



The Quality Of Marine Products And Fish Auction Places (TPI) As Determining Factors In The Welfare Of The Lubuk Pakam Fishing Community

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ABSTRACT

This study aims to analyze the influence of seafood product quality and the role of Fish Auction Places (TPI) on improving the welfare of fishing communities in Lubuk Pakam. As a coastal area with abundant fishery potential, local fishermen still face constraints such as limited storage, processing, and distribution facilities, which impact the quality of their catch. Furthermore, the role of TPI as a means of marketing seafood is not yet optimal, thus reducing its effectiveness in creating fair and transparent prices. This study used a quantitative method with an associative approach, involving 98 respondents, and analyzed through multiple linear regression. The results show that seafood product quality has a positive and significant effect on improving fishermen's welfare. Similarly, the role of TPI has been shown to have a positive influence on fishermen's income and bargaining position. Simultaneously, these two independent variables contribute significantly to improving the welfare of fishing communities. These findings confirm that the synergy between improving product quality and optimizing the function of TPI is an important key in encouraging the creation of sustainable fishermen's welfare.

INTRODUCTION

Indonesia is known as a maritime country that has abundant marine resource potential (Rochwulaningsih et al., 2019). Seafood, particularly fish, is a key commodity, serving not only as a highly nutritious food source but also as a livelihood for millions of coastal communities, including fishermen (Bennett et al., 2018). Fishermen are one of the groups that

rely heavily on marine catches as their primary source of income (Teh et al., 2020). Therefore, improving the quality of seafood and managing its marketing through Fish Auction Places (TPI) are crucial factors in supporting their well-being (Lin, 2023).

In the Lubuk Pakam region, fishermen face various challenges in improving their welfare. One key aspect is the quality of their seafood. The quality of their catch is often compromised due to limited storage, processing, and distribution facilities. Yet, the quality of seafood significantly determines the selling price in the market. Maintaining quality increases the added value of products and optimizes fishermen's income. Furthermore, the existence of Fish Auction Places (TPI) plays a crucial role in the catch marketing system. TPI not only serves as a means of transaction between fishermen and traders but also serves as an instrument for creating fairer, more transparent, and more competitive prices. However, in some areas, including Lubuk Pakam, the role of TPI has not been fully utilized. Issues such as limited facilities, lack of supervision, and a weak auction system can impact the effectiveness of TPI in improving fishermen's welfare.

The welfare of fishing communities is measured not only in terms of increasing income, but also from social, educational, health and family economic sustainability aspects (Lubis et al., 2023). If the quality of seafood can be improved and the Fish Auction Place (TPI) is well-managed, it is hoped that fishermen will obtain more reasonable selling prices, wider market access, and increased income, leading to improved living standards (Izzah & Lubis, 2025). Furthermore, the existence of Fish Auction Places (TPI) also plays a strategic role in determining the welfare of fishing communities. TPI is not just a location for seafood transactions, but also a forum for creating a fairer, more transparent, and more competitive trading system. Through TPI, it is hoped that fish prices will be more stable, distribution more orderly, and fishermen will be less dependent on middlemen. Thus, TPI can be a crucial instrument in improving fishermen's bargaining position.

Field observations indicate that despite abundant marine resources, some fishermen still face challenges in terms of income and well-being. This indicates a gap between resource potential and improvements in fishermen's standard of living. Therefore, research on the influence of seafood product quality and the role of Fish Auction Places (TPI) on improving the welfare of fishing communities in Lubuk Pakam is highly relevant. This research is expected to provide a clearer picture of the extent to which seafood product quality and the presence of TPI contribute to fishermen's welfare. Therefore, the research findings can provide input for local governments, TPI managers, and fishing communities to improve strategies for managing the fisheries sector sustainably.

The fisheries sector is one of the pillars of the economy of coastal communities in Indonesia (Wasik et al., 2024). As an archipelagic country with a vast sea area, the potential for marine products is very large to be utilized as a source of income for the community, especially fishermen (Kronen et al., 2010). However, the contribution of the fisheries sector to improving the welfare of fishermen is often not optimal, especially due to various factors that influence product quality and marketing systems (Hutagalung et al., 2025). The quality of seafood products is an important factor in determining competitiveness in the market (Teviana et al., 2025). Fresh, clean, and health-compliant fishery products have a higher selling value and can expand market reach. Conversely, products that are not maintained at a high quality will lower their selling price, harm fishermen, and impact their well-being (Teviana et al., 2025).

Apart from quality factors, the existence of Fish Auction Places (TPI) also plays a strategic role in the distribution and marketing of seafood. The Fish Auction Center (TPI) serves as a transaction center that ensures price transparency, improves fishermen's bargaining power, and reduces dependence on middlemen. With a robust auction system, fishermen can obtain fairer prices, thereby increasing their income. In Lubuk Pakam, the majority of coastal communities rely on the fisheries sector for their livelihood. However, common problems include fluctuating fish prices, poor post-harvest seafood handling, and the suboptimal function of the TPI as a

marketing tool (Lubis, Teviana, et al., 2025). This situation has resulted in low levels of welfare for fishing communities, both in terms of income, education, and overall standard of living.

Therefore, research into the influence of seafood quality and the role of Fish Auction Places (TPI) on improving the welfare of fishing communities in Lubuk Pakam is crucial. This research is expected to provide an empirical overview of the extent to which these two factors contribute to improved welfare, while also providing input for local governments and relevant parties in formulating policies that support sustainable fisheries sector development.

LITERATURE REVIEW

Quality of Seafood

Fishery products are highly perishable, so quality is influenced by the speed of post-harvest handling, temperature, cleanliness, and cold chain integrity throughout the logistics process (Abbas et al., 2024). Improving quality requires strengthening the cold chain system from vessel to fish processing facility (TPI) to distribution (Yang & Lin, 2017). Fresh fish quality standards are regulated by SNI 2729:2013 (Fresh Fish) and SNI 2346:2011 (organoleptic) testing guidelines (Miriyanti et al., 2019). General indicators include organoleptic values (≥ 7 for fresh), flesh pH, microbiological tests, and hygiene/handling parameters (Chepkemai, 2016). Field studies have shown significant fish quality degradation within hours of landing if cold handling is inadequate; for example, in tuna, organoleptic values dropped from >8 to <7 during the day without temperature control. Recent cold chain research on fillets and frozen commodities emphasizes the importance of temperature control and sanitation (organoleptic testing according to SNI 4110:2020, microbiological testing) to maintain final quality. Economically, the implementation of a cold chain (e.g., bulk ice from a fish processing facility/ice factory) has been shown to increase fishermen's income compared to a non-cold chain system. The mechanism is through better quality, higher selling prices, and lower shrinkage (Li et al., 2022).

Fish Auction Places (TPI)

Regulatory, TPI/PPI are recognized as official landing and auction points. TPI management is typically carried out by regional Technical Implementation Units (UPT), with the following primary functions: transparent transactions, catch recording, provision of ice/clean water facilities, hygiene, and supporting services (levies, price information). An example of local regulation at the district level: the Natuna Regent's Regulation on TPI Management emphasizes the utilization of TPI infrastructure for the benefit of coastal communities, reflecting similar general management norms in many regions. Case studies in Indonesia demonstrate the contribution of well-managed TPIs: cutting the supply chain, improving price transparency, marketing efficiency, and access to inputs (ice, water, sanitation), which impact the quality and income of fishermen (Dulvy et al., 2011). The Ministry of Maritime Affairs and Fisheries' fisheries management guidelines and plans emphasize the institutional role of TPI/PPI in a fair and documented catch trade system.

Improving the Welfare of Fishing Communities

Literature on coastal poverty indicates that poverty rates among fishers tend to be higher than those among non-coastal communities, influenced by seasonality, price fluctuations, and limited infrastructure. Therefore, product quality and market institution (TPI) interventions are seen as pathways to improving welfare (Edlund & Lindh, 2013). In the Deli Serdang context, marketing networks in the coastal village of Pantai Labu influence fishermen's bargaining power; landing/auction infrastructure and logistics to the Lubuk Pakam market contribute to determining prices at the fisherman's level (Lubis et al., 2024). Operational indicators of fisher welfare frequently used include: monthly household income/per trip, basic expenditure, debt

dependency ratio, ownership of productive assets, savings, access to social security, and perceptions of welfare.

Based on the literature review above, the following hypotheses are proposed:

1. H1: The quality of seafood products has a positive and significant effect on improving the welfare of the Lubuk Pakam fishing community.
2. H2: The fish auction site (TPI) has a positive and significant effect on improving the welfare of the Lubuk Pakam fishing community.
3. H3: The quality of seafood products and the fish auction site (TPI) simultaneously have a positive and significant effect on improving the welfare of the Lubuk Pakam fishing community.

METHODS

This research is a quantitative research with an associative approach to determine the influence between two independent variables (Sea Product Quality and Fish Auction Place (TPI) on one dependent variable (Improving the Welfare of the Lubuk Pakam Fishing Community). The sampling technique used purposive sampling. The number of samples was 98 respondents. The Questionnaire Data Collection Technique used a Likert scale. The data were analyzed using multiple linear regression. Statistical Tests using Validity and Reliability Tests: Using Pearson Product Moment and Cronbach's Alpha. Classical Assumption Tests namely Normality Test (Kolmogorov-Smirnov), Multicollinearity Test (VIF), Heteroscedasticity Test (Glejser Test). Multiple Linear Regression Tests: t-test (partial effect), F-test (simultaneous effect), Coefficient of Determination (R^2): Explains how much the independent variable explains the variation of the dependent variable. Data were processed using IBM SPSS Statistics 27 statistical software.

RESULTS

Validity testing was conducted to ensure that each item in the questionnaire was truly capable of measuring the intended variable. Validity was determined by comparing the calculated r value to the table r of 0.361 (based on a certain number of respondents and a significance level of 5%). The test results showed that all statements in the three variables, namely: Quality of Seafood Products (X1), Fish Auction Places (TPI) (X2) and Improving the Welfare of Fishing Communities (Y) had a calculated r value that exceeded the table r value. Therefore, all statement items were declared valid and could be used to measure each variable in this study.

Validity Test

Table 1. Validity Test Results

Variables	Statement	R_{value}	R_{table}	Conclusion
Quality of Seafood Products (X1)	X1.1	0,788	0,361	Valid
	X1.2	0,847		Valid
	X1.3	0,900		Valid
	X1.4	0,501		Valid
	X1.5	0,559		Valid
	X1.6	0,852		Valid
	X1.7	0,900		Valid
Fish Auction Place (X2)	X2.1	0,877	0,361	Valid
	X2.2	0,738		Valid
	X2.3	0,662		Valid

	X2.4	0,646		Valid
	X2.5	0,809		Valid
	Y.1	0,747		Valid
Improving the Welfare of Fishing Communities (Y)	Y.2	0,633	0,361	Valid
	Y.3	0,774		Valid
	Y.4	0,553		Valid
	Y.5	0,514		Valid
	Y.6	0,652		Valid

Reliability Test

Reliability testing aims to assess the internal consistency of the research instrument for each variable. This test uses the Cronbach's Alpha value indicator, with a minimum threshold of 0.60 to be considered reliable. Referring to Table 2, all variables in this study had Cronbach's Alpha values exceeding 0.70.

Table 2 Reliability Test Results

Variables	Statement	Cronbach's Alpha Calculation Results	Cronbach Alpha	Conclusion
Quality of Seafood Products (X1)	X1.1	0,867	0,60	Reliabel
	X1.2	0,857		Reliabel
	X1.3	0,847		Reliabel
	X1.4	0,905		Reliabel
	X1.5	0,896		Reliabel
	X1.6	0,857		Reliabel
	X1.7	0,847		Reliabel
Fish Auction Place (X2)	X2.1	0,684	0,60	Reliabel
	X2.2	0,753		Reliabel
	X2.3	0,819		Reliabel
	X2.4	0,784		Reliabel
	X2.5	0,720		Reliabel
Improving the Welfare of Fishing Communities (Y)	Y.1	0,618	0,60	Reliabel
	Y.2	0,661		Reliabel
	Y.3	0,602		Reliabel
	Y.4	0,703		Reliabel
	Y.5	0,739		Reliabel
	Y.6	0,654		Reliabel

Normality Test

Data normality was tested using the Kolmogorov-Smirnov One-Sample method on unstandardized residual values.

Table 3. Results of Normality Test**Results of the One-Sample Kolmogorov-Smirnov Test**

	Unstandardized Residual	Conclusion
Test Statistic	0,064	
Asymp. Sig (2-tailed)	0,200	Normal

Multicollinearity Test

Based on the results of the multicollinearity test, a tolerance value of 0.975 and a Variance Inflation Factor (VIF) value of 1.026 were obtained for the variables of Seafood Product Quality and Fish Auction Place (TPI). Since the tolerance value is greater than 0.10 and the VIF value is less than 10, it can be concluded that there is no multicollinearity in both variables, so both meet the classical assumptions and are suitable for use in regression analysis.

Table 4. Results of Normality Test**Results of Multicollinearity Test**

Model	Collinearity Statistics		Information
	Tolerance	VIF	
Quality of Seafood Products	.975	1.026	Non Multikolineritas
Fish Auction Place (TPI)	.975	1.026	Non Multikolineritas

Heteroscedasticity Test

Based on the results of the heteroscedasticity test, no heteroscedasticity problems were found in the regression model, as all independent variables had significance values above 0.05. Thus, the classical assumption regarding equality of residual variances was met.

Table 5. Heteroscedasticity Test Table

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	9.459	2.627		3.601	.001
	Quality of Seafood Products	.299	.085	.330	3.539	.001
	Fish Auction Place (TPI)	.268	.102	.245	2.623	.010

Hypothesis Testing

From Table 6, the multiple linear regression equation from the results of this study can be seen as follows :

Table 6. Multiple Linear Regression Analysis

Model		Unstandardized Coefficients		Sig.
		B	Std. Error	
1	(Constant)	9.459	2.627	.001
	Quality of Seafood Products	.299	.085	.001
	Fish Auction Place (TPI)	.268	.102	.010

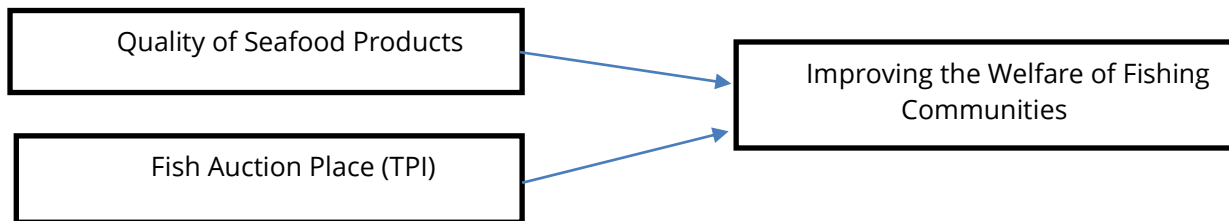
Multiple Regression Analysis

Based on the calculation of multiple linear regression analysis, the following results were obtained

$$Y = 9,459 + 0.299 X_1 + 0.268 X_2$$

The constant (9.459) shows that if the Quality of Marine Products (X1) and Fish Auction Place (TPI) (X2) have a value of zero, then the Improvement in the Welfare of Fishing Communities (Y) is at a base value of 9.459.

Figure 1. Proposed Model



Hypothesis Test

Table 7. t Test

Variables	t _{table}	t _{value}	Sig	Decision
Quality of Seafood Products	1.985	3.539	.001	Accepted
Fish Auction Place (TPI)	1.985	2.623	.010	Accepted

Based on the results of the t-test in Table 7, it is known that the Product Quality variable has a t-value of 3.539, greater than the t-table of 1.985, with a significance level of 0.001 (<0.05). This indicates that the hypothesis regarding the influence of product quality is accepted. Furthermore, the Fish Auction Place (TPI) variable also has a t-value of 2.623, which is greater than the t-table of 1.985, with a significance value of 0.010 (<0.05). Thus, the hypothesis regarding the influence of TPI on the research variables is also accepted.

Table 8. F test

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	171.078	2	85.539	11.465	.000 ^b
	Residual	708.759	95	7.461		
	Total	879.837	97			

Based on the F-test results in Table 8, the calculated F-value was 11.465 with a significance level of 0.000 < 0.05, thus the regression model used was declared feasible. This indicates that the independent variables simultaneously have a significant effect on the dependent variable.

Coefficient of Determination

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.441 ^a	.194	.177	2.73141

The analysis results show that the coefficient of determination (R Square) is 0.194 or 19.4%, which means that the independent variables in the model are able to explain the

variation of the dependent variable by 19.4%, while the remaining 80.6% is explained by other factors outside this research model. The Adjusted R Square value of 0.177 indicates that after adjusting for the number of variables and samples, the model's predictive ability remains quite consistent. The Standard Error of the Estimate value of 2.73141 indicates the level of error in the model's predictions against the actual data.

DISCUSSION

The research results show that the quality of seafood products and the presence of Fish Auction Places (TPI) significantly influence the welfare of fishing communities in Lubuk Pakam. Maintaining the freshness of seafood products increases their selling value, thereby stabilizing fishermen's incomes. This finding aligns with fisheries marketing theory, which states that product quality is a key factor in determining market prices. Furthermore, TPIs have proven crucial as a means of more transparent distribution and transactions. With TPIs, fishermen are no longer dependent on middlemen, thus obtaining fairer prices. This has positively impacted fishermen's standard of living, both economically and socially.

However, challenges remain, such as limited storage facilities and suboptimal management of the TPI. This requires attention from both the local government and management to ensure the TPI's functionality is maximized. Overall, the results of this study confirm that the synergy between improving product quality and optimizing the TPI's role is key to improving the welfare of the Lubuk Pakam fishing community. Each hypothesis is discussed below:

H1: Seafood Product Quality Has a Positive and Significant Impact on Improving the Welfare of Fishing Communities in Lubuk Pakam

The results of this study indicate that the quality of seafood products has a positive and significant impact on improving the welfare of fishing communities in Lubuk Pakam. This finding indicates that the better the quality of seafood produced, the higher the selling value of the products obtained by fishermen, thus directly impacting their income and welfare. Maintaining product quality makes the catch more competitive in both local and regional markets, and is able to meet the needs of increasingly discerning consumers regarding food quality (Sari et al., 2024). This aligns with previous theory and research, which confirm that product quality is a crucial factor in increasing the competitiveness and welfare of fisheries business actors. Therefore, improving fishermen's skills in maintaining the quality of their catch, implementing post-harvest handling standards, and supporting them with support from the government and relevant institutions are important strategies for optimizing the welfare of fishing communities in the region.

H2: Fish Auction Places (TPI) have a positive and significant impact on improving the welfare of fishing communities in Lubuk Pakam

The results of this study indicate that Fish Auction Places (TPI) have a positive and significant impact on improving the welfare of fishing communities in Lubuk Pakam. This indicates that the existence of TPI can provide added value for fishermen, through increased income, wider market access, and more stable and transparent fish prices (Ariwibowo, 2020). TPI also serves as a means of ensuring a fairer catch distribution mechanism, thereby reducing fishermen's dependence on middlemen (Hartono, 2024). This finding aligns with previous research that suggests that TPI not only increases fishermen's bargaining power but also strengthens the local economic structure through the circulation of fish sales proceeds. Therefore, TPI is a crucial instrument in efforts to improve the standard of living of fishermen and encourage community-based economic development in coastal areas in Lubuk Pakam.

H3: Seafood Product Quality and Fish Auction Places (TPI) simultaneously have a positive and significant impact on improving the welfare of fishing communities in Lubuk Pakam.

The results of this study indicate that seafood product quality and the presence of fish auction places (TPI) simultaneously have a positive and significant impact on improving the welfare of fishing communities in Lubuk Pakam. This finding indicates that the better the quality of seafood produced and the more optimal the TPI's function as a distribution center, the greater the opportunity for fishermen to obtain fairer and more profitable selling prices. This condition has a direct impact on increasing fishermen's income, which in turn contributes to improving their standard of living. Furthermore, these results support the theory that improving product quality and the existence of effective marketing facilities can strengthen fishermen's bargaining position in the market (Lubis, Effendi, et al., 2025). Thus, it is understandable that the synergy between product quality factors and the role of TPI is a crucial aspect in efforts to sustainably improve the welfare of fishing communities.

CONCLUSION

Research on the Effect of Seafood Product Quality and Fish Auction Places (TPI) on Improving the Welfare of Fishing Communities in Lubuk Pakam shows that seafood quality plays a crucial role in determining the competitiveness and selling value of fishermen's catches. The better the quality of seafood marketed, the higher the income earned by fishermen. The research demonstrates that maintaining seafood quality, in terms of freshness, cleanliness, and processing methods, can increase consumer confidence. This directly impacts selling prices and expands the market, thereby improving the welfare of fishing communities in Lubuk Pakam.

The existence of Fish Auction Places (TPI) also has a significant positive impact. TPI serves as a fair, transparent, and organized marketing platform for fishermen to sell their catch, thereby reducing the practices of middlemen that are detrimental to fishermen. With the TPI, fishermen can obtain prices that are more in line with the quality of their catch. The auction process also creates a healthy competitive climate among buyers, resulting in more stable fish prices and a profitable environment for fishermen.

The synergy between seafood product quality and the role of TPI has proven to be a crucial factor in improving fishermen's welfare. Fishermen who maintain the quality of their catch and utilize it through the Fish Harvesting Center (TPI) earn better incomes than those who do not. This study also shows that fishermen's welfare depends not only on the quantity of their catch, but more so on the quality and marketing system implemented. With good management, fishermen can achieve optimal results even if the catch is not always large.

Product quality and the TPI together make a significant contribution to improving fishermen's standard of living. Increased income from marine products impacts education, health, and the basic needs of fishermen's families. Furthermore, this study emphasizes that the existence of a TPI must be accompanied by professional supervision and management. An effectively functioning TPI can be a crucial instrument in strengthening fishermen's bargaining position and curbing unfair trade practices. Therefore, the role of local governments and relevant parties is crucial in supporting improvements to TPI facilities, training fishermen on seafood handling, and coaching them on maintaining product quality. These efforts will strengthen the positive impact on improving the welfare of fishing communities. Overall, this study concludes that improving the quality of seafood products and optimizing the function of the TPI are key to improving the welfare of fishing communities in Lubuk Pakam. The combination of the two creates a healthy marketing system, increases income, and encourages the creation of a more prosperous and sustainable life for fishermen.

LIMITATION

This study is limited by its focus on the fishing community in Lubuk Pakam. Socioeconomic conditions, marketing patterns, and auction systems in other regions may differ, so the results cannot necessarily be generalized to all fishing communities in Indonesia. The variables studied focused solely on the quality of seafood and the presence of Fish Auction Places (TPI). However, improving the welfare of fishing communities is also influenced by many other factors, such as government policies, access to capital, weather, fluctuations in global market prices, and transportation facilities. The data collection method used still has limitations because it relies heavily on the honesty and openness of respondents. There is a possibility of information bias because fishermen may provide answers that are considered "safe" or meet the researcher's expectations, rather than based on actual conditions. This study did not fully consider seasonal aspects of fishing activities. The condition of fishermen's catches is strongly influenced by the season, weather, and other marine environmental factors that can affect the quality of seafood and the quantity of fish auctioned at the TPI. The sample size used in this study is limited and may not be representative of the entire fishing population in Lubuk Pakam. Therefore, the analysis results may not reflect the actual conditions of all fishing communities in the region. This study did not deeply examine external factors such as the role of middlemen, distribution chains, and market interventions, which also impact fishers' welfare. This limitation led to a greater emphasis on internal aspects (products and fisheries processing facilities) rather than the market ecosystem as a whole. The measurement tools used to assess the welfare of fishing communities were limited to specific indicators, such as income and economic conditions. However, welfare has broader dimensions, including health, education, housing, and social access, which were not fully addressed in this study. This study was cross-sectional, meaning it was conducted over a single time period. Therefore, the results only reflect conditions at the time of the study and cannot indicate long-term trends related to changes in fishers' welfare due to the quality of seafood and the presence of fisheries processing facilities.

This study did not address the technology and innovation aspects of seafood processing. Post-harvest technology can significantly impact the quality of seafood and ultimately impact the selling price and welfare of fishers. A final limitation is that this study did not compare the conditions of fishers using fisheries processing facilities with those selling their catch directly or through informal channels. This comparison can actually enrich understanding regarding the effectiveness of TPI in improving the welfare of fishing communities.

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