

Development Strategy and Analysis of Fish Cultivation Business Using Local Raw Materials Using

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Abstract

The purpose of this study is to analyze the production costs of a fish farming business carried out by oil palm and rubber farmers in the village of Bencah Kelubi who have become alternative livelihoods for farmers and utilize existing natural resources (catfish innards) as raw material for feed (pellets) to support the business fish farming in ponds. This study uses survey and experimental research methods, namely conducting surveys of internal and external conditions that affect fish farming businesses; while the experiment was carried out by conducting an experiment in processing catfish offal solid waste into fish feed raw material. The appropriate strategy for developing catfish farming business in the village of Bencah Kelubi is to create a hatchery unit to produce seeds, creating catfish culture technology with appropriate applications.

Keywords: Development strategy, utilization of offal, fish farming (pellet).

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INTRODUCTION

The main problem faced by oil palm and rubber farmers in the village of Bencah Kelubi in Kampar district is the fluctuation in the prices of the two commodities, causing farmers' incomes to decline. This has an impact on the economy of farmers who are involved in oil palm and rubber, because oil palm and rubber are the main source of livelihood of the local community, so farmers are no longer able to cover the costs of maintaining and purchasing fertilizer needed to fertilize crops because the price is no longer affordable.

This situation makes it difficult for farmers to meet their daily needs such as living expenses, health and children's education. To switch to another job farmers do not have the experience and skills, so farmers need to be empowered with activities of economic value. In previous studies, farmers have been empowered through fish farming in ponds as an alternative livelihood.

Considering that this fish farming business is still layman for farmers, therefore it is hoped that further activities will be developed to develop a fish

farming business. Fish farming is one of the agribusiness activities, where new agribusiness activities can run if the supporting factors are adequate. One of the supporting factors of fish farming agribusiness is feed. One way to increase farmers' income without leaving rice cultivation is by planting it using the Minapadi system. Sularno and Jauhari [1] in their research suggestion that agri-business could increase net income by 35.29%.

Research on the development strategy of aquaculture in freshwater, there are several researchers who have done it, among others, the strategy of developing aquaculture in langowan [2] and the Feasibility Study and Development of mangrove crab (*Scylla spp*) in Likupang [3]. The development of aquaculture will be carried out optimally if the potential of aquaculture in a region can be well known. Furthermore, the potential of aquaculture that already exists in an area, needs to be developed in accordance with the carrying capacity of the environment.

In fish farming in ponds, fish feed is the biggest cost (around 60%) of the total production cost.

Therefore, to increase profits from fish farming business, fish feed (pellets) with low quality (protein) prices are high. Efforts that can be made to achieve this are producing fish feed with cheap and abundant local raw materials. This can be done by utilizing the innards from the handling of smoked catfish, because these innards are generally thrown into the environment and have not been utilized to the full. Whereas this innards waste based on Hermawati [4] research, Kurniawan [5], has a high protein content which is around 60%. Seeing these problems, a strategy is needed to develop a fish farming business in the village of Bencah Kelubi. The effort is aimed at making fish farming an alternative livelihood for oil palm and rubber farmers; by utilizing the byproducts of handling catfish sap as feed raw material. To support fish farming. This is what underlies this research to help the economy of oil palm and rubber farmers in developing fish farming, especially utilizing feed raw material sources from catfish innards.

Community Based Management or commonly called Community Based Management (CBM) according to Nikijuluw [6] is one of the approaches to managing natural resources, such as fisheries, which places knowledge and environmental awareness of the local community as the basis for its management. Holistic development in development covers all aspects. For this reason, every local resource should be known and utilized. Most coastal communities do depend on marine sector activities (fisheries), but that does not mean that everyone must depend on fisheries. The result of all people relying on fisheries is the possibility of degradation of fish resources, decreased production, increased production costs, decreased income and decreased welfare. This phenomenon is the same as what Gordon [7] calls the tragedy of shared property.

This people-centered development approach to community empowerment then underlies the insight of local resource management (community-based management), which is a people-centered development planning mechanism that emphasizes social learning technology and program formulation strategies. The goal to be achieved is to increase the ability of the community to actualize themselves (empowerment). Community-based management or commonly referred to as Community-Based Management, according to Nikijuluw [6], is an approach to natural resource management that places local community knowledge and environmental awareness as the basis for its management. Law No.31 of 2004 concerning Fisheries in lieu of Law No. 09 of 1985 which was approved by the Indonesian Parliament on September 14, 2004 in article 6 paragraph (2) reads: Management of fisheries for the purpose of fishing and cultivation must consider customary law and / or local wisdom and pay attention to community participation.

According to Dey *et al.* [8], one of the features of the cultivation sector in Asia is the export

orientation. According to Ahmed *et al.* [8] countries that experienced food deficits such as Vietnam, Indonesia, Thailand and Malaysia contributed more than 20% to the total amount of fish trade. In these countries, fish exports are equivalent to around 42% of their food imports.

In the fish processing industry, there are parts of fish that are not processed into products but become waste that is usually ignored by an industry. Disposing of processed fish waste will have a dangerous impact if not handled properly. Waste is basically a material that is wasted or thrown away from a source of human activity, as well as natural processes and does not or does not have economic value, it can even have a negative economic value because handling to dispose of or clean up requires a significant cost in addition to polluting the environment. Waste is a problem in the business of an industry including the fishing industry which produces waste in the process of fishing, handling, transportation, distribution and marketing. Fishery waste can be in the form of discarded, scattered fish, and processed residues that produce liquid and slaughter, washing and processing products [9]. Ghofur [10].

Formulation of the problem

As explained in the background that the fish farming business in the village of Bencah Kelubi is an alternative livelihood for oil palm and rubber farmers. This business is quite good and prospective to be developed, but in the last few months the production of fish produced is not in accordance with the results obtained, this discrepancy is due to the high production costs of fish, especially expensive fish feed so the business income is inadequate, therefore the focus This research is to maintain and develop fish farming business in oil palm and rubber farmers by identifying several problems to be formulated as follows:

- Can catfish offal solid waste be used as raw material for fish feed and how is the application for catfish farming and the quality of the feed products produced.
- What is the most appropriate business development strategy, especially in the use of catfish offal as a feed raw material to support fish farming for farmers in the village of Bencah Kelubi in response to market competition and the impact on the environment.

Research methods

This study uses survey and experimental research methods [11]. The scope of the research is to survey the internal and external conditions that affect the aquaculture business; while the experiment was carried out by conducting an experiment in processing catfish offal solid waste into fish feed raw material.

Research Implementation

The target of this research are the Palm Oil and Rubber Farmers in the village of Bencah Kelubi,

Kampar Regency, which have a fish farming business and catfish fumigation business that produces solid waste in the form of stomach contents (viscera). The aspects that become the study material include: the use of solid waste processing of smoked catfish as a raw material for fish feed (pellets) and the application of raw materials for fish feed to support fish farming in ponds as an alternative livelihood for oil palm and rubber farmers when the price of oil palm and rubber plummeted.

MATERIALS AND TOOLS

The main raw material used in this study is solid waste processing of Siamese catfish (*Pangasius hypophthalmus*) cultivated in the village of Koto Masjid, Kampar district, Riau. In addition, materials used to process catfish solid waste processing into functional components of food and chemicals for quality analysis (hexane, filter paper, K₂SO₄, H₂SO₄, HgO, NaOH, H₃BO₃, HCl, and Na₂SO₃ and packaging materials. In addition, it is used also material for questionnaires and others. The tools used for the processing of solid waste include blenders, flour, oil separator, glass bottles, aluminum pan, stove, filtering equipment, and drying oven.

Table-1: Raw materials making up fish feed formulations

Feed ingredients	Diet				
	K	D-1	D-2	D-3	aPK
Fish flour	44	22	11	0	-
Salted trash fish	0	15	15	15	-
Catfish Intestine	0	7	18	29	-
Tofu Dregs	16	16	16	16	-
Bran	36	36	37	37,5	-
Palm oil	3,5	3,5	2,5	2	-
Bone meal	0,50	0,50	0,50	0,50	-

Data analysis

Analysis of the data used to assess the profile of aquaculture, based on available secondary data such as the number of fish farmers, land area and aquaculture production, fisheries cultivation techniques for the past 5 years. The research data obtained were analyzed by: Quantitative analysis, SWOT analysis [12].

According to David [13], there are four stages in forming a SWOT matrix

- Match an internal power with an external opportunity, then record the results in the SO strategy cell.
- Match an internal weakness with an external opportunity, then record the results in the WO strategy cell.
- Matching internal forces with external threats, then record the results in the ST strategy cell.
- Match an internal weakness with an external threat, then record the results in the WT strategy cell.

The data obtained in the form of primary and secondary data are compiled, simplified and presented in tabulated form. Then the data are analyzed according to the purpose of this study. Data analysis methods used

in this study are qualitative and quantitative methods. The qualitative method is done by descriptive analysis. While the quantitative method is carried out with financial analysis to find out the cost, income level, and income analysis criteria such as, Net Benefit Cost Ratio (Net B/C Ratio), Payback Period (PP), and Break Even Point (BEP).

RESULTS AND DISCUSSION

Analysis of the cost of making feed

In making fish feed, protein content is crucial for fish growth, therefore protein-rich raw materials are needed in fish feed formulas so that in fish feed formulations the protein content must be higher than other nutritional content. In this research, 4 types of fish feed formulas were made using local raw materials. Proximate analysis results from each of these materials (Table 2) that all raw materials contain proteins that vary according to the origin of raw materials. The raw material for viscera flour contains higher protein than the others, then the application of these ingredients in fish feed formulas (Table 3.) shows that the protein content of all formulations is relatively different, especially with control feed.

Table-2: Proximate composition of raw materials making up the fish feed formula

Feed ingredients	Proximate Composition (% Dry Weight)				
	Protein	Fat	Ash	NFE*	Salt
Conventional fish meal	58,84	11,51	24,53	5,13	3,11
Salted trash fish flour	58,55	9,87	27,55	4,03	13,19
Offal Flour	59,48	14,23	7,07	19,22	-
Tofu Dregs Flour	28,27	4,09	2,39	65,25	-
Bran	12,32	5,84	11,06	70,77	-

Table-3: Proximate formulation and composition of the test diet

Feed ingredients		Diet				aPK
		K	F-1	F-2	F-3	
fish flour	44	22	11	0	-	
Salted trash fish	0	15	15	15	-	
Catfish Intestine	0	7	18	29		
Tofu Dregs	16	16	16	16	-	
Bran	36	36	37	37,5	-	
Palm Oil	3,5	3,5	2,5	2		
Bone meal	0,50	0,50	0,50	0,50	-	
Proximate composition by analysis						
Dry ingredients	89,80	87,90	88,08	87,21	90,39	
Protein	34,09	34,04	33,57	33,75	31,79	
Fat	13,15	13,19	13,11	13,08	6,71	
Ashc	13,74	13,79	14,17	14,77	8,62	
NFE	39,03	38,98	39,15	38,39	52,88	

Fish Cultivation Business Analysis

Costs are funds that must be spent by fish farmers during one business season to obtain a yield. In general, the costs incurred can be divided into two kinds, namely fixed costs and variable costs. Fixed costs are the costs of production for which the amount and type do not change in one harvest season. The results showed that the average fixed costs incurred by fish farmers in the form of land rent, business fees, and equipment depreciation. While variable costs are costs that can change the size of one harvest season. Variable costs include labor costs, seeds, fertilizer, lime and feed.

In every business, income is a key factor in the sustainability of a business, especially catfish farming. The income earned by fish farmers is the difference between the total revenue and the total costs incurred. Revenue in a business is the multiplication of production obtained with the selling price of production, so that revenue is determined by the size of the production costs obtained during one harvest

season. In this study, the acceptance of catfish farmers in the village of Bencah Kelubi was estimated at IDR. 1,17,600,000 (1,100 kg x IDR. 16,000 / g) for 10,000 seeds in a period of 3 months.

The income earned by fish farmers from a fish farming business is the difference between the total revenue and the total costs incurred. Production costs for 10,000 catfish seedlings by consuming 1,200 kg of feed with a nominal value of IDR. 11,600,000. Thus, the average income of catfish growers in the village of Bencah Kelubi is IDR.6,000,000 / harvest cycle/3 months.

Identification of Internal and External Factors

Based on the results of the field interviews identified a number of internal and external factors that are considered influential in achieving the objectives of developing catfish farming in the village of Bencah Kelubi, Kampar Regency. The identification results can be summarized in Table 4 below.

Table-4: Results of Identification of Internal and External Factors

No	INTERNAL FACTORS	No	EXTERNAL FACTORS
1.	Strength (S)	2.	OPPORTUNITIES (O)
	a. Water sources and good quality available		a. Demand for catfish is high
	Throughout the year		b. Development expansion opportunities
	b. Seeds are easy to obtain and the price		large business and employment opportunities
	Affordable		c. There is attention and support from
	c. There is a strong will to develop fish		Village government.
	farming business		d. Access to communication information and
	d. Good road and transportation facilities		internet media available
	thereby facilitating access to markets		e. There is assistance from staff
	e. Catfish farming business is promising		lecturers from various universities
	_big profit		
3.	Weakness (W)	4.	Threat (T)
	a. Limited Business Capital		a. Commercial feed prices always go up
	b. Related Knowledge with		b. Transfer of land functions
	technology and cultivation business		c. There are similar competitors
	fish is still low		d. The existence of pest and disease disorders
	c. Fish farming ponds still		e. The price of catfish is often dumped by
	simple		competitor
	d. Fish farming business has not yet become		
	_main business		

Based on the IFAS and EFAS matrices, the strategic assumptions can be formulated as presented in Table 4. Based on the matrix of strategic assumptions as listed in Table 4, a number of strategies can be formulated as follows:

Strategy Strengths – Opportunities (SO)

The S-O strategy is an effort to formulate an effective strategy by maximizing the strength possessed for the development of catfish farming. the formulated program consists of three (3) programs, namely:

- Optimizing the performance of fish farmers through training to increase production and take advantage of assistance provided by various parties
- Development of distribution networks and expanding marketing networks.
- Increasing the potential of existing land to meet the consumption needs of catfish

Strategy Weakness– Opportunities (WO)

The W-O strategy is an effort to minimize the weaknesses that are owned by the development of tilapia aquaculture businesses by utilizing the opportunities they have. The formulated program consists of three (3) programs, namely:

- HR improvement through coaching and training.
- Improving the quality of seeds with research and development programs from relevant agencies.
- Strive for business expansion by improving production management.

Strenghts - Threats(ST)

- The S-T strategy uses its power to develop catfish culture by overcoming existing threats. This program is formulated to consist of three (3) programs, namely:
 - Improve product quality by using superior catfish seeds.
 - Optimizing the function of the catfish farmer group.
 - Improving the quality of human resources to face increasingly fierce competition.

Strategy Weakness – Threats (WT)

The W-T Strategy is a strategy that minimizes the weaknesses faced for the development of catfish farming businesses by overcoming the threats they face. The program is formulated in three (3) programs, namely:

- Develop an effective and efficient production plan to reduce the cost of production facilities. Make a Seeding Unit independently.
- Seek funding assistance from the government to cope with high feed prices.

CONCLUSIONS AND RECOMMENDATIONS

Conclusion

Salai catfish solid waste processing in the form of innards (entrails) can replace other protein sources,

especially trash fish, salted fish, rejects. The protein content of viscera flour is 59.48%. The use of floating ponds with proper construction can take advantage of limited land. The utilization of Tapung river watersheds is effectively used in catfish enlargement activities so that it can improve water quality and save water circulation costs.

The appropriate strategy for developing catfish farming business in the village of Bencah Kelubi is to create a hatchery unit to produce seeds, creating catfish culture technology with appropriate applications.

SUGGESTION

Based on the results of the study the recommendations suggested in the effort development of catfish farming in the village of Bencah Kelubi in Kampar district. QSPM analysis results obtained the best S-O (Strenghts-Opportunities) strategy from three development programs for catfish farming in the village of Bencah Kelubi.

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