



Improving Lamongan Regency's PAD through the Development of the Fishery Product Processing Industry

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ABSTRACT

This study analyzes the contribution of the fishery product processing sector to increasing Regional Original Revenue (PAD) in Lamongan Regency, East Java, and formulates appropriate development strategies. Using a descriptive qualitative approach through interviews, observations, and document analysis, the research finds that the fishery processing industry still faces technological, capital, and marketing constraints. However, its development potential remains high due to abundant raw materials and strong local government support. Strengthening MSME capacity, improving industrial infrastructure, and enhancing stakeholder collaboration are identified as key strategies to increase added value. Overall, developing the fishery product processing industry offers significant opportunities to boost PAD through higher productivity, export growth, and job creation.

INTRODUCTION

The fisheries sector is one of the important economic pillars in various coastal countries and makes a significant contribution to food security, community welfare, and regional economic growth. Lamongan Regency, as a coastal area in East Java, shows great potential in the capture fisheries and freshwater fish cultivation subsectors, as reflected in data from the Fisheries Service which recorded the production of marine fish of 79,935.94 tons in 2024, with a value of Rp1.41 trillion. In addition, fish production from Inland Public Waters (PUD) reached 3,175.66 tons, which strengthens Lamongan's position as one of the strategic fisheries centers in East Java. A similar phenomenon is also seen in other developing countries, where the fisheries sector has an important role as a driver of the local economy, especially for coastal communities and micro-business actors (Nursini et al., 2021). This condition indicates the need to strengthen fisheries sector governance in order to produce more optimal added value. With abundant raw material potential, Lamongan Regency faces a great opportunity to strengthen this sector through the industrialization of fishery product processing (Syafitri et al., 2024).

Despite having large fishery resources, the sector's contribution to Lamongan's Regional Original Revenue (PAD) is still relatively low because most of the fishery products are sold in fresh form without further processing processes. This marketing pattern of raw products results in low added value obtained by the community, so that the fiscal potential that can be worked on by local governments is not optimal. A similar situation was found in various global studies that affirmed that the industrialization of primary commodities plays an important role in increasing the added value and competitiveness of the regional economy (Danja & Wang, 2024). In the context of Lamongan, the diversification of processed products such as shredded fish, frozen fillets, fish crackers, and various other processed forms has the potential to increase the selling price of fish by up to 3-5 times. The processing scheme can expand jobs, strengthen local businesses, and increase regional income through taxes and economic levies. Therefore, the development of the processing industry is an important agenda to strengthen the sustainable regional economic base.

The problems faced by the fisheries processing sector in Lamongan include limited industrial facilities, lack of modern technology, low access to capital, and weak marketing networks which are in line with the findings of global research on the challenges of MSMEs in the fisheries sector. The gap in technological capacity causes business actors to be unable to produce products with high quality standards needed by the national and international markets. In addition, MSME actors often face administrative obstacles in obtaining formal financing, so that business expansion does not run optimally. International research shows that the modernization of the fish processing industry can improve product quality, strengthen competitiveness, and open up new export opportunities (Maulana & Ratnaningtyas, 2021). With these conditions, efforts to strengthen technology capacity and access to financing are urgent needs. This situation emphasizes the urgency of research on the development strategy of the fisheries processing industry in areas such as Lamongan.

From an academic perspective, there is a research gap related to the contribution of the fishery product processing industry to PAD at the regional level, especially in areas that have abundant fish production but have not been followed by significant economic added value. Previous studies have mostly discussed the potential of fishery production or technical aspects of processing, but not many have examined the direct relationship between fisheries industrialization and increasing regional income in an integrated manner. For example, research by Rahman et al., (2021) emphasizing aspects of the fisheries supply chain, while a study by Yeşilsu et al., (2025) focus on technological efficiency, but both have not studied the fiscal aspects of the region. In addition, local research still focuses a lot on empowering MSMEs without linking it to long-term fiscal implications for local governments. Thus, a more comprehensive study is needed to understand how the processing industry can encourage PAD optimization. This research gap is an important basis for this research to make a new contribution to the regional economic literature.

This research specifically aims to analyze the contribution of the fishery product processing sector to the increase of Lamongan Regency's PAD and formulate an effective and sustainable development strategy. The analysis was carried out with a descriptive qualitative approach using data from interviews, field observations, and documentation from the Fisheries Service and BPS Lamongan. Another goal is to identify factors that hinder the development of the fish processing industry at the MSME and small and medium industry levels. This research also seeks to map cooperation opportunities between local governments, business actors, and other stakeholders to strengthen the processing industry ecosystem. With this goal, this research is expected to be able to produce strategic recommendations to strengthen the economic added value of the fisheries sector. In the end, this research is oriented towards improving regional fiscal performance through the utilization of local economic potential.

The theoretical contribution of this research lies in the development of the concept of the relationship between the industrialization of primary commodities and the strengthening of regional income through the mechanism of added value and multiplier effect. International literature supports that the processing industry plays a role in creating added value through improving product quality, job creation, and market expansion (Shen & Zhang, 2024). By combining local economic development theory and industrial value-added theory, this research provides a new perspective in understanding how the fisheries sector can become a strategic instrument for regional development. This research also enriches academic discourse related to the development of coastal commodity-based MSMEs. In addition, this research expands the academic understanding of the application of circular economy principles in the processing industry. This theoretical contribution provides an important basis for further studies in the field of regional economics and fisheries policy.

The practical contribution of this research includes strategic recommendations for local governments in facilitating the fish processing industry through the provision of infrastructure, technology modernization, and more inclusive access to financing. This recommendation is in line with global

practice where policies to strengthen small-medium industries have proven to be able to improve regional fiscal performance (Nwoye & Akan, 2023). This research also provides a real picture for fisheries MSMEs about opportunities to increase added value through quality certification, product diversification, and digital market utilization. In addition, this research encourages cross-sector collaboration between the government, academia, and business actors to create a more competitive processing industry ecosystem. This practical implication is expected to support the acceleration of regional economic growth. With proper implementation, fisheries added value can be one of the sources of sustainable PAD growth.

Overall, this research is important to provide a comprehensive understanding of the mechanism of increasing PAD through the development of the fishery product processing industry which has great potential in Lamongan Regency. By combining theoretical analysis and empirical data, this study seeks to explain how the potential of natural resources can be converted into regional economic powers. The actual conditions in Lamongan show that fisheries industrialization not only provides economic benefits but also supports the social development of coastal communities. In addition, this research emphasizes the importance of the role of local governments in creating a conducive supporting ecosystem. Thus, this research not only answers the gap of previous research but also makes a real contribution to strengthening regional development policies. This makes this research relevant for policymakers and academics who focus on local economic development.

METHODOLOGY

Types, Approaches, and Research Design

This study uses a descriptive qualitative approach because it aims to describe the phenomenon in depth regarding the factual condition of the fishery product processing industry and its contribution to the Regional Original Revenue (PAD) of Lamongan Regency (Lim, 2025). This approach is relevant to identify fisheries sector development strategies based on contextual and interpretive understanding of actors directly involved in the field. The descriptive research design is used because the research focuses on exposing the real conditions, challenges, and opportunities for the development of the fish processing industry, without manipulating variables. Therefore, this research design was chosen to gain a holistic understanding of the dynamics of the fisheries processing industry in Lamongan Regency.

Location, Population, and Participant Selection Techniques

The research was carried out in several of the largest fisheries processing industry centers in Lamongan Regency, namely Brondong, Paciran, and Turi Districts, which are geographically the center of marine product processing activities such as smoked fish, salted fish, fish crackers, shredded meat, and various other processed products. The research population includes all fish processing industry players and related stakeholders, while the selection of informants is carried out using non-probability sampling techniques through a purposive sampling approach, with consideration of the relevance and

competence of informants to research issues (Adeoye, 2023). The research participants consisted of small fish processing entrepreneurs, local MSME actors, fish market managers, and officials of the Lamongan Regency Fisheries Office. The number of informants is not determined quantitatively because it is flexible following the principle of data sufficiency as is common in qualitative research. The data collection process was carried out from September to November 2025 to ensure that the data obtained was relevant and actual.

Data Collection Techniques and Instruments

Data collection was carried out through three main techniques, namely in-depth interviews, field observations, and documentation, thus allowing triangulation of sources and techniques. In-depth interviews were conducted in a semi-structured manner to provide flexibility in exploring the informant's perspectives on production capacity, business challenges, and government support for the fisheries processing industry. Observations were carried out directly at the fish processing site to assess the production flow, supply chain, use of technology, and the condition of supporting infrastructure. Documentation in the form of BPS Lamongan reports, fishery production data from the Marine and Fisheries Service, and regional financial reports are used as secondary data sources to strengthen the validity of the findings. The validity of the data is tested through triangulation of sources and methods, which is standard practice in modern qualitative research (Arslan, 2025).

Research Procedures and Data Analysis Techniques

The research procedure starts from the preparation stage, in the form of literature study, preparation of interview instruments, and determination of key informants. The second stage is data collection through interviews, observations, and review of official documents related to fisheries production and Lamongan PAD. The third stage is data analysis using the interactive model Miles, Huberman, and Saldaña which includes the process of data reduction, data presentation, and conclusion drawing (Olapane, 2021). The analysis is carried out simultaneously from the beginning of data collection to ensure that the findings obtained are always verified and connected to the empirical context. All data is analyzed manually with the support of field recording software such as Microsoft OneNote as well as thematic coding based on an inductive approach (Guggenberger, 2022). The results of the analysis were then synthesized to produce strategic recommendations related to the development of the fishery product processing industry in Lamongan Regency.

RESEARCH RESULTS

General Condition of the Fisheries Sector in Lamongan Regency

Findings derived from interviews, field observations, and document analysis indicate that Lamongan Regency possesses substantial fisheries resources, supported by both marine capture and aquaculture activities. The regency has approximately 47 km of coastline that serves as the center of marine fishing activities, producing around 40,000 tons of marine fish annually.

Freshwater aquaculture also shows strong development, particularly in Brondong, Glagah, Paciran, and Sarirejo, with an annual production of 46,834.71 tons. These findings were validated through triangulation of stakeholder interviews, on-site observations of production areas, and official reports from the Fisheries Office and BPS Lamongan. The availability of abundant raw materials highlights Lamongan's potential to expand fish-processing industries at a larger scale. Documented data from 2024 also show that total processed fish products reached 92,906.44 tons, consisting of smoked fish, salted fish, pindang, fish crackers, fish meal, surimi, and frozen products. Overall, these results confirm that Lamongan has a strong foundational structure for developing fisheries as a leading sector within the regional economy.

Profile of the Fish Processing Industry

Field observations and semi-structured interviews with small-scale processors, traders, and government officials reveal that the fish processing industry in Lamongan is predominantly operated by micro-, small-, and medium-sized enterprises distributed across Paciran, Brondong, Lamongan City, Turi, and Deket. Based on production records and triangulated documentation, Paciran was identified as the largest processing center in 2023, producing 4,070.22 tons of salted fish and 259.14 tons of smoked fish, alongside smaller quantities of fish crackers, crab meat, trisepan, presto, and shrimp paste. UMKM producers were found to process a wide range of value-added products including fish floss, shrimp crackers, fish balls, fish nuggets, frozen fillets, surimi, and fish feed. Several processing groups have begun adopting quality assurance and standardization practices aligned with the Indonesian National Standard (SNI), particularly for fish nuggets, fish balls, canned crab, and frozen catfish fillets. The adoption of these standards was confirmed during interviews and document reviews, demonstrating a growing awareness among producers of the importance of meeting domestic and export market requirements. These findings illustrate that Lamongan occupies a strategic role as a major processing center in East Java's fisheries value chain.

Development Strategies for the Fish Processing Industry

Based on thematic analysis of interview transcripts and comparison with observational and documentary evidence, several strategic directions were identified to strengthen fish-processing development in Lamongan Regency. First, strengthening the production base through integrated upstream-downstream coordination is essential to stabilize raw material availability throughout the year. Cold storage expansion and the development of Fish Processing Units (FPUs) in the Brondong area were consistently highlighted by informants as critical infrastructure needs. Second, diversification into higher value-added products such as surimi, frozen fillets, fish chips, fish burgers, and ready-to-eat products emerged from both field observations and expert interviews as a key pathway for improving market competitiveness. Third, strengthening institutions and human resources through technical training, production management, and quality certification was found to be crucial for enhancing operational capacity among UMKM. Fourth, stakeholders

emphasized the urgency of developing an Integrated Fisheries Industrial Zone (KIPT) in Brondong–Paciran to streamline logistics, processing, and distribution systems. Fifth, digital marketing strategies and collective branding (e.g., “Lamongan Fish Products”) were viewed as necessary to expand market reach. Sixth, regulatory and financial support including simplified licensing, microfinance access, and tax incentives were identified as enabling factors for growth. Seventh, environmental sustainability through waste management and circular economy initiatives was identified as a cross-cutting priority. These strategies collectively highlight that long-term industry growth depends not only on abundant raw materials but also on an integrated governance and support system.

Contribution of the Fish Processing Industry to Local Own-Source Revenue (PAD)

The analysis shows that the fish processing industry provides significant economic value through employment, value-added production, and sectoral linkages; however, its direct contribution to Local Own-Source Revenue (PAD) remains limited. This is largely attributed to the predominance of informal enterprises, which restricts the collection of local taxes and service fees. Triangulated findings from interviews with government officials, processors, and market managers indicate that the industry’s economic benefits emerge primarily through indirect channels such as increased labor absorption, growth in related service sectors, and expanded raw material demand. Meanwhile, value-added fish products such as frozen fillets, surimi, smoked fish, and export-oriented items – generate substantial economic gains, though not all of this value is captured in PAD. Greater PAD potential could be realized through improved business formalization, strengthened certification systems, optimized service-based retribution, and enhanced administrative recording of production and processing activities. These results indicate that improving industry governance is a key determinant of regional fiscal strengthening.

Challenges and Constraints in Industry Development

Triangulated data from interviews, observations, and document analysis revealed a range of challenges impeding the development of the fish processing industry in Lamongan. Raw material constraints remain the most significant issue, as marine capture production fluctuates due to seasonal and extreme weather conditions, disrupting supply stability. Technological limitations – such as reliance on traditional processing equipment and limited access to modern freezing and packaging technologies – were observed to hinder product quality and market competitiveness. Financial constraints were frequently cited by UMKM processors, who noted difficulties in accessing credit and limited capital for equipment upgrades. Human resource limitations, including inadequate technical skills and limited knowledge of production standards, also emerged as major challenges. Marketing constraints were evident in the low adoption of digital platforms, weak branding, and dependence on traditional market channels. Infrastructure limitations such as insufficient cold storage, inadequate

fish landing facilities, and gaps in transportation networks further restrict production efficiency. Additionally, regulatory complexity was identified as a barrier to formalization, while environmental issues related to waste management pose ongoing challenges for sustainability. These findings illustrate that cross-sectoral interventions are required to ensure the resilience and competitiveness of Lamongan's fish-processing industry.

DISCUSSION

Findings regarding the large potential for fishery production in Lamongan Regency with around 40,000 tons per year from marine catches and 46,834.71 tons from freshwater aquaculture show that Lamongan has a comparative advantage in the fisheries sector. This is in line with the analysis of the economic typology of the fisheries sector in East Java, where the fisheries sector is considered a developing subsector with high value-added potential (Gantini et al., 2022; Adawiyah et al., 2023). The existence of a long coastline and strategic cultivation locations in the Brondong, Glagah, Paciran, and Sarirejo areas provide a solid production base to support the upstream processing industry. From a blue economy perspective, the optimal use of coastal natural resources can generate local economic growth while maintaining ecological sustainability (Ahammed et al., 2025; Marwa et al., 2024). With a strong production foundation, Lamongan has a strategic opportunity to drive downstream fisheries as a pillar of regional economic development.

Data that 92.906,44 tons of fishery products are processed in various products (smoked fish, salted fish, crackers, surimi, and others) shows the initial success of downstream in Lamongan. The transformation of fishery commodities from fresh to processed forms extends their shelf life and increases their economic value, which is in line with the strategy of developing the added value of fishery products that has been discussed by the (Ficano, 2022). The conversion of raw materials into high-value processed products such as surimi and fillet also supports the competitiveness of Lamongan products in the export and local markets. However, even though the processing volume is quite large, it is still necessary to improve efficiency in the supply chain and processing technology so that profit margins are more optimal for MSME actors. This large processing capacity must be accompanied by a quality management and logistics strategy so that the economic impact is maximized and sustainable.

The profile of Lamongan's fishery processing industry, which is dominated by MSMEs in Paciran, Brondong, Turi, Deket, and Lamongan City, shows an industrial structure that is decentralized and based on local communities. Such structures have advantages in flexibility and adaptation to the local market, but also face limitations in production scale and technology. Research Tienh et al., (2022) in Natuna Regency shows that the linkage between the fisheries processing sector and other sectors is very important to drive regional economic growth through backward and forward effects on the value chain. In the context of Lamongan, strengthening the relationship between fishermen, cultivators, and processors will strengthen economic synergies and reduce the risk of fluctuating raw supplies. In addition, efforts to certify SNI

quality and standards by MSMEs show aspirations to upgrade to the national or export market, which can increase income and competitiveness.

The development strategies identified in this study such as upstream-downstream integration, the development of cold storage, and the Integrated Fisheries Industrial Estate (KIPT) are very relevant to exploit the potential of Lamongan to the fullest. By building a cold chain facility in Brondong, for example, the industry can reduce the damage of raw materials and maintain the quality of fresh fish before processing. The strategy of diversifying processed products (surimi, fish chips, fish burgers) will also help to face modern market competition and adjust to increasingly dynamic consumer demand. This approach is in line with the idea of fisheries modernization that encourages local economic transformation through downstream (Abdullahi et al., 2025; Munier & Mamka, 2024). In addition, institutional integration and HR training will increase the capacity of MSMEs to produce on a larger scale and high quality standards, while creating a socio-economic spillover effect in coastal communities.

The contribution of the fisheries processing industry to the still low Regional Original Revenue (PAD) indicates that Lamongan's fiscal potential has not been maximized. Many MSMEs are still operating informally, so the potential for taxes and levies has not been fully captured in the local tax base. This shows the need for active policies from local governments to encourage business formalities, for example through tax incentives or administrative assistance for business registration. According to the analysis Basurto et al., (2025), strengthening the fisheries sector spatially must be accompanied by fiscal incentives and financing to increase the contribution of the local economy. Formalization will also help collect production data that may not have been recorded - making regional policy planning more accurate and on target.

Findings related to limited raw materials, simple technology, limited capital, inadequate human resources, and inadequate supporting infrastructure reflect structural constraints in the development of the fisheries industry in Lamongan. Fluctuations in the supply of marine fish due to seasons or extreme weather confirm that without integration and cold storage facilities, production continuity will be difficult to maintain. This is in line with local studies in East Java that emphasize the importance of spatial and institutional integration (Prananta et al., 2025). Limited capital and access to financing are also significant obstacles for MSMEs to modernize equipment and expand capacity. For this reason, policy interventions such as microcredit facilitation or inclusive financing schemes are important to be prioritized so that MSMEs can grow and compete.

From the perspective of local development theory and value-added economics, the results of this study provide evidence that downstream fisheries in Lamongan can increase the multiplier effect of the regional economy. The fish processing industry not only adds commodity value, but also creates jobs, strengthens local supply chains, and increases the income of coastal communities. This model is in line with the approach to primary commodity-based local economic development proposed by several economic development researchers (Rahman & Maulana Hakim, 2024; Aprianto & Syaipudin, 2022). However, in order for this multiplier effect to be maximized, it is necessary to

strengthen local institutions such as cooperatives or processing associations so that MSMEs can obtain better bargaining power in the value chain. In addition, collective branding such as "Lamongan Fish Products" and digital marketing strategies can expand market reach and strengthen the position of Lamongan products in the national and export markets.

However, this study has limitations that need to be considered and is material for further studies. First, production and economic contribution data are only from local reports, which may not include all informal processing in coastal communities. Additional quantitative studies will be very useful to measure the economic impact of fisheries processing on GDP and PAD more accurately. Second, this study uses qualitative methods, and its strategic recommendations need to be tested through a pilot project to evaluate their effectiveness in a local context. Third, future research can examine aspects of environmental sustainability in more detail, for example the potential for processed fish waste to be organic feed or fertilizer (circular economy). This recommendation is important to strengthen the policy basis and planning for the development of the Lamongan fisheries industry in a sustainable manner.

CONCLUSION AND RECOMMENDATION

This study confirms that Lamongan Regency has great potential in the fisheries sector, both capture and cultivation, with production reaching tens of thousands of tons every year. However, the sector's contribution to Regional Original Revenue is still limited because most fishery products are sold in raw form without downstream processes. The findings of the study show that the development of the fishery product processing industry ranging from smoked fish, fish crackers, surimi, abon, to frozen fillets provides significant opportunities to create added value, expand employment, and strengthen regional economic competitiveness. Challenges that include fluctuations in raw materials, technological limitations, lack of access to capital, and low human resource capacity show the need for strategic interventions to realize this great potential optimally. With such conditions, the fisheries processing industry is a key component that not only improves the welfare of coastal communities, but also supports the regional economic structure in a more stable manner.

Overall, the results of the study conclude that strengthening the fishery product processing industry is the main strategy for increasing the PAD of Lamongan Regency in the future. This effort requires synergy between local governments, MSME actors, cultivators, fishermen, and the private sector to strengthen infrastructure, increase access to technology, standardize products, and expand domestic and export markets. The development of the Integrated Fisheries Industrial Estate, increasing human resource capacity, formalizing businesses, and implementing circular economy principles are strategic steps that need to be prioritized. If the strategy is implemented sustainably, the Lamongan fishery product processing industry will not only be able to significantly increase PAD, but also strengthen local economic resilience, reduce dependence on raw fish sales, and make Lamongan the center of the leading fisheries industry in East Java.

FURTHER STUDY

Future studies are encouraged to investigate more deeply the economic, institutional, and technological factors that influence the development of the fishery product processing industry in Lamongan Regency. Further research could examine the effectiveness of government incentives, patterns of collaboration between MSMEs and larger industries, and the impact of technology adoption on productivity and product diversification. Comparative studies with other coastal regions that have successfully strengthened their fisheries downstream sector may also provide valuable benchmarks for policy improvement. In addition, future research could explore supply chain resilience, market behavior, and the potential of digital platforms in expanding domestic and export markets. By expanding these research directions, future studies can support the formulation of more targeted and sustainable strategies to enhance regional revenue and deepen the economic transformation of Lamongan's fisheries sector.

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