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FEASIBILITY ANALYSIS OF NILE TILAPIA AQUACULTURE IN THE NILE TILAPIA CULTIVATION VILLAGE AREA, MATARAM CITY

Analisis Kelayakan Usaha Budidaya Ikan Nila di Kawasan Kampung Perikanan Budidaya Kota Mataram

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ABSTRACT

The Aquaculture Village (KPB) in Mataram City is one of the government's efforts to improve community welfare, create food security and become a strategy to spur competitive tilapia productivity. Currently, the development of Aquaculture Villages faces challenges due to high land conversion, increase in fish feed prices, declining water quality, lack of technology adoption and weak marketing systems. This study aims to analyze the feasibility of tilapia farming business in aquaculture village areas based on technical, market, management, and financial aspects. The research uses qualitative descriptive methods and financial feasibility analysis calculations. The results of the study show that the development of tilapia farming business is still constrained in technical, management and marketing aspects. In the financial aspect, the tilapia cultivation business is feasible to run both in the short and long term. The results of the short-term financial analysis showed an R/C value of 1.28, profit of IDR 285,063,750/cycle and a profitability of 28.44%. The long-term analysis shows a positive NPV value of IDR 2.46 billion, Net B/C of 6.3, and IRR of 49%, with PP for 11 months.

Keywords: Aquaculture Village, Business Eligibility, Mataram City, Tilapia

ABSTRAK

Kampung Perikanan Budidaya (KPB) di Kota Mataram merupakan salah satu upaya pemerintah untuk meningkatkan kesejahteraan masyarakat, menciptakan ketahanan pangan dan menjadi strategi memacu produktifitas ikan nila yang berdaya saing. Saat ini pengembangan Kampung Perikanan Budidaya menghadapi tantangan akibat tingginya alih fungsi lahan, kenaikan harga pakan ikan, penurunan kualitas perairan, minimnya adopsi teknologi serta lemahnya sistem pemasaran. Penelitian ini bertujuan untuk menganalisis kelayakan usaha budidaya ikan nila di kawasan kampung perikanan budidaya berdasarkan aspek teknis, pasar, manajemen, dan finansial. Penelitian menggunakan metode deskriptif kualitatif dan perhitungan analisis kelayakan finansial. Hasil penelitian menunjukkan bahwa

pengembangan usaha budidaya ikan nila masih terkendala dalam aspek teknis, manajemen dan pemasaran. Pada aspek finansial usaha budidaya ikan nila layak dijalankan baik dalam jangka pendek maupun jangka panjang. Hasil analisis finansial jangka pendek menunjukkan nilai R/C sebesar 1,28, laba sebesar Rp 285.063.750/ siklus dan rentabilitas 28,44%. Analisis jangka panjang menunjukkan nilai NPV positif sebesar Rp 2,46 miliar, Net B/C sebesar 6,3, dan IRR sebesar 49%, dengan PP selama 11 bulan.

Kata Kunci: Ikan Nila, Kampung Perikanan Budidaya, Kelayakan Usaha, Kota Mataram

INTRODUCTION

Mataram City, the capital of West Nusa Tenggara (NTB) Province, has potential for developing the aquaculture sector, particularly tilapia (*Oreochromis niloticus*), a leading commodity with high demand due to its savory flavor and affordable price (Primadini et al., 2021). According to data from the NTB Maritime Affairs and Fisheries Service (2024), the fish consumption rate (AKI) of Mataram City residents reached 50 kg per capita per year, indicating a strong preference for fishery products. With a cultivation area of 13.4 hectares, Mataram City produces 392 tons of freshwater fish, dominated by tilapia at 236 tons (Mataram City Fisheries Service, 2024). In addition to meeting food needs, freshwater fish farming also contributes to job creation, increased community income, and the development of other micro and small businesses (Cahyana, 2024).

Tilapia cultivation is a leading commodity in Mataram City due to its high adaptability to various cultivation systems, making it easy to develop according to the capabilities and resources of local farmers (Dailami et al., 2021). However, following the COVID-19 pandemic, aquaculture production in Mataram City stagnated and even declined. This was due to rising feed prices that were not matched by fish selling prices, high land conversion due to urban development pressures, declining aquatic environmental quality, minimal technology adoption, and weak institutional and marketing systems. These conditions have prevented the aquaculture sector from optimally meeting local consumption needs.

As an effort to restore and strengthen the fisheries sector, the Ministry of Maritime Affairs and Fisheries (KKP) is developing the Aquaculture Village (KPB) program in various regions, as stipulated in Ministerial Decree Number 111 of 2023 concerning Aquaculture Villages in Appendix 126. The Lendang Re area in Sayang-sayang Village is designated as an Aquaculture Village focused on tilapia commodity development. This area will be designed to integrate various activities to accelerate the development of fisheries cultivation businesses, reduce poverty and unemployment in rural areas, and improve welfare (Putri & Gumilar, 2023). Through a regional approach, the KPB is expected to become an integrated economic cluster that integrates production, processing, and marketing of fishery products, while encouraging active community participation in fisheries-based economic activities (KKP, 2021).

Business feasibility is a structured and detailed analysis of various factors that can influence the potential success of a project (Wardana et al., 2021). This process is carried out to evaluate whether a business investment is feasible. Aspects in a business feasibility study include technical, marketing, management, and financial aspects (Wahyuni et al., 2009). According to Nugroho et al. (2014), the financial aspect is used to analyze ongoing economic activities, from pre-production investment costs, fixed investment, to working capital. Financial analysis includes short-term analysis (capital, operational costs, revenue, profit, R/C ratio, BEP and profitability) and long-term analysis (NPV, IRR, net B/C and PP). This study aims to analyze the feasibility of tilapia fish farming in the Fishery Cultivation Village (KPB) area to minimize the risk of loss and avoid mistakes in business development, as well as assess whether the business meets investment criteria so that it is feasible to be developed in the future.

RESEARCH METHODS

Research Time and Location

The research was conducted in the Fishery and Aquaculture Village area located in the Lendang Re neighborhood, Sayang-sayang Village, Cakranegara District, Mataram City, from April to July 2025.

Methods and Data Sources

This study used a qualitative descriptive approach to describe and analyze the current state of tilapia fish farming in the Tilapia Fish Farming Village area in Mataram City, based on the existing situation. Data sources consisted of primary and secondary data obtained through surveys, observations, questionnaires, interviews, and literature studies and agency documents. The data collection technique used purposive sampling, considering the criteria that informants and respondents were 38 fish farmers actively running tilapia fish farming businesses in the Fishery and Aquaculture Village area.

Data Analysis

The feasibility of tilapia fish farming in the Tilapia Fish Farming Village area was analyzed through an assessment of four main aspects: technical, marketing, management, and financial. This analysis refers to the concept of a business feasibility study, which states that a business is considered feasible if it meets operational criteria, has market opportunities, is managed effectively, and provides financial benefits. Financial assessment is conducted by analyzing both short-term and long-term business investments, through calculations of the R/C Ratio, profit, profitability, Net Present Value (NPV), Net Benefit Cost Ratio (Net B/C), Internal Rate of Return (IRR), and Payback Period (PP). This analysis is used to determine the additional benefits obtained from business development and to assess whether the business is feasible and profitable to run.

1. Short-Term Financial Analysis

a. R/C Ratio

To determine the level of management of a fish farming business, a business analysis is conducted using the Revenue Cost Ratio (Adi et al., 2019). The calculation formula (R/C Ratio) is:

$$\text{R/C Ratio} = \frac{\text{TR (total revenue)}}{\text{TC (total costs)}}$$

- If R/C > 1, the business is efficient.
- If R/C = 1, the business is inefficient or has only just reached the break-even point.
- If R/C < 1, the business is inefficient.

b. Profit

Profit is an indicator of a company's efficiency in utilizing its resources (Lumi et al., 2019). The formula for calculating profit is:

$$\pi = \text{TR (gross revenue)} - \text{TC (total costs)}$$

c. Profitability

Profitability is a company's ability to generate profits relative to its size or the resources used, such as capital or assets (Artarina & Masdjojo, 2013). Profitability is calculated using the formula:

$$\text{RE} = \frac{\text{L (profit)} \times 100\%}{\text{M (capital)}}$$

2. Long-Term Financial Analysis

a. NPV (Net Present Value)

NPV is considered feasible if its value is positive or greater than zero (Fattah et al., 2019). Conversely, if NPV < 0, the project is not feasible. Meanwhile, if NPV = 0, the company is at the Break-Even Point (Afiyah et al., 2015).

$$\text{NPV} = \sum_{t=1}^{n} \frac{CF_t}{(1+r)^t} - I_0$$

Where:

CF_t = cash flow in period t
r = discount rate
t = year or expected cash flow period
n = expected cash flow period
I_o = initial investment

b. Net Benefit Ratio (Net B/C)

The Net B/C Ratio reflects the number of benefits received compared to costs incurred (Liana et al., 2022). The Net B/C Ratio is calculated by dividing the total discounted revenue by the total discounted costs, or dividing a positive NPV by a negative NPV.

$$\text{Net B/C Ratio} = \frac{\sum_{t=1}^{n} \frac{B_t}{(1+r)^t}}{\sum_{t=1}^{n} \frac{C_t}{(1+r)^t}}$$

Where:

Bt = benefit in period t
Ct = cost in period t
r = discount rate
t = year (economic time)
n = expected cash flow period

c. Internal Rate of Return (IRR)

IRR is a benchmark for a business's ability to repay loan interest. If the IRR calculation results show a value higher than the predetermined rate of return, the project proposal will be accepted. Conversely, if the IRR value is lower than the predetermined rate of return, the project proposal will be rejected (Afiyah et al., 2015).

$$0 = \sum_{t=1}^{n} \frac{CF_t}{(1+r)^t} - I_0$$

Where:

CFt = cash flow in period t
$I0$ = initial investment
r = required rate of return (IRR)
n = expected cash flow period

d. Payback Period (PP)

The payback period (PP) is calculated by comparing the return on investment of a project based on the initial investment payment with the net benefits of the project over a specified period (Kadariah & Clive, 2001).

PP = (Investment capital / net profit per year) x 1 year

RESULT

The Lendang Re neighborhood in Sayang-Sayang Village, Cakranegara District, Mataram City, is located between 8°34'35" - 8°33'45" South Latitude and 116°7'05" - 116°9'10" East Longitude. Its strategic location provides good access to urban infrastructure and local markets. Sayang-Sayang Village, with a relatively high population density and vibrant economic activity, is known as one of the centers of freshwater fish farming in Mataram City, with a fish farming area reaching 3.7 hectares (Mataram City Fisheries Service, 2024). In this area, tilapia cultivation is developed using various methods, such as flowing water ponds, floating net cages, rice paddy ponds, and kangkung fish farming, which are carried out intensively, semi-intensively, and traditionally.

Table 1. Area of Active Tilapia Cultivation Land in Sayang-Sayang Village

No	Neighborhood Name	Rice Pond (m²)	Pond (m²)	Cage (unit)
1	Sayang Daye	500	470	15
2	Sayang Lauk	1,500	100	
3	Lendang Re	5,000	3,722	4
4	Rungkang Jangkuk	-	500	4
5	Derman Sari	-	-	
6	Kramat Nunggal	-	-	
7	Lendang Kelor	-	-	
8	Karang Kuluh	1,000	200	5
	Total	8,000	4,992	28

Table 2. Tilapia Production in Sayang-Sayang Village

No	Year	Number of Active Fish Farmers (People)	Production (kg)
1	2021	106	166,591
2	2022	97	169,318
3	2023	52	125,812
4	2024	52	136,370
5	July 2025	38	74,040

Table 3. Tilapia Production Data as of July 2025

Production Amount (kg)	Amount of Pellet Feed Usage (kg)	Stocking Density (fish/m³)	SR (%)	FCR
74,040	89,830	Rushing pond 100 Cages 100 Stillwater pond 30-50	98	1.3-1.8

Table 4. Tilapia Cultivation Investment Capital

No	Description	Amount (unit)	Unit Price (IDR)	Total Price (IDR)	Economic Period (years)
1	Ground pool (still water)	17	7,500,000	127,500,000	10
2	Semi-concrete pool (rushing water)	24	6,000,000	144,000,000	25
3	Concrete pool	6	15,000,000	90,000,000	30
4	Mina kale	3	2,500,000	7,500,000	10
5	Cages	20	1,500,000	30,000,000	5
6	Drag net	40	400,000	16,000,000	5
7	Happa	30	200,000	6,000,000	5

No	Description	Amount (unit)	Unit Price (IDR)	Total Price (IDR)	Economic Period (years)
8	Barrel	64	130,000	8,320,000	4
9	Harvest basket	69	80,000	5,520,000	4
10	Scales	27	250,000	6,750,000	5
11	Scoop	66	30,000	1,980,000	4
12	Water wheel	4	6,100,000	24,400,000	5
	Total			467,970,000	

Table 5. Fixed Costs

No	Description	1 Cycle	1 Year
1	Electricity	3,000,000	10,500,000
2	Maintenance	1,000,000	3,500,000
3	Depreciation	19,873,750	69,558,125
4	Taxes	1,150,000	4,025,000
	Total	25,023,750	87,583,125

Table 6. Variable Costs

No	Description	Amount	Price	1 Cycle
1	Fry	56,600 fish	200	11,300,000
		11,275 kg	23,000	259,325,000
2	Feed	61,880 kg	11,277	697,855,000
3	Probiotics, Medicines, Vitamins, Lime, etc.			3,550,000
4	Labor	35 people	1,436,000	50,260,000
	Total			1,022,290,000

Table 7. Tilapia Cultivation Business Revenue in KPB Mataram City

No	Description	Production (kg)	Price (IDR)	Amount (IDR)
1	Enlargement	49,160	26,588	1,307,077,500
2	Hatchery	1,100	23,000	25,300,000
	Total			1,332,377,500

Table 8. Results of R/C Ratio Calculations

No	Description	Income (IDR)	Total Cost (IDR)	R/C Ratio
1	Tilapia fish farming	1,332,377,500	1,047,313,750	1.28

Table 9. Results of Net Present Value (NPV) Calculations

Year	Total Cost (IDR)	Income (IDR)	Profit (IDR)	NPV (IDR)
0	467,950,000	-	-467,950,000	-467,950,000
1	2,911,303,375	3,686,087,500	774,784,125	704,349,205
2	2,911,303,375	3,686,087,500	774,784,125	640,317,459
3	2,911,303,375	3,686,087,500	774,784,125	582,106,781
4	2,911,303,375	3,686,087,500	774,784,125	529,187,982
5	2,911,303,375	3,686,087,500	774,784,125	481,079,984
				2,469,091,410.20

Table 10. Results of Long-Term Financial Analysis Calculations

No	Description	NPV	Net B/C	IRR	PP
1	Tilapia fish farming	IDR 2,469,091,410.20	6.3	49%	0.86

DISCUSSION

1. Technical Aspects

Technical or production aspects play a crucial role because they are related to the success of a business and serve as a benchmark for its effectiveness (Primyastanto, 2016). Technical aspects of tilapia cultivation include infrastructure (facilities and equipment) and tilapia cultivation activities. The availability of cultivation facilities and infrastructure plays a crucial role in supporting the smooth production process, business efficiency, and the quality of tilapia cultivation results. Production facilities include various equipment used in cultivation activities, such as broodstock ponds, nursery ponds, grow-out ponds, fish cages, nets, nets, buckets, grading buckets, scoops, pipes, water wheels, and harvesting equipment such as scales, nets, and harvest baskets. Meanwhile, fish cultivation infrastructure functions to support production activities (Hikmah et al., 2023), including the availability of freshwater sources, electricity networks, road and transportation access, and communication networks.

The tilapia cultivation process in the Tilapia Cultivation Village area of Mataram City begins with seeding, nursery, and grow-out.

a. Hatchery

In the hatchery stage, the cultivation activities begin with pond preparation, broodstock maintenance, and spawning, resulting in larvae measuring 1-2 cm within 2-3 weeks. Fish farmers use tilapia broodstock that is at least 7 months old. The quality of these broodstock is not subject to certification. The tilapia broodstock used is sorted from previous tilapia cultivation grow-out activities.

b. Nursery

In the nursery stage, the activities include stocking larvae from independent hatcheries and larvae purchased from the Batu Kumbung BBI until the tilapia reach 5-8 cm and 8-12 cm in size. The nursery process lasts approximately 2.5 months and is carried out in nursery ponds at a stocking density of 100 fish/m^2.

c. Enlargement

Tilapia rearing activities are carried out in still and fast-flowing water ponds (concrete ponds, floating cages, rice paddy ponds). Tilapia rearing activities include pond preparation, seed distribution, feeding, water quality management, pest and disease control, and harvesting. The rearing pond preparation stage begins with draining the pond bottom, cleaning the pond bottom and water channels, controlling pests, cultivating the bottom soil, liming, fertilizing, and filling with water (Amalia et al., 2018). Lime is applied to the pond at a rate of 50-100 grams/m^2 to increase the water pH and kill pathogens and pests (Salsabila & Suprapto, 2018). Pond bottom fertilization uses manure at a dose of 500 grams/m^2, urea, and TSP at a dose of 15 grams/m^2. Pond water is filled 5-7 days after liming and fertilizing. The initial water level is set at 15–20 cm and left for 3–5 days to allow sunlight to reach the bottom of the pond, supporting phytoplankton growth. The water is then refilled to a height of 50–60 cm to stabilize environmental conditions and increase oxygen capacity before seeding. In rice paddy ponds, seeds are stocked at larval sizes: 1 cm, 2–3 cm, and 3–5 cm. In fast-flowing ponds and cages, the tilapia seed size stocked is 8–12 cm, weighing approximately 30 grams per fish. Tilapia fingerlings to be stocked in the grow-out ponds are first acclimatized to adjust to the new environment. In line with research by Salsabila & Suprapto (2018), the acclimatization process increases the chances of successful tilapia rearing.

Tilapia are fed 3% of their body weight two to three times daily, in the morning, afternoon, and evening. Feeding at a dose of 2.5-4% of the fish's body weight can optimally increase the growth of tilapia (Karimah et al., 2018).

Observations during the research period also indicated that pest and disease prevention efforts were implemented. Prevention is the most effective way to reduce the risk of pest and disease attacks (Magdalena, 2021). Pest control (snails and crabs) was carried out by draining

the pond to kill pests. Sludge and leftover feed from previous cultivation were cleaned to reduce the potential for pest breeding, followed by liming. The liming stage was carried out to stabilize the pH and control pest populations (Salsabila & Suprapto, 2018). Disease control was carried out when outbreaks began to disrupt cultivation activities, namely by reducing the frequency of feeding and administering medication. Feed reduction aims to reduce waste production that can degrade water quality and aid the fish's recovery process (Tri Oktami et al., 2024).

Tilapia harvesting in rice paddy ponds is carried out after a 5–6 month rearing period, when the fish reach a weight of 200–400 grams per fish, or according to market demand (3–5 fish/kg). In cages or fast-flowing ponds, the harvesting period is 2.5–3 months. Before harvest, the fish are fasted for 12–24 hours or kept in a sluice for at least one day to maintain their quality during transport and reduce the muddy taste. The harvesting process involves gradually reducing the pond's water volume, then catching the fish using nets and weighing them using a dry weighing system.

In a year, tilapia cultivation in this area occurs in 2–4 cycles, with each cycle lasting approximately 3–6 months, demonstrating a relatively stable production pattern. However, facilities and infrastructure remain challenging. The production roads within the area, used for distributing feed and harvested produce, are in poor condition and narrow. Most of the roads are unpaved and still dirt, often flooding during the rainy season, creating uneven surfaces. The road width of only about 1.60 m limits access for two-wheeled and three-wheeled vehicles (kaisar), hampering the distribution of production inputs and harvests and reducing business efficiency.

The high price of feed is also a difficult problem to overcome. During the grow-out phase, feed is the largest cost component (Mochamad Cholily et al., 2024). Although tilapia cultivation is already profitable, farmers are still unable to increase production scale due to limited capital to purchase feed. The quality of the broodstock and fry used are generally uncertified due to limited knowledge, availability, and the lack of price difference between certified and non-certified fry at the wholesaler level. As a result, farmers are less likely to consider the use of certified fry, even though good-quality broodstock can produce superior fry with a higher survival rate and support increased fish production for consumption (Hikmah et al., 2023).

2. Management Aspects

a. Planning

Planning of fish farming activities in the KPB (Fish Farming Unit) of Mataram City is not comprehensive. Most farmers focus on planning only the production input preparation stage, including fry, feed provision, and maintenance stages. Regarding output aspects, namely harvesting and post-harvest, planning is often neglected, resulting in difficulties for fish farmers in securing labor and buyers at harvest time. This results in longer production times and increased production costs. Planning for collaboration in marketing access to produce is a sound business plan (Muhammad & Andriyanto, 2013).

b. Organization

The 14 fish farmer groups within the KPB area of Mataram City are still not functioning as intended due to limited institutional management capabilities, human resources, and a lack of information regarding group management. The group's institutional function as part of the organization is to serve as a learning environment, a source of information, a provider of production infrastructure, and a marketing tool (Nuryanti et al., 2011).

c. Movement/Supervision

Regarding movement, several stages of tilapia cultivation production do not yet adhere to Standard Operating Procedures (SOPs). Cultivation practices still rely on the knowledge and experience of farmers passed down through generations, often leading to irregularities in

cultivation management, such as the application of fertilizer, lime, medicines, probiotics, and feed, as well as water quality management and overall fish maintenance. However, standard operating procedures (SOPs) for tilapia cultivation are needed as guidelines for cultivation implementation that support business sustainability (Fradina & Latuconsina, 2022). In terms of management supervision, fish farmers are not yet fully disciplined in recording production routinely and accurately, and implementing a production cost control system to improve management efficiency, minimize the risk of loss, and ensure the sustainability of tilapia cultivation businesses. Administration or record-keeping is one of the basic assets in implementing good management within institutions and organizations (Dekayanti et al., 2021).

3. Marketing Aspects

a. Business Prospects

Tilapia cultivation in the KPB area of Mataram City offers promising business prospects due to high market demand, from restaurants, local markets, and the fish processing industry.

b. Marketing Margin

In terms of marketing margin, the main problem faced is stagnant or even declining fish prices, while production costs, particularly feed, continue to rise. For consumption, tilapia weighing 4-5 fish per kg are sold to collectors at IDR 25,500-26,500/kg. Collectors sell to retailers at IDR 28,000, and to end consumers at IDR 33,000/kg. The analysis of the cause of the low marketing margin is due to the long chain of commerce in fish marketing, resulting in farmers receiving significantly less income than the actual market value.

c. Marketing Channels

Marketing channels in the KPB area consist of two types. First, there is the two-level channel, which involves sales through a single intermediary, namely the collector, and the zero-level channel (direct marketing channel), where farmers sell their products directly to end consumers without intermediaries. Most tilapia marketing channels operate within the two-level channel. Longer marketing channels increase marketing costs and create inequities in profit sharing among the parties involved (Nuriati, 2018).

4. Financial Aspects

The financial analysis of tilapia cultivation in the KPB area of Mataram City includes short-term and long-term financial analyses.

a. Short Term

1) Investment Capital

The sources of capital used for the business come from internal capital and external sources, such as stock investors or loans from financial institutions. Investment capital for tilapia cultivation in the Tilapia Cultivation Village area of Mataram City includes ponds (earthen ponds, concrete ponds, semi-concrete ponds, and cages) and equipment (draft nets, scoops, scales, happa, and waterwheels). Based on the description in Table 4, the total investment capital for a tilapia fish farming business in the tilapia fish farming village area is IDR 467,970,000, assuming annual depreciation based on the asset's technical life.

2) Production Costs

Production costs are costs incurred during the production process, including fixed and variable costs. In tilapia fish farming activities in the tilapia fish farming village area in Mataram City, fixed costs incurred in one cultivation cycle are IDR 25,023,750. These fixed costs include electricity, maintenance, depreciation, and taxes. Meanwhile, variable costs are IDR 1,022,290,000, with a breakdown of costs including the purchase of seeds, feed, probiotics, medicines, and labor.

3) Revenue

Revenue from the tilapia fish farming business in the tilapia fish farming village area in Mataram City is derived entirely from the sale of tilapia, both for seeds and consumption. Total revenue in one cultivation cycle is IDR 1,022,290,000. 1,332,377,500.

4) R/C Ratio

The R/C ratio is calculated by comparing total revenue with total expenses (costs). The analysis results show the R/C ratio is 1.28. If R/C > 1, the business is profitable because the cost of revenue is greater than the cost of expenditure (production).

5) Profit

The profit earned from tilapia fish farming in the Tilapia Fish Farming Village area of Mataram City is IDR 285,063,750 in one cycle. Meanwhile, the calculated profit for one year is IDR 973,505,250. Profit itself is the difference between gross revenue and total production costs (Pambudi et al., 2013).

6) Profitability

High profitability indicates the ability of capital to generate optimal profits. One factor influencing the high profitability achieved by fish farmers is the high selling price of tilapia. The average economic profitability of tilapia fish farming in the KPB area of Mataram City is 28.44%. A profitability of 25% indicates that the profits from tilapia farming exceed the average bank investment interest rate, which is around 15–20% (Ariadi et al., 2024).

b. Long Term

1) Net Present Value (NPV)

Overall, the NPV calculation for a tilapia fish farming business in the tilapia fish farming village area of Mataram City using a 10% discount rate over a five-year production period is IDR 2,469,091,410.20. This means that the investment made over the next five years will yield a net benefit of IDR 2,469,091,410.20. A positive NPV value, or NPV > 0, indicates that this business is feasible in the long term (Fattah et al., 2019).

2) Net Benefit-Cost Ratio (Net B/C)

The Net B/C analysis is the result of dividing the positive NPV by the negative NPV (year 0), with a value of 6.3. A Net B/C value > 1 indicates that the business is feasible because it generates net profits that exceed the investment costs. A Net B/C value of 6.3 means that for every IDR 1.00 spent, a benefit of IDR 6.3 is generated. This Net B/C ratio provides an indication of the extent of the benefits obtained compared to the costs incurred (Liana et al., 2022).

3) Internal Rate of Return (IRR)

Based on the analysis of the tilapia fish farming business in the Mataram City Aquaculture Village area, the IRR was 49%. This indicates that the tilapia fish farming business is highly feasible. An IRR of 49% indicates that this business is able to recoup its investment at a rate of return greater than the annual interest rate. The current interest rate (discount factor) is 10%. If the IRR is greater than the discount rate, the investment is acceptable (Abuk & Rumbino, 2020).

4) Payback Period (PP)

The Payback Period (PPC) is used to measure the length of time required to recoup the investment value, calculated by dividing the investment by the profit. A lower return on investment indicates a faster return on investment, making the business more profitable. The average return on investment (PP) for tilapia farming in the Tilapia Cultivation Village area of Mataram City is 11 months, or less than one year. Therefore, the business can be categorized as having a fast return on investment, given that the payback period is less than three years (Saputra et al., 2022).

CONCLUSION

From a technical perspective, the development of tilapia fish farming in the Fishery Cultivation Village in Mataram City is still hampered by the narrow and damaged production roads and the rising cost of feed. From a management perspective, fish farming is still not running optimally due to weak business planning, the non-functioning of group institutions, and the minimal implementation of cultivation SOPs. From a marketing perspective, the long trade chain means that farmers have not yet obtained profits according to actual market value. From a financial perspective, tilapia fish farming is feasible in both the short and long term. The results of the short-term financial analysis show a R/C value of 1.28, a profit of IDR 285,063,750/cycle, and a profitability of 28.44%. The long-term analysis shows a positive NPV value of IDR 2.46 billion, a Net B/C of 6.3, and an IRR of 49%, with a PP of 11 months.

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