

Tackling the Challenge of Marine Plastic



Japan International Cooperation Agency

Marine Plastics: The Problem and Sources

The Problem of Marine Plastics

We use plastic products, from plastic bags to plastic containers to plastic bottles, in nearly every aspect of our daily lives. Most of these products are used only once and never again. Once discharged into the ocean, this unwanted plastic becomes nearly impossible to recover. Over time, it also has the potential to affect marine environments. According to a report presented at the World Economic Forum Annual Meeting 2016, the annual amount of plastic waste discharged into the ocean is estimated to be at least 8 million tons worldwide. Without corrective action, by 2050, the weight of marine plastic litter is expected to surpass the weight of the ocean's fish. Reports indicate this large amount of spilled plastics flowing into the ocean has various harmful effects. It impacts the marine environment and ecosystems; interferes with ship navigation; affects tourism and fishery; and has an impact on residential life in coastal areas. Moreover, this waste contains microplastics, small bits of pulverized plastic generated by waves and ultraviolet rays. Reports suggest this microplastic accumulates in the bodies of marine microorganisms. Plastic is convenient. It has brought various benefits and conveniences to our lives and permeated society and the world economy in a relatively brief period. At the same time, this large amount of spilled plastic waste flowing into the ocean is creating environmental pollution issues on a global scale. Combating this problem has become one of the global community's major challenges.



Roughly 80% of Marine Plastic Originates on Land

It is said that approximately 80% of marine plastic litter is from plastic products disposed of on land, which then migrate to the ocean via rivers and other pathways.*¹ The life of plastics such as cling wrap, plastic bottles, disposable spoons and forks, and other one-way plastic products ends with a single use. These products, not adequately managed on land, eventually flow into the ocean and become marine litter.

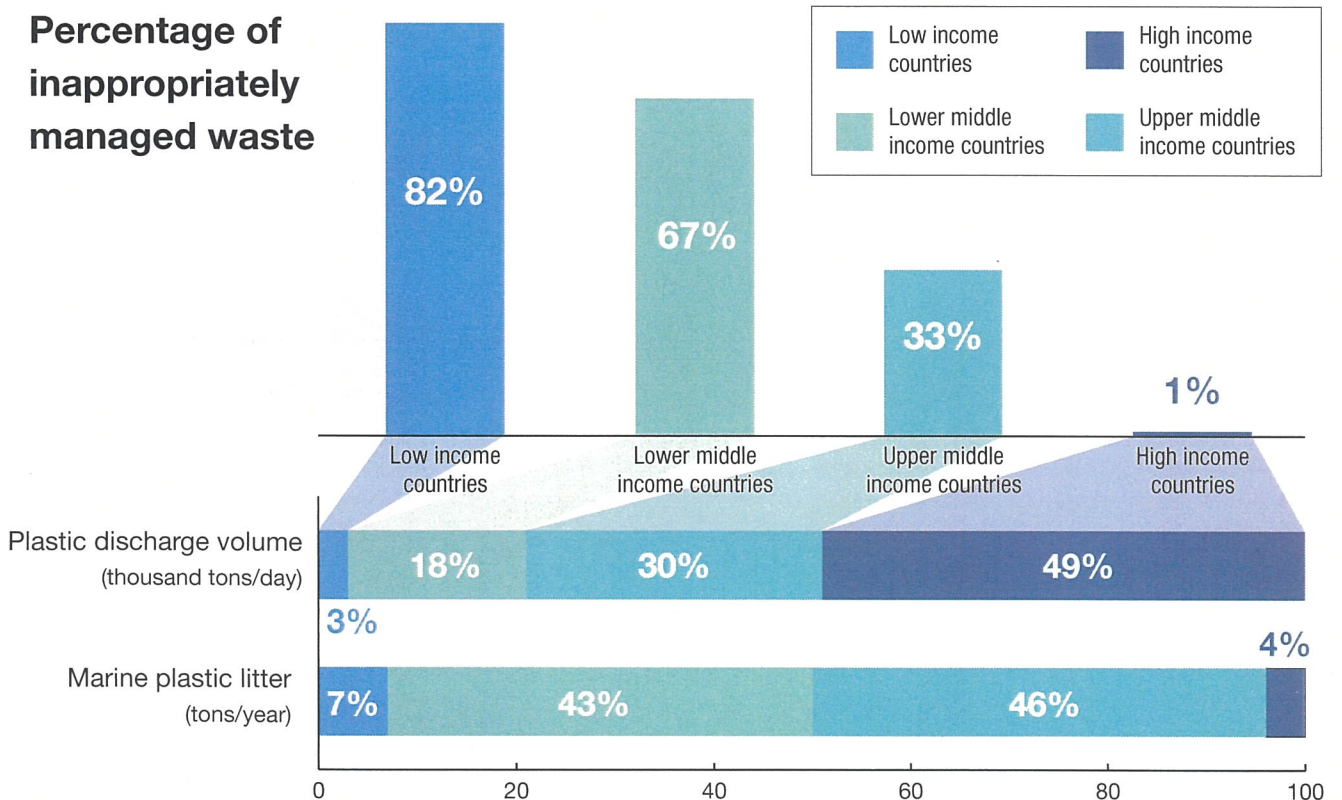
*1: McKinsey & Company and Ocean Conservancy (2015)
"Stemming the Tide: Land-based Strategies for a Plastic-free Ocean"

The Key: Waste Management in Developing Countries

A study released in 2015 estimated the annual amount of plastic waste discharged from land and into the ocean.*² According to the study, the total amount of plastic waste generated is nearly identical between low/middle income countries (developing countries) and high income countries (developed countries). However roughly 96% of the plastic waste flowing into the ocean appeared to be coming from developing countries. The main reason for this is the difference in waste management capabilities between developed and developing countries. According to the study, the total amount of inappropriately managed waste accounts for 82% in low income countries, 67% in lower-middle income countries, 33% in upper-middle income countries and 1% in high income coun-

tries. It is clear that countries with lower income levels tend to have a higher percentage of inappropriately managed waste. Since some 80% of marine plastic originates from terrestrial sources, improving waste management (primarily on land) and preventing the flow of waste plastic into the ocean from developing countries is the key to solving the marine plastic problem in the international community. Nevertheless, these figures are estimates only; they are neither firm nor an accepted international consensus. Further collection of scientific knowledge and development of measurement methods are other important challenges facing the international community.

*2: Jambeck et al., (2015) "Plastic Waste Inputs from Land into the Ocean," in *Science*, Vol. 347, Issue 6223



Created based on Jambeck et al. (2015).

Marine Plastics: Moving Toward a Solution

International Community Initiatives

The efforts of the international community to counter the problem of marine plastic litter have accelerated in recent years. In the Leaders' Declaration of the G7 Summit held in Germany in 2015, the marine plastics problem was mentioned for the first time. Recognition that this problem is a global challenge spread to the international community thereafter. At the United Nations Environmental Assembly in March 2019, the issue of marine plastics was taken up as a central issue. A resolution was adopted for marine plastic pollution and microplastics. It includes setting concrete measures that the international community could take, such as strengthening the foundations for scientific knowledge, establishing a new platform with the participation of diverse entities, and progress reviews

on various international initiatives.

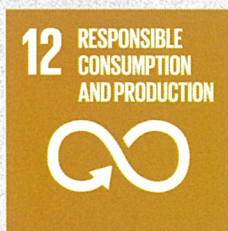
In addition, led by the Japanese government, the "Osaka Blue Ocean Vision" was presented at the G20 Osaka Summit in June 2019. The goal of ending all additional flows of marine plastic into the ocean to zero by 2050 was set. The Implementation Framework for Actions on Marine Plastic Litter was also declared to promote concrete initiatives by individual countries in line with the "G20 Action Plan on Marine Litter". Going forward, information will continue to be shared on measures taken at the country level. Initiatives are also expected to expand this move to countries and regions outside the G20.

Marine Plastic Litter and SDGs

Addressing the problem of marine plastic litter has the potential to contribute to the achievement of several Sustainable Development Goals (2030 Agenda for Sustainable Development) set by the United Nations in 2015.

- **Goal 11 Make cities and human settlements inclusive, safe, resilient and sustainable.**
- **Goal 12 Ensure sustainable consumption and production patterns.**
- **Goal 14 Conserve and sustainably use the oceans, seas and marine resources for sustainable development.**

SUSTAINABLE DEVELOPMENT GOALS



JICA Assistance

As stated above, most plastic flowing into the ocean appears to originate on land. Appropriate onshore waste management is an important tool in combating marine plastic litter. JICA has provided comprehensive, multifaceted support for improving waste management in developing countries. This includes understanding the issues and conditions related to waste management; establishing and strengthening waste collection and transport systems; reducing waste by promoting the 3Rs (reduce, reuse, recycle) and other initiatives pro-

moting effective operation, maintenance, and management of final disposal sites; and helping to train personnel and establish legal and organizational systems. The evidence suggests developing countries account for the majority of marine plastic litter. By drawing on extensive expertise and experience in waste management to assist developing countries, JICA will continue to seek to solve the marine plastic problem, one of the major challenges facing the international community.



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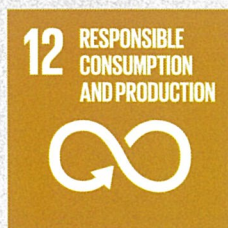
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JICA Initiatives on

Reducing marine plastic litter will require a broad range of measures. These range from switching to alternative materials in manufacturing; heightening consumer awareness to reduce consumption and disposal volumes; implementing more efficient collection, recovery, and transport; promoting resource circularity through intermediate processing; and appropriate development and management of final disposal sites to prevent marine plastic outflows. JICA deploys a diverse range of schemes to help solve the marine plastic problem and improve

overall waste management capabilities. In addition to loan aid, grant aid, and technical cooperation projects, its assistance extends to grassroots technical partnerships with NGOs, municipalities, and other bodies; private sector partnerships that draw on the exceptional technologies and expertise of private sector companies; and the Science and Technology Research Partnership for Sustainable Development (SATREPS), a joint program with the Japan Science and Technology Agency (JST).

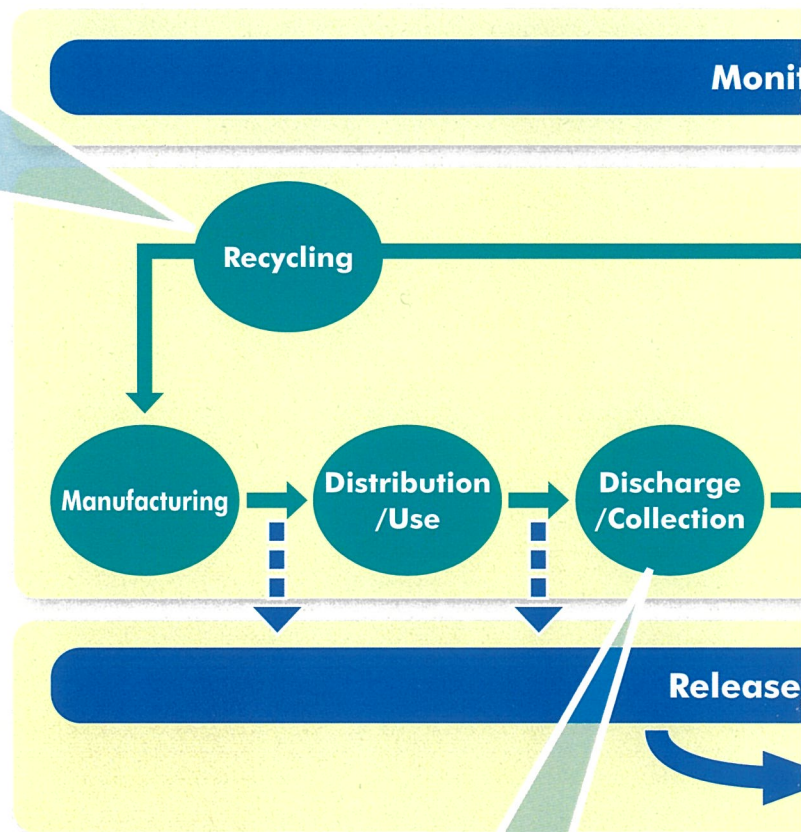
Plastic Recycling

- Private Sector Partnership Project: Feasibility Study on Establishing a Resource Recycling Enterprise in Cebu, the Philippines (2014–2015)

As the country's economy and population grow, the volume of waste generated in the Philippines has continued to increase. Stimulating the plastic and material recycling industry has a major role in promoting resource circularity. GUUN Co., Ltd., a company with headquarters in Yokohama, Kanagawa Prefecture, has developed technologies for manufacturing fluff fuel from waste plastic. It has established an intermediate processing facility in Cebu and cultivated a business that separates waste plastic from other waste materials for fuel manufacture.



GUUN's Recycling Facility in Cebu



Improving Waste Collection Systems

- Development Study: The Study on the Solid Waste Management in Dhaka City (2003–2006)
- Technical Cooperation Project: Project for Strengthening of Solid Waste Management in Dhaka City (2007–2013)
- Grant Aid: The Project for Improvement of Solid Waste Management Equipment (2016–2019)
- Technical Cooperation Project: Project for Strengthening of Solid Waste Management in Dhaka North City, Dhaka South City and Chittagong City (2017–2021); and others.

The first key measure in ensuring effective management of waste products is the secure collection of discharged waste and the transportation of this waste to an intermediate processing facility or disposal site. In Dhaka (now divided into Dhaka North City and Dhaka South City), the rapidly growing capital of Bangladesh, processing the city's increased waste volume has posed a major social challenge. Since the early 2000s, JICA has supported the city in establishing an appropriate waste collection system based on various schemes, including technical assistance, grant aid, and overseas cooperation volunteers. The waste collection rate in Dhaka increased from 44% in 2004 to 80% in 2017.



Regular Waste Collection at Fixed Points in Dhaka North City (Collection vehicle purchased with the JICA Grant Aid (2016–2019))

Marine Plastic Litter

Plastic Resource Recovery

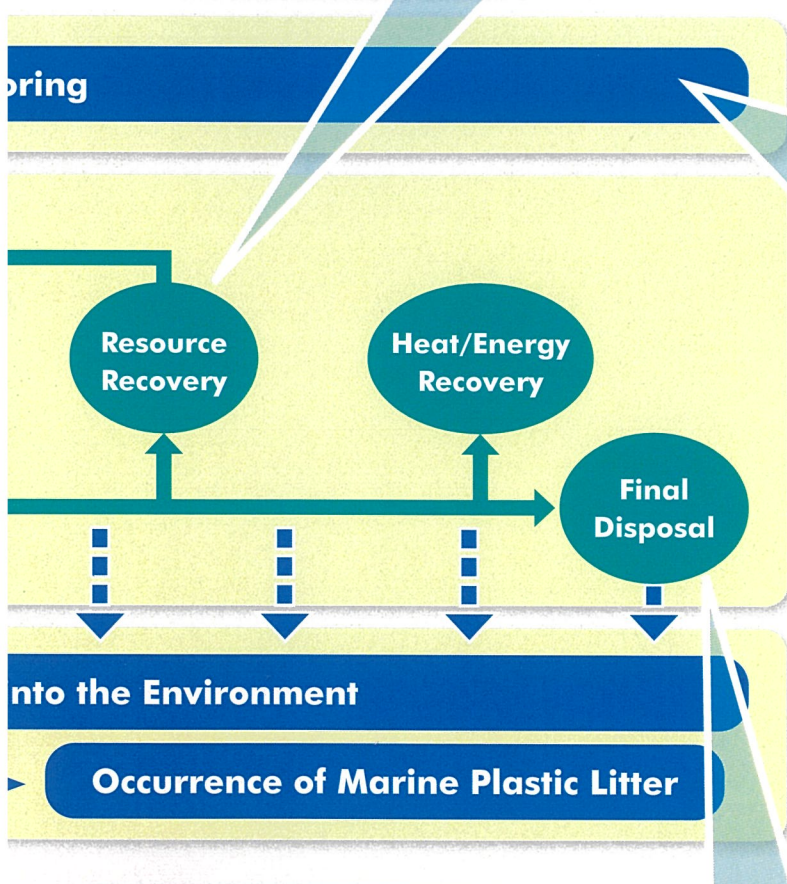
- Technical Cooperation Project: Promotion of Regional Initiative on Solid Waste Management in Pacific Island Countries Phase 2 (J-PRISM2) (2017–2022)

Building a waste plastic collection and recycling system is a key to preventing marine plastic pollution. JICA supported the Marshall Islands in establishing a container deposit program* to raise recovery rates for beverage containers. Since the start of the program in August 2018, the Marshall Islands has collected over 5.0 million plastic bottles annually, helping to reduce the illegal disposal of these bottles into the ocean.

(※) When products in containers are sold, a deposit is added to the price. The deposit is refunded when the containers are returned.



Plastic Bottles Collected through the Deposit Program (Marshall Islands)



Clarifying the State of Marine Plastic Litter

- SATREPS: Formation of a Center of Excellence for Marine Plastic Pollution Studies in the Southeast Asian Seas (2020–2025)

A partnership between Kyushu University and other research institutes in Japan and Chulalongkorn University and other research institutes in Thailand will pursue studies in Thailand that encompass the analysis of the volume of marine plastic generation, investigations of current levels, and research on how this plastic affects the marine environment. Recommendations based on the results of these studies will be submitted to government agencies.



Plastic Waste Litter on a Beach in Thailand

Preventing Plastic Outflows from Disposal Sites

- Grant Aid: The Project for the Construction of National Landfill (2018–2020)
- Technical Cooperation Project: Promotion of Regional Initiative on Solid Waste Management in Pacific Island Countries Phase 2 (J-PRISM2) (2017–2022)

Improper management at final disposal sites can lead to waste being dispersed, which negatively affects the surrounding environments and generates outflows of plastic and other waste into the ocean. Through a Grant Aid (2018–2020), JICA supports Palau in building a new disposal site. Through a Technical Cooperation Project (2017–2022), JICA provides support for the extension of the embankment slope at the existing disposal site and establishes systems to ensure effective operation, maintenance, and management. This prevents the scattering of waste, including waste plastic, from the disposal sites.



Palau M Dock Final Disposal Site (rendered with UAV imaging)



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