# Financial Feasibility Analysis of Salted Anchovy Processing on Pasaran Island, Bandar Lampung

ERLINA RUFAIDAH[1], MAYA RIANTINI[1], YULIANA SALEH[1], LESTARI GITA NUR'AINI[1], ARYAN DANIL MIRZA. BR[2]
[1]Agribusiness Department, Universitas Lampung, Bandar Lampung, INDONESIA
[2]Accounting Department, Universitas Lampung, Bandar Lampung, INDONESIA

*Abstract:* - The purpose of this study was to determine the financial feasib anchoviesility, and sensitivity of salted anchovy processing business on Pasaran Island, Bandar Lampung City. Data collection was carried out from November to December 2021. The research method used was a survey and the selection of research sites was carried out purposefully (deliberately). Sources of data are obtained from the interview process using questionnaires. The analytical method used is investment criteria and descriptive-quantitative analysis. The results showed that the financial analysis carried out on the processing of salted anchovy on Pasaran Island, Karang City Village, Teluk Betung Timur District, Bandar Lampung City was profitable and feasible to continue, with investment criteria indicators: NPV is IDR 12,450,776,125.40, Net B /C is 11.82, Gross B/C is 1.18, IRR is 125.16% and PP is 2.84 years. The sensitivity analysis of salted anchovy processing on Pasaran Island, Karang City Village, Teluk Betung Timur District, Bandar Lampung City shows that the business is sensitive to changes in certain conditions. At a 4.8% increase in production costs, the business is still feasible to continue, while when there is a 10% decrease in the amount of production, a 14.45% decrease in selling price, the business is not feasible to continue. Owners should increase the number of production equipment to achieve maximum production capacity and expand the market to increase target consumers.

*KeyWords:* Financial Feasibility, Salted Anchovy, Production Cost, Sensitivity Analysis.

Received: July 22, 2022. Revised: October 19, 2022. Accepted: November 21, 2022. Published: January 30, 2023.

## 1 Introduction

Indonesia's fishery potential is very large, this condition is supported by Indonesia's total area of 7.81 million km$^2$ with 74.26% being waters, with the existing marine area, Indonesia has enormous marine and fishery potential, [1]. Fisheries and marine products are widely used by the Indonesian people as an economic source, as can be seen from the number of people who work in the fisheries and marine sector such as fishermen and marine and fishery product processors. The fisheries sub-sector contributes significantly to GDP of IDR 431 468.90 billion in 2020, [2]. Fisheries resources that have great potential are small pelagic fish, especially anchovies.

Anchovy is one type of fish that is widely consumed by the public and produced. The production volume of anchovy in Lampung Province is 22,101.95 tons, with this amount, Lampung Province is ranked 5th as the province with the largest anchovy production volume in Indonesia. Conditions that support this, one of which is:

Bandar Lampung as the capital city of Lampung Province, is synonymous with industrialization and has quite a lot of fishery households. Fishery households are households whose livelihoods and types of business activities are engaged in the fisheries sub-sector, [3]. Lampung Province has a wide coastline. in 2020. The large production volume is offset by the large number of Fish Processing Units owned by Bandar Lampung City is 824 units, [3].

The purpose of this study is to analyze the income of salted anchovy processors on Pasar Island, analyze the financial feasibility and business sensitivity (what-if analysis). Pasaran Island is one of the centers for making salted anchovy which is located in Teluk Betung Timur District, Karang City Village, Bandar Lampung City. Pasaran Island is one of the fish processing centers, namely the processing of anchovies into salted anchovies. Determination of the market island as a center for salted anchovy processing, through the Decree of the Mayor of Bandar Lampung No.258/23/HK/2010 concerning the determination of the location of the Minapolitan Area of Bandar Lampung City which includes Pasaran and Lempasing islands. and also stipulated in the RTRW (Regional Spatial Plan) of Bandar Lampung City in 2011-2030 as a strategic minapolitan area in driving the regional economy and the use of appropriate technology.

Anchovies that have been caught by fishermen using a tool called a floating chart are then purchased by the processor and immediately boiled using sea water to become salted anchovies on the boat in the condition that the anchovies are still fresh and alive. This process is what distinguishes salted anchovies from Pasaran Island from other salted anchovies. Salted anchovy from Pasaran Island has a more delicious and savory taste when compared to other anchovies.

Salted anchovy processing on Pasaran Island should be a superior business, judging from the quality of the products that have been produced. Salted anchovy processing business on Pasar Island has several problems, one of which is uncertain income. This is because anchovy is one of the commodities that will experience a decline in prices in 2021, [4]. In addition, the availability of raw materials also depends on fishermen who go to sea, if fishermen do not go to sea, then there is no raw material that can be processed into salted anchovies. The factors that affect traditional fish processing are the availability of raw materials and the availability of raw fish, [5], [6]. Fisherman's capture fisheries production is also influenced by other natural factors such as the tsunami. Tsunami has a negative impact on the number of fish caught by fishermen, [7].

Under these conditions, whether the business provides benefits that are greater than the costs to be incurred is the next problem, so it is necessary to analyze the feasibility of the salted anchovy processing business on Pasaran Island. Considering the competition between salted fish entrepreneurs and the acquisition of raw materials can affect income and business development, the researchers tried to see how much investment and profit and the financial feasibility of salted fish processing business on Pasaran Island. This study does not only focus on investment ratios but also adds what-if analysis in which this modeling is useful for knowing the effects of changes in production parameters (i.e. inflation, increases in raw material prices) on changes in production system performance in generating profits.

# 2 Research Method

## 2.1 Research Time and Location

This research was conducted on Pasaran Island, precisely in Karang City Village, Teluk Betung Timur District, Bandar Lampung City. Bandar Lampung City was chosen *purposively*, with the consideration that Pasaran Island is one of the production centers for processing salted anchovy with superior quality in Lampung Province. Data collection was carried out from November to December 2021.

## 2.2 Data Collection

The population in this study were salted anchovy processing producers on Pasaran Island, Karang Village Village, Teluk Betung Timur District, Bandar Lampung City with sales ranging from Rp. 2,000,000,000.00 to Rp. 15,000,000,000.00. The sample in this study was 35 respondents who were determined based on the slovin formula. Respondents in this study all fit into the criteria for micro-enterprises with sales results ranging from IDR 2,000,000,000.00 up to IDR 15,000,000,000.00, [8]. The sampling technique used a purposive sampling method with the criteria for sales results ranging from Rp. 2,000,000,000.00 to Rp. 15,000,000,000.00. The data collection method used a survey method in the form of a questionnaire. The types of data used in this study are primary data and secondary data. Primary data is data obtained directly through interviews using questionnaires to salted anchovy processing producers on Pasaran Island, Karang City Village, Teluk Betung Timur District, Bandar Lampung City. Secondary data were obtained through literature study related to this research.

## 2.3 Data Analysis

### 2.3.1 Income Analysis

The income of anchovy processors is the difference between the revenue and the costs incurred by the processor. Income is calculated using the following formula, [9]:

$$\pi = YP_y - \sum X_i P_{Xi} - BTT \quad (1)$$

Description : Income

| | |
|---|---|
| Y | : Production quantity |
| Py | : Price per unit of production |
| Xi | : Factors of production |
| Pxi | :Price per unit factor of production |
| BTT | :Total fixed costs |

### 2.3.2 Financial Feasibility Analysis

A business feasibility study basically aims to determine the feasibility of a business based on investment criteria. Some of these criteria include net present value (*Net Present Value* = NPV), internal rate of return (*Internal Rate of* Return = IRR), cost benefit ratio ( *Gross Benefit Cost Ratio* = Gross B/C; *Net Benefit Cost Ratio* = Net B/C ) and the investment return period ( *Payback Period* = PP), [10].

**a.** ***Net Present Value*** **(NPV)**

NPV is the difference between the *Present Value* of the total benefit and the *Present Value* of the total cost expressed in units of money (IDR). If the NPV value is greater than zero (NPV > 0) then the business is feasible to carry out, otherwise if the NPV value is less than zero (NPV < 0) then the business is not feasible to continue. NPV is mathematically formulated as follows:

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

Information:
$B_t$ = Benefits in year t.
$C_t$ = Cost in year t.
i = *Discount rate* (%).
t = Year.

***b.*** ***Net Benefit Cost Ratio*** **(*Net B/C*)**

*Net Benefit Cost Ratio* (*Net B/C)* is the ratio between positive net benefits and negative net benefits. *Net B/C* assessment criteria are if it is greater than one ( *Net B/C* >1) then it is feasible and if it is less than one ( *Net B/C* <1) then it is not feasible. *Net Benefit Cost Ratio* (*Net B/C),* is mathematically formulated as follows.

$$Net\ B/C\ = \frac{\sum_{t=0/1}^{n} \frac{Bt-Ct}{(1+i)^t}}{\sum_{t=0/1}^{n} \frac{Bt-Ct}{(1+i)^t}}$$

Information:
$B_t$ = Benefits in year t.
$C_t$ = Cost in year t.
i = *Discount rate* (%).
t = Year.

**c.** ***Gross Benefit Cost Ratio*** **(*Gross B/C)***

*Gross B/C* is a comparison both benefits and costs are gross (*gross*). The *Gross B/C* assessment criteria are the same as the *Net B/C assessment criteria.* Mathematically, *Net B/C* is formulated as follows:

$$Gross\ B/C\ = \frac{\sum_{t=0/1}^{n} \frac{Bt}{(1+i)^t}}{\sum_{t=0/1}^{n} \frac{Ct}{(1+i)^t}}$$

Information:
$B_t$ = Benefits in year t.
$C_t$ = Cost in year t.
n = Age of business.
i = *Discount rate* (%).

**d.** ***Internal Rate of*** **Return (IRR)**

IRR) is the *discount rate* (DR) which results in an NPV equal to 0. The magnitude resulting from this calculation is in percentage units (%). A business is said to be feasible if its IRR is greater than its *opportunity cost of capital* (DR).

Mathematically, IRR is formulated as follows

$$\mathrm{IRR} = \mathrm{i}_1 + \frac{\mathrm{NPV1}}{\mathrm{NPV1} - \mathrm{NPV2}}\ \mathrm{x}\ (\mathrm{i}_2 - \mathrm{i}_1)$$

Information:
$i_1$ = *Discount rate* that produces positive NPV.
$i_2$ = *Discount rate* that produces negative NPV.
$NPV_1$ = positive NPV.
$NPV_2$ = negative NPV.

**e.** ***Payback Period*** **(PP)**

*Payback Period* (PP) measures how fast the payback period is. Businesses that have a small or fast payback *period* are more likely to be selected. The *Payback Period method* is mathematically formulated as follows.

$$Payback\ Period = \frac{\mathrm{I}}{\mathrm{Ab}}$$

Information:
I = The amount of investment required.
Ab = Net benefit that can be obtained each year.

### 2.3.3 Sensitivity Analysis

Sensitivity analysis aims to assess what will happen with the results of the feasibility analysis of an investment or business activity, if there is a change in the calculation of costs or benefits. The variables used in the sensitivity calculation are an increase in the purchase price of raw materials by 4.80%, a decrease in production by 10%, and a decrease in the selling price of 14.45%. The sensitivity rate criterion is if the sensitivity rate is greater than one (sensitivity rate > 1) then the effort is sensitive to changes, on the contrary if the sensitivity rate value is less than one (sensitivity rate < 1) then the effort is

not sensitive to changes. Sensitivity analysis can be mathematically defined as follows, [11]:

$$\text{Sensitivity analysis} = \frac{\left|\frac{X_i - X_0}{X}\right| \text{ x } 100\%}{\left|\frac{Y_i - Y_0}{Y}\right| \text{ x } 100\%}$$

Information:
$X_i$ = *Gross* B/C/ *Net* B/C/NPV/PP after the change.
$X_0$ = *Gross* B/C/ *Net* B/C/NPV/PP before the change.
X = Average change in *Gross* B/C/ *Net* B/C/NPV/PP.
$Y_i$ = Production cost/selling price/production quantity after change.
$Y_0$ = Production cost/selling price/production quantity before change.
Y = Average change in production costs/selling price/quantity of production.

## 3 Results and Discussion

### 3.1 Characteristics of Salted Anchovy Processing

Respondents in this study were salted anchovy processors on Pasaran Island, Karang Barat Urban Village, amounting to 35 people. Characteristics of respondents in this study can be seen from the age, amount of capital, capital status, and business experience and education level. The characteristics of the respondents can be seen in Figure 1 below.

Age affects a person's ability to carry out activities and do work. Productive age is in the age range of 15-64 years, [12]. The majority of salted anchovy processors in Pasar Island who are respondents in this study are in the productive age group. At productive age, processors tend to have the ability to properly process and develop salted anchovy processing business. Business experience also affects the processor's ability to process fish, the longer the business experience, the better the business skills because they have learned from previous mistakes that have been made. Work experience has a positive and significant effect on fishermen's business income, [13]. The initial capital status of the majority of respondents came from borrowing. Capital has a significant effect on income, meaning that the higher the amount of venture capital will have a positive effect on income [13], [14], [15], [16]. Education will significantly affect an individual's income level, the higher the level of education, the income level will also increase, [17]. Education affects the income of cattle farmers through a mindset in developing and managing their business, [18].

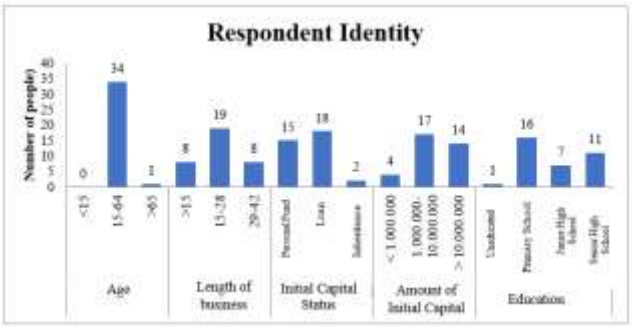


Fig. 1: Characteristics of Respondents processing salted anchovy in Pasaran Island

### 3.2 Income Analysis of Salted Anchovy Processors in Pasaran Island

The income of salted anchovy processors in Pasaran Island is analyzed by calculating the difference between revenue and production costs incurred. The income obtained by fishermen if it is not balanced with daily expenses will increase the poverty gap, [19]. The income of salted anchovy processors on Pasaran Island is calculated in units (IDR/month). The production costs consist of direct raw material costs, direct labor costs and *overhead costs* . Revenue from salted anchovy processing on Pasaran Island, Bandar Lampung City can be seen in Table 1.

Anchovy processors on Pasaran Island produce 3 types of salted anchovies, which are Nasi - salted anchovies, Buntiau - salted anchovies, and Jengki - salted anchovies. The cost of buying the three direct raw materials is also different, Nasi anchovy has the highest purchase cost among other types of anchovy, this is in line with prior research where Nasi anchovy has the most expensive purchase price among other raw materials, [20]. The income obtained from the sale of salted anchovy is also the largest among the other three types of anchovy, this is because the selling price of salted anchovy is high.

Table 1. Income of salted anchovy processors on Pasaran Island

| No | Information | Value (IDR/Month) |
|---|---|---|
| **I** | **Reception** | |
| | Nasi - Salted anchovy | 237,319,062.50 |
| | Buntiau - Salted anchovy | 125,466,830,36 |
| | Jengki - Salted anchovy | 98,691,357.14 |
| | **Total receipts** | **461.477.250.00** |
| **II** | **Production cost** | |
| | Direct material cost | 351.511.306.25 |
| | Direct labor costs | 41,409,047.62 |
| | *Overhead* costs | 47,262,066.00 |
| | **Total cost** | **440,182,419.87** |
| **III** | **Income** | **21,294,830,13** |

*Source: Primary data, 2021 (processed data)*

The selling price of Nasi-salted anchovy is higher, due to high consumer demand for salted anchovy. The taste of Nasi-salted anchovy is better, the texture is softer and has a cleaner and more attractive color than the Jengki - salted anchovy and Buntiau salted anchovy. The high price of anchovy rice is in accordance with the prior research that price and taste affect consumer demand, [21]. The income earned by salted anchovy processors on Pasaran Island is IDR 21,294,830.13 every one month. This is in line with the prior research that the anchovy processing business also experienced a profit IDR 5,444,237.00/week, [20]. The results of this study are also in line with the prior research that capture fishermen also experience a profit of IDR 7,473,852 every three months, [14]. The income earned by salted anchovy processors on Pasaran Island is quite large every month. The large income obtained by the processor is also offset by the large costs incurred in the production process and the resulting product also has a high selling price in the market.

## 3.3 Financial Feasibility Analysis of Salted Anchovy Processing Business on Pasaran Island Analysis

Financial analysis was used to determine the feasibility of anchovy processing business on Pasaran Island, Bandar Lampung City. Indicators of the magnitude of the benefits obtained by anchovy processors whether they are feasible to be developed can be seen from the net present value ( *Net Present Value* = NPV), the internal rate of return ( *Internal Rate of* Return = IRR), the cost benefit ratio ( *Gross Benefit Cost Ratio* = Gross B /C; *Net Benefit Cost Ratio* = Net B/C) and the investment return period ( *Payback Period* = PP).

The costs used in the salted anchovy processing business on Pasaran Island consist of investment costs and operational costs. The costs incurred when the business is started, the investment costs for anchovy processing can be seen in Table 2. It is known that the total investment cost incurred by anchovy processors on Pasaran Island is IDR 538,525,285.71. The largest investment cost issued by anchovy processors on Pasaran Island is a boat with a cost of IDR 230,600,000.00 this is different from that stated by the Department of Investment and One-Stop Integrated Services, Muara Enim Regency that the largest cost incurred is drums of IDR 5,000,000.00, [22].

Table 2. Investment costs for salted anchovy processing on Pasaran Island

| No | Investment Type | Economic life (Years) | Investment Value (IDR) |
|---|---|---|---|
| 1 | Land | - | 200,000,000.00 |
| 2 | Building | 10 | 80,000,000,00 |
| 3 | Boat | 10 | 232,600,000.00 |
| 4 | Stew | 5 | 8,500,000.00 |
| 5 | Frame | 3 | 14,714,285.71 |
| 6 | Receptacle | 3 | 769,571.43 |
| 7 | Scales | 8 | 3,000,000.00 |
| 8 | Gas | 4 | 1.095.000,00 |
| | **Total** | | **540,678,857.14** |

*Source: Primary data, 2021 (processed data)*

The income of salted anchovy processors on Pasaran Island is seen from the revenue minus the costs incurred. The revenue obtained is the result of the sale of three types of teriasisin fish obtained by the processor. Operational costs incurred in the form of direct material costs, direct labor costs, *overhead costs*. The direct material cost is the cost to buy anchovy rice, anchovy buntiau and anchovy jengki. Direct labor costs consist of two activities, boiling activities and sorting & drying activities. *Overhead* costs consist of salt, gas, cardboard, duct tape, diesel fuel, transportation costs, consumption, and PBB.

The income of salted anchovy processors on Pasaran Island for the last ten years can be seen in Table 3. It can be seen that in year 5 had the largest income value, because in that year the selling price of anchovy was the highest, this is in line with prior research which states that the selling price has a significant effect on fishermen's income, [15].

Table 3. Income of 10 years salted anchovy processor

| year | Reception | Cost | Income |
|---|---|---|---|
| 1 | 0.00 | 540,678,857.14 | -540,678,857.14 |
| 2 | 5,365,855,393 | 5,230,047,574.11 | 135,807,818.75 |
| 3 | 5,662,113,321 | 5,230,047,574.11 | 432,065,747.32 |
| 4 | 5,824,409,036 | 5,245,531,431.25 | 578,877,604.46 |
| 5 | 6,260,224,286 | 5,231,017,574.11 | 1,029,206,711.61 |
| 6 | 6,399,781,607 | 5,238,547,574.11 | 1,161,234,033.04 |
| 7 | 6,399,781,607 | 5,245,531,431.25 | 1,154,250,175,89 |
| 8 | 6,260,224,286 | 5,230,047,574.11 | 1,030,176,711.61 |
| 9 | 5,559,029.914 | 5,234.142,574.11 | 324,887.340.18 |
| 10 | 5,572,149,986 | 5,245,531,431.25 | 326,618,554.46 |

*Source: Primary data, 2021 (processed data)*

Calculation of the feasibility of salted anchovy processing business on Pasaran Island, Teluk Betung Timur District, Kota Karang Village, Bandar Lampung City using the economic life of the boat used (10 years) which is calculated by performing *Compounding Factor* (cf) is used to increase the benefits obtained from the business. salted anchovy processing on Pasaran Island in the past and the current cost becomes the current value. The interest rate used is based on the average *discount rate* since KUR was launched on November 5, 2007 until 2021, which is 8.8%, [23]. The results of the calculation of the financial feasibility of anchovy processing business on Pasaran Island can be seen in Table 4.

Table 4. The results of the calculation of the financial feasibility analysis of salted anchovy processors on Pasaran Island

| Criteria | Unit | Mark | Assessment criteria | Information |
|---|---|---|---|---|
| NPV | IDR | 7,433.955.071.72 | > 0 | Worthy |
| *Net B/C* | - | 7.44 | >1 | Worthy |
| *Gross B/C* | - | 1.11 | >1 | Worthy |
| IRR | % | 78.17% | >8.8 | Worthy |
| PP | Year | 3.89 | <10 | Worthy |

*Source: Primary data, 2021 (processed data)*

Based on Table 4, it is known that the results of the assessment of investment criteria indicators are *Net Present Value* (NPV), *Internal Rate of* Return (IRR), *Gross Benefit Cost Ratio* ( *Gross* B/C), *Net Benefit Cost Ratio* ( *Net* B/C) and *Payback Period* (PP) as follows.

**a. *Net Present Value* (NPV)**

*Net Present Value* is obtained from the difference between the total *present value* of benefits and the total *present value* of costs or, the NPV value is expressed in units of money (IDR). The result of the NPV calculation is IDR 7,433,955,071.72. The NPV value of the business is positive or more than 0, so the salted anchovy processing business on Pasaran Island is profitable and deserves to be continued. This study is in line with prior research that the Payang Jabur fishery business at the Asemdoyong Beach Fishing Port, Pemalang Regency is feasible to continue with an NPV value of IDR 134,865,778 [24].

**b. *Net Benefit Cost Ratio* ( *Net B/C***

*Net Benefit Cost Ratio* ( *Net B/C)* is the ratio between positive net benefits and negative net benefits. Based on the *Net* B/C value obtained from the calculation of the salted anchovy processing business on Pasaran Island, it is 7.44. This means that for every IDR 1.00 in net costs that have been incurred, it will generate a net income of IDR 7.44. The *Net* B/C value is more than 1, then the salted anchovy processing business on Pasaran Island is feasible to continue. The catfish processing agroindustry is feasible to continue with a *Net* B/C value of 1.23, [25].

**c. *Gross Benefit Cost Ratio* ( *Gross B/C)***

*Gross* B/C in salted anchovy processing business on Pasaran Island is 1.11. The *Gross* B/C value means that every IDR 1.00 of expenses incurred generates income of IDR 1.11. The *Gross* B/C value of the salted anchovy processing business on Pasaran Island is greater than one, it shows that the business is feasible to continue. The catfish processing agroindustry is feasible to continue with a Gross B/C value of 1.90, [26].

**d. *Internal Rate of Return (IRR)***

IRR is the interest rate that produces the NPV value equal to zero. The results of the calculation of the IRR value at an interest rate of 8.8% using *a discount factor* of 78.17%. The IRR value is greater than the current interest rate, so the salted anchovy processing business on Pasaran Island is feasible to continue. Business of shredded fish agroindustry is feasible to do with an IRR value of 45.43%, [26].

**f. *Payback Period* (PP)**

*Payback Period* (PP) measures how fast the payback period is. The results of the PP calculation on the analysis of the financial feasibility of anchovy processing business on Pasaran Island are 3.89 years. The PP value is

less than the economic life of the boat, which is 10 years, so the salted anchovy processing business on Pasaran Island is feasible to continue. The agroindustry of processed products made from tilapia is feasible to be carried out with a PP value for 3 months 16 days, [27].

### 3.4 Sensitivity Level Analysis

Sensitivity analysis is used to see the impact of a changing situation on the results of NPV, IRR, *Net* B/C, *Gross* B/C, and *payback period*. Changes that occurred in this study were 10% salted anchovy production, 14.45% change in the selling price of salted anchovy and 4.8% increase in direct raw material costs. The results of the sensitivity analysis of these changes can be seen in Tables 5, 6 and 7.

Table 5. Changes in the investment criteria for salted anchovy processing business on Pasaran Island (10% decrease in production)

| Criteria | Change Value | Sensitivity Rate | Information |
|---|---|---|---|
| NPV | IDR -193,283,018,42 | 20.01 | sensitive |
| *Net B/C* | 0.93 | 14.78 | sensitive |
| *Gross B/C* | 1.00 | 1.00 | sensitive |
| IRR | 6.32% | 16,16 | sensitive |
| PP | 6.44 years old | 4.69 | sensitive |

*Source: Primary data, 2021 (processed data)*

Investment criteria after a 10% decrease in salted anchovy production in Pasaran Island. Shows that based on the *Gross* B/C, IRR, and PP and *Gross B/C values, the* salted anchovy processing business on Pasaran Island is still feasible to continue, while the NPV and *Net* B/C values indicate that the business is not feasible to continue and is sensitive to changes. This is not in line with prior research that the nursery business is still viable at a 16.25% decline in seedling production, [28].

Table 6. Changes in the value of the investment criteria for salted anchovy processing business on Pasaran Island (price reduction of 14.45%)

| Criteria | Change Value | Sensitivity Rate | Information |
|---|---|---|---|
| NPV | IDR -3,588,213,478,21 | 36,80 | sensitive |
| *Net B/C* | 0.21 | 12.13 | sensitive |
| *Gross B/C* | 0.95 | 1.00 | sensitive |
| IRR | 0.10% | 12.13 | sensitive |
| PP | 12.75 years | 6.84 | sensitive |

*Source: Primary data, 2021 (processed data)*

Based on sensitivity analysis, it shows that a decrease in selling price of 14.45% causes changes in the value of NPV, *Net* B/C, *Gross* B/C, and IRR. This value indicates that the business is not feasible to continue and based on the value of the sensitivity rate, the investment criteria are sensitive to changes. This result is not in line with the prior research that when there is a 10% decrease in the selling price of salted anchovy, the business is still feasible to continue, [29].

Table 7. Changes in the value of the investment criteria for anchovy processing business in Pasaran Island (cost increase of 4.8%)

| Criteria | Change Value | Sensitivity Rate | Information |
|---|---|---|---|
| NPV | IDR 4,819,579,278,05 | 9.10 | sensitive |
| *Net B/C* | 4.75 | 9.41 | sensitive |
| *Gross B/C* | 1.07 | 0.80 | Not sensitive |
| IRR | 53.46% | 8.01 | sensitive |
| PP | 4.66 years | 3.84 | sensitive |

*Source: Primary data, 2021 (processed data)*

Based on the sensitivity analysis of the 4.8% increase in costs, it shows that the value of NPV, *Net* B/C, *Gross* B/C, IRR, and PP is feasible to continue. This research is in line with previous research that showed an increase in the price of fresh flat fish raw materials by 10%, 15%, and 20% [30]. *Gross* B/C shows that it is not sensitive to changes, this can happen because the calculation of the income of anchovy processors compared to the costs incurred in production is still in the gross calculation and has not become a net profit.

So, the sensitivity analysis of salted anchovy processing on Pasaran Island, Bandar Lampung City shows that the business is sensitive to changes in certain conditions. At a 4.8% increase in production costs, the business is still feasible to continue, while when there is a 10% decrease in the amount of production, a 14.45% decrease in selling price, the business is not feasible to continue. Owners should increase the number of production equipment to achieve maximum production capacity and expand the market to increase target consumers.

## 4 Conclusion

Based on the research that has been done, it can be concluded that the salted anchovy processing business on Pasaran Island, Bandarlampung City has profit of IDR 21,294,830,13 every month and deserves to be developed. The results showed that the financial analysis carried out on the processing of salted anchovy on Pasaran Island, Karang City Village, Teluk Betung Timur District, Bandar Lampung City was profitable and feasible to continue, with investment criteria indicators: NPV is IDR 12,450,776,125.40, Net B /C is 11.82, Gross B/C is 1.18, IRR is 125.16% and PP is 2.84 years.

The sensitivity analysis of salted anchovy processing on Pasaran Island, Karang City Village, Teluk Betung Timur District, Bandar Lampung City shows that the business is sensitive to changes in certain conditions. At a 4.8% increase in production costs, the business is still feasible to continue, while when there is a 10% decrease in the amount of production, a 14.45% decrease in selling price, the business is not feasible to continue. Based on the results of this study, suggestions that can be made by the owner of anchovy processing are as follows:

1. Owners should increase the number of production equipment to achieve maximum production capacity and expand the market to increase target consumers. By expanding the market, the owner's business can last longer if there is a decrease in the selling price or an increase in the price of anchovy raw materials. This is because expanding market share can increase the number of consumers which can reduce fixed costs per unit, [31].
2. Owners should make production cost efficiency to be able to optimize profit in the following ways:
   a. Strengthening upstream (suppliers) to obtain quality anchovy raw materials at a more affordable price.
   b. Overhead costs should be separated into variable overhead costs and fixed factory overhead costs. The overhead costs used in this production consist of the cost of salt, gas, cardboard, duct tape, diesel fuel, transportation costs, consumption and property tax. So, the variable overhead costs consist of the cost of salt, gas, cardboard, duct tape, diesel fuel, transportation costs, consumption, while the fixed overhead costs are property tax. This separation method is necessary because changes in production quantities will affect variable overhead costs.
   c. Implementing Activity Based Costing (ABC) and Activity Based Management (ABM) to optimize production processes and cost calculations, so as to avoid under costing and overcosting in determining selling prices.

Based on the suggestions above, it is expected that the profit received is in accordance with the costs incurred and the time required to return the investment is not too long.

The results of this study have theoretical and practical implications. Theoretically, this research does not only focus on investment ratios but also adds what-if analysis in which this modeling is useful for knowing the effects of changes in production parameters (i.e. inflation, increases in raw material prices) on changes in production system performance in generating profits. Practically, this research provides knowledge to micro entrepreneurs, especially salted anchovy processing producers on Pasaran Island, Karang City Village, Teluk Betung Timur District, Bandar Lampung City related to the feasibility of salted anchovy business and can be an analytical tool for anchovy processing producers. salt to determine the strategy used in developing its business. This study emphasizes the investment ratio, so that future research can develop other aspects related to the feasibility study, such as social, economic, and political aspects, industrial environmental aspects, and market aspects. Future research also can compare for financial feasibility analysis between two regions and further identify the factors that cause business excellence in both regions.

*References:*

[1] Pratama, O. 2020. *Konservasi Perairan Sebagai Upaya Menjaga Potensi Kelautan dan Perikanan Indonesia*. Direktorat Jenderal Pengelolaan Ruang Laut. https://kkp.go.id/djprl/artikel/21045-konservasi-perairan-sebagai-upaya-menjaga-potensi-kelautan-dan-perikanan-indonesia.

[2] Central Bureau of Statistics. 2020. [Seri 2010] PDB Seri 2010 (Milyar Rupiah), 2020. https://www.bps.go.id/indicator/11/65/1/-seri-2010-pdb-seri-2010.html. Accessed on 22 April 2021.

[3] Department of Marine Affairs and Fisheries, Lampung Province. 2019. Rencana Strategis Dinas Kelautan dan Perikanan Provinsi Lampung. Bandar Lampung. https://dkp.lampungprov.go.id/uploads/renstra_2019-2024_dkp.pdf. Accessed on 19 Oktober 2021.

[4] Central Bureau of Statistics. 2021. *Perkembangan Indeks Harga Perdagangan Besar*. https://www.bps.go.id/pressrelease/2021/10/01/1780/pada-september-2021--indeks-harga-perdagangan-besar--ihpb--umum-nasional-turun-0-01-persen.html. Accessed on 20 Oktober 2021

[5] Fatchiya, A. Amanah, S., dan Sadewo, A. 2019. Faktor-Faktor yang Mempengaruhi kemampuan Pengolah Ikan Tradisional di Kabupaten Cirebon. *J. SOSEK*. 14(2):239-247. http://dx.doi.org/10.15578/jsekp.v14i2.7086

[6] Sutarni. 2013. Faktor-Faktor Yang Mempengaruhi Produksi Pengawetan Ikan Asin Teri di Kecamatan Labuhan Maringgai Kabupaten Lampung Timur. *ESAI*. 7(1):1-14. https://jurnal.polinela.ac.id/ESAI/article/view/996/682.

[7] Riantini, M., Zakaria, W. A., Listiana, I., Ulfa, P. N., Mutolib, A., & Widyastuti, R. A. D. 2021. Impact of the Sunda Strait tsunami on fish production and environment in South Lampung Regency, Lampung Impact of the Sunda Strait tsunami on fish production and environment in South Lampung Regency , Lampung. *ULICoSTE 2020*. 1–6. https://doi.org/10.1088/1755-1315/739/1/012021.

[8] Legal Documentation and Information Network, Supreme Audit Agency, Republic of Indonesia. 2021. *Peraturan Pemerintah (PP) Nomor 7 Tahun 2021 Kemudahan, Perlindungan, dan Pemberdayaan Koperasi dan Usaha Mikro, Kecil, dan Menengah*. https://peraturan.bpk.go.id/Home/Details/161837/pp-no-7-tahun-2021.

[9] Adityas, M.R., Hasyim A.I., dan Affandi, M.I. 2018. Analisis Pendapatan Usaha tani Dan Pemasaran Sayuran Unggulan Di Kawasan Agropolitan Kabupaten Tanggamus. JIIA. 6(1):41-48. https://jurnal.fp.unila.ac.id/index.php/JIA/article/view/2497/2181.

[10] Nurmalina, R., Sarianti, T., dan Karyadi, A. 2014. *Studi Kelayakan Bisnis*. IPB Press. Bogor.

[11] Pahlevi, R., Zakaria W.A., dan Kalsum, U. 2014. Analisis Kelayakan Usaha Agroindustri Kopi Luwak di Kecamatan Balik Bukit Kabupaten Lampung Barat. JIIA. 2 (1) : 48-55. https://jurnal.fp.unila.ac.id/index.php/JIA/article /view/560.

[12] Central Bureau of Statistics. 2020. *Istilah*. https://www.bps.go.id/istilah/index.html?Istilah_page=4. Accessed on 05 Februari 2022.

[13] Lamia, K.A. 2013. Faktor-Faktor yang Mempengaruhi Tingkat Pendapatan Nelayan Kecamatan Tumpaan, Kabupaten Minahasa Selatan. *Jurnal EMBA*. 1 (4) : 1748-1759. https://ejournal.unsrat.ac.id/index.php/emba/article /view/3371.

[14] Indara S. R., Bempah I., dan Boekoesoe, I. 2017. Faktor-Faktor Yang Mempengaruhi Pendapatan Nelayan Tangkap di Desa Bongo Kecamatan Batudaa Pantai Kabupaten Gorontalo. *AGRINESIA*. 2 (1) : 91-97. https://ejurnal.ung.ac.id/index.php/AGR/article/view/2443.

[15] Ridha, A. 2017. Analisis Faktor-Faktor yang Mempengaruhi Pendapatan Nelayan di Kecamatan Idi Rayeuk. *Jurnal Samudra Ekonomi Dan Bisnis*. 8 (1) : 646-652. https://ejurnalunsam.id/index.php/jseb/article/download/205/153.

[16] Yuroh, F., dan Maesaroh I. 2018. Faktor-Faktor Yang Berpengaruh Terhadap Pendapatan dan Produktivitas Agroindustri Gula Kelapa di Kabupaten Pangandaran. *Jurnal Pemikiran Masyarakat Ilmiah Berwawasan Agribisnis.* 4(2):254-273. https://jurnal.unigal.ac.id/index.php/mimbaragribisnis/article /view/1451.

[17] Julianto, D., dan Utari, P.A. 2018. Analisa Pengaruh Tingkat Pendidikan Terhadap Pendapatan Individu Di Sumatera Barat. *Jurnal Penelitian dan Kajian Ilmiah Menara Ilmu.* 12 (10):24-34. https://jurnal.umsb.ac.id/index.php/menarailmu/article/view/1009.

[18] Hartati. Putro, S., dan Sutardji. 2013. Pengaruh Tingkat Pendidikan Terhadap Tingkat Pendapatan Masyarakat Peternak Sapi Perah Di Desa Sukorame Kecamatan Musuk Kabupaten Boyolali. ***Journal Edu Geography.*** 1(2):33-38. https://journal.unnes.ac.id/sju/index.php/edugeo/article /view/1453.

[19] Riantini, M., Yazid, M., Husin, L., Adriany, D., & Listiana, I. 2019. The Factors Affecting The Vulnerability Indicators Of Fishermen Household In Tanggamus Regency Of Lampung Province, Indonesia. *International Journal of Social Science and Economic Research*. *4*(9). 5984–5997.

[20] Sirait, M.D., dan Purwoko A. 2012. Kajian Risiko Usaha Pengolahan Ikan Teri di Desa Pagurawan, Kecamatan Medang Deras, Kabubapaten Batubara, Provinsi Sumatera Utara. *AGRISEP*. 11 (2) : 187-196. https://ejournal.unib.ac.id/index.php/agrisep/article/view/508.

[21] Imtihan dan Irwandi. 2020. Analisis Faktor-Faktor yang Mempengaruhi Permintaan Ikan Asin Laut di Kota Padang. *Jurnal Penelitian dan Kajian Ilmiah Menara Ilmu.* 14(1):63-71. https://doi.org/10.31869/mi.v14i1.1763.

[22] Department of Investment and One-Stop Integrated Services, Muara Enim Regency. 2020. *Analisis Kelayakan Investasi Pengolahan Ikan Asap & Ikan Asin.* Sumatera Selatan. http://www.dpm-ptsp.muaraenimkab.go.id/bedahinvestasi_v51/upload/dokumen/PENGOLAHANIKANASAPDANIKANASIN.pdf. Accessed on 05 Februari 2022.

[23] Kredit Usaha Rakyat (KUR). 2021. *Evolusi KUR*. https://kur.ekon.go.id/evolusi-kur. Accessed on 10 Januari 2022.

[24] Ningsih, R.S., Mudzakir, A.K., dan Rosyid, A. 2013. Analisis Kelayakan Finansial Usaha Perikanan Payang Jabur (*Boat Seine*) di Pelabuhan Perikanan Pantai Asemdoyong Kabupaten Pemalang. *Journal of Fisheries Resources Utilization Management and Technology*. 2(3): 223-232. https://ejournal3.undip.ac.id/index.php/jfrumt/article/view/3852.

[25] Kusumastuti, A.N., Darsono., dan Riptanti, E.W. 2016. Analisis Kelayakan Finansial dan Sensitivitas Agroindustri Pengolahan Ikan Lele (Studi Kasus di Kub Karmina, Kecamatan Sawit, Kabupaten Boyolali). *AGRISTA*. 4(3):59-69.

[26] Hidayat, A.F., Baskara, Z.W., Wediningsih, W., dan Sulastri Y. 2018. Analisa Kelayakan Finansial Usaha Agroindustri Abon Ikan di Tanjung Karang, Kota Mataram. *Jurnal Ilmiah Rekayasa Pertanian dan Biosistem*. 6(1):69-75. https://doi.org/10.29303/jrpb.v6i1.77.

[27] Yudaswara, R.A., Rizal A., Pratama, R.I., dan Suryana, A.A.H. 2018. Analisis Kelayakan Usaha Produk Olahan Berbahan Baku Ikan Nila (*Oreochromis Niloticus*) (Studi Kasus di CV Sakana Indo Prima Kota Depok). *Jurnal Perikanan dan Kelautan*. 9(1):104-111. http://jurnal.unpad.ac.id/jpk/article/view/18229.

[28] Anwar, M.S., Hasyim, A.I., dan Affandi, M.I. 2018. Analisis Kelayakan Finansial Usaha Pembibitan Lada di Desa Sukadana Baru Kecamatan Marga Tiga Kabupaten Lampung Timur. JIIA. 6(2):110-116. http://jurnal.fp.unila.ac.id/index.php/JIA/article/view/2775.

[29] Winarti, L. 2016. Kelayakan Finansial Usaha Pengolahan Ikan Asin di Kecamatan Seruyan Hilir Kabupaten Seruyan, Kalimantan Tengah. *ZMIP*. 41(3):304-309. https://ojs.uniska-bjm.ac.id/index.php/ziraah/article/view/524.

[30] Winarti, L. 2016. Analisis Sensitivitas Usaha Pengolahan Kerupuk Ikan Pipih di Kecamatan Seruyan Hilir Kabupaten Seruyan. *ZMIP*. 41(2):177-182. https://ojs.uniska-

[31] Rosenfeld, S. A. (2003). Expanding Opportunities: Cluster Strategies That Reach More People and More Places 1. European Planning Studies, 11(4), 359–377. doi:10.1080/09654310303643

**Contribution of Individual Authors to the Creation of a Scientific Article (Ghostwriting Policy)**

Erlina Rufaidah responsible for reviewing the literature. Maya Riantini collected data. Yuliana Saleh completed the write up of this research. Lestari Gita Nur'aini, did the empirical analysis of this study. Aryan Danil Mirza. BR provided policy recommendation and suggestion.

**Sources of Funding for Research Presented in a Scientific Article or Scientific Article Itself**

The research in this manuscript is supported by Faculty of Agriculture, Universitas Lampung.

**Conflict of Interest**

The authors have no conflicts of interest to declare that are relevant to the content of this article.