ANALYSIS THE ADDED VALUE OF WOOD PROCESSING IN THE FURNITURE BUSINESS IN BALAPULANG DISTRICT, TEGAL REGENCY

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ABSTRACT

Wood is chosen as the raw material for furniture because it produces better products. However, furniture craftsmen in Balapulang District need to consider the added value of furniture, and the limited raw materials hinder the production process. This study aims to determine the added value generated from furniture production processes in Balapulang District, Tegal Regency, as well as strategies that can be used to overcome the scarcity of raw materials. The methods used in this study are the Hayami value-added analysis method and SWOT analysis (Strength, Weakness, Opportunity, Threat). The results showed that the added value obtained after passing through the production process for a wardrobe was Rp2,917,519, with a value-added ratio of 61%.
Meanwhile, the added value of school tables and chairs after going through the production process was Rp1,995,365, with a ratio of 53%. The appropriate strategy to overcome the scarcity of raw materials is an aggressive strategy with developing S-O (Strength and Opportunities) strategies. The value-added analysis using the Hayami method shows that processed products such as wardrobes and school tables and chairs provide significant income for furniture craftsmen. Somebody must consider production efficiency and workers' skills to produce innovative and attractive products. Cooperation between craftsmen and quality wood suppliers is necessary to obtain raw material stocks. The government can support the development of the furniture industry through infrastructure development, increased market access, training, and education to improve economic growth and community welfare in Balapulang District, Tegal Regency

Keywords: furniture; Added-value; SWOT.

1. Introduction

Land availability, soil fertility levels, and a favorable climate make Indonesia's natural products relatively abundant; one of the commodities in agriculture is wood. Indonesia's forest wood products have quality and advantages compared to other countries, and this certainly has a good impact on terms of production and export (Ministry of Industry, 2021). The higher Indonesia's agricultural output, the better it will be able to attract international markets and provide positive things for the economy. According to data from the Central Bureau of Statistics (2020), the highest wood-producing island in Indonesia is Sumatra Island, with a wood production of 41.73 million m^3, followed by Kalimantan Island, with a wood production of 9.71 million m^3, and Java Island, with a wood production of 7.76 million m^3. The results of forest wood production in Indonesia can be seen in Table 1.

Table 1. Forest Wood Production in Indonesia in 2016 – 2020

Types of Forest Wood	Forest Wood Production (M^3)				
	2016	2017	2018	2019	2020
Logs	3.807.662	4.368.171	4.796.636	4.584.023	N/A[1]
Sawn Wood	1.873.777	1.912.366	2.078.551	2.529.113	258.143
Plywood	3.683.640	3.761.198	4.213.557	4.157.686	386.292

Source : Central Bureau of Statistics (2022)

Tegal Regency is one of the largest furniture-producing districts in Central Java besides Jepara Regency; from the results of verification conducted by the Central Bureau of Statistics of Tegal Regency, 2020, there are a total of 416 industries in Tegal Regency, of which the number of furniture industry centers and wood craftsmen is 14% (57 centers). Wood is chosen as a raw material for the furniture industry because processed products from wood have better results compared to other substitute materials such as plastic, cloth, and iron.

The lack of management skills of furniture craftsmen in Balapulang sub-district resulted in furniture craftsmen not considering the added value of the furniture produced, many of whom get smaller profits compared to the Capital spent. According to research conducted by Palupi et al. (2016), optimal profit can be obtained by applying cost analysis, including raw material costs, labor costs, and factory overhead costs incurred by the company. It takes information on the added value of products for furniture craftsmen as a reference to make decisions, especially regarding products with high selling values.

In addition to the need for more knowledge about the added value there, there are other problems, namely limited raw materials. This is because the raw materials for business depend on nature, and the planting age of trees is quite long. A small supply of raw materials can affect the course of production and cause craftsmen to lose money (Perwitasari & Soetriono, 2020). The limited raw materials require craftsmen to take raw materials from outside KPH Balapulang to maintain production. This creates additional costs such as shipping costs, the price of raw materials from other regions being more expensive, and the amount of wood depending on the weather and season. According to research conducted by Hidayat and Ridayanti (2018), if more potential raw materials are owned, they can create added value and reduce the number of unemployed.

2. Literature Review

2.1 Added Value

According to Hayami et al. (1987), added value is the added value of a commodity due to the process of changing form (from utility), place utility, and storage (time utility); the amount of added value depends on the process it has gone through; the calculation of added value can be done during the processing process and marketing. Using the Hayami method of analysis, conversion factors, labor coefficient, product value, added value, value-added ratio, labor benefits, other input contributions, and profit and margin levels.

Factors that affect added value consist of technical and non-technical factors. Technical factors consist of the amount and quality of raw materials used, the quality of products produced, the application of technology, production capacity, and the use of labor elements.

[1]Data on the production of log types in 2020 are not available.

Non-technical factors consist of selling prices, prices of raw materials for production, labor wages, the value of other inputs (other than fuel), investment capital, and market information. The value-added function can be formulated as follows:

NT = f (K, B, T, H, U, h, l)

NT = Added Value
K = Production Capacity (Kg)
B = Raw materials used (Kg)
T = Manpower required (People)
H = Output Price (Rp)
U = Labor wages (Rp)
h = Raw material prices (Rp/Kg)
L = Other Output Values (Rp)

2.2 Production Theory

Production is the change of factors of production into goods of production or a process in which inputs are converted into outputs. The production process requires inputs in the form of production factors such as Capital, labor, expertise or ability, and land so that production activities can run smoothly. The production process is divided into two parts, namely short-term production and long-term production. In short-term production, there are factors of production that are fixed (fixed input), and the amount can change (variable input). Capital is included in fixed inputs because the amount does not affect production results; labor is variable or can change because its use follows the amount of production. In long-term production, all factors of production can change the amount (Suparmoko, 2017).

The production function can be formulated as follows:

Q = f (K, L, R, T)

Q = Outputs produced
K = Capital
L = Labor
R = Resources
T = Technologies

The production function indicates the maximum amount of output that can be produced if a certain number of inputs are used in the production process.

3. Research Methodology

3.1 Research Design

This study used descriptive and quantitative methods. A descriptive approach is research that aims to determine the value of a variable without any relation to other variables. The data collection method uses saturated sampling or census methods. Sugiyono (2008) states that the soaking sampling method or census is a sampling technique if all population members are used as samples.

3.2 Data Analysis Techniques

The Hayami method and SWOT analysis are used to determine the amount of added value and determine strategies to overcome the scarcity of raw materials. This research was carried out in Balapulang District, with the population in this study being furniture craftsmen totaling 33 people. The data used in the study were primary data from interviews and the distribution of questionnaires to furniture craftsmen.

3.2.1 Value Added Analysis

The Hayami method calculates the added value of the wood processing process into furniture. To find out the amount of added value from the process of turning wood into furniture, a calculation formula is used using the procedure that can be seen in Table 1.

Table 1. Procedure for Calculating Value Added Hayami Method

	Variable	Value
	Output, Input, Harga	
1.	Output/ Total production (unit)	A
2.	Raw material input (m^3 / unit)	B
3.	Labor Input (HOK/unit)	C
4.	Conversion factors (1) / (2)	D = A/B
5.	Labour coefficient (3) / (2)	E = C/B
6.	Product price (Rp /unit)	F
7.	Average wages of labour/person (Rp /HOK)	G
	Revenue and Profit	
8.	Raw material input price (Rp /unit)	H
9.	Additional material costs (Rp /unit)	I
10.	Product value (4) x (6) (Rp /unit)	J = D X F
11.	a. Added value (10) - (8) – (9) (Rp /unit)	K = J – I – H
	b. Value added ratio (11a) / (10) (%)	L% = (K/J) %
12.	a. Labor Income (Rp /unit)	M = E X G
	b. Labor benefits (12a) / (11a) (%)	N% = (M/K) %
13.	a. Profit (11a) – (12a) (Rp /unit)	O = KM
	b. Profit rate (13a) / (10) (%)	P% = (O - J) %
	Remuneration for Production Factors	
14.	Margin (10) - (8) (Rp / unit)	Q = J – H
	a. Labor income (12a) / (14) (%)	R% = (M/Q) %
	b. Other input contributions (9) / (14) (%)	S% = (I/Q) %
	c. Enterpreneur Profit (13a) / (14) (%)	T% = (O/Q) %

Source: Hayami (1987) at Febriyanti (2017)

3.2.2 SWOT Analysis (Strengths, Weaknesses, Opportunities, Threats)

SWOT analysis (Strengths, Weaknesses, Opportunities, and Threats) is used to analyze aspects of an organization or company to describe various potentials by involving two strategic factors, namely IFAS (Internal Strategic Factors Analysis Summary), consisting of strengths and weaknesses, and EFAS (External Strategic Factors Analysis Summary), consisting of

opportunities and threats. After obtaining a score from the weighting of each factor, four quadrants of recommendations are obtained, which are depicted in the following SWOT analysis diagram.

Figure 1. SWOT Analysis Diagram

4. Results

4.1 Value Added Analysis

Added value is the value obtained from processing, changing shape, storage, or changing hands. In this study, the method used to analyze added value is the Hayami method. The first value-added analysis is furniture production in the form of wardrobes.

A value-added analysis was conducted to obtain information on the estimated value-added received by furniture craftsmen in Balapulang District. Based on Table 2, it can be seen that the average number of wardrobes produced in one month is 8 units. To produce cabinets with this amount, raw materials in the form of wood, as much as 3 m^3 are needed. The added value obtained after passing through the production process into cabinets amounted to Rp2,917,519. The added-value ratio is 61%. The profit received by furniture craftsmen for every cubic meter of raw materials after production amounted to Rp2,302,609 with a profit rate ratio of 79%. The added value produced is only partially received by craftsmen alone but is accepted by workers and artisans. From Table 2, the benefits received by workers amounted to Rp614,909, or 21% of the total added value.

Table 2. Results of Value-Added Analysis of Furniture Industry Biological Method in the Form of Cabinets

No	Output, Input, Price	Value
1	Total Production (Units)	8,0
2	Raw Materials (m^3)	3,0
3	Labour (HOK)	21,4
4	Conversion factors	2,7
5	Labour Coefficient	7,1
6	Product Price (Rp/unit)	1.786.000
7	Average Wages of Labour (Rp)	86.001
	Revenue and Profit	
8	Raw Price (Rp/m^3)	1.622.000
9	Additional material costs (Rp/unit)	223.148
10	Product value (Rp/unit)	4.762.667
11	a. Added Value (Rp/unit)	2.917.519
	b. Added Value Ratio (%)	61
12	a. Labour Income (Rp/m^3)	614.909
	b. Labour Benefit (%)	21
13	a. Profit (Rp/m^3)	2.302.609
	b. Profit Rate (%)	79
	Remuneration of Production Factor	
	Margin (Rp/m^3)	3.140.667
14	a. Labor Income (%)	20
	b. Other Input Contribution (%)	7
	c. Enterpreneur Profit (%)	73

Source: Primary Data (2023)

The value-added analysis in the second part is on school desks and chairs. Based on value-added analysis based on Table 3, it can be seen that the average production of furniture in one month in the form of school tables and chairs produced is 59.2 units. 4.3 m^3 of raw wood materials are needed to produce tables and chairs with this amount. The added value obtained from raw wood materials for school tables and chairs after the production process amounted to Rp1,995,365, with a ratio of 53%. The profit received by craftsmen for every cubic meter of raw materials converted into tables and chairs is Rp1,574,744, with a profit ratio of 79%. The added value produced is only partially received by craftsmen but accepted by workers and artisans. The benefits received by workers amounted to Rp420,622, or 21% of the total added value. The results of the value-added analysis of school desks and chairs can be seen in Table 3 below:

Table 3. Results of Value-Added Analysis of Furniture Industry Biological Method in the Form of School Tables and Chairs

No	Output, Input, Harga	Value
1	Total Production (Units)	59,2
2	Raw Materials (m^3)	4,3
3	Labour (HOK)	21,4
4	Conversion factors	13,5
5	Labour Coefficient	4,8
6	Product Price (Rp/unit)	279.048
7	Average Wages of Labour (Rp)	86.001
	Revenue and Profit	
8	Raw Price (Rp/m3)	1.545.238
9	Additional material cost (Rp/unit)	231.539
10	Product Value (Rp/unit)	3.772.142
11	a. Added Value (Rp/unit)	1.995.365
12	b. Added Value Rate (%)	53
12	a. Labour Income (Rp/m3)	420.662
	b. Labour Benefit rate (%)	21
13	a. Profit (Rp/m3)	1.574.744
	b. Profit rate (%)	79
	Balas Jasa Untuk Faktor Produksi	
	Margin (Rp/m3)	2.226.904
14	a. Labor Income (%)	19
	b. Other Input Contribution (%)	10
	c. Enterpreneur Profit (%)	71

Source: Primary data processed, 2023

4.2 SWOT Analysis

To find out the right strategy to overcome the scarcity of raw materials faced by furniture craftsmen in Balapulang District, IFAS and EFAS Matrics are used. Before making the matrix, it is necessary to identify internal factors in the form of strengths and weaknesses and external factors in the form of opportunities and threats.

From the results of interviews with 33 respondents, it can be seen in Table 4 that the strength score is 2.889 and the total weakness score is 0.333; it can be interpreted that the influence of the strength factor is greater than the weakness factor owned by the furniture industry in Balapulang District, with a comparison between strength and weakness of 2.556. The calculation of Internal strategy evaluation (IFAS) can be seen in Table 4 as follows:

Table 4. Internal Strategic Factor Evaluation Matrix (IFAS)

No	Internal Factors	Weight	Rating	Weight Score
	Strength factor			
1	Have skilled workers	0,222	4	0,889
2	Using quality raw materials	0,111	2	0,222
3	Production support equipment	0,222	4	0,889
4	Advantages obtained by craftsmen	0,222	4	0,889
Total Strength				2,889

Weakness Factors				
5	Capital availability	0,056	1	0,056
6	Raw material prices	0,056	1	0,056
7	Sales Process	0,111	2	0,222
Total Weakness				0,333
Total IFAS		1		2,556

Source: Primary data processing, 2023

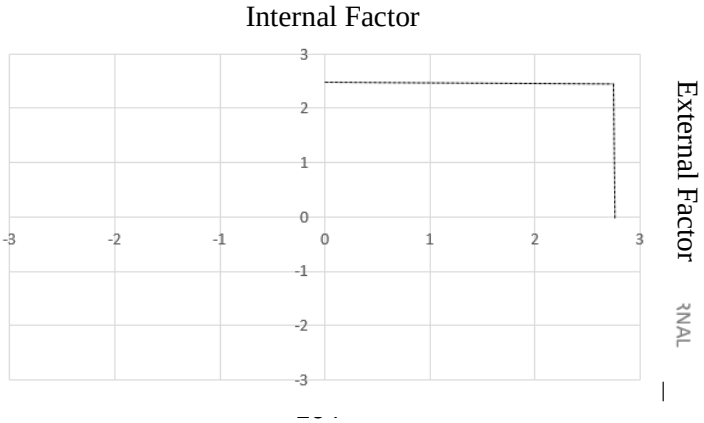
In addition to internal factors, external factors are needed, such as taking advantage of opportunities and avoiding threats from outside the furniture industry, to determine the right strategy to overcome the scarcity of furniture raw materials. It can be seen in Table 5 that the opportunity score is 3 and the total threat score is 0.133; it can be interpreted that the influence of opportunity factors is greater than the threat factors owned by the furniture industry in Balapulang District, with a comparison between opportunities and threats of 2.867. The calculation of external strategy evaluation (EFAS) can be seen in Table 5 as follows:

Table 5. External Strategic Factor Evaluation Matrix (EFAS)

No	External Factors	Weight	Rating	Weight Score
Opportunity Factor				
1	Demand for table and chair furniture to meet educational needs.	0,267	4	1,067
2	Demand for cabinet furniture to meet the needs of the community.	0,267	4	1,067
3	Product innovation.	0,200	3	0,600
4	Government assistance	0,133	2	0,267
Total Opportunities				3
Threat Factors				
5	Climate change threatens wood production.	0,067	1	0,067
6	Business competition	0,067	1	0,067
Total Threat				0,133
Total EFAS		1		2,867

Source: Primary data processed, 2023.

The results of the IFAS and EFAS matrices are obtained as a result of strategies to overcome the scarcity of raw materials; a position matrix is needed to produce coordinate points (x, y). The X value is obtained from the result of the difference between strength and weakness, which is 2.556, and the Y value is obtained from the result of the difference between opportunity and threat, which is 2.867. Therefore, the strategic position of the furniture industry is obtained through t



5. Discussion

5.1 Analysis of Added Value Received by Furniture Craftsmen in Balapulang District.

5.1.1 The added value of cabinets

In Table 2, the added value generated from processing wood into cabinets produces positive added value with a value-added ratio of >40%. The added value is obtained by reducing the value of products by reducing the price of raw materials and the value of other inputs. This value is still a gross added value because it has not been reduced by labor rewards. Labor income is obtained by multiplying the labor coefficient by labor wages, which is Rp. 614,909. Rewards for the total profit received by craftsmen amounting to Rp. 2,302,609/m3 are obtained from reducing added value with labor rewards.

5.1.2 The added value of school desks and chairs

In Table 3, the added value generated from wood processing into school tables and chairs produces positive added value with a value-added ratio of >40%. The added value is obtained by reducing the value of products by reducing the price of raw materials and the value of other inputs. This value is still a gross added value because it has not been reduced by labor rewards. Labour income is obtained from the multiplication of the labor coefficient with labor wages, which is Rp. 420,662. Rewards for the total profit received by craftsmen of Rp. 1,574,744/m3 are obtained from reducing added value with labor rewards.

5.1.3 The results of the analysis carried out on each craftsman produce added value and different benefits; as happened in the field, some furniture craftsmen get high added value, but the profits obtained are small or even negative. This is because the amount of production does not always determine the added value and profits obtained. There are several other factors added during the production process, such as the price of raw materials, workers' wages paid, and different shipping costs between craftsmen.

5.2 Analysis of strategies to overcome the scarcity of raw materials.

In Figure 4.1, it is obtained that the right strategy to overcome the scarcity of raw materials is in the position of quadrant I; the result is obtained from the evaluation matrix between internal and external factors, which produces coordinate points (x, y) with x values derived from internal factors of 2,556 and y values from external factors of 2,867, resulting in coordinate points (2.56; 2.86). The next stage is decision-making to develop a strategy that has been described by the SWOT matrix, which will later be used as a reference to overcome the scarcity of raw furniture materials. The strategies in question are:

- Digital technology is very important for craftsmen by utilizing science and technology as much as possible to obtain information related to Capital and the availability of raw materials from KPH Balapulang and wood farmers.
- The increasing demand for furniture needs to be accompanied by sufficient Capital to meet market demand.
- Workers who have the latest skills and technological knowledge can provide innovation to the furniture products produced; there needs to be assistance from the government in the form of training for craftsmen to increase their skills in processing furniture.

6. Conclusion

Based on the results of the research that has been done, the following conclusions can be drawn:

- The results of the calculation of added value using the Hayami method showed that the added value produced in furniture products in the form of cabinets and school chair tables is positive, namely Rp2,917,518/m^3 for cabinets and Rp1,995,365/m^3 for school chair tables. Positive added value can benefit furniture craftsmen in Balapulang District, Tegal Regency.
- Based on the results of the SWOT matrix, it is known that the right strategy to overcome the scarcity of raw materials is the S-O strategy by utilizing strengths to obtain as many opportunities as possible. The demand for furniture is large enough to be a good opportunity for craftsmen, but the scarcity of raw materials is one of the inhibiting factors. To still be able to take advantage of these opportunities, several things are done before production, namely preparing raw materials before the production process so that the production process can still run and obtain good quality and raw material prices to minimize losses. In addition, craftsmen must also improve management capabilities and optimize the use of available resources to improve production efficiency.

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