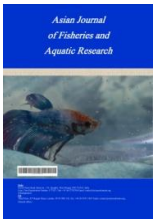

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Analysis of Value Added of Salted Little Tuna in Bandung Regency, West Java, Indonesia (The Case Study in Pindang Ikan Family Business)

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

This study aimed to analyze the value-added of salted little tuna in Bandung Regency. The general method used in this research is the case study method. The data analysis method used is quantitative descriptive analysis. And to analyze the value-added, the Hayami's methods were used. The research conduct in Bandung regency from July to August 2021. The results of this research show that value added of salted little tuna in Bandung regency is 27**%** it means the price of salted little tuna increase 27% from the price of fresh little tuna fish. So, the value-added of salted little tuna is relatively still low. The strategic that used to increase the value added of salted little tuna i.e., increasing in production, increasing in price, and decreasing in costs.

Keywords: Value added; processing; salted little tuna.

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1. INTRODUCTION

Bandung Regency is one of the regencies in West Java that has a high production of fishery processed products with a contribution of 10.5% in 2020 [1]. Salted fish is a processed fish product with high production and tends to increase from 2017 to 2020. This can be seen from the contribution of salted fish to the total fishery processed products in Bandung Regency in 2020 as much as 87% [2] Bandung Regency has 169 persons fishery product processors engaged in the salted fish sector [1]. Salted fish produced with raw materials for seawater fish, freshwater fish, and brackish water fish. Common fish used in processing salted fish include tuna, milkfish, scads fish, salmon, and carp. Salted little tuna is one of the superior products from Bandung regency with a high production volume.

Salted fish is one of the fishery processed products that is quite popular and much liked by the people of Indonesia [3]. Little tuna is one type of fish that is widely used as raw material for salted fish. This is because little tuna has high protein and a firm meat texture, so it is favored by consumers [4]. Processing activities of fishery products such as salted little tuna can provide value-added and selling value of fish eryproducts [5].

Value added is the difference between the value of the product with the cost of raw materials and other input costs [6] The amount of value-added obtained can indicate that the processing process provides added value or not. Value-added analysis could be used as a study material in business development [7] and indicators of the business economic activities [8]. Value-added analysis using the Hayami's methods aims to determine productivity, output value, added value, profit, remuneration for labor and processing profits [9].

Salted little tuna processing activities in Bandung Regency continue to experience development, and demand is increasing. This proves that salted little tuna processing, especially in Bandung regency, still exists in the market. Therefore, further research is needed to analyze the value-added of salted little tuna in the Bandung regency.

2. METHODOLOGY

This research used the case study method in Pindang Ikan Family business, located in Mekarsari Village, Ciparay District, Bandung Regency. This research was done from July to August 2021. Here is the figure of the research location.

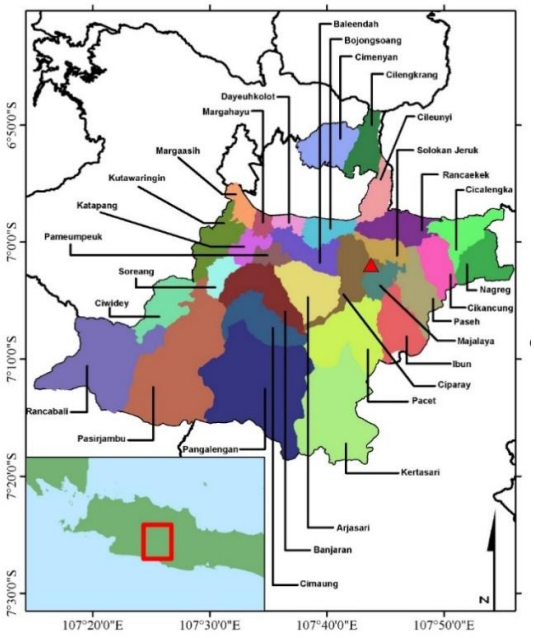

Fig. 1. Research map location

The type of data used is primary data obtained by using observations and interviews. Types of secondary data obtained from various sources such as books, journals, scientific paper reports, the Department of Marine and Fisheries of West Java Province, the Department of Food and Fisheries of Bandung Regency. The determination of the sample is based on the criteria, i.e.:

1) The processor of salted little tuna lived in Bandung Regency
2) Have a minimum of 5 years of business experience.
3) Located at the processing site, in Ciparay District
4) The scale of business included Micro, Small and Medium Enterprises (MSMEs)
5) The respondent was ready to be interviewed.

The data analysis used quantitative descriptive analysis, to measure the overall value added component answer the research objectives. The value added analysis used Hayami's methods, to determine productivity, output value, value-added, profit, remuneration for labor, and processing profits. The value-added analysis uses the following formula [6] is presented in Table 1.

Criteria of value added (VA) index [6]:

1) If VA > 0, means that the fish processing business provides value-added (positive).
2) If VA < 0, means that the fish processing business does not provide value-added (negative).

Criteria of value added (VA) level [10]:

1. If the value-added level < 15% means that the fish processing business has low value-added.
2. If the value-added level 15 - 40% means that the fish processing business has moderate value-added.
3. If the value-added level > 40% means that the fish processing business has high value-added.

Table 1. Hayami's Methods Table

Variable	Score
I. Output, Input, and price	
1. *Output* (kilogram/process)	A
2. *Input* (kilogram /process)	B
3. Labor (People/process)	C
4. Conversion Factor	D = A/B
5. Labor Coefficient (DWP/ kilogram)	E = C/B
6. Output Price (USD)	F
7. Labor Wages (USD/DWP)	G
II. Revenue and Profit	
8. Price of Raw Materials (USD/ kilogram)	H
9. Contribution of Other Inputs (USD/ kilogram)	I
10. Value of Output (USD/ kilogram)	J = D x F
11. a. Value Added (USD/ kilogram)	K = J – H - I
b. Value Added Ratio (%)	L = (K/J) x 100%
12. a. Labor Income (USD/ kilogram)	M = Ex G
b. Labor Share (%)	N = (M/K) x 100%
13. a. Profit (USD/ kilogram)	O = K -M
b. Profit Ratio (%)	P = (O/K) x 100%
III. Feedback to the Owner of the Factors of Production	
14. Margin (USD/ kilogram)	Q = J - H
a. Labor Income (%)	R = (M/Q) x 100%
b. Other Input Contributions (%)	S = (I/Q) x 100%
c. Profit (%)	T = (O/Q) x 100%

3. RESULTS AND DISCUSSION

3.1 Technical and Economical Performance of Salted Little Tuna

3.1.1 Pre-production of salted little tuna processing

Salted little tuna processing through several to produce salted little tuna with good taste and quality. Processing activities are carried out in a semi-permanent factory building located around the main house used explicitly to manufacture salted little tuna, storage of equipment and all materials for producing salted fish. The technology used in processing salted little tuna is still traditional.

The processing of salted little tuna begins with the providing raw materials in the form of little fresh tuna. The raw materials used are obtained from Caringin Market, Bandung. The raw materials used for one-time production are 100 kilograms. Fresh little tuna is purchased for 1.27 USD/kilogram, with the size commonly used a piece for a kilogram. The selection of quality raw materials affects salted little tuna quality [11].

The equipment used to process salted little tuna is quite simple and easy to find in the market. The equipment used in processing salted little tuna is large drum, small drum, gas stove, knife, cutting board, freezer, and plastic basin. The not too expensive is an advantage of processing salted little tuna [3]. Here is a salted little tuna equipment table.

Based on the data in the table above, the total cost incurred for the processing equipment for salted little tuna is 225.74 USD. The highest equipment cost is a freezer with a price of 176.91 USD per unit. Meanwhile, the lowest equipment cost is two cutting boards for 1.42 USD. The highest proportion of salted little tuna processing equipment was freezer at 78.37% and the lowest proportion was cutting board at 0.63%. When viewed from the lifetime of the equipment used in processing salted little tuna. The average lifetime is one year except for the freezer, which has a lifetime of 5 years. The depreciation of salted little tuna processing equipment was obtained at 84.21 USD, with the highest depreciation being the freezer at 35.38 USD/year and the lowest being the cutting board at 1.42 USD/year.

3.1.2 Salted little tuna processing

The processing of salted little tuna begins with the good handling of raw materials. Fresh little tuna is cleaned with running water and then weeded (the entrails of the fish are thrown away). The cleaned little tuna is then arranged on a large drum to add salt as an additional ingredient. Salt is used to provide a savory taste and reduce water content in fish to prevent or inhibit the growth of spoilage bacteria. Salt used in one production process is 9 kilograms. So, at one time of production the additional material cost is 1.15 USD. Salt commonly used in the processing of salted fish as much as 5-10% of the total weight of the fish with a salt layer thickness of about 0.5 cm [3]. Therefore, the quality of the salt used can affect to salted little tuna processing [11].

Table 2. Salted little tuna equipment

No	Equipment	Unit	Volume	Unit Price (USD/Unit)	Total Cost (USD)	Proportion (%)	Lifetime (Year)	Depreciation (USD/Year)
1	Large drum	Unit	4	3.54	14.15	6.27	1	14.15
2	Small drum	Unit	3	2.12	6.37	2.82	1	6.37
3	Gas stove	Unit	2	10.61	21.23	9.40	1	21.23
4	Knife	Unit	2	1.42	2.83	1.25	1	2.83
5	Cutting board	Unit	2	0.71	1.42	0.63	1	1.42
6	Freezer	Unit	1	176.91	176.91	78.37	5	35.38
7	Plastic basin	Unit	2	1.42	2.83	1.25	1	2.83
TOTAL					225.74	100		84.21

The salted little tuna arranged in a large drum and given salt is then carried out in the boiling process. The boiling process is carried out for 4-6 hours. This is by the statement of [4] that the cooking process takes 4-10 hours. The boiling process is carried out using a gas stove and gas as a heat source. The size of the fire can determine the level of maturity and quality of salted little tuna. In addition, the use of fire that is too large effects to the durability of the drum used [3]. Production time is strongly influenced by the amount of equipment used during the processing, especially the big drum owned by the salted little tuna entrepreneur [5].

The cooked salted little tuna are then drained to reduce the fish's water content and extend the fish's shelf life. To speed up the cooling process, it can be done by pouring clean water over the fish that has been thoroughly cooked [3]. Salted little tuna production is carried out two times a week and eight times every month.

3.1.3 Marketing of salted little tuna

The marketing system for salted little tuna still includes regional sales. Salted little tuna produced by this business is sold at Ciparay Market and several customers around Ciparay District. Most household-scale salted fish processors sell directly to consumers, such as traditional markets around their homes [5].

The salted little tuna sold uses newsprint packaging and 35 cm crackle bags for 0.92 USD/kilogram. The drum is also used as a container for salted fish during boiling or steaming and as packaging during transportation and marketing. Poor packaging will greatly affect to the quality of the stored salted fish. Meanwhile, good packaging can reduce damage due to handling during the processing and prevent dirt that causes harmful substances. The use of 0.07 mm PE plastic packaging for storing salted little tuna for six days at room temperature can maintain the stability of the quality of salted little tuna [11].

The salted little tuna produced in one production is 50 kilograms. Based on the study results, the production using raw materials as much as 100 kilograms of little fresh tuna can produce 50 kilograms of salted little tuna with a selling price of 3.89 USD/ kilogram. Then it was found that the yield of the product was 50%, this is in accordance with the statement of [12] that the highest yield of little tuna is in the meat part as much as 50%.

3.2 Value Added Analysis

Processing fresh little tuna into salted little tuna can provide value-added for salted fish processors. Here is an analysis table of the value-added of the salted little tuna in Bandung Regency.

3.2.1 Output, input and price

Based on the research results on this business using 100 kilograms of little fresh tuna as input. The input used in this business is higher when compared to research conducted by [5]. This is because, production is not carried out every day. So, in one production can produce more output.

For one time the production of salted little tuna involved 2 persons. Compared with the salted little tuna processor in Puger Regency, East Java the number of laborers used is more, namely 10 Daily Work People (DWP)/process [13]. The small number of laborers used in the processing of salted little tuna is because only families still run the business. Thus, the laborers involved are also only focused on the owner's own family.

The conversion factor of the salted little tuna processing business is 0.5. The conversion factor states that every 1 kilogram of little tuna fish used in the processing can produce 0.5 kilograms of salted little tuna. The conversion factor produced is higher than Puger Regency [13]. The size of the conversion factor produced in processing can be influenced by several things, such as the use of raw materials, the contribution of other inputs, and the weight loss of raw materials due to the processing [14].

The labor coefficient of processing salted little tuna is 0.02 DWP/kilogram. This shows that to process 1 kilogram of little tuna fish into salted little tuna requires an outpouring of labor as much as 0.02 DWP or 0.16 hours. The labor coefficient in Bandung Regency is smaller than Puger Regency with 0.165 DWP/kilogram [13]. This is due to the difference in the number of labors involved in the processing and the amount of raw materials processed [14].

The output price of processing salted little tuna is 3.89 USD. It means the output price in this business is higher than in Puger Regency [13]. This is because the specified selling price has

adjusted to the circulating market price [15]. Differences in location can also affect the market price set. In addition, the output price that has been determined only uses a rough calculation [9].

The labor wage for this business is 2.65 USD/DWP while in Puger Regency is 0.067 USD/DWP [13]. As mentioned before the labor wage in this business is higher. The high wages of workers can be influenced by the number of wages received equally between processors at each processing stage [14].

3.2.2 Revenue and profit

The price of raw materials in this business is 1.27 USD while 0.71 USD in Puger Regency [13]. It means the input price in this business is higher. This is because the price of little tuna used as raw material depends on the season of the fish. The price of little tuna is lower than the non-fish season [16]. In addition, based on the results of interviews, the scarcity of raw material stocks in the market causes the high selling price of little fresh tuna. So processors have to spend more to buy raw materials.

The contribution of other inputs from this business is 0.14 USD. Contribution of other inputs includes, among others, costs for equipment, salt, packaging materials, gas, and labor costs. When compared with salted little tuna processor in Puger Regency, the contribution of other inputs is 0.38 USD [13] Thus, the contribution of other inputs in this business is lower. This is because the cost of auxiliary raw materials and depreciation costs are less or lower prices [14].

The output value in this business is 1.95 USD. The output value in this business is higher than in Puger Regency with 1.94 USD [13]. This is because, the magnitude of the output value is influenced by the value of the conversion factor and the price of raw materials [17].

Table 3. Value Added of Salted Little Tuna in Bandung Regency

Variable	Score
I. Output, Input, and price	
1. *Output* (kilogram /process)	50
2. *Input* (kilogram /process)	100
3. Labor (People/process)	2
4. Conversion Factor	0.5
5. Labor Coefficient (DWP/ kilogram)	0.02
6. Output Price (USD)	3.89
7. Labor Wages (USD/DWP)	2.65
II. Revenue and Profit	
8. Price of Raw Materials (USD/ kilogram)	1.27
9. Contribution of Other Inputs (USD/ kilogram)	0.14
10. Value of Output (USD/ kilogram)	1.95
11. a. Value Added (USD/ kilogram)	0.53
b. Value Added Ratio (%)	27
12. a. Labor Income (USD/ kilogram)	
b. Labor Share (%)	0.053
	10
13. a. Profit (USD/ kilogram)	0.48
b. Profit Ratio (%)	90
III. Feedback to the Owner of the Factors of Production	
14. Margin (USD/ kilogram)	0.67
a. Labor Income (%)	8
b. Other Input Contributions (%)	21
c. Profit (%)	71

The value-added index in this business is 0.53 USD/kilogram. This shows that, every 1 kilogram of little tuna fish that has been processed into salted little tuna is able to provide the value-added of 0.53 USD/kilogram. The value-added generated in this business provides positive value-added by referring to the added value criteria of [6]. If it compares with value-added in Puger Regency with 0.85 USD/kilogram, the value-added in this business still lower. However, it can be concluded that the processing of salted little tuna provides positive value-added. The amount of value-added can be influenced by conversion factors and other input contributions [17]. The greater the value-added obtained, the better the overall processing process [8]. Value-added can also be described as an effort to increase production value while still paying attention to the allocation of production costs incurred [18].

The value added ratio in this business is 27%. This means that 27% of the product value is value added obtained from processing salted little tuna. It included in the moderate value-added ratio group referring to [10] criteria. The value-added ratio in this business is still smaller than in Puger Regency which has 43.65%. The difference in the value-added ratio can be influenced by the value of the input and the contribution of other inputs [8]. The higher output value and lower raw material prices and other input contributions can also affect value added [17].

The labor income from this business is 0.053 USD/kilogram. This shows that 1 kilogram of little tuna fish which is processed into salted little tuna provides labor income of 0.053 USD/kilogram. While in Puger Regency the labor income is lower when compared in this business [13]. Labor income is the income of workers from each processing of one kilogram of raw materials [15]. Labor income is also a wage that is directly received by the labor from the added value [14].

The labor share from this business is 10%. That higher if compared with salted little tuna processor in Puger Regency which has 1.347% [13].

The profit obtained from this business is 0.48 USD/kilogram. It means that every 1 kilogram of little tuna with the value added obtained from processing into salted little tuna generates a profit of 0.48 USD/kilogram. The profit in this business is still lower than Puger Regency which has 0.84 USD/kilogram of profit. The profit value shows the amount of compensation received by the owner of salted little tuna processing business. The difference in profit value is influenced by value added and labor income. The greater the value added generated and the smaller the income from the workforce received, the greater the profit obtained [17].

The profit ratio obtained from this business is 90%. The profit ratio is higher than in Puger Regency that obtained 43.076%. If the level of profit obtained is high, the processing can increase economic growth [15].

3.2.3 Feedback to the owner of the factors of production

The margin in this business is 0.67 USD/kilogram. The amount of margin is distributed among labor income, other inputs contribution and profit. The largest remuneration obtained by the company came from the profit as much as 71%. This means that the profit contributes 0.0050 USD in every 0.0071 USD of the company's margin. The second largest remuneration is the other inputs contribution as much as 21%. This means that the contribution of other inputs contributes 0.0015 USD in every 0.0071 USD of the company's margin. The smallest remuneration is labor income as much as 8%. This means that labor income contributes 0.00057 USD in every 0.0071 USD of the company's margin.

Based on the results of research, the value added of processing salted little tuna in Bandung Regency are still relatively low. However, traditional fish processing has a greater prospect to be developed, compared to modern processing. This prospect is supported by the availability of fish resources, high demand, the simplicity of the technology used, and the large number of traditional processing home industries [3]. To increase the value added in this business, the processors must be more efficient in the production costs used. Further research can be carried out to provide an alternative to cost reduction in fish processing so that it is more efficient [8].

4. CONCLUSION

Based on the research, it was found that the value added index of salted little tuna business in Bandung Regency was 0.53 USD/kilogram with a value added ratio is 27%. The processing of

salted little tuna provides value added and had moderate value added level. Therefore, it can be concluded that the processing of salted little tuna business in Bandung Regency can provide value added processors. The strategic that used to increase the value added of salted little tuna i.e., increasing in production, increasing in price, and decreasing in costs. Management policy that can be done to develop salted little tuna processing business is to set prices through market surveys and market trends. By making appropriate pricing policies, it can increase sales of salted little tuna.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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