

## *Original Paper*

# Policy Analysis and Cooperation Suggestions on ASEAN Countries' Marine Plastic Waste Pollution

Shihong Bi<sup>a,b,c</sup>, Wenyu Jiang<sup>c\*</sup>, & Yu Yang<sup>d</sup>

<sup>a</sup> Institute of the Belt and the Road Initiatives, Kunming, China

<sup>b</sup> Center for China's Neighborhood Diplomacy Studies, Kunming, China

<sup>c</sup> Institute of International Studies, Yunnan University, Kunming, China

<sup>d</sup> Postal Savings Bank of China, Kunming, China

\* Wenyu Jiang, Institute of International Studies, Yunnan University, Kunming, China

### ***Fund Project***

*National Social Science Foundation of China History Research Institute Major Historical Issues Special Major Bidding Project "Development History of Modern Countries in Southeast Asia" 2023 project. (Project Number: 23VLS026); National Social Science Foundation Youth Project "Research on the Competition for the Right to Speak in the South China Sea under the Situation of Multiple Security and China's Response" 2024 project. (Project Number: 24CGJ027)*

Received: October 11, 2024    Accepted: November 08, 2024    Online Published: November 23, 2024  
doi:10.22158/ape.v7n3p80    URL: <http://dx.doi.org/10.22158/ape.v7n3p80>

### ***Abstract***

*In recent years, ASEAN and its member states have increasingly prioritized marine environmental issues, with particular attention to the problem of marine plastic waste. On one hand, ASEAN has issued a collective declaration on marine plastic waste management, elevating the importance of this issue within the region to new heights. The organization has implemented corresponding measures at both international and regional levels, achieving certain positive results. On the other hand, the deep management of marine plastic waste within ASEAN has been constrained by factors such as funding, technology, and management practices. Moreover, both China and ASEAN face numerous challenges in addressing marine plastic waste. Under the framework of their Blue Partnership, the two sides should enhance strategic dialogue and engage in multi-stakeholder, in-depth cooperation.*

### ***Keyword***

*The Blue Partnership, Marine Plastic Waste, Sustainable Development, Regional Governance*

Marine plastic waste pollution, as one of the most pressing environmental challenges, poses threats to marine life, climate change, and human health. Statistics show that plastic waste accounts for 85% of all marine litter, and by 2040, the amount of plastic waste entering the ocean globally is projected to nearly double, with an additional 23 to 37 million tons of plastic waste entering the ocean each year (UN environment programme, 2021). In March 2022, the United Nations Environment Assembly adopted the *Draft Resolution to End Plastic Pollution*, aiming to combat plastic waste pollution through legally binding measures.

In Southeast Asia, marine plastic waste pollution is particularly severe. Although ASEAN countries account for less than 9% of the global population, they received 17% of the world's plastic waste between 2017 and 2021. Southeast Asia is also considered one of the main regions where land-based plastic waste leaks into the ocean, generating approximately 31 million tons of plastic waste annually (Julius Cesar Imperial Trajano, 2022). Moreover, the region is the world's largest source of marine plastic waste. Given that ASEAN's urbanization rate is expected to exceed 70% by 2050, the issue of marine plastic waste in the region is likely to worsen.

China and ASEAN countries are among the world's largest producers and consumers of plastics. At present, China has elevated marine plastic waste management to the policy level. Through documents such as the *Vision for Maritime Cooperation under the Belt and Road Initiative*, the *China-ASEAN Strategic Partnership Vision 2030*, and the *China-ASEAN Environmental Protection Cooperation Strategy (2016–2020)*, marine plastic waste management has been designated as a key area of environmental cooperation between China and ASEAN.

## 1. Status of Marine Plastic Waste in ASEAN Countries

In order to achieve the overall goal of the ASEAN Community 2025, ASEAN envisions “environmental ecological sustainability in the context of social change and economic development”, while Marine plastic waste, a prominent Marine environmental problem, poses a threat to the social and economic development of ASEAN countries.

### 1.1 The Amount of Marine Plastic Waste is Enormous

The total amount of Marine plastic waste in ASEAN countries is very large, and it is one of the main sources of Marine plastic in the world. As shown in Table 1, according to the World Economic Forum, of the 10 countries with the most plastic waste pollution in the world's oceans in 2023, six are located in Southeast Asia. The Philippines alone leaks 356,371 tons of plastic waste into the ocean a year, accounting for about 35% of the global leakage and leading the world. They are followed by Malaysia (73,098 tonnes), Indonesia (56,333 tonnes), Myanmar (40,000 tonnes), Vietnam (28,221 tonnes) and Thailand (22,806 tonnes), which generate more than 31 million tonnes of plastic waste per year (Liviana, 2023). In addition, Marine microplastic pollution in Southeast Asia is severe. Because Southeast Asia has rich mangrove, seagrass, and coral habitats in coastal and shallow waters, plastic waste is present in beach sediments, benthic sediments, and Marine biota and accumulates along

high-chain vegetation lines, which in turn leads to microplastic accumulation. Concentrations of microplastics in sea water in Southeast Asia ranged from 0.13 to 11,100 pieces per litre, comparable to those recorded in the Arctic Ocean and Santa Monica Bay.

**Table 1. Countries with the Most Serious Marine Plastic Waste Pollution**

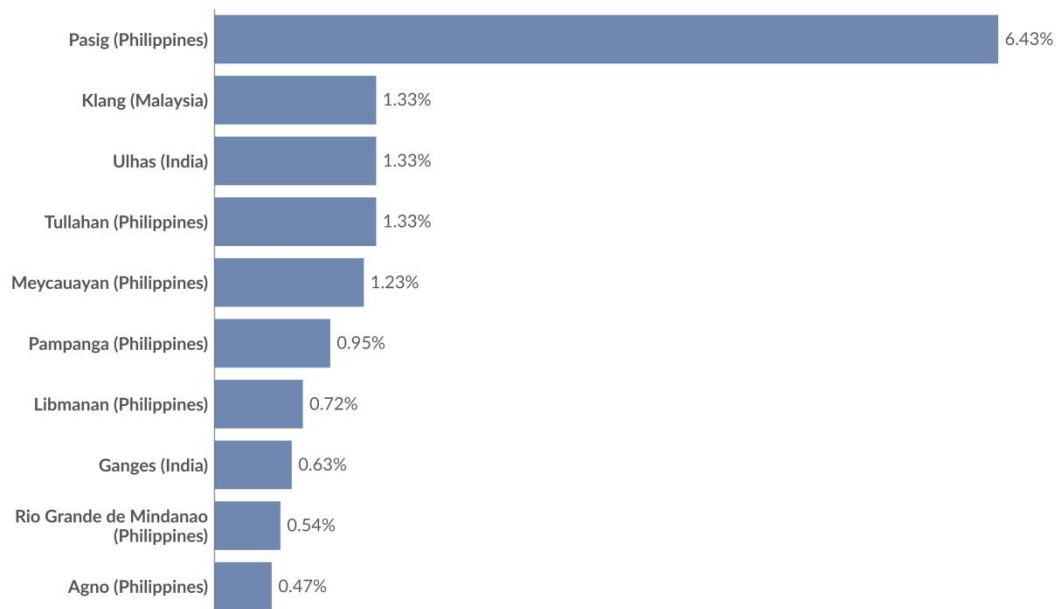
Rank	Country	Annual Marine Plastic Waste (tons)
1	Philippines	356,371
2	India	126,513
3	Malaysia	73,098
4	China	70,707
5	Indonesia	56,333
6	Myanmar	40,000
7	Brazil	37,799
8	Vietnam	28,221
9	Bangladesh	24,640
10	Thailand	22,806
Others (Worldwide)		176,012
Total		1,012,500

*Date source: "How to defeat the plastic tide threatening the ASEAN region's green growth", World Economic Forum, October 10, 2023.*

### 1.2 Marine Plastic Waste Has Diverse Sources

In Southeast Asia, the main sources of marine plastic waste include plastic debris carried into the ocean by rivers, plastic products discarded offshore by fisheries or tourists, and more. First, many rivers in ASEAN countries are heavily polluted with waste, significantly contributing to the influx of trash into the ocean. River-carried waste is a major component of land-based sources of marine debris. As shown in Figure 1, according to data from *Science Advances*, 7 out of the world's top 10 rivers carrying the most plastic waste into the ocean in 2021 were located in the Philippines, and 1 was in Malaysia (Meijer et al., 2021). Second, coastal fishing and tourism activities are also significant contributors to the increase in marine plastic waste. Approximately 20% of plastic waste in the marine environment originates from the ocean itself, mainly from fishing activities. For example, in the coral reefs of Darvel Bay in eastern Sabah, Malaysia, plastic debris such as plastic bags, bottles, and fishing nets/lines has been discovered, with fishing nets/lines accounting for the largest proportion at 21%. Tourism also plays a role, as large numbers of visitors flock to beaches and coastal areas. Due to improper waste disposal by tourists and inadequate management by local authorities, beaches and nearshore areas in several ASEAN countries have seen a marked increase in waste. A significant

portion of this waste consists of plastic products, such as single-use beverage bottles, straws, plastic bags, and sunscreen packaging.



**Figure 1. Rivers That Contribute the Most to Ocean Plastic Pollution**

*Date source: Meijer et al. (2021). More than 1000 rivers account for 80% of global riverine plastic emissions into the ocean. Science Advances.*

### 1.3 Marine Plastic Waste Is Improperly Managed

Many ASEAN countries have weak waste recycling and processing capabilities and lack basic waste management infrastructure, resulting in imported waste being inadequately handled. Only about 10% of imported waste is properly recycled, while the remaining 90% is illegally dumped into the ocean, incinerated, or abandoned in landfills. Following China's implementation of bans on the import of foreign waste in 2017, many Western countries that previously relied on China as a destination for plastic waste exports shifted to ASEAN countries as alternative export destinations. This has placed greater pressure on ASEAN nations from plastic waste-exporting countries. In 2018, ASEAN countries saw a 362% surge in plastic waste imports. During just the first seven months of 2018, approximately 754,000 tons of plastic waste were imported into Malaysia.

## 2. Policy Mechanisms of ASEAN and its Member States for Addressing Marine Plastic Waste

In response to the severe marine plastic waste pollution, ASEAN has been improving its mechanisms for addressing transboundary environmental issues and has adopted several collective declarations targeting marine plastic waste management. ASEAN member states have also demonstrated their commitment to tackling marine plastic waste by undertaking various governance actions.

### 2.1 ASEAN's Policy Mechanisms for Addressing Marine Plastic Waste

Firstly, establishing cooperative mechanisms to address transboundary environmental issues. During this period, ASEAN focused on environmental assets and national resilience. In 1977, ASEAN member states adopted the *Treaty of Amity and Cooperation*, which included environmental issues on ASEAN's agenda for the first time. During this phase, ASEAN launched the *ASEAN Sub-Regional Environmental Programme* with the goal of safeguarding the "sustainable availability of natural resources" to combat poverty and improve quality of life.

ASEAN began paying greater attention to transnational challenges and shared responsibilities. The organization recognized that environmental issues such as regional pollution impacted the "common well-being of ASEAN people". Environmental protection and sustainable development were seen as essential to achieving "a better standard of living". During this phase, ASEAN resolutions and agreements started addressing ecological management. ASEAN has articulated multiple environmental goals and adopted institutionalized approaches to achieve them, emphasizing mechanisms for sustainable development. In 1989, ASEAN introduced the *ASEAN Senior Officials on the Environment (ASOEN)*, which clarified the authority for transboundary environmental regulation. This marked the full integration of environmental issues into ASEAN's institutional framework.

Secondly, Joint Declarations on Cooperation for Marine Debris Management. In November 2017, the *ASEAN Conference on Reducing Marine Debris* was held in Thailand. In June 2019, the ASEAN Summit released the *ASEAN Framework of Action on Marine Debris* and the *Bangkok Declaration*. This framework addresses marine debris management from policy, legal, technological, and awareness perspectives. As ASEAN's first official document on marine debris management, it holds milestone significance. Another declaration emphasizes an integrated land-sea approach to waste management, with a focus on strengthening marine plastic waste governance. It also calls for enhanced cooperation among ASEAN member states, as well as at regional and international levels. In May 2021, ASEAN adopted the *Regional Action Plan for Combating Marine Debris in ASEAN Member States (2021-2025)*, which aims to provide implementable and scalable solutions for addressing marine plastic waste in the ASEAN region.

### 2.2 Policy Mechanisms of ASEAN Member States for Addressing Marine Plastic Waste

Firstly, formulating governance plans and setting clear targets. Indonesia, Thailand, and Vietnam have introduced governance plans and targets directly related to marine plastic waste, which are currently being implemented. Indonesia's government adopted the *Marine Debris Action Plan 2017-2025*, aiming to reduce marine waste at its source and cut marine plastic waste by 70% by 2025. Thailand's plan was established to reduce marine plastic waste by 50% by 2027. With an even more ambitious target, Vietnam aims to reduce marine plastic waste by 75% by 2030.

The second measure is to limit plastic consumption and production. Currently, all ASEAN countries have, to varying degrees, restricted plastic consumption, and some have enacted restrictive policies on plastic production. In 2018, the Indonesian government issued Presidential Decree No. 82 on Ocean

Waste Management and its Action Plan (2018-2025), aimed at encouraging companies to produce more biodegradable and recyclable plastic. In October 2018, the Philippine government issued Executive Order No. 1866, urging the public to avoid using disposable plastic products and banning the use of plastic straws and stirrers. In November 2020, Vietnam passed the Amended Law on Environmental Protection for 2020, limiting the use of disposable plastic products and imposing an environmental tax on plastic bags at a rate of 40,000 Vietnamese dong (approximately \$1.76) per kilogram.

Thirdly, strengthen waste management. In many ASEAN countries, less than half of the collected and treated waste was disposed of properly before, and most of it was handled by households using simple equipment, with poor treatment quality and low subsequent economic value. Therefore, all ASEAN countries have strengthened their waste management. In June 2020, the Indonesian government passed Presidential Regulation No. 97/2017, introducing policies and strategies for household waste management, aiming to reduce waste by 30% and manage 70% of it by 2025. Moreover, plastic waste management was also included in the Presidential Regulation No. 83/2018 on marine waste management of the Indonesian government. ASEAN countries have increased investment in waste management capacity building. In May 2019, the Philippine Department of Environment and Natural Resources listed marine waste management as the top priority for coastal and marine projects and enacted the Ecological Solid Waste Management Act, stipulating that waste is a recyclable resource and should be managed through reducing generation and recycling, and requiring local governments to implement it in practice. In August 2022, the Thai government formulated the National Solid Waste and Hazardous Waste Management Master Plan, encouraging citizens to use central facilities and adhering to the principle of reducing, reusing, and recycling waste. Furthermore, Indonesia has adopted the “Waste Bank” as a new model for improving waste management, the Waste Bank draws on the mode of depositing and withdrawing funds in banks, treating sorted waste as a commodity stored in the bank, and allowing citizens to receive deposits in their personal accounts based on the value of the waste.

Fourth, resist the import of foreign waste. Many countries in ASEAN have implemented corresponding control measures on foreign plastic waste, including suspending the import of plastic waste and implementing return policies. In May 2019, Malaysia sent back 450 tons of plastic waste from Australia, Canada, Japan, and the United States. After six years of diplomatic protests, the Philippines sent back 69 plastic waste containers to Canada in June 2019. By June 2019, Malaysia had monitored 62 license holders related to plastic waste and closed 148 illegal plastic recycling factories. Under the revised Basel Convention, US plastic waste will be banned from entering contracting parties starting from 2021, and Indonesia is one of the main advocates of the convention.

### **3. The Effectiveness and Limitations of ASEAN Countries' Measures to Address Marine Plastic Waste**

Currently, ASEAN countries have made some progress in managing marine plastic waste, effectively reducing the amount of imported plastic waste from external regions and preventing more plastic waste

from entering the ocean. They have also developed a multi-stakeholder governance model. However, overall, the management of marine plastic waste in ASEAN countries is still in its early stages of implementation, leaving significant room for improvement.

### *3.1 Effectiveness of Marine litter Management in ASEAN Countries*

First of all, ASEAN countries effectively respond to the pressure of transshipment of plastic waste from outside the region and clean up existing Marine plastic waste. Asean's resistance to plastic waste from Western countries has significantly reduced the amount of plastic waste transferred into the sea from Western countries, effectively reducing the flow of plastic waste into the ocean. In 2019, global plastic waste exports to Southeast Asia fell by 32%, and the total volume of plastic waste trade fell by 616,703 tons year-on-year. In addition, beach litter in many ASEAN countries has been effectively cleaned up, and the Marine ecological environment has been improved to some extent. Ngos and businesses have contributed a lot to the clean-up of Marine plastic waste. Take the Ocean Conservancy as an example, in 2019, the number of plastic waste cleaned up by its volunteers on Philippine beaches was about 7 million pieces, and the length of the beach was about 6,000 kilometers. The Ocean Conservation Society has carried out the same cleanup activities in many ASEAN countries and achieved fruitful cleanup results, effectively reducing the accumulation of beach garbage and improving the coastal landscape. In addition, many jobs have been created in the treatment of Marine plastic waste, which has promoted social development and increased the employment rate. As far as the Ocean Plastic Removal Project (STOP) is concerned, by the end of 2022, the project has built five waste treatment facilities in Indonesia and collected more than 5,000 tons of plastic waste, creating 333 full-time jobs.

Secondly, the management of Marine plastic waste in ASEAN countries promotes the formation of a multi-actor co-governance model. Countries have a strong policy implementation capacity, regions have a broad appeal and policy leadership role, and the participation of non-regional actors can provide more funding and program support for governance. Asean countries encourage national actors, organizations and the private sector to participate in the management of Marine plastic waste. In addition to traditional governance subjects - official entities such as states and regional organizations - ngos have also injected vitality into the management of Marine plastic waste in ASEAN countries. In 2018, the "Ocean Plastic Clean" project, led by the United Nations Economic and Social Commission for Asia and the Pacific Indonesia, focused on Thailand, Vietnam and Vietnam to improve waste management efficiency and public awareness through the participation of local governments and communities, improve waste management systems, and reduce the flow of plastic waste into the ocean. In 2019, ASEAN and Norway launched the Collaborative Project on Local Capacity Building to Reduce Plastic Waste Pollution (ASEANO), piloting sustainable plastic waste management practices in Indonesia and the Philippines, which will be replicated across ASEAN.

### *3.2 Inadequate Management of Marine Litter in ASEAN Countries*

Firstly, there is a lack of coordination mechanisms at the national level to control Marine plastic waste, leading to unclear powers and responsibilities, and low disposal efficiency. Although ASEAN countries

all have departments responsible for waste management, few countries have a dedicated agency responsible for Marine plastic waste management. At present, only Indonesia has established a national coordination group for Marine debris management to coordinate the management of various departments and monitor the implementation of policies. In most ASEAN countries, the responsibility for managing Marine plastic waste is often vested in one or more ministries. For example, the issue of Marine plastic litter in Singapore is the responsibility of the Ministry of Environment and Water Resources; The responsibility for Marine plastic waste management in Thailand is vested in several departments, including the Ministry of Natural Resources and Environment and the Office of Natural Resources and Environment Policy and Planning.

Secondly, there is a lack of scientific research on Marine plastic waste and microplastic treatment practices at the national level. Firstly, ASEAN countries' research on Marine plastic waste is obviously insufficient. At present, most of the data used by relevant academic research institutes in ASEAN countries come from outside the region, and there are few local relevant studies. The research on Marine plastics in ASEAN countries mainly focuses on two aspects, namely, quantifying the plastic waste on the coast and in the ocean and exploring the impact of Marine plastic waste on the environment and ecology. Among them, Indonesia, Singapore and Vietnam have carried out traceability research on Marine plastic waste. In terms of the study of hot spots for Marine plastic waste, only Indonesia has done relevant research. Most ASEAN countries have only conducted relatively basic quantitative research on Marine plastic waste, and there are few studies on the impact of Marine plastic waste on the ecosystem and the accumulated plastic content in organisms, which makes the people of ASEAN countries have insufficient awareness of the harm of Marine plastic waste. Second, it is difficult to say that ASEAN countries have taken adequate measures to control Marine microplastics. Marine microplastics have potential negative impacts on Marine life, ecosystems and human health. However, in the practice of Marine plastic waste management in ASEAN countries, there is a lack of management of Marine microplastics, most of which are macro Marine plastic waste management, such as plastic bottles, plastic bags and plastic plates and other visible plastic products.

Thirdly, the lack of binding nature of the ASEAN Way leads to slow progress. First of all, the lack of ASEAN governance strength leads to the lack of enforcement of relevant programs. At present, ASEAN only manages Marine plastic waste through soft laws such as declarations and action frameworks, which is weak compared with the EU's management of Marine plastic waste through legislation. The European Union has issued the "European Plastics Strategy in the circular economy", which has made specific provisions on how to reduce the pollution of plastic waste in the circular economy model, and has reduced the negative impact of Marine plastic waste from the level of regional legislation. In contrast, ASEAN is particularly inadequate in the implementation and enforcement of Marine plastic waste management and circular economy policies. Secondly, ASEAN lacks a working mechanism to control Marine plastic waste, which affects work efficiency. Although ASEAN has a working group for Marine environmental governance, ASEAN lacks a directly related working



mechanism for the management of Marine plastic waste, resulting in low governance efficiency and ineffective governance. At the same time, because ASEAN participates in the work of multiple mechanisms, it is difficult to follow up and connect existing projects, thus affecting the efficiency of governance. In addition, the overall organizational structure of ASEAN Environmental Cooperation Framework is scattered, the mechanism structure procedures are many, and the approval procedures are complicated and there are many meetings, which hinder the progress of the approval process of project proposals.

#### **4. China-Asean Cooperation Proposal on Marine Plastic Waste Management**

China and ASEAN countries are separated by a strip of water, and our cooperation has a solid political, economic and cultural foundation. In recent years, under the guidance of the “21st Century Maritime Silk Road”, the two sides have jointly built a cooperation platform for Marine environmental governance, jointly built a “blue partnership” and a “Green Silk Road”, and promoted cooperation in scientific research, project monitoring and financial investment in Marine plastic waste management. In order to further promote China-Asean response to Marine plastic waste management, specific recommendations are as follows:

##### *4.1 Build a China-Asean Cooperation Mechanism on Marine Plastic Waste Management, and Strengthen Dialogue at the Strategic Level*

At present, China and ASEAN are cooperating on Marine environmental governance under the framework of the Blue Partnership, the China-Asean Environmental Cooperation Center has been established, and the *China-Asean Environmental Cooperation Strategy and Action Framework (2021-2025)* has been issued. However, for more detailed cooperation on Marine plastic waste management, the cooperation mechanism between the two sides needs to be further strengthened. For China, first, it is necessary to establish a daily liaison mechanism with the ASEAN Marine Garbage Knowledge Center and the Mekong Basin Garbage Pollution Monitoring Center, so that China can have in-depth understanding and precise participation. The second is to deeply integrate the management of Marine plastic waste between China and ASEAN with the current China-Asean environmental cooperation mechanism, and explore the establishment of a new cooperation mechanism while further promoting cooperation on Marine plastic waste management with the help of the existing mechanism; The third is to strengthen dialogue at the policy level. Although China and ASEAN have published a series of documents on the issue of dealing with internal Marine plastic waste, they have not raised their cooperation to the strategic level. China and ASEAN can carry out more dialogue on Marine plastic waste management at the official level, carry out special activities, and issue cooperation documents to lead non-governmental cooperation.

##### *4.2 Guide the Participation of Multiple Subjects to Implement the In-depth Implementation of China-Asean Marine Plastic Waste Control*

Through bilateral and multilateral cooperation mechanisms between China and ASEAN countries, we

will draw a conclusion from one example and implement the control of Marine plastic waste between China and ASEAN at multiple levels. At the national level, China can first carry out bilateral cooperation or establish multilateral cooperation mechanisms with countries with better economic and social development and serious Marine plastic waste pollution, and drive more ASEAN countries to strengthen cooperation with China in Marine plastic waste management. Secondly, China can take the lead in pilot cooperation in coastal cities near ASEAN countries and gradually expand regional cooperation, such as continuing to carry out China-Asean coastal cities roundtable dialogue, promoting consensus on plastic reduction, implementing action plans, and building cooperation networks. Thirdly, China and ASEAN countries can start from universities and scientific research institutions to carry out research on the source analysis and risk assessment of Marine plastic waste, and develop new technologies such as monitoring, assessment and recycling of Marine plastic waste, so as to provide a rigorous and feasible policy basis for the formulation of relevant policies between China and ASEAN.

#### *4.3 To provide a Demonstration Effect for Marine Plastic Waste Management in ASEAN Countries*

China adheres to the concept of ocean governance with the harmony of the sea, adheres to the construction of Marine ecological civilization with equal emphasis on development and protection, and consolidates the blue consensus for the management of Marine plastic waste between China and ASEAN. Whether in terms of conceptual consensus or regional practice, China can provide solutions and practical paths for ASEAN countries in Marine plastic pollution control. China attaches great importance to the management of Marine plastic waste, issued the “14th Five-Year Plan” plastic pollution control action Plan, proposed to establish a plastic waste collection and disposal system, and establish a long-term mechanism for Marine plastic waste cleanup, and strengthen scientific research efforts. In 2023, Taizhou, Zhejiang Province, China first piloted a new model of “blue cycle” Marine plastic waste management, and was awarded the “Champion of the Earth Award” by the United Nations. Based on the above experience, China can provide technical support to ASEAN in the field of Marine plastic waste management. In addition, economic cooperation is an important direction for China and ASEAN to build a blue partnership, and the two sides can take plastic circular economy as a starting point to combine environmental sustainability with blue economy development.

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