CASE STUDY

Cooperation on Management of Marine Plastic Debris[1]

CHOTTHONG, Benjamas
TANAWAT, Tanirat and
JUETHONG, Boonyaporn[2]

1. Background

National economic expansion and change in consumption's behaviors have contributed to an increase in the rate of plastic production and consumption. While current Covid-19 pandemic, economic slow-down and devastation of tourism industry found to have little impact on plastic consumption due to exponential growth in online shopping for foods and other products and greater demand for medical equipment. These situations have contributed to increase use of plastic products and packages.

Production and consumption of plastics have continued to expand for over 50 years due to their lightweight, durability and low production costs. In 2017, domestic consumption of plastics accounted for over 6.07 million tons. Most of plastics are used for packaging while the rest are utilized in manufacturing electric and electronic appliances as well as construction tools. Thailand produced approximately 2 million tons of plastic wastes annually. Of these, around 0.5 tons were recycled, roughly, 1.44 tons were disposed in landfills and approximately 0.06 tons were not properly treated and unintentionally released into marine environments. Plastic wastes are not readily biodegradable and can persist in the ecosystems for relatively long period of time. Some plastic wastes were found to derived from reservoirs in densely populated urban areas, industrial zones and tourism sites on the coastline. In addition, more plastic wastes were reportedly disposed directly into the sea by certain economic activities.

The problem of marine plastic debris and coastal pollution have been identified by the IPBES Global Assessment Report on Biodiversity and Ecosystem Services published by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) as an outcome of the changes in land use and increase in activities on coastal areas which had unprecedented implications to deterioration of marines ecosystems. Overcoming this problem would require efforts to address policy, action and knowledge gaps, particularly in monitoring long-term effects of plastic wastes. This study aimed to gather information on marine plastic debris and their impacts on marine and coastal ecosystems and environments, and to identify gaps in management of marine plastic debris in order to develop policy recommendations that can accommodate current national and global situations on the issue.

2. Situation on Marine Plastic Debris in Thailand

Marine plastic debris can travel over incredibly long distance by oceanic currents and winds and have thus become a problem throughout the world. The wastes were not only found on coastal areas but also presented further away from their origins including on isolated islands in oceans and at North and South Poles. They can be found on water surface, in water column and on sea floors at various depths. Plastic wastes are durable, slowly decomposed over time and able to persist in the sea for hundreds of years, presenting a prevailing risk to lives of marine plants and animals and wellbeing of marine ecosystems.

1 The information sources for the phase 1 of the action plan on management of plastic wastes (2020-2022) by Pollution Control Department, Thailand's biodiversity assessment by Office Of Natural Resources and Environmental Policy and Planning (2020-2022), the reports on development of the action plan on management of marine plastic debris by Thailand Environment Institute (2021), the 2018 and 2019 annual reports of Department of Marine and Coastal Resource and IPBES Global Report, 2019.

2 Research Service Center, Thailand Environment Institute

Information on marine debris in Thailand are mainly derived from 2 sources. The first concerned untreated plastic wastes found on Thai beaches by Ocean Conservation Organizations and other volunteers during beach clean-up activities in 2013. The activities found plastic bottles to be the most common on beaches where plastic straws, candy warping, food containers, plastic bags and polystyrene foam products were also found. The other source was a survey by Department of Marine and Coastal Resources in 2017-2018. The survey found plastic bags and food/beverage containers to be the most common (Department of Marine and Coastal Resources, 2018-2019). Although these wastes were derived from local consumption, some were found to be transported over the border while others were originated from coastal communities, ports, coastal tourism sites, fishing vessels and maritime transportation.

Marine plastic debris are hazardous to and can disrupt lives of marine animals and sea birds in coastal areas. Discarded nets, ropes, rubber bands, balloons and other fishing gears can cause injury, illness, suffocation, starvation and strangulation to marine animals. The animals caught in unused nets, trawls and traps were susceptible to drowning while being tangled with plastic cans, bottles and loops would disrupt the animals' lives and/or growth, causing physical abnormality and even fatality. Marine animals often mistook plastic wastes for food and their ingestion did result in malnutrition, internal injury, intestinal obstruction, starvation and fatality. Once ingested, plastic wastes are not digested and thus accumulated in animals' stomachs, suppressing hunger and the urge to feed and causing malnutrition.

Marine plastic debris deposited on sea floors were found to be mostly discarded trawls and ropes. These wastes reportedly caused habitat deterioration by adversely affected feeding and spawning sites of marine animals and disrupted biological process on the sea floors including by blocking sunlight and obstructing oxygen exchange between water and sediments. The wastes also present a notable problem for coral reefs since discarded trawls found on the reefs can damage and kill coral as well as induce algae growth that accelerate coral death by reducing exposure to sunlight.

Marine plastic debris also pose a significant threat to sea turtles, dugongs, dolphins and whales including species classified as critically endangered, protected by the laws and enlisted by The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). Mass stranding of 3,508 marine animals during 2012-2019 was caused by being tangled in discarded trawls and other fishing gears, lost in navigation, feeding on marine plastic debris and infection in their blood. In 2019, Department of Marine and Coastal Resources reported that 207 from 893 beaching animals were adversely affected by marine plastic debris. Most of them were sea turtles that ingested or were tangled with marine plastic debris.

Plastic wastes can disintegrate to particles of less than 5 millimeter in diameter (micro plastic) and were found to persist in estuaries' sediments, on sea surface, in water column and in marine animals. Microplastics that contaminate any marine ecosystem can enter food chain and enter human body via ingestion of contaminated marine animals.

3. The country's mobilization of policies and actions on management of marine plastic debris

Thailand has cooperated with neighbouring countries to develop plans for management of marine plastic debris since 2015. Several sectors played notable roles in reducing plastic waste and addressing other aspects of the waste problem including by conducting study on biodegradable materials as plastic substitutes for packaging, developing tools for waste collection on beaches and in the sea, adopting measures to encourage the use of biodegradable plastic products by business operators, carrying out a feasibility study on the use of taxation mechanisms in promoting and supporting comprehensive plastic waste management and adopting concepts of circular economy in relevant plans and projects. A specific action plan on prevention and mitigation of marine plastic debris problem is being developed with support from the World Bank in order to enhance comprehensiveness in addressing the sources of the marine plastic debris.

An overview of the efforts to reduce plastic wastes took note of the roles played by private sectors who involved in production of plastics and plastic products, ranging from manufacturers to retailers. These included organizing an association known as PPP Plastic in order to take active roles in mobilizing policy actions and enabling continuous communication to the society. In addition, over 10 business operators jointly announced their policies and targets on reducing plastic packaging and producing packages that facilitate recycling.

In addition, over 20 civil society and international organizations have become aware of the marine plastic debris problem and took actions to support efforts to address the sources of the wastes inlands, on the coastline and in the sea. These included actions to address specific aspects of the problem, meet the needs of specific sites or serve as pilot initiatives of large schemes. They all aimed to mobilize social actions and policy adoption through implementation of measures on information, economic incentive and systematic waste management, particularly waste segregation and recycling.

Nevertheless, actions that brought significant changes at local level have remained to be pioneering in nature and have not yet enabled wider implications of their achievements. Some coastal communities were engaged in plastic waste management. They were, however, found to collect wastes to earn extra income and did not exhibit any changes in behavior to reduce waste generation.

4. Conclusions drawn from analysis of current situation

1) **Plastic waste problem is a common policy agenda:** Marine plastic debris is not a local problem in Thailand since the flow of plastics produced and used occurs through their importation and exportation. The problem itself is transboundary in nature and the origins of the wastes are often too difficult to be identified. International cooperation is therefore needed to fill the gaps and build capacity despite divergence of situations on plastic production and waste management in order to ensure common benefits from reduction of impacts on marine environment.

2) **Prioritizing production and utilization of plastics and management of plastic wastes with emphasis on voluntary over mandatory:** Thailand adopted the concepts of circular economy to minimize wastes from production and utilization. The IPBES Global Report recommended switching to sustainable production and consumption, pursuing reduction and alteration of wastes and by-products, disclosing information on practices concerning reduction of pollution or wastes, enabling regulation and prosecution, promoting efficiency in resource use and alterative economy and providing markets for sustainable supply chains. Thailand has adopted these recommendations with exception to those related to the use of legal measures to enable regulation and prosecution.

3) **Participation and adaption by business sectors:** The country's actions have been consistent with IPBES's recommendations on enabling consultation to determine roles of stakeholders and ensure mutual supportiveness for needed reforms. The stakeholders themselves are comprised of intergovernmental organizations, the states, NGOs, the public, local communities, funding agencies, scientific and education organizations and the private sector. Of these stakeholders, Thailand needs to pay more attention to scientific and education organizations and addresses concerns of local communities, fishermen and tourism operators in coastal areas when significant change occurred in such areas.

4) **Any change requires options, knowledge and communication:** IPBES placed a particular focus on development and utilization of scientific knowledge, innovations and technologies as tools in identifying options and addressing problems. Technical gaps have continued to persist in adopting the concept of circular economy, understanding types of plastics, microplastics and their substitutes, monitoring and preventing impacts of marine plastic debris on marine animals and ecosystems, identifying options to avoid using plastics commonly found on beaches and in the seas and seeking means and ways to retrieve lost fishing gearss. In addition, information gathering and communication employed in efforts to build greater awareness must reach out to wider audience.

5. Policy recommendations

Based on current situation and actions taken in Thailand and recommendations put forward by the IPBES Global Report, specifically targeted interventions to propel tremendous changes for achieving common targets should be adopted. These include legal and policy reform to stimulate and support change in resources management and consumption and individual changes in behavior and habits that may collectively drive adoption of laws and policies. To this end, three policy recommendations were identified for management of marine plastic debris as follow;

1) **Conducting study and research to develop new knowledge and innovations** on plastic substitutes and alteration of products that are known to have adverse impacts on marine ecosystems including containers, packages and utensils related to food and beverage as well as fishing gearss. These may include studies on products' life-cycle, impacts of marine plastic debris on biodiversity (particularly rare marine animals) as well as microplastics contamination in marine animals and ecosystems and its impacts on food chain.

2) **Controlling and enforcing laws on release of plastic wastes into the sea** by ensuring collection and segregation of wastes from every sources, providing for proper waste disposal facilities in coastal areas and on islands, regulating single-use plastics at tourism sites in coastal areas and on islands and making the disclose of information on commercial fishing gears mandatory, particularly trawls which are often lost in commercial fishing.

3) **Protecting and rehabilitating marine and coastal ecosystems** by developing guidance and rules to protect marine protected areas and other vulnerable sites, supporting regular clean-up on coral reefs and seagrass beds, organizing training and other capacity building activities on rescuing marine animals affected by fishing gears and plastic wastes for sea protection volunteers and civil volunteers for marine and coastal protection and building international cooperation on development of databases and monitoring on marine plastic debris.

Cross-sector cooperation is critical for the above-mentioned actions. Decision-makers, however, can also achieve sustainable changes by effectively elevating and revising legal and policy tools, enabling reforms and phasing-out subsidies and counterproductive policies and adopting additional measures that are necessary for reform in longer term. Appropriate options should be offered at local levels and policy innovations should be tested and adopted as pilot initiatives. In addition, networks of marine protected areas should be expanded and effectively managed in order to enhance protection and connectivity.