



THE Impact Rankings Questionnaire

University : Universitas Indonesia
Country : Indonesia
Web Address : ui.ac.id

[14] SDG14: Life Below Water

[14.3] Supporting aquatic ecosystems through action.

[14.3.4] Technologies towards aquatic ecosystem damage prevention (direct work)

Work directly (research and/or engagement with industries) on technologies or practices that enable marine industry to minimize or prevent damage to aquatic ecosystems.

“Microplastic abundance and distribution in surface water and sediment collected from the coastal area.”

Research Scheme : PUTI Q2

Researchers : Prof. Dr. Dra. Noverita Dian Takarina, M.Sc.
(Faculty of Mathematics and Natural Sciences)

Description:

Rapid development has increased the microplastics discharges into marine environments, including coastal waters at Jakarta Bay, Indonesia. This study is proposed to assess microplastics abundance and distribution in surface water and sediment from coastal water at Jakarta Bay. The samples were collected from 12 locations representing Ancol, Muara Baru, and Muara Angke - Muara Karang. Samples of water and sediment were extracted to obtain microplastics. Microplastics were identified based on their morphology (shape) and numbered for their abundance. The polymer of microplastics was determined using Raman Spectrophotometer. The results showed that microplastics were successfully identified and counted in water and sediment samples at all collection points. The number of microplastics was 1532 particles in the water sample and 1419 particles in the sediment sample. The shape of microplastics observed in the water and sediment samples were fibers, films, fragments, and pellets. Among those, fiber and film were the most dominant microplastic detected both in surface water and sediment in all locations. Three polymers, namely polyethylene, polypropylene, and polystyrene, were detected in the microplastic samples. These findings prove that microplastics with their various types can contaminate the aquatic environment. The most common microplastics shapes in sediment were fiber (55.7%) > film (31.1%) > fragment (9.9%) > pellet (3.2%) and for the surface water were film (53.5%)>fiber (33.9%) > fragment (7.8%) > pellet (4.7%). The abundance of microplastics in the sediment (166.8 particles/kg, 95%CI: 148.0-185.0) was significantly higher ($p < 0.05$) than in surface



water (70.9 particles/L, 95%CI: 55.6-86.2). The abundance of microplastics was significantly different among locations ($p < 0.05$, $F = 2.115$), with microplastics in sediments were higher in Ancol, and Muara Angke - Muara Karang have the highest microplastics in surface water. These results can provide valuable information on which parts of the Jakarta Bay areas should be prioritized first regarding microplastics management.

Evidence **Link:** <https://www.scopus.com/record/display.uri?eid=2-s2.0-85121000165&origin=inward&txGid=d48377c07d5fd6fceb10830d7b218abb>



“Formulating an Excise Duty on Plastic: A Strategy to Manage Marine Plastic Waste in Indonesia”

Research Scheme : PUTI Doktor
Researchers : Kosuke Mizuno, Ph.D.
(School of Environmental Science Programme)

Description:

Plastic excise duty is one of the programs prescribed to combat the marine waste problem in Indonesia. This article presents an insight into the formulation of the government regulations needed to implement plastic excise duty. Initially planned to be implemented by 2018, the program is still in process almost five years later. This article aims to identify the core issues discussed in the process, the stakeholders playing the central role, and their perspectives by interviewing key informants involved in the inter-ministerial committee. This research identified four ministries as definitive stakeholders as representatives of fiscal, industrial, and environmental groups. These groups have distinct interests in five core issues discussed during the negotiation process: the urgency of implementing an excise duty, its goals, scope of implementation, rate of tariff, and the settings for earmarking. This research found that environmental consideration was the central premise during the interministerial negotiation. However, the government’s hesitation to immediately implement an excise on plastic bags shows that currently, the government tends to prioritize economic considerations.

Evidence **Link:** <https://www.scopus.com/record/display.uri?eid=2-s2.0-85143600824&origin=inward&txGid=435c86efccb355401c664ef56d64ddf8>



“The effect of port development on coastal water quality: Evidence of eutrophication states in Indonesia”

Research Scheme : Riset Dasar Kemendikbudristek
Researchers : Muhammad Halley Yudhistira, Ph.D.
(Faculty of Economics and Business)

Description:

Developing transport infrastructure must involve a comprehensive cost-benefit analysis, and accounting for environmental quality changes associated with such an infrastructure is one important aspect that can help complete this problem. In this study, we used difference-in-difference to estimate coastal water quality changes, measured by the Chlorophyll-a concentration, related to port development in Indonesia over the last decade. Using unique MODIS-derived monthly water quality data, we found that the presence of a local small port causes a 1.7% increase in Chlorophyll-a in coastal areas within 6 km of the port. The effects are concentrated in the first two months of operation, and there is also evidence for anticipation effects associated with the construction period. We found a greater effect in Indonesia's eastern regions, which rely on small ports for their local activities. Furthermore, we argue that the effect can be substantial in a larger port, despite posing a limited risk on marine pollution.

Evidence Link: <https://www.scopus.com/record/display.uri?eid=2-s2.0-85127065184&origin=inward&txGid=5a84604a291ccec8dd7f49a895911a88>

Evidence Link: <https://research.ui.ac.id/research/uncategorized-en/sdgs14/>