

RESEARCH BRIEF

EFFICIENTLY REDUCING POLLUTION FROM THE SEAFOOD INDUSTRY REQUIRES DIFFERENTIATED ENVIRONMENTAL FEES

A research brief based on the study titled *Heterogeneity In Shadow Prices Of Water Pollutants: A Study Of The Seafood Processing Industry In Vietnam*.

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Motivation

The seafood processing industry plays a vital role in job creation and economic growth, particularly in regions like the Mekong River Delta of Vietnam. However, this industry also generates a significant amount of organic pollutants, predominantly discharged into riverside and seashore areas. Addressing water pollution from seafood processing operations is crucial for environmental sustainability and public health. The current regulatory framework in Vietnam applies a platform standard and environmental fee for water pollutants, but little is known about the actual Marginal Abatement Costs (MACs) incurred by seafood processing firms in reducing these pollutants. Understanding the MACs and their heterogeneity is essential for designing effective pollution reduction policies. This study aims to fill this research gap by estimating the MACs of three water pollutants (BOD, COD, and TSS) in the seafood processing industry, exploring the factors influencing MACs, and providing insights for policymakers to develop cost-effective and tailored pollution reduction strategies.

Research Objectives

This study aimed to estimate the Marginal Abatement Costs (MACs) of three water pollutants (BOD, COD, and TSS) in the seafood processing industry and analyze the heterogeneity of MACs along with their influencing factors.

Methodology

The researchers collected panel data from seafood processing firms in the Mekong River Delta region of Vietnam. They employed the directional distance function with Stochastic Frontier Analysis (SFA)

to estimate the MACs of the pollutants. Regression analysis was also conducted to identify the factors influencing the MACs.

Main Findings and Implications

The study calculated the MACs for BOD, COD, and TSS in seafood processing firms, yielding average values of 463 USD/ton, 303 USD/ton, and 38 USD/ton, respectively. These figures represent the cost incurred to reduce one ton of each respective pollutant in wastewater.

Notably, **the estimated shadow prices of COD were found to be 3.5 times higher than the environmental protection fee charged by the Vietnamese government.** Conversely, **the shadow prices of TSS were significantly lower than the fee.** This suggests that while the fee may effectively generate revenue, it may be less effective in encouraging firms to reduce COD pollution. However, the TSS charge appears to provide a strong incentive for firms to mitigate TSS discharge, given that their MACs are much lower than the fee.

This research highlights the heterogeneity in MACs among seafood processing firms and emphasizes the importance of considering such heterogeneity when designing effective pollution reduction policies. The findings suggest that applying uniform standards or fees may not efficiently target firms with different abatement costs. Instead, a tradable permit system could offer a more efficient approach. The study acknowledges limitations in data sampling and the inability to include certain interactions and square terms due to multicollinearity, suggesting avenues for future research.

This research contributes valuable insights into the MACs of water pollutants in the seafood processing industry, informing policymakers and stakeholders about the cost implications of pollution reduction and the need for tailored approaches to promote sustainable practices in the sector.

Understanding Water Quality Indicators

BOD, or Biochemical Oxygen Demand, is the amount (in mg/l) of dissolved oxygen necessary for aerobic organisms to break down organic matter in water over a specific time and temperature. BOD is an indicator of water's organic pollution, which higher BOD value indicating higher organic pollution.

BOD test needs 20 days at 20°C, which is too long. BOD test results in 5 days, indicated by BOD5, is approximately 70% of the 20-day results. Today BOD5 is used worldwide.

COD, or Chemical Oxygen Demand, is similar to BOD. While BOD indicates the biodegradable organic pollution, COD represents the degree of both biodegradable and non-biodegradable organic pollution. So COD value is always larger than BOD value.

TSS, or Total Suspended Solids, is the amount of insoluble solids content in water, measured in mg/l.

Source: [Understand Water Parameters BOD, COD, TSS, etc. in a Simple Way \(cnwwtp.com\)](https://cnwwtp.com)