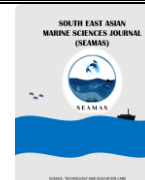




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Technical and financial analysis of 1 GT Gill net fishing in Teluk Lancar Village, Bantan District, Bengkalis Regency, Riau Province

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Abstract

This research was conducted in February 2023 at Teluk Lancar Village, Bantan District, Bengkalis Regency, Riau Province, to know fishermen's techniques in carrying out fishing activities using gill nets with 1 GT boats and how the business feasibility of fishermen using gill nets with boats 1 GT using the survey method. The results showed that the fishermen's technique of operating gill nets in Teluk Lancar Village measured the water's depth; after that, the net was used and thrown to the right of the ship while moving backward (setting). Furthermore, within 1 or 2 hours, the crew lifted the nets in the water onto the ship and moved forward. Fishermen's investment in business activities is IDR 27,600,000.00. The total costs incurred in fishing business activities amount to IDR 92,190,000.00/year, the income received by fishermen is IDR 113,352,000.00/year, the revenue that fishermen have obtained is IDR 21,162,000.00/year, the results of calculating business feasibility based on the formula Revenue Cost of Ratio (R/C), Payback Period of Capital (PPC), and Financial Rate of Return (FRR) this business is feasible to continue and also develop.

1. INTRODUCTION

Capture fisheries involve capturing fish and other aquatic organisms in the wild, such as in the sea, and its factors are not intentionally controlled by humans, as in the case of fishermen residing in coastal areas. Windasai et al. (2021) explain that fishermen are an integral part of Indonesian society, often associated with coastal communities who manage the potential fisheries resources and deserve attention in terms of education. Fishermen utilize fisheries resources for their livelihoods, such as using gillnets for fishing. According to Maikel et al. (2018), gillnets are vertical nets set in the water to intercept the swimming direction of fish, and they are favored by fishermen operating in certain areas, hoping that all fish or aquatic organisms in the area can be captured.

Fishermen utilize gillnet fishing equipment with boats as their primary fishing vessels. According to Ayu et al. (2016), the boats employed for operating gillnet fishing gear typically belong to the fiberglass type, ranging between 1 to 2 GT (100 cm in width and 84 cm in height, with variable lengths of 10 m, 11 m, and 12.5 m). Gillnet fishing with boat assistance is widespread among fishermen in various regions, including Teluk Lancar Village, located in the Bantan District of Bengkalis Regency, Riau Province. Based on data from the Bengkalis Regency Central Bureau of Statistics (BPS) for the year 2020, Teluk Lancar Village spans an area of approximately 38.30 km², constituting 8.58% of the total area of the Bantan District. The village is home to 568 households (KK) and a population of 1,874 individuals, comprising 972 males and 902 females. The primary livelihood for most residents in the

village revolves around fishing, employing various fishing gear such as shrimp nets, drift nets, purse seines, and gillnets.

Government assistance in the form of boats began in 2012, with a total of 10 units provided. However, as the years passed, the number of government-assisted ships decreased. In 2012, 10 fishermen were utilizing the assistance of fiberglass boats weighing 1 GT. By 2023, this number dwindled to only 3 fishermen. Additionally, in 2023, there was only 1 fisherman using gillnets with a fiberglass boat weighing 1 GT. The decline in the number of fishermen using gillnet fishing gear with the assistance of fiberglass boats weighing 1 GT is attributed to vessel damage. Damage to fishing vessels is caused by insufficient maintenance, stemming from fishermen's lack of knowledge regarding the upkeep of fiberglass vessels. Marta & Novrianto (2020) explain that fishermen use marine resources as coastal resources for their livelihoods and are not dependent on educational attainment.

The fiberglass boat, measuring 1 GT, is built using fiberglass material. The ship has a length of approximately 7 m and a width of around 1.5 m. The boat has a diesel engine and a cargo capacity for 2 individuals, consisting of 1 captain and 1 crew member. Suryana et al. (2013) elucidate that the size of the boat plays a crucial role in its movement and substantially impacts the catch, indicating that a larger GT of the ship results in a higher catch. Moreover, according to Wulandari (2017), the quantity of crew members (ABK) involved in small-scale gillnet fishing activities is usually restricted, with an average of 3 individuals per boat, which includes the captain. Each crew member fulfills a distinct and crucial function during the gillnets' deployment (setting) and retrieval (hauling).

The fiberglass boat requires a significant investment and expenses. Afandi et al. (2022) explain that investment refers to capital expenditure in the form of money spent at once to purchase goods and other equipment. Furthermore, Suratiah in Rialdi & Rahim (2018) explains that costs play a crucial role in decision-making in a business, including total costs. Total cost is the overall expenditure incurred during production, including fixed and variable costs. Based on the estimates, the magnitude of investment and costs does not correspond to the fish production by fishermen. This research aims to understand the techniques employed by fishermen in carrying out fishing activities and to assess the feasibility of fishermen's businesses using gillnet gear with a 1 GT boat.

2. RESEARCH METHODS

Time and Place

This research was conducted in January 2023 in Teluk Lancar Village, Bantan District, Bengkalis Regency, Riau Province.

Research Methods

The survey method was used in this research. The survey method is conducted to obtain facts from phenomena and gather actual information involving relevant stakeholders in fisheries and the social and economic aspects of a particular group engaged in fisheries activities. Subsequently, all the data collected are processed to achieve the research objectives (Nazir, 2013). The types of data used in this research are primary and secondary. According to Sugiyono (2015), primary data is the data directly obtained by the data collector, while secondary data is provided to the data collector through documents and also through the research of others.

Data Analysis

Fishermen's Techniques Analysis

The research employs the descriptive analysis method to elucidate the fishing techniques of fishermen using gillnet fishing gear with a 1 GT vessel. Descriptive analysis, as outlined by Nazir (2013), involves systematically and accurately describing facts and characteristics related to a population or activities within a specific field. This method relies on data variables obtained from the subjects under study and observed facts in the field to understand the research subject comprehensively.

Analysis of Fishermen's Business Feasibility

Investment

For calculating the investment value, this research is referring to (Hendrik, 2013), by using the formula as follows:

$$TI = MT + MK$$

Where:

- TI : Total investment (IDR) is the sum of fixed capital and working capital (IDR)
 MT : Fixed capital (IDR) includes the cost of the boat, engine, fishing gear, and other equipment that support the fishing business (IDR)
 MK : Working capital (IDR/Trip) includes the cost of purchasing supplies, consumption, and other miscellaneous expenses.

Gross Income

For calculating the gross income this research is referring to (Soekartawi, 2006), using the formula as follows:

$$TR = P \times Q$$

Where:

- TR : Total revenue (IDR)
 P : Product price (IDR/kg)
 Q : Total sales (IDR/kg)

Profit

For calculating the profit, this research is referring to (Rahim & Hastuti, 2007), by using the formula as follows:

$$\pi = TR - TC$$

Where:

- π : Profit (IDR)
 TR : Total revenue (IDR)
 TC : Total cost (IDR)

The Business Feasibility

To know the feasibility of the business, the revenue-cost ratio needs to be calculated. The formula refers to Rahim & Hastuti (2008), the formula and it is written as follows:

$$R/C = \frac{TR}{TC}$$

Where:

- RCR = Revenue Cost of Ratio (IDR)
 TR = Total revenue (IDR)
 TC = Total cost (IDR)

With the business criteria:

- $R/C > 1$, the business is profitable and worth continuing.
- $R/C < 1$, the business is experiencing losses and is not worth continuing.
- $R/C = 1$, e-business is breaking even.

Payback Period of Capital (PPC)

The payback period of Capital (PPC) is used to determine how long it takes to recoup the initial investment, calculated with the formula:

$$PPC = \frac{TI}{JI} \times \text{period}$$

Where:

- PPC = Payback Period of Capital

TI	= Total Investment
JI	= Profit
Periode	= Business duration

The decision criteria for the payback period method are as follows: If the payback period is greater than the economic life, the investment is rejected. The investment is accepted if the payback period is less than the economic life. Therefore, the assessment based on the payback period method is that the project is accepted if the payback period is shorter than the required maximum time. Conversely, the investment is rejected if the payback period is more extended than needed (Nainggolan, 2018).

Financial Rate of Return (FRR)

The Financial Rate of Return (FRR) is calculated using the formula (Hendrik, 2013):

$$FRR = \frac{NI}{TI} \times 100\%$$

Where:

FRR	= Financial Rate of Return
NI	= Net Income
TI	= Total Investment

The criteria for the business: a) If FRR is greater than the bank interest rate, it is advisable to invest in the business. b) If FRR is less than the bank interest rate, it is advisable to deposit the investment in the bank, as it would be more profitable.

3. RESULTS AND DISCUSSION

General Conditions of the Research Location

The village of Teluk Lancar is located in the Bantan District of Bengkalis Regency, Riau Province. Furthermore, the areas that border Teluk Village are Kembang Luar Village in the Bantan District (to the North), Sekodi Village in the Bengkalis District (to the South), the Malacca Strait (to the East), and Kelemantan Village in the Bengkalis District (to the West).

The Business Feasibility

Afandi et al. (2022) explain that fishermen's investment entails a singular expenditure of funds for procuring goods and equipment for their business activities. The total investment fishermen make in their business endeavors is IDR 27,600,000.00.

Table 1. Investment

No	Investment components	Price (IDR)
1	Boat	11.000.000,00
2	Engine	8.000.000,00
3	Fishing Gear	8.000.000,00
4	Box	600.000,00
Total Investment		27.600.000,00

The total cost is calculated based on the total fixed costs and total variable costs incurred in the fishing activities conducted by the fishermen. The total fixed costs are displayed in Table 2, and the total variable costs are in Table 2.

Fixed costs in the fishermen's business activities amount to IDR 6,750,000.00 per year. According to Mulyadi (2009), fixed costs are expenses that remain constant regardless of the volume of activity. Furthermore, Carter (2009) states that fixed costs are costs that do not change when business activity increases or decreases.

Table 2. Fixed costs of fishermen's business

No	Components of fixed costs	Price (IDR)	Economical lifetime (Year)	Depreciation expenses (IDR/Year)	Maintenance expenses (IDR/Year)	Fixed cost (IDR/Year)
1	Fiberglass boat	11.000.000,00	20	550.000,00	800.000,00	1.350.000,00
2	Engine	8.000.000,00	20	400.000,00	200.000,00	600.000,00
3	Fishing Gear	8.000.000,00	2	4.000.000,00	500.000,00	4.500.000,00
4	Box	600.000,00	3	200.000,00	100.000,00	300.000,00
Total fixed costs (IDR/Year)						6.750.000,00

Table 3. Variable costs of fishermen's business

No	Components of variable costs	Requirements (Trip)	Unit	Price (IDR/Unit)	Variable costs (IDR/Trip)	Variable costs (IDR/Month)	Variable Costs (IDR/Year)
1	Diesel fuel	10	L	10.000	100.000	800.000	9.600.000
2	Ice	20	Block	2.000	40.000	320.000	3.840.000
3	Consumption	3	Day	150.000	450.000	3.600.000	43.200.000
4	Wage for fishing boat crews	3	Day	100.000	300.000	2.400.000	28.800.000
Total variable costs (IDR/Year)					890.000	7.120.000	85.440.000

The fixed costs fishermen incur in fishing activities amount to IDR 85,440,000.00 annually. Mulyadi (2009) explains that fixed costs are variable costs whose amount constantly changes in proportion to the volume of activities. Meanwhile, according to Garrison (2006), variable costs are costs that change in proportion to changes in the activity level.

Table 4. Total costs of fishermen's business

No	Component	Cost (IDR/year)
1	Fixed costs	6.750.000
2	Variable costs	85.440.000
Total Costs (IDR/Year)		92.190.000

The annual expenditure for fishermen's fishing operations totals IDR. 92,190,000. Suratihah, referenced in Rialdi & Rahim (2018), emphasizes the pivotal role of costs in business decision-making, particularly the comprehensive nature of total expenses, which cover all expenditures incurred during the production process, comprising both fixed and variable costs.

Fishermen's Income

Fishermen's income refers to the financial earnings derived from their activities within the fishing industry. This income primarily stems from selling captured fish and other marine resources, including crustaceans and mollusks. The fishermen's total income is influenced by various factors, including the quantity and quality of the catch, market demand and prices for seafood, operational costs such as fuel and equipment maintenance, and regulatory policies governing fishing activities. Additionally, factors such as seasonal variations, weather conditions, and environmental factors may also impact the fluctuation of fishermen's income. Despite facing numerous challenges and uncertainties, fishermen's income is their primary source of livelihood, supporting their families and communities dependent on the fishing industry (Rialdi & Rahim, 2018). The income of fishermen can be seen in Table 5

Table 5. Fishermen's Income

No	The types of fish caught	Fishermen's catch production (kg/year)	Fish prices (IDR/kg)	Income (IDR/year)
1	<i>Ilisha elongata</i>	2.000	11.000,00	22.000.000,00
2	<i>Harpadon nehereus</i>	2.568	1.000,00	2.568.000,00
3	<i>Chirocentrus dorab</i>	2.096	25.000,00	52.400.000,00
4	<i>Selachimorpha sp</i>	2.000	8.000,00	16.000.000,00
5	<i>Selaroides sp</i>	1.456	14.000,00	20.384.000,00
Total income (IDR/Year)				113.352.000,00

Based on Table 5, it can be observed that the income of fishermen amounts to IDR 113,352,000.00 per year. Fishing activities are conducted during daylight hours for one month, comprising 8 trips, each lasting 3 days. It is noted that the operational stages of fishing include preparation and setting (deployment/rearrangement of gillnets) and hauling (lifting gillnets onto the motorized boat). Zain et al. (2016) propose that the operational method of gillnet fishing consists of several stages: equipment preparation, deployment, and retrieval.

Fishermen's Revenue

Fishermen's revenue is the total income derived from various fishing-related activities, such as selling fish, crustaceans, mollusks, and other marine products. This revenue encompasses the earnings generated by fishermen through the sale of their catch in local markets, to wholesalers, or through direct transactions with consumers. The income earned by fishermen plays a crucial role in their livelihoods and the sustainability of fishing communities. It directly impacts their ability to support themselves and their families, invest in fishing equipment and technology, and contribute to the local economy (Panelewen et al., 2020). The fishermen's revenue can be seen in Table 6.

Tabel 6. Fishermen's revenue

No	Components	Total (IDR/Year)
1	Gross revenue	113.352.000,00
2	Total cost	92.190.000,00
Revenue (IDR/Year)		21.162.000,00

The obtained revenue by fishermen amounted to IDR 21,162,000.00/year. According to Panelewen et al. (2020), profit is the objective of a business activity, where, with the existence of profit, an individual can expand or develop their business.

Revenue Cost of Ratio (R/C), Payback Period of Capital (PPC), and Financial Rate of Return (FRR)

The revenue cost of ratio or R/C ratio involves comparing the total revenue to the total costs. This analysis is conducted to ascertain the income gained per unit of cost expended within the fishing business entity (Fitri in Munthe et al., 2023). As described by Hendrik (2013), the payback period of capital assesses the duration required to recoup the initial investment. It is calculated by dividing the total investment by the annual profit. The financial rate of return (FRR), elucidated by Riyanto in Hendrik (2013), entails assessing the relationship between net income and investment, expressed as a percentage. The results of R/C, PPC, and FRR calculations can be seen in Table 7.

The calculation of the revenue cost ratio at 1.2 indicates that in the fishing activity, the fishermen's business obtains a value of 1.2, meaning that the venture is deemed feasible for continuation, development, and future operation. According to Hardito et al. (2021), the business receives double the income compared to the costs incurred, making this activity highly profitable.

Table 7. Revenue Cost of Ratio (R/C), Payback Period of Capital (PPC), and Financial Rate of Return (FRR)

No	Component	Amount (IDR/Years)
1	Revenue Cost of Ratio	
	A. Total gross revenue	113.352.000,00
	B. Total costs	92.190.000,00
R/c		1,2
2	Payback Period of Capital	
	A. Total investment	27.600.000,00
	B. Total revenue	21.162.000,00
Ppc		1,3
3	Financial Rate of Return	
	A. Total revenue	21.162.000,00
	B. Total investment	27.600.000,00
FRR		76,67

The value of the PPC at 1.3 implies that the return on investment in the fishing business activity is achieved within 1.3 years or 1 year and 3 months 18 days, against an economic lifespan of 20 years. This suggests a relatively rapid return on investment from the fishing enterprise. As stated by Nainggolan (2018), if the payback period exceeds the economic lifespan, the investment is rejected, while if it is less than the economic lifespan, the investment is accepted. Hence, the evaluation criterion for the payback period method is acceptance if the period is shorter than the maximum required time. Otherwise, the investment is rejected.

The financial rate of return value of 76.67 for fishing activity indicates that investment in this venture is advisable. According to Hendrik (2013), if the FRR exceeds the bank interest rate, investment in the venture is recommended; otherwise, if the FRR is less than the bank interest rate, it is preferable to deposit the investment in a bank for greater profitability. The applicable bank interest rate is the BRI bank's annual interest rate of 11%.

4. CONCLUSIONS

The fishermen's investment in fishing business activities amounts to IDR 27,600,000.00. The total expenses incurred in fishing activities amount to IDR 92,190,000.00 per year, while the income received by fishermen totals IDR 113,352,000.00 per year. The revenue obtained by fishermen amounts to IDR 21,162,000.00 per year. The feasibility of the business, calculated based on the formulas of R/C at 1.2, PPC at 1.3, and FRR at 76.67, indicates that the venture is viable for continuation and development.

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