



Business feasibility analysis of purse seine at Fish Auction Place (Tempat Pelelangan Ikan/TPI) Kranji, Lamongan

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ABSTRACT

Lamongan Regency is one of the districts in East Java which have high potential of fishery resources. Purpose of this study is to determine the business feasibility of purse seine fishing gear at TPI Kranji, Lamongan. The data collection technique was carried out by field observations and in-depth interviews. Methods of data analysis with financial analysis using Net Present Value (NPV), Payback Period (PP), and Benefit Cost Ratio (B/C Ratio) methods. Analysis results shows that the purse seine business at TPI Kranji was financially feasible according to the NPV value at the 5th year of IDR 1,890,298,600. The purse seine business at TPI Kranji also can return the initial investment costs in a period of 1 year based on the PP calculation and the B/C Ratio value is obtained 22.49 so it is classified as financially feasible. It is recommended that fishing business using purse seines at TPI Kranji is not only an effort to get the maximum profit, but also to maintain the sustainability of fisheries in a sustainable manner.

Keywords: purse seine, bussiness feasibility, TPI Kranji.

INTRODUCTION

Lamongan Regency is one of the districts in East Java Province which is located 7.12°S and 112.42°E. The total area is approximately 1,812.8 km², about 3.78% of the total area of East Java. Lamongan have a coastline of 47 km and sea area of 902.4 km², including an area of 12 miles from the coastline. Kranji Village is located in Paciran District, Lamongan Regency, East Java Province. The majority of Kranji people work as fisher, approximately 730 people from the 6,417 population of Kranji Village [1].

The potential of fishery resources in Kranji Lamongan village is relatively high, and also the capture fisheries activities. The Fish Auction Place (*Tempat Pelelangan Ikan*, TPI) Kranji is under the auspices of the Lamongan Regency Fisheries Service. TPI Kranji is the largest TPI in the Lamongan area after TPI Brondong. TPI Kranji has good quality fish catches and is still fresh because the fish produced from catching purse seine is immediately sold. Purse seine is the majority of fishing gear used in Kranji.

Purse seine is an effective fishing tool for catching pelagic fish that live in groups. This fishing gear is rectangular and is equipped with a cone rope tied to the net's bottom and crimped through the ring. Purse seine operations are carried out by circling the school of fish to form a large wall which is then pulled from the bottom of the net to form a pond [2].

The operational management of purse seine fishers depends on production factors include labour, fuel, boats, fishing gear and supplies for fishers while at sea, and fishermen's ability to operate the fishing gear. The use

of production factors properly can increase efficiency besides increase fishermen's catch and income [3]. Management is needed in capture fisheries as one of the uses of marine resources that rely on marine services.

The operational management is the most critical component in a fishing unit including the purse seine fisheries business. The most important components include the procurement of investment, fixed costs to support fishing activities, and variable costs to support fishing activities and others. This management is critical because it will significantly affect the fishing unit's profit or loss using the purse seine. The business feasibility analysis is used to provide direction for a production process in capture fisheries management [4]. Hence, the aim of this study was to analyzing the feasibility of marine capture fisheries business using purse seine in TPI Kranji. It is important because it will affect the purse seine fisher's economy in the Kranji.

METHODS

The study is carried out for two months, starting from 19 August to 19 October 2020 at the TPI Kranji, Lamongan Regency, East Java (Figure-1). The data collection technique was carried out by field observations and in-depth interviews.

The analysis used for the feasibility of the TPI Kranji Lamongan purse seine business is by calculating the Net Present Value (NPV), Payback Period (PP), and Benefit Cost Ratio (B/C). NPV is calculated based on the difference between benefits and costs plus investment, which is calculated using the Equation (1) [5-7].



Figure-1. Research location maps

$$NPV = \sum \frac{B_t - C_t}{(1-i)^t} \quad (1)$$

where B_t is net revenues in year t , C_t is cost in year t , i is discount rate (4%), and t is number of time periods (year). If the NPV of an investment or business is positive, it means that the discounted present value of all future cash flows related to the investment will be positive, and therefore attractive.

The payback period (PP) is a calculation of time for the initial investment to return (Equation (2)) [5-7]. The shorter the payback, the more desirable the investment. On the contrary, the longer the payback, the less desirable it is.

$$PP = \frac{\text{cost of the investment}}{\text{average annual cash flow}} \quad (2)$$

To determine whether a business is experiencing a profit or loss and whether or not a business is feasible to continue, it can be seen by B/C value which calculated by comparing the gross income (GI) and total cost (TC) (Equation (3)) [5-7]. Decision making criteria is as follows: net $B/C > 1$ a feasible investment because it provides benefits and net $B/C < 1$ investments are not feasible.

$$B/C = \frac{GI}{TC} \quad (3)$$

RESULTS AND DISCUSSIONS

Investment Costs

Investment business feasibility is the use of sources expected to provide profitable returns in the future [8,9]. This research uses real investment types. The real investment is an investment made in a fixed cost [8], such as ship or engines in the fisheries business. The fixed costs components incurred by purse sein fishers are ship, engines, fishing gear, *bohlam* lamp (lights bulb), *gardans*, generators, and mercury lamp with the average cost incurred is IDR 1,774,750,000 (Table-1). Ship investment costs are the largest costs. Based on the interview's result, according to Mudjiono, a fisher at Kranji Village, a teak wood boat's price in 2020 reach IDR 900,000,000. Teak wood boat is durable and good quality, so the price is also high.

Mercury lamp also has high investment cost. This lamp used by fishers of the Kranji to fish at night. The fish will cluster under the mercury light, and the purse sein will

be operated if the fish are already clustered. The price of this lamp reaches IDR 113,000,000. Only 2-3 people have mercury lamps in Kranji because the price is quite high. This investment cost is a major factor in conducting a business as a means of the production process to obtain future profits in a business that is expected to achieve maximum profits with minimal cost expenditures.

Fixed Costs

Fixed costs include depreciation costs and maintenance costs. Maintenance costs include the costs of maintenance of ships, machines, nets, and business fees for purse sein fishing gear. The depreciation costs include depreciation on ships, engines, fishing gear, light bulb, mercury lamp, generator and *gardan*. The ship maintenance costs incurred for the purse sein fishing gear business are IDR 149,123,700 (Table-2). Ship maintenance costs within one year, namely IDR 15,600,000, including painting the ship, changing wood due to brittle wood, and enlarging/expanding the hold (storage area). They usually change or sharpen the colour of ship every three months when the ship is already dull in colour.

Meanwhile, for machine maintenance within one year, the costs incurred are IDR 12,960,000. Maintenance costs on the machine include replacing damaged parts and others. For maintenance costs on the net, the total cost incurred is IDR 81,600,000. Net maintenance costs incurred because damage to the nets due to environmental factors such as the nets getting caught in the payang fishing gear. If this happens, fishers need to provide new nets. Usually, fishers also embroider the net with holes caused by the big fish that are caught. The retribution fees incurred on the purse sein fishing gear business is 2.5% of capture fisheries production according to the TPI Kranji regulations. The retribution cost that must be incurred by purse sein fishing gear operators within one year is IDR 38,963,700.

Table-1. Investment costs of purse sein fishery business at TPI Kranji

Components	Maximal value	Minimal value	Average value	Economic life (year)
	(IDR 000)			
Ship	900,000	820,000	860,000	25
Machine	524,000	314,000	419,000	10
Catching tools	400,000	300,000	350,000	10
Lamp	12,000	7,500	9,750	5
Gardan	30,000	25,000	27,500	10
Generator	2,500	1,500	2,000	10
Mercury lamp	113,000	100,000	106,500	3
Total	1,981,500	1,568,000	1,774,750	

Table-2. Fixed costs of purse sein fishery business at TPI Kranji

Components	Economic life	Costs (IDR)
Maintenance of ship	1 year	15,600,000
Maintenance of machine	1 year	12,960,000
Maintenance of net	1 year	81,600,000
Retribution fee	1 year	38,963,700
Total		149,123,700

Table-3. Variable costs (IDR) of purse seine fishery business at TPI Kranji

Components	Unit	Number	Costs/unit	Total costs/trip	Total costs/year
Solar	Litre	150	7,000	1,050,000	327,600,000
Ice	Block	10	13,000	130,000	40,560,000
Water	Gallon	4	4,000	16,000	4,992,000
Labor wages	People	20	150,000	3,000,000	936,000,000
Total variable costs					1,309,152,000

Variable /Operational Costs

Variable or operational cost is a cost which total amount will change in proportion to the change in activities volume. This cost includes the operational costs of the purse fishing gear business, including diesel, ice blocks, gallons of water, and labour wages (Table-3). The purse seine business's operational costs in one trip are IDR 4,196,000. The fuel which required 150 litres of diesel (the fishing operation in the Kranji area is quite far, approximately 500 miles from the mainland), with the cost of diesel per litre is IDR 7,000, then the total cost of diesel per trip is IDR 1,050,000.

Furthermore, ten blocks of ice are needed, the price of 1 block of ice is IDR 13,000, so the cost for ice blocks are IDR 130,000. Purse seine fishers need this ice block to maintain the fish's freshness when it stored in the hold. The gallon of water, which is the consumption of fisher, needed per trip is 4 gallons, the price of 1 gallon is IDR 4,000, then the cost per trip is IDR 16,000. Besides, each trip's labour wage is IDR 150,000 and each trip earn IDR 3,000,000. The total cost incurred by the purse seine business vessel for one year is IDR 1,309,152,000 (Table-3).

Profit

Profit is the excess obtained from all revenue or net income minus all expenses incurred in running a business or production [10]. In fisheries business, profit is the difference between the production result's value and the total cost of production incurred. The purse seine fisher business's profit in TPI Kranji is obtained from the income of fish sales minus the total of the costs incurred. The profit obtained by the purse seine fishing business at TPI Kranji is IDR 5,410,024,300 (Table-4).

Table-4. Profit of purse seine fishery business at TPI Kranji

Components	Value (IDR)
Fixed cost	300,823,700
Variable cost	1,309,152,000
Total cost	1,609,975,700
Income	7,020,000,000
The advantage	5,410,024,300

Business Feasibility Analysis

Net Present Value (NPV)

Based on the NPV calculation, the value of money received during five years investment period and the interest rate 4% in the TPI Kranji purse seine business is IDR 1,890,298,600. From this value, it is stated that the purse seine business at TPI Kranji Lamongan is classified as feasible business. The NPV calculation has advantages such as calculating the time value of money and calculating the residual value of the business. While the

weakness is it must be able to estimate the level of relevant capital costs during the economic life of the business, and the degree of business feasibility is influenced by cash flow and the economic life of the business.

Payback Period (PP)

This analysis is to calculate the investment costs that must be spent in year t . The PP calculation analysis result shows that the return on investment of the purse seine business in TPI Kranji is within one year. Based on the criteria of the PP, it states that the faster the return on investment, the business is feasible to run.

B/C Ratio

The average B/C ratio value in the purse seine business is 22.49. This value is obtained from the calculation of income divided by working capital for one year. The B/C ratio value in the purse seine business at TPI Kranji shows that the business is feasible to continue because the B/C value > 1 .

Prediction of NPV, PP, and B/C Ratio Values in 2021

Based on the calculation of Net Present Value, Payback Period, and B/C ratio in 2020, the purse seine business is stated feasible with NPV value of IDR 1,890,298,600, while the PP value is 1 year for the return on investment costs, and B/C ratio of 22.5. From these results, it can be predicted in 2021 by adding as much as 5% in each detail of fixed costs, variable costs, and income, which results in an NPV value of IDR 2,448,784,800 which show that in 2021 the purse seine business is still financially feasible. The business value increases by 5% compared to 2020. The PP value indicates that the return on capital is within one year. Moreover, B/C ratio with a value of 23.74, which also shows that the purse seine business in 2021 is financially feasible.

CONCLUSIONS

The result of the study shows that the purse seine business at TPI Kranji include to the financially feasible business according to the NPV value of IDR 1,890,298,600 at the 5th year is obtained. From this value, it is stated that the purse seine business at TPI Kranji is worth running. Whereas in the Payback Period calculation, the result is 1, which explains that this purse seine business can return the initial investment costs in 1 year. It also proves that the purse seine business was financially feasible. The B/C ratio value is also calculated and the value is obtained 22.49. The B/C ratio criteria state that if the B/C ratio value is more than one, the business is classified as financially feasible.

Furthermore, fishing business using purse seine at TPI Kranji is not only an effort made to get the maximum

profit, but is also directed at maintaining the sustainability of fisheries in a sustainable manner, for example by reducing the impact of fisheries gradually through avoiding by-catch, involving the fisheries sector in alternative activities such as ecotourism, and reducing marine debris.

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