



South East Asian Marine Sciences Journal (SEAMAS)

Journal Homepage: <https://journal.stedca.com/index.php/seamas>



Feasibility Analysis of Salted Amoy Croaker (*Pseudocienna amovens*) Business in Belawan Bahari Village, Medan Belawan Sub-District, Medan City, North Sumatra

Von Braun Situmeang¹, Darwis^{1*}, Hazmi Arief¹

¹Department of Fishery Socio-Economics, Faculty of Fisheries and Marine,
Universitas Riau, Pekanbaru, Riau, Indonesia

*darwis.an@lecturer.unri.ac.id

Article Info

Keyword:

Business feasibility,
Salted amoy croaker,
R/C ratio,
Financial rate of return,
Payback period

Received:

August 19, 2026

Accepted:

September 29, 2026

Published:

October 1, 2026

Abstract

The processing of amoy croaker (*Pseudocienna amovens*) into salted fish is a traditional practice among coastal communities that provides economic value-added and contributes to improving the welfare of fishermen in Belawan Bahari Village, Medan Belawan Subdistrict, Medan City, North Sumatra Province. This study aims to calculate the investment, production costs, revenue, and income, as well as to analyze the feasibility of the salted amoy croaker processing business based on large, medium, and small business scales. The research method used was a survey employing a census technique to collect data from 17 salted amoy croaker business operators, using questionnaires and structured interviews. This study aimed to analyze the feasibility of the salted amoy croaker (*P. amovens*) processing business in Belawan Bahari Village, Medan Belawan District, based on large, medium, and small business scales. A survey method was used, with a census of 17 business operators through questionnaires and structured interviews. The results of research show an average monthly production of 8,970 kg (large scale), 5,175 kg (medium scale), and 2,277 kg (small scale), with total investments of IDR 183,652,516, IDR 104,005,681, and IDR 46,468,602 respectively, and net incomes of IDR 18,577,151, IDR 11,427,819, and IDR 4,286,897 per month. Feasibility analysis yielded R/C ratios of 1.10–1.12, Financial Rate of Return (FRR) of 0.09%–0.11%, and a payback period of 9.10–10.76 months across all business scales. Thus, the salted amoy croaker processing business in Belawan Bahari Village is declared financially feasible for further development.

This is an open access article under the
[Creative Commons Attribution 4.0
International License](https://creativecommons.org/licenses/by/4.0/)



1. INTRODUCTION

Indonesia is an archipelagic nation with enormous marine and fisheries resources (Ramadhani, 2023). The fisheries sector plays a vital role, not only as a provider of affordable animal protein for the public, but also as a source of employment and a contributor to the country's foreign exchange earnings (KKP, 2022). One of its main supporting regions is North Sumatra Province, which recorded a capture fisheries production of 395,818 metric tons in 2024 (KKP, 2025). In this province, the city of Medan, specifically the Medan Belawan Subdistrict, through the Belawan Ocean Fisheries Port (PPS), serves as the hub and main gateway for fishing, landing, and marketing of marine products. The Belawan Bahari neighborhood has developed into a center for both the landing and processing of traditional fishery products (Nursanni et al., 2024). The abundance of catch, not all of which is absorbed by the fresh fish market, has prompted the community to process it into value-added products, such as salted fish, to extend shelf life and

increase market value (Amelia et al., 2025). One of the main commodities processed in this area is amoy croaker (*Pseudocienna amovenssis*), which is known for its high protein content and abundant availability of raw materials.

Based on 2025 data from the Ministry of Marine Affairs and Fisheries' Fishery Port Information Center, the average monthly landing volume of amoy croaker reached 41,587 kg, with a landing price of IDR 10,000 per kilogram, resulting in a monthly production value of IDR 415,870,000. Assuming stable production, the estimated total annual volume could reach nearly 500 metric tons, with an economic value approaching IDR 5,000,000,000. This high production figure indicates that the supply of raw materials is more than sufficient to support the sustainable operation of the salted amoy croaker processing business. Although supported by significant raw material potential and the expertise of traditional processors, the sustainability of this business still faces challenges in the form of limited information regarding its financial viability. Financial management and business feasibility assessments are essential to determine whether the processing business truly delivers optimal efficiency and profitability. Therefore, this study was conducted to analyze the financial feasibility of the salted amoy croaker processing business in Belawan Bahari Village, Medan Belawan Subdistrict, Medan City, North Sumatra Province, which is expected to serve as a basis for consideration by business operators and the government in making decisions regarding future business development.

2. RESEARCH METHODS

Time and Place

This study was conducted in January 2026 in Belawan Bahari Village, Medan Belawan Subdistrict, Medan City, North Sumatra Province.

Method

The method used in this study was a survey using a quantitative approach. The survey was conducted to collect data on the characteristics and research variables of a specific population (Hair et al., 2019). In this study, the survey was conducted in person through interviews with all owners of salted amoy croaker processing businesses at the study site.

Procedures

Determination of Respondents

The respondents in this study were all business owners involved in the processing of amoy croaker fish who are actively operating in the Belawan Bahari neighborhood, totaling 17 business owners. Respondents were selected using the census method, in which the entire population was included in the sample because the number was relatively small. The use of the census method is also consistent with the guideline that a population of fewer than 100 people should be sampled in its entirety (Arikunto, 2010). This number includes 3 large-scale businesses, 5 medium-scale businesses, and 9 small-scale businesses, ensuring that the data obtained accurately reflects the overall conditions of the population.

Data Collection

The types of data used in this study are divided into two categories: primary data and secondary data. Primary data consists of information collected directly from respondents at the research site through interviews. This data includes information on production costs, raw materials, labor, packaging, selling prices, monthly production and sales volumes, as well as processing and marketing procedures. Secondary data consists of supporting data obtained from literature reviews and relevant agencies, such as local government departments and the Central Statistics Agency (BPS). This data includes official documents, books, journals, and articles that provide contextual information about the study area and the salted amoy croaker industry in the research region (Lawrence, 2014).

Data Analysis

Investment

Investment refers to the total initial capital expended to operate a business (Malau et al., 2020). In the salted fish processing business, investment consists of fixed capital in the form of production facilities and equipment (Amura et al., 2021) as well as working capital, which includes raw materials and labor costs (Jambak, 2023). Total investment is calculated using the formula:

$$TI = FC + WC$$

Description:

- TI = Total investment in the salted amoy croaker processing business (IDR)
 FC = Fixed capital in the salted amoy croaker processing business (IDR)
 WC = Working capital in the salted amoy croaker processing business (IDR)

Revenue and Income

Total Cost (TC): Calculated by adding fixed costs and variable costs (Suratiah, 2015): $TC = FC + VC$

Revenue (TR): Calculated by multiplying the volume of products produced by the selling price (Hasnidar, 2017): $TR = P \times Q$

Profit (π): The profit obtained from the difference between total revenue and total costs (Neliyana et al., 2014): $\pi = TR - TC$

Business Viability

Revenue Cost Ratio (R/C Ratio): Assesses business efficiency by comparing total revenue to total costs (Soekartawi, 2007): $R/C \text{ Ratio} = TR / TC$

Criterion: If the R/C Ratio is > 1 , the business is profitable and viable; if < 1 , the business is not viable.

Financial Rate of Return (FRR) measures the percentage return on invested capital (Hendrik, 2014): $FRR = NI / TI \times 100\%$

Where NI is net income, and TI is total investment

Criterion: If the FRR value is greater than the prevailing bank interest rate, then it is more profitable to invest capital in that business.

Payback period of capital (PPC) measures the time required to recover the entire investment capital (Hendrik, 2016). This method is used to determine how quickly the investment can be recouped (Abuk & Rumbino, 2020): $PPC = TI / NI \times \text{periode}$

Criterion: If the PPC is shorter than the economic life of the equipment, then the business investment is considered viable.

3. RESULTS AND DISCUSSION

Investment Gulamah Salted Fish Processing Business (*P. amovens*)

Investment represents the total funds invested by business actors to support the sustainability of amoy croaker production activities. Total investment consists of fixed capital for purchasing long-term production facilities and working capital to finance daily operational needs. The magnitude of this investment value depends heavily on the production scale, equipment capacity, and operational efficiency of each business actor.

Figure 1. Business investment in amoy croaker (*P. amovens*)

Business scale	Fixed capital (IDR)	Working capital (IDR/month)	Total investment (IDR)
Large	22.829.667	160.822.849	183.652.516
Medium	11.933.500	92.072.181	104.005.681
Small	5.216.400	41.252.202	46.468.602

Table 1 shows that the highest average total investment is in the large business scale, amounting to IDR 183,652,516, which consists of IDR 22,829,667 in fixed capital and IDR 160,822,849 in working capital. This indicates that high production capacity requires the

provision of larger facilities and higher operational costs. Table 1 also shows that for the medium business scale, the average total investment is recorded at IDR 104,005,681, with fixed capital of IDR 11,933,500 and working capital of IDR 92,072,181. Meanwhile, the small business scale requires the lowest average total investment, amounting to IDR 46,468,602, comprising IDR 5,216,400 in fixed capital and IDR 41,252,202 in working capital.

It is clear from Table 1 that working capital accounts for the largest proportion of total investment across all business scales. Most of the funds are allocated to routine operational needs such as purchasing fresh fish raw materials, salt, and labor wages. This difference in investment values confirms that an increase in business scale is directly proportional to the capital required to maintain smooth production, in line with findings that small- and medium-scale fishery processing businesses require varying capital structures depending on the product type, production capacity, and operational scale (Zamroni & Purnomo, 2005).

These findings align with the results of a study on amoy croaker businesses in Langkat, which showed that monthly working capital dominates the investment structure—amounting to approximately IDR 144.3 million (medium scale) and IDR 72.15 million (micro scale), compared to fixed capital of IDR 29.32 million and IDR 9.12 million, respectively (Shalichaty et al., 2021). In the context of salted fish in general, a similar structure was reported in Central Tapanuli, where working capital per production cycle (fish raw materials, salt, and labor) constitutes the largest expense component. In contrast, fixed capital is mainly allocated to drying grounds, soaking tanks, and supporting equipment (Hendrik, 2010). Thus, the dominance of working capital in total investment shown in Table 1 reflects the general characteristics of salted fish processing, which is raw-material- and labor-intensive, where scaling up production absorbs operational funds rather than long-term asset purchases

Revenue and Income

Total Costs

Total production cost is the overall expense incurred during the amoy croaker processing over one production period, calculated by summing variable costs and fixed costs.

Figure 2. Total costs of amoy croaker (*P. amovens*)

Business scale	Variable costs (IDR/month)	Fixed costs (IDR/month)	Total production costs (IDR/month)
Large	159.521.500	1.301.349	160.822.849
Medium	91.245.500	826.681	92.072.181
Small	40.783.800	469.303	41.253.103

Table 2 shows that the highest total production cost occurs at the large business scale, reaching IDR 160,822,849 per month (variable costs of IDR 159,521,500 and fixed costs of IDR 1,301,349). This high cost is influenced by the large production capacity, which demands more raw materials, labor, and production equipment. Table 2 also presents the total production cost for the medium scale at IDR 92,072,181 per month (variable costs of IDR 91,245,500 and fixed costs of IDR 826,681), while the small scale records the lowest figure at IDR 41,253,103 per month (variable costs of IDR 40,783,800 and fixed costs of IDR 469,303). This demonstrates that variable costs strongly dominate expenditures across all business scales, depending on daily production volume, while fixed costs make only a minor contribution.

The dominance of variable costs in this expense structure is consistent with findings in salted fish businesses in Central Tapanuli, where variable costs (fish raw materials, salt, and labor) were reported as the largest component of total production costs. In contrast, fixed costs (equipment depreciation and facility costs) contributed minimally (Hendrik, 2010). Specifically regarding amoy croaker, Shalichaty et al. (2021) also reported that variable (non-fixed) costs for medium and micro scales reached hundreds of millions of rupiah per month with a ratio of approximately 2:1 according to production volume, clearly proving that variable components drive total costs. A similar pattern was observed in salted fish enterprises in Cirebon, where

variable costs (mainly raw fish and labor) accounted for over 95% of total production costs per period, while fixed costs made up only about 4–5% (Wachdijono et al., 2021).

Therefore, the cost structure in Table 2, where variable costs exceed 99% of total production costs across all scales, closely reflects the general characteristics of the salted fish agro-industry, which is highly sensitive to raw material prices and wages rather than changes in fixed costs.

Revenue

Business revenue is the total sales value derived from Amoy croaker sales during a one-month production period before deducting total production costs. The amount of revenue is determined by the volume produced and the selling price at the producer level.

Figure 3. Revenue of amoy croaker (*P. amovens*)

Business Scale	Salted fish production (kg/month)	Selling Price (IDR/kg)	Revenue (IDR/month)
Large	8.970	20.000	179.400.000
Medium	5.175	20.000	103.500.000
Small	2.277	20.000	45.540.000

Table 3 shows that the highest average revenue was obtained by the large business scale, reaching IDR 179,400,000 per month with a production volume of 8,970 kg, followed by the medium scale at IDR 103,500,000 per month (5,175 kg), and the small scale at IDR 45,540,000 per month (2,277 kg). Since the selling price across all business scales is uniform at IDR 20,000 per kg, the differences in total gross revenue among business scales are entirely driven by the monthly production volume.

This pattern aligns with findings in amoy croaker businesses in Langkat, where monthly revenues for medium and micro scales reached hundreds of millions and tens of millions of rupiah, respectively, with the primary difference lying in the production volume capacity absorbed by labor and drying facilities. In another location, Perlis Village, Langkat, producer-level selling prices for amoy croaker were also uniform across scales at IDR 17,000/kg for both medium and micro enterprises, making sales volume the primary determinant of revenue differences (Shalichaty et al., 2021). With a uniform selling price of IDR 20,000/kg across all business scales in this study, the linear increase in revenue from small (IDR 45.54 million) to medium (IDR 103.5 million) and large scales (IDR 179.4 million) mirrors the rise in monthly production volume, consistent with real-world revenue generation mechanisms in amoy croaker businesses.

Income

Business income represents the net profit obtained from the difference between business revenue and total production costs during a one-month production period.

Figure 4. Income of amoy croaker (*P. amovens*)

Business Scale	Revenue (IDR/month)	Total Costs (IDR/month)	Net Income (IDR/month)
Large	179.400.000	160.822.849	18.577.151
Medium	103.500.000	92.072.181	11.427.819
Small	45.540.000	41.253.103	4.286.897

Table 4 shows that the highest net income was earned by the large scale at IDR 18,577,151 per month (revenue of IDR 179,400,000 minus costs of IDR 160,822,849), followed by the medium scale at IDR 11,427,819 per month (revenue of IDR 103,500,000 minus costs of IDR 92,072,181), and the small scale at IDR 4,286,897 per month (revenue of IDR 45,540,000 minus costs of IDR 41,253,103). Positive profit figures across all business scales demonstrate that amoy croaker processing is profitable; the larger the business scale and production capacity, the higher

the net income generated. These results are in line with findings in salted fish enterprises in Bontang Kuala, where the average monthly profit reached IDR 14.16 million per business unit, with all business scales generating positive profits (Kurniawan et al., 2023). Specifically, for amoy croaker, Shalichaty et al. (2021) also reported net profits across medium and micro scales, with larger margins observed in medium scales due to higher production capacity. In Paotere, Makassar, salted fish profits fluctuated seasonally (IDR 33.34 million during peak season and IDR 15.70 million during low season) but remained consistently positive, confirming business feasibility (Ramadani et al., 2025). Thus, the positive net income across all scales in Table 4 (IDR 4.29–18.58 million/month) reinforces the general conclusion that amoy croaker processing holds promising profitability prospects, where scaling production directly enhances net profits.

Feasibility Analysis

Revenue Cost Ratio

The Revenue Cost Ratio (R/C) is a business feasibility indicator used to assess financial efficiency by comparing total revenue to total production costs within a single period.

Figure 5. Revenue-Cost Ratio (R/C) values of amoy croaker processing businesses

Business Scale	Revenue (IDR/month)	Total Costs (IDR/month)	R/C Ratio
Large	179.400.000	160.822.849	1,11
Medium	103.500.000	92.072.181	1,12
Small	45.540.000	41.252.202	1,1

Table 5 indicates that amoy croaker processing in Belawan Bahari Urban Village is financially efficient, profitable, and viable for further development across all scales, as all R/C ratios exceed 1. The medium business scale achieved the highest efficiency with an R/C ratio of 1.12, attributed to optimized production factors and effective operational cost management. This is followed by the large scale at an R/C ratio of 1.11 and the small scale at 1.10, collectively proving that production expenditures at all scales generate revenues exceeding the invested capital.

The R/C ratio values across all scales in this study (1.10–1.12) fall within the common range reported in salted fish literature, where an $R/C > 1$ serves as the primary criterion for declaring a business efficient and feasible for development (Lubis & Siregar, 2021). In Rebo Village, Bangka, cost efficiency reached an R/C of 1.73 (Sari et al., 2020), while for amoy croaker in Langkat, Shalichaty et al. (2021) also reported R/C ratios above 1 for both medium and micro scales. Therefore, while the R/C values of 1.10–1.12 in Belawan Bahari are slightly lower than in some other studies, they fully meet feasibility standards ($R/C > 1$) and confirm that the business is financially efficient and viable for continuous operation.

Financial Rate of Return

The Financial Rate of Return (FRR) is a financial feasibility indicator used to measure the return on investment by comparing net income to the total capital deployed in business activities.

Figure 6. Financial Rate of Return (FRR) for gulamah salted fish processing business

Business Scale	Total Investment (IDR)	Net Income (IDR/month)	FRR
Large	183.281.133	18.948.534	0,10
Medium	103.898.292	11.535.208	0,11
Small	46.469.908	4.286.492	0,09

Table 6 shows that the highest FRR value was achieved by the medium business scale at 0.11 (a return of IDR 0.11 per IDR 1.00 of capital), followed by the large scale at 0.10 (total investment of IDR 183,281,133 and net income of IDR 18,948,534), and the small scale at 0.09 (total investment of IDR 46,469,908 and net income of IDR 4,286,492). Positive FRR values that exceed bank interest rates across all scales confirm that amoy croaker processing in Belawan

Bahari Urban Village is profitable and worth developing, with the medium scale demonstrating the most efficient capital yield.

The monthly FRR values in this study (0.09–0.11 per month) are within the range reported for salted fish operations in Central Tapanuli, where FRR is used to benchmark investment returns against bank interest rates (Hendrik, 2010). For amoy croaker in Langkat, Shalichaty et al. (2021) similarly concluded that medium-scale operations yield better capital returns than micro-scale ones, matching the peak FRR observed in the medium scale here. Meanwhile, in Percut Village, Deli Serdang, financial feasibility was reported with an ROI of 9.76% per year, demonstrating that salted fish enterprises generally offer returns superior to traditional bank deposits (Sartika, 2022). Thus, monthly FRR values of 0.09–0.11 in Belawan Bahari show that Amoy Croaker processing delivers attractive returns on investment compared to bank interest rates, with the medium scale offering optimal efficiency

Payback Period of Capital

The Payback Period of Capital (PPC) is a financial feasibility indicator used to measure the time required to recover total invested capital through monthly net income.

Figure 7. Payback Period of Capital (PPC) of amoy croaker processing businesses

Business Scale	Total Investment (IDR)	Net Income (IDR/month)	PP (months)
Large	183.652.516	18.577.151	9,89
Medium	104.005.681	11.427.819	9,1
Small	46.129.703	4.287.798	10,76

Table 7 shows that the fastest PPC was recorded by the medium scale at 9.10 months or approximately 9 months and 3 days (total investment of IDR 104,005,681 and monthly net income of IDR 11,427,819), followed by the large scale at 9.89 months or approximately 9 months and 27 days (total investment of IDR 183,652,516 and monthly net income of IDR 18,577,151), and the small scale at 10.76 months or approximately 10 months and 23 days (total investment of IDR 46,129,703 and monthly net income of IDR 4,287,798). A payback period under one year across all scales proves that amoy croaker processing in Belawan Bahari Urban Village features rapid capital recovery, low risk, and high viability, with capital turnover efficiency peaking at the medium scale.

Payback Period figures in this study (9.10–10.76 months) fall well within standard ranges reported for salted fish processing, where capital recovery under 1–2 years is considered rapid and viable. For amoy croaker businesses in Langkat, capital recovery times for both medium and micro scales were classified as fast, confirming operational viability across scales (Shalichaty et al., 2021). Meanwhile, in Paotere, Makassar, the payback period was reported at 2.18 years-longer than in this study, yet still meeting feasibility criteria because it remains shorter than the economic lifespan of the assets (Sahruni, 2025). In Lampung, salted fish processing across various scales also demonstrated payback periods under 10 years, indicating financial viability (Kertanegara, 2022). Consequently, a PPC of 9.10–10.76 months in Belawan Bahari highlights that initial investment can be recovered in less than a year, which is exceptionally fast and highly competitive relative to findings in other regions

4. CONCLUSIONS

Based on the research findings regarding the business feasibility analysis of salted amoy croaker processing in Belawan Bahari Urban Village, it can be concluded that: The average total investment and monthly production costs are IDR 183,652,516 and IDR 160,822,849 for the large scale; IDR 104,005,681 and IDR 92,072,181 for the medium scale; and IDR 46,468,602 and IDR 41,253,103 for the small scale, respectively; the average monthly revenue and net income are IDR 179,400,000 and IDR 18,577,151 for the large scale; IDR 103,500,000 and IDR 11,427,819 for the medium scale; and IDR 45,540,000 and IDR 4,286,897 for the small scale, respectively; Salted amoy croaker processing across all business scales is feasible, profitable, and prospective. This is

evidenced by an R/C Ratio of 1.10–1.12 ($R/C > 1$), an FRR of 0.09–0.11 (9%–11%), and a Payback Period (PPC) of 9.10–10.76 months (capital recovery in under one year).

AUTHOR CONTRIBUTIONS

VBS: Conceptualization, Methodology, Investigation, Data Curation, Writing – Original Draft; D: Formal Analysis, Visualization, Writing – Review & Editing; HA: Supervision, Project Administration, Writing – Review & Editing.

SOURCES OF FUNDING

There is no funding

CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

AI DECLARATION

AI-assisted technologies have been used in the writing process to improve the readability and language of the manuscript. No artificial intelligence tool generated primary research data

REFERENCES

- [KKP] Kementerian Kelautan dan Perikanan. (2022). *Laporan kinerja Kementerian Kelautan dan Perikanan tahun 2022*. Kementerian Kelautan dan Perikanan Republik Indonesia. Jakarta.
- [KKP] Kementerian Kelautan dan Perikanan. (2025). *Laporan kinerja Kementerian Kelautan dan Perikanan tahun 2025*. Kementerian Kelautan dan Perikanan Republik Indonesia. Jakarta.
- Abuk, G.M., & Rumbino, Y. (2020). Analisis kelayakan ekonomi menggunakan metode net present value (NPV), metode internal rate of return (IRR) payback period (PBP) pada unit stone crusher di CV. X Kab. Kupang, Prov. NTT. *Jurnal Teknologi*, 14(2): 68-75.
- Amelia, L., Banjarnahor, E.K., & Frianti, A. (2025). Analisis karakteristik pengolahan ikan teri asin, studi kasus di home industri Ibu Nyai, Pangandaran. *Jurnal Perikanan Pantura (JPP)*, 8(2): 891-901.
- Amura, D., & Pirhel, P. (2021). Analisis finansial usaha perikanan tangkap di Teluk Ambon Luar sebagai upaya pengelolaan perikanan berkelanjutan. *TRITON: Jurnal Manajemen Sumberdaya Perairan*, 17(1): 46-56.
- Arikunto, S. (2010). *Prosedur penelitian: Suatu pendekatan praktik*. Rineka Cipta. Jakarta.
- Hair, Jr., Page, M., & Brunsveld, N. (2019). *Essentials of business research methods*. Routledge.
- Hasnidar, H. (2017). Analisis kelayakan usaha ikan hias di Gampong Paya Cut Kecamatan Peusangan Kabupaten Bireuen. *Jurnal Sains Pertanian*, 1(1): 210887.
- Hendrik, H. (2010). Analisis usaha pengolahan ikan asin di Kecamatan Pandan Kabupaten Tapanuli Tengah Sumatera Utara. *Jurnal Perikanan dan Kelautan*, 15(1): 295976.
- Hendrik, H. (2014). Analisis usaha keramba jaring apung, prospek dan kendala pengembangannya di Nagari Tanjung Sani Kabupaten Agam Provinsi Sumatera Barat. *Jurnal Perikanan dan Kelautan*, 19(1): 36-44.
- Hendrik, H. (2016). Studi Kelayakan usaha dan analisis resiko lingkungan pengolahan limbah padat ikan patin (*Pangasius hypophthalmus*). *Jurnal Ilmu Lingkungan*, 10(1): 78-86.
- Jambak, J.E.R. (2023). *Analisis usaha pengolahan ikan asin dalam meningkatkan perekonomian masyarakat Kelurahan Muara Nibung Kabupaten Tapanuli Tengah*. UIN Syekh Ali Hasan Ahmad Addary Padangsidempuan. Sumatra Utara.
- Kertanegara, K. (2022). *Analisis finansial dan nonfinansial usaha pengolahan ikan asin di Desa Tarahan, Lampung*. Universitas Lampung. Lampung
- Kurniawan, E., Hasid, Z., & Busari, A. (2023). Analisis pendapatan usaha pengolahan ikan asin pada usaha rumah tangga di Bontang Kuala, Kalimantan Timur. *Galung Tropika*, 12(2): 159-168.
- Lawrence, N.W. (2014). *Social research methods: Qualitative and quantitative approaches*. Pearson. 592 p

- Lubis, Y., & Siregar, R.S. (2021). *Analisis pendapatan dan kelayakan usaha pengolahan ikan asin (Studi Kasus: Kelurahan Pasar II Natal, Kecamatan Natal Kabupaten Mandailing Natal)*. Universitas Medan Area. Sumatra Utara
- Malau, J.W., & Sofyani, T. (2020). Analisis usaha penangkapan ikan malong (*Muraenesox cinereus*) dengan alat tangkap rawai dasar (*Bottom longline*) di Kecamatan Sei Tualang Raso Kota Tanjung Balai Provinsi Sumatera Utara. *Jurnal Sosial Ekonomi Pesisir*, 1(4): 18-28.
- Neliyana, N., Wiryawan, B., Wiyono, E.S., & Nurani, T.W. (2014). Analysis Financial fisheries of purse seine in Lampulo Fishing Port Banda Aceh Provinsi Aceh. *Marine Fisheries*, 5(2): 163-169.
- Nursanni, B., Ginting, L.M., Rahmadi, M.T., Prayogo, R.R., & Pasaribu, M.N.H. (2024). Pemanfaatan mekanisasi mesin pengering untuk peningkatan produktivitas UMKM ikan asin di Desa Belawan Bahari. *Prosiding Seminar Nasional Pengabdian kepada Masyarakat Lembaga Penelitian dan Pengabdian kepada Masyarakat Universitas Negeri Medan Tahun 2024*, SN24.064, 804.
- Ramadani, A.A. (2025). *Strategi pengembangan usaha pengolahan ikan asin di TPI Paotere Makassar*. Universitas Hasanuddin. Sulawesi Selatan
- Ramadhani, A. A. (2023). Potensi keunggulan kompetitif sumber daya kelautan Indonesia. *Jurnal Ekonomi Sakti*, 12(3): 291–296.
- Sahruni, R.J. (2025). Analisis kelayakan finansial usaha pengolahan ikan Asin di TPI Paotere Makassar. Universitas Hasanuddin. Sulawesi Selatan.
- Sari, F.Y., Pranoto, Y.S., & Purwasih, R. (2020). Analisis usaha ikan asin (Studi Kasus Desa Rebo Kecamatan Sungailiat Kabupaten Bangka). *Journal of Integrated Agribusiness*, 2(1): 20-36.
- Sartika, S., Lubis, M.M., & Saleh, K. (2022). Analisis nilai tambah dan kelayakan usaha pengolahan ikan asin (Studi kasus: Desa Percut, Kec. Percut Sei Tuan, Kab. Deli Serdang). *AGRISAINS: Jurnal Ilmiah Magister Agribisnis*, 4(1): 24-33.
- Shalichaty, S.F., Ratrinia, P.W., & Damanik, S. (2021). Business analysis of Gulamah (*Johnius trachycephalus*) salted fish small and medium enterprises (SMEs) in Perlis, Berandan Barat, Langkat, North Sumatera. *Coastal and Ocean Journal (COJ)*, 5(1), 1-8.
- Soekartawi, S. (2007). Beberapa hal yang perlu diperhatikan dalam melakukan analisis sistem agroindustri terpadu. *Journal of Agribusiness and Agricultural Economics*, 1(2): 31-45.
- Suratiah, K. (2015). *Ilmu Usahatani*. Penebar Swadaya. Jakarta. 124 p.
- Wachdijono, W., Faqih, A., & Hani, U. (2021). Produktifitas nilai tambah dan titik impas pada usaha pengolahan ikan asin. *Teknotan: Jurnal Industri Teknologi Pertanian*, 15(2): 97-106.
- Zamroni, A., & Purnomo, A.H. (2005). Identifikasi kebutuhan modal usaha berskala kecil dan menengah dalam industri pengolahan perikanan. *Jurnal Penelitian Perikanan Indonesia*, 11(3): 41-50