

ANALYSIS OF FISH POND COST AND INCOME STRUCTURE MAS (*Cyprinus carpio*) IN PADANG GELUGUR DISTRICT PASAMAN DISTRICT, WEST SUMATRA

Fuji Lestari¹, Muhammad Jamil², Fiddini Alham³

^{1,2,3} Department of Agribusiness, Faculty of Agriculture, University of Samudra, Langsa, Aceh, Indonesia.

Email: fujibelvina03@gmail.com

Corresponding Author

DOI: 10.15408/aj.v17i1.36206

Abstract

This study analyzes Carp Ponds' Cost Structure and Income in Padang Gelugur District, Pasaman Regency. The method used in this research is the survey method and direct interviews with carp farmers. The sampling technique uses a simple random sampling method (randomly) with a sample size of 32 goldfish farmers. The data collected include primary data and secondary data. The data obtained will be processed and analyzed mathematically. The results showed that the cost structure, namely fixed costs of IDR. 3,105,438.00 (3.16%), variable costs of IDR. 94,899,281 (96.89%) are the average fixed costs of IDR. 602.29, variable costs on average IDR. 18,405, the average total cost of Rp.19,005. Based on the mathematical formula of carp pond business income in Padang Gelugur District, IDR. 20,588,603/ha/harvest season. The average revenue is IDR. 118,593,750/ha/harvest season a, and the actual cost IDR. Rp98,00 is 147 /ha/harvest season. Based on the R/C ratio carp, the farming business is profitable because the R/C ratio is $1.21 > 1$. Based on BEP production, it shows a yield of 4,261 kg; this indicates that carp farmers must achieve production of that size to break even. The BEP price of IDR. 19,007/kg means carp farmers must set a minimum fee of IDR. 19,007/kg to reach BEP.

Keywords: *Cost Structure, Income, Business Feasibility*

INTRODUCTION

The most significant contribution to the development of aquaculture comes from freshwater aquaculture. Soaloon (2021), as cited in Amri (2011), added that the wealth of fishery resources in Indonesia includes 2000 species of freshwater fish; there are at least 27 types that have been cultivated. One of the leading commodities of aquaculture is goldfish. Goldfish (*Cyprinus carpio*) is a freshwater fish commodity with rich animal protein, which is very easy to obtain and breed (Yampu et al., 2022).

Padang Gelugur is one of the sub-districts in Pasaman Regency, West Sumatra, as a place of research because this area has good potential for developing a carp farming business and has a prominent enough land. The carp farming business in Padang Gelugur District uses traditional pond systems (earthen ponds) and still uses simple technology. The cultivation business is very dependent on natural conditions, especially weather conditions. If the weather is good, then the cultivation business can survive and provide benefits for farmers, but if there are extreme weather changes, sudden fish deaths, of course, will result in losses for farmers. People with a livelihood and income from the goldfish business are one of the community groups that carry out business activities by

obtaining payment from the goldfish business activities themselves to fulfill their needs. Generally, goldfish farms in Padang Gelugur Subdistrict have a pond area between 3,500 m²-7,500 m², which has different production values. However, the average net income each goldfish farm receives is relatively low. The more comprehensive the pond is owned, the more seeds are stocked, and the higher the net revenue received should be. The income received by farmers is influenced by the production produced, the selling price of fish, and the cost components incurred. The low output of fisheries will automatically impact the income of carp farmers in the Padang Gelugur Subdistrict. The low goldfish production in the Padang Gelugur Subdistrict is caused by weather conditions, stocking density, and feed. Feeding plays a vital role in the success of aquaculture because fish need sufficient food to grow and develop properly.

Based on the description above, this study aims to analyze carp ponds' cost structure and income in the sub-district of Padang Gelugur, Pasaman Regency.

RESEARCH METHODS

Research Location and Time

This research was conducted from January to February 2023. This research was conducted in Padang Gelugur District, Pasaman Regency, West Sumatra. The location of this study was determined purposive (deliberately) according to the research objectives, considering that there are carp ponds in that location.

Data Processing and Analysis Methods

The research method used is the survey method and direct interviews with respondents in carp ponds. The sampling technique is done by simple random sampling with a total sample of 32 people in carp ponds. Data collected include primary data and secondary data. Data analysis methods used in this study are:

a. Production Cost

Production costs can be calculated by summing fixed and variable costs (Antri Sianturi et al., 2020).

$$TC = TFC + TVC$$

Where:

TC= Total Cost (IDR /production period)

TFC= Fixed Cost (IDR /production period)

TVC= Variable Cost (IDR /production period)

Average Fixed Cost (AFC) calculation using the formula:

$$AFC = TFC/Q$$

Description:

AFC= Average fixed cost (IDR /Unit)

TFC= Fixed Cost (IDR /production period)

Q = Total Production (kg/production period)

Calculation of average variable costs (AVC) using the formula:

$$AVC = TVC/Q$$

Description:

AVC = Average Variable Cost (IDR /Unit)

TVC = Variable Cost (IDR / production period)
Q = Quantity of Production (kg/production period)

Average total cost (ac) calculation using the formula:

$$AC = TC/Q \text{ Atau } AC = AFC + AVC$$

Description:

AC = Average Total Cost (IDR /Unit)
AFC = Average Fixed Cost (IDR /Unit)
AVC = Average Variable Cost (IDR /Unit)

a. Revenue

Revenue is the multiplication of the number of units sold by the price per unit of the product, according to Ahyari (1987).

$$TR = P \times Q$$

Description:

TR = Revenue (IDR /production period)
P = Production Price (IDR /kg)
Q = Total Production (kg/production period)

b. Income

Income is the difference between revenue and total costs spent by farmers. Ahyari (1987), the revenue formula is as follows:

$$\Pi = TR - TC$$

Description:

Π = Profit (IDR /production period)
TR = Revenue (IDR /production period)
TC = Total Cost (IDR /production period)

c. R/C ratio

R/C ratio is the ratio between revenue and costs (Soekartawi, 1995). This formula can be written systematically as follows:

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

Description:

TR = Revenue (IDR /production period)
TC = Total Cost (IDR / production period)

With the criteria: $R / C > 1$ goldfish business profitable. $R / C < 1$ goldfish business is not good. $RC = 1$ goldfish business breaks even

d. Break Event Point (BEP)

The event point also called the break-even point Wahyuni (2021), is calculated using the following formula:

$$\text{Bep Production (Kg)} = \frac{\text{a total of all costs}}{\text{sales price}}$$

Bep Price (IDR) =

With criteria: If production $>BEP$ = business is profitable. If the selling price $>BEP$ =

good company.

RESULT AND DISCUSSION

Cost Structure Analysis

The cost structure of carp farming is the cost components incurred by households, from pond preparation, purchase of seeds, feed, medicines, and labor to the harvest process and forming a single cost unit. Cost analysis is needed in a business to know the expenses and revenues so that the industry is well known. The following is a description of the cost structure in carp ponds.

1. Fixed costs

Fixed costs are costs that are not used up in one production process. In the sense that costs do not affect the amount of production produced.

Table 1. Fixed Costs of Goldfish Ponds

| Description | Total Cost (IDR) |
|------------------------|---------------------|
| Tool depreciation cost | 277.313,00 |
| Land rental cost | 2.828.125,00 |
| Total Average | 3.105.438,00 |

Source: Primary Data Processed In 2023

Based on the table above, the fixed costs incurred by farmers include the cost of tool depreciation and land rental costs calculated per season; the average debt of carp farmers is IDR. 277,313.00 / season, and land rental costs of IDR. 2,828,125.00 / ha/season. The total average spent by all carp farmers in the cultivation process is IDR. 3,105,438.00/season.

2. Variable costs

Variable costs are costs that are used up in one production. In the sense that costs are affected by the amount of output produced.

Table 2: Variable Costs of Goldfish Ponds

| No | Description | Total Cost (IDR) |
|----------------------|-------------|----------------------|
| 1. | Seeds | 3.440.625,00 |
| 2. | Feed | 89.503.125,00 |
| 3 | Medicine | 195.000,00 |
| 4 | Lime | 362.031,00 |
| 5 | Labor | 1.388.500,00 |
| Total average | | 94.889.281,00 |

Source: Primary Data Processed In 2023

The data above shows that the variable costs incurred by carp farmers for 1 (one)

period include seed, feed, medicine, lime, and labor costs. The total average variable costs incurred in 1 (one) period amounted to IDR. 94,899,281.00/ha/season.

3. Cost Structure

Table 3. Cost Structure of Goldfish Farming Business

| No | Cost component | Total cost (IDR) / harvest season | Total cost (%) |
|--|------------------------|--------------------------------------|----------------|
| Total fixed costs (TFC) | | 3.105.438,00 | 3,16 |
| 1. | Land rental fee | 2.828.125 | 2,88 |
| 2. | Tool depreciation cost | 277.313 | 0,28 |
| Total biaya variabel (TVC) | | 94.899.281 | 96,89 |
| 1. | Seeds | 3.440.625 | 3,51 |
| 2. | Feed | 89.503.125 | 91,33 |
| 3. | Lime | 362.031 | 0,36 |
| 4. | Medicine | 195.000 | 0,19 |
| 5. | Labor | 1.388.500 | 1,41 |
| Total Cost (TC) | | 97.994.718 | |
| Average Fixed Cost | | 602,29 | |
| Average Variable Costs | | 18.405 | |
| Average Total Cost/Output (IDR) | | 19.005 | |

Source: Primary Data Processed In 2023

Based on the table above, the total fixed costs incurred amounted to IDR. 3,105,438.00 / harvest season or 3.16% of the total fixed costs. At the same time, the total variable costs incurred during the production process amounted to IDR. 94,899,281 / harvest season, or 96.89% of total variable costs. Calculate the average fixed costs from fixed costs divided by the amount of goldfish production obtained by IDR. 602.29 / harvest season. The average variable price is obtained from the variable price divided by the amount of goldfish production, which amounted to IDR. 18,405/season. The average total cost for each output amounted to IDR. 19,005/season. This shows that variable costs are more significant than fixed costs; based on the study results, the cost structure of carp ponds that incur the most costs is variable. Variable costs include seeds, feed, lime, medicines, and labor. Of the variable cost components of feed costs is a part of the cost of the most significant expenditure of 91.33%, according to Ningsih (2021), as cited in Efendi (2007), feed is essential in fish farming activities, in carp farming more than 60% of production costs are used for the procurement of feed.

4. Carp Farmer Revenue

Revenue is the yield obtained multiplied by the selling price. The revenue of goldfish farmers in Padang Gelugur Subdistrict can be seen in the following table:

| Description | Total |
|----------------------------------|----------------|
| Carp price (IDR /Kg) | 23.000,00 |
| Goldfish production (kg/harvest) | 5.156 |
| Total revenue (IDR /harvest) | 118.593.750,00 |

Source: Primary Data Processed In 2023

The table above explains three interconnected things: the selling price per

kilogram, goldfish production, and revenue. The total average goldfish production in Padang Gelugur Subdistrict, with a sample of 32 respondents, was 5,156 kg or 5.156 tons with a land area of 0.84 hectares. The average goldfish production is 5,156 kg with a sales price of IDR.23,000 per kilogram. So, the average revenue is IDR. 118,593,750.00 / season.

5. Revenue

The income carp farmers receive results from calculating the difference between revenue and total costs. The measure of goldfish farm income can be seen in the following table:

| Description | Total |
|--------------------|--------------------|
| Cost of Acceptance | IDR.118.593.750,00 |
| Total cost | IDR. 98.005.147,00 |
| Total income | IDR. 20.558.603,00 |

Source: Primary Data Processed In 2023

The data above shows that the goldfish farming business in Padang Gelugur District, Pasaman Regency, is profitable. It is known that the revenue from the carp farming business amounted to IDR. 118,593,750.00. In contrast, the total cost incurred amounted to IDR. 98,005,147.00, so the average income earned in carp farming amounted to IDR. 20,558,603.00 / ha/season.

6. Business Feasibility

a. R/C Rasio

The R/C ratio is the ratio of revenue to production costs.

| No | Description | Value (Rp) |
|-----------|-------------|---------------------|
| 1 | Revenue | IDR. 118.593.750,00 |
| 2 | Total Cost | IDR. 98.005.147,00 |
| R/C ratio | | 1,21 |

Source: Primary Data Processed In 2023

Based on the calculation results of the R / C ratio obtained of 1.21, it shows that if the R / C is greater than 1 ($R / C > 1$), then the business run by goldfish farmers in Padang Gelugur District, Pasaman Regency is profitable. This points to the statement of Rahardi and Hartono (2003) that if the R / C ratio is smaller than one, the additional costs incurred will generate less income than the additional costs.

b. Break Event Point (BEP)

| Description | |
|-------------|--------------------------------------|
| 1. | BEP Production/unit |
| | a. Total Cost (IDR) 98.005.147,00 |
| | b. Selling price (IDR /kg) 23.000,00 |
| | BEP Production 4.262 kg |

| | | |
|---|--------------------------|-----------------------|
| 2 | BEP Cost | |
| | Total Cost (IDR) | 98.005.147,00 |
| | Production quantity (kg) | 5.156 |
| | BEP Cost | IDR. 19.007,00 |

Source: Primary Data Processed In 2023

The production BEP was obtained at 4,262 kg, meaning that when the production was obtained at 4,262 kilograms, the farmers' income reached the break-even point. The price BEP results obtained at IDR.19,007.00 / kg show that the business can break even at a selling price of IDR.19,007.00 / kg. If the selling price is less than IDR.19,007.00, then the company will experience a loss, and vice versa.

CONCLUSIONS

Based on the results of research conducted in Padang Gelugur District, Pasaman Regency, West Sumatra, the cost structure of carp farming includes fixed costs of IDR. 3,105,438.00 / harvest season, variable costs of IDR. 94,899,281 / harvest season. The details of the fixed expenses incurred amounted to 3.20%, consisting of land rental costs (2.88%) and tool depreciation costs (0.28%). While variable costs amounted to 96.89%, consisting of seed costs (3.51%), feed costs (91.33%), lime costs (0.36%), medicine costs (0.19%), and labor costs (1.41%). The average income farmers earn in Padang Gelugur District, Pasaman Regency, is IDR. 20,588,603 / harvest season.

REFERENCE

- Ahyari, A. 1987. *Production Control*. Yogyakarta: BPFE.
- Antri Sianturi, M.J., Lubis, Z., & Siregar, T.H.S. (2020). Analysis of Farming and Marketing Channels of Cocoa Beans in Juhar District, Karo Regency, North Sumatra Province. *AGRI SCIENCE: Scientific Journal of Masters in Agribusiness*, 2(2), 181-193.
- Ningsih, F. (2021). *Maintenance of Carp (Cyprinus carpio L.) Seeds with Different Feeding Frequencies at UPT BBI Sukorejo Gondang Legi*.
- Soaloon, F. (2021). *Analysis of the Efficiency of Catfish (Clarias Batrachus) Rearing Business in Menaming Village, Rambah District, Rokan Hulu Regency*.
- Soekartawi. 1995. *Basic Principles of Marketing Management for Agricultural Products*. Rajawali Press. Jakarta.
- Wahyuni, T., & Yuliana, H. (2021). Cost Analysis of Cultivated Agarwood Oil Distillation in Tenggara, East Kalimantan. *Journal of Forest Products Research*, 39(2), 88-98.
- Yampu, R., Bhakti, F. K., Usman, H., Abadiyah, A. K., & Lambu, A. (2022). Analysis of Carp Cultivation Business of Semi-Intensive System at Upt Maju Jaya in Duyu Village, Tatanga District, *Journal City*, 1(2), 51-60.