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Economic value of east java shrimp exports since 2000-2024 literature review

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ABSTRACT

Shrimp is one of Indonesia's leading fishery commodities and contributes significantly to national export earnings in the marine and fisheries sector. East Java Province has become one of the main centers of shrimp production and export due to its extensive aquaculture areas, developed fisheries infrastructure, and access to international export markets. This study uses a Structured Narrative Literature Review (SNLR) approach to analyze the development of the economic value of East Java shrimp exports during 2000–2024. Data were collected from scientific journals, government reports, statistical publications, and fisheries research documents sourced from Google Scholar, Scopus, BPS, and the Ministry of Marine Affairs and Fisheries. The review indicates that shrimp exports from East Java have shown significant growth, particularly after the expansion of whiteleg shrimp cultivation. Export competitiveness is influenced by production capacity, technology adoption, global demand, international quality standards, and trade policies. The study concludes that shrimp exports play a strategic role in regional economic growth and national fisheries development.



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Introduction

The maritime and fisheries sector is an economic sector with significant potential to support national development. As an archipelagic nation, Indonesia possesses abundant and diverse marine resources, including both capture and aquaculture. Shrimp is one of the leading commodities with high economic value (Rühmann et al. 2020). Shrimp is a major export commodity in Indonesia's fisheries sector. This product enjoys high demand in the global market, serving as a staple food in countries such as the United States, Japan, and European countries. The value of global shrimp trade continues to increase in line with the growth in global seafood consumption.

East Java Province holds a strategic position in the national shrimp industry. This region boasts a long coastline and extensive shrimp ponds in various regencies, including Sidoarjo, Gresik, Lamongan, Banyuwangi, Probolinggo, and Situbondo. Furthermore, the presence of a fisheries processing industry and export facilities supports the development of the shrimp trade in this region (Zhu et al. 2022). Since the early 2000s, shrimp production in East Java has undergone significant changes. This change was primarily driven by advances in whiteleg shrimp cultivation technology, which has begun to replace tiger shrimp. Whiteleg shrimp offer several advantages, including rapid growth, improved disease resistance, and high productivity.

This increase in production has resulted in increased volume and value of shrimp exports. Shrimp products from East Java are exported not only fresh but also in processed forms such as frozen shrimp, peeled shrimp, and other seafood products. Shrimp export value is a key indicator in assessing the fisheries sector's economic contribution to regional and national development. Therefore, a comprehensive analysis of shrimp export developments is necessary to understand trends, driving factors, and challenges facing this sector. This study uses a Systematic Literature Review (SLR) approach to analyze various studies and reports discussing the economic value of shrimp exports from East Java Province since 2000 (Ali 2023).

Method

Research Approach

This study employs a Structured Narrative Literature Review (SNLR) approach to examine the development of shrimp exports in East Java and the factors influencing their economic value. Unlike the Systematic Literature Review (SLR), which emphasizes strict quantitative selection procedures, the Structured Narrative Literature Review focuses on a comprehensive and critical interpretation of previous studies through a structured and transparent review process.

The SNLR approach enables researchers to synthesize findings from various sources, compare perspectives, identify research trends, and explain relationships among economic, trade, and fisheries variables related to shrimp exports. This method is considered suitable because the topic involves multidimensional aspects, including international trade, aquaculture production, export policy, and regional economic development. Through this approach, the study develops an integrated narrative regarding the dynamics of East Java shrimp exports based on relevant academic and institutional literature (Liu et al. 2024).

Data Sources

The data used in this research were obtained from various secondary literature sources, including National and international scientific journals, University research reports, Trade statistics publications, Government reports, Articles related to economics and the fisheries industry.

The literature and document search was conducted through several academic databases and institutional sources, including Google Scholar, Scopus, ScienceDirect, Statistical reports from the Central Statistics Agency (BPS), Policy reports from the Ministry of Marine Affairs and Fisheries of the Republic of Indonesia. These sources were selected to ensure the credibility, relevance, and comprehensiveness of the information related to shrimp export performance and economic factors in East Java.

Structured Narrative Literature Review Procedure

The Structured Narrative Literature Review in this study was conducted through several systematic stages to ensure transparency and relevance in the literature selection process.

Literature Identification

The first stage involved identifying relevant literature using several keywords related to the research topic, including *shrimp export Indonesia*, *East Java shrimp exports*, *shrimp aquaculture Indonesia*, *fisheries export East Java*. The search process aimed to gather a broad range of studies discussing shrimp exports, fisheries trade, aquaculture production, and export-related economic factors.

Literature Screening

After the identification stage, the collected literature was screened based on predefined inclusion criteria. The selected studies had to be relevant to shrimp exports and fisheries trade, be published between 2000–2024, contain economic, production, or trade-related data. At this stage, duplicate and irrelevant articles were excluded to improve the quality of the reviewed literature.

Literature Evaluation and Classification

The remaining literature was then evaluated through a detailed reading process to assess its relevance and contribution to the research objectives. The evaluation focused on several aspects, such as Development of shrimp export value, Economic factors influencing exports, Trade and fisheries policies, Aquaculture production trends, Regional competitiveness. The selected literature was subsequently grouped into thematic categories to facilitate narrative analysis and comparison among studies (Cabrera and Cabrera 2023).

Narrative Synthesis

The final stage involved synthesizing the findings narratively by integrating information from various studies into a coherent explanation. The synthesis aimed to provide a comprehensive understanding of (Rana 2023) The development of East Java shrimp exports, Key economic and policy determinants, Challenges and opportunities in the shrimp export sector, The contribution of shrimp exports to regional economic development. Through this narrative synthesis, the study highlights patterns, similarities, and differences among previous studies while identifying research gaps relevant to future research (Andayani, Widodo, and Agustito 2021).

Literature Selection Process

The literature selection process in this Structured Narrative Literature Review followed a structured filtering procedure adapted from literature review transparency principles. Literature Identification Articles identified from databases and institutional sources: 145 articles, Initial Screening Articles remaining after title and abstract screening: 78 articles. Full-Text Evaluation Articles considered relevant after full-text review: 42 articles

Final Inclusion

Articles included in the narrative analysis: 36 articles. The selection process indicates that only the most relevant and high-quality literature was included in the final review. This structured procedure improves the transparency, consistency, and reliability of the research findings while ensuring that the narrative synthesis is based on credible academic and institutional sources.

Results and Discussions

Development of Shrimp Production in East Java

Shrimp production is a major factor influencing export value. East Java is one of the provinces with the largest shrimp production in Indonesia. Shrimp farming in this region is growing rapidly due to several factors: availability of large pond areas, cultivation technology support, fisheries sector investment, high global market demand The development of intensive and super intensive ponds significantly increases shrimp productivity. In addition, the transformation from tiger prawn cultivation to whiteleg shrimp cultivation is an important factor in increasing production (Setyawan et al. 2022).

Shrimp production plays a strategic role in determining the export value of Indonesia's fisheries sector. In the context of international trade, shrimp is a leading commodity with high competitiveness in the global market. Increased production directly impacts export volume, making this commodity a significant source of foreign exchange. Therefore, efforts to increase shrimp production are a primary focus in the development of the aquaculture sector.

Regionally, East Java is known as one of the provinces with the largest contribution to shrimp production in Indonesia. This region boasts geographical advantages and resources that support sustainable shrimp farming. With its long coastline and favorable environmental conditions, East Java is capable of becoming a production center and a major supplier of shrimp for national export needs(Riyanto et al. 2021).

The rapid growth of shrimp farming in East Java is inextricably linked to various interrelated supporting factors. These factors create a conducive aquaculture ecosystem, thereby increasing productivity and yield quality. The combination of natural resources, technology, and economic support is key to this sector's success in meeting global market demand(Sudaryanto et al. 2020).

The first major contributing factor is the availability of extensive pond land. Coastal areas in East Java offer significant potential for the development of both traditional and modern ponds. The vast land area allows for large-scale production expansion and provides flexibility in implementing various cultivation systems according to the needs and capabilities of the farmers(Paksi et al. 2024).

Furthermore, support for cultivation technology is a crucial factor in increasing efficiency and productivity. The application of modern technologies such as aeration systems, water quality management, and the use of high-quality feed can improve shrimp survival rates. This technology also helps reduce the risk of disease and accelerates the production cycle, resulting in optimal harvest yields(Andini et al. 2025).

The third factor is increased investment in the fisheries sector, particularly shrimp farming. This investment comes from both the government and the private sector, recognizing the enormous potential of

shrimp. Capital support allows for the development of more modern pond infrastructure, such as intensive and super-intensive ponds, which can produce large quantities in a relatively short time.

High global market demand is also a major driver of shrimp farming growth. Countries such as the United States, Japan, and China continue to demonstrate significant demand for shrimp products. This situation creates a vast market opportunity for Indonesia, particularly East Java, to increase exports and strengthen its position in the international market (Fadhilah 2024).

The development of intensive and super-intensive ponds is one innovation that has played a significant role in increasing production. This system allows for higher stocking densities with more controlled environmental management. As a result, productivity per unit pond area increases dramatically compared to traditional systems, enabling them to meet large market demand (Firmansyah, Kusumastanto, and Mulyati 2020).

In addition to improving cultivation systems, commodity transformation is also a crucial factor in boosting production. The transition from tiger shrimp to whiteleg shrimp has had a positive impact because whiteleg shrimp offer advantages in terms of faster growth, disease resistance, and better feed efficiency. This makes cultivation more economical and profitable for farmers (Kartika and Handoyo 2024).

Overall, the combination of land availability, technological advancements, investment support, and high global demand make East Java a highly promising shrimp production hub. With the right development strategy, this sector can not only increase export value but also significantly contribute to economic growth and the well-being of coastal communities in Indonesia.

Development of East Java Shrimp Export Value

The following is an estimate of the development of shrimp export value from East Java based on various statistical sources.

Table 1. Development of East Java Shrimp Export Value (2000–2024)

Year	Export Value (million USD)
2000	180
2002	210
2004	245
2006	300
2008	355
2010	410
2012	480
2014	520
2016	560
2018	610
2020	636
2022	690
2024	720

Shrimp Export Trend Chart Export Value (USD)

The development of shrimp export value from East Java shows a very positive trend from 2000 to 2024. Estimated data shows a relatively consistent increase from year to year, reflecting the increasingly strong position of shrimp as a leading regional export commodity. This increase reflects not only production growth but also increased competitiveness in the international market (Lestari et al. 2024).

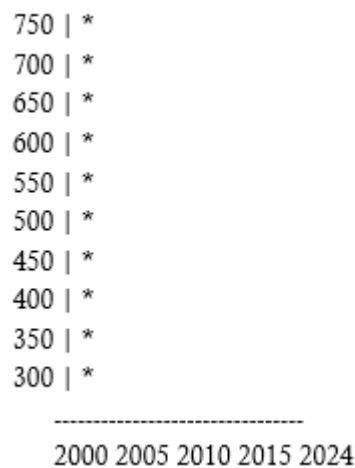


Figure 1.The graph shows a consistent trend of increasing shrimp export value since 2000.

At the beginning of the period, in 2000, East Java's shrimp exports were recorded at US\$180 million. This figure marked the starting point for growth, which then gradually increased to US\$210 million in 2002 and US\$245 million in 2004. This increase indicated improvements in the production system and increasing global demand for Indonesian shrimp (Amalina, Yusida, and Wijayanti 2024).

From 2006 to 2010, export value growth became increasingly significant. In 2006, exports reached US\$300 million, then increased to US\$355 million in 2008, and reached US\$410 million in 2010. This surge reflected the development of more modern cultivation systems and increased production capacity in East Java.

From 2012 to 2016, the upward trend continued, albeit at a more stable pace. Export value reached US\$480 million in 2012, then increased to US\$520 million in 2014, and US\$560 million in 2016. This stable growth indicates that the shrimp farming sector has entered a strengthening phase, with production efficiency and product quality increasingly maintained (Lubis and Muniapan 2024).

Furthermore, from 2018 to 2020, export value increased from US\$610 million to US\$636 million. While growth was not as high as the previous period, this figure still demonstrates the resilience of the fisheries sector to various challenges, including global economic dynamics. This indicates that demand for shrimp remains strong in the international market.

Entering the latest period, from 2022 to 2024, export value again experienced a significant increase, from USD 690 million to USD 720 million. This increase indicates recovery and market expansion following various previous global challenges. It also reflects the success of the strategy to increase production and export quality (Saliem et al. 2021).

Looking at the trend chart, the pattern formed shows a continuously rising line without significant declines. This chart indicates that shrimp export value has experienced stable long-term growth. This gradual increase indicates that the shrimp sector has strong and sustainable fundamentals.

Several key factors driving this increase in export value include increased production through intensive cultivation systems, the use of modern technology, and improved supply chain management. Furthermore, improved product quality standards also play a crucial role in meeting increasingly stringent export market requirements (Rapitasari and Dwiarta 2022).

External factors, such as high demand from export destination countries, also significantly contributed to the growth in export value. The international market continues to require large shrimp supplies, providing East Java with an opportunity to sustainably increase its export volume and value.

Overall, the development of East Java's shrimp export value from 2000 to 2024 shows a positive and consistent trend. This confirms the strategic role of shrimp in the regional and national economies. By maintaining quality, increasing productivity, and expanding markets, shrimp exports still have significant potential for continued growth in the future (Rochayatun and Bidin 2022).

Export Destination Countries

The main export markets for East Java shrimp include: 1 United States 2 Japan 3 China 4 European Union 5 South Korea. The United States is the largest market because seafood consumption in that country is very high.

Discussion

Economic Contribution of Shrimp Exports

Shrimp exports make a significant economic contribution to regional development.

These contributions include 1) increasing foreign exchange; 2) increasing farmer income; 3) developing the processing industry; 4) creating jobs. The shrimp processing industry is also growing rapidly in East Java, especially in the Surabaya and Sidoarjo areas.

Factors Determining Export Value

Pond Production, High pond production increases export volume. International Price, Global price fluctuations affect the value of shrimp exports. Cultivation Technology, Intensive cultivation technology increases pond productivity. Trade Policy, International trade agreements affect export market access.

Pond production is a fundamental factor that directly determines the volume of shrimp exports. The higher the pond production, the greater the potential supply for international markets. In regions like East Java, increasing pond production depends not only on land area but also on effective aquaculture management. A good aquaculture system can improve shrimp survival rates and accelerate harvest times, resulting in a higher annual production frequency. This ultimately drives a significant increase in export volume (Tampubolon et al. 2023).

In addition to quantity, the quality of pond production also significantly impacts export competitiveness. High-quality shrimp are more readily accepted in the global market and command a higher selling price. Therefore, pond management that pays attention to water quality, feed, and shrimp health is crucial. Optimal pond production is not only about quantity but also about consistent quality that meets international standards (Ashardiono and Trihartono 2024).

The next highly influential factor is the international price of shrimp. Export value is determined not only by volume but also by the selling price on the global market. When global shrimp prices rise, export value will increase even if production volume remains relatively constant. Conversely, if global prices decline, export value may decline even if production volume increases. This indicates that international price fluctuations have a direct impact on foreign exchange earnings from the shrimp export sector.

These price fluctuations are influenced by various factors, such as global supply and demand conditions, changes in import policies in destination countries, and global economic conditions. Major consumer countries such as the United States, Japan, and China play a significant role in determining market prices. When demand from these countries increases, prices tend to rise, resulting in greater profits for exporters.

Aquaculture technology is a key factor in increasing pond productivity. The application of intensive technologies, such as aerators, biofloc systems, and digital water quality monitoring, can significantly increase production efficiency. This technology allows farmers to control pond environmental conditions more precisely, thereby minimizing the risk of crop failure (Ajija, Zakia, and Purwono 2021).

Besides increasing productivity, aquaculture technology also plays a role in reducing production costs. With more efficient feed use and more controlled management, farmers can achieve higher yields at relatively lower costs. This provides a competitive advantage for Indonesian shrimp products in the global market, as they can compete on both price and quality (Abdurohim and Ramdan 2023).

Technological advancements have also driven the emergence of intensive and super-intensive cultivation systems, capable of producing large-scale production on relatively limited land. These systems offer a solution to land constraints while maximizing output. Thus, technology not only increases production quantity but also strengthens the sustainability of the shrimp farming sector (Purwono et al. 2022).

On the other hand, international trade policies also play a crucial role in determining the success of shrimp exports. Trade agreements between countries can either open or restrict market access for shrimp products. Policies such as import tariffs, quotas, and quality and food safety standards significantly impact export success.

Favorable trade agreements can provide broader market access and lower trade barriers, making shrimp products more competitive in the international market. Conversely, protectionist policies from destination

countries can pose challenges for exporters. Therefore, the government's role in fostering international trade cooperation is crucial (Apriani, Marissa, and Igamo 2022).

Overall, these four factors pond production, international prices, cultivation technology, and trade policies are interrelated and form a system that influences the value of shrimp exports. Optimizing these four aspects will determine Indonesia's success, particularly East Java's, in maintaining and enhancing its position as a major shrimp exporter in the world (Destiningsih et al. 2020).

Shrimp Export Competitiveness

The competitiveness of Indonesian shrimp exports is determined by several factors: 1) production efficiency; 2) product quality; 3) food safety standards; 4) trade logistics. Shrimp products must meet international food safety standards such as HACCP and export quality certification. The competitiveness of Indonesian shrimp exports is a key factor in determining the success of international market penetration and maintaining its position as a major global exporter. In the increasingly competitive context of global trade, shrimp products are not only required in terms of quantity, but also quality, efficiency, and compliance with various international standards. Therefore, several key factors determine this competitiveness, ranging from production efficiency to logistics systems that support distribution.

The first and most influential factor is production efficiency. This efficiency encompasses how the cultivation process is carried out at optimal costs while still producing maximum output. In practice, production efficiency can be achieved through the use of modern technology, proper feed management, and effective disease control. High efficiency can reduce production costs, making product prices more competitive in the global market without sacrificing quality (Lail 2025).

Furthermore, production efficiency is also related to the farmer's ability to optimally utilize resources. Efficient use of land, water, and energy will increase productivity while maintaining environmental sustainability. This is increasingly important given that the international market now focuses not only on price but also on sustainability in the production process (Masruroh 2020).

The second factor is product quality. Exported shrimp must meet high quality standards, including size, freshness, texture, and cleanliness. Product quality significantly determines its acceptance in the international market, as global consumers tend to prefer consistent and reliable products. Therefore, post-harvest handling processes, such as cold storage and packaging, are crucial in maintaining shrimp quality until it reaches consumers (Susilowati et al. 2021).

Product quality is also closely linked to Indonesia's reputation as an exporting nation. Maintaining product quality will boost international market confidence, thereby opening up broader export opportunities. Conversely, declining quality can lead to product rejection and even restricted market access.

The third factor is compliance with international food safety standards. In global trade, every shrimp product must meet strict standards to ensure safe consumption. One commonly used standard is HACCP, a system that identifies and controls potential hazards in the food production process. Implementing this standard ensures that shrimp products are safe from biological, chemical, and physical contamination.

In addition to HACCP, various export quality certifications are also essential requirements for entering international markets. Export destinations such as the United States, Japan, and the European Union have strict regulations regarding food safety. Therefore, exporters must ensure that the entire production and distribution process meets these standards to ensure smooth product acceptance (Meldona 2022).

The fourth and equally important factor is trade logistics. An efficient logistics system will ensure that shrimp products can be delivered quickly, safely, and in a fresh condition. Given that shrimp is a perishable product, the cold chain system is a vital component of the distribution process. Delays or disruptions in logistics can lead to quality degradation and even significant economic losses.

The development of logistics infrastructure, such as ports, transportation, and cold storage facilities, significantly supports smooth exports. Furthermore, efficiency in administrative and customs processes also plays a role in accelerating the flow of goods to international markets. A sound logistics system can reduce distribution costs and shorten delivery times, thereby increasing product competitiveness in the global market (Moenardy and Sinaga 2021).

Overall, the competitiveness of Indonesian shrimp exports is determined by the synergy between production efficiency, product quality, food safety standards, and trade logistics. These four factors are interrelated and must be optimally managed to face increasingly fierce global competition. By maintaining a

balance between economics, quality, and sustainability, Indonesia has a significant opportunity to further enhance its position as a major player in the global shrimp trade (Abdillah 2025).

Shrimp Industry Challenges

Some of the challenges facing the shrimp industry include: 1) Diseases in ponds; 2) Climate change; 3) Global price fluctuations; 4) Competition with other producing countries such as Vietnam and Thailand. The shrimp industry is a strategic sector in the fisheries economy, but its development faces various complex and dynamic challenges. These challenges stem not only from internal factors such as pond conditions and cultivation management, but also from external factors such as global environmental changes and international competition. Therefore, understanding these various obstacles is crucial to maintaining the sustainability and competitiveness of the shrimp industry in the global market (Sifaiyya, Y. 2024).

One of the main challenges frequently faced is disease outbreaks in shrimp ponds. Diseases can cause high shrimp mortality rates and significantly reduce productivity. Some common diseases include White Spot Syndrome Virus and Early Mortality Syndrome, which can spread rapidly in poorly controlled environments. These disease outbreaks are often difficult to predict and require prompt and appropriate treatment to prevent significant losses for farmers.

Furthermore, suboptimal pond health management also exacerbates the risk of disease spread. Poor water quality, excessively high stocking densities, and the use of inappropriate feed can trigger disease outbreaks. Therefore, implementing biosecurity and regular environmental monitoring are crucial steps to minimize these risks.

The next challenge is climate change, which directly impacts the cultivation environment. Temperature changes, erratic rainfall, and an increased frequency of extreme weather events can affect pond water quality and shrimp health. These conditions make the cultivation process more unstable and unpredictable, increasing the risk of crop failure.

Climate change also impacts water resource availability and salinity, which are critical factors in shrimp farming. Imbalances in these environmental parameters can hinder shrimp growth and increase susceptibility to disease. Therefore, adapting to climate change through improved technology and management is an urgent need for this industry (Tran, N., et al. 2017).

Furthermore, global price fluctuations pose an equally significant challenge. Shrimp prices on the international market are heavily influenced by supply and demand dynamics, as well as global economic conditions. When prices decline, exporters' and farmers' incomes are depressed, even if production remains high. Conversely, price increases can generate profits, but are often unstable and difficult to predict.

This price volatility is also influenced by trade policies, currency exchange rates, and market conditions in export destination countries. This requires industry players to adopt flexible strategies, such as market diversification and increased production efficiency, to remain resilient in uncertain conditions.

Another significant challenge is competition with other shrimp-producing countries. Countries like Vietnam and Thailand have already developed their shrimp industries with advanced technology and efficient management systems. Both countries boast advantages in productivity, product quality, and access to international markets.

This competition demands that Indonesia continuously enhance its competitiveness through innovation and quality improvement. Without sustained efforts, Indonesia's position in the global market could be eroded by more adaptive and efficient competitors. Therefore, enhancing human resource capacity, technology, and policy support are crucial.

Overall, these challenges demonstrate the need for a comprehensive and sustainable approach to the shrimp industry. Disease management, climate change adaptation, price risk management, and increased global competitiveness must be integrated. With the right strategy, the Indonesian shrimp industry has a significant opportunity to continue growing and become a major player in the international market.

Policy Implications

To increase the competitiveness of shrimp exports, several strategic policies are required: 1) Improvement of cultivation technology; 2) Strengthening the processing industry; 3) Development of new export markets; 4) Sustainable pond management.

Improving the competitiveness of Indonesian shrimp exports requires an integrated approach through various strategic policies that address global challenges while capitalizing on market opportunities. In the context of increasingly fierce international competition, policies should not only focus on increasing production but also encompass aspects of quality, sustainability, and value chain efficiency. Therefore, comprehensive strategic measures are needed to ensure the Indonesian shrimp industry can maintain and expand its global market share.

One key policy is improving cultivation technology. Technology plays a crucial role in increasing productivity, efficiency, and the quality of cultivated produce. The implementation of modern cultivation systems, such as intensive and super-intensive systems, the use of water quality sensors, and automated feeding, can significantly increase yields. Furthermore, technology also helps control disease and maintain pond environmental stability. This allows for increased productivity without the need for significant land expansion.

Strengthening technology must also be accompanied by increased human resource capacity. Shrimp farmers need training and mentoring to optimally adopt technology. Without adequate understanding, even sophisticated technology will not yield optimal results. Therefore, collaboration between the government, academia, and the private sector is key to accelerating technology transfer in the shrimp farming sector.

The second policy is strengthening the shrimp processing industry. The processing industry plays a crucial role in increasing the added value of products before export. Processed shrimp, such as frozen, peeled, or ready-to-eat, has a higher selling value than raw products. Furthermore, processing also helps extend the product's shelf life, making it safer for distribution to international markets (Bostock, J. 2010).

Strengthening this sector requires investment in processing infrastructure, such as cold storage facilities, flash-freezing technology, and modern packaging systems. Strict food quality and safety standards, including the implementation of HACCP, must also be enforced to ensure products meet global market requirements. With a strong processing industry, Indonesia can increase its competitiveness through product differentiation and superior quality.

Furthermore, developing new export markets is a crucial strategy to reduce dependence on traditional markets. Currently, Indonesian shrimp exports are heavily dependent on specific countries such as the United States and Japan. While these markets still have significant potential, market diversification is necessary to anticipate the risk of policy changes or declining demand in key destination countries.

New market development can be achieved by exploring opportunities in regions such as the Middle East, Eastern Europe, and Africa. Furthermore, product promotion through international exhibitions, trade cooperation, and economic diplomacy can help open access to broader markets. By expanding market networks, export stability can be better maintained and the risk of dependency can be minimized.

Another strategic policy is sustainable pond management. The concept of sustainability is becoming increasingly important in global trade, as consumers and export destinations increasingly pay attention to environmental and social aspects of the production process. Environmentally friendly pond management, such as efficient use of water resources, waste reduction, and coastal ecosystem preservation, provides added value that can enhance product competitiveness.

Beyond environmental aspects, sustainability also encompasses community well-being and long-term business continuity. Sustainable farming practices will maintain long-term pond productivity and reduce the risk of environmental damage that could hamper future production. Sustainability certification can also provide added value, increasing international market confidence in Indonesian shrimp products (Anderson, JL 2003).

Implementing these policies requires support from various parties, including the government, businesses, and research institutions. The government plays a crucial role in creating supportive regulations, providing incentives, and strengthening infrastructure. Meanwhile, businesses must be able to adapt to change and continuously improve production quality and efficiency.

Overall, increasing the competitiveness of Indonesian shrimp exports cannot be achieved through a single policy, but rather through the synergy of various mutually supportive strategies. By optimizing cultivation technology, strengthening the processing industry, expanding export markets, and implementing sustainability principles, Indonesia has a significant opportunity to strengthen its position as one of the world's leading shrimp exporters.

Conclusions

This study shows that shrimp exports are an important economic sector for East Java Province and Indonesia as a whole. From 2000 to 2024, shrimp exports showed a significant upward trend. This growth was driven by advances in whiteleg shrimp cultivation technology, increasing global demand, and the strengthening of the fisheries processing industry. However, this sector still faces various challenges, such as pond diseases, climate change, and global competition. Therefore, sustainable fisheries development strategies and improving product quality are the main keys to maintaining the competitiveness of shrimp exports in the international market.

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