

FINANCIAL ANALYSIS, SUSTAINABILITY PROSPECTS, AND DEVELOPMENT STRATEGIES FOR SMOKE FISH INDUSTRY CLUSTER IN DEMAK REGENCY

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Abstract. The fishery sub-sector has an important role as a protein contributor for the people of Indonesia. Processing can make fish durable and allow it to be distributed from production centers to consumer centers. This study aims to analyze and identify financial, sustainability prospects, and strategic priorities for developing smoked fish industry clusters in Demak Regency. This study uses a survey method using financial analysis, Analytic Hierarchy Process (AHP) and SWOT. The method of determining the location used purposive sampling. The method of determining respondents using the census method and purposive sampling method. The results of the research on financial analysis of smoking fish are suitable for cultivation. NPV is Rp. 4,166,419,299, Net B/C is 1.47, IRR is 49.9%, and PP is for 1 year 1 month 18 days. The results of the study showed that the average total value of the sustainability of the fish smoking industry cluster was 2.216 or 73.8% (high). The results of research on the development strategy of smoking KUB Asap Indah fish are in the quadrant I (Progressive) growing and developing area. From the results of the SWOT analysis and the calculation of the overall evaluation value, it is obtained that the alternative and the main priority of the smoked fish business development strategy of KUB Asap Indah is that entrepreneurs can increase production and expand the market by making production and marketing plans.

1. Introduction

Indonesia has a high potential for fisheries resources, with a total production of 19,406,000 tons in 2013 with a total capture fishery of 6,150,000 tons. The northern part of Demak Regency is bordered by the waters of the North Coast of Java, which includes 4 sub-districts. Sea fish caught in Demak Regency is more than 2000 tons per year. Wet fish production is sold at 2 TPI, namely in Moro Demak with a production of 2,393,447 kg, and TPI Wedung with a production of 44,154 kg [1]. The role of fishery product processing activities is very important, because fishery products include products that decompose quickly if not processed/consumed immediately. The popular fish preservation process is by smoking.

Smoking is defined as the absorption of various chemical compounds from wood smoke into fish meat, accompanied by half drying and usually preceded by a salting process[12]. Fish smoking is one of the potential fisheries product processing businesses in Demak Regency. In 2000 a joint business group was established under the name “ASAP INDAH” which was chaired by Mr. Tejo. Fresh fish raw materials that are processed into smoked fish are imported from surrounding areas such as Demak, Pati, Rembang, Jepara, and Probolinggo. Types of smoked fish include catfish (*N. Thalassinus*), stingray (*Aetobatus* spp.), tuna (*Euthynnus alleterates*), catfish (*Clarias batrachus*), etc. The average amount of smoking of fish carried out by one processor ranges from 80 kg to 200 kg per day.

Based on this description, the objectives of this study include:

1. Financial analysis of the fish smoking industry cluster in Demak Regency
2. Identify the sustainability status of the fish smoking industry cluster in Demak Regency.
3. Develop a strategic priority for developing a fish smoking industry cluster in Demak Regency

2. Material and Methods

This study uses a survey method. By using financial analysis, Analytic Hierarchy Process (AHP) and SWOT. The method of determining the location used purposive sampling in the fish smoking industry cluster KUB Asap Indah, Bonang District, Demak Regency. The research was carried out from June to October 2021. There are 2 methods of determining respondents, namely: respondents from the fish smoking industry using the census method with 78 respondents and key person respondents using purposive sampling method with 24 respondents. The data used in this study are primary and secondary data.

Financial Analysis

1. Net Present Value (NPV)

Net present value is a method that calculates the difference between the present value of investments (capital outlays) and the present value of net cash receipts (present value of proceeds) both from operational cash flows and from cash flow terminals in the future come (during the life of the investment) [11]. The formula for calculating the net present value is:

$$NPV = \sum_{i=1}^n NB_i (1+i)^{-n}$$

atau

$$NPV = \sum_{i=1}^n \frac{NB_i}{(1+i)^n}$$

atau

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

where:

NB = Net benefit = Benefit – Cost

C = Investment cost + Operation cost

Bi = Benefit that has been discounted

Ci = Cost that has been discounted

i = Factor discount

n = Year (time)

If the result of the NPV calculation is greater than zero, then the fish smoking industry cluster is said to be feasible.

2. Internal Rate of Return (IRR)

Internal rate of return is the interest rate that makes the NPV equal to zero, because the present value of the cash flow at that interest rate is the same as the internal investment[11]. The formula for IRR can be formulated:

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

where:

i1 = discount rate that produces NPV1 (%)

i2 = discount rate resulting in NPV2 (%)

The fish smoking industry cluster is said to be feasible if the IRR value generated is higher than the loan interest rate prevailing in the community.

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

Net B/C is the ratio between positive net benefits and negative net benefits or the ratio between the profits from the business and the costs incurred [6]. The formula for the net benefit ratio is formulated:

$$NetB/C = \frac{\sum_{i=1}^n \overline{NB_i}(+)}{\sum_{i=1}^n \overline{NB_i}(-)}$$

where:

NB1 (+) = net benefit that has been positively discounted (Rp)

NB1 (-) = net benefit that has been discounted negatively (Rp)

If the Net B/C is greater than 1 (one) it means that the fish smoking industry cluster is feasible to work on and if it is smaller than 1 (one) it means that the fish smoking industry cluster is not feasible to work on.

4. Payback Period (PP)

Payback Period (PP) is the period for which the initial fee is refunded. The faster the return, the more attractive the alternative is compared to other alternatives [8]. The calculation of the payback period can be mathematically formulated as follows:

$$\text{Payback Period} = \frac{I}{AB} \times 1$$

where:

I = Investment value

AB = Net cash inflow that has been discounted

The business is feasible to run if the payback period of the business is not too long near the end of the project or longer than the life of the project. A relatively fast payback period is preferred for investment [8].

Sustainability Analysis

Sustainability analysis was carried out using the Analytical Hierarchy Process (AHP) method. To determine the status of sustainability, a sustainability analysis is carried out on its five dimensions which include: (1) ecology; (2) social; (3) economy; (4) institutional and (5) technology with. This method of analysis is carried out by weighting each parameter based on its level of importance, with a measurement scale of 1 to 9. The final assessment of the sustainability level is determined based on the multiplication of the weight and score of each parameter. The score is obtained from the assessment of a number of indicators with a score range of 0 to 3 [4]. The category of sustainability level namely: (i) high category (2.1-3.0); (ii) Medium category (1.1-2.0); and (iii) Low category (0.0-1.0) [2].

SWOT-AHP Analysis

Hierarchical structure is divided into four levels. The first level is the goal (goal) to be achieved by the decision; the second level is based on four groups of factors as defined by the SWOT technique: Strengths (S), Weaknesses (W), Opportunities (O) and Threats (T); the third tier is constituted by factors belonging to each of the four previous tier groups; and finally, the fourth level is based on strategies that must be evaluated and compared [7]. That each level will be compared in pairs and this procedure should be repeated separately for all possible pairs of SWOT factors [10]. From the pairwise comparison, the relative priority value of each SWOT factor is calculated using the eigenvalues.

The steps for the SWOT-AHP method are as follows [5,9,10,13]:

- Identify strategic factors that affect the company and conduct a SWOT analysis.
- Structure the hierarchy from a holistic managerial point of view (from the top level to the level where it is possible to intervene to solve the problem).
- Perform pairwise comparisons between SWOT factors and strategic sub-factors to determine their level of importance.
- Evaluate alternative strategies with respect to each SWOT factor.

Therefore, if V_j is the overall evaluation value of the strategy ($j = 1, 2, \dots, n$) then the general formula used is:

$$V_j = W_S \sum_{i=1}^{i=ms} W_{si} U_{si,j} + W_W \sum_{i=1}^{i=mw} W_{wi} U_{wi,j} + W_O \sum_{i=1}^{i=mo} W_{oi} U_{oi,j} + W_T \sum_{i=1}^{i=mt} W_{ti} U_{ti,j}$$

From this equation, the V_j value of each existing strategy will be obtained. The value of Strategic Efficiency j is obtained from the strategic efficiency assessment of each factor component using a rating scale of 0 to 5 conducted by the respondents, where the order of increasing the weight value of 0 is inefficient until the weight value of 5 is very efficient [3].

3. Results and Discussion

Characteristics of Smoked Fish Processor

The demographic conditions of smoked fish processors referred to in this study include age and number of family members. While the socio-economic characteristics of smoked fish processors include condition/level of education, length of business/experience. These characteristics are detailed in Table 1. The average smoked fish processor is included in the productive age. The average number of family members is 3-4. The average level of education is elementary school level. The average experience of running a smoked fish business is 11 to 15 years.

Table 1. Characteristics of Age, Education Level, Length of Business/Experience and Number of Family Members of Smoked Fish Processors

No	Description	Criteria	Smoked Fish Processor
1	Age	31-40	16 (20,51)
		41-50	30 (38,46)
		51-60	32 (41,03)
		Total	78 (100)
2	Level of education	No school	7 (8,97)
		Primary school	54 (69,23)
		Junior high school	16 (20,52)
		Senior High School	1 (1,28)
		Total	78 (100)
3	Business Length	1 – 5	4 (5,13)
		6 - 10	33 (42,31)
		11 – 15	41 (52,56)
		Total	78 (100)
4	Number of Family Members	1 – 2	1 (1,28)
		3 – 4	61 (78,20)
		≥ 5	16 (20,52)
		Total	78 (100)

Source: Primary Data Analysis, 2022.

Smoked Fish Financial Analysis

The investment assessment criteria are used to analyze the feasibility of the fish smoking business at KUB Asap Indah based on financial aspects.

Table 2. Results of feasibility analysis of KUB Asap Indah

Criteria	Assessment Results (DF 12%)
NPV	4.166.419.299
IRR	49,91296172
Net B/C	1,478069018
PP	1 year 1 month 18 days

Source: Primary Data Analysis, 2022.

The NPV obtained is Rp. 4,166,419,299 shows that KUB Asap Indah according to present value is profitable to run because it provides an additional net benefit of Rp. 4,166,419,299 over a period of 2 years. $NPV > 0$, it means that a project has been declared profitable and can be implemented [11]. Business can be said to be profitable if it has a Net B/C value of more than one, meaning that every one unit of cost incurred produces a profit of more than one unit [6]. The Net B/C value of 1.47 indicates that each additional cost incurred of Rp. 1 will result in an additional net benefit for KUB Asap Indah of Rp. 1.47. The IRR value obtained is 49.9 percent, which is greater than the discount rate used, which is 12 percent. The IRR percentage shows how much the business returns to the investment invested. The provision for decision making using the IRR method is that if the IRR is greater than the calculated level of capital costs, then the investment project is feasible to implement [11]. The payback period obtained is 1 year 1 month 18 days indicating that the investment return

period is faster than the age of the business. The business is feasible to run if the payback period of the business is not too long near the end of the project or longer than the life of the project. A relatively fast payback period is preferred for investment [8].

Smoked Fish Sustainability Analysis

Table 3. Sustainability of Fish Smoking Business

No	No Parameter	Sustainability Score
1	Ecological dimension	2,246813
2	Social dimensions	2,382447
3	Dimensions of the economy	2,753379
4	Institutional dimensions	1,96941
5	Dimensions of technology	1,730091
Average sustainability score		2,216428

Source: Primary Data Analysis, 2022.

The average total value of the sustainability of the fish smoking industry cluster is 2.216 or 73.8%. This value is included in the high category, so that it becomes a guide for managers and other stakeholders to maintain and increase the productivity of various programs and activities that support the sustainability of the KUB Asap Indah fish smoking industry cluster in Wonosari Village, Bonang District, Demak Regency.

Smoked Fish SWOT Analysis

Internal Environmental Analysis

Analysis of the internal environment of smoking KUB Asap Indah fish was carried out by identifying its strengths and weaknesses.

Table 4. Recapitulation of Weighted Internal Factors IFE Matrix

No	Strategic Internal Factors	Priority	Rating	Priority X Rating
Strength				
1	Easy capital with cooperatives	0,26	4	1,04
2	Short marketing channel	0,04	4	0,16
3	Locations concentrated in one place	0,38	3	1,14
4	The product has a distinctive taste and various types of smoked fish	0,07	3	0,21
5	Production capability	0,13	3	0,39
6	Product quality and quality	0,06	3	0,18
7	Institutional	0,06	3	0,18
Total		1		3,3
Weakness				
1	Human resources are still low	0,14	3	0,42
2	The packaging is still simple and there is no permit	0,22	3	0,66
3	The place of production is not spacious and has not paid attention to cleanliness	0,09	2	0,18
4	Technology limitations	0,07	3	0,21
5	Promotion is still minimal	0,07	3	0,21
6	Lack of innovation and creativity	0,06	3	0,18
7	Product durability	0,35	2	0,70
Total		1		2,56

Source: Primary Data Analysis, 2022.

Based on Table 4. the highest score on the power factor is the centralized location factor with a score of 1.14. The lowest score on the power factor is the short marketing channel factor with a score of 0.16. In the weakness factor, the highest score is found in the product resistance factor with a score of 0.70. The lowest score on the weakness factor, namely the factor where the production area is less extensive and has not paid attention to cleanliness and lack of innovation and creativity with a score of

0.18, from the strategic internal factor score on strength gets a total score of 3.3 while the strategic internal factor score on weakness gets a total score of 2.56.

External Environmental Analysis

Analysis of the external environment for smoking KUB Asap Indah fish was carried out by identifying the opportunities and threats possessed by smoking KUB Asap Indah fish.

Table 5. Recapitulation of Weighted External Factors of the EFE Matrix

No	Strategic External Factors	Priority	Rating	Priority X Rating
Opportunity				
1	Demand is getting higher	0,20	3	0,60
2	Population and economic growth	0,14	4	0,56
3	Government support	0,37	3	1,11
4	Technology and information development	0,06	3	0,18
5	Broad market segment	0,17	4	0,68
6	High fishery potential	0,06	3	0,18
Total		1		3,31
Threat				
1	Increase in input prices	0,05	3	0,15
2	A competitor's processed fish product appears	0,18	3	0,54
3	Availability of fish raw materials	0,15	3	0,45
4	The price of fuel, water and electricity goes up	0,07	3	0,21
5	Location near settlement	0,39	3	1,17
6	Smoke and smelly waste	0,16	2	0,32
Total		1		2,84

Source: Primary Data Analysis, 2022.

Based on Table 5. the highest score on the opportunity factor is the government support factor with a score of 1.11. The lowest score on the opportunity factor is the technology and information development factor, and the high fishery potential factor with a score of 0.18. The threat factor has the highest score on the location factor near settlements with a score of 1.17. The lowest score on the factor of increasing input prices with a score of 0.15. The total score of strategic external factors on opportunities gets a total score of 3.31 while the score of strategic external factors on threats gets a total score of 2.84.

Internal External Matrix (IE Matrix)

Based on the analysis carried out previously, internal factors and external factors were weighted, the total score on the IFE matrix (strength score minus weakness score) was 0.74 where the KUB Asap Indah fish smoking entrepreneur had strong internal potential. This means that the strengths of KUB Asap Indah fish smoking entrepreneurs can maximize their business and improve their weaknesses well. Meanwhile, the total score of the EFE matrix (opportunity score minus threat score) is 0.47, which shows that KUB Asap Indah fish smoking entrepreneurs have a high external position. This shows that the smoker of KUB Asap Indah fish is good at taking advantage of opportunities and minimizing threats. The total IFE and EFE matrices are then analyzed on the IE matrix by making a diagram, so that the position of the KUB Asap Indah fish smoking business is known.

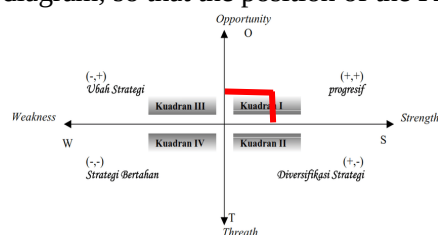


Figure 1. IE Total Matrix Chart

Hierarchical Structure Analysis and Strategy Priority Analysis

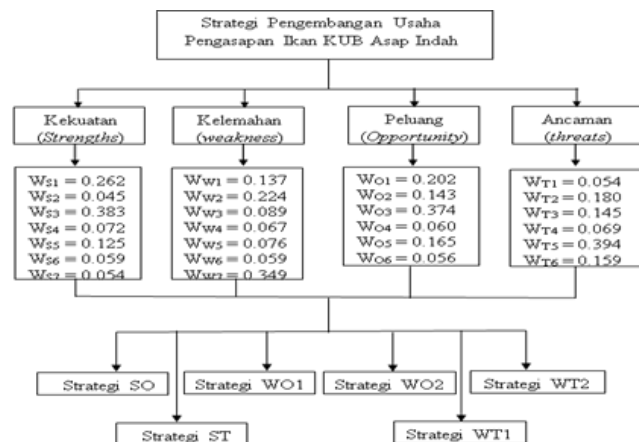


Figure 2. Hierarchical Structure of Fish Smoking Development Strategy.

Table 7. Strategy Priority Order

No	Strategy	Evaluation value	Priority
1	Entrepreneurs can increase production and expand the market considering that beautiful smoked KUB smoked fish products are already well known by making production and marketing plans	4,479727	1
2	Build warehouse and cold storage to store raw materials	3,518834	2
3	There is a need for the role of the relevant government to provide training and assistance, especially related to factors in the use of technology and information for the development of fish smoking business	2,586334	6
4	The packaging of KUB Asap Indah fish smoking products is made in vacuum packaging and has a permit at BPOM and MUI	2,887704	4
5	Improving the waste treatment system and site cleanliness	2,702569	5
6	Doing product promotion	2,921523	3

Source: Primary Data Analysis, 2022.

The results of the calculation of the overall evaluation value, obtained the priority strategies for developing the KUB Asap Indah smoked fish business sequentially, namely: 1) Entrepreneurs can increase production and expand the market considering that KUB Smoked Indah smoked fish products are already well known by making production and marketing plans; 2) Build warehouse and cold storage to store raw materials; 3) Conduct product promotions; 4) The packaging of KUB Asap Indah's smoked fish products is made in vacuum packaging and has a permit at BPOM and MUI; 5) Improving the waste management system and site cleanliness; 6) There is a need for the role of the relevant government to provide training and assistance, especially related to factors in the use of technology and information for the development of fish smoking business.

4. Conclusion

Based on the results of the research on financial analysis, the KUB Asap Indah fish smoking center deserves to be managed with an NPV of Rp. 4,166,419,299, Net B/C of 1.47, IRR value of 49.9%, and

PP obtained for 1 year 1 month 18. fish smoking industry is 2,216 or 73.8% (high). Score the highest sustainability is found in the economic dimension of 2.75 and the lowest is in the technological dimension of 1.73. This value is included in the high category, so it becomes guidelines for managers and other stakeholders to maintain and increase the productivity of various programs and activities that support sustainability KUB Asap Indah fish smoking industry cluster in Wonosari Village, Bonang District, Demak Regency.

Based on the results of research on the development strategy of smoking KUB Asap Indah fish, mapping the IE matrix, it is known that the smoking business of KUB Asap Indah fish being in the quadrant I (Progressive) area which is growing and developing. From the results of the SWOT analysis and the calculation of the overall evaluation value, The alternative and priority strategies for developing the KUB Asap Indah smoked fish business in sequence are: 1) Entrepreneurs can increase production and expand the market considering that KUB Smoked Indah smoked fish products are already well known by making production and marketing plans; 2) Build warehouse and cold storage to store raw materials; 3) Conduct product promotions; 4) The packaging of KUB Asap Indah's smoked fish products is made in vacuum packaging and has a permit at BPOM and MUI; 5) Improving the waste management system and site cleanliness; 6) There is a need for the role of the relevant government to provide training and assistance, especially related to factors in the use of technology and information for the development of fish smoking business.

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