Financial Analysis of Catfish Cultivation Businesses in Sedenganmijen Village, Krian District, Sidoarjo Regency

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Financial Analysis of Catfish Cultivation Businesses in Sedenganmijen Village, Krian District, Sidoarjo Regency

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Abstract

The title of this research is "Financial Analysis of Catfish Farming in Sedenganmijen Village, Krian District, Sidoarjo Regency," this study aims to conduct a financial analysis of catfish farming in Sedenganmijen Village, Krian District, Sidoarjo Regency. Six catfish cultivators were chosen as participants for this analysis. Detailed data encompassing variable costs, fixed costs, and total revenue was gathered from each participant. Using this information, the analysis involved computing the profit, Return Cost Ratio (R/C), and Benefit Cost Ratio (B/C) for each participant. The findings revealed that all six participants yielded substantial profits, ranging from 52% to 99% of their total incurred costs per harvest cycle. Additionally, the R/C analysis indicated ratios between 1.52 and 1.99, all exceeding 1, signifying favorable returns for each participant. Moreover, the B/C analysis showcased ratios between 0.52 and 0.99, all-surpassing 0, further supporting the viability of continuing catfish cultivation for these individuals.Given the positive outcomes across these three analyses, it is recommended that all six participants continue their catfish farming endeavors.

Keywords: Catfish cultivation, profit, business feasibility.

1. Introduction

Indonesia is one of the countries with the largest ocean area in the world, and in line with this, Indonesia has enormous fish resource potential. The Ministry of Maritime Affairs and Fisheries (KKP) emphasizes that the potential for aquaculture in Indonesia is very large, it noted that aquaculture production in 2022 will reach 16.87 million tonnes (Tuter, 2023). Therefore, the government continues to encourage the enthusiasm of fish farmers so that they continue to develop rapidly and support the country's economy through the aquaculture sector.

Cultivation of freshwater fish in ponds mainly involves carp, catfish, catfish, and tilapia, which contribute more than 80 percent of the total production. In Indonesia, this is a brief profile of some of the most commonly cultivated freshwater fish (Falah, 2019).

Catfish farming is considered one of the agribusiness ventures, and its success relies on various supporting factors. Among these factors is the availability of designated areas focused on fisheries, commonly known as agropolitan areas. An agropolitan area is essentially an agricultural city that not only grows and develops but also facilitates, promotes, attracts, and supports the expansion of agribusiness activities within a specific region.

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Catfish, a freshwater fish variety, enjoys significant popularity among the Indonesian population. Renowned for its tender meat texture and delectable taste, catfish has become a preferred choice for many. Beyond its culinary appeal, catfish boasts essential nutrients crucial for human health. High in protein, fatty acids, and omega-3, catfish is recognized for its potential benefits to heart and brain health. Additionally, catfish is an economically viable option due to its relatively low cost and ease of cultivation.

Sedenganmijen Village, situated in the Krian District of Sidoarjo Regency, covers an area of 145.31 hectares and is home to 27 Neighborhood Associations (RT) and 8 Resident Associations (RW). The village has a population of 5,453 people as of 2023 (Sedenganmijen, 2023).

Pokdakan, located in Sedenganmijen Village, serves as a community hub for the local economy, particularly in the cultivation of freshwater fish. The community primarily focuses on cultivating tilapia, catfish, and catfish, with catfish being the dominant species due to its promising demand for consumption. The catfish cultivation area spans 1.2 hectares, hosting approximately 90 ponds of varying sizes. Cultivators employ two main types of ponds-rectangular and circular. The average size of rectangular ponds is 2x6 meters, while circular ponds have a diameter of 3-4 meters. These ponds are strategically placed on individual plots of land measuring 10x15 meters, accommodating 6-7 ponds per plot. The unique feature of these ponds is their construction using bamboo for walls and tarpaulin for the pool structure, giving them an above-ground characteristic. Referred to as "land pools" by cultivators, these above-ground tarpaulin ponds have proven to be highly effective. Not only do they significantly reduce production costs compared to other methods, but their mobility allows for relocation as needed. The use of above-ground tarpaulin ponds emerges as a practical and efficient approach for catfish farmers, as highlighted by Herry (2022).

Number of members of the freshwater fish cultivation Pokdakan in Sedenganmijen Village, Krian District, Sidoarjo Regency.

Table 1. Number of Catfish Farmers (people)

No	Year	Number of Cultivators
1	2017	15
2	2018	15
3	2019	15
4	2020	15
5	2021	36
6	2022	36
7	2023	36

Source: Secretary of Pokdakan Village Sedenganmijen

Pokdakan was established in 2017 with an initial membership of 15 catfish cultivators, a count that has remained consistent until 2020. However, from 2021 onwards, the membership has surged to 36 catfish cultivators, representing a more than twofold increase compared to the figures recorded in 2020.

In a study conducted by Hamdan & Hutar (2023), titled "Analisis Kelayakan Investasi Usaha Budidaya Ikan Air Tawar di Kabupaten Sumba Timur," involving six businesspeople, the findings revealed that the investment in freshwater fish farming was deemed feasible for four businesses. However, the two businesses did not demonstrate feasibility. The assessment of business feasibility was determined using the net benefit-cost ratio method, which indicated feasibility for all six businesses. This conclusion was drawn based on the businesses' ability to generate income that exceeded the costs incurred in the process.

Research conducted by Faisal (2022) with the title Studi Kelayakan Usaha Budidaya Ikan Lele dengan Sistem Kolam Terpal (Studi Kasus Pada Peternak Ikan Lele Dengan Sistem Kolam Terpal Di Desa Kacangan Kecamatan Ngunut Kabupaten Tulungagung). By taking 5 catfish farmers whose data was analyzed using R/C, it was found that the average R/C value was 1.63, making it feasible to implement catfish farming using a tarpaulin pond system. The estimated harvest success that can be achieved is 80% of the total planted seeds.

Research conducted by Wajdi et al. (2018) entitled Studi Kelayakan Usaha Budidaya Ikan Lele Di Desa Karanggeneng Kecamatan Karanggeneng Kabupaten Karanggeneng, resulting in a B/C Ratio of 1.95. So the business is worth pursuing.

Research conducted by Kaswara & Nuswantara (2022) entitled Analisis Kelayakan Finansial Usaha Budidaya Ikan Lele di Kecamatan Belitang Kabupaten Ogan Komering Ulu Timur, used the B/C Ratio with a result of 1.21 so that the business can be said to be financially feasible.

Previous research by Rosalina (2014) entitled Analisis Kelayakan Usaha Budidaya Ikan Lele di Kolam Terpal di Desa Namang Kabupaten Bangka Tengah, used the R/C Ratio with a result of 1.78 so that the business was worth pursuing.

Based on the description above, this research aims to financially analyze the feasibility of the catfish cultivation business in Sedenganmijen Village, Krian District, Sidoarjo Regency.

In line with the research objectives, it is imperative to expound on theories pertinent to catfish cultivation, encompassing aspects such as production costs, business revenues, profits, and

business feasibility. Providing a comprehensive understanding of these theoretical frameworks will enhance the research's ability to meet its intended goals and contribute meaningfully to the field of catfish farming.

Catfish, belonging to the Order Siluriformes and categorized as a bony fish, is a prominent freshwater fish. The Javanese catfish, scientifically known as Clarias Batrachus, exhibits exceptionally high productivity and is extensively cultivated in Indonesia. Typically inhabiting freshwater environments, catfish are commonly found in rivers with moderate water flow or calm waters such as lakes, reservoirs, and swamps. Several factors play a crucial role in influencing the survival of catfish, including stocking density, feeding practices, disease management, and water quality, as highlighted by Billah (2020). Among the diseases frequently affecting catfish and other freshwater fish, fungal infections and red gill diseases are prevalent issues faced by cultivators. Cultivators often encounter these fish diseases, necessitating preventive measures. Farmers commonly prepare special feeds incorporating various spices to mitigate disease levels in fish. This approach not only aids in disease prevention but also contributes to enhancing the overall quality of the fish.

In any production activity, there are associated production costs, comprising both fixed costs and variable costs. Fixed costs remain constant regardless of the quantity of output produced and represent the expenses related to fixed inputs or factors. These costs, attributed to fixed factors, do not fluctuate with changes in the level of output and must be incurred even if no production occurs.

On the other hand, variable costs are contingent on the quantity of output produced and pertain to the expenses associated with variable inputs or factors. Variable costs, linked to variable factors, fluctuate directly with the level of output and are nonexistent when no production takes place (Welch & Welch, 2010).

The total cost of producing a specific quantity of output is the summation of both fixed and variable costs for that particular level of production. This relationship can be expressed by the following formula (Krugman & Wells, 2009):

$$TC = TFC + TVC$$

Where:
TC : Total Cost
TFC : Total Fixed Cost
TVC : Total Variable Cost

After the harvest period, the produce is sold to gain revenue for the entrepreneur. Total revenue is the result of multiplying the total amount of production produced by the selling price of the product. According to (Pindyck & Rubinfeld, 2018) to calculate revenue a formula is used:

$$TR = P.Q$$

Where:
TR =Total Revenue
Q = Quantity sold
P = Product selling price per unit

Entrepreneurs can determine their profits or losses by examining the financial outcomes of their business activities. Profit, specifically, represents the disparity between the total revenue generated from sales and the entirety of costs incurred throughout the production process. It's essentially the surplus remaining after deducting all expenses from the revenue.

The profit formula is as follows (Mankiw, 2015: 288):

$$\pi = TR - TC$$

Where:
Π : Total Profit
TR : Total Revenue
TC : Total Cost

In analyzing the feasibility of a business, various methods can be used. In this research, Revenue Cost Ratio (R/C) and Benefit Cost Ratio (B/C) are used.

According to Soekartawi (1995) Revenue Cost Ratio is a comparison between total income and total costs with the following formula:

$$R/C = \frac{Total\ Revenuev(TR)}{Total\ Cost\ (TC)}$$

There are 3 categories in this calculation, namely:

a. R/C > 1, it means the business is profitable.
b. R/C = 1, it means the business breaks even.
c. R/C < 1, it means the business is losing money.

According to Kasim (2004) to calculate the Benefit Cost Ratio (B/C) the formula is used:

$$B/C = \frac{Total\ Profit\ (\pi)}{Total\ Tost(TC)}$$

Criteria:

a. B/C > 0, business can continue to be operated
b. B/C < 0, the business cannot continue to be operated
c. B/C = 0, business reaches break-even point

2. Method

This research was conducted in October-November 2023 by taking 6 catfish farmers as informants using a purposive sampling technique. The criteria for the informants selected were those who had an area of catfish cultivation with an area of 10x15 meters and containing 6 to 7 ponds with a diameter of 3 to 4 meters. Data was collected using a questionnaire by exploring various costs incurred by catfish farmers, both variable costs and fixed costs, as well as sales proceeds received by catfish farmers, as well as calculating the profits obtained by informants. Data analysis includes total fixed costs, total variabel cost, total cost, total revenues, and total profit and then analyzes business feasibility using Revenue Cost Ratio (R/C) and Benefit Cost Ratio (B/C) analysis.

3. Results

3.1 Total Variable Cost

Total variable cost encompass the overall expenses that are subject to fluctuations based on production levels, as illustrated in Table 2. These costs represent the entirety of variable expenses accrued by catfish farmers within a single harvest cycle.

Table 2. Total Variable Cost

No	Informan	Land area (meters)	Total Variable Cost (IDR)
1	Martono	10x15	3,236,000
2	Suroso	10x15	3,236,000
3	Wahyudi	10x15	3,310,000
4	Galih	10x15	9,950,000
5	Soni	10x15	8,290,000
6	Anjas Yudhanto	10x15	4,698,000

Source: Informants

According to Table 2, all six informants share the same land area, which is 150 meters. However, there are variations in their variable costs. Galih, among the informants, incurred the highest variable cost at IDR 9,950,000, while Wahyudi had the lowest variable cost at IDR 3,310,000. This discrepancy in variable costs can be attributed to the fact that some informants have not fully utilized their entire land for catfish cultivation.

3.2 Total Fixed Cost

Total fixed cost are costs that are relatively fixed in amount or the size of the costs does not depend on the amount of production. Examining Table 3 reveals that the six informants exhibit distinct fixed costs. Galih recorded the highest fixed cost, totaling IDR 20,550,000, while Anjas Yudhanto had the lowest fixed cost at IDR 3,080,000. The variance in fixed costs can be attributed to some informants not fully utilizing their entire land for catfish cultivation.

Table 3. Total Variable Cost

No	Informan	Land area (meters)	Total Variable Cost (IDR)
1	Martono	10x15	8,160,000
2	Suroso	10x15	7,910,000
3	Wahyudi	10x15	8,450,000
4	Galih	10x15	20,550,000
5	Soni	10x15	8,710,000
6	Anjas Yudhanto	10x15	3,080,000

Source: Informants

3.3 Total Cost

Total costs (TC) are the total costs that must be borne by producers when carrying out a

production process. Total costs are equal to fixed costs (TFC) plus variable costs (TVC).

$$TC = TFC + TVC$$

Where:

TC : Total cost of catfish farming business (IDR)

TFC : Total fixed costs for catfish farming (IDR)

TVC : Total variable costs in the catfish farming (IDR)

The following is the total cost of catfish farming in Sedenganmijen Village, Krian District, Sidoarjo Regency.

Table 4. Total Variable Cost

No	Informan	Land area (meters)	Total Cost (IDR)
1	Martono	10x15	11,396,000
2	Suroso	10x15	11,146,000
3	Wahyudi	10x15	11,760,000
4	Galih	10x15	30,500,000
5	Soni	10x15	17,000,000
6	Anjas Yudhanto	10x15	7,778,000

Source: Table 2 and Table 3

Based on Table 4, it is known that the catfish cultivation business managed by Mr. Martono in Sedenganmijen Village, Krian District, Sidoarjo Regency, incurs total costs of IDR 11,396,000/harvest cycle. The catfish cultivation business managed by Mr. Suroso in Sedenganmijen Village, Krian District, Sidoarjo Regency, costs a total of IDR 11,146,000/harvest cycle. The catfish cultivation business managed by Mr. Wahyudi in Sedenganmijen Village, Krian District, Sidoarjo Regency, costs a total of IDR 11,760,000/harvest cycle. The catfish cultivation business managed by Mr. Galih Prayogi in Sedenganmijen Village, Krian District, Sidoarjo Regency, costs a total of IDR 30,500,000/harvest cycle. The catfish cultivation business managed by Mr Soni in Sedenganmijen Village, Krian District, Sidoarjo Regency, incurs fixed costs of IDR 17,000,000/harvest cycle. In the catfish cultivation business managed by Mr. Anjas Yudhanto in Sedenganmijen Village, Krian District, Sidoarjo Regency, variable costs of Rp. 7,778,000/harvest cycle are incurred.

3.4 Total Revenue

Total revenue is the amount of receipts from the sale of goods and/or services. Revenue is the amount of money received by farmers from the sale of catfish.

$$TR = P.Q$$

Where:

TR :Total Revenue

Q : Quantity sold

P : Product selling price per kg.

Table 5. Total Revenue

No	Informan	Land area (meters)	Total Revenue (IDR)
1	Martono	10x15	22,200,000
2	Suroso	10x15	22,200,000
3	Wahyudi	10x15	22,200,000
4	Galih	10x15	55,500,000
5	Soni	10x15	25,900,000
6	Anjas Yudhanto	10x15	22,200,000

Source: Informant

Based on Table 5, it is known that the catfish cultivation business managed by Mr. Martono in Sedenganmijen Village, Krian District, Sidoarjo Regency, received a total income of IDR 22,200,000/harvest cycle. In the catfish cultivation business managed by Mr. Suroso in Sedenganmijen Village, Krian District, Sidoarjo Regency, he received a total income of IDR 22,200,000/harvest cycle. The catfish cultivation business managed by Mr. Wahyudi in Sedenganmijen Village, Krian District, Sidoarjo Regency, received a total income of IDR 22,200,000/harvest cycle. In the catfish cultivation business managed by Mr. Galih Prayogi in Sedenganmijen Village, Krian District, Sidoarjo Regency, he received a total income of IDR 55,500,000/harvest cycle. The catfish cultivation business managed by Mr Soni in Sedenganmijen Village, Krian District, Sidoarjo Regency, incurs fixed costs of IDR 25,900,000/harvest cycle. The catfish cultivation business managed by Mr. Anjas Yudhanto in Sedenganmijen Village, Krian District, Sidoarjo Regency, incurs variable costs of IDR 22,200,000/harvest cycle.

3.5 Profit Analysis

Profit is the difference between the total revenue from sales and the total costs incurred in the production process.

The profit formula is as follows:

$$\pi = TR - TC$$

Where:

Π : Total profit (IDR/harvest)

TR : Total Revenue (IDR/harvest)

TC : Total cost (IDR/harvest).

Table 6. Total Revenue

No	Informan	Total Revenue (IDR)	Total Cost (IDR)	Total Profit (IDR)

1	Martono	22,200,000	11,396,000	10,804,000
2	Suroso	22,200,000	11,146,000	11,054,000
3	Wahyudi	22,200,000	11,760,000	10,440,000
4	Galih	55,500,000	30,500,000	25,000,000
5	Soni	25,900,000	17,000,000	8,900,000
6	Anjas Yudhanto	22,200,000	7,778,000	14,422,000

Source: Table 4, Table 5.

Based on Table 6, the informant who made the biggest profit was Galih with IDR 25,000,000, while the informant who made the smallest profit was Soni with IDR 8,900,000.

3.6 Business Feasibility Analysis

3.6.1 Revenue Cost Rasio

Revenue Cost Ratio (R/C) is used to evaluate the feasibility of a business or project. Revenue Cost ratio (R/C) measures the extent to which revenue from the business can cover the total costs incurred. Mathematically it can be formulated as follows:

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

Where:
R/C : Revenue Cost Ratio
TR : Total Revenue (IDR/harvest)
TC : Total cost (IDR/harvest).

The results of the R/C calculation are as shown in Table 7.

Table 7. R/C Calculation

No	Informan	TR (IDR)	TC (IDR)	R/C	Information
1	Martono	22,200,000	11,396,000	1.95	Worth Running
2	Suroso	22,200,000	11,146,000	1.99	Worth Running
3	Wahyudi	22,200,000	11,760,000	1.89	Worth Running
4	Galih	55,500,000	30,500,000	1.82	Worth Running
5	Soni	25,900,000	17,000,000	1.52	Worth Running
6	Anjas Yudhanto	22,200,000	7,778,000	2.85	Worth Running

Source: Table 6.

Informant Anjas Yudhanto achieved the highest revenue-cost ratio (R/C) at 2.85, indicating that his ability to leverage total costs allows him to generate total revenue 2.85 times the total cost. In contrast, informant Soni had the lowest revenue-cost ratio (R/C) at 1.52, signifying

that Soni's capacity to utilize total costs enables him to generate total revenue only 1.52 times the total cost.

3.6.2 Benefit Cost Ratio

Benefit Cost Ratio (B/C) is a comparison between benefits and costs. The greater the comparison between benefits and costs, the more profitable a business will be. Mathematically it can be formulated as follows:

$$B/C = \frac{\pi}{TC}$$

Where:
B/C : Benefit Cost Ratio
Π : Total profit (IDR/harvest)
TC : Total cost (IDR/harvest).

The results of the B/C calculation are as shown in Table 8.

Table 8. B/C Calculation

No	Informan	π (IDR)	TC (IDR)	R/C	Information
1	Martono	10,804,000	11,396,000	0.95	Worth Running
2	Suroso	11,054,000	11,146,000	0.99	Worth Running
3	Wahyudi	10,440,000	11,760,000	0.89	Worth Running
4	Galih	25,000,000	30,500,000	0.82	Worth Running
5	Soni	8,900,000	17,000,000	0.52	Worth Running
6	Anjas	14,422,000	7,778,000	1.85	Worth Running

Source: Table 4 and Table 6.

The highest Benefit Cost Ratio (R/C) was informant Anjas with a figure of 1.85. This means that informant Anjas's ability to use total costs is able to provide a total profit of 1.85 times the total cost or a total profit of 185%. Meanwhile, the lowest Benefit Cost Ratio (R/C) was from informant Soni with a figure of 0.52. This means that Soni's informant's ability to use total costs is only able to provide a total profit of 0.52 times the total cost or a total profit of 52%.

4. Discussion

The catfish farmers predominantly bear significant expenses in the form of total fixed costs, which amount to approximately twice the total variable costs, assuming full utilization of all the land they possess. Their land holdings are uniform, as they participate in the land plot program, resulting in an equivalent land area owned by each farmer.

Based on the profit analysis, the six informants made a profit because the total revenue exceeded the total cost.

The R/C analysis indicates that the six informants' business endeavors are highly promising, as the R/C calculation results surpass 1. Similarly, the B/C analysis reinforces the worthiness of pursuing these business services, as the B/C ratios also exceed 0 for all six informants.

Future researchers could greatly benefit from conducting a Return on Investment (ROI) analysis to delve deeper into evaluating the financial viability of the catfish farming business. This analysis could offer valuable insights into the profitability and efficiency of the investments made in this venture, providing a comprehensive perspective for prospective endeavors in the field.

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