



INCEPTION WORKSHOP FOR ASEAN-NORWEGIAN COOPERATION PROJECT ON LOCAL CAPACITY BUILDING FOR REDUCING PLASTIC POLLUTION IN THE ASEAN REGION (ASEANO) AND ASSOCIATED ACTIVITIES

3-6 March 2020



Executive Summary

Representatives from PEMSEA, NIVA, and CSEAS undertook a trip to Cavite, Philippines, facilitated by Cavite PG-ENRO, to study the proposed pilot site for the Philippine sub-component of the ASEANO project, to meet relevant stakeholders, and to launch the sub-component through an inception workshop with relevant stakeholders from the city of Dasmariñas and nearby areas.

During two days of site visits, various sites along the river were visited and documented, and local stakeholders including politicians and academe representatives were met. These visits allowed the project team to obtain a better picture of existing waste reduction efforts along the Imus river. For the river, the project team observed an expected increase in pollution levels as the river moved downstream, and observed numerous areas of waste accumulation and points of waste entry into the river. The university stakeholders, Cavite State University and De La Salle University Dasmariñas, expressed great support for the project and are enthusiastic about becoming involved in the research component of the project. Local politicians were also supportive, and referred us to their various material recovery schemes, which across different jurisdictions performed similar material recovery including producing biogas, recycling plastic into new products such as bags and ecobricks, and creating charcoal.

The Inception Workshop held on 5th March brought together stakeholders and interested parties with the dual aims of introducing these parties to the project and providing an opportunity for the project team to ask questions of these individuals. Local inputs and recommendations were sought on a number of different topics, and these inputs will be used to guide the project going forwards.

A project team meeting comprising of core representatives from Cavite, PEMSEA, NIVA and CSEAS, was held to reflect on the learnings of the previous days and chart the way forward for the Philippine sub-component. Existing information will be compiled into a background report on the Imus river, which will be included as a section within the overall ASEANO project's baseline report. Further smaller meetings and discussions are expected over the coming months, and future in-person meetings are expected around the middle of the year.

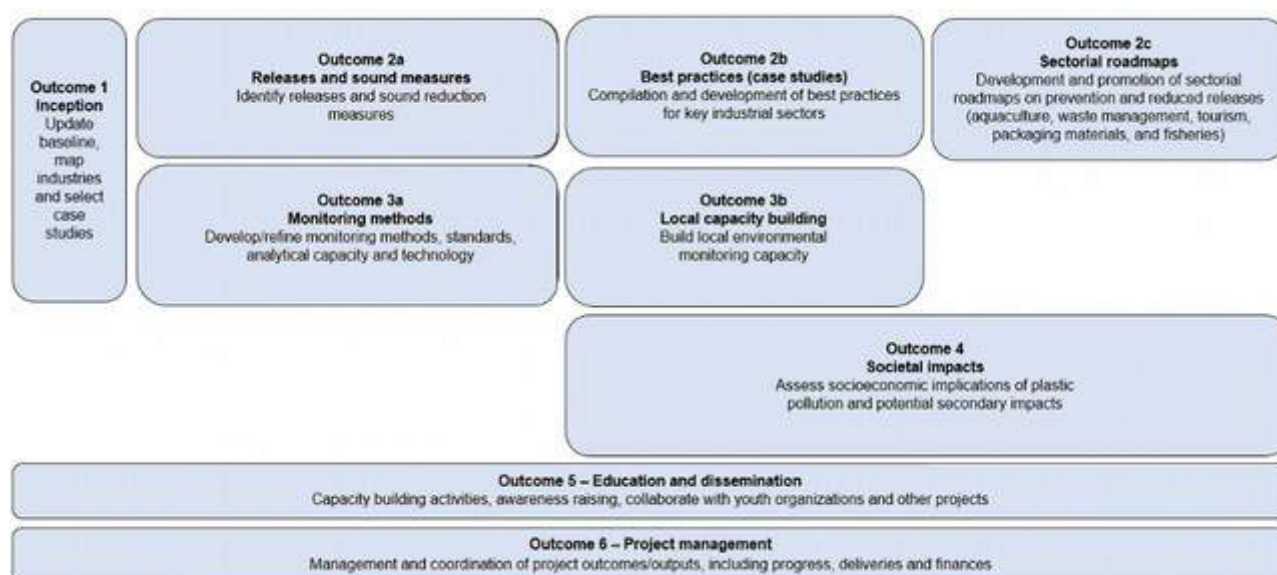
1.0 Introduction

- 1.1 An inception workshop for the Philippine component of the ASEAN-Norwegian cooperation project on local capacity building for reducing plastic pollution in the ASEAN region (ASEANO project) was held on 5 March 2020. In the two days prior to this, the ASEANO project team conducted a number of site visits in the province of Cavite.
- 1.2 This inception workshop follows an overall ASEANO preparatory workshop in May 2018, the official launch of the project with ASEAN level stakeholders in December 2019, followed by local stakeholder consultation and launch of the Indonesian component of the project in December 2019, and two stakeholder consultations in Cavite in February 2020.
- 1.3 The ASEANO project aims to identify and implement best practices for reducing plastic litter in the ASEAN region. Increasing global attention on marine plastic pollution is especially focused around the seas of East Asia, whose surrounding countries produce a majority of the world's plastic waste.
- 1.4 Plastic impacts a variety of industries, including aquaculture, tourism, fisheries, packaging, and waste. Its use and treatment has implications for development, the environment, livelihoods, and human health and well-being. Commonly considered solutions include better waste collection, a reduction of use, and finding and utilizing alternatives.
- 1.5 The ASEANO project was jointly created by ASEAN and Norway to build knowledge and capacity regarding plastic waste in the ASEAN region. Norway has taken a leading role in the international battle against marine litter and microplastic, both in terms of providing funding and knowledge. The potential for Norway to contribute making a difference with respect to protection of human health and the environment in the ASEAN region is large.
- 1.6 The Philippines, with a large population and fast-growing economy, is considered a significant source of plastic waste. The province of Cavite, which contains the southern sections of the metropolitan area surrounding Manila, is one of the country's fastest developing regions. Considering rapid change, alongside the support of the local government, Cavite has been selected as the pilot site for the ASEANO project in the Philippines. Further discussion among project partners and the local government selected the Imus river, and specifically the city of Dasmariñas, as the main area of focus.
- 1.7 PEMSEA (Partnerships in Environmental Management for the Seas of East Asia) is collaborating with partners including the Norwegian Institute for Water Research (NIVA) and the Center for Southeast Asian Studies (CSEAS) Indonesia to institute the ASEANO project in the Philippines.
- 1.8 More information, such as schedules, participants, and the results of past meetings, is provided in the annex.



2.0 Objectives, design, and expected outputs

- 2.1 The four days of this event consisted of three separate events. A series of site visits by representatives of PEMSEA, NIVA, and CSEAS, organized by Cavite PG-ENRO, took place from 3-4 March. On 5 March an Inception Workshop brought together the representatives from these organizations with political representatives from the city of Dasmariñas and its component Barangays, along with provincial bodies, business representatives, and NGO representatives. The final day saw a planning meeting between PEMSEA, NIVA, CSEAS, and Cavite to map the road ahead.
- 2.2 The Philippine component supports the overall objectives and outcomes of the ASEANO project. The philosophy of the project includes a strong focus on including stakeholders and expertise from member states throughout all stages and outcomes.



Overall targeted outcomes of the ASEANO project

- 2.3 Activities under the Philippine component currently fall under *Outcome 1: Inception*.
- 2.4 The 3-4 March Site Visits were a research opportunity for participants from NIVA and CSEAS. The planned itinerary included government offices and research centers, local universities, and various sites along the Imus river. Such visits would allow not only a first-hand understanding of existing programs and capacity, but also a chance to speak to various stakeholders at each site.
- 2.5 The inception workshop on 5 March provided a chance for those from the pilot site, such as local politicians, provincial government employees, business representatives, and NGO representatives to become more familiar with the project and those involved in it. The workshop portion of the day also allowed members of the project team to elicit insight and feedback from those attending on various aspects of the project.
- 2.6 The Partners Meeting on the final day allowed for project members to reflect on lessons learned over the previous days and discuss next steps.

3.0 Site Visits: Day 1 (3 March 2020)

3.1 Cavite State University (CVSU)

- 3.1.1 The first visit was to Cavite State University (CVSU), which has expressed interest in lending their research expertise with the project. CVSU has a history of cooperation with PEMSEA, for example housing the IIMS database.
- 3.1.2 Construction of a Water Testing Laboratory is in the final stage of development. This will provide increased capacity to analyze the contamination of water samples. Also under construction is a 5-story interdisciplinary laboratory, which is in the process of being internally furnished. For coastal management the CVSU has developed the AquaBEST center.
- 3.1.3 CVSU has an established GIS lab states that it has already developed various geodatasets for Cavite, including that of watersheds, barangays, and land use. Maps showing the watersheds and the barangays within those watershed were presented. It estimates that the Imus watershed contains 1.3 million people spread among 214 barangays. (The nearby Ylang-ylang watershed has 0.5 million people spread over 51 barangays).



3.2 Barangay San Jose (Tagaytay City)

- 3.2.1 The next site visit was to Barangay San Jose, a part of Tagaytay City that has become a model for solid waste management (SWM). The barangay covers 418ha and has a permanent population of around 4,693. It is administratively divided into 8 puroks. Due to its location on the Tagaytay ridge, its population grows up to three times on weekends due to tourists. Its permanent population is also increasing, being projected to grow to 5,665 people by 2024.
- 3.2.2 The current captain was first elected in 2013. Solid waste management within the barangay has been a priority for him. Barangays have responsibilities for SWM under RA 9003 (Ecological Solid Waste Management Act of 2000), and to fulfil these San Jose implemented the ECO SIMILA project. A waste amount and characterization study (WACS) was carried out by studying 5 households in each purok for a week. This study found that plastic made up 9.74% of total waste. (48.29% of all waste was biodegradable, and 21.89% was recyclable.) 43.9% of household waste is discarded into rubbish bins, usually into old sacks.



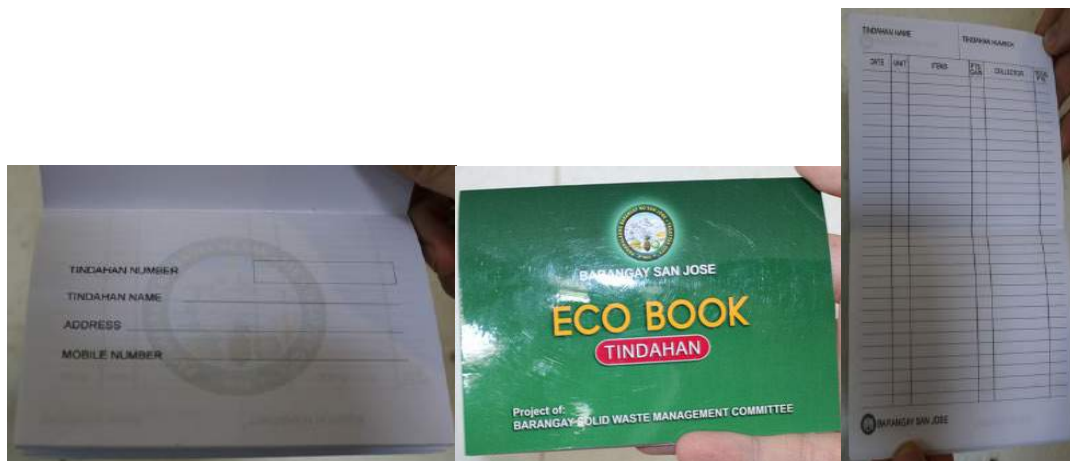
Barangay captain Jojit Desingano

- 3.2.3 The barangay office, which is small and can only hold a handful of staff, is integrated with a materials recovery facility (MRF). This MRF was built starting on 18 December 2015 by the actual barangay staff (eliminating labor costs).
- 3.2.4 IEC regarding SWM is spread by purok leaders. In addition, the barangay delivers an eco-pamphlet to each household during the first quarter of every year. The barangay's elementary school has a competition where students race to segregate waste.
- 3.2.5 The barangays responsibility is to collect waste along the smaller roads. (Tagaytay City's CENRO handles the main highway, which does not have any rubbish bins to disincentivize dumping.) Normal waste is collected 4 days a week, with collection each of those days covering 2 puroks. Recyclables are collected on Fridays, and biodegradable waste is collected on Saturdays. The barangay is also responsible for cleaning Oplan creek.
- 3.2.6 The barangay waste policies were established through barangay executive orders. Executive order 1 from 2015 established a barangay waste council. Executive order 2 from 2016 implemented the "no segregation no collection" policy. Council members must submit a monthly report of activities to receive payment. Barangay San Jose is on of the 15% of Cavite's 829 Barangay's that comply with RA 9003. Dumping sites are monitored to ensure those from outside the barangay do not dump their waste within the barangay.



Segregated waste is collected at the MRF

- 3.2.7 The barangay captain informed the project team that there are incentives to promote eco-bag usage. Furthermore, an "ecobook" is given to each household where they record the waste they put into their recyclables. Each kg of recyclables provides points which can be redeemed for groceries and other household goods at the barangay office. A separate ecobook is provided to students, and points for these can be redeemed for school supplies. Bottles filled with cigarette butts can be exchanged for rice (unclear if this is a separate initiative).



Eco Books are provided to each household to track recyclable waste

3.2.8 The MRF has a number of initiatives to generate value from waste. An eco-community garden grows vegetables, with plastic being recycled for use as plant pots. Women hired at the MRF can earn up to P200 per day. 3 senior citizens are hired to double check the segregation of waste received by the MRF. Others make products for sale, including rugs from old cloth, throw pillows filled with plastic (sold for P100), and paper bags (paper is sealed with a starch-based glue). The MRF has a shredder to cut up residual plastic waste, and a charcoal bricking machine. Charcoal produced by this machine is sold for P30/kg. Cleanup drives are organized for local groups, including youth groups, senior groups, womens' groups, and fathers' groups.



The community garden has bottles filled with plastic as walls, and sells charcoal and paper bags made on site

3.2.9 Aside from these sales, income is gained from businesses in Tagatay City who pay the barangay to collect their segregated waste. In total, recycling earns the barangay a net of P88,000 per month. Livelihood generation adds another P16,260. This money is used to fund a nutrition program and DRRM efforts amongst other things. The barangay has also created the "eco-tipid impok" program that serves as a bank for children, which they can withdraw from when they reach the 6th grade.

3.2.10 Income from the recycling program allowed the barangay to continue to improve their SWM services. Initial income allowed the barangay to secure a dedicated tricycle to be paid by installments. The barangay now has a dedicated garbage truck, which can also be used to take waste they cannot process to CENRO processing areas. An interest-free P1000 loan is available to businesses looking to improve their waste practices. Sari-sari stores get a discount on business permits for reducing plastic use.



- 3.2.11 Recycling work extends to the 8 puroks of the barangay. A rubbish collection fee of P20 per household goes directly to the puroks, not to the barangay. Puroks have their own eco-community gardens, and storage areas for waste destined for the MRF. Each purok now has its own eco-trike to deal with waste collection. A yearly SWM competition is held by the barangay where the puroks can win awards.
- 3.2.12 Experience with SWM meant that Barangay San Jose was able to submit its barangay SWM plan to CENRO-Tagaytay early. Initial waste collected amounted to 1.5 tons/purok/day. SWM practices are targeted at reducing this by 30%, and the barangay has already achieved a 27-28% reduction thanks to diversion of waste to the MRF.
- 3.2.13 According to the barangay captain, the biggest challenge his SWM efforts faced was changing mindsets. He also believed that such solutions are not possible without strong political will. The actions taken within his barangay are seen as a potential model by many, and his barangay has been visited by those from other barangays and even other countries in order to observe Barangay San Jose's waste management practices.



Other initiatives in San Jose MRF

3.3 Silang MRF

- 3.3.1 Immediately downstream of Tagaytay City is the municipality of Silang. Silang has a municipal MRF with a variety of equipment which is used to recycle materials. The MRF is isolated in a field, with a dirt road for rubbish trucks to bring waste in on.
- 3.3.2 A densifier compresses waste plastic into more solid material. This densifier boils plastic in cooking oil, which is in itself waste as it is donated used from restaurants. One sort of ecobrick is made using this densified plastic, with it being combined with gravel in order to assure traction.



Weaker ecobricks made from densified plastic. The gravel is added for traction.

3.3.3 Other ecobricks are created by mixing plastic and other materials. The January 2020 Taal Volcano eruption led to a lot of ashfall in Cavite, and this ash has been innovatively used in the creation of current ecobricks. Ecobricks are 1 part plastic, 1 part white sand, and 3 parts ash. Bricks from previous batches were strong enough to be used in buildings (the material that volcanic ash replaced was not clear), and were used to construct the buildings in the MRF.



3.3.4 Charcoal is also made here, although the machines are far more elaborate than those used in Barangay San Jose.



Charcoal making machine

3.3.5 As Silang is a municipality, it was able to afford more expensive equipment. All the equipment involved in creating ecobricks totalled P3 million. One plastic shredder, for example, costs P300,000.

3.4 Pasipit Bridge

3.4.1 The first point along the river visited was the Pasipit Bridge. The river was shallow and mostly clear, although there was discolored water flowing in from a nearby drain. Small fish were visible in the river, concentrated where the waste water was entering the river. A gray algae flourished in water coming from the drain.



Discolored water (right) flows from a drain into the main river (left).

3.5 General Mariano Alvarez (GMA) MRF

3.5.1 The municipality of General Mariano Alvarez (GMA) was the next location visited. GMA is a smaller municipality at just 11.4km², but is still home to over 150,000 people. After meeting with the mayor, the project team visited the MRF located next to the municipal hall. GMA has three MRFs, each of which fulfils a different function.



Underground biogas system, with biogas being collected through the green pipe.

- 3.5.2 The visited MRF was MRF-3, which takes in biodegradable waste and produces biogas. An underground tank can extract gas from around 400-500kg of waste per day. Mixing this waste 1:1 with water and sealing it in the tank means it undergoes anaerobic digestion, which produces gas which can be used for cooking among other uses. Leftover sludge is extracted and used as fertilizer. A smaller mobile unit can handle up to 25kg/day



Mobile biogas unit

3.6 Conclusion of Day 1

- 3.6.1 Discussions throughout the day yielded some extra useful information. Garbage collection for constituents is often free, but it costs LGUs \$500 per ton of waste dumped into landfills. Thus there is financial incentive to improve Cavite's SWM, especially as it lacks its own landfill. National government can suspend LGU governments over a lack of SWM compliance.

4.0 Site Visits: Day 2 (4 March 2020)

4.1 Imus river sites

4.1.1 Throughout the second day a number of sites along the Imus river were visited. These provided a first-hand look at river management along different stretches of the river. Plastic waste was seen throughout, with there being more downstream than upstream. The areas upstream tended to have quite steep slopes, which were often vegetated. Despite this, the watercourse seemed shallow and the river flow was not fast. These observations were made during the dry season, and so it is expected that in the wet season the river will run faster and with more volume. Downstream areas of the river had a much wider flow and shallower banks. In these areas some houses and other buildings directly abut the river. Roads in these downstream areas are reported to flood regularly.



Steep vegetated slopes were common across upstream areas of the Imus river

4.1.2 One area of note was an area of the river being developed as a public promenade in Dasmariñas. The natural sides to the river have been augmented with rocks held in place with wire, giving the slope a stepped feel. Rubbish pickers were seen here collecting large rubbish from the river, although it was clear that it was not a thorough clean as much waste, especially small items or films, was ignored. The river here was shallow enough for them to walk through the water wearing wellington boots.



Promenade des Dasmariñas is still under construction



Small inlets, trash pickers, and a pipe flowing directly into the river which seems to have waste coming out of it

4.1.3 A downstream area of river near a DENR-IV monitoring station was the location where dredged rubbish was piled onto the riverbank to dry out. Cavite PG-ENRO intends to pay for this piled waste to be transported to landfill in the upcoming months. The river had suspended nets that the project members were informed were for use in aquaculture. This area of the river was also observed to be used for swimming despite the contamination of the water. Downstream areas of the river were noted to be tidal, rising and falling with the waters of Manila Bay.



Banks decrease in height as the river goes downstream, until the river is wide and flat and houses are built right up to the rivers edge.

4.2 De La Salle University Dasmariñas (DLSU-D)

4.2.1 De La Salle University Dasmariñas (DLSU-D) gave the project team a tour around their campus. The tour primarily showed different aspects of the chemistry building, which catered to both research scientists and students. A dedicated biology building is currently under construction. In conversation, the project team were informed that DLSU-D also had undertaken a great deal of social science research, and had the capacity to do more. The project team was given a tour of the Museo De La Salle at the end of the visit.

4.3 Imus MRF

4.3.1 The city of Imus, which lies immediately downstream of Dasmariñas, was the next site visited. After meeting the mayor, who expressed support for the project, the project team proceeded to the Imus CENRO MRF.

4.3.2 Like other MRFs, the one in Imus makes ecobricks, although these are intended only for paving and not for building. Plastic is mixed by manual shovelling (similar to making concrete) in with 1 part plastic to 1 part cement to 6 parts sand. 1 kg of each part (a total of 8 kg of material) produces 120 bricks. Each of these bricks sells for P14.



Hand-mixed ecobrick material

4.3.3 Imus runs its own recycling points scheme. Points are earned by depositing recyclable material, and can be redeemed to obtain household goods. There is also a raffle, with each kg of residual plastic donated providing one raffle ticket.



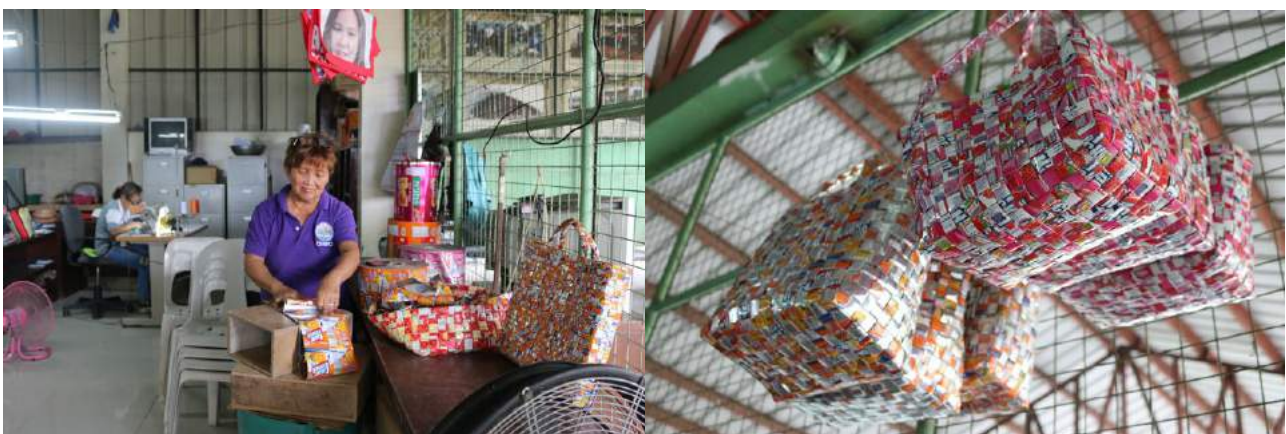
Deposit scheme for recycling material

4.3.4 Charcoal is produced here through a much simpler machine than that used in Silang. Each piece of charcoal was stated to burn for 5 hours. One individual informed the team that 16 pieces sell for P35, although the only packs on display were packs of 30.



Charcoal is made using a much simpler machine

4.3.5 Plastic, such as those from sachets, is cut up by hand and woven together by hand to produce handbags. These are produced in 3 sizes. One individual making them costed them at P50, P100, and P150 (although another individual priced the larger two at P50 and P100). From cutting plastic to weaving the bags, each bag takes a day to make. Along with some other products, they are sold directly from the MRF.



Sachets are cut into plastic threads and woven together

4.3.6 It was claimed that Imus produced 4 tons of plastic residuals per month from households, although project team members considered this figure to seem too low. Another figure provided was an even lower 16 tons per year.

4.4 DENR EMB Region-IVA Water Quality Monitoring System

4.4.1 The Imus river is already monitored for water quality by DENR EMB Region-IVA, and the project team visited a downstream monitoring station. This is one of 8 monitoring stations along the Imus river. Here, water is tested for fecal coliform and some other pollutants. Material that comes in is tested quickly. The capacity to monitor heavy metal levels is expected soon, with some necessary equipment already in place in the building. The Imus river is covered under the Manila Bay rehabilitation plan, which aims for rivers in Cavite to achieve certain cleanliness standards, however the staff member asked did not know if there was a deadline to meet this standard.

4.5 PG-ENRO Cavite

4.5.1 The final site visit was to the offices of PG-ENRO Cavite. Here too there are recycling efforts, with old sachets and similar packing being stitched together into bags. Sachets are even collected from staff themselves in the coffee room. These bags are simpler than the ones made at the Imus MRF, and therefore take less time to create, as they can be completed within an hour using a sewing machine.



Materials for these bags are not cut up, which means the process is faster and easier, but also that extra material is needed (for sewing and for handles) and that it is more obviously recycled waste

4.6 Conclusion of Day 2

4.6.1 At the end of the day, project team members prepared questions and organized for the Inception Workshop the following day.

5.0 Inception Workshop (5 March 2020)



5.1 Opening

- 5.1.1 The Inception workshop brought together representatives from throughout Dasmariñas, from politics, civil service, civil society, and business. This workshop is intended to introduce them to the project and the project team, as well as elicit feedback on particular topics chosen by the project team.
- 5.1.2 Following attendee introductions and a presentation by the Cavite Provincial Capitol Choir, welcome statements were given by Cavite Governor Jonvic Remulla, Norwegian Ambassador Bjørn Jahnsen, and PEMSEA Executive Director Aimee Gonzales. Jonvic Remulla noted that politicians do not have all the answers, and need scientific research to inform decisions. Bjørn Jahnsen spoke of the embassy's plans to align with the government of Norway's green policies, for example by being the first embassy in the Philippines to install solar panels. The embassy also plants trees every year to offset its CO₂ footprint. The embassy promotes waste-to-energy. While this is frowned upon under current Philippine legislation due to the potential for air pollution, the embassy promotes new technology that can ensure there is no air pollution. There is a proposal for a meeting of Norwegian experts and investors to be held in ADB in October this year. Aimee Gonzales discussed PEMSEA and the province of Cavite's long standing partnership, with Cavite being one of PEMSEA's learning sites for implementing ICM projects. Pollution reduction and solid waste management is one of the priority programmes of PEMSEA's regional strategy, the Sustainable Development Strategy for the Seas of East Asia (SDS-SEA). She indicated that if the project is successful, there is tremendous opportunity to scale up and replicate the experience and lessons learned to other areas, not only within the province, but within the country and region as a whole.

5.2 Project Team Presentations

- 5.2.1 An introductory presentation on the project was given by PEMSEA SDS-SEA Project Manager Nancy Bermas. She reiterated the necessity of the project, noting the significant amounts of global plastic that come from the Philippines. Previous studies have claimed that up to 74% of leakage to the environment in the Philippines is from collected wastes, which highlights the need to reduce and divert in the Philippines. She then described the format of the workshop to the participants, and walked through what would happen throughout the day.
- 5.2.2.1 NIVA Research Director Thorjørn Larssen gave the next presentation, starting with the history of NIVA. NIVA was originally formed to clean up a polluted fjord in Oslo, before expanding to other salt and freshwater bodies of water in Norway, and now working internationally. They are an interdisciplinary body combining natural and social sciences. They currently tackle four key topical areas: climate change, biodiversity, environmental pollutants, and sustainable business. They have expertise along the entire chain of plastic pollution.
- 5.2.2.2 He emphasized that plastic pollution is a relatively new issue. There is no historic data, little baseline data, no inclusion in most regular monitoring, no standardized monitoring methods or systems set up for QA, a lack of quantitative data for riverine litter, a lack of knowledge of effects on society and the environment, a lack of data on human health impacts, a lack of data on final fates, a lack of ERA methods and data, and therefore a lack of understanding of best measures. Developing best measure knowledge is crucial.
- 5.2.2.3 The Cavite case study is the second started within ASEANO, with the Bandung case study beginning last year, and a third one in Viet Nam being planned.
- 5.2.3.1 CSEAS Executive Director Arisman than gave his presentation. CSEAS is a regional research center based in Jakarta. Its work focuses on meeting the SDGs throughout Southeast Asia. He notes ASEANO has already been approved by all 10 ASEAN member states.
- 5.2.3.2 The case study in Bandung focuses on the Citarum river, which flows through 9 cities in West Java and Banten. It provides 80% of Java's surface waters, and powers 3 hydroelectric dams. Work on the ground in Bandung is set to start the week after this inception workshop, and maps for the river and the regency. A previous study sampled 9 rivers entering Jakarta bay monthly for 13 months, using 1.5x75m nets to catch waste. Trash booms have also been set up in some places near Jakarta.
- 5.2.3.3 Socioeconomic questions have been raised for this project. One desire is for stakeholder mapping, to understand the role of LGUs in regulations for household waste collection and disposal and what the contribution of the informal sector is, among other questions. Also desired is a map of household consumption, use, and disposal of plastics. Thirdly a better understanding of business interaction is desired, such as the impacts of small and medium enterprises (SMEs), and the viability of extended producer responsibility (EPR) regulations.
- 5.2.4.1 Anabel Cayabyab of PG-ENRO provided more information about Cavite. The province covers 142,606ha, divided among 8 districts, which are further divided into 7 cities and 16 municipalities, which are in turn broken up into 829 barangays. As of the 2015 census the province was home to 3,687,301 people, and has an expected growth rate of 3.37%. 25% of the province was urbanized in 2003, 35% in 2013, and 43% is expected to be urbanized within 2020 according to comprehensive land use plans. Plans by LGUs mean a total of 65% is expected to become urbanized. The province has a 122,574.0560m coastline, and jurisdiction over 93,678.375ha of ocean.
- 5.2.4.2 This urbanization has had a deleterious effect on the natural environment. Despite running from mountains to the ocean (the province is divided into upland, central, and lowland areas), the province has a water deficit. Sea level rise is expected to bring significant challenges to the province. There are only 5 natural sanctuaries in the province.

- 5.2.4.3 The Cavite government is committed to achieving SDG6 (Water Supply and Sanitation). It achieved ICM Certification Level 1 in 2015, when it began the Cavite Water Summit. Subsequent summits were held in 2017 and 2019. Fresh water is classed per DENR regulations in classes AA, A, B, C, and D. AA is disinfection only, B is recreational, C is for fishery and agriculture, and D is merely navigable. The Imus river has 8 monitoring stations to track its quality. (The map of Imus river shown in this presentation was different from the one provided by CVSU, showing Kawit as the end-point not Bacoor, and generally seeming more westerly.)
- 5.2.4.4 In 2019, the Water Summit included a Solid Waste Summit, and discussed the need to establish infrastructure facilities to deal with potable water and solid waste. (Currently Cavite has no landfill, and establishing its own sanitary landfill was one option that was explored.) A 2017 solid waste study noted Bacoor generated the most waste out of all Cavite's municipalities, which was expected as it has the highest population.
- 5.2.5.1 The last presentation was given by Elisa Aguirre of Dasmariñas City Solid Waste Management. Dasmariñas covers 9,013ha, which is divided between 75 barangays. The city is home to 659,019 people.
- 5.2.5.2 For solid waste, the city is aimed to achieve 55% waste diversion by 2020. There are 65 junkshops operating within the city which recycle some waste. The city's eco-center I has 3 500kg bioreactors which convert biodegradable waste into soil conditioners (the conditioners do not meet the legal minimum effectiveness to be called fertilizer). The city intends to build a new sanitary landfill, for which they are awaiting environmental approval.
- 5.2.5.3 In post-presentation discussion, representatives from CVSU noted that recent efforts had moved away from IEC to providing barangays with more technology, and that this has been a more useful strategy. It was also brought up that outright plastic bans were difficult. As a final point, the quality of the river was discussed, where it was noted that the river was still used as a source of fish despite potential health risks.
- 5.2.6.1 A summary of previous discussion and multi-stakeholder consultations was given by Anabelle Cayabyab. The first multi-stakeholder consultation took place on 6 February 2020 at the Cavite Provincial Capitol. Its conclusions centered around a need to improve data. Waste generation data was last measured in 2015. Baseline assessments are needed on biophysical factors, social factors, point sources, and the volume and flow of waste. In terms of existing efforts, it might be useful to replicate methods from the USAID project by DLSU-D on plastic pollution in Manila Bay. CVSU has capacity to undertake watershed delineation studies and biophysical assessments. As an initial point for waste generation, it was noted that Cavite does not have a plastic manufacturing industry, only a plastic retailing industry. Existing MRFs do not have the capacity to handle all of Cavite's waste.
- 5.2.6.2 The second meeting took place on the 28th of February. During this meeting it was decided to narrow down focus to just the Imus river, instead of also including the Ylang-Ylang river. Participants also suggested a full social impact study. Past studies by CVSU and DLSU-D focused only on the implementation of RA 9003. The NGO Caritas noted that while it undertakes IEC throughout its areas of operation, it has no tool to measure the effectiveness of such campaigns.

5.2.6.3 Past ocular visits resulted in some notes of interest. Due to the impending wet season, there is a large cleanup under the Malabon Bridge every May. Material dredged from the river includes some items classed as toxic waste. Most rivers in Cavite meet cleanliness class C, but there is a need to improve monitoring. Under WQMA guidelines, the rivers should be improved to B or SB. A governing board created to fulfil the Clean Water Act is chaired by DENR-EMB, and vice-chaired by the Governor of Cavite (usually represented by Cavite PG-ENRO). Provincial solid waste management boards established in every province include mayors of each municipality, representatives from the provincial legislature, and members of the provincial Government. Potential areas of collaboration between these different organizations include capacity development, environmental profiling, tackling point and non-point sources of plastic waste, and undertaking social impact assessments.

5.3 Local Stakeholder Discussions

5.3.1 The rest of the day was taken up by group discussions, which were introduced by Daisy Padayao. Attendees were divided into four groups, and invited to answer prepared questions by members of the project team regarding different aspects of plastic management and waste: industry engagement, monitoring tools and methodologies, IEC, and social impacts. A synthesis of outputs from these discussions is provided in **Annex V**.



6.0 Project Team discussion (6 March 2020)



- 6.1 The project team (consisting of individuals from PEMSEA, ASEANO, CSEAS, Cavite PG-ENRO, CVSU, and DLSU-D) met on 6 March to discuss the next steps of the project in the Philippines. Discussion was led by Thorjørn Larssen, who focused discussion around a work plan for 2019-2022.
- 6.2 A full baseline report on the Imus river is due in June. This will be prepared by Thomas Bell from PEMSEA, and will bring together previous work, learnings from the site visits and inception workshop, and further discussions with various stakeholders.
- 6.3 Significant discussions emerged about who to use as an advisory group. Anabelle Cayabyab suggested using a solid waste management technical working group that already existed, while Arisman noted that the Philippines' ASEAN contact point, DENR-BMB, should be included in any advisory board. Nancy Bermas noted that DENR-BMB has no specific Cavite representative. In response to a suggestion by Thorjørn Larssen of setting up a small board with Anabelle Cayabyab as head, Anabelle Cayabyab noted that this would need an implementing agreement and MoU. Nancy Bermas suggesting including ASEANO in the existing PEMSEA-DENR reporting mechanism, which would satisfy Arisman's concerns. Anabelle Cayabyab further noted that representatives from all Imus river municipalities should be included on any board.
- 6.4 Ways to study the river system received a great deal of attention as well. It was agreed that industry assessments should be watershed-based. For modelling, it was noted that UP-MSI has a simulation model of plastics in Manila Bay, which showed that plastics from the bay could actually flow into the rivers. For samples, it may be useful to work with WQMA, who currently sample water quality (but not solid waste).

- 6.5 For future contributions, it was agreed that PEMSEA would continue to serve as the main contact point for the project, with PG-ENRO serving as the primary contact point within Cavite. NIVA expected to visit again, perhaps in May or June to coincide with the beginning of the wet season. On academia, CSEAS is drafting a separate MoU with Indonesian university ITV in addition to the one they have with local government, and recommends it as a model. Anabelle Cayabyab agrees that if there are no funds being transferred that PEMSEA would be better served dealing directly with the universities.
- 6.6 On funding and specific sub-projects, Thorjørn Larssen noted that certain funding thresholds trigger different funding processes. Any potential microplastic work would depend on the establishment of appropriate lab facilities. A material flow analysis would be a useful precursor to any socioeconomic analysis. CVSU stated that they could carry out biophysical analysis of the Imus river, while DLSU-D offered to carry out the socioeconomic studies. It was discussed that the socioeconomic studies would focus on Dasmariñas, and perhaps include a few comparison points from other municipalities and cities along the Imus river.
- 6.7 CVSU invited PEMSEA for a study visit to go over existing knowledge and material, looking over past studies and perhaps the IIMS. DLSU-D noted they would share documents, and also could facilitate a visit. Anabelle Cayabyab noted that sari-sari stores were difficult to bring into studies, and suggested that sari-sari mapping take place beginning later this year to ensure sufficient time. There may be 1000-2000 sari-sari stores in General Trias, and up to 100 in any single barangay. Such information can be included in a future socio-economic profile. CVSU noted that previous IEC campaigns missed households, especially women, which was a serious impediment to the studies as this missed demographic is critical in waste disposal. Another difficulty is that residents may be transient, staying for only 6 months or 1 year. There is also a need to be aware of potential issues regarding interviewees, as they may be wary of government surveys due to a fear of displacement or a fear of drug searches.
- 6.8 On copyright and data access, CVSU asks for a provision on data release and intellectual property to be included in any MoU. CSEAS presented the ASEAN logo, which had already been approved by ASEAN. For use in the Philippine-specific project, it was agreed that a line of logos including partners such as the Cavite Government could be included below the existing line of logos.

7.0 Next steps for PEMSEA

7.1 Agreements and Understandings

- 7.1.1 A MoA between PEMSEA and Cavite PG-ENRO will provide a legal basis for Cavite PG-ENRO to implement the project. Due to a need to review on both sides, this may take 1-2 months.
- 7.1.2 Separate MoAs or MoUs may be useful for PEMSEA's cooperation with CVSU and DLSU-D.

7.2 Background Report

- 7.2.1 The background report (or baseline report) for the Imus river and the overall Philippine sub-component is expected to be completed by June. It will form part of the overall ASEANO report.
- 7.2.2 A copy of the draft Indonesian sub-component report is expected in order to try and standardize the sub-reports before joint inclusion in the overall report.

7.3 Ongoing considerations

- 7.3.1 It is expected that there will be meetings between PEMSEA staff and CVSU and DLSU-D staff in order to flesh out details in the background report.
- 7.3.2 This report will provide the basis for further research, such as a profiling of the Imus river and social impact assessment studies. These are expected to be carried out by CVSU and DLSU-D, in coordination with PEMSEA and NIVA. Work plans are expected to be sent to PEMSEA and PG-ENRO in the next month.
- 7.3.3 Another expected area of future study is of industry stakeholders. Planning for this will begin by the end of 2020.
- 7.3.4 The question of the makeup of an advisory group is unresolved. The suggestion of working through existing mechanisms received some support during the Project Team meeting (see point 7.3 above), but the details need to be discussed between PEMSEA and PG-ENRO.
- 7.3.5 Preparations should be made for NIVA's next visit, which is tentatively scheduled for May or June.
- 7.3.6 PEMSEA is seeking to hire a project manager to be based in Cavite, who will have the ASEANO project included within their responsibilities.

Annex I:

Provisional Itinerary for Site Visits

3 March

Time	Duration	Activity
07:00 – 07:30	30 mins.	Departure from the The Bayleaf Hotel
07:30 – 08:15	45 mins.	Travel from The Bayleaf Hotel to Cavite State University (CVSU), Indang, Cavite
08:15 – 09:15	1 hour	Presentation by CVSU Visit to CVSU Laboratory and the Provincial Water Testing Laboratory
09:15 – 10:15	1 hour	Travel to San Jose, Tagaytay City
10:15 – 11:15	1 hour	Visit to a community-based solid waste management at Barangay San Jose, City of Tagaytay
11:15 – 12:15	1 hour	Travel to Silang, Cavite
12:15 – 13:00	Lunch	
13:00 – 14:00	1 hour	Visit to the Silang Material Recovery Facility (MRF) Visit to WQMA Sampling site at Pasipit Bridge (Upstream)
14:00 – 15:00	1 hour	Travel from Silang to General Mariano Alvarez (GMA)
15:00 – 16:00	1 hour	Site Visit to the Material Recovery Facility with Biogas Technology of the Municipal Government of GMA located at Barangay Gregorio De Jesus, GMA
16:00 – 17:30	1 hour 30 mins.	Travel to Bayleaf Hotel
17:30 – 18:30	1 hour	Group Discussion / Synthesis

4 March

Time	Duration	Activity
07:00 – 07:30	30 mins.	Departure from the Bayleaf Hotel
07:30 – 08:30	1 hour	Travel to Silang De La Salle University, Dasmariñas City, Cavite
08:30 – 09:30	1 hour	Courtesy Call and Presentation by DLSU-D Visit to DLSU-D Laboratory Visit to WQMA Sampling site at De La Salle Bridge (Midstream)
09:30 – 10:30	1 hour	Travel to Imus
10:30 – 11:30	1 hour	Visit to Material Recovery Facility (MRF) – Ecological Center of Imus City
11:30 – 12:30	Lunch	
12:30 – 13:30	1 hour	Travel to the Water testing Laboratory of the Environmental Management Bureau Region IVA of the Department of Environment and Natural Resources (DENR-EMB Region IVA)
13:30 – 14:30	1 hour	Presentation of DENR-EMB Region IVA Tour inside the Water Testing Laboratory
14:30 – 15:30	1 hour	Travel to Noveleta Visit to WQMA Sampling site at Magdiwang Bridge (Downstream)
15:30 – 17:00	1 hour 30 mins.	Travel to the Bayleaf Hotel
17:00 – 18:30	1 hour and 30 mins.	Group Discussion / Synthesis

Annex II:

Provisional Itinerary for Inception Workshop

Time	Activity
07:00 – 08:30	Registration
08:30 – 09:00	Invocation Philippine National Anthem Cavite Hymn Provincial Capitol Choir
09:00 – 09:15	Acknowledgement of Guests and Participants
09:15 – 09:25	Welcoming Message Honorable Juanito Victor C. Remulla Governor, Province of Cavite
09:25 – 09:35	Opening Message His Excellency Bjørn Jahnsen Norwegian Ambassador to the Philippines
09:35 – 09:45	Message Ms. Aimee T. Gonzales Executive Director PEMSEA Resource Facility
09:45 -10:00	Objectives of the workshop, format and expected outputs Ms. Nancy Bermas Project Manager, GEF/UNDP SDS-SEA Scaling up Project PEMSEA Resource Facility
10:00 – 10:30	Group Photo and Coffee Break
10:30 – 11:00	Introduction to the ASEANO Project and NIVA's support Dr. Thorjørn Larssen Research Director Norwegian Institute for Water Research
11:00 – 11:20	Coordinating arrangements for the ASEANO Project at the Regional Level Arisman Executive Director Center for Southeast Asian Studies
11:20 – 11:40	Salient Features of the Watersheds and Coastal Management in the Province of Cavite Ms. Anabelle L. Cayabyab, MPA Provincial Government-Environment and Natural Resources Officer (PG-ENRO) Province of Cavite
11:40 – 12:00	Dasmariñas City Solid Waste Management Ms. Eloisa Aguirre City Environment and Natural Resources Officer Dasmariñas City, Province of Cavite

12:00 – 13:00	Lunch Break
13:00 – 14:00	<p>Preliminary Results and Recommendations from the Multi-stakeholder Consultations; Baseline Report on IYRR and Proposed Implementing Arrangements at the Local Level</p> <p>Ms. Anabelle L. Cayabyab, MPA Provincial Government-Environment and Natural Resources Officer (PG-ENRO), Province of Cavite</p>
14:00 – 15:15	<p>Workshop Discussion on the Key Components of the ASEANO Project</p> <p>Four breakout groups will be formed to discuss the following topics: Topic 1: Industry engagement Topic 2: Monitoring tools and methodologies Topic 3: Information, education and communication campaign Topic 4: Social impacts</p> <p>Each topic will be covered for 15 minutes. The four groups will rotate every 15 minutes to cover the 4 topics.</p> <p>Facilitators and rapporteurs will be assigned per topic to guide and document the highlights from the discussions.</p> <p>The facilitators and rapporteurs will consolidate the results of the discussions and prepare the presentations for the remaining 15 minutes. The rapporteurs will present the summary of the discussions for their assigned topics at the plenary.</p>
15:15 – 15:30	Coffee Break
15:30 – 16:30	Plenary Discussion: Presentation of workshop results and consensus building (15 minutes presentation and Q & A)
16:40 – 16:50	Summary and wrap up (NIVA and PEMSEA)
16:50 – 1700	<p>Closing Remarks</p> <p>Honorable Felix Grepo Chairperson, Committee on Environment Sangguniang Panlalawigan, Cavite Province</p>

Annex III:

Provisional Itinerary for Project Team meetings

Schedule	Activity	Responsible Person
9:00 – 12:00	Project team meeting to: <ul style="list-style-type: none">- review the results and recommendation from the Inception Workshop;- finalize the 3-year work and financial plan for the Philippines' component;- confirm the project management and implementing arrangements; and- agree on the next steps.	NIVA, CSEAS, PEMSEA, PG-ENRO and Cavite Network of Learning Centers

Annex IV:

Full list of participants for the Inception Workshop

The following list details participants who took part in the workshop portion. It does not include special guests such as Cavite Governor Jonvic Remulla, Norwegian Ambassador to the Philippines Bjørn Jahnsen, PEMSEA Executive Director Aimee Gonzales, or the Cavite Provincial Capitol Choir.

VI.1 Participants from NIVA

- VI.1.1 Thorjørn Larssen, Research Director
- VI.1.2 Nina Tuscano Buenaventura, Lab Engineer
- VI.1.3 Anne Josephine Nordbø, Coordinator
- VI.1.4 Elin Marianne Karlsson, Social Scientist
- VI.1.5 David Pettersen Eidsvoll, Head Engineer
- VI.1.6 Rachel Rosanna Hurley, Researcher

VI.2 Participants from CSEAS

- VI.2.1 Arisman, Executive Director
- VI.2.2 Muhammad Ichsan Nurbudi, Researcher
- VI.2.3 Ratnawati Kusuma Jaya, Project Manager
- VI.2.4 Khaira Anisa, Administrative Officer

VI.3 Participants from PEMSEA

- VI.3.1 Thomas Bell, Science and Communications Officer
- VI.3.2 Elsie Merina, Programme Assistant
- VI.3.3 Jun Dacaymat, Technician
- VI.3.4 Nancy Bermas, SDS-SEA Project Manager
- VI.3.5 Daisy Padayao, Country Manager

VI.4 Participants from Cavite PG-ENRO:

VI.4.1 Alexander R. Montana, Traffic Aide

VI.4.2 John Neil M. Carungcong, Traffic Aide

VI.4.3 Johnny M. Anito, Admin Aide

VI.4.4 Junie S. Espijon, AA1

VI.5 Other individuals:

VI.5.1 Jessica Itaas, Cavite Economic Zone Representative

VI.5.2.1 Editha Tayko, SM Dasmariñas

VI.5.2.2 Vincent Hodrial, SM Dasmariñas

VI.5.3 Joan Paula Tolentino, CENRO Bacoor

VI.5.4 Alliona Gayle Villaluz, MENRO Novaleta

VI.5.5 Jose Malumay, CENRO Cavite City

VI.5.6 Teresita Nuestro, MENRO Maragondon

VI.5.7 Evangelina P. Pangilinan, MENRO Naic

VI.5.8 Marconi F. Austria, MENRO Rosario

VI.5.9 Sheila Eamiguez

VI.5.10.1 Allan Chua, CAO Bacoor

VI.5.10.2 Marlon P. Cobornay, CAO Bacoor

VI.5.10.3 Gerald Matthew F. Giron, CAO Bacoor

VI.5.11 Elma T. Valenzuela, Naic agriculturalist

VI.5.12 Leonisa P. Morales, MAO Ternate

VI.5.13 Michael Dapdapig, DENR-EMB R4A WQMA

VI.5.14 Lionel L. Dalope Ceso V, DILG Cavite

VI.5.15 Moselle Bobadilla, DPWH Cavite

VI.5.16 Ronita Unlayao, DENR-PENRO

VI.5.17 Alvin Mojica, PG-ENRO Office of the Provincial Administration for Community Affairs

- VI.5.18 Eloisa G. Rozul, PG-ENRO PDRRMO
- VI.5.19 Glenn Miller B. Leyva, PG-ENRO Legal Office
- VI.5.20 Sheila Herrera, PG-ENRO PPDO
- VI.5.21 Gina Perena, PG-ENRO PICAD
- VI.5.22 Reynante Soriano, PG-ENRO PEO
- VI.5.23.1 Donato Barbuco, PG-ENRO PHO
- VI.5.24.2 Arnulfo A. Alcain, PG-ENRO PHO
- VI.5.24.3 Karen C. Dela Cruz, PG-ENRO PHO
- VI.5.25 Darianna Borja, PG-ENRO COPS
- VI.5.26.1 Paul Mark Feranil, PG-ENRO POPCOM
- VI.5.26.2 Nilo C. Bucao, PG-ENRO POPCOM
- VI.5.27 Sheril Mangalina, PG-ENRO HSO
- VI.5.28 Anna May C. Serrano, PG-ENRO PICAAD
- VI.5.29.1 Naureen T. Sustal, PG-ENRO ACTG
- VI.5.29.2 Erllen S. Leonel, PG-ENRO ACTG
- VI.5.30 Anjenneette Canaria, PG-ENRO ACCTG
- VI.5.31.1 Joy L. Paulo, PG-ENRO SP
- VI.5.31.2 Abigael Valereia, PG-ENRO SP
- VI.5.32 Nilo C. Bucao, PG-ENRO PPO
- VI.5.33 Reena Panganiban, PG-ENRO PSWDO
- VI.5.34 Romulo V. Gomez, PG-ENRO CCMA
- VI.5.35 Jun Gregorio, DILG P.O.
- VI.5.36 Joyce Bustillo, Provincial Board Member and 6th District Chairman Environment Representative
- VI.5.37 Raul Rex D. Mangubat, Vice Mayor of Dasmariñas
- VI.5.38 Eloisa Aguirre, CENRO Dasmariñas
- VI.5.39 Jose Zaldy Amoroso, SP Chairman on Environment Dasmariñas Representatives

- VI.5.40 Martha Roberta Barrvon, Public Market Administrator Dasmariñas
- VI.5.41 Leonila Sibugao, Representative of the President of Liga ng mga Barangay
- VI.5.42 Edgar Echon, CPDO Dasmariñas
- VI.5.43 Ryan Losande, Diocese of Imus
- VI.5.44 Amir Andsen, Representative of the Mayor's League President

VI.6 The following academia representatives all attended the Inception Workshop. Some were previously met during site visits, and some later participated in the Project Team meeting.

- VI.6.1 Participants from De La Salle University Dasmariñas
 - VI.6.1.1 Emmanuel Calairo, AVCR
 - VI.6.1.2 Geraldine Zamora, URO-RTEC
 - VI.6.1.3 Johnny A. Ching, URO Director
 - VI.6.1.4 Marlon Pereja, Associate Professor
 - VI.6.1.5 Mario Torres, Associate Professor

VI.6.2 Participants from Cavite State University

- VI.6.2.1 Hernando D. Robles, President
- VI.6.2.2 Noel Sedigo, Associate Professor
- VI.6.2.3 Junser P. Magpantay, PCO
- VI.6.2.4 Glenn Bryan Creencia, Infotech

Annex V:

Collation of inputs from the Inception Workshop group discussions

A. INDUSTRY ENGAGEMENT

Origin of waste

Participants agreed that most single use plastic in the area originates from the food and beverage industry, particularly through food packaging. This is an important industry to consider, and alternatives such as paper bags may be a short-term possibility.

Households are another large factor in plastic waste, and they can be hard to reach. Previous efforts may not have reached women in households as much as they would need to.

The retail industry works in part through a sachet culture, although there is disagreement about how much of this reflects the buying power of consumers.

While not important as the above sectors, other relevant sectors include industrial and economic zones, government offices, business establishments, schools, agriculture, and hospitals.

Impacts and causes for concern

The impacts of plastic waste affect all industries. All sectors are affected by the clogging of waterways, which exacerbates flooding. Mussel and oyster aquaculture along with beach tourism resorts were specifically mentioned as impacted industries. Coastal ecosystems and marine protected areas, including turtle nesting sites, are further worries.

Water pollution in general is a significant issue for many participants, due to the widespread knowledge that current underground water usage is unsustainable.

Possibilities for change

Incentives provided by government for change were widely mentioned, with the note that any systems need to be sustainable. Some incentive systems mentioned were:

- Reward programs to return waste (trash to cash)
- Sin taxes
- Product design modification (eg. away from sachets)
- Rebatelements for compliant/engaged retailers and a recognition system for green business projects
- Government support for alternative packaging (such as bamboo coffee stirrers)

There were calls for collaboration and partnership, and engagement with the university consortium. Participants also noted the solutions would require discipline and commitment.

B. MONITORING TOOLS AND METHODOLOGIES

Suggested research locations

Specific monitoring locations that were suggested were existing trash traps, which are metal structures that can be opened and closed. There are two known to already be in place in Dasmariñas: one in Barangay Buro I, and one in Barangay Salitran. The one in Burl Uno is run by the government, and is cleared weekly (unclear if responsibility is under the Purok or the Barangay). No measurements are currently made of this waste. Seven more potential trash trap locations are being examined by the DENR. The one in Salitran is being run by the Orchard golf course, and is placed upstream to prevent waste entering the course.

As household waste (eg. thin single-use sachets) is considered by participants to be the primary source of waste in the river, one potential barangay that may be useful to research is Paliparan III, which has a high population, including significant numbers of students. Public areas such as plazas are common littering spots, as are abandoned lots. Waste is often dumped near existing piles of waste.

Also suggested where the upstream and downstream boundaries within Dasmariñas, and perhaps midstream points, to be able determine which waste enters the system within the city. Riverbanks with informal settlers present another area of interest. In terms of access, places under bridges such as below the Salitran bridge are easy to access. Waste may differ between the wet and dry seasons.

DPWH has a retarding basin project set to complete in November 2020, which has sites in nearby municipalities and cities. These might be areas that collect plastic waste and need to be cleaned out. The nearby Labac river system has four trash traps in the main river, with eight being installed in its tributaries. Others (made of aluminium wire) have been installed in the Taal Volcano protected landscape in Batangas and are monitored by DENR. Waste from these is sorted and may provide points of comparison.

Existing practices

Existing waste practices include barangays collecting waste from rivers on Mondays. Estimated weight is determined by assessing the volume of collected waste. These estimates are meant to be reported to CENRO, but these reports are not always accurate. Waste cleanup nationwide is reported to the DILG on a barangay level, including with before and after pictures. There is an award each year for the completeness and punctuality of reports. Every two barangays in the city share one collection truck. City garbage collected have rough estimates for the volume of waste they collect, and some sell directly to junk shops.

From public schools, waste is collected every day. The DENR hires “river warriors” to collect waste. Some participants suggest they collect perhaps 100-300kg daily, although others suggest the main river is only cleaned up monthly with the barangays being cleaned up weekly. The weight of collected plastic is recorded.

Single use plastics have reportedly been banned from government offices by the DENR, and CVSU has a plastic ban designed to match national guidelines, and is looking into banning single use plastic completely (Universities can be fined up to P200,000 per day for violating RA 9003 by the DENR). Some commercial chains have switched to more degradable plastics.

Some parts of the Imus river have fences, preventing access and potentially hindering dumping. Jurisdiction over water bodies is not always obvious, as subdivision boundaries are often stream, and some small creeks and easements may be paved over, or occupied by informal settlers.

CVSU cut down on its waste. It used to pay P20,000 a month to transport residual waste, but this is now reduced to every three months.

Caritas Imus carries out IEC for zero waste and circular economy in 83 parishes across Cavite. Two of these are in Dasmariñas.

Dasmariñas has an MRF only for biodegradable waste, unlike nearby LGUs. A past study by CVSU looked at rubbish in a trash trap and found most waste in the river was biodegradable. Participants suggest that a sanitary landfill is needed in Dasmariñas to reduce expenditure on waste transport and fees, allowing funds currently used to transport waste to other LGUs to be redirected. They also noted a need to update the 10 year SWM plan.

There is some public scepticism about segregation, often as waste is mixed by collectors into one truck, making household segregation seem worthless. Some segregation bins are effectively non-functional due to a lack of segregated collection. Sites established for compliance with laws (eg. RA 9003) are often set up without sustainable support systems. On the other hand, a lack of waste discipline is disheartening for officials and collectors. Rules mandating a no segregation no collection policy are sometimes ignored to decrease workloads.

Recording of data

At the moment, barangays fill up pre-existing forms and send them to C-ENRO. This was considered by participants to be the best way of obtaining data from LGUs and other bodies. Manual reporting is widely considered superior to online systems. For students, it was suggested an app could be used for class activities.

A database should be developed to incorporate information from surveys. The contribution of barangays should be maximised, which will require capacity training (for example on classifying plastic). House to house surveys could be manually conducted.

C. INFORMATION, EDUCATION AND COMMUNICATION CAMPAIGN

Suggestions by participants

Community rapid assessment and immersion is a useful structure, especially in Participatory Disaster Risk Assessment (PRDA). This requires community assessment, to identify the educational attainment and background of community members.

One suggestion was to bring back GMRC (Good Moral and Right Conduct) into the school curriculum, and include waste management in that. Also noted was that ways should be found to also educate parents. Proper solid waste management should be integrated into school and university curriculums. Teachers need training for capacity, and training modules need to be developed. This could utilize personnel from DENR who are trained in community education and public awareness. Training modules should be run through focus group discussion and/or general assemblies, and modified based on target participants and audience.

Advertisements and commercials are useful to spread waste management information. Social media can be effective at reaching and empowering youth, such as through SWM monitoring applications. IEC campaigns can also use events such as pageants to spread their message.

Incentives that work include discounts for reusable containers, promotions of ecobags and tupperwares, contests, and awards and recognition. Academe should research environmental policy, and policy makers can be shown as role models with political will and determination.

It was suggested that the project could look into producing soil mixtures, waste-to-energy, refuse derived fuel (RDF), and using plastics in asphalt.

Specific IEC materials that were suggested as useful:

- Audio-visual presentations on subjects such as the life cycle of plastics
- Social media material
- Documentaries and short films (and specifically a Green Film Festival supported by SM)
- LED billboards
- Posters
- Promotions of alternative materials such as Sintra instead of tarpaulin
- Games and other applications
- Infographics

Existing experience

Due to the range of experiences and positions among participants, many skills were offered. Participants had experience of involvement in advocacy campaigns, research and field validation, developing IEC materials, previous experience in waste reduction initiatives, community mobilization, and developing legislation.

- SM noted its support in helping the government manage plastic waste.
- LGU Dasmariñas supported monitoring, mobilization, and information dissemination.
- CENRO can contribute IEC through HOAs and barangays, and provide IEC to manpower campaigns.

Already implemented programs include Basuraffle in Naic, and Walang Plastikan and Basura mo Tikman Mo in Bacoor.

Existing community organization

Numerous community groups exist that could be utilized to effectively spread IEC campaigns. They are on both barangay and city levels, with each group having differing compositions that could be targeted in various ways.

Example local groups:

- Religious groups
- Gender-based groups
- Private schools
- Local LGUs
- Youth sector
- Women's group
- 4Ps (Pantawid Pamilyang Pilipino Program)
- Senior Citizen
- Mountaineers
- Farmers' association
- TODA (Tricycle Operators and Drivers Association)
- Fraternities and sororities
- HOA (Homeowners Association)
- PWD
- Purok leaders
- Solo parents
- SM Foundation
- Fishermen
- Other community-based organization
- Military
- Association of Private Schools
- Association of Zumba Dances
- School Organizations
- Cooperative
- JCIS
- JAYCEES
- KDBM – Kababaihan sa Dasmariñas sa Bagong Milenyo
- Green Ladies
- Shoreline Kabalikat sa Kaunlaran
- Environment Health and Safety Organization - Org. for PCO and Safety Officers (PEZA)
- Pawikan Patrollers – in Naic

Examples from these groups with existing waste-related programs:

- Women's group - segregation, selling recyclables
- Farmers association – composting
- SM Foundation – water recycling, “Trash to Cash” program
- 4Ps, SK, Youth Org. and PWDs – weekly cleanups every morning
- Employees – monthly cleanup
- Youth sector – collection of garbage in subdivision
- Schools – active group in solid waste management
- Subdivision – prohibit junkshop collectors to enter; hire civilian workers as eco-aides; fraternities – involved in weekly cleanup
- Couples for Christ – bringing mugs, reusable plates, utensils during gatherings
- Catholic church – collection of recyclable plastics
- Shoreline – composting and organic farming
- Green Ladies – clean and green programs
- PEZA – monitoring of waste generation

D. SOCIAL IMPACTS

The main challenges and opportunities for managing household waste include:

- Segregation at source and by the collection truck
- Low motivation, participation, awareness, and discipline
- Gaps in social behaviour and between different levels of government
- Improper waste disposal, including having no communal MRFs and no bins to segregate waste in
- A lack of alternatives to some plastic products (eg. sachets)
- A lack of political will, and fear that cracking down will be unpopular
- A lack of capacity at barangay level
- Rate of urbanization and a lack of space

Most effective measures to reduce plastic waste:

- Strict implementation and enforcement of law and policy (more stick than carrot, with incentives moving to penalties)
- Coordination and collaboration between agencies and their partners, including a harmonization of policies and approaches among local communities and municipalities.
- Changing practices, such as bringing reusable containers to stores, or having more vending machines
- Innovative product design and plastic alternatives

Should single use plastics be banned?

- Might work if old practices such as reusable containers are brought back, and manufacturers are on board with this change. However, this would only work with alternatives and with widespread national implementation.
- Producers may find a way around the definition of single-use, and plastic remains cheaper than other options and thus more accessible to manufacturers and to poorer consumers. Poor families cannot afford to bulk buy, and reducing sachets may affect the viability of sari-sari stores.

Annex VI:

Summary report from the pre-inception multi-stakeholder workshop (6-7 February 2020)

I. Introduction

1. The objectives of the subject workshop include:
 - present the ASEANO project on capacity building on marine litter reduction;
 - clarify/ solicit feedback from stakeholders on the project;
 - identify needs, resources, gaps, synergies with other initiatives and opportunities for the province and Dasmariñas City; and
 - identify other relevant stakeholders on the project.
2. The workshop was attended by representatives from academe (CVSU and De La Salle Dasmariñas), national government agencies (DENR (PENRO and EMB-R4A), DILG, DPWH), relevant provincial departments (disaster, planning, legal), private sector (Cavite Economic Zone, SM Dasmariñas, FCIE), LGU Dasmariñas and the Diocese of Imus as representative for NGO. The list of participants is given in Annex 1.
3. Ms. Anabelle Cayabyab, Cavite PGENRO provided the objectives and expected outputs from the subject workshop. PEMSEA provided the introduction to the ASEANO Project.

II. Summary of Discussions

4. The meeting noted the need to gather feedback from other LGUs along the upstream/downstream of the Imus-Ylang Ylang watershed on the ASEANO Project. Only LGU Dasmariñas was present in the subject workshop. It was however explained that the workshop was just an initial consultation and the field visit that will be undertaken after the workshop will also meet other LGUs (e.g., Tagaytay, Silang, Imus) within the watershed and can also get their inputs for the Project. Other LGUs will also be involved in project activities.
5. It was explained that the focus of the Project is the Imus-Ylang Ylang watershed but project activities (e.g., plastic reduction measures) will be piloted in the City of Dasmariñas. It was explained that pilot implementation in one site (e.g., City Dasmariñas) was considered in view of the project timing (i.e., 3 yrs) and budget.
6. It was raised during the meeting the possibility for the Project to consider two (2) LGUs for pilot implementation to allow comparison on their existing management plans, ordinances and their level of implementation, including gaps and challenges.
7. LGU Dasmariñas indicated the need to update their waste generation data; their data is dated 2015. CVSU and De La Salle Dasmariñas both agreed that there is a need to develop a full baseline study of the biophysical and social assessment of plastic waste generation in the area. It was suggested that for manageability, the baseline study can further zero-in into the Imus River, which will be delineated to determine the barangays of the different LGUs within the Imus River that will be included in the baseline study. CVSU has the capacity to undertake the river catchment delineation and the biophysical assessment, including identification of point sources and volume of waste generation. De La Salle Dasmariñas has an ongoing USAID-funded project on plastic pollution study in Manila Bay. The study looks into the volume and types and volume of plastic waste generation,

efficiency of solid waste collection, including a social assessment component that looks into the knowledge, attitude, and practices towards plastic pollution. The project will also apply a modeling software developed by the University of Georgia on the flow of plastic pollution in Manila Bay. This study can possibly be replicated in Imus River. It was also suggested to include Noveleta in the study as this is the coastal municipality next to Manila Bay and may have the highest plastic waste accumulation.

8. LGU Dasmariñas also indicated its high interest if the project will introduce technology/ies for plastic reduction that can be sustained by the LGU after the project. There were queries if there have been assessment/studies on the different technologies/practices on solid waste management and their effectiveness and sustainability. LGU Dasmariñas has an existing biogas, bioreactor and shredder for solid waste management and the only LGU in Cavite with engineered SLF. She also asked if it would be possible for the Project to provide "granulator" that will enable them to save on their cells in the SLF.
9. The meeting also noted the suggestion for the ASEANO Project to look into the existing policies/governance for waste management, their level of implementation and effectiveness and how these can be further strengthened. It is also important to consider the involvement of plastic producing industries in the Project.
10. For the SME group, they reported that they are complying with the different national laws and local ordinances on addressing plastic pollution. They are also implementing various programs on waste management (e.g., trash to cash program). They raised the need for alternatives for plastics, the need to consider other technologies for waste reduction (e.g., those being done in Singapore) and changes in the day-to-day lifestyle of people.
11. The Diocese of Imus, which represented the NGO, presented their ongoing public awareness campaigns in the Diocese in promoting the concept of "zero waste" and circular economy, in response to the Bishop Circular on zero waste. Funding for mobilization of resource speakers and the limitation of resource speakers are their main challenges in implementation.
12. It was also noted that CVSU has undertaken a microplastic study on shells in Bacoor and Calatagan. The study looked into the level of microplastic in shells and health risk assumption based on consumption patterns of the community. The next phase of the study, awaiting funding, is the FTIR analysis of microplastic.
13. The workshop agreed that a meeting will be convened on February 28 in Cavite to present the consolidated outputs from the pre-inception consultation workshop and the field visit prior to the inception workshop in March.

III. Summary of Field Visits

(Further pictures: https://drive.google.com/open?id=1xCAHmR5I_9B_cuvnGGv5lIttAzXjtAjsZ)

14. The PRF staff and PGENRO visited the water testing laboratory in CVSU, which is currently being constructed and the laboratory facilities of De La Salle Dasmariñas. De La Salle Dasmariñas has an existing capacity for basic water quality and bacteriological parameters, and heavy metal analysis. In terms of instrumentation, De La Salle Dasmariñas has UV-Visible spectrophotometer, AAS, HPLC and their medical school have IR.



15. The continuation of the field visit was conducted a day after, on February 7, by PRF and PGENRO staff. The EMB-Kawit Laboratory has existing capacity for basic water quality parameters (2nd floor), and will soon include metals and organic parameters (3rd floor). Regarding the possible visit of the delegation on 3-4 March, PGENRO staff will coordinate with Ms. Kaithleen Aquino which of these days will work for them as it coincides with audit visit to the laboratory.



16. As mentioned above, it was proposed during consultation with the stakeholders to include Noveleta in the study to complete the flow from head upstream in Tagaytay to the mouth of the river in Noveleta, which the group visited. A consideration in visiting Noveleta is the timing of high-tide and low-tide in the place, especially if the group plans to take the group to the Mangrove center, which will entail 10-15 minute boat ride per way.



17. Next, the group visited the Imus Material Recovery Facility and Composting Facility. Afterwards, the group proceeded to the Imus Eco-Center. The Imus Eco-Center is currently being renovated, and trying to complete the works for the inception workshop. One concern in visiting Imus is the time allotted for transport as it eats so much time reaching the area due to congestion as well as narrow streets for the shuttle used in transporting the participants.





18. The group also visited the merging river in Dasmariñas near the Promenade Park. This was brought up during the stakeholder consultation as part of the merging river belongs to De La Salle Dasmariñas, which the LGU is complaining about foul smell from discharge. During the ocular, the foul smell was not present.



19. Next is another MRF in Silang, which compared to the MRF in Imus, did not have foul smell in the surroundings. The facility is located in a vast compound, where the garbage trucks unload their collected waste. The facility also showcased the bricks that were made from the collected ashfall during the Taal volcano eruption.



20. Finally, the group visited Brgy San Jose in Tagaytay, which showcased community based SWM. The Barangay Chairman waited for the group to arrive even past 6pm and toured the group in the facility next to the barangay hall. He briefed the group about the barangay programs on solid waste management and how it gets replicated in each town.



21. An ocular visit was also conducted in Bayleaf Hotel as potential venue for the workshops. Their conference facilities are sufficient for the requirements of the workshop and the guest rooms are presentable for accommodation of the participants.



Annex VII:

Feedback from the second multi-stakeholder workshop (28 February 2020)

The 28th February 2020 multi-stakeholder workshop sought for feedback on a number of areas in preparation for the main inception workshop. The following table was generated live during that meeting:

Existing local policies/regulations for reduction of plastic releases	<ul style="list-style-type: none"> • RA 9003 (CVSU study on compliance to RA 9003 (2019) covering the whole province) • Evaluation of RA 9003 in City of Dasmariñas (De La Salle Dasmariñas, 2012) • Provincial Ordinance 007-2012 – selective plastic ban and promotion of the use of eco-bags (PG-ENRO started monitoring of compliance in Feb 2020) • Amendment to Provincial Ordinance on styrofoam • Regulated use of plastics (Dasmariñas) • Ongoing effort – National Plan of Action on Marine Debris/Litter
Existing local plans for reduction of plastic releases	<ul style="list-style-type: none"> • Cavite SWM Plan 2013-2022 • Dasmariñas SWM Plan
Existing management measures/programs for reduction of plastic releases	<ul style="list-style-type: none"> • SM Dasmariñas – trash to cash program • MRF, dumpsites, recycling facilities and composting centers (SOC Cavite) • Recycling of plastics (Villar Foundation) • PEZA – MOA with DENR on the implementation of environmental policies; Memo Circular 2003-06 – management of solid waste in economic zone; locators have existing SWM Plans which includes recycling and waste reduction measures; PEZA conducts regular monitoring and provides PEZA environmental performance award as incentive; some locators have partnerships with Villar Foundation and ABS-CBN on plastic recycling (possible for the site visit)
Monitoring and research activities on plastics	<ul style="list-style-type: none"> • CVSU – microplastic study in shells (Bacoor) • De La Salle Dasmariñas – plastic pollution study in Manila Bay!!br0ken!! • CVSU pollution loading (point and non-point sources) in Canas, Maragondon, Labac-Alemang
Available data on plastic debris releases (sources and transport)	<ul style="list-style-type: none"> • WACS 2015, Dasma • Data on waste generation and recycling in SM malls • (available simple methodologies to determine waste generation that can be implemented by HH or other sectors)
Existing labs and capacity for analysis (impacts)	<p>De La Salle Dasmariñas - water quality, including metals and bacteriological analysis</p> <p>EMB R4A – basic water quality analysis</p> <p>CVSU Lab – biological and physical lab (for instruction); GIS Lab for external</p>

<p>Training needs and targeted research on plastics</p> <p>Awareness programs on plastics</p>	<ul style="list-style-type: none"> ● Impacts of awareness raising campaigns <ul style="list-style-type: none"> - Zero waste campaign of the Diocese of Imus; started in upland and now moving to lowland; SEARCHDEV Program of Caritas - Proposal to establish refilling stations in church cooperatives in 2020
<p>Areas for cooperation</p>	<p>(how to improve to include assessment of the impact of awareness raising campaign)</p>
<p>Establishment of project advisory group</p>	<ul style="list-style-type: none"> ● Multi-sector partnerships and engagement; arrangements for collaboration ● PSWM Boards – LCEs, Provincial Heads, no private sector & academe; TWG includes academe, NGO, private sector, recycling sector) – can be enhanced to include private sector/SME ● WQMA Board – members are LGUs, multisectoral; government and nongovernment organizations
<p>Gaps and potential risks and constraints</p>	<ul style="list-style-type: none"> ● Political risks; engagement and harmonization of efforts and development perspectives of all the LGUs within the watershed
<p>League of Mayors in Cavite</p>	<p>If possible, invite even the President during the Inception Workshop</p>

Annex VIII:

Documents and photos

Documents and photos from this event can be accessed through the following link:
<https://drive.google.com/drive/u/2/folders/1QaPIFzW9WGccg4IWeSP3pHmbNpFplEQq>

Glossary of selected acronyms

ASEANO	ASEAN-Norwegian cooperation project on local capacity building for reducing plastic pollution in the ASEAN region
CAO	City Assessor's Office
CENRO	City Environment and Natural Resources Office
COPS	Cavite Office of Public Safety
CPDO	City Planning and Development Office
CSEAS	Center for Southeast Asian Studies
CVSU	Cavite State University
DENR	Department of Environment and Natural Resources
DENR-EMBRO 4A	Department of Environment and Natural Resources – Environmental Management Bureau Regional Office, Region 4A
DENR-PENRO	Department of Environment and Natural Resources – Provincial Environment and Natural Resources Office
DILG	Department of Interior Local Government
DLSU-D	De La Salle University Dasmariñas
DPWH	Department of Public Works and Highways
FCIE	First Cavite Industrial Estate
FTIR	Fourier Transform InfraRed spectroscopy
IEC	Information, Education, and Communication
IIMS	Integrated Information Management System
LGU	Local Government Unit
MAO	Municipal Assessor's Office
MENRO	Municipal Environment and Natural Resources Office
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
MRF	Materials Recovery Facility
NGO	Non-Governmental Organization
NIVA	Norwegian Institute for Water Research (Norsk institutt for vannforskning)
PDRRMO	Provincial Disaster Risk Reduction and Management Office
PEMSEA	Partnerships in Environmental Management for the Seas of East Asia
PEZA	Philippine Economic Zones Authority
PG-ENRO	Provincial Government – Environment and Natural Resources Office
PHO	Provincial Health Office
PICAD	Provincial Information and Community Affairs Department
PPDO	Provincial Planning and Development Office
PPO	Provincial Police Office
PRF	PEMSEA Resource Foundation
PSWDO	Provincial Social Welfare and Development Office
RA	Republic Act
SDG	Sustainable Development Goals
SME	Small and Medium Enterprises
SWM	Solid Waste Management
WACS	Waste Amount and Characterization Study
WQMA	Water Quality Management Area