

# ANALYSIS OF THE FINANCIAL FEASIBILITY OF RAISING VANAME SHRIMP (*Litopenaeus vannamei*) INTENSIVE SYSTEM IN POKDAKAN MINA JAYA TAMIANG DAGANG SETIA VILLAGE MANYAK PAYED DISTRICT TAMIANG ACEH DISTRICT

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## *Abstract*

An intensive system of cultivating Vaname Shrimp requires more significant costs than traditional systems. With high stocking densities, intensive name shrimp cultivation can produce high shrimp production. So, with this reality, the intensive system of vaname shrimp cultivation can be implemented by the community, especially the community in Aceh Tamiang Regency. This research was conducted in Pokdakan Mina Jaya Tamiang, Dagang Setia Village, Manyak Payed District, Aceh Tamiang Regency. The study aims to determine the financial feasibility of growing name shrimp in Pokdakan Mina Jaya Tamiang, Dagang Setia Village, Manyak Payed District, Aceh Tamiang Regency. This research uses a case study and is analyzed descriptively and quantitatively. Determination of the sample using a purposive sampling technique. The analysis calculated is Net Present Value (NPV), Net B/C Ratio, Internal Rate Return (IRR), and Break Event point (BEP). The research results show that the NPV obtained was 3,463,203,7,05 greater than 0; The IRR received was 67.37% greater than the interest rate, namely 10.5%; The Net B/C ratio obtained was 2.72, greater than 1; Production BEP is 38,490 kg; And the BEP price is IDR 37,615. So, it can be concluded that the Intensive System Vaname Shrimp (*Litopenaeus vannamei*) rearing business in Pokdakan Pond Mina Jaya Tamiang is profitable and feasible.

Keywords: *Vaname Shrimp; Financial Feasibility; Intensive Farming*

## INTRODUCTION

Shrimp cultivation has high economic value and development prospects in society, which is indicated by the increasing number of community cultivation activities and consumer demand, both from the public and exports, which continues to increase. According to Martini (2017), shrimp cultivation in Indonesia focuses more on vaname shrimp (*Litopenaeus vannamei*). This is because name shrimp have faster growth, shorter cultivation periods, are more resistant to disease and environmental changes, and more efficient feed conversion rate than tiger shrimp (*Penaeus monodon*). The development of a name shrimp cultivation is increasingly rapidly replacing tiger shrimp cultivation.

Pond cultivation is an economic activity that utilizes coastal resources using pond media. Pond cultivation can be carried out in almost all parts of Indonesia in coastal areas. This activity is expected to improve the welfare of

coastal farmers and fishermen, increase the country's foreign exchange, and reduce dependence on capture fisheries production, which is experiencing stagnation. The potential for pond cultivation can be seen from the pond land area in Indonesia, which continues to increase (KKP, 2018).

Mina Jaya Tamiang's Pokdakan Pond implements an intensive system of shrimp cultivation. Intensive system shrimp farming requires more significant costs compared to extensive system cultivation. Intensive system cultivation uses more production inputs. One of the characteristics of an intensive cultivation system is high stocking density (Maulana et al., 2022). Mina Jaya Ponds initially implemented a traditional cultivation system where management depended on the generosity of nature. The conventional approach is simple, so control is not complicated, but the Production is low. The stocking density of Pokdakan Mina Jaya's name shrimp in the traditional shrimp farming system is only around eight individuals/m<sup>2</sup>. After using intensive technology with the assistance of the Ministry of Maritime Affairs and Fisheries, the stocking density can reach approximately 100 individuals/m<sup>2</sup>.

Manyak Paid subdistrict is one of the vaname shrimp producers in the Aceh Tamiang district. However, the cultivation that is widely applied by the community is shrimp cultivation using the traditional system. Many are still unfamiliar with intensive cultivation systems, which bring more significant profits than conventional systems.

Based on the description above, this research aims to determine the level of financial feasibility of rearing vaname shrimp using an intensive system in Pokdakan Mina Jaya Tamiang, Dagang Setia Village, Manyak Payed District, Aceh Tamiang Regency.

## **RESEARCH METHODS**

### **Time and Location of Research**

This research was conducted in Pokdakan Mina Jaya Tamiang, Dagang Setia Village, Manyak Payed District, Aceh Tamiang Regency, in January 2023. The location selection was carried out deliberately (Purposive sampling).

### **Data Types and Sources**

This research uses a case study method and is analyzed quantitatively and descriptively. The data type used is primary data obtained directly through interviews and secondary data from literature and other references related to this research. The sampling technique in this research was carried out deliberately (purposive sampling). The purposive sampling technique gradually determines research samples based on specific considerations (Antara in Sugaepi, 2013). The model in this research is Mr. Tajriansyah, chairman of Pokdakan Mina Jaya Tamiang, who knows more and has information related to the group, and a technician who works on the pond with the consideration that he has the data needed in this research.

### **Data analysis**

The data analysis method used in this research is:

**a. Production cost**

Production costs are the sum of fixed and variable costs (Chusnul in Lesmana et al 2021).

$$TC = FC + VC$$

Where:

TC = Total Cost (Rp/year)

FC = Fixed Cost (Rp/year)

VC = Variable Cost (Variable Cost)(Rp/year)

**b. Reception**

A quantity measures the sales price revenue multiplied by a business's Production (Budiman in Lesmana et al., 2021).

$$TR = P \times Q$$

Where:

TR (Total Revenue) = Reception (Rp/year)

P (Price) = Price Sell (Rp/year)

Q (Quantity) = Production amount (Kg/year)

**c. Profit**

Profit is the result of reducing revenue costs (TR) and production costs (TC) in a business unit (Primyastanto, 2016).

$$\Pi = TR - TC$$

Where:

$\Pi$  (Profit) = Profit (Rp/year)

TR = Revenue (Rp/year)

TC = Production Cost (Rp/year)

**d. Net B/C ratio**

The net B/C ratio compares the positive net present value with the negative net current worth (Gittenger in Latifah et al. 2009).

$$\text{Net B/C} = \frac{PV+}{PV-}$$

Where :

1. Net B/C > 1, meaning the business is feasible to run
2. Net B/C = 1, meaning that the business being run is at the break-even point
3. Net B/C < 1, meaning the business being run is not feasible

**e. NPV (Net Present Value)**

Net Present Value (NPV) is the difference between the present value of incoming cash flows and the current value of outgoing cash flows in a specific period (Ariadi et al., 2019).

$$NPV = \frac{Bt - Ct}{(1+i)^t}$$

Where:

Bt = Benefit for year t

Ct = Cost for year t

i = Discount Rate

T = Year

Criteria:

1. If NPV > 0, then the business is worth doing

2. If  $NPV < 0$ , then the business is not worth doing
3. If  $NPV = 0$ , then the business is in a BEP state

**f. IRR (Internal Rate Of Return)**

IRR is also an analytical method for assessing the internal rate of return based on the NPV value and applicable interest rates (Primyastanto, 2016).

$$IRR = i1 + i2 \frac{NPV1}{NPV1 - NPV2}$$

Where :

IRR = Internal Rate Of Return

i1 = The interest rate that produces the smallest negative NPV

i2 = Interest rate that produces the smallest positive NPV

NPV1 = Present value using i1

NPV2 = Present value using i2

With Criteria: If the IRR exceeds the applicable interest rate, the business is worth pursuing. The company is not worth pursuing if the IRR is smaller than the applicable interest rate.

**g. BEP (Break Event Point)**

Break Event points are divided into two types, namely Rupiah BEP and Unit BEP, which can be calculated using the formula (Pulungan in Lesmana et al. 2021).

$$BEP \text{ Price} = \frac{\text{Total Cost Production}}{\text{Total Production}}$$

$$BEP \text{ Production} = \frac{\text{Total Cost Production}}{\text{Sell Price}}$$

With Criteria: Business is feasible if  $\text{Production} > \text{BEP production}$ . Business is possible if the selling price  $>$  the BEP price.

## RESULTS AND DISCUSSION

### Production cost

#### Investment Costs

The investment costs incurred by Pokdakan Mina Jaya Tamiang in the intensive system of vaname shrimp cultivation were IDR. 2,009,310,000. The first largest cost incurred is the cost of intensive pool construction, amounting to Rp. 1,600,000,000, with eight pools, each with an area of 2,000 m<sup>2</sup> – 3000 m<sup>2</sup>. The second biggest cost is purchasing a generator engine worth Rp. 25,000,000, the cost of building a warehouse and mess is IDR. 10,000,000, the cost of purchasing the windmill is Rp. Two hundred eighty-eight million with 48 waterwheels, and the cost of purchasing a water pump is IDR 40,000,000 with four pumps. The generator engine rotates the waterwheel in the event of a power outage. The warehouse is a storage place for cultivation tools and shrimp feed. The wheel is used for aeration in the pond and is rotated for 1×24 hours. Water pumps are used to pump water from rivers to enter ponds. The third highest cost is equipment for name shrimp cultivation activities, such as robin machines, paralon pipes, nets, scales, anchos, feed buckets, and hoses. The total cost is IDR. 17,560,000.

#### Fixed cost

The fixed costs incurred by Pokdakan Mina Jaya Tamiang in rearing

vaname shrimp are IDR 284,726,250/year. The components that are fixed costs in this research are land rent of IDR 80,000,000/year; depreciation costs amounting to IDR 157,526,250/year; technician salary of IDR 43,200,000/year; and maintenance costs of IDR 4,000,000/year.

### Variable Costs

The variable costs incurred by Pokdakan Mina Jaya Tamiang for growing vaname shrimp are IDR 1,844,069,000/year. The component that is a variable cost in this research is the cost of fry of IDR. 199,760,000/year; feed costs Rp. 1,269,509,000/year; electricity costs IDR. 224,400,000/year; the cost of medicine and vitamins is IDR. 3,200,000/year; the cost of lime is IDR. 27,200,000/year; and a technician bonus of IDR 120,000,000/year for two people. Table 1 above shows the fixed costs incurred, namely IDR 284,726,250. The variable expenses incurred are IDR. 1,844,069,000. Then, you can find out the total production costs by adding up the fixed and variable costs, which are as big as IDR. 2,128,795,250/year.

### Reception

Revenue is obtained from partial harvest 1, partial 2, partial 3, partial 4, and total harvest. Partial harvest is a method of harvesting some of the shrimp in a pond; this is done to reduce the density of shrimp in the pond. The revenue generated by the Mina Jaya Tamiang pokdakan in one year is IDR. 3,590,916,810. The biomass or weight of shrimp harvested during two cycles is 56,595 kg. Revenue is obtained from the selling price multiplied by the shrimp biomass (kg). The selling price of vaname shrimp per kilo always varies depending on how many shrimp are in one kilo.

### Profit

The profit generated by Pokdakan Mina Jaya Tamiang from the difference between total revenue and total Production is IDR 1,462,121,560 / year. The profits generated from the intensive vaname shrimp cultivation business in Pokdakan Mina Jaya Tamiang indicate that this business can be feasible.

Table 1 Total Production Costs for Raising Vaname Shrimp in Pokdakan Mina Jaya Tamiang

No	Description	Total Fees (Rp/Year)
1.	Fixed cost	284,726,250
2.	Variable Costs	1,844,069,000
	<b>Total</b>	<b>2,128,795,250</b>

Source: Primary Data processed in 2023

### Financial Feasibility Analysis

The analysis used to see the financial feasibility of a business is by using the Net Present Value (NPV), Internal Rate Return (IRR), Net Benefit Cost Ratio (Net B/C ratio), and Break *Events Points* (BEP)

Table 2 Financial Feasibility Analysis of the Intensive System of Vaname Shrimp Raising Business in Pokdakan Mina Jaya Tamiang

No	Information	Research result	Decision
1.	<i>Net Present Value</i> (NPV)	3,463,203,705	Worthy
2	Net B/C ratio	2.72	Worthy
3	<i>Internal Rate Return</i> (IRR)	67.37%	Worthy
4	Production BEP	38,490	Worthy
5	BEP Price	37,615	Worthy

## CONCLUSION

The vaname shrimp rearing business in Pokdakan Mina Jaya Tamiang provides profits and is worthy of continued and implemented. Based on the company's financial feasibility analysis calculation, all aspects are feasible with a Net Present Value (NPV) of IDR 3,463,203,705. The Internal Rate of Return (IRR) value was obtained at 67.37%. The net B/C obtained was 2.72. The Production BEP received was worth 38,490 kg. The BEP price obtained is IDR 37,615. Based on the results, the Net Present Value (NPV) value is more significant than zero (NPV > 0), the Internal Rate of Return (IRR) value is greater than the interest rate (IRR > 10.5%), and the Net B/C value is greater than zero. If it is greater than one (Net B/C > 1), it can be concluded that the vaname shrimp rearing business in Pokdakan Mina Jaya Tamiang is feasible to run or continue.

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