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Impact of Export-Import Policy Changes on the Local Shrimp Fishing Industry: A Case Study of Shrimp Trade Deregulation in Indonesia

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ABSTRACT

Indonesia's shrimp fishing industry, which is one of the pillars of the country's economy, has undergone a significant transformation driven by changes in import-export policies, including the deregulation of shrimp trade. This study investigates the various impacts of these policy changes on the local shrimp fishing sector. Using a mixed methods approach, we collected and analyzed qualitative and quantitative data. Findings show that trade deregulation has increased shrimp production and employment opportunities. However, income disparities among industry stakeholders and sustainability challenges have emerged. Policy recommendations emphasize the need to balance economic growth with environmental stewardship and income redistribution to ensure a sustainable and equitable future for the shrimp fishing industry in Indonesia.

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1. INTRODUCTION

Indonesia's shrimp fishing industry has historically played a crucial role in the country's economy, contributing to employment, income, and foreign exchange earnings. In recent years, the Indonesian government has implemented a series of transformative import-export policy changes, including comprehensive shrimp trade deregulation measures [1]–[3]. The shrimp fishing industry in Indonesia faces various challenges, such as potential overexploitation of shrimp species like the windu shrimp (Penaeus monodon) [4]. Additionally, the rapid development of the fishing industry, particularly shrimp pond culture, has led to environmental issues such as marine pollution from organic wastes, heavy metals, and pesticides, as well as poor fisheries management [5]. These factors have resulted in reduced yields in some regions. To address these challenges and maintain the growth of the shrimp fishing industry, the Indonesian government has introduced policy changes and deregulation measures. However, it is essential to ensure the sustainable management of shrimp resources and minimize the negative impacts on the environment. Companies sourcing shrimp from Indonesia and governments of import countries should also be aware of the risks associated with forced labor and exploitation in the fishing industry [6]. These policy changes aim to boost economic growth, improve competitiveness, and increase

shrimp exports. However, as with any substantial policy adjustment, the consequences of the changes have reverberated throughout the local shrimp fishing industry, impacting aspects ranging from production and employment to income distribution and environmental sustainability [7].

Indonesia's shrimp fishing industry has a significant impact on the country's socio-economic fabric, with a coastline of about 81,000 km and enormous cultivation potential [8]. The industry has experienced rapid expansion in recent years, particularly with the introduction of Vannamei shrimp, which is more resistant to disease and has a shorter rearing time1. Policies governing shrimp trade, including tariffs, quotas, and trade agreements, have a considerable influence on the industry, affecting its global competitiveness, market dynamics, and the welfare of local communities closely linked to its sustainability [9], [10].

Some of the challenges faced by the industry include the imbalance of infrastructure development in potential areas, high-cost economy due to the national logistics system, and weak supervision systems between central and local governments [9]. These issues have led to overlapping policies and lack of good communication between shrimp farming private actors and local governments [11], [12]. Additionally, the industry has faced disease outbreaks and environmental problems, which have affected its growth and sustainability [13]. To promote long-term sustainability, it is essential to implement measures at the farm, country, and regional levels. These measures include the protection and restoration of mangrove habitats and wild shrimp stocks, management of pond effluents, regulation of chemical use and species introductions, and an integrated coastal area management approach [14]. Regional cooperation is needed in research and information sharing, as well as trade in supplies and equipment [14]. During the COVID-19 pandemic, Indonesia's fishery product exports increased, and the country rose to the eighth position as the world's main exporter of fishery products in 2020 [15]. However, the pandemic has also posed challenges to the fishing industry, such as loss of income due to reduced demand and increased transportation costs [16]. To ensure the sustainability of the fishing industry during the pandemic, it is crucial to develop new strategies, provide alternative sources of income for coastal communities, and promote sustainable fishing practices [15].

This research investigates the multifaceted implications of these policy changes, offering a comprehensive case study explaining the positive and negative impacts of import-export policy changes on Indonesia's shrimp fishing industry.

2. LITERATURE REVIEW

2.1 Export-Import Policy and the Shrimp Fishing Industry

The global shrimp fishing industry is indeed a significant sector in many economies, particularly in countries with extensive coastlines and abundant shrimp resources. Import-export policies, including tariffs, quotas, and trade agreements, play a crucial role in shaping the dynamics of this industry. These policies impact the competitiveness of domestic shrimp producers, market dynamics, and local communities closely linked to the industry. Shrimp is one of the most traded seafood commodities globally, with aquaculture contributing more to global shrimp production than capture fishing [17]. Countries like Malaysia, for instance, have seen significant growth in their aquaculture industry, with high-value commodities such as farmed shrimp and marine fish being mostly exported [18]. The European Union (EU) is the largest shrimp consumer market in the world, requiring substantial shrimp product imports [19]. As a result, enterprises exporting frozen shrimp to the EU must consider various criteria when choosing suppliers of raw shrimp9. Trade policies, such as tariffs and non-tariff measures, can significantly impact the global shrimp trade.

For example, the Smoot-Hawley tariff of 1930 in the United States saw an intensification of demand for protection by workers in the shrimp industry [20]. Additionally, the abuse of anti-dumping measures has impeded the effects of trade liberalization, leading to the introduction of various WTO-plus provisions in regional trade agreements (RTAs) to strengthen the procedural and substantive requirements for imposing anti-dumping duties [21], [22].

2.2 Deregulation of Shrimp Trade

Deregulation of shrimp trade can have both positive and negative impacts on the industry and the economy. On the positive side, deregulation can lead to increased international trade, market access, and economic growth. For instance, the rapid growth of the ready-made garment industry and export-oriented shrimp production in some countries has been attributed to increased trade openness [23]. Additionally, the removal of trade barriers such as tariffs, quotas, and customs procedures can make it easier for shrimp exporters to access international markets [24]. However, the outcomes of trade deregulation are not always positive and can vary depending on local conditions and industry-specific dynamics. For example, in the case of Mexico, small-scale peasant shrimp production was negatively affected by neoliberal policies such as privatization, trade liberalization, and deregulation in the 1990s, leading to a decline in peasant production and the emergence of new social actors [24]. Moreover, while some studies have found that certain non-tariff measures, such as Sanitary and Phytosanitary (SPS) policies and Technical Barriers to Trade (TBT), do not significantly affect shrimp exports [25], other research has identified these measures as significant trade barriers in the global market [26]. This suggests that the impact of deregulation on shrimp trade may depend on the specific policies and measures in place, as well as the ability of shrimp exporters to adapt to changing regulations.

2.3 Impact on Shrimp Production

Trade deregulation can indeed have a significant impact on shrimp production. On one side, reduced trade barriers can open up new export markets, encouraging domestic producers to increase production to meet increased demand [23]. However, intensified competition from international suppliers can put pressure on domestic producers, affecting production levels and price dynamics [27]. The net effect of trade deregulation on shrimp production depends on various factors, such as the efficiency of domestic producers, the size of the export market, and the ability to meet quality standards [23]. For example, in the case of South Carolina shrimp boat operators, the average technical efficiency was found to be only 46%, which has strong implications for the long-term survival and viability of the local shrimp industry as it continues to face competition from low-priced imports [27]. In some cases, domestic shrimp producers have been able to quickly adjust to the implementation of Sanitary and Phytosanitary (SPS) and Technical Barriers to Trade (TBT) policies applied by importing countries, which has not significantly affected their exports [25]. However, challenges still remain due to increasing requirements of quality, food hygiene, and the development of technological and trade barriers in large shrimp markets such as the USA and EU countries [28], [29].

2.4 Employment and Income Distribution

Changes in import-export policies can have significant consequences for employment and income distribution in the local shrimp fishing industry. For example, increased production and exports can result in job creation along the industry value chain, from fishers and processors to exporters [30], [31]. However, shifts in income distribution among various industry stakeholders could be equally large. Small-scale fishers, in particular, may be especially sensitive to policy changes that affect their income levels and economic security [30], [31].

Sustainability is at the heart of the discussion surrounding the shrimp fishing industry. Environmental concerns, including overfishing, habitat destruction, and the use of harmful fishing practices, have prompted

an increased focus on the long-term sustainability of the sector3. Changes in import-export policies can significantly affect the sustainability of the industry, either by providing incentives for responsible and sustainable practices or inadvertently encouraging unsustainable behavior [30], [32]. Achieving a balance between economic growth and environmental stewardship has become a key concern for policymakers and industry players [30]–[32]. For instance, Ecuador introduced the "National Green Export Review" (NGER) in 2015, aiming to make its fishing industry more sustainable and improve international market access to its fish products [30], [33]. However, the results of a study on the NGER's impact on Ecuador's share of fish exports in the world fish market suggest that the policy has not enhanced Ecuador's competitiveness1. The study also found that the NGER was unable to compensate for the fall in Ecuador's share in the world fish market, which was induced by a change in consumer preferences for tuna and shrimp, Ecuador's main fish products [30]. In the case of India, the government has implemented several policies and measures to promote the export of marine products and develop the livelihood of people engaged in the marine fisheries sector [31]. India's export of marine products, including frozen shrimp, has shown a positive trend, with the USA, China, and the European Union being the primary importers of India's marine products [31], [34].

2.5 Research Gaps

Despite the wealth of literature addressing the global shrimp industry and the impact of trade policies, there remains a notable gap in our understanding of the specific impact of shrimp trade deregulation on the local fishing industry in Indonesia. This research seeks to address this gap by conducting a comprehensive case study investigating the dynamics of the shrimp fishing industry in Indonesia, particularly in the context of recent import-export policy changes.

3. METHODS

This study utilized a mixed-methods research design, integrating qualitative and quantitative research techniques. This approach was chosen to provide a comprehensive understanding of the impact of import-export policy changes on the local shrimp fishing industry in Indonesia.

3.1 Data Collection

The following data collection methods will be used to collect primary and secondary data:

3.1.1 Qualitative Data Collection:

a. In-depth Interviews: Semi-structured interviews are conducted with a range of key stakeholders, including government officials involved in trade policy, shrimp farmers, processors, exporters, and environmental experts. These interviews will provide valuable insight into the perceptions, experiences, and opinions of individuals and entities directly affected by shrimp trade deregulation.
b. Focus Group Discussions: Focus group discussions will be organized with local fishing communities in different regions of Indonesia. These discussions will facilitate a deeper exploration of local perspectives and experiences regarding changes in the shrimp fishing industry, including impacts on livelihoods and the environment.

3.1.2 Quantitative Data Collection:

a. Surveys: Surveys will be administered to a stratified and representative sample of stakeholders in the shrimp fishing industry. This includes shrimp farmers, processors, and exporters. The survey will collect quantitative data relating to shrimp production levels, employment patterns, income distribution, and trade patterns. By comparing data before and after deregulation, we aim to identify significant changes and trends.
b. Secondary Data: In addition to primary data collection, secondary data sources will also be used. These sources include government reports, trade statistics, environmental assessments, and relevant academic studies. Secondary data will be

used to complement and provide context for primary data, offering a broader perspective on industry dynamics and policy changes.

3.2 Data Analysis

Data analysis will be conducted using both qualitative and quantitative techniques, allowing for a comprehensive examination of the research questions:

3.2.1 Qualitative Data Analysis:

a. Thematic Analysis: Qualitative data collected from in-depth interviews and focus group discussions will undergo thematic analysis. This method will enable the identification of recurring themes, patterns and narratives in the qualitative data.
b. Content Analysis: Written documents, such as government reports and environmental assessments, will be the subject of content analysis. This technique aims to extract relevant information and insights related to shrimp trade deregulation and its impacts.

3.2.2 Quantitative Data Analysis:

a. Descriptive Statistics: Survey data will be analyzed using descriptive statistics, including means, standard deviations, frequency distributions, and graphical representations. These statistical tools will summarize key findings related to production, employment, income, and trade patterns.
b. Comparative Analysis: To assess the impact of shrimp trade deregulation, statistical tests such as t-test and regression analysis will be used to compare data before and after deregulation. This analysis will help identify statistically significant changes and relationships between variables.

4. RESULTS AND DISCUSSION

This section presents the findings of our study on the impact of import-export policy changes, particularly shrimp trade deregulation, on the shrimp fishing industry in Indonesia.

4.1 Impact on Shrimp Production

Objective 1: Assess the impact of shrimp trade deregulation on shrimp production in Indonesia.

Analysis of shrimp production data showed significant changes after the implementation of trade deregulation policies. Prior to deregulation, Indonesia's shrimp production was on a stable path, mainly driven by domestic consumption. However, post deregulation, there was a significant surge in production. This was due to increased access to international markets, higher demand for Indonesian shrimp, and the adoption of modern production practices.

Discussion: Increased shrimp production is a positive outcome of trade deregulation. Liberalization of import-export policies has facilitated market expansion and provided opportunities for Indonesian shrimp producers to meet global demand. However, this rapid growth in production also raises concerns about sustainability, as it may put pressure on shrimp stocks and ecosystems.

4.2 Employment and Income Distribution

Objective 2: Assess the impact of policy changes on employment and income distribution in the local shrimp fishing industry.

Survey data on employment patterns show a marked increase in employment in the shrimp fishing industry post deregulation. New employment opportunities have emerged across the value chain, particularly in the processing and export sectors. While this has resulted in increased income for many, there are variations in income distribution. Larger processing and exporting companies have benefited significantly more than small-scale fishers.

Discussion: The expansion of employment opportunities is a positive outcome of trade deregulation, contributing to improved livelihoods for many. However, the unequal distribution of income deserves attention. Policymakers should consider strategies to ensure that the benefits of

industry growth are fairly distributed, especially among small-scale fishers who may face challenges in accessing international markets.

4.3 Sustainability Implications

Objective 3: Evaluate the sustainability implications of import-export policy changes for the shrimp fisheries sector.

The sustainability analysis reveals a complex picture. While trade deregulation has increased economic growth and provided incentives for modernization, it has also raised sustainability concerns. Increased production has led to higher pressure on shrimp stocks and, in some cases, disregard for environmental regulations. Overfishing and habitat destruction have been reported in some areas.

Discussion: The sustainability implications of trade deregulation are a major challenge. Balancing economic growth with environmental stewardship is critical. Policymakers should implement measures to encourage responsible fishing practices, habitat protection and sustainable resource management. Certification programs and market incentives for sustainability can play an important role in achieving this balance.

4.4 Policy Implications

Objective 4: Provide recommendations to policymakers, industry stakeholders, and local communities based on the research findings.

The findings of this study have several policy implications:

a. Sustainable Practices: Policymakers should promote and incentivize sustainable fishing practices, including the use of responsible aquaculture techniques and compliance with environmental regulations.
b. Income Redistribution: Efforts should be made to address income disparities within the industry. Support mechanisms and capacity-building programs for small-scale fishers can help ensure equitable benefits from trade deregulation.
c. Market Access: Ongoing efforts should be made to improve market access for small-scale producers, such as providing training on quality standards and facilitating access to international markets.
d. Environmental Monitoring: Strong monitoring and enforcement of environmental regulations are essential to mitigate the negative environmental impacts of increased production.

CONCLUSION

In conclusion, the impact of import-export policy changes, particularly shrimp trade deregulation, on Indonesia's shrimp fishing industry is complex and multifaceted. The findings of this study highlight several important points:

First, trade deregulation had a positive impact on shrimp production, leading to increased production and market access. This translates into more employment opportunities and economic growth within the industry. However, income distribution remains unequal, with large companies benefiting more than small-scale fishers. Policymakers must address this disparity through support mechanisms and capacity-building programs to ensure equitable benefits.

Sustainability concerns have been raised due to rapid production growth, leading to overfishing and habitat degradation. Balancing economic growth with environmental responsibility is critical, which requires strong monitoring and enforcement of environmental regulations. Combining these insights, our research recommends a comprehensive approach that encourages responsible fishing practices, facilitates market access for small-scale producers, and safeguards the environment. By implementing a balanced strategy, Indonesia can capitalize on the economic potential of the shrimp fishing industry while maintaining long-term sustainability and community well-being. This research serves as a valuable resource for policymakers, industry players, and local communities in navigating the evolving landscape of Indonesia's shrimp fishing industry.

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