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The Influence of Capital, Labor, and Technology on the Production Value of Processed Fish at POKLAHSAR BALI, Padang City

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ABSTRACT

This study aims to analyze the influence of capital, labor, and technology on the production value of processed fish in the BALI Fishery Product Processing and Marketing Group (POKLAHSAR) in Padang City. The method used is a descriptive quantitative approach with multiple linear regression analysis using SPSS 25.0 software. Primary data were obtained through questionnaires and interviews with POKLAHSAR members, while secondary data were obtained from related agencies. The results showed that all independent variables had a positive and significant effect on production value. The coefficient of determination (R^2) value of 0.764 indicates that 76.4% of the variation in production value can be explained by capital, labor, and technology factors. The capital variable has the most dominant influence on increasing production value. This finding emphasizes the importance of capital support, increasing labor capacity, and adopting appropriate technology as strategies to strengthen the competitiveness of fishery-based micro-enterprises in the coastal areas of Padang City.

Keywords: ***POKLAHSAR BALI, production, capital, labor, technology***

INTRODUCTION

The fisheries sector plays a crucial role in the coastal economy, not only as a provider of highly nutritious food but also as a primary source of livelihood for coastal communities (Firdaus et al., 2018). Within the context of local economic development, fisheries processing activities serve to increase added value and expand employment opportunities for the community (Wardana et al., 2025). Through processing activities, fresh fish products are transformed into various high-value processed products such as crispy fish, fish floss, fish crackers, and ready-to-eat foods (Afriani et al., 2022).

In Padang City, one of the main actors in fishery product processing is the BALI Fishery Product Processing and Marketing Group (POKLAHSAR). This group was established to develop local economic potential based on fishery resources through household-scale fish processing activities. POKLAHSAR BALI's processed products have been marketed locally and are part of coastal community empowerment efforts. However, the productivity and production value of this group tend to fluctuate. Factors such as limited business capital (Sari & Purwantoro, 2025), workforce size, and the level of processing technology implementation are the main factors hindering increased production capacity and efficiency (Marlina et al., 2025).

Theoretically, these three factors are the main components of the economic production function, as explained in the Cobb-Douglas model, where output or production value is the result of the optimal combination of capital, labor, and technology inputs (Naufal et al., 2025). Capital serves as a source of financing for raw materials, equipment, and operational costs (Ginting, 2018). Labor

plays a role in the production, packaging, and distribution of products (Amir & Monika, 2020), while technology determines the efficiency, quality, and durability of processed products (Jusmi et al., 2025). If these three factors are managed well, production value will increase significantly.

However, in practice, small business groups like POKLAHSAR often face limited access to capital, workforce training, and technological innovation. Most production activities still use simple equipment and family labor. This results in low production capacity and dependence on a narrow local market. However, with policy support and the adoption of appropriate technology, the fish processing sector can contribute significantly to the blue economy, an economic system that utilizes aquatic resources sustainably and inclusively.

This research is important because POKLAHSAR BALI represents a coastal community-based micro-enterprise model that has the potential to be developed as a major player in the local economy. By understanding the factors that influence production value, it is hoped that strategies can be formulated to increase capacity and efficiency that are oriented towards the welfare of group members while supporting the sustainability of fisheries businesses in Padang City. The purpose of this study is to analyze the influence of capital, labor, and technology on the production value of processed fish from POKLAHSAR BALI Padang City, determine the most dominant factors in influencing production value and provide recommendations for strategies to increase production efficiency and the competitiveness of coastal community-based fishery processing businesses.

THEORETICAL FRAMEWORK

Production Value in Fishery Product Processing Business

Production value is the total economic value generated from the production process, reflecting the level of efficiency and performance of a business. In micro- and small-scale fishery processing businesses, production value is influenced by the business owner's ability to manage key input factors, such as capital, labor, and technology. Increasing production value is a crucial indicator of business success because it directly relates to revenue, business sustainability, and product competitiveness in the market (Sukirno, 2018). In this study, the production value of processed fish is positioned as the dependent variable (Y).

Production Function Theory (Cobb–Douglas)

Theoretically, the relationship between input and output is explained through a production function, one of which is the Cobb–Douglas model, which states that output is a function of the combination of capital, labor, and technology. This model is widely used in the analysis of fisheries businesses and MSMEs because it is able to quantitatively explain the relative contribution of each production factor to output (Ginting, 2018; Naufal et al., 2025). In the context of fishery product processing, capital plays a role in the procurement of raw materials, equipment, and operational costs, labor plays a role in the production and packaging process, while technology determines production efficiency, quality, and continuity.

Capital as a Factor of Production

Capital is a key production factor, encompassing business funds, production equipment, and other supporting facilities. Adequate capital enables businesses to scale up production, improve product quality, and reduce unit production costs. Various studies have shown that capital has a dominant influence on increasing production value in small-scale fisheries processing businesses (Ginting, 2018; Sari & Purwantoro, 2025). In this study, capital (X_1) is positioned as an independent variable suspected of having a positive effect on the value of processed fish production.

Labor in the Production Process

Labor is a production factor that plays a direct role in product processing, packaging, and distribution. The number of workers, along with their skills and experience, will influence the speed, efficiency, and quality of production. Amir & Monika (2020) stated that increasing the quality and quantity of labor is directly proportional to the increase in output in fishery processing businesses. In this study, labor (X_2) is treated as an independent variable influencing production value.

Technology as a Driver of Production Efficiency

Technology in fishery processing businesses encompasses the use of production equipment, processing methods, and packaging techniques. Adopting appropriate technology can increase production efficiency, reduce raw material losses, and improve product quality and shelf life. Afriani et al. (2022) emphasized that implementing simple technology tailored to the needs of fishery MSMEs can significantly increase production volume and value. In this study, technology (X_3) is positioned as an independent variable with a positive effect on production value.

RESEARCH METHODS

This study uses a descriptive quantitative approach with the aim of analyzing the influence of capital, labor, and technology on the production value of processed fish in the BALI fish processing and marketing group (POKLAHSAR) in Padang City. This approach was chosen because it is able to describe the functional relationship between variables and measure the magnitude of the influence of each independent variable on the dependent variable objectively through a statistical analysis model. The study was conducted in Ulak Karang Utara Village, Padang Utara District, Padang City, which is the main activity location of POKLAHSAR BALI. This group was selected purposively because it is one of the fishery business groups active in fish production and processing activities in the coastal area of Padang City. The study period was carried out from July to September 2025.

The data used consists of primary and secondary data. Primary data was obtained through direct interviews and questionnaires distributed to the administrators and members of POKLAHSAR BALI involved in the production process. Meanwhile, secondary data was obtained from group reports, government agencies (DKP and the Cooperatives Office), and other supporting data relevant to the research topic. The analysis technique used in this study is multiple linear regression analysis, which aims to determine the effect of independent variables, namely capital (X_1), labor (X_2), and technology (X_3) on the dependent variable, namely production value (Y). The linear regression model equation used is as follows:

$$Y = a + b\_1X\_1 + b\_2X\_2 + b\_3X\_3 + e$$

Where:

1. Y = Value of Processed Fish Production (rupiah),
2. X_1 = Capital (rupiah),
3. X_2 = Labor (people),
4. X_3 = Technology (score of level of use of production tools),
5. a = constant,
6. b_1, b_2, b_3 = regression coefficients of each independent variable,
7. e = error term.

The analysis was carried out using SPSS software version 25.0, which includes a t-test (partial) to see the influence of each independent variable individually on production value, an F-test (simultaneous) to determine the influence of the three variables together, and a coefficient of determination (R^2) test to measure the extent to which the independent variables are able to explain variations in changes in the production value of processed fish.

RESULTS AND DISCUSSION

General Description of POKLAHSAR BALI Business

POKLAHSAR BALI is a fishery product processing and marketing group located in Ulak Karang Utara Village, Padang City. The group's members are housewives and coastal MSMEs who process fresh fish into various value-added products such as fish pempek (fish pempek), fish dim sum, tuna risoles (tuna risoles), and fish-filled tofu. Production activities are carried out using a semi-traditional system that still relies on manual labor and simple equipment. Government support through the Padang City Maritime Affairs and Fisheries Office and the Cooperatives and MSMEs Office provides opportunities to increase production capacity through assistance with processing equipment and blue economy-based entrepreneurship training.

Fishery processing activities at the group level, such as these, are crucial for the economic empowerment of coastal communities. According to Wardana et al. (2025), innovations in processing

fishermen's catches can increase the added value and competitiveness of fishery products at the local level. Therefore, increasing the efficiency of production factors in processing groups like POKLAHSAR is strategic for strengthening the regional economy.

Results of Multiple Linear Regression Analysis

Multiple linear regression analysis was used to determine the effect of capital (X_1), labor (X_2), and technology (X_3) on the value of processed fish production (Y). Based on the results of data processing using SPSS version 25.0, the following model equation was obtained:

$$Y = 2.514 + 0.421X_1 + 0.337X_2 + 0.289X_3$$

The model shows that all independent variables have a positive effect on production value. This means that increased capital, labor force, and the application of processing technology contribute directly to the increase in production value of the POKLAHSAR BALI group.

t-test (Partial)

Table 1. Results of the t-Test (Partial)

Variables	Regression Coefficient	t-count	t-table (α = 0.05)	Sig.	Information
Capital (X_1)	0.421	3,812	1,703	0.001	Significant
Labor (X_2)	0.337	2,947	1,703	0.005	Significant
Technology (X_3)	0.289	2,613	1,703	0.012	Significant

All variables had a calculated t-value > t-table and a Sig < 0.05, meaning each independent variable significantly influenced the value of processed fish production. These results reinforce the Cobb-Douglas production function theory, which emphasizes that output is a function of the combination of capital, labor, and technology inputs (Naufal et al., 2025).

F Test (Simultaneous)

Table 2. F-Test Results (Simultaneous)

Source of Variation	F-count	F-table (α = 0.05)	Sig.	Information
Regression Model	24,387	2.95	0.000	Significant

The calculated F-value (24.387) > F-table (2.95) with Sig < 0.05 indicates that the three variables (capital, labor, and technology) simultaneously have a significant effect on production value. This proves that increasing synergy between production factor inputs can produce optimal output, as stated by Sukirno (2018) and Ginting (2018) who emphasized that capital and labor are the main drivers of small business efficiency.

Coefficient of Determination (R^2)

Table 3. Value of the Coefficient of Determination (R^2)

Model	R	R Square	Adjusted R Square	Standard Error of Estimate
1	0.874	0.764	0.739	0.216

The R^2 value of 0.764 means that 76.4% of the variation in production value can be explained by capital, labor, and technology variables, while 23.6% is influenced by other factors such as raw material prices, market conditions, and distribution efficiency. A high R^2 value indicates the model has strong explanatory power. This finding is in line with Marlina et al. (2025) who stated that the operational efficiency of the small-scale fisheries industry is greatly influenced by optimal management of input factors.

Discussion

The research results show that capital is the most dominant factor in increasing the value of processed fish production in POKLAHSAR BALI. Greater capital allows for increased production capacity, equipment improvements, and the procurement of more raw materials. This finding aligns with Sari & Purwantoro (2025), who stated that capital is the primary determinant of income growth in the small-scale smoked fish industry. Furthermore, labor also significantly influences production value. A larger workforce with technical skills will accelerate the production process and improve the quality of the results. These results are consistent with research by Amir & Monika (2020), who found that labor efficiency is directly proportional to increased output in fishery product processing groups.

Technological factors have a positive influence on production value because the application of modern processing equipment can reduce raw material loss, extend product shelf life, and maintain hygiene standards. According to Afriani et al. (2022), the adoption of simple yet effective technology in fisheries MSMEs can increase product volume and quality. The results of this study also emphasize the importance of implementing the blue economy concept in developing the fish processing industry at the community level. This approach prioritizes resource efficiency, added value, and environmental sustainability (Nurqalbi, 2024). Therefore, strengthening POKLAHSAR institutions based on the blue economy can be a sustainable development strategy in the regional fisheries sector.

From a policy perspective, collaboration between actors within the triple helix approach (government, academics, and community) needs to be optimized. Local governments play a role in providing capital and training, academics provide innovation and technological research, while community groups implement production and marketing activities. This model has proven effective in increasing the capacity of coastal MSMEs in various regions (Wardana et al., 2025; Marlianingrum et al., 2025) and can be adapted to strengthen the economic resilience of fisheries groups in Padang City. Overall, the results of this study demonstrate that the combination of capital strengthening, workforce optimization, and the adoption of modern processing technologies is key to increasing the efficiency and added value of fishery products. Implementing this strategy will support the vision of inclusive and sustainable coastal economic development through the empowerment of local resource-based MSMEs.

CONCLUSION

Based on the analysis results, it can be concluded that capital, labor, and technology have a positive and significant effect on the production value of processed fish at POKLAHSAR BALI, Padang City, both simultaneously and partially. Capital is the most dominant factor because it determines production capacity, product variety, and the availability of raw materials, equipment, and packaging. Labor plays an important role through skills and experience that influence production efficiency and quality, while technology supports increased productivity and product hygiene standards. Simultaneously, these three factors explain 78% of the variation in production value ($R^2 = 0.78$). These findings indicate that strengthening capital, increasing human resource capacity, and implementing appropriate technology are key strategies in increasing the competitiveness of fishery micro-enterprises. In addition to its economic impact, this study emphasizes the importance of strengthening POKLAHSAR institutions as a means of empowering coastal communities in line with the principles of a sustainable blue economy.

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