140 tons of waste per day and are approaching full capacity. Thus, sustainable waste treatment solutions are more critical than ever. A study by Nguyen et al. (2018) focused on Phú Quốc Island's economic feasibility for SWM solutions. The results of this study show that the potential for electricity generation from solid waste on Phú Quốc is approximately 4.77 MW with a corresponding production cost from 6.4 to 5.3 cents per kWh. With a payback time on investment being about 13 years, the net profit margin and the return on investment is 18.9% and 14.9%, respectively. Although limited data on Phú Quốc Island was found in the literature, more informative data likely exist but was not examined during the compilation for this report.

## 2.7 Prior Stakeholder Engagement and USAID MWRP

Significant activism in Vietnam has focused on addressing ineffective municipal SWM practices, reducing marine plastic pollution, improving SWM, supporting initiatives to recycle waste, and enhancement of social justice. USAID has several other recent and ongoing activities in Vietnam that have been successful under its Municipal Waste Recycling Program (MWRP), which runs from 2016-2021, and will be complementary to the work of CCBO. These include programs related to education and outreach, promotion of the 3Rs, improving SWM models, programs related to gender equality, as well as women's and youth empowerment. Furthermore, issues of SWM are often closely linked to issues of environmental and social injustice and there are opportunities for CCBO to build upon existing work and partnerships of USAID in the region.

Projects funded under the MWRP are continuing to address issues related to waste management and plastic pollution in Vietnam. Comprehensive results of these projects were not available at the time of writing, but a summary of the projects based upon a recent USAID publication is in Annex II. Further insight will be gained once all projects are complete and final results are made available.

It is assumed that USAID CCBO desires for new projects to begin where MWRP projects have ended and to fill in geographic data collection gaps, etc. According to USAID, under the MWRP and with an investment of \$1.5 million, eight grantees improved SWM services and promoted better household-level waste management practices among nearly two million residents across Vietnam.<sup>32</sup> In addition, a recent USAID report from Vietnam outlines two case studies that: i) captured lessons from the design and implementation of behavioral solutions to marine plastic pollution through the experiences of MWRP grantees, ii) developed understanding of contextual factors that matter for behavioral solutions, and iii) leveraged research insights to inform future programming.<sup>33</sup>

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<sup>32</sup> "Partnering with Cities to Reduce Ocean Plastics: The Municipal Waste Recycling Program: Vietnam," May 2020. <https://urban-links.org/wp-content/uploads/20200605-MWRP-Vietnam-Country-Profile.pdf>

<sup>33</sup> "Behavior Change in Local Systems to Mitigate Ocean Plastic Pollution: Case Study of USAID's Municipal Waste Recycling Program in Two Vietnamese Cities, May 2020. [https://urban-links.org/wp-content/uploads/5-15-2020\\_MWRP-case-study.pdf](https://urban-links.org/wp-content/uploads/5-15-2020_MWRP-case-study.pdf)

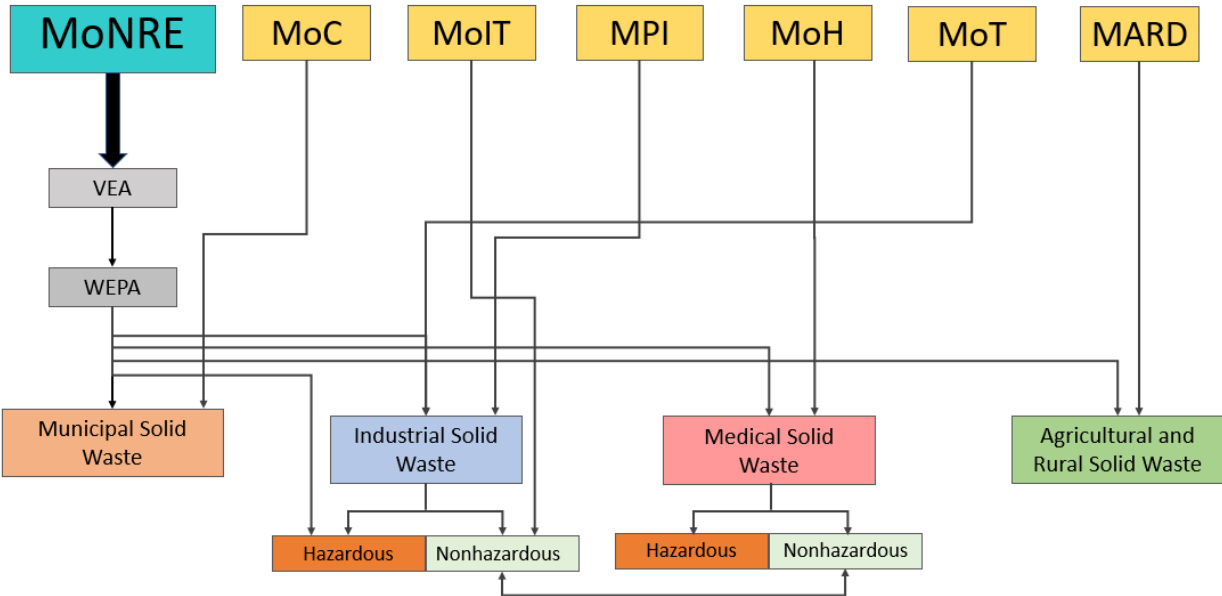
### 3. Relevant National and Local Actions

The previously discussed components of MSW management fall under legal and political frameworks in addition to an institutional structure, suitable technologies, operations management, financial resources, public participation and awareness, and a well-developed action plan for sound implementation.<sup>34</sup> This section discusses the legal frameworks and the current policy landscape.

#### 3.1 National Framework and Supporting Legislation

Under the Environmental Protection Law (EPL), the Ministry of Natural Resources and Environment (MoNRE) is responsible for environmental affairs and implementing as well as monitoring environmental protection laws in Vietnam. The Vietnam Environmental Administration (VEA) under the MoNRE is responsible for state management in the environmental sector, The Waste Management and Environment Promotion Agency (WEPA) that works under the VEA is directly responsible for waste management. Five other ministries are also involved in SWM as regulated under the EPL, and several ministries are responsible for managing different categories of waste. The MoNRE along with the Ministry of Construction (MoC) and the Ministry of Planning and Investment (MPI) are responsible for handling municipal solid waste. The Ministry of Agriculture and Rural Development (MARD) is responsible for management of agriculture and rural waste; the Ministry of Health (MoH) is responsible for handling solid waste generated in hospitals and medical establishments; the MoNRE, the MPI, the Ministry of Industry and Trade (MoIT), and the Ministry of Transport (MoT) are all responsible for handling industrial solid waste and hazardous waste (Figure 3).

Figure 3. Institutional Framework of Solid Waste Management



The legislation system in Vietnam includes a constitution, laws and ordinances, by-law documents including decrees that are issued by the government, circulars that are issued by ministries, and Prime Ministerial

<sup>34</sup> Shekdar, 2009; Guerrero et al., 2013.

decisions. Table I provides a chronological-ordered list of some of the most prominent SWM policies. In Vietnam, various terms have been used to define waste and the 3Rs such as recyclables, scraps, discarded products, waste management, and waste reuse which can often make newly written legislation challenging to interpret. These various terms are defined by the following legislation (Nguyen, 2017):

- Environmental Protection Law 2014 (EPL 2014);
- Decree 38/2015/ND-CP on waste and scrap management;
- Decision 16/2015/QĐ-TTg on take-back and treatment of discarded products;
- Circular 36/2015/TT-BTNMT on management of hazardous waste; and
- Inter-ministerial circular 58/2015/BYT-BTNMT on medical waste management.

Table I. Environmental Legislation of solid waste management in Vietnam (Source: Le Hoang et al., 2009; Tran, V. C. M., Le, H. S., & Matsui, Y., 2019)

| Date              | Name                               | Details  |
|-------------------|------------------------------------|--|
| December 4, 2019  | Decision No. 1746/QĐ-TTg (NAPMPDM) | Prime Minister issued the National Action Plan for Management of Marine Plastic Litter by 2030. CCBO aims to support this through their proposed activities.   |
| January 1, 2019   | Resolution No. 01-NQ-CP            | Government issued main task and solutions to implement the Socio-Economic Development Plan and State Budget Plan with mission of reducing plastic waste and strengthening international cooperation in solving the problem of plastic pollution in the ocean |
| October 22, 2018  | Resolution No. 36-NQ TW            | Develops a strategy for sustainable development of marine economy to 2030, with a vision to 2050, to prevent, control, and reduce pollution of the marine environment  |
| May 7, 2018       | Decision No. 491/QĐ-TTg (NSGMSW)   | Encourages sustainable and environmentally sound levels of waste treatment with an aim to shift from dependence on landfills and a transition to solid waste power plant facilities  |
| November 29, 2007 | Decree No. 174/2007/NĐ-CP          | Provides environmental protection charges for solid waste; charge rates and regime of the collection, remittance, management, and use of environmental protection charges for solid waste  |
| April 9, 2007     | Decree No. 59/2007 NĐ-CP           | The Government's promulgation of the regulation on solid waste management activities, and the rights and duties of persons related to solid waste management   |
| August 9, 2006    | Decree No. 80-81/2006/NĐ-CP        | The Government's promulgation of the regulation of sanctions against administrative violation in the field of protection of the environment (replaces decree No. 121/2004/ND-CP; detailing of the implementation of the law on environmental protection      |
| November 29, 2005 | Law on Environmental Protection    | Took effect July 1, 2006 and replaced the environmental protection law of 1993   |
| August 17, 2004   | Decision No. 153/2004/QĐ-TTg       | The Prime Minister's decision on the provision of sustainable development in Vietnam   |
| December 2, 2003  | Decision No. 256/2003/QĐ-TTg       | The Prime Minister's decision on approving the national strategy on environmental protection up to the year 2010 and vision to the year 2020   |
| April 22, 2003    | Decision No. 64/2003/QĐ-TTg        | The Prime Minister's approval of the plan for managing establishments causing serious environmental pollution  |
| June 25, 1998     | Decision No. 36-CT/TW              | The Central Committee of the Communist Party of  |



|                                 |  |  |
|---------------------------------|--|--|
|                                 |  | Vietnam's steering of further promotion of environmental protection  |
| December 27, 1993               | Decision No. 29-L/CTN  | The Prime Minister's provision of the law to protect the environment   |
| <b>Legislation on Recycling</b> |  |  |
| June 15, 2015                   | Decree No. 38/2015 ND-CP   | Household solid waste was required to be classified into three groups: disintegrable organic waste, reusable and recyclable waste, and the remaining group   |
| June 23, 2014                   | Article 85-97 of the Environmental Law   | The Government specified the responsibility to separate solid wastes at source and implementation of 3R and ORWM systems in communities  |
| December 17, 2009               | Decision No. 2149/QĐ-TTg National 3R Strategy  | The Government set the national target for recovery rate (including recycled, reused, recovered energy, or produced fertilizer) of household solid waste in urban areas by 85% in 2020, and 90% in 2025  |
| April 2, 2004                   | Decision No. 03/2004/QĐ-BTNMT  | The Ministry of Natural Resources and Environment's decision on importing waste as materials for domestic production   |
| May 6, 2002                     | Official Letter No. 1146/BKHCHNMT-MTg  | The Ministry of Science, Technology, and Environment's approval of the National Action Plan for Cleaner Production   |
| <b>Standards</b>                |  |  |
|                                 | TCXDVN 320-2004<br>TCVN 7241-2003<br><br>TCXDVN 261-2001<br>TCVN 6707-2000<br><br>TCVN 6706-2000<br>TCVN 7605-2000<br>TCVN 6696-2000 | Standard for designing hazardous waste landfills<br>Standard for determining dust concentration in flue gas in health care solid waste incinerators<br>Standard for designing landfills<br>Standard for prevention and warning signs for hazardous waste<br>Classification of hazardous solid waste<br>Classification of non-hazardous solid waste<br>Requirements for environmental protection for sanitary landfills |

Review of Vietnam legislation demonstrates that municipal waste management is not clearly defined and classified by source origin or toxicity level. Although unofficial, municipal solid waste often is defined as all waste generated in urban areas which includes household, business, street, hospital, industry, market, construction and demolition, and market waste. This is sometimes referred to as ordinary municipal solid waste (OMSW). To further define waste type, household waste is often referred to as urban domestic waste (UDW), which accounts for around 60-70% of MSW in Vietnam.<sup>35</sup>

The development of MSW policies and practices will continue to be a key part of Vietnam's long-term marine debris reduction strategy and the NAPMPDM. In addition, circular economy concepts will be an important component for sustainable development, considering the long-term development strategy to reduce marine debris. Furthermore, the institutional framework and legislation of MSW management can continue to be revisited to make sure it is in line with the program goals. During the process of reforming and revising the institutional framework and legislation for MSW practices, the following may be considered:

<sup>35</sup> MONRE, 2011.

- (i) Institutional frameworks can unite economic and social concepts with MSW practices
- (ii) Institutional frameworks can be implemented nationally while also regionally-tailored
- (iii) Institutional frameworks can address current fragmented and disconnected policies
- (iv) Solutions related to organizational and managerial systems of MSW can fill gaps
- (v) Institutional frameworks can promote and create sustainable growth, job creation, enhancement of environmental and marine protection, as well as improving the livelihoods of those who work in the SWM sector

### 3.2 Local Framework and Support

On a local level, the People's Committee is the highest administrative body of the city and is responsible for implementing regulations from the state level for SWM, approving local waste treatment projects, mobilizing investment capital from various sources for construction of landfills, encouraging NGOs to participate in waste management activities, directing waste treatment projects, and organizing the local waste management scheme. Every district has its own People's Committee that draws up an annual report for the MoNRE and the MoC on waste treatment under their geographic coverage. The People's Committee also provides instruction, promotes best practices, and facilitates investment and subsidization for waste collection, projects, and plans. Furthermore, several departments within the People's Committee are responsible for different sectors of waste management. Some are directly in charge, such as the Department of the Environment and Natural Resources (DONRE), Department of Construction (DOC), Department of Agriculture and Rural Development (DARD) and the Department of Health (DH). Others are indirectly in charge, such as the Department of Planning and investment (DPI) and the Department of Finance (DF). It is important to note that the DOC and DONRE may take on a different role with regard to SWM in each city or province.<sup>36</sup> Table 2 further breaks down the roles of each department operating under the People's Committee.

Table 2. Departments within the People's Committee delegation of tasks

| Department of Construction (DOC)  | Department of Natural Resources and Environment (DONRE)  | Department of Agriculture and Rural Development (DARD)   | Department of Health (DH)  |
|---|--|--|--|
| <ul style="list-style-type: none"> <li>• Advises People's Committee to apply state's directive management of solid waste in collaboration with other services</li> <li>• Responsible for the management of domestic waste in urban areas, construction waste</li> </ul> | <ul style="list-style-type: none"> <li>• Runs state guidelines for environmental protection</li> <li>• Advises People's Committee to apply the state's directive management of solid waste in collaboration with other services</li> <li>• Manages domestic waste in rural areas, hazardous solid waste (with the DH)</li> </ul> | <ul style="list-style-type: none"> <li>• Responsible for agricultural waste in collaboration with DONRE</li> </ul> | <ul style="list-style-type: none"> <li>• Dictates regulations and manages the waste collection and storage inside health facilities</li> </ul> |

<sup>36</sup> Nguyen, 2017.

|            |  |  |  |
|------------|--|--|--|
| and sludge | and DOIT) and Craft villages (with DARD) |  |  |
|------------|--|--|--|

### 3.3 National Action Plan

Vietnam has made significant political commitments to manage and reduce plastic waste and ocean plastic pollution. On October 22, 2018 Resolution No. 36-NQ/TW of the Eighth Conference of the Party Central Committee XII was issued on *Sustainable Development of Vietnam’s Marine Economy to 2030 with a Vision to 2045*. This set the goal of preventing, controlling, and significantly reducing pollution of the marine environment. In alignment with Vietnam’s international commitments, the government issued Resolution No. 01/NQ-CP of January 1, 2019 describing the main task and solutions to implement the Socio-Economic Development Plan and State Budget estimate with the mission to reduce plastic waste and strengthen international cooperation in solving the problem of plastic waste inputs into the ocean. In order to implement these tasks assigned by the Government, the MoNRE has coordinated and consulted with ministries, branches, localities, agencies, organizations, experts in the field, scientists, and international partners on the drafting of the Prime Minister’s Decision No. 1746/QD-TTg promulgating the *National Action Plan for Management of Marine Plastic litter by 2030* on December 4, 2019.

The outline presented below is not intended to be fully comprehensive of the *National Action Plan for Management of Marine Plastic litter by 2030* (NAPMPDM), but rather to provide a general overview of items included. The full outline of proposed action items is provided in Annex II, but key activities are as follows to implement innovations and fulfill Vietnam’s commitments to other countries regarding resolution of plastic litter and marine plastic litter:

- Strive to become a leader in mitigation of marine plastic pollution.
- Establish science- and evidence-based baseline information on marine litter.
- Mainstream circular economy (CE) and green growth initiatives.
- Enhance recovery and recycling coverage and markets.
- Prevent leakage from collected or disposed waste.
- Reduce sea-based sources of marine litter.
- Manage litter that is already existing in the marine/riverine environment.
- Promote public awareness and behavioral change around the management of waste and plastic pollution.
- Develop, monitor, assess and update efforts in implementing the NAPMPDM.
- Enhance policy support and enforcement for marine litter prevention and management.
- Promote and enable sufficient and cost-effective financing and other institutional resource requirements for the implementation of the NAPMPDM.

By 2025, the country aims to build and develop mechanisms and policies on marine debris management that will ultimately reduce marine plastic litter by 50%, collect 50% of abandoned or discarded fishing gear, eliminate single-use plastics and non-biodegradable plastic bags in 80% of coastal tourist areas, conduct nationwide beach cleanup campaigns at least twice a year, and strive for at least 80% of marine protected areas to be free of plastic litter. By 2030, Vietnam’s goal is to reduce marine plastic litter by 75%, collect 100% of abandoned fishing gear, halt all disposal of fishing gear into the sea, eliminate single-use plastics and

non-biodegradable plastic bags in 100% of coastal tourist areas, and strive for at least 100% of marine protected areas to be free of plastic litter (See Figure A1 in Annex II for a summary of these changes). Throughout this proposed timeline, Vietnam will annually monitor the marine plastic litter situation and conduct plastic marine litter assessments occurring every five years.

## 4. CCBO Alignment

The activities proposed in the CCBO Year One+ Work Plan for Vietnam (July 2020 to September 30, 2021), including focused work at key engagement sites, largely complements existing legislation under Vietnam’s Environmental Protection Law Articles 85-97 to implement sound 3R and SWM systems in communities. The *National Action Plan on Marine Plastic Debris Management until 2030* (NAPMPDM) also has sections dedicated to improving SWM and recycling markets, with a focus on implementing effective and innovative SWM strategies that ultimately strive to mitigate marine plastic litter. This will be accomplished by using circular economy concepts to enable mechanisms for the design of innovative SWM practices. Other sections of the NAPMPDM discuss promoting large-scale education and behavioral change campaigns pertaining to plastics litter, reducing litter from marine sources, conducting nationwide clean ups, collecting baseline and ongoing data on marine pollution and policy implementation, promoting a shift to sustainable waste treatment practices, and enhancing international collaboration and investment.

Of particular relevance, in the NAPMPDM until 2030, subtask items of Tasks One, Three, and Four (below), align with CCBO Objective I to promote 3Rs practices and strengthen local and regional markets for recycled plastics as follows:

- Task 1.** Promote education and change to behavior pertaining to plastics and marine plastic litter
- Task 3.** Control plastic litter at source
- Task 4.** Enhance international cooperation, scientific research, application, development, and transfer of marine plastic litter processing technologies.

The following table maps CCBO Activities to related action items and resource requirements in the NAPMPDM. The complete NAPMPDM is provided in Annex II, but this is intended to provide an overview of areas for potential collaboration. Key resources that overlap with CCBO efforts are bolded.

Table 3. Aligning NAPMPDM Needs and Tasks with CCBO Activities

| NAPMPDM Goals   | NAPMPDM Tasks   | CCBO [Work Plan] Activity   |
|---|---|---|
| <b>Baseline information/standardized general waste and plastic waste characterizations; Policy Recommendations; Effective models on the proper management, operation, and maintenance of recycling and sanitary landfill Facilities; education and training</b> | <b>1.1.2</b> Promote marine plastic litter collection, processing programs, methods, and purposes of waste classification at the source of generation so as to break the habit of using single-use plastics and non-biodegradable plastic bags<br><br><b>3.1.1</b> Investigate, enumerate, classify, and evaluate land-based, ocean-based, and island-based plastic waste sources | <b>VN 1.2.1</b> - Establish baseline of how waste, especially plastics, is managed in CCBO engagement sites |

|   |  |   |
|---|--|---|
|   | <b>3.1.2</b> Effectively implement classification models of plastic waste at source  |   |
| <b>Operations management assessments;</b> SWM training and development;<br><b>geographically tailored consultations;</b> Online database for logistical organization  | <b>1.3.2</b> Enhance plastic waste managerial capacity and experience for managing officials of coastal localities at all levels   | <b>VN 1.2.3</b> - Introduce and begin completing 3R/SWM Local Government Capacity Index (Capacity Index) with CCBO engagement sites               |
| <b>Technical expertise</b> and human resources; <b>Baseline information/studies</b> per material type; <b>Provide support to model formulation</b>  | <b>1.1.2</b> Promote marine plastic litter collection, processing programs, methods, and purposes of waste classification at the source of generation so as to break the habit of using single-use plastics and non-biodegradable plastic bags<br><br><b>3.1.1</b> Investigate, enumerate, classify, and evaluate land-based, ocean-based, and island-based plastic waste sources<br><br><b>3.1.2</b> Effectively implement classification models of plastic waste at source   | <b>VN 1.2.4</b> - Provide data and technical assistance to develop or strengthen local SWM Plans  |
| <b>Technological and logistical expertise for management; facilitation on international networking and knowledge exchange;</b> Online database for sharing information  | <b>4.1.2</b> Promote in-depth exchange, research and sharing of information and data concerning marine plastic litter with other nations and territories in the region and around the world<br><br><b>4.2.2</b> Proactively adopt and participate in international conventions<br><br><b>4.3.2</b> Attract international technical assistance and investment in control of marine plastic litter; receive models of management and technologies for manufacture of alternative products, plastic waste recycling and transition to a circular economy and green growth | <b>Activity 1.3 (no sub-activities)</b> - Share international and domestic best practices through virtual or in-person training and consultations |
| Support to embedding the marine litter lens in policies, programs and in mandates of existing national and local law; enforcement bodies; Technical expertise and manpower; <b>Pre-requisite technical and policy studies and baseline research; Pre-requisite technical and policy studies and research;</b> Workshops and consultations | <b>3.3.1</b> Inspect and monitor enforcement of regulations on collection and processing of plastic waste from marine economic activities<br><br><b>3.4.1</b> Prevent and mitigate disposal and loss of fishing gear in connection with strict imposition of mechanisms for handling of violations<br><br><b>3.4.2</b> Inspect and monitor and deal with violations against regulations on marine waste disposal   | <b>Activity 1.4 (and all sub-activities)</b> - Improve local implementation and enforcement of laws, policies, and regulations                    |
| Support to embedding the  | <b>4.4.2</b> Encourage research on and   | <b>VN 1.5.1</b> - Develop   |

|  |   |  |
|--|---|--|
| marine litter lens in policies, programs and in mandates of existing national and local law; enforcement bodies; Technical expertise and manpower; <b>Pre-requisite technical and policy studies and baseline research</b>   | development of systems for marine plastic litter collection and processing with regard to Vietnam’s current situation<br><br><b>4.1.1</b> Commit to resolving marine plastic waste together with the international community, especially with ASEAN member states and other countries bordering the East Asian seas   | Overviews of 3R/SWM Funding Options  |
| Baseline information/studies per material type; <b>SWM systems development</b> ; Policy recommendations; <b>Value chain analysis</b> ; Funds to support <b>pilot testing of innovative technologies, logistical frameworks and approaches</b>  | <b>1.2.2</b> Implement effective models of collection, classification, transfer, and processing of coastal and marine plastic waste<br><br><b>4.3.2</b> Attract international technical assistance and investment in control of marine plastic litter; receive models of management and technologies for manufacture of alternative products, plastic waste recycling and transition to a circular economy and green growth | <b>VN 2.1.1</b> - Assess locally viable technology and infrastructure solutions that may be recommended in future program years or support local/international decision making |
| <b>Identify convenient recycling and reuse markets</b> ; develop a means for collection storage;   | <b>2.1.2</b> Locate plastic waste storage equipment and collection sites in a suitable, safe, and convenient manner, ensuring environmental hygiene and aesthetics  | <b>VN 2.1.2</b> - Track current commodity and reuse markets, quality control specifications and capacity   |
| <b>Identify potential points for business growth and development</b> ; Training and development; <b>Technical expertise</b> and human resources; Consider providing support to national campaigns that are developing social marketing materials and dissemination, or investigate how CCBO can capitalize on these efforts to build and measure longer-term behavior change | <b>1.4.1</b> Encourage organizations and individuals to vigorously recycle and reuse plastic waste, and promote development of a circular economy   | <b>VN 2.1.3</b> - Promote 3Rs by identifying and testing new local business models   |
| <b>Pre-requisite technical and policy studies and research</b> ; Transboundary online database to serve as a hub for data sharing, proper management operations, mobilizing action groups, etc.; Workshops and consultations   | <b>4.1.2</b> Promote in-depth exchange, research and sharing of information and data concerning marine plastic litter with other nations and territories in the region and around the world<br><br><b>4.2.1</b> Maintain and strengthen cooperative relations with international marine organizations   | <b>Activity 2.3 (and all sub-activities)</b> - Engage the private sector on 3Rs  |

As identified in Table 3, CCBO has strong alignment with the NAPMPDM especially in enhancing SWM models following circular economy concepts, building SBC through educational and community efforts, developing effective policy measures with sustainable implementation, and collaborating with international partners on knowledge exchange and data sharing. In particular, the NAPMPDM acknowledges a need for technical expertise, baseline research, and incentives for foreign investment to develop and introduce sustainable SWM technologies.

## 5. Recommendations and Gap Identification

The following recommendations are made with the acknowledgment that this report is based on CCBO's first-year work plan, with three additional program years to follow. In terms of prioritization and timing, addressing historical barriers should come first along with any projects related to data gathering, monitoring and assessment (especially if baseline data is desired before starting other projects). In addition, the support of livelihoods, gender, and inclusion, while called out as a separate section here and as its own Activity in the Year One Plan, should be interwoven into every project so that this is not an afterthought or add-on, but part of the overall CCBO context. Community engagement is also critical at initial stages and years in the program; authentic inclusion in the process will build local relationships. Finally, other partnership creation can be cultivated from initial years, but implemented in subsequent years after developing initial relationships to see if there is alignment with goals and initiatives. CCBO should continue to assess the regional context to leverage projects and programs conducted at those scales as well across all intervention points.

**Addressing Historical Barriers.** The need for expanded SWM in Vietnam continues. The NAPMPDM repeats some of the same provisions called for in the NSGMSW and runs the risk of facing the same difficulties in implementation without examination of current barriers and future funding mechanisms. CCBO Activities 1.4 – Improve local implementation and enforcement of laws, policies, and regulations – and 1.5 – Strengthen the financial sustainability of SWM in CCBO engagement sites – could prove instrumental in providing a model for the application of existing national SWM legislation as well as the proposed NAPMPDM. The current NAPMPDM references a need for national and international level funding but does not address local revenue streams for project implementation. This is something that should be aligned with CCBO and addressed to ensure sustainability of the work.

**Development of SWM Plans.** For land-based sources of plastic pollution, improved SWM systems are fundamental to solving the plastic pollution problem particularly systems tailored for the community. For responses to all land-based sources of plastic pollution, increased use of information instruments is recommended. CCBO Activity 1.2 – Support the development and/or strengthening of long-range SWM Plans in engagement sites – could prove instrumental in providing data and technical assistance to implement appropriate SWM plans.

**Partnerships and Funding.** The NAPMPDM references involving international technical assistance and investment in the control of marine plastic litter, but details are indistinct at this phase. CCBO activities align with this approach by making the necessary connections for international public-private partnerships to help secure feasible and community-tailored SWM systems. The NAPMPDM mentions international governmental assistance but has limited exploration of private-sector focused SWM/3R strategies and

could benefit from the insights gained from CCBO Activity 2.3 – Engage the private sector on 3Rs, and also CCBO Activity 1.3 – Share international and domestic best practices through virtual or in-person training and consultations.

**Scaling Community Engagement.** CCBO’s model of engagement sites as pilot cities with projects across multiple modes of engaging with the 3Rs and SWM could be valuable in demonstrating effective policy and SBC. The SBC model called for in CCBO’s Vietnam work plan is distinctly participatory with a community-specific focus, directly referencing the ineffectiveness of top-down education campaigns. The NAPMPDM focuses on education of consumers primarily through nationwide cleanups and campaigns. Although different in context, findings from CCBO’s SBC research could be examined for learnings in disseminating information and awareness to a wide variety of stakeholders as well as traditional education approaches. CCBO could also explore models to engage local partners to quickly scale effective participatory SBC approaches in conjunction with a national educational campaign and outreach program.

**Waste Research and Policy Enforcement.** CCBO also plans to use household-level research with Trials of Improved Practices (TIPs) to assess ability and willingness to pay. This model is again participatory and works with local partners to test adaptive behavioral alternatives. NAPMPDM could benefit from CCBO’s household-level and business-level research as well as CCBO Activity 1.4 – Improve local implementation and enforcement of laws, policies, and regulations to set binding and measurable targets for plastic waste reduction and robust monitoring, reporting, and enforcement mechanisms. In summary, CCBO could target existing research efforts to inform implementation of the NAPMPDM and play a role in encouraging representation of vulnerable populations such as women, youth, and the informal sector in the local implementation of the NAPMPDM.



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## Annex II. Relevant and Complementary Programs

### NATIONAL ACTION PLAN FOR MANAGEMENT OF MARINE PLASTIC LITTER BY 2030

Download the PDF Report -

[https://www.vn.undp.org/content/vietnam/en/home/library/environment\\_climate/national-action-plan-for-management-of-marine-plastic-litter-by-.html](https://www.vn.undp.org/content/vietnam/en/home/library/environment_climate/national-action-plan-for-management-of-marine-plastic-litter-by-.html).

#### Local Engagement and Supporting Work in Vietnam -

In June 2019, the Vietnamese Prime Minister, Nguyen Xuan Phuc, launched a national anti-plastic waste movement to address the national problem of managing plastic waste, and on September 6, 2020 Hanoi launched a program in which waste is traded for gifts; a move to encourage segregation at source. In collaboration with Tetra Pak Vietnam (a major milk carton producer), Lagom Vietnam (a recycling company) and NHC Social Enterprise, Hanoi launched a pilot program to facilitate the collection, sorting and recycling of milk cartons in kindergartens and primary schools throughout the city.

Furthermore, numerous efforts have been made to educate citizens and enhance public awareness on the marine plastic pollution.

- As a part of the *Japan International Cooperation Agency's Implementation Support for 3R Initiative*, environmental education activities are being carried out to teach Hanoi citizens the Japanese concept of "mottainai"<sup>37</sup> and the importance of the 3Rs.
- *United Nations International School (UNIS)* Hanoi's "Green Grid" plan which includes "learning about the lifecycle of materials and acting as conscientious consumers" and "learning about societies and economies & working towards a more sustainable world", as well as the creation of a *School Recycling 2019 – 2020 Program* in Hanoi have been implemented to raise awareness.
- *Vietnam Recycles* provided educational materials during their second annual Household Collection Program to help residents understand the importance of environmental protection.
- *Panasonic* conducted a UNESCO World Heritage Eco Learning activity at the Thang Long Imperial Citadel to promote environmental awareness among Hanoi's youth.
- The Vietnam chapter of the *Suntory Mizuiku-Education Program for Nature* began in 2015, conducting classes for third and fourth grade children to learn about the importance of water, sanitary management, and the importance of preserving water resources; by 2019, approximately 24,000 children have participated in the program since its inception.
- *URENCO* in Hanoi is working on a plan to separate waste for power generation, in which waste will be separated into many categories such as: recyclable, organic, combustible, and non-combustible waste.
- *HCMC* has turned to private companies such as *The Coca Cola Company* and *Tetra Pak* to help lower the waste management problem. Their work included putting recycling bins around *HCMC* and investing in the waste management system.

There are non-governmental organizations that are investigating, supporting, and developing new methods for solid waste management starting at the local level within villages and cities. One such organization is the Environment and Development Action in Vietnam (Enda Vietnam) which is the Vietnamese member of the international network Enda Tiers Monde based in Dakar, Senegal. Enda Vietnam works with the poor in urban areas including migrants with an emphasis on working with the informal sector of waste pickers, developing community-based solid waste management systems, and raising environmental awareness. One

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<sup>37</sup> "Mottainai" can be translated as "don't waste anything worthy" or "what a waste," and has come to represent environmental awareness. It has been used to encourage people to "reduce, reuse, and recycle" and promote environmental protection. (<https://www.weforum.org/agenda/2019/08/the-japanese-have-a-word-to-help-them-be-less-wasteful-mottainai/> )

of their major projects focuses on HCMC to develop waste management strategies that are usable throughout the country. Enda's previous projects started three IWC cooperative district groups, and the current goal is to expand this model throughout HCMC.

#### **Existing MWRP Grantee Projects in Vietnam -**

In Ha Long City, where two MWRP grantees operate, initiatives to embrace the National Anti-Plastic Movement are adopting new municipal policies. *The Centre for Supporting Green Development (GreenHub)* is a local civil society organization with a mission to connect communities and resources to embrace green lifestyle practices, sustainable production, and natural conservation. GreenHub is currently conducting a project to support the progression in laying the groundwork for a “model cities” approach to waste management in the Cat Ba Archipelago, Hai Phong Province, and Ha Long Bay. The project focuses on researching and piloting scalable environmentally friendly solutions to replace polystyrene contained in buoyancy devices for aquaculture farms. *The Center for Marine life Conservation and Community Development (MCD)*, a member of the Vietnam Zero Waste Alliance (VZWA), is implementing two MWRP grants, both reaching their mid-point, one in Ha Long Bay and one in Nam Dinh. The principal activities in Ha Long Bay involve conducting perception surveys with the fisherfolk community by consulting the Quang Ninh Fisheries Management Branch, Bach Dang Ward of People's Committees, and Management Board of the Fishing Port to understand their awareness of ocean plastic issues and to engage them in project activities. In Nam Dinh, 471 people participated in project activities thus far, which included the completion of a synthesis and mapping of the status of waste collection, transport, and disposal in the project sites. MCD is also working with the Jambeck Research team at the University of Georgia to conduct a Circular Assessment Protocol for the cities of Hanoi and Nam Dinh, as well as finalizing a river trash trap design to pilot and subsequently produce.

*Environnement et Développement du Tiers-Monde (ENDA)* in Ho Chi Minh City (HCMC) is fostering close cooperation between IWC organizations and the Department of Natural Resources and Environment (DONRE) in HCMC to improve the city's SWM system and to increase household compliance with a waste segregation at source regulation. The project continues to support IWC cooperatives by offering training courses on cooperative laws and management to 109 IWC leaders and district managers.

In Hue City, the *Centre for Social Research and Development (CSRD)* collaborated with DONRE and the Ministry of Education and Training to implement activities in nine schools to raise awareness among youth on the impact of plastic waste pollution on the Perfume River and coastlines. CSRD worked with 5,715 students, 500 teachers and administrators, and 100 pilot households. CSRD partnered with a “no plastic” civil society group, the Green Club, and youth unions in the target schools, as well as collaborated with the private sector, such as the SWM firm Hue Urban Environment and Public Works Joint Stock Company.

The *Center for Environment and Community Research (CECR)* completed a project that supports the integration of community-based recycling into the Da Nang City SWM strategy. CECR was actively supported by Da Nang People's Committee, the Ministry of Natural Resources and Environment (MONRE), the city environmental department, city and ward Women's Union committees, and the Youth Union, whose participation was critical to the project's success. CECR built consensus on addressing the problem of plastic waste management and on developing strategies for changing community SWM and recycling practices, which were identified as two of the most important issues in Da Nang's Strategy for Integrated Solid Waste Management to 2025 and Vision to 2050.

*World Wide Fund for Nature (WWF)* on Phú Quốc island, with the support of the District People's Committee, developed an island-wide platform for addressing solid waste and recycling issues which has resulted in 18 commitments from leading hotels and other businesses to switch to other alternatives in place of single-use plastic disposables. This effort is also being promoted by the Phú Quốc Chamber of Commerce.

*Global Alliance for Incinerator Alternatives Philippines Inc. (GAIA)* in collaboration with GreenVietis is focusing

on the implementation of the zero-waste model in Hoi An and on the Cham Islands which are faced with growing SWM issues due to the rapid rise in tourism. It is estimated that approximately 1.5 million tourists visit these sites per year and contribute 0.6 kg of waste per hotel room per day, which is equivalent to three times the typical household waste stream.

### **Additional Information –**



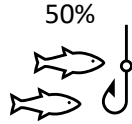
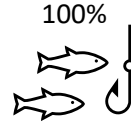


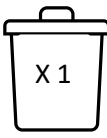

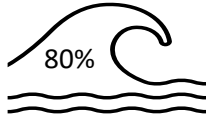
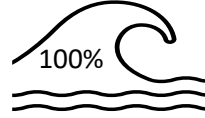
Names and descriptions of high-traffic areas where there is likely to be more waste generated (such as shipping ports, airports, or large markets):

- Large Markets (Wong, 2020)
  - Hoi An Central Market
  - Han Market, Da Nang
  - Hanoi Weekend Night Market
  - Dong Ba Market, Hue
  - Quang Ba Flower Market, Hanoi
  - Binh Tay Market, HCMC
  - Dong Xuan Market, Hanoi
  - Phan Tiet Central Market
  - Ben Thanh Market, HCMC
  - Nha Trang Market
- Floating Markets - Highly Polluted (Tran, 2019)
  - Phong Dien, Can Tho
  - Cai Be, My Tho
  - Phung Hiep, Hau Giang
  - Cai Rang, Can Tho

Names and descriptions of major cultural events that may increase human traffic and waste:

- Major Festivals (Wong, 2020)
  - Lunar New Year (Tet) - Biggest festival of the year. Religious celebration, many fireworks and flower stalls. Largest festival location is Hanoi. January/February
  - Hue Festival - Biannual celebration in Hue City. Includes cultural games, events, and performances and takes place in April/May/June
  - Perfume Festival - Local's go to Hanoi's Perfume Pagoda to pray for a prosperous year and pay respects to Buddha. Includes food offerings, deity statues, and incenses. In February/March
  - Mid-Autumn Festival - Includes paper lanterns, lion dances, and food stalls. Largest location is Hoi An. In Mid-September
  - Hu King Temple Festival - Celebrates the first king of Vietnam in early April. Main event at the Hung Temple in the Phu Tho province.
  - Lim Festival - Celebrates folk singing performances and games. Held in Lim Village in the Bac Ninh province. Occurs mid-February
  - Wandering Souls Day - Families go to Buddhist temples and graves to offer prayers, flowers, and food. Largest location is Hue. Occurs in Early September
  - Hoi An Lantern Festival - A monthly event in the town of Hoi An. All electricity is shut off and establishments only use candles and lanterns for light. Occurs on the 14th day of each month
  - Buddha's Birthday - Temples are adorned with lavish decorations with locals offering fruit, flower garlands, and various Vietnamese dishes. This event often draws thousands of visitors looking to partake in street parades and prayer sessions. Largest Location is Hoi An. Occurs on the 8th day of the fourth lunar month (Early May).
  - Phu Giay Festival - Worshippers pray to the goddess Lieu Hanh for good fortune while carrying bamboo relics and wearing traditional clothes. Festival also hosts many folk games and dances. Occurs within the Kim Thai Commune in Late March to Early April.

Figure A4. NAPMPDM Goals for Vietnam in 2025 and 2030

| 2025 GOAL   | 2030 GOAL  |
|---|--|
|  <p>Reduce marine plastic litter by 50%</p>  |  <p>Reduce marine plastic litter by 75%</p>  |
|  <p>Collect 50% of abandoned or discarded fishing gear</p>   |  <p>Collect 100% of abandoned or discarded fishing gear and halt all disposal of fishing gear into the sea</p> |
|  <p>Eliminate single-use plastics and non-biodegradable plastic bags in 80% of coastal tourist areas</p> |  <p>Eliminate single-use plastics and non-biodegradable plastic bags in 100% of coastal tourist areas</p>      |
|  <p>Conduct nationwide beach cleanup campaigns at least twice a year</p>                                |  <p>Conduct nationwide beach cleanup campaigns at least twice a year</p>                                      |
|  <p>Strive for at least 80% of marine protected areas to be free of plastic litter</p>                 |  <p>Strive for 100% of marine protected areas to be free of plastic litter</p>                               |