



รายงานฉบับสมบูรณ์ (Final Report)  
**โครงการศึกษาที่มาของขยะทะเล  
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## Executive Summary

Marine debris is an urgent issue that has caught international attention for its adverse impacts on the environment, economy, and human health. According to a widely cited study by Jambeck et al. (2015), Thailand was ranked as the world's sixth largest contributor of plastic marine debris, causing various parties across the globe to pressure Thailand about this issue. In response, Thailand had elevated marine debris to become one of its national agendas, but there are still no comprehensive national action plans to effectively address the marine debris problem. To date, the statistics used to support studies on marine debris are still contentious among the stakeholders involved as there is no in-depth research at the national level about the sources of marine debris within the context of Thailand. Without identification of sources of marine debris in Thailand's context, policies cannot effectively target the actual causes of the problem. The objectives of this study are two-fold. The first objective is to identify the key sources of marine debris in Thailand to inform decision makers about which source should be targeted first. The second objective is to develop measures to address the marine debris problem based on the priority list.

This study uses two approaches in identifying the sources of marine debris. The first approach seeks expert opinion about the sources of marine debris. In the expert meeting, experts from academia, government agencies, the private sector, and the public sector that are relevant to the marine debris problem were invited to discuss the sources of marine debris in Thailand. The expert opinions obtained from the meeting were then processed, resulting in a list of percentage contributions for each source. This methodology is appropriate for this study, because percentage contributions were based on opinions of multiple experts, all of which have direct background and expertise relevant to the marine debris problem. However, this approach also has a limitation as the expert opinion is subjective, depending on the experience and background of expert, which can result in bias. The second approach uses the beach clean-up data from the Department of Marine and Coastal Resources and uses this data to identify sources of marine debris by using Matrix Scoring Technique.

Both approaches gives consistent picture about the key sources of marine debris in Thailand. The top three sources on the priority list include communities and vendors located in close proximity to coastal areas and waterways, beach tourism, and leakage from landfill or open dump site. Other sources of marine debris in Thailand include fishing vessels, trading vessels, and sea-based tourism, such as snorkeling and island recursions.

Measures to address the marine debris problem are comprising of both cross-cutting measures and source-specific measures. Cross-cutting measures will mainly target plastic bags, beverage bottles and plastic cups, and foam containers, because they are the most prevalent types of marine debris. The cross-cutting measures include measures that aim to reduce waste generation among consumers, provision of at-source waste segregation incentives as well as measures to improve waste management and prevent waste leakage into the environment. For plastic waste, cross-cutting measures include fees on the single-use plastic bag, setting up waste banks, launching public campaigns to encourage recycling and installing more trash cans in the public. For foam waste, this study recommends that the government should completely ban the use of all foam containers as they are not reusable and not economically viable for recycling. The government can start enforcing these cross-cutting measures at the pilot sites before implementing them at the national level.

The source-specific measures recommended by this study are as follows.

1. Communities and vendors located in close proximity to coastal areas and waterways:
  - a. Raise public awareness and educate community members, especially children, about the importance of proper waste sorting
  - b. Set up waste bank in the communities to encourage trash sorting and recycling
  - c. Increase access and frequencies of waste collection services
  - d. Improve wastewater treatment infrastructure and keep them well-maintained to reduce the amount of waste entering waterways through the sewage system
2. Beach tourism:
  - a. Impose smoking bans at beaches and providing designated smoking areas to reduce the amount of cigarette butts being littered at beaches
  - b. Install more trash cans along the beaches and shorten the distance between each trash can to promote proper waste disposal among tourists
3. Leakage from landfill or improper waste disposal:
  - a. Conduct a study to investigate where and by how much improper waste disposal like open dumping are occurring nationwide
  - b. Promote changing from open dumping to controlled dumping or waste disposal at sanitary landfills

4. Fishing vessels:
  - a. Collect waste management fees and fines from fishing vessels at harbors and ports to reduce derelict fishing gears being abandoned or discarded in the ocean
  - b. Use tags or labels that can track fishing gears to reduce lost fishing gears
  - c. Enact a deposit and refund scheme for fishing gears
  - d. Communicate with immigrant fishing workers in their native languages to raise awareness about marine debris
  - e. Partner with the fishing business owners to regulate the workers' behavior
5. Trading vessels:
  - a. Install reception facilities at ports to facilitate and improve waste management for trading vessels
  - b. Coordinate with local authorities to transport wastes from the port to proper waste disposal sites
6. Island tourism:
  - a. Impose deposit and refund schemes for single-use containers like beverage bottles and food containers
  - b. Use waste management technology, such as composting organic wastes and waste compactors