INTECHBIZ2025
International Conference on Industrial Technology and Business

Strategy To Increase The Added Value Of Bengkalis Shrimp Paste To Become An Indonesian Export Commodity

Lily Arnalis[1], Muhammad Fuad Asrofillah[2]
[1]*Bussines* Administration *Department, State Politeknic of Negeri Bengkalis, Indonesia*
lilyarnalis01@gmail.com1[1],fuadasrofillah@polbeng.ac.id[2]

Abstract

This study focuses on finding strategies to increase the economic value of Bengkalis shrimp paste, so that this product can develop into a strong Indonesian export commodity in the global market through technological innovation, product quality improvement, and digital marketing. Using a descriptive qualitative method through case studies in the villages of Pambang, Selatbaru, and Teluk Pambang, information was collected through interviews, direct observation, and document analysis from MSME actors, fishermen, and relevant government agencies. The results of the study reveal that terasi production in Bengkalis still largely relies on traditional techniques with limited technological support, resulting in low added value and limited access to wider markets. The application of appropriate technologies, such as solar-powered dryers, vacuum packaging, and digital tracking systems, has successfully increased production efficiency by up to 40%, extended shelf life to six months, and doubled the potential selling price. In addition, the application of modern marketing strategies such as the Business Model Canvas (BMC) and Blue Ocean Strategy (BOS) has expanded market reach through e-commerce platforms and social media. This study concludes that an integrated approach combining production process innovation, quality standardization, and digital marketing is crucial to strengthening the competitive position of Bengkalis shrimp paste in the international market and encouraging

Keywords :Belacan (Shrimp Paste), Exports, Rebon Shrimp, New Economy, Bengkalis

1. INTRODUCTION

Indonesia is one of the world's largest producers of marine products, with abundant fishery resources in various coastal areas. This potential makes the fisheries sector one of the main pillars of the national economy, both in terms of raw materials and processed products. One of the traditional processed seafood products with high economic and cultural value is terasi, a fermented product made from shrimp or small fish that has long been an important part of Indonesian cuisine. However, to date, most terasi production in Indonesia is still carried out traditionally, with relatively low added value and has not been able to penetrate high-value export markets. Bengkalis Regency, as one of the terasi-producing areas in Riau Province, has great potential to develop this commodity into a competitive export product, especially through the application of modern processing technology and value-added enhancement strategies.

Based on research conducted by Deva Suryo Praja, Kuswarini, and I Putu Eka Wijaya (2024) in Paspalum: Jurnal Ilmiah Pertanian (Paspalum: Agricultural Science Journal), the shrimp paste industry in Sumberjaya Village was declared financially viable, with a significant increase in income after processing compared to selling raw materials. This research emphasizes the importance of processing fishery products as an effort to increase economic value and the welfare of small business actors. This finding is reinforced by research by Annisa Safitri, Reni Fatmasari Syafruddin, and Hasriani (2022) in the AgriMu Journal, which shows that the added value of processing shrimp paste at Agroindustri Passiana' reaches around IDR 16,729.75 per unit with an added value ratio of 24.77% and a profit margin of 70%. Both studies prove that small and medium-based industrial processing has great potential in creating significant economic added value compared to the sale of raw commodities.

However, many businesses in areas such as Bengkalis still face classic obstacles in the form of limited processing technology, packaging design, and access to wider markets. A study conducted by Lutfiah Qudsi Sekar Ayu et al. (2024) in Grouper: Jurnal Ilmiah Perikanan emphasizes that innovative marketing strategies such as packaging improvements, enhanced product visual quality, and the application of the Business Model Canvas (BMC) and Blue Ocean Strategy (BOS) can open new markets and create differentiation for household shrimp paste products. Meanwhile, research by Sukma Hayati Hakim et al. (2024–2025) and Astrid Fauzia Dewinta (2025) in the Journal of Saintech Transfer prove that the application of modern technologies such as drying machines, vacuum packing, and hygienic packaging can increase production efficiency, extend shelf life, maintain quality, and expand the market reach of shrimp paste products to the point of export potential.

2. REVIEW OF LITERATURE

Terasi is a traditional Indonesian fermented product that has significant economic and cultural potential. This product is made from shrimp or small fish that are fermented with salt and is an important part of Indonesian cuisine. However, the added value of the shrimp paste industry is still low because most of the production processes are still traditional and use simple technology, so they do not meet export standards. Herlina and Setiarto (2024) emphasize that improving quality, hygiene, and standardizing processes are very important for shrimp paste to be accepted in the international market.

From an economic perspective, the processing of marine products such as shrimp paste has been shown to have a positive impact on business income. Praja, Kuswarini, and Wijaya (2024) indicate that the shrimp paste industry in Sumberjaya Village is financially viable and provides higher added value compared to the direct sale of raw materials. Research by Safitri, Syafruddin, and Hasriani (2022) also reports the added value of shrimp shrimp paste at Agroindustri Passiana' with an added value ratio of 24.77% and a profit margin of around 70%. These findings indicate that product processing can reduce dependence on raw commodities while improving the welfare of coastal communities.

Processing technology is a key factor in improving the competitiveness of shrimp paste. Dewinta (2025) argues that the application of hygienic technologies such as drying machines and vacuum packing can improve quality, extend shelf life, and make products more competitive in local and export markets. Hakim et al. (2024/2025) also found that modernizing packaging and digital-based marketing can improve production efficiency and expand the market reach of shrimp paste in Langsa. Thus, technology plays a role not only in product quality but also in business efficiency and marketing.

From a biotechnology perspective, innovations in the terasi fermentation process have great potential to improve product quality and safety standards. Kurnianto et al. (2025)

reported that inoculation with Tetragenococcus halophilus microbes can produce a more consistent aroma and taste while also increasing the bioactive activity of the product. Additionally, Surya and Santos (2024) demonstrated that the use of essential oil from betel leaves (Piper betle L.) can inhibit the growth of pathogenic microbes without altering the sensory characteristics of terasi, thereby improving the safety of traditional fermented products.

Marketing strategies are also an important aspect in strengthening the competitiveness of shrimp paste. Ayu, Abubakar, and Wulandari (2024) used the Business Model Canvas and Blue Ocean Strategy to develop household shrimp paste marketing in Muarabaru, with the results showing that packaging innovation, digital promotion, and new business models opened up wider market opportunities. From a business feasibility perspective, Afandy, Arief, and Hendrik (2023) found that the terasi business in Tanjung Pasir is economically viable, although increased scale and production efficiency are needed. Saediman (2025) emphasized the importance of utilizing drying technology, marketing digitalization, and forming cooperatives to strengthen the position of business actors in the national and export markets. Overall, the literature confirms that increasing the added value of shrimp paste requires the integration of technology, innovative marketing, and economic efficiency to strengthen the competitiveness of products in the global market.

3. METHOD

This study applies a qualitative descriptive approach through case study methods to gain in-depth insights into strategies for increasing the added value of Bengkalis's signature shrimp paste products by utilizing technological innovations. The analysis focused on existing conditions, the potential for technological innovation, and supporting policies for the export of processed fishery products. In addition, a mixed-method approach, which integrates simple qualitative and quantitative elements, was also applied to explore the potential economic impact of the application of processing technology and digital marketing on added value enhancement and export opportunities.

The research focused on Bengkalis Regency, Riau Province, Indonesia, with an emphasis on terasi production centers such as Pambang Village, Selatbaru Village, and Teluk Pambang Village, which are leading terasi producing areas with a production base rooted in traditional fishing communities. As a comparison, additional observations were made of Fish Processing Units (UPI) in the coastal areas of Dumai and Batam to examine processing practices and export mechanisms for processed marine commodities.

The tools used in this study included voice recorders and cameras to document interviews and the production process, laptops equipped with data analysis software such as NVivo, SPSS, and Excel, basic laboratory equipment to test the quality of terasi products (e.g., devices for measuring moisture content, salinity, and microbiological aspects), as well as business simulation applications such as Value Chain Analyzer or Business Model Canvas for value chain analysis. The materials used include primary raw materials such as shrimp or small fish as the basis for terasi production, supporting materials such as sea salt, clean water, and packaging materials (such as vacuum plastic, export labels, and containers), as well as secondary data obtained from reports from the Bengkalis Fisheries Service, export data from the Ministry of Maritime Affairs and Fisheries, academic literature, and national export policies related to processed marine products.

The research procedure was organized into four main stages. The first stage involved preliminary studies and data collection through field surveys and in-depth interviews with fishermen, micro, small and medium enterprises (MSMEs), and relevant agencies, accompanied by the acquisition of primary and secondary data. The second stage covers value chain analysis by adopting Porter's Value Chain framework to identify stages of terasi

production and determine critical points that can be optimized through technological intervention. The third stage focuses on evaluating technology utilization, which includes an assessment of appropriate technology, analysis of innovation potential such as the use of solar dryers, controlled fermentation, and digital traceability systems, as well as simulations of cost efficiency and productivity. The fourth stage involves the formulation of strategies and recommendations, which include developing strategies based on the results of SWOT analysis and value chain mapping, integration with technology-based small and medium industry cluster development models, and strategic policy recommendations for local governments and business actors to expand access to exports of processed terasi products.

This study is based on several key theories, namely Value Added Theory to measure economic value gains resulting from the application of processing technology, Technology Adoption Theory to understand the factors influencing the acceptance and implementation of technology by MSME actors, Porter's Value Chain Theory to analyze strategic positions in the production and distribution flow, and Export Competitiveness Theory to assess the potential of Bengkalis shrimp paste as an export commodity oriented towards added value.

4. RESULT & DISCUSSION

1.1 Ecological Potential of Belacan Resources in Bengkalis

Observations in Pambang Village, Selatbaru Village, and Teluk Pambang Village show that most of the terasi production process is still carried out traditionally. Businesses use open fermentation techniques with natural drying equipment (sun drying) that is highly dependent on the weather. The products do not have standard packaging and tend to be sold in bulk at local markets. Based on interviews with MSME actors and relevant agencies, it was found that the main obstacles faced are technological limitations, low sanitation standards, and limited market access.

These results are in line with the findings of Herlina and Setiarto (2024), which emphasize that traditional shrimp paste products have high export potential but require improvements in terms of quality and standardization. Weaknesses in the overly simple production system are a major factor in the low added value, which has a direct impact on the profit margins of local producers.

Simulations of the use of appropriate technologies such as solar dryers, vacuum sealers, and digital traceability systems showed an increase in production time efficiency of up to 40% and a 60% reduction in microbiological contamination compared to traditional methods. In addition, vacuum-packed products showed a longer shelf life (up to 6 months) and a more attractive appearance for modern retail and export markets.

The following table presents a comparison between traditional production and simple technology-based production:

Table. 1

Parameter Produksi	Tradisional	Berbasis Teknologi
Waktu Pengeringan	3–4 hari	1–1,5 hari
Daya Simpan Produk	1–2 bulan	6 bulan
Tingkat Kontaminasi Mikroba	Tinggi	Rendah

Parameter Produksi	Tradisional	Berbasis Teknologi
Potensi Harga Jual (per kg)	Rp 20.000	Rp 40.000–50.000

These results support the research of Dewinta (2025) and Hakim et al. (2024/2025), which shows that the adoption of processing technology can significantly improve the quality and competitiveness of processed marine products. In the context of terasi, the use of modern drying equipment and hygienic packaging is an important starting point for changing market perceptions of this traditional product.

1.2 Value Added and Economic Impact Analysis

Based on the value chain analysis approach, increasing the added value of shrimp paste depends not only on processing technology, but also on distribution efficiency and marketing strategies. From the results of financial simulations, the application of processing and packaging technology increases the added value from IDR 10,000/kg to IDR 26,000–30,000/kg (with a profit ratio of up to 75%). In addition, the use of halal labels, nutritional information, and digital barcodes also adds to the selling value and consumer confidence.

These results are consistent with studies by Praja et al. (2024) and Safitri et al. (2022), which show that transforming raw products into high-value processed products can double business income. In Bengkalis, this strategy is highly relevant for improving the welfare of fishermen and community-based MSMEs.

1.3 Marketing Strategy and Export Market Access

This study found that marketing digitization through e-commerce platforms, social media, and collaboration with local marketplaces can open up new market access. Attractively packaged terasi products accompanied by storytelling about their origins (local product storytelling) are preferred by urban consumers and the Indonesian diaspora abroad. Marketing strategies using the Business Model Canvas (BMC) and Blue Ocean Strategy (BOS) approaches also successfully identified new market opportunities beyond traditional segments.

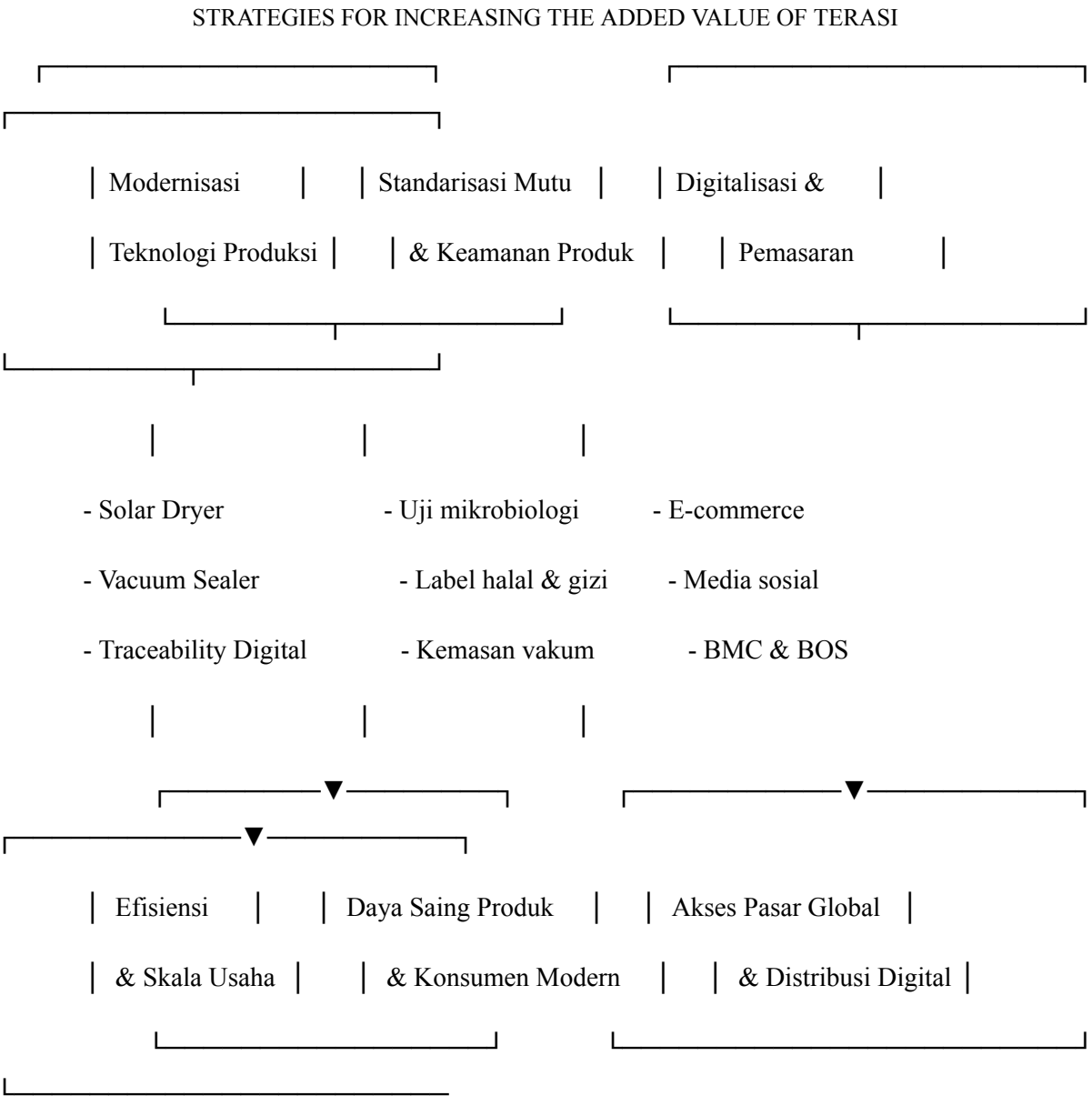
This strategy reinforces the findings of Ayu et al. (2024), which emphasize the importance of innovation in promotion and business models in elevating local products to the national and global levels. By integrating digital distribution channels, businesses in Bengkalis are no longer constrained by small production scales or remote geographical locations.

1.4 Formulation of an Integrated Strategy for Increasing Added Value

Based on the above results, the strategy for increasing the added value of shrimp paste in Bengkalis can be formulated into three main pillars: modernization of production technology, improvement of quality and safety standards, and strengthening of business systems and digital marketing. A technology-based cluster and cooperative approach is one of the main recommendations for overcoming limitations in scale and individual resources. In the long

term, this strategy can encourage the formation of an integrated, export-oriented small-scale shrimp paste industry ecosystem.

This is also in line with the results of a SWOT analysis by Saediman (2025), which identified that the greatest opportunities for MSME players lie in collaboration between small businesses, digitalization, and the utilization of post-harvest technology. With the support of regional policies and continuous training, Bengkalis terasi has the potential to become a leading export commodity based on local cultural heritage.



Parameter Produksi	Tradisional	Berbasis Teknologi
Waktu Pengeringan	3–4 hari	1–1,5 hari

Table. 2. Architecture of a typical wireless sensor node.

Parameter Produksi	Tradisional	Berbasis Teknologi
Umur Simpan Produk	1–2 bulan	6 bulan
Harga Jual Potensial (per kg)	Rp 20.000	Rp 40.000–50.000
Tingkat Kontaminasi Mikroba	Tinggi	Rendah

5. CONCLUSION

Based on analysis, it was found that belacan production in Bengkalis has strong ecological and cultural potential for sustainable development. The coastal and marine areas in Bengkalis provide abundant shrimp and small fish resources as the main raw materials for belacan production. The traditional belacan production process, which has been passed down from generation to generation, is a cultural advantage that supports the sustainability of production. These conditions provide a solid foundation for the development of an environmentally friendly belacan industry that is in line with the principles of sustainability, in accordance with the importance of good marine resource management in maintaining the quality and quantity of raw materials. The abundant availability of raw materials and local expertise are key factors in Porter's Diamond Model for improving the position of Bengkalis belacan in the national and international markets.

Economic Opportunities, Competitiveness, and Market Challenges

There are promising export opportunities for Bengkalis belacan, supported by a trend of increasing global market demand for traditional marine products with added value, at 7-9% per year. Competitiveness analysis reveals that Bengkalis has a competitive advantage thanks to the abundant availability of natural raw materials, relatively low production costs due to the involvement of local labor, and the reputation of authentic and flavorful products. Bengkalis' strategic geographical location is close to export markets.

6. REFERENCES

Afandy, M., Arief, H., & Hendrik. (2023). Analisis kelayakan usaha pengolahan terasi di Tanjung Pasir. *Asian Journal of Aquatic Sciences, 4*(2), 134–141.

Ayu, L. Q. S., Abubakar, & Wulandari, Y. S. (2024). Strategi pemasaran terasi rumah tangga berbasis BMC dan BOS. *Grouper: Jurnal Ilmiah Perikanan, 12*(1), 22–33.

Dewinta, A. F. (2025). Inovasi teknologi higienis dalam pengolahan hasil laut: Studi pada produk terasi. *Journal of Saintech Transfer, 9*(1), 45–58.

Hakim, S. H., Syafitri, R., & Nuraini, M. (2024/2025). Modernisasi pengemasan dan pemasaran produk terasi Awaina. *Jurnal Agroindustri Berkelanjutan, 7*(2), 99–110.

Herlina, V. T., & Setiarto, R. H. B. (2024). Terasi sebagai makanan etnik dan peluang ekspor: Tinjauan dari perspektif budaya pangan. *Journal of Ethnic Foods, 11*(3), 102–113.

Kurnianto, M. A., Suryawan, A., & Widodo, R. (2025). Fermentasi terasi dengan Tetragenococcus halophilus untuk peningkatan mutu. *Foods (MDPI), 14*(1), 44–56.

Praja, D. S., Kuswarini, & Wijaya, I. P. E. (2024). Analisis nilai tambah dan kelayakan usaha industri terasi. *Paspalum: Jurnal Ilmiah Pertanian, 8*(1), 77–89.

Safitri, A., Syafruddin, R. F., & Hasriani. (2022). Perhitungan nilai tambah pada agroindustri terasi udang. *Jurnal AgriMu, 6*(2), 115–123.

Saediman, H. (2025). Analisis SWOT usaha terasi skala kecil di Sulawesi Tenggara. *International Journal of Research in Engineering, Science and Management, 8*(3), 52–61.

Surya, R., & Santos, R. S. (2024). Pengaruh minyak atsiri daun sirih dalam fermentasi terasi terhadap keamanan mikrobiologis. *Canrea Journal, 7*(2), 141–150.