Tuijin Jishu/Journal of Propulsion Technology
ISSN: 1001-4055
Vol. 45 No. 1 (2024)

Profitability of Fish Culture Using Budikdamber System Under Water Quality Control in Kediri City, Indonesia

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Abstract: - Budikdamber catfish business is one of fish cultivating method using bucket as rearing media that does not require large areas of land and large capital. The aim of this research is to analyze the effect of water quality on the profitability and financial feasibility of Budikdamber catfish business which using bucket media. The data analysis used in this research is water quality analysis, profitability and financial feasibility. The results of water quality measurements during the maintenance period were within normal limits based on the parameters of the average water temperature during maintenance range 27-31°C, pH values range 6.8-7.2, dissolved oxygen obtained at 5 – 6 mg/l, and ammonia results obtained at 0.5 -1.0 mg/L. Good water quality results in profitability parameters in the form of R/C of 2.98, a profit of IDR. 6,665,467, BEPs worth Rp. 512,687, BEPu of 26 Kg, and profitability of 174%. Meanwhile, the financial feasibility parameters produce an NPV value of IDR 10,660,120, an IRR of 22%, a B/C of 1.41 and a PP of 1.4 years so that the profitability and financial feasibility parameters showed Budikdamber catfish business is profitable and feasible. In addition, Budikdamber catfish business is not very sensitive to changes in operational costs and reduced benefits. In 1st scenario, costs increase by 40% and benefits decrease by 47.8%, in 2nd scenario, costs increase by 63.3% and benefits decrease by 40%, in 3rd scenario, costs up 183%, and 4th scenario benefits down 61.2%.

Keywords*: Budikdamber, Profitability, Water Quality*

1. Introduction

Fisheries production is expected to have a role as food availability supporter from animal protein sources in order to improve nutrition and aim to improve the quality of human resources [1]. The main cultivated freshwater consumption fish in Indonesia are gourami, carp, tilapia and catfish [2]. African catfish (*Clarias gariepinus*) one of freshwater fishes that widely cultivated commercially in Indonesian. However, the development of African catfish cultivation in Indonesia, there are many obstacles such as limited land and hight price of fish feed which continues to increase from year to year. Cultivating catfish in buckets is a solution to the

problem of limited land currently available, this is because cultivating fish in buckets can be done on limited land using the home yard and the capital required is not too large [3].

The Budikdamber system (Cultivation fish in buckets) is a buckets system for fish cultivation media as an alternative way to cultivate plants and fish in one rearing area [4]. Budikdamber is a fish production activity that possible to carried out by both experienced aquaculture communities and ordinary people who have never carried out cultivation activities before. This is due to the minimal volume of cultivation media in buckets rearing area [5]. Poklahsar Bankid Sejahtera is one groups under control of Fisheries and Maritime Service in Kediri City. Poklahsar Bankid Sejahtera has been established since 2020 and operates in various fields. The fields involved fisheries, agriculture and ikat weaving. Fishery products such as budikdamber (Figure 1) and floss catfish food. Agricultural products such as dried butterfly pea flowers, butterfly pea flower chips and butterfly pea syrup. Meanwhile, ikat products offered ikat cloth, goyor sarongs, ikat pouches, ikat school bags, ikat tote bags, ikat clothes, ikat outerwear, headbands, ikat hats, ikat necklaces and woven key chains. These three fields ware processed and marketed to the wider community. This is to increase the added value of a product compared to selling products without further processed. This group was founded to be able to develop products and promote to people outside the region. It can reach a wide market outside the region.

Figure 1. Catfish Budikdamber

Budikdamber is carried out to meet the input from the production of catfish floss that will be marketed. However, it will also be sold fresh to the local community. The catfish species used in budikdamber was pearl catfish. Pearl catfish is a type of fish that moves passively. It was suitable for fish cultivated with budikdamber system. Apart from this, feed behaviour of pearl catfish has a voracious appetite. Pearl catfish also fast growth. Poklahsar Bankid Sejahtera has received a grant in the form of facilities for implementing budikdamber from Kediri City Government through the Kediri City Fisheries and Maritime Service to improve quality of the facilities and infrastructure used is guaranteed.

Several factors considered in order to produce good quality of catfish are water quality and feeding frequency. Water quality is the main aspect in cultivating system, which includes temperature of 25 - 30^{O}C, optimal pH of 6.5 - 8, and turbidity of less than 400 NTU [6]. Good water quality delivered to lower mortality rate and lead to produce profits or a financially viable business. According to [7] measuring profitability to measure business performance achievements is an important element in efforts to estimate and assess changes in economic resources in the future and can be managed and controlled. On the basis of controlling changes in economic resources, it is possible to estimate the business capacity to generate cash and determine the suitability of business management strategies. The aim of this research was to analyze the effect of water quality on the profitability and financial feasibility of catfish farming using bucket media.

2. Methods

This research was carried out in May – December 2023, there are 30 members of the Poklahsar Bankid Sejahtera catfish cultivation business in Kediri City with 116 units of catfish buckets or "budikdamber" media. This location was chosen because this farmer uses a cultivation medium using buckets in the process of growing catfish into food fish. The data analysis used in this research is water quality analysis, profitability and financial feasibility.

Water quality analysis includes: temperature, pH, DO, ammonia, nitrate and nitrite at catfish farming business, including:

Temperature

Temperature is an important physical factor everywhere in the world. Rising temperatures speed up chemical reactions; According to Van't Hoff's Law, a 10°C increase in temperature will double the reaction speed, although this law does not always apply. For example, metabolic processes will increase to a peak with an increase in temperature but then decrease again. Any change in temperature tends to influence the number of chemical processes occurring simultaneously in plant and animal tissues, thereby affecting the biota as a whole.

pH

The level of H ions or pH in water is one of the chemical factors greatly influences the life of organisms in aquatic environment. These two expressions show that pH of water can be measured and pH value ranges from 0-14. A certain pH can describe whether the water is acidic or alkaline. As more CO^2 content produced from respiration, the reaction moves to the right and gradually releases H^+ ions which causes the water pH drop or more acid. The opposite reaction occurs during photosynthesis which requires a lot of CO^2 ions, causing the water pH to increase. During photosynthesis, phytoplankton and other aquatic plants will take CO^2 from the water during the photosynthesis process, causing the water pH increase during the day and decrease at night.

DO (Dissolved Oxygen)

Oxygen is very important as fundamental need of aquatic organisms for respiration. The optimal of dissolved oxygen is different based on species and stages of fish life. Likewise, in the same environment, the need of dissolved oxygen varies depending on the species of fish. In general, dissolved oxygen needed at an early stage is higher than at an advanced stage. Critical limits for fish depend greatly on acclimatization and other environmental factors.

Ammonia

Ammonia in waters comes from metabolic waste (excretions) of animals and the decomposition process of organic materials by microorganisms. In cultivation activities, the presence of ammonia results from the excretory activities of the biota itself and the decomposition process of organic material from leftover feed and manure during cultivation. Ammonia in waters will be found more in the form of ammonium ion if the pH of the waters is less than 7, whereas in waters with a pH of more than 7, free ammonia or non-ionized ammonia which is toxic is found in greater quantities.

Nitrate

Nitrate (NO_3) is a natural inorganic ion which is part of the nitrogen cycle. In nature, nitrogen occurs in the form of organic compounds such as urea, protein and nucleic acids or as inorganic compounds such as ammonia, nitrite and nitrate. Nitrate is formed from nitric acid which comes from ammonia through a catalytic oxidation process. Nitrite is also a metabolic product of the nitrogen cycle. Nitrates and nitrites are components that contain nitrogen bonded to an oxygen atom.

Nitrit

Nitrite (NO_2) is an intermediate form between ammonia and nitrate (nitrification) and between nitrate and nitrogen gas (denitrification). Therefore, nitrite is unstable in the presence of oxygen. The nitrite content in natural waters contains around 0.001 mg/L of nitrite. Nitrite levels of more than 0.06 mg/L are toxic to aquatic organisms. The presence of nitrites illustrates the ongoing biological process of breaking down organic materials that have low dissolved oxygen levels.

The analysis used to measure profit is R/C, BEP, profit and profitability.

1. R/C is a comparison between revenue and costs to measure business profits. If the R/C is more than 1, the business will make a profit [8], with the following formula:

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

2. BEP is a business without profit or does not experience a loss on certain units or sales. If the amount of production a business produces is above the break-even production amount, the business is declared profitable [9], with the following formula:

$$\text{BEPu} = \frac{\text{FC}}{\text{P} - \text{VC}}$$

Meanwhile, BEPs if the revenue from a business generates greater than the break-even revenue, the business is declared profitable, using the following formula:

$$\text{BEPs} = \frac{\text{FC}}{1 - \frac{\text{VC}}{\text{s}}}$$

3. Profit is the difference between revenue and total costs. If the value is positive and greater than 0 (zero) then the business is declared profitable [8], with the following formula:

$$\pi = TR - TC$$

4. Profitability is the ability of capital to generate profits in a business. If the capital issued in certain units will produce profits according to the percentage of profitability results [10], with the following formula:

$$\text{Profitability} = \frac{\pi}{M} \times 100\%$$

Meanwhile, financial feasibility uses NPV, B/C, IRR and PBP. The formula for calculating the financial feasibility of the catfish cultivation business is as follows:

1. *Net Present Value* (NPV) is the difference between the value of benefits and costs currently assessed. If NPV produces a positive value or greater than zero then it can be declared feasible [9], with the following formula:

$$NPV = \sum_{i=1}^{n} \overline{B_i} - \overline{C_i} = \sum_{i=1}^{n} N\overline{B_i}$$

2. *Benefit Cost Ratio* (B/C) is a comparison between the present value of net cash and the present value of a business's investment. If the B/C value produces a value of more than 1, the business is declared feasible [9], with the following formula:

$$B/C = \frac{\sum PVNet\ Benefit}{\sum PVInvesment}$$

3. *Internal Rate of Return* (IRR) is a value used as a measurement of capital's ability to generate profits in percentage form. If the IRR value is greater than the discount factor, the business is feasible [11], with the following formula:

$$IRR = i_1 + \frac{NPV_1}{NPV_1 + NPV_2} \times (i_2 - i_1)$$

4. *Payback Period* (PBP) is the ability of a business to return investment expenditures in a certain period. The faster the return on investment, the more feasible the business being run [11], with the following formula:

$$PBP = \frac{Investment}{net\ benefit/year}$$

3. Results And Discusion

Technical and Water Quality of Budikdamber Business

Budikdamber Media Preparation of Catfish Cultivation

The media used as a cultivation container is an 80L bucket (diameter 50 x height 58 cm). The stages of preparing the cultivation media consist of cleaning the container, placing it and filling it with water. At the budikdamber media preparation stage, the bucket that will be used as a cultivation medium is first cleaned using clean water and then dried as a sterilization process and without using any chemicals including lime/dolomite. Then the bucket is filled with 70% water, where the water used is ground water or well water with a depth of 12

meters. Filling the water takes 15 minutes and then leaving it for 24 hours before the fish are stocked. The process of raising fish in budikdamber media without the use of aeration and without the addition of fertilizer.

Distribution of Budikdamber Catfish Seeds

The fish seeds used were pearl catfish seeds which came from t Kediri City Fisheries Service with an initial size of 7-8 cm. The characteristics of the seeds are healthy, agile and come from superior parents. The number stocked in each bucket is 100 seed. Seed distribution without a quarantine process, but acclimatization is carried out first. During the spreading process, the seeds are first acclimatized or adapted to the prepared maintenance media. The characteristics of good fish seeds are: 1. Healthy and without defects 2. The same size of seeds 3. Response to feeding 4. Free from disease organisms 5. In accordance with standards [12].

Maintenance/Enlargement of Budikdamber Catfish

a. Feeding

The application of Budikdamber system and correct frequency of feeding is expected to reduce costs because this system saves land, water and feed usage but produces large production [4]. The length of maintenance time is 75-90 days depending on the target harvest weight that the fish achieves. The frequency of feeding is 2 times a day, 20 grams. The feed type used is manufactured feed or pellets with types 781-1, 781-2 and 781-3 where the administration is adjusted to the size of the fish. During maintenance, probiotics (EM4, water and Yakult) are added at a dose of 1 bottle cap. According to [13], one of the factors supporting the success of cultivation is feed. Feed utilization is greatly influenced by the nutritional content and digestibility of the feed. The additional use of probiotics can improve the quality and digestibility of feed. Probiotics produce enzymes that facilitate the digestive process such as amylase, protease, lipase and cellulase [14] which are able to break down complex molecules into simpler molecules. Growth occurs because the energy requirements required exceed the energy required for body maintenance or other activities so that the excess energy can be utilized for growth [13].

b. Water Quality Management

Water quality is the main factor supporting survival rate of cultivated organisms including: temperature, pH, dissolved oxygen (DO), salinity, NO2, NO3, and NH4 [15]. Change the water as much as 50% of the water flow once a week. The temperature, DO and pH parameters were measured every day, while the ammonia, nitrate and nitrite parameters were measured once every 2 weeks. The aquatic environment as a living place or living medium for aquatic organisms is one of the most important aspects that needs to be considered when carrying out aquaculture. Water quality of a cultivation container greatly determines the life of aquatic organisms being cultivated, both from the aspect of water source used, such as physical, chemical and biological parameters, as well as the aspects needed to manage water quality. DO and temperature measurements were carried out using DO meter, pH measurements used universal pH indicator paper while measurements of ammonia, nitrate and nitrite used a Salifert Freshwater Test brand test kit with colorimetric techniques. The results of water quality in the budikdamber rearing media are as shown in Table 1.

Table 1. Water quality of Budikdamber catfish business

No.	Water Quality	Result	SNI 6484.3
1	Temperature (°C)	27 - 31°C	25 - 30°C
2	pH	6.8 - 7.2	6.5 – 8.0
3	DO (mg/L)	5 – 6	Min. 3
4	Ammoniac (mg/L)	0.5 - 1.0	Max. 0.1
5	Nitrite (mg/L)	0 - 0.1	0.01 -1.0
6	Nitrate (mg/L)	0 - 2	0.1 – 2.0

The results of water quality measurements during the maintenance period were within normal limits. Water quality that is not good and meets optimum limits can affect the growth and survival of fish and cause disease attacks in fish [16]. The average water temperature during maintenance ranges from 27-31°C and is still within the normal range. According to SNI (2014), the temperature range for growing catfish is between 25-30°C. The

pH value obtained during maintenance ranges from 6.8-7.2 and can be categorized as still within normal limits. This is supported by SNI (2014), that the pH for catfish growth ranges between 6.5-8.0. Dissolved oxygen was found to be 5 – 6 mg/l and in the normal or sufficient category. Dissolved oxygen in waters is a limiting factor for aquatic organisms in carrying out activities [17]. The ammonia results obtained were 0.5-1.0 mg/L which is quite high. According to [13], a good ammonia level is <1 mg/L. Ammonia concentrations above 1.5 mg/L can be toxic to fish, making it an obstacle in cultivation.

Harvesting Budikdamber Catfish Business

Catfish harvest is carried out after a maintenance period of 60 days. The total weight of the catfish that has been harvested is then weighed. Harvesting kale is done by cutting the stems, leaving approximately 10 cm of stems from the roots so that they can grow again and be harvested in the next 15 days. The harvesting process can be done in part or in total. Partial harvesting is done without drying, simply by selecting the fish to be harvested according to the desired size or according to consumer wishes. Meanwhile, total harvesting is harvesting that is carried out all at once by removing all the water.

Figure 2. Budikdamber Catfish Production

Profit and Financial Feasibility of the Budikdamber Business

Capital, Production Costs and Revenue from the Budikdamber Catfish Business

Micro-scale fish farmers who carry out fish farming activities obtain capital for operational costs partly from bank loans and partly from loans from other parties such as family [18]. Capital covers the sources of capital used to run the Budikdamber catfish business. The capital used for Budikdamber catfish business is capital comes from the owner's personal funds and the Fisheries Service (Table 2). The fixed capital of Budikdamber catfish business for products with sales sizes 8-9 and 12 per kilo gram is IDR 25,706,401 and annual depreciation costs are IDR 365,391, with the following details:

Table 2. Fixed Capital of Budikdamber Catfish Business

No	Fixed Capital	Quantity (Unit)	Price (IDR/Unit)	Total Price	Technical Age (years)	Depresiation (/year)
1	Land	30	800000	24,000,000	-	
2	Bucket 80L	3	88,000	264,000	5	52,800
3	Bucket 150L	7	185,000	1,295,000	5	259,000
4	Plastic cups 250ml	155	171	26,505	1	26,505
5	Wire	4	1,700	6,800	3	2,267

6	Hose	3	5,800	17,400	5	3,480
7	Water Pipe Instalation	8	6,462	51,696	5	10,339
8	Feed bucket	1	15,000	15,000	3	5,000
9	Solder	1	30,000	30,000	5	6,000
Total				25,706,401		365,391

Resource: (Authors, 2023)

Production costs for Budikdamber Catfish Business include fixed costs (Fix Cost) and variable costs (Variable Cost). Production costs for catfish products with sales sizes of 8-9 and 12 per kilo gram consist of fixed costs and variable costs. Fixed costs are IDR 593,558 per year (Table 3). Fixed costs include maintenance costs, PBB, and depreciation costs. The following is a breakdown of the fixed costs of Budikdamber Catfish business at Poklahsar Bankid Sejahtera.

Table 3. Fixed Costs of Budikdamber Catfish Business

No	Fixed Costs Components	Value (IDR)
1	Maintenance Cost/years	194,167
2	PBB	34,000
3	Depreciation Cost/years	365,391
Total		593,558

Resource: (Authors, 2023)

Variable costs are costs required in one production cycle. Variable costs are IDR 2,766,975 per cycle (Table 4). Variable costs include costs for 7 cm catfish seeds, kale seeds, feed, probiotics, planting media and plastic. The following is a breakdown of variable costs of Budikdamber catfish products with sales sizes of 8-9 and 12 per kilo gram.

Table 4. Variable Costs of Budikdamber Catfish Business

No	Variable Costs Components	Value (IDR)
1	Catfish seeds	871,875
2	Kale seeds	647,400
3	Feed (kg)	1,200,000
4	Probiotic (bottle)	13,200
5	Planting media/coconut fiber (kg)	24,000
6	Plastic	10,500
Total		2,766,975

Resource: (Authors,2023)

Revenue from production IDR 10,026,000 per year (Table 5). The annual harvest yield is 313.50 kg with a harvest size of 8-9 per kg resulting in revenue of IDR 6,270,000 per year. The annual harvest yield is 187.80 kg with a harvest size of 12 per kg resulting in revenue of IDR 3,756,000 per year. The price of catfish is set at IDR 20,000 per kg. The following is a detailed calculation of revenue from Budikdamber Catfish business for products with sales sizes of 7 – 8 and 12 per kilo gram.

Table 5. Revenue of Budikdamber Catfish Business

No	Data	Cycles Number per years	Product Number per years	Cost (IDR)	Total (IDR)
1	Size 25cm (8-9 fish)	3	313.50	20,000	6,270,000
2	Size 20cm (12 fish)	3	187.80	20,000	3,756,000
Total Revenue			501		10,026,000

Resource: (Authors, 2023)

Profitability of Budikdamber Catfish Business

Revenue Cost Ratio (R/C) is a comparison value between revenue and costs incurred. The R/C from Budikdamber catfish business obtained from revenues of IDR 10,026,000 and divided by the total costs of IDR 3,360,533, the R/C is 2.98, so this business is profitable to develop because the R/C ratio is >1.

Profit is revenue minus costs. Total income (TR) is influenced by price and fish biomass. Fish biomass is influenced by individual fish growth and fish death. Meanwhile, cost components include seed procurement costs, labor costs, feed costs, facilities and equipment costs, energy costs, probiotic costs and chemical costs (including fertilizer) [19]. Profits from the Budikdamber catfish business with product output with sales sizes of 8-9 and 12 per kilo gram are obtained from total sales (total revenue) of IDR 10,026,000 and reduced by total costs (TC) amounting to IDR 3,360,533, a gross profit of IDR 6,665,467 was obtained. Then you have income tax of IDR 666,547, the profit after income tax is IDR 5,998,920. To obtain net profit, the calculation is carried out after zakat with the zakat provision being 2.5% of profits before zakat. The amount of zakat is IDR 149,973.01 so that the net profit after zakat is IDR 5,848,947.4.

BEP or break-even point where the company does not experience losses but also does not make a profit. BEP consists of BEP units and BEP sales. BEP units for products with a sales size of 8-9 per kilo gram are calculated from the total cost (TC) of IDR 3,360,533 divided by the selling price of IDR 20,000 minus variable costs of IDR 2,766,975 with total production for one year of 313.50 kg, then we get BEP unit is 26 kg. The meaning of the BEP unit is that the business will experience a break-even point, namely no profit and no loss when producing 26 kg of catfish. The BEP price is calculated by dividing the total cost of IDR 3,360,533 with the product sales margin per kilogram. This business reaches the break-even point when it produces 26 kg of catfish with income of IDR 512,687.

Unit BEP for a product with a sales size of 12 per kilo gram is calculated from the total cost (TC) of IDR 3,360,533 divided by the selling price of IDR 20,000 minus variable costs of IDR 2,766,975 with total production for one year of 187.80 kg, then unit BEP is obtained 15 kg. The meaning of BEP unit is that the business will experience a break-even point, namely no profit and no loss when producing 15 kg of catfish. The BEP price is calculated by dividing the total cost of IDR 3,360,533 with the product sales margin per kilo. This business reaches the break-even point when it produces 15 kg of catfish with income of IDR 307,122. According to [20], differences in selling prices and production costs depending on location and cultivation process can affect the BEP value of sales and production.

Profitability of Budikdamber Catfish business at Poklahsar Bankid Sejahtera obtained by comparing net profit with working capital or assets which is then converted into a percentage by multiplying by 100%. Profit net on products with sales sizes of 8-9 and 12 per kilo gram of IDR 5,848,947.4 and working capital or TC of IDR 3,360,533, resulting in a profitability of 174%, then this business can collect a profit of IDR 174 from the business capital used. Thus, this business is declared profitable because profitability > loan interest rate.

Financial Feasibility of Budikdamber Catfish Business

Net Present Value (NPV) is a financial analysis to determine whether a business is feasible or not by calculating the difference between current income and expenses in a certain period. The NPV for the Budikdamber catfish business in Poklahsar Bankid Sejahtera was IDR 10,660,120, so this business is worth running because the NPV is > 0.

IRR is a long-term financial analysis to measure the percentage of a business's ability to repay loans or capital. The IRR for the Budikdamber catfish business at Poklahsar Bankid Sejahtera was obtained at an IRR of 22%, so this business is worth running because the IRR > the interest rate (discount rate).

Net Benefit-Cost Ratio (Net B/C) is the ratio between net benefits with a net benefit that is detrimental to the business. Net This Benefit Cost Ratio is obtained by dividing the present value of the benefit flow (PV) with the present value of the cost flow, which aims to find out comparison between the total costs incurred in a business against the benefits it will obtain. The feasibility indicator is if Net B/C is greater than one (Net B/C>1) then the business is worth running. On the contrary if Net B/C is less than one (Net B/C<1) then the business is not worth running. The Net B/C value is greater than one which means every additional cost to the business Cultivation will produce benefits that are greater than the costs added. The Net Benefit-Cost Ratio (Net B/C) for the Budikdamber catfish business at Poklahsar Bankid Sejahtera is 1.41. This business is worth running because the Net Benefit-Cost Ratio (Net B/C > 1). The results showed [21], the highest BCR was also obtained in fish fed the right pellet feed due to the low cost of feed formulation. SAFM pellets are made from locally available feed ingredients and are cheaper compared to commercial feed produced with more expensive animal origin feed ingredients.

Payback period for the Budikdamber catfish business at Poklahsar Bankid Sejahtera is 3.87 years or 46.44 months, and 1,393.2 in days. So, in 3.87 years, the Budikdamber catfish business at Poklahsar Bankid Sejahtera can return the initial capital or investment.

Sensitivity Analysis of Budikdamber Catfish Business

Sensitivity analysis is an analysis to see the influences that will occur due to changing circumstances. Sensitivity analysis of the Budikdamber Catfish business in Poklahsar Bankid Sejahtera uses the following calculations:

1st Scenario - Costs Increase 40.0% Benefits Decrease 47.8%

Sensitivity analysis assuming costs increase 40.0% from IDR 3,360,533 to IDR 4,704,746.01 and benefits decrease from IDR 10,026,000 to IDR 5,233,572. Based on these assumptions, the Catfish Budikdamber business at Poklahsar Bankid Sejahtera experienced a loss, because NPV < 0, namely Rp. - 13,271, IRR of 12%, Net B/C < 1 with a value of 0.992 and PP with a length of 3.40 years.

2nd Scenario - Costs Increase 63.3% Benefits Decrease 40%

Sensitivity analysis assuming costs increase 63.3% from IDR 3,360,533 to IDR 5,487,750 and benefits decrease 40% from IDR 10,026,000 to IDR 6,015,600. Based on these assumptions, the Catfish Budikdamber business at Poklahsar Bankid Sejahtera experienced a loss, because NPV < 0, namely IDR - 18,787, IRR of 12%, Net B/C < 1 with a value of 0.989 and PP with a length of 3.41 years

3rd Scenario - Costs Increase 183% Fixed Benefits

Sensitivity analysis assuming costs increase 183% from IDR 3,360,533 to IDR 9,496,866 and costs remain fixed. Based on these assumptions, the Budikdamber Catfish business at Poklahsar Bankid Sejahtera experienced a loss, because NPV < 0, namely IDR - 11,530, IRR of 12%, Net B/C < 1 with a value of 0.9932 and PP with a length of 3.40 years.

4th Scenario - Fixed Benefit Costs Decrease 61.2%

Sensitivity analysis assuming fixed costs and benefits decreased 61.2% from IDR 10,026,000 to IDR 3,890,088. Based on these assumptions, the Budikdamber Catfish business at Poklahsar Bankid Sejahtera experienced a loss, because NPV < 0, namely Rp. - 9,151, IRR of 12%, Net B/C < 1 with a value of 0.995 and PP with a length of 3.39 years.

Based on the 4 scenarios in the sensitivity analysis, it shows that the business is not very sensitive to changes because the new business experiences losses or is not feasible when changes occur, increasing costs by 40% and decreasing benefits by 47.8%, so the Budikdamber Catfish business at Poklahsar Bankid Sejahtera can be said to be not too sensitive to change.

4. Conclusions And Recommendations

Poklahsar Bankid Sejahtera has implemented good cultivation methods and resulting water quality based on temperature, DO, pH, ammonia, nitrate and nitrite parameters is within normal condition. The profitability of

Pokhlasar Bankid Sejahtera through budikdamber business based on the parameters of R/C, profit, BEPs, BEPu and profitability produces profitable criteria. Meanwhile, the financial feasibility of water quality under normal limit conditions produces a decent value. Recommendation that can be given to catfish budikdamber business in order to increase productivity and profits are method and feeding frequency needs to be improved and complies with CBIB standards for feeding will be optimal and will reduce affect water quality and also need to increase aeration in the system for oxygen supply.

5. Acknowledgement

The author would like to thank the Institute for Research and Community Service (LPPM) Brawijaya University for providing financial support through Research Grant (HPU) program for Fiscal Year 2023, Poklahsar Bankid Sejahtera and Journal Management for supporting the publication of the article.

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