International Applied Science
UMJember Proceeding Series (2024) Vol. 3 No 2: 137-149

Proceedings of the SEMARTANI 3 2024

Analysis of Added Value and Financial Feasibility of the Oyster Mushroom Agroindustry in Jember Regency

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Published: Juli, 2024

Abstract: Jember Regency is one of the oyster mushroom producing districts in Java Province East. The relatively low price of raw oyster mushrooms means that it is not enough to support the economy of oyster mushroom farmers. Efforts to get added value from oyster mushrooms are by processing oyster mushrooms into processed products. The research aims to determine the level of financial feasibility of businesses and the added value of the oyster mushroom agro-industry in Jember Regency. The research was carried out using survey methods and in-depth interviews with oyster mushroom and industry experts as well as secondary data from literature, articles, journals and data from the Central Statistics Agency. Calculating added value using the Hayami method and calculating financial feasibility analysis of products that have high added value. The results of the added value analysis using the Hayami method show that the oyster mushroom product that has the highest added value is oyster mushroom broth amounting to IDR 172,688- (profit percentage 69.08%), oyster mushroom kebab IDR 47,751 (profit percentage 59.69%) and followed by crispy oyster mushrooms amounting to IDR 40,158 (profit percentage 57.37%) followed by oyster mushroom nuggets amounting to IDR 37,048 (profit percentage 55.57%). The financial feasibility results show that the oyster mushroom agro-industry in oyster mushroom broth products is feasible to run. These eligibility criteria show that at an interest rate of 9.75% the NPV value is IDR 626,388,706, the IRR value is 43.25%, the Net B/C Ratio is 1.12 production break-even point is 22,716 units per year, return on capital is 3.86 years. Sensitivity analysis of financial feasibility with an increase in raw material prices of 10%, 20% and 30% still shows a feasible decision. In the sensitivity analysis, a decrease in the product's selling price of 5% and 10% indicates that the decision is feasible, while a decrease in the product's selling price of 15% indicates that the decision is not feasible to carry out..

Keywords: Oyster mushrooms, Hayami method, financial feasibility analysis.

INTRODUCTION

Indonesia is an agricultural country that is rich in agricultural, forestry, plantation, livestock and fishery products. These natural conditions provide opportunities for the majority of Indonesian people to carry out farming activities in the agricultural sector and those related to agriculture. In the agricultural sector, horticulture has great prospects for development. This is related to the many horticultural varieties that have high economic value if cultivated properly. The development of horticultural crop commodities is based on market share, competitive advantage, economic value of production area distribution and agroecosystem suitability. The leading national horticultural commodities include bananas, mangoes, oranges, durian, potatoes, red chilies, shallots and nuts. However, specific areas also include oyster mushrooms as a leading commodity. The abundant availability of raw materials, human resources, agro-climatic suitability, and fairly high market absorption make mushroom commodities a great opportunity to be developed on a large scale. Mushrooms are an organic vegetable commodity that does not use chemicals, so they are very helpful in preserving the environment because waste originating from planting media or mushroom growing media can be used as organic

fertilizer and is very good for soil and plant fertility. Fungi can live on rotting wood, sawdust, and straw. Based on research results, it was noted that oyster mushrooms contain 19-30% protein, 50-60% carbohydrates, and contain a number of amino acids, vitamin B1, vitamin B2, vitamin B3, vitamin B5, vitamin B7, vitamin C, and other minerals [1].

Indonesia is also a producer of oyster mushrooms, where in 2021 oyster mushroom products amounted to 69,243 tons, increasing to 84,456 tons in 2022 [2]. Meanwhile, Jember Regency is one of the oyster mushroom producing districts in East Java Province. The harvest area for oyster mushroom vegetables in East Java in 2021 was 557,145 ha, then in 2022 it increased by 625,284 ha [3]. Oyster mushroom production in Jember Regency for East Java Province is the first highest production at 66,112 quintals, followed by Kediri district at 62,158 quintals and Malang at 52,609 quintals [4].

Oyster mushrooms or Pleurotus Ostreatus are a type of mushroom that can be consumed. This mushroom has good nutrition and taste so it is liked by the public. Oyster mushrooms are very easy to cultivate, this is because the raw materials are easy to obtain, the price is cheap, the mushrooms are easy to adapt and do not know the harvest season [5]. The oyster mushrooms produced are quite abundant and produced sustainably, but this is not enough to support the economy of oyster mushroom farmers. This is due to the limited knowledge and technology possessed by mushroom farmers so that the oyster mushrooms produced so far have only been sold in raw form at low prices relatively cheap without changing it into other products that have higher economic value. One agricultural product that can be developed easily and is in high demand is mushrooms. White oyster mushroom cultivation is an agricultural business with considerable commercial opportunities because its economic value continues to increase. The problems often faced by mushroom farmers include mushroom production capacity is still low, marketing still uses traditional methods, and does not use good financial bookkeeping, so partners will never know for sure the actual profit amount [6].

The benefit that can be obtained by cultivating mushrooms is that it can increase your income. Especially for mushroom farmers who cultivate and process. Oyster mushrooms have become a trend recently because they aim to increase income and improve people's consumption patterns. This business is very promising because the price and public consumption interest are quite high. The oyster mushroom business trend continues to increase which has a positive impact on demand for mushrooms [7]. Processing oyster mushrooms into various processed products is an effort made to increase the selling value of oyster mushrooms. This prospect is what makes oyster mushrooms a brilliant idea for opening new business opportunities for those with an entrepreneurial spirit. Apart from that, it can also open up new job opportunities to reduce unemployment in Jember Regency. The development of the processed oyster mushroom agroindustry will increase economic productivity and can stimulate primary agricultural production, there by generating incentives from the demand and supply side.

The Hayami method is a value added analysis method that can estimate changes in the value of raw materials after receiving treatment. The value added method is one of the most important indicators resulting from a company's economic activities and reflects its economic strength [8]. The Hayami method was chosen because by using the Hayami method, apart from knowing the added value of a product, you can also find out the amount of output value, production productivity, and also the amount of remuneration to owners of production factors such as capital, donations of other inputs, company profits, and labor. Financial analysis is a feasibility analysis that looks from the perspective of the company as owner. Several other things that must be considered in financial analysis are the timing of returns before the parties interested in project development run out of capital [9].

The existence of an agro-industry that supports the added value of agricultural products is very beneficial in increasing income, because the easily damaged nature of agricultural products can be minimized with further processing, and these processed products have a higher selling value compared to unprocessed agricultural products. High production activities with efficient costs are the entrepreneur's goal in order to obtain high income. To avoid the possibility of the company experiencing losses and to find out the potential efficiency of the business carried out by the company, it is necessary to analyze the position of costs and income obtained by the company to find out what kind of business is being carried out. Therefore, researchers want to know the level of financial feasibility of businesses and the added value of the oyster mushroom agro-industry in Jember Regency.

METHOD

The research was carried out in Jember Regency, using a purposive method of determining the location, taking into account that in this area there is an oyster mushroom processing agro-industry. Apart from that, this area is the largest oyster mushroom producing area in East Java. This research uses two sources and data collection techniques, namely:

1) Primary data was obtained directly using interview techniques with entrepreneurs and workers as well as related parties.
2) Secondary data is data obtained from various references, scientific journals, publications, as well as report data from related agencies such as the Central Statistics Agency, along with publications that are relevant to this research. The agro-industry sampled in this research is 1 oyster mushroom processing entrepreneur who already has a brand and business license.

Meanwhile, the procedure for calculating added value using the Hayami method is shown in Table 1.

Table 1. Calculation of added value based on the Hayami method

Variable	Mark
Output, Input, and Price	
Output (Kg)	(1)
Input (Kg)	(2)
Labor (HOK)	(3)
Conversion Factor	(4) = (1)/ (2)
Labor Coefficient (HOK)	(5) = (3)/ (2)
Output Price (Rp/Kg)	(6)
Direct Labor Wages (Rp/HOK)	(7)
Revenue and Profits	
Price of Raw Materials (Rp/Kg)	(8)
Other Input Contributions (Rp/Kg)	(9)
Output Value (Rp/Kg)	(10) = (4) x (6)
a. Added Value (Rp/Kg)	(11a) = (10) - (9) - (8)
b. Value Added Ratio (%)	(11b) = (11a)/(10) x 100 %
a. Direct Labor Income (Rp/Kg)	(12a) = (5) x (7)
b. Labor Share (%)	(12b) = (12a)/(11a) x 100 %
a. Profit (Rp/Kg)	(13a) = (11a) - (12a)
b. Profit Rate (%)	(13b) = (13a)/(11b) x 100 %
Remuneration for Owners of Production Factors	
Margin (Rp/Kg)	(14) = (10) - (8)
Direct Labor Income (%)	(14a) = (12a)/(14) x 100 %
Contribution of Other Inputs (%)	(14b) = (9)/ (14) x 100 %
Company Owner Profit (%)	(14c) = (13a)/(14) x 100 %

This financial feasibility analysis comes from investment cost structure data, fixed costs, variable costs, and assumed costs in the oyster mushroom agroindustry. Assessment of the financial feasibility of the oyster mushroom agroindustry is carried out using financial feasibility criteria which include Net Present Value (NPV), Internal Rate of Return (IRR), Net Benefit/Cost Ratio (Net B/C Ratio), Break Event Point (BEP), and Pay Back Period (PBP). In analyzing the financial feasibility of the oyster mushroom agro-industry, to anticipate the possibility of changes in parameters that influence investment decisions, a sensitivity analysis will be carried out to determine the limits of parameter changes that are still acceptable in investing in the oyster mushroom agro-industry.

1) *Net Present Value* (NPV)

The NPV method requires data on initial cash outflows, future net cash inflows and the desired minimum rate of return [10].

$$NPV = \sum_{t=1}^{n} \frac{Bt-Ct}{(1-i)^t} \quad \ldots\ldots (1)$$

Information:
B = profit
C = cost
i = discount rate (interest rate)
t = period
n = age of business
Assessment criteria:
If NPV > 0, then the business is feasible
If NPV = 0, then the business has no profit and no loss
If NPV < 0, then it is not feasible

2) *Internal Rate of Return* (IRR)

Internal Rate Of Return(IRR) is used to predict the potential profit of an investment or find out the maximum interest rate for a business so that the NPV is at 0 or up to the limit of profit and loss [11].

$$IRR = i' \frac{NPV'}{NPV'-NPV''}(i'' - i') \quad \ldots\ldots (2)$$

Information:
NPV' = NPV which is still positive
NPV" = negative NPV
i' = discount rate which still gives a positive NPV
i" = discount rate which gives a negative NPV
Assessment criteria:
If IRR > the applicable interest rate, then the project is declared feasible
If the IRR < the applicable interest rate, then the project is declared unfeasible

3) *Net Benefit/Cost Ratio* (*Net* B/C *Ratio*)

According to [12] Net Benefit Cost Ratio (Net B/C Ratio) is a comparison between the profits obtained and the total costs incurred. Net Benefit Cost Ratio (Net B/C Ratio).

$$Net\ \mathrm{B/C}\ Ratio = \frac{\sum_{t=1}^{n} \frac{Bt}{(1-i)^t}}{\sum_{t=1}^{n} \frac{Ct}{(1-i)^t}} \quad \ldots\ldots (3)$$

Information:
B = profit
C = cost
i = discount rate (interest rate)
t = period
Assessment criteria:
Net B/C Ratio > 1: the business is feasible because it provides profits
Net B/C Ratio = 1: the business has no profit and no loss
Net B/C Ratio < 1: the business is not feasible because it is experiencing losses

4) *Break Event Point* (BEP)

Break Even Points(BEP) is the break-even point at which total income is equal to total costs [13]. BEP can be done in two ways, namely on the basis of rupiah selling prices and on production:

(1) BEP based on selling price:

$BEP_{(Rp)} = \frac{FC}{1\frac{VC}{S}}$ ……..…… (4)

(2) BEP on production basis:

$BEP_{(V)} = \frac{FC}{P-V}$ ……..……..…. (5)

Information:
FC = Fixed costs (Rp)
VC = Variable costs (Rp)
C = Production (kg)
P = Unit sales (Rp)
S = Total sales (Rp)
V = Variable cost per unit (Rp)

5) *Pay Back Period* (PBP)

The Payback Period (PP) method is a method used to calculate the length of the period required to return the money invested from the annual cash inflow (proceeds) generated by the investment project [10].

$PBP = \frac{Nilai\ Investasi}{Pendapatan}\ x\ 1\ tahun$ …… (6)

Assessment criteria:
PBP > maximum period: business is not feasible
PBP < maximum period: feasible business

6) Sensitivity Analysis

Sensitivity analysis is used to find out how far the business feasibility analysis is still feasible if there are changes in the values of the variables, both targets and constraints. The method used for sensitivity testing is the switching value method (replacement value). Switching value analysis (replacement value) used to find out how much change in sales value and variable costs will produce normal profits, namely NPV equals 0 or close to it, IRR equals the prevailing interest rate, Net B/C Ratio equals 1, and PBP equals the period in question used. By carrying out a sensitivity analysis, the possible consequences of these changes can be known and can be anticipated in advance to prevent losses in the project being planned [14].

RESULTS AND DISCUSSION

Value Added Analysis

Analysis Added value is a method of estimating the extent to which raw materials that receive treatment experience changes in value. Value added analysis is useful for estimating the remuneration received by agro-industrial entrepreneurs and measuring the amount of job opportunities created by agro-industrial entrepreneurs. The discussion of added value is divided into 3 parts, namely Output Value, Input and Price; Revenue and Profits; and Remuneration for the Owners of Production Factors. The oyster mushroom agroindustry in Jember Regency produces several product variants from oyster mushrooms, including oyster mushroom kebabs, oyster mushroom broth, oyster mushroom nuggets and crispy oyster mushrooms. The added value of each oyster mushroom product is shown in Table 2.

Table 2. Calculation of value added analysis using the Hayami method

	Variable	Oyster Mushroom Kebab	Oyster Mushroom Broth	Nuggets Oyster Mushroom	Crispy Oyster Mushrooms
I.	**Output, Input and Price**				
	1. Output (Kg)	50	20	50	35
	2. Input (Kg)	25	16	30	30
	3. Labor (HOK)	5	5	5	5

	4. Conversion factors	2.00	1.25	1.67	1.17
	5. Labor coefficient (HOK)	0.20	0.31	0.17	0.17
	6. Output price (IDR /Kg)	40,000	200,000	40,000	60,000
	7. Direct labor wages (IDR /HOK)	46,154	46,154	46,154	46,154
II	**Revenue and Profits**				
	8. Price of raw materials (IDR /Kg)	15,000	15,000	15,000	15,000
	9. Other input contributions (Rp/Kg)	17,249	62,312	14,619	14,842
	10. Output value (IDR /Kg)	80,000	250,000	66,667	70,000
	11. a. Added value (IDR /Kg)	47,751	172,688	37,048	40,158
	b. Value added ratio (%)	59.69	69.08	55.57	57.37
	12. a. Direct labor income (IDR /Kg)	9,231	14,423	7,692	7,692
	b. Share of labor	19.33	8.35	20.76	19,16
	13. a. Profit (IDR /Kg)	38,520	158,265	29,355	32,466
	b. Profit rate (%)	80.67	91.65	79.24	80.84
III	**Remuneration for Owners of Production Factors**				
	14. Margin (IDR /Kg)	65,000	235,000	51,667	55,000
	a. Direct labor income (%)	14.20	6.14	14.89	13.99
	b. Contribution of other inputs (%)	26.54	26.52	28,29	26.99

c. Company owner's profit (%)	59.26	67.35	56.82	59.03

Output Value, Input, and Price of Oyster Mushroom Agroindustry Products

Analysis of the added value of various variants of oyster mushroom agro-industry products illustrates how much added value each processing provides. In calculating the added value using the Hayami method, the production/output of oyster mushroom kebab products from the input of oyster mushrooms, namely 25 kg, can produce 50 kg of oyster mushroom kebabs. In the oyster mushroom broth product, an input of 16 kg of oyster mushrooms produces an output of 20 kg of oyster mushroom broth. For oyster mushroom nugget products, with an input of 30 kg, it produces 50 kg of oyster mushroom nuggets. Then the crispy oyster mushroom product with an input of 30 kg of mushrooms produces 35 kg of crispy oyster mushroom product.

The conversion factor value is calculated based on the division between the amount of output produced and the raw materials used. From the results of calculations for the oyster mushroom agroindustry on oyster mushroom kebab products, the conversion value was obtained, namely 2.00, which means that 2.00 / kg of oyster mushroom kebabs can be produced in 1 kg of oyster mushrooms. In the oyster mushroom broth product, the conversion value obtained is 1.25, which means that 1.25/Kg of oyster mushroom broth can be produced in 1 kg of oyster mushrooms. For oyster mushroom nugget products, the conversion value obtained is 1.67, which means that 1.67/Kg of oyster mushroom nuggets can be produced in 1 kg of oyster mushrooms. Then for the crispy oyster mushroom product, the conversion value was obtained, namely 1.17, which means that 1.17/Kg of crispy oyster mushrooms can be produced in 1 kg of oyster mushrooms.

The labor coefficient is the result of labor divided by the amount of raw materials used in production. From the results of the table above, the labor coefficient in the production of oyster mushroom kebabs is 0.20, which means that to process 1 kg of input, 0.20 labor is needed. In the oyster mushroom broth product, the labor coefficient is 0.31, which means that to process 1 kg of input, 0.31 labor is needed. The labor coefficient in the production of nugget oyster mushrooms is 0.17, which means that to process 1 kg of input, 0.17 labor is needed. Then for the crispy oyster mushroom product, the labor coefficient is 0.17, which means that to process 1 kg of input, 0.17 labor is needed.

Acceptance and Profits of the Oyster Mushroom Agroindustry

The output price is the selling price of oyster mushroom kebab products per kg, namely IDR 40,000, of which the oyster mushroom agroindustry sells products measuring 500 grams per piece. Labor wages are the costs incurred to pay for the labor required during one production process, on average IDR 46,154. For oyster mushroom broth products, the output price per kg is IDR 200,000, of which the oyster mushroom agroindustry sells products measuring 100 grams per piece. For oyster mushroom nugget products, the output price per kg is IDR 40,000, of which the oyster mushroom agroindustry sells products measuring 500 grams per piece. Then the crispy oyster mushroom product, the output price per kg is IDR 60,000, of which the oyster mushroom agroindustry sells products measuring 250 grams per piece

The price of raw materials used in the production of oyster mushroom kebabs, oyster mushroom stock, oyster mushroom nuggets and crispy oyster mushrooms is IDR 15,000 per kg. The contribution of other inputs used in one production process of oyster mushroom kebabs per kg is IDR 17,249. For oyster mushroom broth products, the contribution of other inputs per kg is IDR 62,312. For oyster mushroom nugget products, other input donations per kg are IDR 14,619. Then another input contribution of crispy oyster mushrooms per kg is IDR 14,842. The contribution of other inputs is the cost of using other inputs per kilogram of product.

The output value is the multiplication of the conversion factor by the output price. The output value of the oyster mushroom kebab product is IDR 80,000 per kg. In the oyster mushroom broth product, the output value is IDR 250,000 per kg. The output value for oyster mushroom nugget products is IDR 66,667 per kg. Then the crispy oyster mushroom product with a product value of IDR 70,000 per kg.

Added value is the increase in value of a product after undergoing a processing process, where the result is the output value minus the contribution of other inputs minus the price of raw materials, the resulting added value from oyster mushroom kebabs is IDR 47,751 per kg. The oyster mushroom broth product obtained an added value of 172,688 per kg. The added value of oyster mushroom nugget products is 37,048 per kg. Then the added value from crispy oyster mushrooms is IDR 40,158 per kg. The added value ratio is the ratio between added value and output value. The resulting value added ratio for oyster mushroom kebabs is 59.69%. The value added ratio for oyster mushroom broth is 69.08%. In the oyster mushroom nugget product, the added

value ratio was 55.57%. Then the crispy oyster mushroom product produces an added value ratio of 57.37%. The amount of added value obtained from the calculation is in line with the ratio of added value to output value. Based on the Hayami methodratio added value is said to be low if the percentage is below <15%; moderate if the percentage is between 15%-14%; and high if it has a percentage above >40%. Based on these criteria, the processing of oyster mushroom kebabs, oyster mushroom broth, oyster mushroom nuggets and crispy oyster mushrooms has high added value because it has a percentage above >40%, meaning that the development of the oyster mushroom agro-industry provides added value for the business. The research also found that the most profitable product to produce based on added value analysis was oyster mushroom broth.

Direct labor income/rewards are wages earned by workers in one production. The result of labor income in oyster mushroom kebab products is IDR . 9,231/kg, so the share of labor in producing oyster mushroom kebabs is 19.33%. The profit obtained by the oyster mushroom agroindustry is IDR 38,520/kg or 80.67% of the added value of the product, which means that for every production, a profit of 80.67% of the added value is obtained. In the oyster mushroom broth product, labor income is IDR . 14,423/kg, so the share of labor in producing oyster mushroom stock is 8.35%. The profit obtained by the agro-industry is IDR 158,265/kg or 91.65% of the added value of the product, which means that for every production, a profit of 91.65% of the added value is obtained. The result of labor income in oyster mushroom nugget products is IDR 7,692/kg, so the share of labor in producing oyster mushroom nuggets is 20.76%. The profit obtained by the oyster mushroom agroindustry is IDR 29,355/kg or 79.24% of the added value of the product, which means that each time the product is produced, a profit of 79.24% of the added value is obtained. Then the crispy oyster mushroom product, labor income is IDR 7,692/kg, so the share of labor in producing oyster mushroom stock is 19.16%. The profit obtained by the agro-industry is IDR 32,466/kg or 80.84% of the added value of the product, which means that for every production, a profit of 80.84% of the added value is obtained.

Remuneration for Oyster Mushroom Agroindustry Production Factor Owners

Through added value analysis, companies are expected to be able to find out which products are the most profitable to produce. This margin is the difference between the value of the product and the price of oyster mushroom raw materials per kilogram for each successive product processing, resulting in a margin of IDR 65,000, IDR 235,000 IDR 51,667, IDR 55,000 distributed for each labor factor, namely direct labor income of 14.20%, 6.14%, 14.89% and 13.99% as well as for profits obtained by the company for each processing of oyster mushroom kebabs, mushroom broth oysters, oyster mushroom nuggets, crispy oyster mushrooms, namely 59.26%, 67.35%, 56.82% and 59.03%. From the research results, it is recommended that companies produce processed products with high added value, namely oyster mushroom broth.

Financial Feasibility Analysis

Based on Hayami's calculations above, the financial feasibility analysis that will be calculated is the oyster mushroom broth product because it has high added value. A synthetic flavoring that has been widely distributed on the commercial market is Monosodium Glutamate (MSG). The addition of MSG to food products is useful for enhancing and emphasizing the taste and adding umami or savory taste to food [15]. The results of Basic Health Research in 2018 also reported that MSG was consumed by around 77.6% of Indonesia's total population [16]. The World Health Organization (WHO) through the Joint FAO/WHO Expert Committee on Food Additives (JECFA) has set a safe threshold for MSG for humans, namely 120 mg/kg body weight per day. However, excessive use of MSG for a long time can cause health problems [15]. Increasing public awareness of healthy lifestyles has led to the development of an innovative natural flavoring product called mushroom stock powder. The use of mushrooms as an alternative natural seasoning, apart from providing a savory and delicious taste to food, also provides various health benefits, so mushrooms are often referred to as functional food. Mushroom-based flavorings can be made from various types of mushrooms including Basidiomycota mushrooms such as oyster mushrooms (Pleurotus ostreatus), shiitake (Lentinus edodes), straw mushrooms (Volvariella volvacea) and wood ear mushrooms (Auricularia auricula) [17]. However, oyster mushrooms are more popular with the public because of their high nutritional content, such as protein, phosphorus, iron, thiamin and riboflavin, low fat content, and have been used as traditional medicine. Apart from that, according to the Indonesian Mushroom Agribusiness Society (MAJI), of the various types of mushrooms, oyster mushrooms are the most popular among consumers. Oyster mushrooms dominate 55-60% of total national mushroom production, so the decision to build and develop an agro-industry or invest needs to consider a number of funding sources allocated to obtain a profit, which is called the financial aspect. To

determine whether the investment decision to be invested is feasible, a method or procedure is needed that can be used as a tool to assess the investment decision making. [18].

The process of assessing the feasibility of the oyster mushroom agro-industry business on oyster mushroom broth products from a financial aspect is carried out byanalyzeestimates of cash outflows and cash inflows over the life of a project or investment. Cash flow will be formed from estimated initial costs, working capital, operating costs, production costs and income. To determine the feasibility of the oyster mushroom agro-industry business, measuring instruments are used, namely Net Present Value (NPV), Internal Rate of Return (IRR), Net Benefit/Cost Ratio (Net B/C Ratio), Break Even Point (BEP), and Pay Back Period (PBP).

Assumption

As a starting point for financial analysis, assumptions are needed as a basis for estimating investment costs. The basic assumptions used for the financial analysis of the oyster mushroom agroindustry are adjusted to the conditions at the time the study was carried out and refer to the results of calculations in other aspects. The assumptions of the financial feasibility analysis of the oyster mushroom agro-industry in the oyster mushroom broth product were chosen because this product is a product that has high added value from the oyster mushroom agro-industry. The financial feasibility analysis assumptions can be seen in Table 3.

Table 3. Assumption of financial feasibility of oyster mushroom broth agroindustry

No	Description	Unit	Mark
1	Production for one year	Kg	48,000
3	Bank interest	%	9.75%
4	Monthly production	Kg	4,000
5	Initial business capital	IDR	303,458,655
6	Loan capital	IDR	708.070.195
7	Variable costs per Kg	IDR	9,630
8	Number of working days	Day	26
9	Months worked per year	Month	12
10	Working hours per day	O'clock	8
11	Number of shifts	Shifts	1
12	Capacity usage	%	100
13	Production per day	Kg	154
14	Raw material requirements	IDR	74,880,000
15	Average price	IDR	20,000
16	Gross income	IDR	960,000,000
17	Earnings before interest and taxes	IDR	262.196.150

Analysis Appropriateness Oyster Mushroom Broth Agroindustry Finance

Financial feasibility analysis is an activity that studies in-depth means of an activity or business that will be carried out, to determine whether or not a business activity is feasible or not. Thus, a feasibility study, which is also often called a feasibility study, is a consideration in making a decision, whether to accept or reject a planned business idea or project [19]. The results of the financial feasibility analysis of the oyster mushroom agroindustry can be seen in Table 4.

Table 4. Analysis of the financial feasibility of the oyster mushroom broth agroindustry

No.	Parameter	Unit	Amount
1	*Break Even Points* (BEP)	Units	22,716
2	*Pay Back Period* (PBP)	Year	3.86
3	*Net Present Value* (NPV)	IDR	626,388,706
4	*Internal Rate of* Return (IRR)	%	43.25%

5	*Net Benefit/Cost Ratio* (Net B/C)	- 1.12

Based on the results of the financial feasibility analysis of the oyster mushroom broth agroindustry in Table 4, it shows that the NPV value for developing the oyster mushroom agroindustry is IDR 626,388,706. These results show that the oyster mushroom agroindustry makes a profit in 10 years of IDR 626,388,706. This business has an NPV greater than 0 so this business is said to be feasible to run.

The IRR value shows the percentage of profit that will be obtained each year or is the business's ability to return bank interest. This means that the IRR is the same as the interest rate when NPV = 0. The IRR value is calculated by looking for positive and negative NPV values which are then interpolated, if the IRR > bank interest rate then the business is worth doing and if the IRR < bank interest rate then the business is not worth doing. The analysis results show that the IRR value is 43.25%. This means that when compared with the interest rate set at 9.75%, investment in the oyster mushroom agroindustry is still profitable to develop.

Another analytical tool that can be used to determine the criteria for whether a business is worth running or not is calculating the Net B/C Ratio. If the Net B/C Ratio > 1 then the business can be carried out, whereas if the Net B/C Ratio < 1, then the business cannot be carried out. The analysis results show that the Net B/C Ratio value is 1.12. This shows that the oyster mushroom agroindustry provides a net profit of1.12times the total costs incurred.

The minimum production capacity that must be produced is calculated using Break Even Point (BEP) analysis. Break Event Point analysis or break-even analysis can formulate the point at which revenues are equal to costs. The scale or volume of business carried out must be above the break-even point. The calculation of the break-even point for the oyster mushroom agro-industry shows that the minimum production that must be achieved is 22,716 units per year. This, when compared with the planned production capacity, is still smaller, making it worth pursuing. The Pay Back Period aims to find out how long it takes for business actors to return the investment/capital that was initially spent. The results of financial analysis calculations show that the payback period for investment capital is as long as 3.86 year. This means that the investment in the oyster mushroom agroindustry will be returned in the fifth year of the investment's lifespan. The faster the investment capital is returned, the business undertaken is worthy of further development.

Sensitivity Analysis

Sensitivity analysis was carried out to determine the impact of changes in production parameters on changes in production system performance in generating profits. Sensitivity analysis can be carried out by changing the financial analysis calculation scenario on several variables that are considered easy to change, such as raw material prices, interest rates, product selling prices, operational costs, etc. After carrying out the analysis, it can be seen to what extent the impact of these changes will have on the feasibility of the project and at what level the project is still feasible to implement. Sensitivity analysis can be carried out using a switching value approach, carried out by trial and error regarding the changes that occur, so that the maximum level of increase or decrease that can affect the feasibility of a business can be known [20]. Sensitivity analysis of the financial feasibility of the oyster mushroom agro-industry using five change scenarios using the switching value method, namely raw material prices increase 10%, raw material prices increase 20%, raw material prices increase 30%, decrease product selling prices 5%, decrease product selling prices 10% and a 15% reduction in product selling prices. The results of the sensitivity analysis of the financial feasibility of the oyster mushroom broth agroindustry can be seen in Table 5.

Table 5. Sensitivity analysis of the financial feasibility of the oyster mushroom broth agroindustry

Eligibility Criteria	BEP	PBP	NPV	IRR	Net B/C	Information
Raw materials up 10%	23,063	4.02	IDR 569,277,484	40.37%	1.11	Worthy
Raw materials up 20%	23,421	4.15	IDR 523.178.801	37.96%	1.10	Worthy
Raw materials up 30%	23,790	4.31	IDR 471,573,848	35.30%	1.09	Worthy

Selling price down 5%	25,140	4.72	IDR 328.255.128	27.94%	1.06	Worthy
Selling price down 10%	28,144	6.09	IDR 30,121,550	11.54%	1.01	worthy
Selling price down 10%	31,963	8.56	IDR -268,012,028	-9.07%	0.95	Not feasible

The results of the sensitivity analysis in Table 5 show that an increase in raw material prices of 10% does not affect financial feasibility decisions. This can be seen from several eligibility criteria which still indicate a feasible decision. The positive NPV value is IDR 569,277,484, the IRR value is greater than the discount rate determined at 40.37% of the Net B/C Ratio > 1, namely 1.11. The BEP value is below the annual production amount, namely 23,063 units per year, and the PBP is less than the project life, namely 4.02 current investment years.

The eligibility criteria for raw material prices to increase by 20% does not affect the financial feasibility decision. It can be seen that the financial feasibility criteria have a positive NPV value of IDR 523,178,801, the IRR value is greater than the discount rate determined at 37.96%, the net B/C Ratio > 1, namely 1.10, the BEP value is below the annual production amount, namely 23,421 units per year, and the PBP is still less than the age the project is 4.15 years. The third scenario, if the price of raw materials rises by 30%, shows that the agro-industry is still feasible to run. This is due to the positive NPV value of IDR 471,573,848, the IRR value is greater than the discount rate determined at 35.30% of the Net B/C Ratio > 1, namely 1.09. The BEP value is below the annual production amount, namely 23,790 units per year, and the PBP is less than the project life, namely 4.31 current investment years.

In scenarios 4, 5, and 6, changes in selling price reduction variables are used, namely 5%, 10%, and 15% respectively. A reduction in selling prices of 5% and 10% still shows that the decision is feasible because each financial feasibility criteria measurement tool used such as NPV, IRR, Net B/C Ratio, BEP, and PBP still produces values that are categorized as feasible. However, a 15% decrease in selling price indicates a decision that financial analysis is not feasible to carry out, because several financial feasibility criteria have values that do not meet the requirements for business feasibility to be carried out, namely NPV has a negative value of IDR -268,012,028. The calculated IRR value is still below the discount rate of -10.67% < discount rate of 9.75% and Net B/C Ratio < 1 of 0.95. If the Net B/C Ratio has a value of less than 1 then the business is not worth running. And produces a PBP value of 8.83 years. This shows that when the selling price has decreased by 15%, the agro-industry is not suitable for development, resulting in losses if not handled properly.

CONCLUSION

The results of the added value analysis using the Hayami method show that the oyster mushroom product that has the highest added value is oyster mushroom broth amounting to IDR 172,688- (profit percentage 69.08%), oyster mushroom kebab IDR 47,751 (profit percentage 59.69%) and followed by crispy oyster mushrooms amounting to IDR 40,158 (profit percentage 57.37%) followed by oyster mushroom nuggets amounting to IDR 37,048 (profit percentage 55.57%).

The financial feasibility results show that the oyster mushroom agroindustry in oyster mushroom broth products is feasible. These eligibility criteria show that at an interest rate of 9.75% the NPV value is IDR 626,388,706, the IRR value is 43.25%, the Net B/C Ratio is 1.12 production break-even point is 22,716 units per year, return on capital is 3.86 years. Sensitivity analysis of financial feasibility with an increase in raw material prices of 10%, 20% and 30% still shows a feasible decision. In the sensitivity analysis, a decrease in the product's selling price of 5% and 10% indicates that the decision is feasible, while a decrease in the product's selling price of 15% indicates that the decision is not feasible to carry out.

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