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THE PLASTIC WASTE CRISIS IN INDONESIA AND THAILAND: CHALLENGES, ENVIRONMENTAL IMPACTS, AND SUSTAINABLE SOLUTIONS

KRISIS SAMPAH PLASTIK DI INDONESIA DAN THAILAND: TANTANGAN, DAMPAK LINGKUNGAN, DAN SOLUSI BERKELANJUTAN

Oot Hotimah [1], Elma Amalia Agustine [2*], Aulia Nurhanifah [3], Bunga Febianto[4]
[1]Geography Education, Faculty of Social Sciences and Law, Universitas Negeri Jakarta,
Email: oothotimah@unj.ac.id
[2]Geography Education, Faculty of Social Sciences and Law, Universitas Negeri Jakarta,
Email: elma.agustine@gmail.com
[3]Geography Education, Faculty of Social Sciences and Law, Universitas Negeri Jakarta,
Email: aulianurhanifah25@gmail.com
[4]Geography Education, Faculty of Social Sciences and Law, Universitas Negeri Jakarta,
Email: febiantobunga@gmail.com

*email Koresponden: aulianurhanifah25@gmail.com

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Abstract

The plastic waste crisis in Indonesia and Thailand is one of the biggest environmental challenges in Southeast Asia, triggered by increased plastic consumption due to urbanization, economic growth and modern lifestyles. This study aims to analyze the challenges, environmental impacts, and sustainable solutions related to plastic waste management in both countries. The method used is qualitative analysis based on secondary data from scientific literature, reports of international institutions. The results show that Indonesia faces serious problems in plastic waste management that cause marine pollution to other countries, while Thailand struggles with the high volume of domestic and imported plastic waste. The resulting environmental impacts include damage to marine ecosystems, threats to biodiversity, and human health risks from microplastics. Recommended solutions include the implementation of national regulations that support sustainability principles, 3R (Reduce, Reuse, Recycle) strategies, promotion of eco-friendly packaging, and public education to reduce the use of single-use plastics. The study concludes that regional collaboration among ASEAN countries is needed to effectively address the plastic waste crisis to protect ecosystems and human health in the long term.

Keywords: Plastic Waste, Indonesia,

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Abstrak

Krisis sampah plastik di Indonesia dan Thailand menjadi salah satu tantangan lingkungan terbesar di Asia Tenggara, dipicu oleh peningkatan konsumsi plastik akibat urbanisasi, pertumbuhan ekonomi, dan gaya hidup modern. Penelitian ini bertujuan untuk menganalisis tantangan, dampak lingkungan, dan solusi berkelanjutan terkait pengelolaan sampah plastik di kedua negara. Metode yang digunakan adalah analisis kualitatif berbasis data sekunder dari literatur ilmiah, laporan lembaga internasional. Temuan menunjukkan bahwa Indonesia menghadapi masalah serius dalam pengelolaan limbah plastik yang menyebabkan pencemaran laut hingga ke negara lain, sementara Thailand berjuang dengan tingginya volume sampah plastik domestik dan impor. Dampak lingkungan mencakup kerusakan ekosistem laut, ancaman terhadap keanekaragaman hayati, serta risiko kesehatan manusia akibat mikroplastik. Solusi yang direkomendasikan meliputi penerapan regulasi nasional yang mendukung prinsip keberlanjutan, strategi 3R (Reduce, Reuse, Recycle), promosi kemasan ramah lingkungan, serta edukasi masyarakat untuk mengurangi penggunaan plastik sekali pakai. Penelitian ini menyimpulkan bahwa kolaborasi regional antarnegara ASEAN sangat diperlukan untuk mengatasi krisis sampah plastik secara efektif demi melindungi ekosistem dan kesehatan manusia secara jangka panjang.

Kata Kunci: Sampah Plastik, Indonesia, Thailand

1. INTRODUCTION

Plastic waste has become a pressing environmental issue in the world. Plastic has the advantage of being cheap, lightweight, easy to obtain, and durable plastic is an inseparable part of human life today. Almost all industrial sectors use plastic ranging from food packaging, drinks, various household appliances, children's toys, even medical devices and so on using plastic. But behind its advantages, plastic is a big threat to the environment if its waste is not managed properly. The phenomenon of plastic waste has become a scary thing and should be more concerned about its use in all countries. Not only in developing countries but also in developed countries.

Indonesia and Thailand are among the top contributors of plastic waste to the oceans (Jambeck et al., 2015). Indonesia is also experiencing challenges in managing the increasing amount of plastic waste. According to recent research from the University of Leeds, Indonesia produces 3.35 million tons of plastic waste per year. Thailand produces about 995 thousand tons of plastic waste per year. In 2018, Thailand was recorded to import up to 75,000 tons of plastic waste per month to meet domestic demand. This plastic waste mostly comes from poorly managed single-use plastic consumption, as well as low recycling rates of less than 10% in both countries (Lebreton et al., 2018).

Previous studies have shown that plastic waste has far-reaching environmental, health, and economic impacts. Lamb et al. (2018) found that plastics polluting marine ecosystems increase the risk of disease in coral reefs by 89%, which negatively impacts marine biodiversity and the fisheries sector. Another study by UNEP (2018) stated that uncontrolled burning of plastic waste in developing countries results in toxic gas emissions that contribute to air pollution and increase the risk of cancer and respiratory disorders.

In addition to environmental and health impacts, plastic waste also has an economic impact. Ocean Conservancy (2020) reported that marine plastic waste pollution is hurting the tourism sector in Southeast Asia, including Indonesia and Thailand, with an estimated loss of

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billions of dollars per year due to decreased tourist visits to plastic-polluted destinations. In addition, the World Bank (2021) pointed out that the cost of inefficient plastic waste management burdens government budgets, while fishermen also suffer losses due to reduced fish catches affected by plastic pollution in their waters.

This article aims to analyze in-depth the plastic waste crisis in Indonesia and Thailand which includes various challenges in managing plastic waste, the impact on the environment, and sustainable solutions in overcoming plastic waste problems. This article is expected to provide greater insight in overcoming plastic waste management and encourage more effective policies in reducing the negative impact of plastic use on the environment and life.

2. RESEARCH METHOD

This research uses a qualitative approach with descriptive methods to analyze the plastic waste crisis in Indonesia and Thailand. This approach was chosen because it allows researchers to deeply understand the challenges, impacts, and sustainable solutions related to plastic waste management in both countries. The descriptive model is used to provide a detailed description of the plastic waste management situation, identify the main challenges faced, explain the environmental impacts caused, and evaluate the policies and solutions that have been implemented. The data used in this study was obtained through a literature study technique which was carried out by collecting secondary data from various sources such as scientific journals, books, international agency reports, national policy documents, and relevant online articles. This technique aims to understand the global and local context related to the plastic waste crisis.

Data analysis was conducted through several stages. First, the data that has been collected is selected and sorted based on its relevance to the research objectives in the data reduction process. Next, relevant data was organized in the form of narratives or tables for easier understanding. Finally, conclusions were drawn based on key findings from the data analysis to identify important patterns in plastic waste management and formulate recommendations for sustainable policies and actions. To ensure data validity, the researcher used triangulation techniques by comparing information from various sources. With this research method, the study aims to provide in-depth insights into the plastic waste crisis in Indonesia and Thailand and offer sustainable solutions that can be implemented both locally and regionally.

3. RESULTS AND DISCUSSION

Plastic waste in Indonesia and Thailand continues to increase every year. This is due to population growth and the lifestyle of people who depend on plastic, especially single-use plastic. Based on the World Bank Report (2021), Indonesia produces around 6.8 million tons of plastic waste per year, 620 thousand tons of which end up in the ocean. Meanwhile, Thailand produces around 3.9 tons of plastic waste annually, with 300 thousand tons polluting the marine ecosystem

Table 1. Plastic Waste Data

Country	Plastic Waste Production (Million Ton/Year)	Plastic Waste to Sea (Thousand Tons/Year)	Cycle Level Repeat (%)
Indonesia	6,8	620	<10%
Thailand	3,9	300	<15%

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Source: World Bank, 2021.

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From the data, it can be seen that the use of plastic waste in Indonesia and Thailand is quite high. Plastic waste management by recycling is still very low in both Indonesia and Thailand. This is caused by several factors including the lack of adequate infrastructure in waste management, low public awareness in disposing of waste properly, lack of public knowledge in sorting waste and recycling.

A. Challenges in Plastic Waste Management

1. High consumption of single-use plastics
   The use of single-use plastics is still rampant in various sectors, such as the food and beverage industry, retail, and household sectors. In Indonesia, more than 60 percent of the total plastic waste generated is single-use plastic. Plastic waste in Thailand is recycled at a rate of about 0.5 million tons per year, while the remaining 1.5 million tons are mostly single-use plastics (SUP) such as hot plastic bags, cold plastic bags, plastic bags with handles, plastic cups, plastic straws, foam boxes, and food containers.
2. Lack of Adequate Waste Management Infrastructure
   The waste management system in both countries still has many shortcomings, especially in terms of sorting, collection and recycling. Improving waste management infrastructure is a crucial step in addressing Indonesia's waste problem. The construction of modern landfills and waste processing facilities such as incinerators and organic waste processing plants are needed to effectively manage waste. In Thailand, less than a quarter of the available plastic is recycled into valuable materials, according to the World Bank.
3. Low Public Awareness
   Despite plastic waste reduction campaigns, public awareness in sorting and recycling waste is still low. Littering is a very common practice in Thailand. This often leads to blockage of city sewers, resulting in flooding during heavy rains. Discarded plastic waste also usually flows into rivers and canals, and eventually ends up in the sea.

B. Impact

Plastic waste is a significant environmental problem in Indonesia and Thailand, negatively impacting ecosystems and human health. Here are some of the main impacts of the plastic waste problem in Indonesia and Thailand:

1. Marine Ecosystem Pollution
   a. Indonesia is ranked fifth in the world for poorly managed plastic waste. Mismanaged waste is material that is disposed of carelessly or improperly and has a high risk of entering the ocean. There are about 820 thousand unmanaged plastic waste in Indonesia. Marine plastic waste in Indonesia accounts for about 6.8 percent of the total mismanaged plastic waste (Meijer, van Emmerik, van der Ent, Schmidt, & Lebreton, 2021, p. 6). Then about 6.8% of the total mismanaged plastic waste ends up in the ocean, threatening the lives of marine life through entanglement or ingestion, which can cause death in marine animals.
   b. According to Raphael Bissen and Sakonvan Chawchai (2020), microplastic contamination of three sessile invertebrate species is common in the east coast region of Thailand. In this study, microplastic contamination of three sessile invertebrate species commonly found in the region. The results showed significant accumulation of microplastics in the organisms, reflecting the high level of anthropogenic pollution on the east coast of Thailand. These findings highlight the need for

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conservation measures to protect coastal ecosystems and human health that may be affected by microplastic contamination.

2. Waste Crisis in Tourism Destinations
   a. According to Bali Partnership, a coalition of academics and NGOs Bali is estimated to produce around 1.6 million tons of waste every year, with almost 303,000 tons of it being plastic waste. Only 48% of the total waste is managed responsibly. For example, Gili Trawangan generates about 18 tons of waste per day, while in low season it reaches 15 tons, this is a serious problem that affects the environment and the tourist experience.
   b. Garbage from other countries often pollutes Thailand's beaches, as is the case in Phuket. Phuket Island, a popular tourist destination in Thailand, is facing a garbage crisis with more than 1,000 tons of waste generated every day. This accumulation of garbage not only spoils the scenery of the tourist destination but also creates health problems for local residents.
3. Air Pollution from Burning Plastic Waste Harms Health
   a. Indonesia is one of the countries with the highest plastic waste burning rate, with Jakarta coming in 9th in the world, burning around 72,294ton of plastic waste every year. Burning plastic releases toxic substances such as dioxins and furans, which can cause respiratory problems, asthma, and cancer.
   b. In 2025 Thailand, especially Bangkok experienced seasonal severe air pollution, with many schools closing due to poor air quality. PM 2.5 levels reached 108 micrograms per cubic meter, well above the safe limit set by the WHO. People reported breathing difficulties and other health symptoms due to air pollution. Vulnerable groups such as children and the elderly were particularly affected (Nafilah Sri Sagita K, 2025).

C. Policy

1. Marine Ecosystem Pollution
   a. The Indonesian government has issued Presidential Regulation No. 83 of 2018 which aims to reduce marine plastic waste by 70% by 2025. This is part of the National Action Plan (NAP) for plastic waste management. Indonesia also participates in environmental diplomacy at the ASEAN and global levels to address the issue of marine plastic debris, given that the problem is transnational. These efforts include collaboration with other countries to improve waste management and public awareness on the dangers of plastic waste.
   b. Thailand has banned the import of plastic waste from January 2025, in a move to control pollution and protect public health. This policy came about due to concerns about the negative impact of plastic waste imported from developed countries. In addition to the import ban, Thailand is also implementing the concept of Extended Producer Responsibility (EPR), the management of waste from consumers to producers. This includes a buy-back system for certain products.
2. Waste Crisis in Tourism Villages
   a. Since July 1, 2019, Bali has banned the use of single-use plastic bags, plastic straws, and polystyrene through Governor Regulation No. 97/2018. This aims to reduce plastic waste generation, which reaches 303,000 tons per year. The Bali Provincial Forestry and Environment Office is working with various organizations to monitor the implementation of this regulation. In addition, it is necessary to increase public

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awareness regarding waste management to reduce the volume of waste generated, especially during the tourist season.

b. The Thai government launched a campaign to raise public awareness about the importance of good waste management. This includes education on waste segregation and recycling. Improving waste management infrastructure in tourist areas such as Phuket is essential to handle the more than 1,000tonnes of waste generated daily. This includes the construction of more efficient landfills and recycling facilities.

3. Air Pollution from Burning Plastic Waste Harms Health

a. To deal with this, the government has made several efforts such as: Government Regulation No. 27 Year 2020: Regulates specific waste management, including hazardous and toxic waste (B3). It aims to ensure proper handling of different types of waste. Government Regulation No. 81 Year 2012: Regulates the management of household and similar waste, providing a framework for more effective management. And improves facilities to support recycling and reduction of single-use plastics.

b. Thailand has regulations governing air pollution emissions, although implementation is often inconsistent, especially in big cities like Bangkok. The Thai government has issued plans to address air pollution issues, including enforcement of laws against open burning and vehicle emissions. In the face of severe air pollution, many schools in Bangkok are closed to protect children's health. It also upgraded the air quality monitoring system to provide real-time information to the public about PM 2.5 pollution levels.

D. Sustainable Solutions

Addressing the plastic waste crisis in Indonesia and Thailand requires a comprehensive effort that not only focuses on reducing waste production, but also involves system change, cross-sector collaboration, and active community participation. Based on research results, best practices from other countries, as well as government and community programs, here are some sustainable solutions that can be implemented:

1. Regional and International Collaboration

Collaborative approaches between developed and developing countries in Southeast Asia have led to innovations in plastic waste management. Hotimah et al. (2024) highlighted that cooperation between Japan, Singapore, Indonesia, Vietnam, and Thailand includes more effective recycling programs, public awareness campaigns, and the use of the latest technology. In addition, Indonesia is strengthening its commitment through international cooperation such as the Global Plastic Action Partnership (GPAP) and the ASEAN Regional Action Plan to Combat Marine Plastic Debris, with a target of reducing marine plastic debris by 70% by 2025.

2. Participatory Approach and Community Education

Participatory approaches to plastic waste management in Indonesian cities are key to creating sustainable solutions. Aromi et al. (2023) emphasized the importance of community involvement in plastic waste management, focusing on education and behavior change. Programs such as waste banks and ecobricks in schools have successfully increased community awareness and participation in reducing plastic waste.

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3. Policy and Regulatory Transformation
   The transformation of global plastic waste management policies after the Global Plastics Treaty has implications for national regulations in Indonesia. Rezi and Rahayu (2024) identified regulatory gaps between Indonesia's current legal framework and the GPT principles, particularly in the implementation of Extended Producer Responsibility (EPR), monitoring, and public awareness. Adopting best practices from other countries, such as EPR in the European Union and technological innovation in Japan, can strengthen Indonesia's national regulations in addressing the plastic waste crisis.

4. CONCLUSION

The plastic waste crisis in Indonesia and Thailand has become the biggest environmental challenge in Southeast Asia. Increased plastic consumption due to urbanization, economic growth, and modern lifestyles has led to a range of negative impacts on the environment, human health, and the economy. Indonesia generates millions of tons of plastic waste every year, much of which ends up in the ocean, while Thailand faces high volumes of domestic and imported plastic waste. Environmental impacts include pollution of marine ecosystems, threats to biodiversity, and health risks from microplastics and air pollution from plastic combustion. In addition, the plastic waste crisis is also hurting the tourism sector and local economies. The main challenges in plastic waste management in both countries include high consumption of single-use plastics, lack of adequate waste management infrastructure, and low public awareness in sorting and recycling waste. To address these issues, recommended sustainable solutions include the implementation of national regulations such as Presidential Regulation No. 83/2018 in Indonesia and a ban on plastic waste imports in Thailand from 2025. In addition, the promotion of the 3Rs (Reduce, Reuse, Recycle) strategy, the use of eco-friendly packaging, public education, as well as regional collaboration between ASEAN countries are needed to effectively address this crisis. This article concludes that a holistic approach through effective policies, infrastructure improvements, and changes in people's behavior are key to protecting ecosystems and human health in the long term.

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