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THE EAST ASIAN SEAS CONGRESS

PEMSEA

Charting a New Decade of

Healthy Oceans, People and Economies

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Collab 14

Replicable Models on Marine Plastic Pollution Monitoring

9 November 2021, 2:00 PM - 5:00 PM (GMT+7)
Online via Zoom

ORGANIZER:

ASEANO

ASEAN-Norwegian Cooperation Project on Local Capacity Building for Reducing Plastic Pollution in the ASEAN Region (ASEANO)

PEMSEA

Partnerships in Environmental Management for the Seas of East Asia (PEMSEA)

East Asian Seas (EAS) Congress 2021

"Charting a New Decade of H.O.P.E (Healthy Ocean, People, and Economies)"

Replicable Models on Marine Plastic Pollution Monitoring

9 November 2021, 2:00PM – 5:00PM (GMT+7)

Organized by PEMSEA in partnership with the Norwegian Institute for Water Research (NIVA) and the Center for Southeast Asian Studies (CSEAS)

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PROCEEDINGS

1. INTRODUCTION

The issue of marine plastic pollution has become internationally prominent in both public and policy circles. Eight million tons enter the ocean annually and consumption is expected to increase. East Asia is reported to produce over half of the plastic waste entering the oceans according to a 2015 report by Ocean Conservancy. Recognizing the region's role in the plastic pollution crisis, the Association of Southeast Asian Nations (ASEAN) issued the Bangkok Declaration on Combating Marine Debris in June 2019 to signify the commitment of ASEAN countries to take concrete actions and collaborate on preventing and significantly reducing marine debris, including plastic waste. The PEMSEA Network of Local Governments (PNLG) has also issued a declaration towards combating the issue (http://www.pemsea.org/publications/agreements-and-declarations/pemsea-network-local-governments-sustainable-coastal). These statements include the application of scientific knowledge to combat marine debris, such as by monitoring to support science-based policy and decision-making.

Much plastic waste in the ocean originates from land, and therefore a 'source-to-sea approach' is needed to handle marine plastic pollution. Additionally, monitoring guidelines and tools must be properly configured to the local context based on institutional capacity and socioeconomic and environmental circumstances. In this regard, collaboration between different countries and communities is crucial for sharing best practices and practical yet innovative solutions to understand how they might be replicated or scaled-up in new areas.

This collab highlighted the lessons learned from the ASEAN-Norwegian Cooperation Project on Local Capacity Building for Reducing Plastic Pollution in the ASEAN Region (ASEANO), and from other efforts in the region to reduce the flow of plastic waste into the ocean. Various projects shared examples of approaches to understanding and tackling the monitoring of plastic pollution issues, while providing peer-to-peer knowledge sharing between presenters and attendees.

2. OPENING OF THE WORKSHOP

2.1 The session was opened by moderator **Arisman, Executive Director of the Center for Southeast Asian Studies (CSEAS)**. He introduced the event as part of the collabs leading up to the East Asian Seas Congress 2021. Noting the investment ASEAN is putting into the issue of marine plastic pollution, Arisman provides, as an example, the ASEAN-Norwegian cooperation project on local capacity building for reducing plastic pollution in the ASEAN region (ASEANO). This event highlighted lessons learnt from this project, as well as other similar initiatives in the ASEAN region.

2.2 H.E. **Ekkaphab Phanthavong**, Deputy Secretary-General of ASEAN, welcomed the participants and thanked them for joining the collab. He also thanked the Government of Norway for its ongoing support for the region. The ocean is under immense pressure and threats, including that of marine plastic pollution. Marine debris negatively impacts economic sectors including tourism and shipping, and the COVID-19 pandemic has magnified existing impacts. ASEAN has committed to tackling the marine pollution crisis, highlighted by the adoption of the Bangkok Declaration on Combating Marine Debres in the ASEAN Region in 2019. The ASEAN Regional Action Plan on Combatting Marine Debris was launched in May 2021. He acknowledged that there are other initiatives throughout the region looking into this issue, including the Sustainable Development Strategy for the Seas of East Asia (SDS-SEA) Implementation Plan 2018-2022 (http://pemsea.org/publications/reports/sds-sea-implementation-plan-2018-2022).

DSG Phanthavong further noted that this collab is aligned with the theme of the East Asian Seas Congress 2021, "Charting a New Decade of Healthy Oceans, People, and Economies", and the ASEAN Regional Action Plan. Given that the issues surrounding marine plastic pollution are complex, it is necessary to be able to make informed decisions on relevant measures, and to have the ability to maintain such measures. He stated that the webinar was an opportunity to share lessons learnt, challenges, and opportunities. We will not only learn from the ASEAN region, in particular ASEANO project locations in the Philippines and Indonesia, but also from nearby areas outside of the region. This collab thus served the role of bringing new insight and practical solutions to the topic. He hoped that this knowledge exchange and collaboration improves the capacity for data collection and management to support policy-making. Together, he told the participants that we can work towards cleaner and healthier oceans and coasts.

2.3 The second welcome message was given by H.E. **Kjell Tormod Pettersen**, Ambassador of Norway to ASEAN. He begun by stating that the ASEAN region is critically located, being part of the central pathway of global maritime trade, and that our oceans are becoming increasingly polluted, and only cooperation can achieve results. Thus, it was good that PEMSEA has brought many relevant actors together to address the issue. Accurate data on waste generation and leakage is to a large extent lacking. More responsive measures are needed for both land and sea based sources. Global estimates are based on models, today's workshop should help improve these models. In the upcoming months we are looking towards negotiating a global treaty on plastic pollution. Joining forces is the only way forwards for this challenge. This collab served as a milestone in the ASEANO project, and Ambassador Pettersen wished all the participants the best.

3 WORKSHOP PRESENTATIONS

3.1 Importance of Monitoring Plastic Production Throughout Southeast Asia

The first presentation on the "What, why, and how" of monitoring plastic pollution was given by **Dr. Marianne Olsen, Research Director of the Norwegian Institute for Water Research (NIVA)**.

While research into plastic pollution is rapidly expanding, there is a lot of information regarding plastic flows and impacts that remains lacking. Over half of studies are still looking at sources and

distribution, with other areas such as harmful effects and preventative measures relatively under-researched. Plastic is predominantly produced and consumed on land, from where it often falls into rivers and then flows into the sea. Rivers act as conveyer belts carrying waste from land to sea. To be effective, marine litter monitoring thus requires monitoring of upstream river areas.

Due to the lack of data in general, we only have estimates based on models with large uncertainties. Waste management needs to be improved, but it is hard to assess the best way without reliable and comparable data. The vast majority of the plastic in the oceans flows through rivers, so being able to accurately assess waste flows is key to understanding how to tackle the problem. ASEANO uses a catchment approach, to assess the entire river drainage flow into the ocean.

There are gaps in existing research such as standardized sampling and reporting, and river studies. Different existing models create very different pictures on the impact of river plastic. All these models are based on highly variable data, and lack a significant amount of verification through ground-truthed data and testing of their predictions. The plastic life cycle is complex, covering both physical processes and human systems. This is where models and monitoring interact, and where they have the great potential to support each other. Better understanding of the overall plastic system would improve the understanding of environmental impact, to better inform policy and regulation, and approaches to improve the system.

3.2 Quantification of Plastic Litter Transportation from River Citatum, Indonesia

The second presentation was given by **Dr. Hidayat S.Kom, Chairman of the Indonesian Society of Limnology**. Hidayat presented the results of the ASEANO project in Indonesia, which focused on the Citarum river. He mentioned that the river was once named the most polluted river on earth. The government is engaging in restoration and mitigation efforts to try and tackle this problem.

The ASEANO project is measuring baseline values for plastic pollution in the Citarum river to anchor future monitoring. Different aspects of plastic pollution are being considered. One approach looks at riverbank zone dynamics, for which 30x30x10cm samples from the riverbank were taken to better understand how plastic settles there. Collection of plastic within the water column was carried out using a trash boon hanging from a bridge. These approaches found that the magnitude of waste in the river varied throughout the year, as does waste composition. This is likely related to rainfall.

Alongside these studies, other types of monitoring were tested simultaneously: visual counting and UAV imaging. Such simultaneous testing allows results from different methods to be compared and thus helps assess the effectiveness of each. The results found with the visual methods were similar to those found through the trash nets. Rain was found to heavily increase waste flows, creating seasonal variation. The effect of the tide was also significant.

3.3 OCEAN CSI: Marine Debris Investigations

The third presentation was given by **Gary Stokes, Operations Director at OceansAsia**. OceansAsia is an NGO based in Hong Kong which researches marine issues. His organization noticed a significant increase in debris around Hong Kong as the use of facemasks proliferated during COVID-19. Similar occurrences have been observed in other parts of the region.

As part of their findings, he mentioned that there is a background of debris outside of facemasks, which can be determined by examining the origin of different debris pieces. Much of the debris appears to come from the fishing industry. These include baskets and trays, oil and fuel cans, polystyrene boxes and buoys, nets, and water bottles.

Using images of coastal debris taken near Hong Kong, it made it possible for them to identify the origin of different types of waste, and thus generate an estimate of the impact of different sources. The debris in examined beaches is mostly comprised of polystyrene and plastic bottles, other types of debris such as abandoned oil drums are comparatively rarer. They welcome collaboration with other organizations to examine beaches from different regions, through the use of photos, including those captured by drones, showing coastal garbage patches.

3.4 Korea National Marine Debris Monitoring Program (KNMDMP)

The fourth presentation was by **Dr. Sunwook Hong, Founder and President of OSEAN**, who presented the Korea National Marine Debris Monitoring Program. OSEAN launched this program to survey beaches with government support in 2008. Their empirical research found much of the debris originated from sea-based sources, which is unusual compared to most studies of marine plastics. One common example of marine debris was polystyrene buoys, often used in offshore aquaculture farms.

This research allowed the government to take specific action with regards to these buoys. The quality of domestic data has improved over time. National training workshops are held 1-3 times a year, and there are checks to compare photos to data in an online database. Citizen scientists have thus been empowered to provide high-quality quantitative data.

The program involves the ROK government through the Ministry of Oceans and Fisheries (MOF), along with a coordinating body, non-profit organizations, and citizen groups. The management body is responsible for reviewing the quality of data generated from the surveys. The research program started with 20 sites in 2008, and has now expanded to 60 sites. Debris is sorted and analyzed, with volunteers noting whether the items came from domestic or foreign sources, and the relevant material and weight. The results gathered from all over the RoK coasts are compiled into an online database. Results are submitted to the government yearly, and these reports are available online to the public.

Overall, she noted that the presence of marine debris has decreased over the program's lifetime, but the proportion of plastic has not. EPS (expanded polystyrene) buoys remain the most common form of debris, leading to specific government intervention to promote alternatives and regulate and ban their future use. This initiative is a model case for cooperation between the government and civil society, and has been noted as an example of best practices in some international forums.

3.5 Community understanding of plastic pollution in Cavite, Philippines

The fifth presentation was given by **Dr. Edwin Lineses, from De La Salle University Dasmariñas (DLSU-D)**. This presentation was on the ASEANO project in the Philippines, with a focus on community understanding of plastic waste and plastic pollution initiatives in Cavite Province.

The study focused on five communities lying along the Imus River. These communities were mostly comprised of women (71%), high school graduates, house owners, employed, married, and had a median age of 42 and an average household size of 5. They had lived in these communities on or near the river for an average of 22 years, and had an average income of around P10,500. These communities, like many lower-income households in the Philippines, practice what is known as "tingi" culture, or a 'sachet economy'. The practice reflects that household goods are usually sold and purchased in small sachets for single use, rather than in bulk.

The DLSU-D team including Dr Lineses carried out surveys on 'willingness and ability to pay', along with 'knowledge attitudes and practices' of these communities, it was found that while many of the public are aware of plastic pollution, and about some of its negative impacts to their communities

and to the ocean, only about a third of those surveyed knew about existing community level initiatives to address plastic pollution. The most well-known initiative was river cleanup activities, which was mentioned by 92% of respondents, rather than the many recycling initiatives in different barangays and LGUs. People understand the issues and are willing to participate in solving the issues, but often don't see or know how they can participate in such activities.

3.6 Adapting Variations in Plastic Pollution Monitoring to National or Local Circumstances

The first session was wrapped up by **Dr. Rachel Hurley from NIVA**, who summarized how the various sessions fed into the wider goal of adapting new monitoring methods. Marine plastic has received the most plastic research attention, although methods are still not harmonized. Methods for validation are also needed. On the coastline, beach surveys are already established.

Monitoring for rivers is harder as they are dynamic and vary, with natural and human modifications. Thus, there is no single system able to be used for a universal baseline model. Plastic movement and accumulation will be unique depending on the context. This means an understanding and explanation of the geographical context needs to be retained in data analysis and in modelling, and models and expectations need to be adjusted to fit each location.

There are different techniques for monitoring. Observation based techniques include drones, cameras, and direct in-person observation. These often only work up to a certain level of waste, after which observers can be overwhelmed. It also only catches floating items.

Nets provide a method for physical interception. This introduces challenges regarding net harmonization and relationship to the river. Trash racks/boons provide the next method, where plastic is trapped along the entire river length. Local context is also important for this method.

All the above methods capture moving plastic, but not trapped plastic. Monitoring and otherwise understanding trapped plastic will require additional studies and new methods to be tested, such as the riverbank surveys in the Citarum river. In general, methods need to be flexible enough to record and perhaps account for potential variability.

Further research and open dialogue is required. We need to understand what each methodology is measuring, and what the implications and learning for each are. We should be taking steps to validate measurements, and work towards harmonization. New methods are needed to fill gaps and unmeasured areas. Local and national solutions have a strong role to play globally.

SIDE SESSION

A second short session was held to tackle regional and global mechanisms to deal with plastic pollution.

3.7 Understanding the State of Marine Litter in the Arafura and Timor-Seas Region and Setting Response Actions

The first presentation was by **Mr. Almerindo Olivera Da Silva, National Project Coordinator for Timor-Leste** within the UNDP/GEF Arafura and Timor Seas Ecosystem Action Phase II (ATSEA-2) Project. This project runs from 2019-2024, involving Indonesia, Timor-Leste, and Papua New Guinea, as well as Australia.

The ATSEA-2 region faces marine debris issues, notably plastics and other derelict fishing gear. A study in East Nusa Tenggara found most resident saw sea-based pollution as more serious than land-based

pollution, and were also aware of the impacts pollution had on marine life. In surveys in Timor-Leste, plastic and other debris from in-shore and off-shore fisheries were the most common sorts of waste.

Going forward, the ATSEA-2 project aims to initiate a citizen science approach similar to that which is in well-established use by OSEAN. Within the ATSEA-2 region, the need to tackle plastic pollution at source has been deemed critical. Better integration of integrated coastal management (ICM) plans into government policies is needed.

Closing up this presentation was a short public communications video on the impacts of plastic pollution.

3.8 A New Global Treaty on Plastic Pollution: Perspectives from Asia and Implications for Monitoring Efforts at Various Scales

The final presentation was given by **Mr. Huy Ho, the EPR and Global Plastics Policy Coordinator for the World Wildlife Fund for Nature (WWF)**. This presentation advocates for the negotiation and approval of a global treaty on plastic pollution. Huge amounts of plastic are now generated each year, of which 11 million tonnes enters the ocean to deleterious environmental and economic effect. The negative impacts of plastic are greater than the market costs, creating a burden on societies. Transboundary impacts mean no country can deal with the issue on their own, leading to the proposal to create a new legally binding global agreement.

As of November 2021, 128 countries have called for such an agreement, and an additional 26 have stated they would consider it. WWF expects that discussions on such a treaty may begin at a UN Environment Assembly in February 2022. WWF has examined how Asian countries may be affected by such a treaty, seeking to incorporate their experience into the broader picture. In a recent report on the matter, WWF that a lack of data, as well as gaps in existing monitoring, were common issues facing Asian countries. Many government agencies also lacked technical expertise and knowledge.

An international treaty might potentially cover topics like EPR and microplastics. WWF suggest a phase-out of certain kinds of plastics, along with more EPR, and international support mechanisms. A global treaty will also need to adopt common definitions, policies regarding the establishment of national action plans and phase-outs of some materials, a reporting mechanism, and capacity building. WWF recommends all states join in the effort to start the conversation on a new treaty, and especially suggests civil society engages with their governments on the matter.

4. OPEN DISCUSSION

The webinar as a whole wrapped up with another brief question and answer session. **Mr. Arisman** selected two questions to ask the speakers.

QUESTION 1: How did the COVID-19 pandemic affect levels of plastic pollution?

- According to **Dr. Marianne OIsen**, NIVA does not have specific statistics on plastic usage in the Southeast Asian region, but it is obvious that there has been an increase in plastic usage. Countries have their own mechanisms when it comes to waste management, but both human and economic resources have been directed towards the pandemic, away from other priorities. While the ASEANO project has not had specific studies on this topic, a NIVA desktop study in India investigated the challenges the country was facing related to COVID-19. That study looked at how the COVID-19 pandemic affected the total amount of waste and the waste management system, as well as problems and health issues facing informal settlers and waste pickers.

- **Dr. Hidayat S.Kom** stated that plastics have seen use due to hygiene benefits in a time of more remote delivery and greater fear of contagion, however this has come with increased leakage into the environment. He notes especially the need to ensure proper management of plastic medical waste.

- **Mr. Gary Stokes** noted that as shown in his presentation, they noticed an increase in plastic medical waste washing ashore near Hong Kong at the very early stages of Covid-19. Alongside increases in medical waste was an increase in the single-use plastic containers being used during 21-day quarantine periods, as well as from an increase in food delivery.

- **Dr. Sunwook Hong** stated that the increase in single-use plastic waste in RO Korea did not include medical waste as that is well managed. However, for other waste the policies of the Ministry of Environment when it comes to single-use plastic was suspended: many food establishments reverted to single-use plastic utensils, and food delivery saw an increase in usage of plastic containers.

- **Dr. Edwin Lineses** shared the thoughts of Ms. Anabelle Cayabyab, Provincial Government Environment and Natural Resources Officer (PG-ENRO). According to PG-ENRO, at the start of 2020, long before the peak of the COVID-19 pandemic, there was already a significant rise in online food deliveries, which resulted in the use of more plastics. Dr. Lineses also shared that a study concluded that daily, the Philippines use an average of 49 million masks. He thus agreed with the previous answers that COVID-19 has contributed to the country's plastic waste.

QUESTION 2: There will be talks of having a global treaty on plastic pollution in the next United Nations Environment Agency conference. How effective will the treaty be as a legally binding regional mechanism on marine plastic pollution monitoring?

- **Mr. Almerindo Olivera da Silva** said that since the treaty is not yet in place, there are ongoing discussions on how effective it may be in the region. When countries find good solutions, they can then discuss on how to work together to tackle this transboundary crisis. In Timor-Leste and Papua New Guinea marine litter is not yet a major crisis as both are small countries. Timor-Leste also does not have a big industry, so there is not much waste produced. However, they still seek to take action now in preparation for future events.

  Timor-Leste and Papua New Guinea will have to effectively coordinate with Indonesia and Australia for any regional mechanism on plastic pollution monitoring. The most important factor is that on a regional level, there must be a MOU or regulations allowing countries to support each other. Managing the issue will be the responsibility of the entire region, not any one country. Countries support each other in industrialization but they must also support and aid in waste management as it is a side-effect of industrialization.

- **Dr. Marianne Olsen** said she is very excited to finally have this treaty. Many things are not yet known but it seems likely there would be a standard monitoring and reporting mechanism incorporated into the text. This kind of monitoring would hopefully not just focus on the environment, but also into how countries can provide the data and information necessary to know the effects of the measures being adapted for mitigating plastic waste.

- **Dr. Sunwook Hong** states that with this new treaty, statistical data collected from waste management, waste being discarded, and plastics in the ocean can be combined to create a data reporting template. It will be easier than harmonizing the beach debris or floating debris monitoring system. When evaluating the treaty's success and failures, there will be a need to have high quality data. Countries in In Southeast Asia can use the model presented by Mr. Strokes to record their plastic debris in beaches and coastlines.

5. CLOSING REMARKS

5.1 The closing remarks were given by Anabelle Cayabyab, from the Provincial Government Environment and Natural Resources Office (PG-ENRO) in Cavite Province, Philippines. This statement shared the importance and impact that plastic pollution and its management has for the province of Cavite, which is a longstanding partner of PEMSEA and an implementer of integrated coastal management.

The Province of Cavite has six rivers that drain into Manila Bay, and a population of over 4 million. It has developed a solid waste management plan to improve the way it tackles the growing pressures caused by the increasing population and economy. Municipalities and cities are expected to establish their own waste sorting and recycling centers.

While many initiatives are ongoing, Cavite recognizes it continues to face a significant challenge. It aims to continue improving its policies and actions, with evidence-based initiatives. In addition to continuing to carry out its own research, representatives are grateful for the various speakers for sharing their learnings and initiatives in this webinar forum, which provides further ideas and inspiration for the Cavite government and other local offices and agencies engaged in plastic management.

Three broad lessons are shared by Cavite. Firstly, public attitudes regarding waste are important, it cannot be solved purely through government action. Secondly, a science-based approach is crucial. Lastly, an organized facility is important, to bring together and focus various capacity and knowledge which may be present, and to implement and monitor relevant solid waste management ordinances.

There is no magic solution to plastic pollution. It needs cooperation between government, business, NGOs, and communities. It will also take time to tackle. At the moment, Cavite is investing in its own research on solid waste management actors in the province, such as those involved in the collection and disposal of wastes. It is benefiting from grants like those provided by ASEANO to look into the plastic management system. The provincial government also looks forward to learning from other locations and to share their own experience towards marine pollution, as well as to other areas of sustainable ocean and coastal development. She invited other participants to visit Cavite and learn more about the environmental programs of the province, including those relating to solid waste management and pollution reduction.

A recording of the event can be accessed at: https://www.youtube.com/watch?v=k988MBCGuUs