

FEASIBILITY ANALYSIS OF *KEKAR TILAPIA* FARMING IN SOUTH KONAWE REGENCY

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ABSTRACT

The fisheries sector plays a vital role in developing and providing business and employment opportunities to support the community and regional economy. *Kekar tilapia* is one of the freshwater fish farming commodities in the fisheries business sector and relatively new tilapia variety with the advantages of a thick (stocky) and a more comprehensive body shape with a smaller head than others tilapia. This case study aimed to determine the income and feasibility of *kekar tilapia* farming in the South Konawe Regency, explicitly studying the *UKM Empang Sari* (Small and Medium Enterprise/SME of Empang Sari). Research variables included cost components (fixed and variable costs) and revenue components (production and selling price). The data were analyzed using income and business feasibility analyses. The study results reveal that tilapia fish farming in South Konawe Regency is profitable and feasible, with IDR 4.355.000 per production cycle or IDR 13.066.000 per year with an R/C ratio of 1.6. Hence, it is suggested that *UKM Empang Sari* increase the *kekar tilapia* cultivation.

Keywords: feasibility analysis; fisheries, income; *kekar tilapia*, SME of *Empang Sari*

INTRODUCTION

The fisheries sector significantly supports the regional economy by developing business and providing employment opportunities for the community. The BPS (Statistics of Southeast Sulawesi Province, 2020) reported that in 2019, the business sectors with the largest Gross Regional Domestic Product (GRDP) in Southeast Sulawesi Province were agriculture, forestry, and fisheries sectors with a total of IDR 30.67 trillion. In addition, Pontoh (2012) stated that aquaculture could increase community incomes, expand job and business opportunities, and be a foreign exchange earner. Specifically, in the fisheries sector, general fisheries or freshwater aquaculture production was 146 tons out of 2,057 tons in 2019 (Statistics of Southeast Sulawesi Province, 2020). These results were produced by regencies/cities in Southeast Sulawesi, including the South Konawe Regency.

South Konawe Regency is one of the regencies in Southeast Sulawesi Province, which has a sizeable freshwater fishery potential. Based on Statistics of Southeast Sulawesi Province (2020), the fishery production of calm water ponds in South Konawe Regency in 2019 was 197 tons with a value of IDR 4.395.837.000. The production results indicate that this fishery potential positively impacts coastal and rural economies in South Konawe Regency. Therefore, the available potential must be managed and developed continuously and sustainably. Tamba et al. (2014) and Sitompul et al. (2015) argued that fisheries business development improves aquaculture businesses and creates new jobs and business opportunities for the community. In addition, Dahuri et al. (2004) stated that the long-term goal in fisheries development is to improve fishers' and fish cultivators' welfare and living standards.

The freshwater fisheries production quantities in South Konawe Regency are huge, indicating that freshwater fishery businesses in South Konawe Regency have excellent prospects and potential to be developed continuously. Aquaculture commodities cultivated by the community in South Konawe Regency are very diverse, fish used for both food and hobbies (ornamental fish/pet). Among those that are cultivated to meet the needs is tilapia.

Tilapia (*Oreochromis niloticus*) is a freshwater fish from the *Cichlidae* family, one of the most well-known fishery commodities in the community because of its low price, tasty, and high in protein (Boyd et al., 2004). This omnivorous fish can weigh 250 grams after 3-4 months of rearing with an initial seed weight of 30-50 grams (Cholik et al., 2005) and weigh up to 400 grams (Amri & Khairuman, 2003). The survival rate reaches 80% at the hatchery stage and 65 to 75% at the grow-out stage (Wiryanto et al., 2010). There are several varieties and names of tilapia, including red tilapia, red-tilapia gift, *gesit tilapia*, *get tilapia*, *salin tilapia*, *local tilapia*, *best tilapia*, *citralada tilapia*, *nirvana tilapia*, *larasati tilapia*, *pandu tilapia*, *kunti tilapia*, *srikandi tilapia*, *tilapia sultana*, *anjani tilapia*, *anilasa tilapia*, and *kekar tilapia*.

Kekar tilapia is an excellent variety of tilapia. It has more advantages than other tilapia; this variety has a thick (stocky) body and a wider body shape with a smaller head. In South Konawe Regency, *kekar tilapia* was cultivated a year ago by the UKM Empang Sari, an Small and Medium Enterprise (SME) producing freshwater fish in Mekar Jaya Village, North Moramo District. As *kekar tilapia* is a relatively new variety, research related to this specific tilapia is limited, especially from economic or financial aspects. The previous studies did not specifically study *kekar tilapia*, such as research on the feasibility of tilapia farming in Limboto Lake (Zakaria et al., 2017), in Pasaten Village, Minahasa Regency (Wowor et al., 2017), in floating net cages in Dairi Regency, North Sumatra Province (Tamba et al., 2014) in West Lombok Regency (Marini & Artika, 2018) and the feasibility of wanayasa tilapia farming in the Mekarsari cultivator group (Diatin et al., 2007). Therefore, it is necessary to study the feasibility of *kekar tilapia* farming in the South Konawe Regency. This study was conducted to determine the income level and the feasibility of *kekar tilapia* farming in the South Konawe Regency.

MATERIALS AND METHODS

This case study was conducted from May to July 2021 in South Konawe Regency, focusing on UKM Empang Sari as a study object. The research variables in this study are The respondent's identity includes age, education level, business scale, and experience in managing a freshwater fish farming business, Cost components, which include fixed cost and variable cost components, The revenue component includes the amount of production and the product selling price.

The data in this study were analyzed using income and business feasibility analyses. Income analysis was carried out mathematically with stages to calculate total costs, revenues, and income, with the equation of Mubyarto (1995).

Cost

$$TC = FC + VC \quad (1)$$

Information: TC = Total Cost; FC = Fixed Cost; and VC = Variable Cost

Revenue

$$TR = Y \cdot Py \quad (2)$$

Information: TR = Total revenue; Y = Yield/ Production and Py = Price of Yield (Unit Price of Production)

Income

$$I = TR - TC \quad (3)$$

Information: I = Income (Revenue); TR = Total Revenue (the amount of production time the price); and TC = Total cost (the sum of all variable costs and fixed costs).

After obtaining business income, the further feasibility analysis of tilapia farming was carried out using the Revenue Cost Ratio (R/C) calculation. Revenue Cost Ratio (R/C) is the ratio between total revenue and total cost. The equation for calculating the R/C ratio is as follows (Soekartawi, 2002).

$$\text{Revenue Cost Ratio} = \frac{TR}{TC} \quad (4)$$

Information: R/C = Revenue Cost Ratio; TR = Farming revenue (IDR) and TC = Total farming cost (IDR), with criteria $R/C > 1$ means that *kekar tilapia* cultivation is feasible. When $R/C < 1$, *kekar tilapia* farming is not feasible, and when $R/C = 1$, tilapia cultivation is said to break even (break event point)

RESULTS AND DISCUSSION

Business Overview

The UKM Empang Sari is a freshwater fish farming unit that has run the business for more than ten years, ranging from hatcheries to grow-out activities. Some of the fish cultivated besides tilapia are catfish, gourami, carp, and *pangasius*. In this study, the focus is on the farming of *kekar tilapia*. The UKM Empang Sari began to farm *kekar tilapia* in early 2020. Previously, this SME farmed *Gift tilapia* and *Larasati tilapia*. The following is a brief description of the *kekar tilapia* farming business: hatching, rearing/growing-out, and marketing.

1. Seeds Procurement

Seeds are an essential production factor in aquaculture because seed quality will determine fish growth in aquaculture ponds. Good seeds are old enough to be stocked in a grow-out pond characterized by a minimum seed body length of 7 cm, agile movement, and bright colors. The *kekar tilapia* seeds at the research site came from East Java.

2. Growing-out and harvesting

The *kekar tilapia* should be kept in grow-out ponds, such as mud ponds, cement ponds, or tarpaulin ponds, as the UKM Empang Sari did. *Kekar tilapia* is harvested after the fish are more than 70 days old and weigh 300-350 grams per head.

3. Marketing

The Marketing of *kekar tilapia* cultivated by the UKM Empang Sari is generally done at the marketplace, both for retailers and resellers. To maintain the *kekar tilapia* availability in the market, the UKM Empang Sari is gradually cultivating it in several tarpaulin ponds.

Business Analysis

Cost

Production costs are all expenditures made in a business to obtain production factors and raw materials used in the production process (Sukirno, 2003). Cost structure components are fixed costs and variable costs. Fixed costs are the total costs incurred to obtain production factors that cannot be changed in number, while variable costs are the total costs incurred to obtain production factors that can change in number (Sukirno, 2003).

The fixed cost component in *kekar tilapia* farming with a tarpaulin pond model are ponds developing, guardhouses, and equipment procurement costs. Fixed costs of *kekar tilapia* farming in the South Konawe Regency are detailed in Table 1.

Table 1. Cost components of *Kekar Tilapia* farming in South Konawe Regency

No	Cost Components	Number of units	Unit Price (IDR)	Total (IDR)	Economic Life (months)	Depreciation Value (IDR)
A. Fixed Cost						
1.	Tarpaulin size 4x6 m	4 sheets	1.250.000	5.000.000	24	833.333
2.	Wood and boards	0.5 M ³	2.000.000	1.000.000	24	166.667
3.	Scales	1 unit	250.000	250.000	36	27.778
4.	Scoop	1 piece	100.000	100.000	4	100.000
5.	Medium size bucket	3 pieces	50.000	150.000	12	50.000
6.	Guardhouse	1 Unit	5.000.000	5.000.000	120	166.667
	Total Fixed Costs			11.500.000		1.344.444
B. Variable Costs						
1.	Seedling size 7 cm	1.000 heads	1.000	1.000.000		
2.	Feed protein pellet 16-18%	225 Kg	10.000	2.250.000		
3.	Labor	4 OB	700.000	2.800.000		
4.	Supplements etc	1 pack	500.000	500.000		
	Total Variable Cost			6.550.000		

Based on Table 1, it can be seen that the total fixed cost of *kekar tilapia* cultivation in South Konawe Regency with a maintenance period of 4 months (3 months of maintenance process and one month of preparation and harvesting) was IDR 11,500,000, with a depreciation value of IDR 1.344.444. While the variable costs were IDR 6.550.000,-. The fixed and variable costs analyses

showed that the total cost of *kekar tilapia* farming in South Konawe Regency using tarpaulin ponds measuring 2x4 m in four ponds was IDR 7.894.444 per production process or IDR 23,683,333 per year.

Income and Business Feasibility

Income and business feasibility analyses were carried out to determine the profit amount and the feasibility of *kekar tilapia* farming in the South Konawe Regency. In detail, the revenue, income, and feasibility of *kekar tilapia* farming in the South Konawe Regency are presented in Table 2.

Table 2. Revenue, income, and feasibility of *Kekar Tilapia* farming in South Konawe Regency

No	Description	Quantity
A	Revenue	
1	Production (Kg/ production cycle)	350
2	Price (Rp/Kg)	35.000
	Total Revenue (IDR/ production cycle)	12.250.000
B	Income	
1	Total Revenue (IDR/ production cycle)	12.250.000
2	Total Costs (IDR/ production cycle)	7.894.444
C	Income/profit (IDR/ production cycle)	4.355.556
D	Feasibility (R/C)	1.6

The analysis results are shown in Table 2 highlight that the total revenue from the *kekar tilapia* farming in South Konawe Regency is IDR 12.250.000 per production process or IDR 36.750.000 per year and income of IDR 4,355,556. Based on the feasibility analysis results as presented in Table 2, it can be inferred that the R/C ratio value of the *kekar tilapia* farming business in the South Konawe Regency is 1.6. According to Soekartawi (2002) and Musa et al. (2005), the R/C value above 1 means that the business is feasible to be run. The R/C ratio of 1.6 also indicates that for every IDR 1 of the cost spent on *kekar tilapia* cultivation, it will generate IDR 1.6. In other words, the amount of revenue obtained in the *kekar tilapia* cultivation is 1.6 times the total cost used. Several research results related to the feasibility of tilapia cultivation are also not much different from the results of this study. The related studies are; the feasibility of tilapia cultivation using the floating net cage method in Limboto Lake, which obtained an R/C value of 1.4 (Zakaria et al., 2017); The tilapia cultivation in West Lombok Regency that showed tilapia cultivation is feasible with a Revenue Cost Ratio (R/C) value of 1.5 (Marini & Artika, 2018); and research on tilapia aquaculture with a net cage system that obtained a BCR value of 1.98 (Wowor et al., 2017).

CONCLUSIONS AND SUGGESTION

Based on the analysis results and discussion, it can be concluded that the *kekar tilapia* cultivation business in South Konawe Regency is profitable because the company has an income of IDR 4.355.000 per production cycle or IDR 13.066.000 per year with an R/C ratio value of 1.6 (greater than 1). Hence, it is suggested to UKM Empang Sari to increase the amount of production of *kekar tilapia* because this tilapia variety cultivation is feasible. In addition, this tilapia fish farming can be an alternative income source to enhance the community economy.

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