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Business analysis of small pelagic purse seine with two vessels: Case study in FV. Intan Istambul in the Bali Strait, Pengambengan Bali, Indonesia

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Abstract

The waters of the Bali Strait are among the areas rich in fishery resources, with the main fish community being lemuru (*Sardinella lemuru*). The average production of *Sardinella lemuru* in the Bali Strait reached 64,961 tons from 2004 to 2014. According to data from the Jembrana Regency Government (2015), the sustainable potential of marine fisheries resources in the waters of West Bali is 56,947 tons per year, consisting of 53,947 tons of pelagic fish and 3,877 tons of demersal fish. The composition of catches during the study using trawl nets over 15 trips, with 1–7 settings per trip, resulted in a total catch of 76,082 kg. The breakdown of the catch includes 19,026 kg of *Sardinella lemuru*, 3,624 kg of Decapterus spp., and 53,432 kg of *Euthynnus affinis*, with tuna being the dominant species. The highest catch occurred during trip 9, with a total of 10,876 kg. A feasibility study on small pelagic purse seine fishing using two vessels indicated a Payback Period (PP) of 67.4 months, meaning it takes 5 years, 7 months, and 12 days to recover the initial investment. The business is feasible to run despite being categorized as slow in capital recovery. Based on the breakeven point (BEP) criteria, the BEP price is IDR 803,325,503.64, meaning the business reaches a break even point when sales reach this amount. Meanwhile, the total revenue is IDR 1,594,409,500, indicating the business is profitable. The BEP unit value is 139,337.15 kg, meaning the business breaks even when fish production reaches this amount. The total production is 276,551.00 kg, which exceeds the BEP unit value, making the business feasible. Additionally, the revenue-cost (R/C) ratio is R/C = 1.25, which is greater than 1, indicating that the business is viable. The return on investment (ROI) is 18%, meaning the percentage of profit obtained from the invested capital over one year is 18%. This classifies the business as reasonably profitable and viable.

Keywords: *Sardinella Lemuru*; Financial Analysis; Composition; Purse Seine

1. Introduction

The Bali Strait are among the areas rich in fishery resources, with the main fish community being *Sardinella lemuru* [1]. The average production of *Sardinella lemuru* in the Bali Strait reached 64,961 tons from 2004 to 2014. The sustainable potential of marine fishery resources in the waters of West Bali is 56,947 tons a year, consisting of 53,947 tons of pelagic fish and 3,877 tons of demersal fish [2]. The main commodities caught by fishermen in these waters include bonito (*Euthynnus affinis*), scad (*Decapterus* spp.), lemuru (*Sardinella lemuru*), lobster (*Panulirus* spp.), squid (*Loligo* sp.), grouper (*Epinephelus*), and various other fish species. Among these catches, lemuru contributes significantly to the total purse seine catch in the Bali Strait. In 2016, *Sardinella lemuru* accounted for 71% of the total catch [3].

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The main issue faced by purse seine fishermen in Jembrana is the unpredictable income due to fluctuating fish production. As a result, fishermen must manage their expenses and revenue carefully. Fishermen typically only consider the cost of a single fishing trip, meaning they lack awareness of the total expenses, income, revenue, and profit over a year-long period [4]. The lack of information on proper business management in Pengambengan, Bali, has led fishermen to focus solely on profit without considering the large investment costs they incur [5]. Consequently, fishermen are unaware of the time required to recover their capital, the percentage of return on investment, and whether their investment costs are capable of being recouped. Therefore, a financial feasibility analysis is necessary to address these issues faced by purse seine fishermen [6].

One method for determining whether a business activity is viable for development is financial analysis. This is essential for evaluation to ensure business sustainability. Thus, financial assessment plays a crucial role in evaluating fishing operations to determine the extent to which good business management practices can be applied to future business plans [7][8].

Fisheries businesses developed by fishermen are expected to support their economy. These businesses must be profitable to ensure sustainability. Conducting business analysis in fisheries is the best way to anticipate the high level of uncertainty in capture fisheries. The uncertainty in question refers to the fact that fishing businesses and their development are highly dependent on fishing seasons and natural factors [9].

Financial analysis is not only useful for estimating operational budget projections but also for determining whether a business is viable and profitable in the long run or whether it is unsustainable due to losses [10][11].

The objectives of this study are to analyze the composition of small pelagic purse seine catches using two vessels and to assess the feasibility of the fishing business based on several aspects: profit and loss calculation, *Payback Period* (PP), *Break Even Point* (BEP), *Return On Investment* (ROI), and *Revenue Cost Ratio* (R/C Ratio). This research is expected to provide insights to readers and future researchers on fish potential and utilization, offer feasibility assessments for fishing businesses, and serve as a reference for entrepreneurs or investors considering investing in purse seine fisheries.

2. Material and methods

The research was conducted from February 15 to May 15, 2024, at the Pengambengan Fishing Port, Bali, using a small pelagic purse seine with two vessels. The research activities consisted of two methods: direct observation and interviews. The research location map can be seen in Figure 1 below:

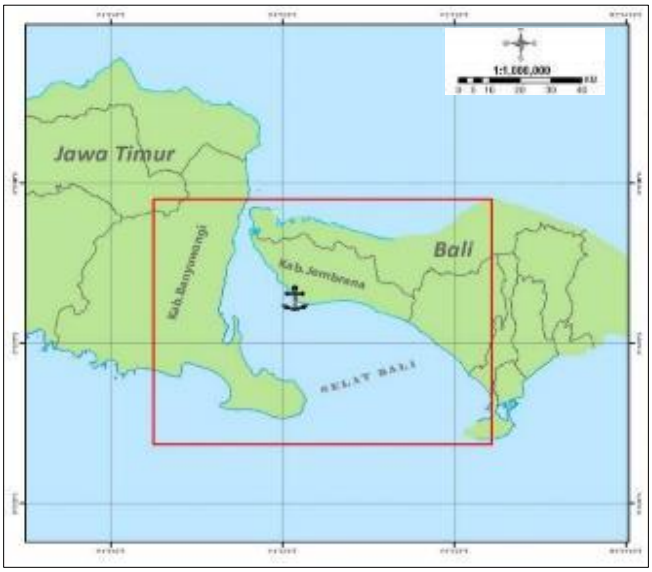

Figure 1 Research location map

The materials and equipment used during the research included a purse seine vessel, stationery, a mobile phone, a calculator, a ruler, and questionnaire sheets.

2.1. Method of data collection

The data collection process was carried out using several methods, including:

- Field Observation, which involved participating in fishing operations.
- Interviews with relevant parties, such as company representatives, crew members, vessel owners, and local communities.
- Documentation, which included ship records, fishing gear data, and other documents related to fishing activities.

Primary data were obtained through direct observations aboard the vessel during fishing operations. Meanwhile, secondary data were collected during the research, including vessel data and literature references used as theoretical foundations.

2.2. Data analysis

The collected data were analyzed based on technical aspects, catch composition, and financial analysis using the following formulas:

2.2.1. Catch Composition Analysis

The catch composition was analyzed descriptively by categorizing each fish species and calculating their proportion using the formula:

$$\mathbf{Kj} = \frac{\boldsymbol{ni}}{\boldsymbol{N}} \mathbf{x\ 100\%.}$$

Where:

- Kj = Species composition (%)
- Ni = Total catch of each fish species (kg)
- N = Total catch (kg)
- i = Fish species

2.2.2. Financial Analysis

According to [12], financial analysis in fisheries businesses is conducted to measure business performance by calculating Profit, *Net Present Value* (NPV), *Benefit Cost Ratio* (B/C Ratio), *Internal Rate of Return* (IRR), and *Payback Period* (PP). Below are brief explanations of the financial indicators:

2.2.3. Profit and Loss Analysis

Business analysis is a method for assessing the financial performance of a fishing enterprise over time [13]. This analysis evaluates the profitability of a fisheries business through revenue analysis. The profit/loss calculation follows the formula by [14]:

$$\boldsymbol{\pi = TR - TC}$$

Where

- π = Profit
- TR = Total Revenue
- TC = Total Cost

Criteria

- If TR > TC, the business is profitable.
- If TC > TR, the business is unprofitable.
- If TR = TC, the business is at the break-even point (no profit or loss).

2.2.4. Revenue Cost Ratio (RC Ratio)

The *R/C Ratio* is used to assess the relative profitability of a business over a one-year period in relation to its operating costs.

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

Where

- R/C = Revenue-Cost Ratio
- TR = Total Revenue
- TC = Total Cost

Criteria

- If R/C > 1, the business is profitable.
- If R/C < 1, the business is approaching losses.
- If R/C = 1, the business neither gains nor loses.

2.2.5. Return of invesment (ROI)

According to [15], ROI is calculated to determine the percentage of profit relative to the total investment.

$$\boldsymbol{ROI} = \frac{\boldsymbol{Profit}}{\boldsymbol{Investment}} \boldsymbol{X\ 100\%}$$

Criteria:

- > 25% = Good
- 15-25% = Fair
- 5-15% = Poor
- < 5% = Very Poor

2.2.6. Payback Period (PP)

The *Payback Period* (PP) method measures how quickly an investment can be recovered, expressed in months or years. It is an investment appraisal technique to determine the time required to recover the capital of a project or business [16].

$$\boldsymbol{PP} = \frac{\boldsymbol{Investment\ Value}}{\boldsymbol{Profit}} \boldsymbol{x\ 1year}$$

2.2.7. Break Event Point (BEP)

The *Break-Even Point* (BEP) represents the state where a business neither profits nor loses [17]. BEP analysis studies the relationship between Fixed Costs, Variable Costs, Activity Volume, and Profit**.** In profit planning, BEP is a Profit Planning Approach based on the relationship between Cost and Revenue [18].

$$\boldsymbol{BEP\ (kg)} = \frac{\boldsymbol{FC}}{\boldsymbol{P - V}}$$

$$\boldsymbol{BEP\ (IDR)} = \frac{\boldsymbol{FC}}{\frac{\boldsymbol{1 - P}}{\boldsymbol{V}}}$$

Where

- FC= Fixed Cost
- P= Selling Price
- V= Variable Cost per Unit

3. Results and discussion

The dominant fishing gear used by fishermen in Pengambengan Bali is the small pelagic purse seine with two boats, locally known as "*slerek*" The fishing operation follows the "two-boat system" and a daily work pattern (one day fishing). The number of crew members ranges from 20 to 40 people**.** The vessels used during the study can be seen in Figure 2 below:

Figure 2 Small pelagic purse seine with two boats FV. Intan Istambul.

3.1. Distribution of Caught Fish

[19] define a distribution channel as a grouping of intermediaries who have rights to a product during the marketing process, from the first owner to the final owner. There are two distribution flow processes for the caught fish:

- Fish purchased by collectors is distributed to retail traders and then sold to consumers.
- Fish taken by processing plants is processed into fishery products and then distributed by distributors to consumers.

The distribution flow of the caught fish can be seen in Figure 3 below:

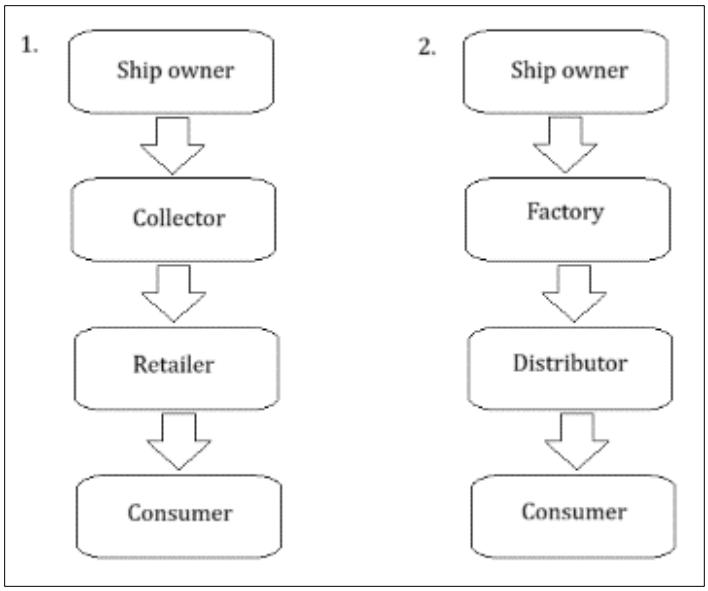

Figure 3 Distribution of Caught Fish

Boat owners or fishermen do not directly interact with end consumers when distributing their catches. Instead, collectors and processing plants serve as the direct consumers for fishermen or boat owners. The catch is unloaded by fishermen at fish auction place (TPI) Pengambengan, where the fish is weighed and auctioned before being transported to processing plants. Fish that has been weighed and auctioned is transported by truck to the processing plant. Fish purchased by retailers is packed in styrofoam and distributed to surrounding areas.

3.2. Composition of Catch a Trip

The fishing operations that the author participated in during the research using purse seines lasted for 15 trips, 1 to 7 times setting per trip and the total catch for 15 trips was 76,082 kg. The types of catches can be seen in Appendix 8 and Table 1 below:

Table 1 Types and results of catches per trip

No	Species	Catch (kg)	Percentage (%)
1	*Euthynnus affinis*	53,432	70
2	*Sardinella lemuru*	19,026	25
3	*Decapterus* spp.	3,624	5
TOTAL		76,082	100

Based on Table 1. the total catch was 76,082 kg with the type of catch being *Sardinella lemuru* as much as 19,026 kg, *Decapterus* spp. as much as 3,624 kg, *Euthynnus affinis* as much as 53,432 kg. For the percentage of fish caught by FV. Intan Istanbul can be seen in Figure 4 below

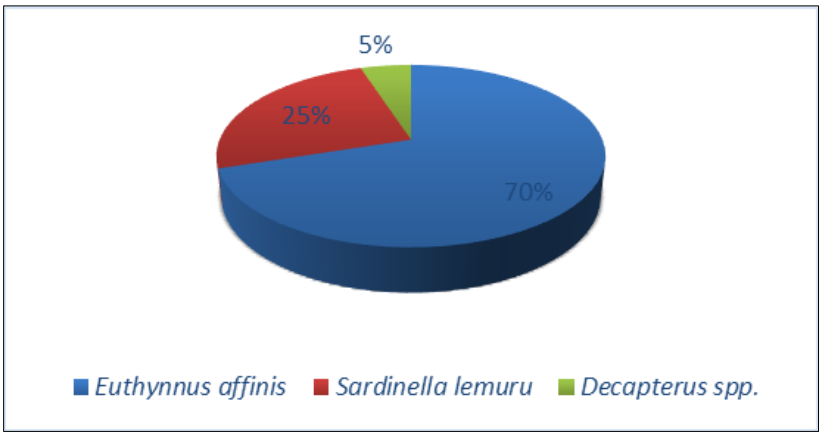

Figure 4 Diagram of Types of Catches During Research

Based on Figure 4. the type of catch is *Sardinella lemuru* as much as 19,026 kg with a percentage of 25%, *Decapterus* spp. as much as 3,624 kg with a percentage of 5%, *Euthynnus affinis* as much as 53,432 kg with a percentage of 70%. Based on Table 5, the type of catch per trip is 76,082 kg with the type of catch, namely *Sardinella lemuru* as much as 19,026 kg, *Decapterus* spp. as much as 3,624 kg, *Euthynnus affinis* as much as 53,432 kg.

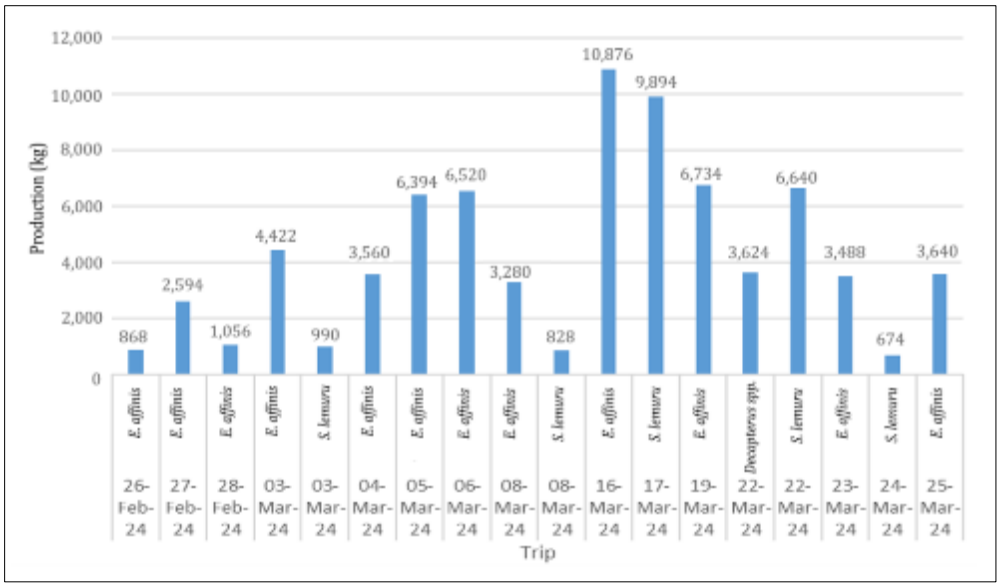

Figure 5 Graph of Catch Results Per Trip

Based on Figure 5. that the catch that dominates is *Euthynnus affinis* with the highest catch on trip 9 with a catch of 10,876 kg, although on trip 14 the catch was 674 kg with the lowest catch.

3.3. Catch Results 1 (one) year

Purse seine fishing operations for 1 year took place in January – December with a total of 71 trips with 1 to 7 trips setting per trip and the total catch was 276,551 kg. The catches can be seen in Table 2 below.

Table 2 Types and catches for 1 (one) year

No	Species	Catch (kg)	Percentage (%)
1	*Sardinella lemuru*	255,345	92
2	*Euthynnus affinis*	21,206	8
	Total	276,551	100

Source: Pengambengan Production Data 2023

Based on Table 2, the catch for 1 (one) year was 276,551 kg with the dominant type of catch, namely *Sardinella lemuru* as much as 255,345 kg and *Euthynnus affinis* as much as 21,206 kg. The percentage of fish caught for 1 (one) year can be seen in Figure 6 below:

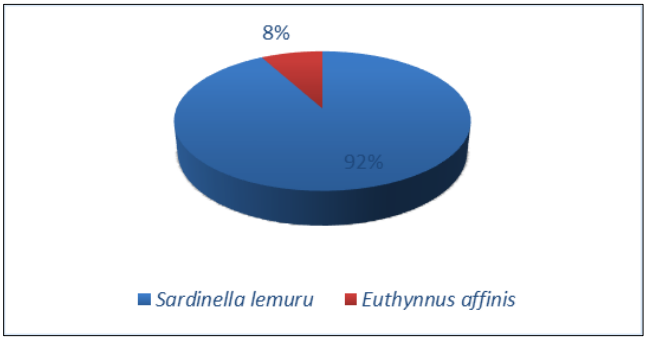

Figure 6 Production Diagram for 2023

Based on Figure 6. the type of catch during the year is dominated by *Sardinella lemuru* as much as 255,345 kg with a percentage of 92%, *Euthynnus affinis* as much as 21,206 kg with a percentage of 8%. The catches in 1 (one) year can be seen in Table 3 and Figure 7 below

Table 3 1 (one) catch in 2023

Period	Production (Kg)
January	21,972
February	14,274
March	18,236
April	12,687
May	30,919
June	31,337
July	35,680
August	51,338
September	22,070
October	22,346
November	7,262
December	8,430

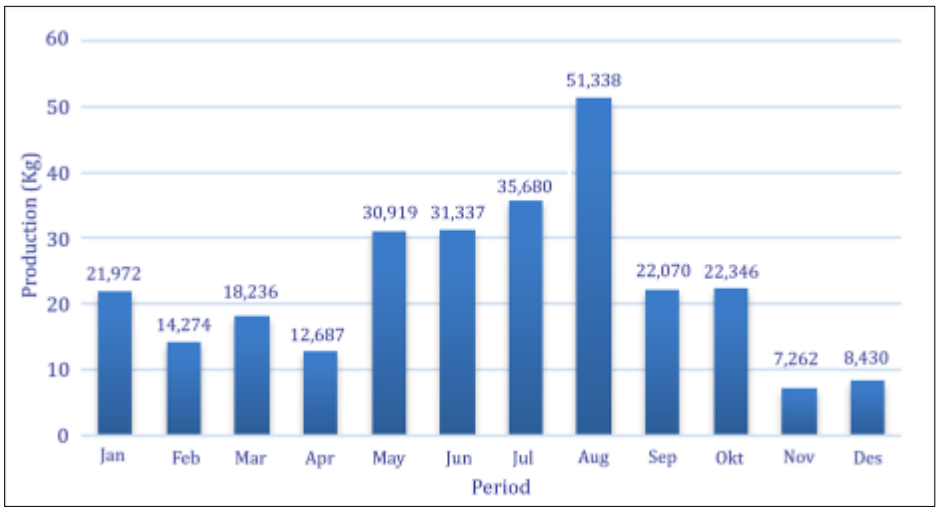

Figure 7 Catch Results Diagram

Based on Figure 7. above, it can be seen that the total catch per year has experienced a very significant increase and decrease. The highest catch was obtained in August, namely 51,338 kg, the highest catch and in November, 7,262 kg, the lowest catch.

3.4. Sale of Pertrip Catch

The total catch in February-March 2024 was 76,082 kg. The composition of the main catch types is: *Sardinella lemuru* as much as 19,026 kg, *Decapterus spp.* as much as 3,624 kg and *Euthynnus affinis* as much as 53,432 kg. Total sales proceeds amounted to IDR 364,735,800.00.

3.5. Sale of Catch for 1 (one) Year

The total catch in January – December 2023 was 255,680 kg. The main types of catch are: *Sardinella lemuru, Decapterus* spp. and *Euthynnus affinis*. The total proceeds from sales of catches for 1 (one) year are IDR 1,594,409,500. For more details, see Table 4 below.

Tabel 4 Sales of catches for 1 year

Period	Production (Kg)	Value (IDR)
January	21,972	122,536,000
February	14,274,00	97,476,000
March	18,236,00	93,700,000
April	12,687,00	73,865,500
May	30,919,00	205,188,000
June	31,337,00	223,064,000
July	35,680,00	123,808,000
August	51,338,00	301,360,000
September	22,070,00	177,705,000
October	22,346,00	95,240,000
November	7,262,00	27,926,000
December	8,430,00	52,541,000
Total	276,551	1,594,409,500

3.6. Economic Aspects

Fishing activities cannot be separated from economic activities, because fishing activities aim to obtain results (costs) received that are greater than the costs incurred [20].

3.6.1. Investment Costs

Based on the results of interviews with ship managers, investment costs are the initial capital that must be spent to start a business. The amount of capital for investment is IDR 1,778,000,000. This capital consists of one purse seine vessel, 6 units of 123 HP engines, one purse seine unit and fishing Fishing Fishing Aids consisting of light vessels, lasers, auxiliary machines in the form of generators, and handy talky. The following are the investment costs incurred which can be seen in Table 5 below

Table 5 Investment Costs

No	Type	Unit	Economic Age	Price/Unit (IDR)	Value (IDR)
1	Boat	2	15 years	500,000,000	1,000,000,000
2	Machine	6	10 years	120,000,000	720,000,000
3	Fishing Gear	1	5 years	30,000,000	30,000,000
4	Fishing Aids	1	3 years	20,000,000	20,000,000
5	Generator engine	1	6 Years	8,000,000	8,000,000
Investment amount					1,778,000,000

3.6.2. Fixed Costs

Fixed costs are costs that do not change even if the amount of production increases or decreases. Fixed costs consist of depreciation costs, maintenance costs which include repairs to ships, engines and fishing equipment. Depreciation costs are obtained from the investment divided by the economic life. Economic life or useful life is the time period over which an asset is used in productive activities. The economic life of each ship is 15 years, engines 10 years and fishing gear 5 years [21]. Maintenance costs are costs incurred for maintenance. The fixed cost components for the purse seine fishing vessel business consist of maintenance and depreciation costs for vessels, fishing gear, engines, navigation equipment, auxiliary equipment and generators. Fixed costs are costs incurred in the production process and their use is not influenced by the number of ups and downs in production levels.

3.6.3. Depreciation Expenses

According to [22], depreciation or depreciation in accounting is the systematic allocation of the depreciable amount of an asset over its useful life. The calculation used to calculate the depreciation value is based on the straight-line method ~~(Straight Line Metode)~~ namely the calculation of purchase costs per investment unit minus the residual value divided by the economic life of each investment unit multiplied by the number of trips per year, namely 71 trips. To make it clearer, the details of depreciation costs can be seen in Table 11 below:

To calculate depreciation costs, use the following formula:

$$\mathbf{D} = \frac{\mathbf{NB} - \mathbf{NS}}{\mathbf{T}}$$

Where:

- D = Depreciation/Shrinkage
- NB = Unit Value of an Item
- NS = Residual Value of the Unit (10%)
- T = Economic Age

Table 6 Depreciation Costs

Depreciation (depreciation)						
		(a)	**(b)**	**(c)**	**(d)**	**(and)**
No	**Type**	**Price/unit (IDR)**	**Residual value (10%) (IDR)**	**(th)**	**Trip**	**(e = a-b/c*) (IDR)**
1	Boat	1,000,000,000	100,000,000	15	71	60,000,000
2	Machine	720,000,000	72,000,000	10	71	64,800,000
3	Fishing gear	30,000,000	3,000,000	5	71	5,400,000
4	Fishing Aids	20,000,000	2,000,000	3	71	6,000,000
5	Generator engine	8,000,000	800,000	6	71	1,200,000
Amount						**137,400,000**

Based on Table 6. above, the depreciation costs incurred by FV. Intan Istanbul during the investment issued is IDR 137,400,000.

3.6.4. Maintenance Costs

Maintenance costs are included in the fixed costs that must be paid by the ship owner even though the ship is not operating. Maintenance of an item is needed so that the quality of the item is maintained. Maintenance costs can be seen in Table 7 below:

Table 7 Maintenance Costs

Maintenance				
		a	**b**	**C = a*b**
No	**Types of Maintenance**	**Cost/month (IDR)**	**Number of months**	**Cost/year (IDR)**
1	Boat	7,000,000	11	77,000,000
2	Machine	5,000,000	11	55,000,000
3	Fishing gear	2,700,000	11	29,700,000
4	Fishing Aids	1,500,000	11	16,500,000
5	Generator engine	500,000	11	5,500,000
Total fixed costs		16,700,000		183,700,000

Based on Table 7 above, the total maintenance costs incurred per month during moonlight are IDR 16,700,000, while the maintenance costs for 1 (one) year of fishing are IDR 183,700,000.

3.6.5. Licensing Costs

Based on Republic of Indonesia Government Regulation no. 85 of 2021 concerning types and rates for types of Non-tax revenue (PNBP) that apply to the Ministry of Maritime Affairs and Fisheries (KKP)**.** In this regulation, licensing rates for fishing businesses. The PNBP and Business License for Trade and Services (SIUP) rates are IDR 42,000,000 for one year.

3.6.6. Variable Costs

Variable costs *(Variable Cost)*, are costs whose size is directly related to the amount of production, where the size is determined by the amount of production.

3.6.7. Operating costs

These costs consist of fuel requirements, ice blocks, gallons of water, and others. In summary, it can be seen in Table 8 which represents the average operational costs per trip.

Table 8 Operational Costs

a. Operating costs						
No	**Description**	**Volume**	**Unit**	**Price (IDR)**	**Amount / Trip (IDR)**	**Number/Year (71 Trips) (IDR)**
1	Fuel oil	450	Liter	6,800	3,060,000	217,260,000
2	Liquid oil	5	Liter	35,000	175,000	12,425,000
3	Fresh water	2	ton	3,000	6,000	426,000
4	Mineral water	6	Large bottle	5,000	30,000	2,130,000
5	Ice block	50	block	14,000	700,000	49,700,000
6	Gasoline	5	liter	10,000	50,000	3,550,000
Amount					4,021,000	285,491,000

Based on the table 8 above, the total variable costs are IDR 4,021,000 per trip. Meanwhile, the total variable costs for 71 trips are IDR 285,491,000.

3.7. Crew wages

Profit sharing for crew members is applied without any binding agreement or agreement. The distribution depends on the results obtained during fishing. For the ship owner 50% of the net production proceeds, Stage Master 20%, engineer 15%, crew (30 people). The following is the salary distribution from January – December 2023 which can be seen in Table 9 below:

Table 9 Crew wages

Description	Value (IDR)
Gross results	1,594,409,500
Net results (production results - operating costs)	1,308,918,500
Ship owner (50% of net proceeds)	654,459,250
Skipper (20% of the ship owner's share)	130,891,850
Engineer (15% of the results shared by the Skipper)	78,535,110
Crew (1 person)	14,834,409.67

3.8. Tax Fees

Based on Government Regulation Number 85 of 2021 concerning types and rates for types of Non-Tax Revenue (PNBP) that apply to the Ministry of Maritime Affairs and Fisheries (KKP). Tax fees include ship mooring fees and docking pool cleaning fees. In Pengambengan Value Added Tax (PPN) for ships measuring more than 5 to 30 GT, a fee of IDR 500.00 per ¼ etmal (6 hours) is charged. FV. Intan Istambul has an LOA of 20.72 m with a total mooring time of 271 meters in the period January to December 2023, so the total mooring costs incurred for 1 (one) year is IDR 701,890. Meanwhile, the pool cleaning fee at PPN Pengamben for ships of more than 5 GT is charged at IDR 100.00 per ¼ etmal (6 hours). A 30 GT ship with a total time of 141 meters, so the total pool cleaning costs incurred for 1 (one) year is IDR 423,000.

3.8.1. Fishery Product Levy Costs

Based on Jembrana Regency Regional Regulation No. 14 of 2011 concerning Business Services Retribution which was included to provide legal certainty for the use of fish auction and weighing services as well as ensuring fish production data landed by fishermen at fish landing centers. Where every use of the service is subject to a mandatory 2% retribution (1% for fishermen and 1% for buyers) of the production value of fish at auction or weighed at TPI. Fishery Product Levy Fees can be seen in the table 10 below:

Table 10 Costs of Fishery Product Levy

Post-production withdrawal	production/year (IDR)	Informations
30 GT fishing vessel	1,594,409,500	IDR 1% x fish production value when landed
Total Fishery Incoming tax (PHP)	15,944,095	

Based on Table 10 above, the total Fishery Income tax (PHP) issued for the total tax value for 71 trips is IDR 15,944,095.

3.9. Financial Analysis

The financial analysis used is five methods. This method is Loss/Profit Analysis (R/L), *Benefit Cost Ratio (B/C Ratio)*, *Break Even Point (BEP)*, *Payback Period (PP),* And *Return of Invesment (ROI).* The following is a short-term analysis which can be seen in the table 11 below:

Table 11 Short term analysis

NO	Information	Value (IDR)
1	Investment	
	Boat	1,000,000,000.00
	Machine	720,000,000.00
	Fishing Gear	30,000,000.00
	Fishing Aids	20,000,000.00
	Generator engine	8,000,000.00
	Investment Amount	1,778,000,000.00
2	Fixed Costs	
A	Shrinkage	
	Boat	60,000,000.00
	Machine	64,800,000.00
	Fishing gear	5,400,000.00
	Fishing aids	6,000,000.00
	Generator engine	1,200,000.00
	Amount of Depreciation Expenses	137,400,000.00
B	Maintenance	
	Boat	77,000,000.00
	Machine	55,000,000.00
	Fishing gear	29,700,000.00
	Fishing aids	16,500,000.00
	Generator engine	5,500,000.00
	Total Maintenance Costs	183,700,000.00
C	SIUP fees	42,000.00
	Fixed Cost Amount	321,142,000.00
3	Variable Costs	
A	Operating costs	
	Description	Route/Year (71 Trips)
	Subsidized fuel	217,260,000.00
	Liquid oil	12,425,000.00
	Freshwater	426,000.00
	Gallon water	2,130,000.00
	Block ice	49,700,000.00
	Gasoline	3,550,000.00
	Total operational costs	285,491,000.00
B	Crew wages	654,459,250.00

C	PHP Fees	15,944,095.00
D	Ship mooring costs	701,890.00
E	Pool cleaning fees	423,000.00
	The amount of costs is not fixed	957,019,235.00
	Total Cost Amount	1,278,161,235.00
4	Reception	1,594,409,500.00
	Production/Year (Kg)	276,551.00
	Selling price per unit (IDR 000/Kg)	5,76,34
	Variable Cost per unit	3,460,55
5	Profit	316,248,265,00
6	Revenue cost ratio (R/C)	1,25
7	Return Of Investment (ROI)	18%
8	Payback Period (PP)	5,62
9	BEP based on units (Kg)	139,337,15
10	BEP Based on value (IDR 000)	803,325,503,64

3.10. Profit and Loss Analysis

Profit is the amount of revenue after deducting the costs incurred for the production process, both fixed and variable.

- π = Total Revenue (TR) – Total Cost (TC)
- = IDR 1,594,409,500 – IDR 1,278,161,235
- = IDR 316,248,265

Where
- p = Profit/loss
- TR = Total Sales/income
- TC = Total Cost

Profit analysis aims to determine the input and output components involved in the business and the amount of profit obtained from the business [23]. The criteria for profit are:

- If TR > TC, business activities make a profit
- If TR < TC, business activities do not make a profit
    - If TR = TC, the business activity is at the break-even point or the business does not gain or make a loss

Based on the criteria above TR > TC, purse seine profits reach IDR 316,248,265 in 1 year.

3.11. Revenue Cost Ratio

This analysis aims to find out to what extent each rupiah value of costs used in business activities can provide a certain amount of revenue as a benefit. Income and cost analysis (R/C Ratio) is a comparison between the level of gross income obtained and the total costs incurred. According to [24].

$$\frac{R}{C}\ \text{Ratio} = \frac{\text{Sales}}{\text{Total Cost}}$$

$$\frac{\text{IDR } 1{,}594{,}409{,}500}{\text{IDR } 1{,}278{,}161{,}235} = 1.25$$

- If R/C > 1, the business activity makes a profit
- If R/C < 1, business activities are approaching losses
- If R/C = 1, business activities do not make a profit/loss

Based on Above On effort *purse his*, R/C = 1.25 means it is greater than 1, meaning this business is worth pursuing.

3.12. Return On Investment (ROI)

ROI is carried out to determine the amount of profit obtained compared to the amount of investment invested.

$$\text{ROI} = \frac{\text{Profit X } 100\%}{\text{Investment}}$$

$$\frac{\text{IDR } 316{,}248{,}265}{\text{IDR } 1{,}778{,}000{,}000}$$

ROI = 18%

With criteria

> 25% : Good

15 – 25% : Quite good

5 – 15% : Pretty bad

< 5% : Bad

The calculation above shows the *Return On Investment* (ROI) value of 18%, which means that the percentage of profit value obtained from the amount of capital invested in a period of 1 year is 18%, the business is included in the quite good category and is feasible to run.

3.13. Break Even Point (BEP)

Break Even Point (BEP) or break-even point is a situation where a business is in a position of not making a profit and not experiencing a loss [24].

$$\text{BEP (kg)} = \frac{\text{FC}}{\text{P} - \text{V}}$$

$$\text{BEP (kg)} = \frac{321.142.000{,}00}{5{,}763.34 - 3{,}459.81}$$

$$= 139{,}337.15 \text{ Kg}$$

Information

- FC= Fixed Costs
- P= Selling Price
- V= Variable Price Per Unit

The value of the BEP unit is 139,337.15 kg, which means the business can reach the break-even point when fish production is 139,337.15 kg. Meanwhile, the total fish production was 276,551.00 kg, which is greater than 139,337.15 kg, which means this business is feasible to run.

$$\text{BEP (Rp)} = \frac{\text{FC}}{\frac{1 - \text{P}}{\text{V}}}$$

$$\text{BEP (Rp)} = \frac{321.142.000,00}{\frac{1 - 5.765,34}{3.459,81}}$$

$$= 803,325,503,64$$

The BEP price value is IDR 803,325,503.64, which means the business will reach the break-even point when sales reach the price of IDR 803,325,503.64, while total sales are IDR 1,594,409,500.00, which means this business is worth running.

3.14. Payback Period (PP)

Method *Payback Period* (PP) is a technique for assessing the return period (period) of investment in a project or business.

$$PP = \frac{\text{Investment x 1 year}}{\text{Profit}}$$

$$\text{PP} = \frac{\text{IDR 1,778,000,000}}{\text{IDR 316.248.265}} \text{x 1 year}$$

- PP = 5.62 x 12 months
- PP = 67.4 months
- PP = 5 years 7 months 12 days

So, the time needed to return investment capital is 5 years 7 months 12 days.

4. Conclusion

Composition of catch at FV. Intan Istanbul, which the author followed during the research, lasted for 15 trips, 1-7 times setting per trip and the total catch for 15 trips was 76,082 kg. type of catch, namely *Sardinella lemuru* as much as 19,026 kg with a percentage of 25%, *Decapterus* spp. as much as 3,624 Kg with a percentage of 5%, *Euthynnus affinis* as much as 53,432 kg with a percentage of 70%.

Calculation of business feasibility analysis on FV. Intan Istanbul shows value PP is 67.4 months, which means it will take 5 years 7 months 12 days to return the investment capital. The business is worth running even if it falls into the category of slow capital returns. In the BEP criteria, the BEP price value is IDR 803,325,503.64, which means the business will reach the break-even point when sales reach the price of IDR 803,325,503.64. Meanwhile, total sales amounted to IDR 1,594,409,500. The value of the BEP unit is 139,337.15 kg, which means the business can reach the break-even point when fish production is 139,337.15 kg. Meanwhile, total fish production was 276,551.00 kg, which was greater than 139,337.15 kg. Likewise, for the B/C Ratio value, R/C = 1.25, meaning it is greater than 1. For the ROI value of 18%, the business is included in the quite good category and is feasible to run.

Compliance with ethical standards

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Disclosure of conflict of interest

No conflict of interest to be disclose

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