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Analysis Of Added Value Of Cape Cotton Oil Refining In Waeapo District, Buru Regency

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Abstract

This research was conducted in Waeapo District, Buru Regency from July to August 2024. The respondents in this study were eucalyptus oil distillation farmers. The analysis used was descriptive analysis and added value analysis (Hayami method). The results of the study showed that clove leaf oil distillation is one type of essential oil that can be produced from the dry clove leaf oil distillation process carried out for 8 hours with an average of 783.33 kg of raw materials used / production. The average added value produced by eucalyptus oil distillation in Waeapo District, Buru Regency is IDR 1,938.92 / kg in one production with an average added value ratio of 44.8%. From the results of this added value analysis, it was obtained that clove leaf oil distillation in Waeapo District, Buru Regency provides high added value ranging from > 40%.

Keywords: Value Added Analysis, Refining, Eucalyptus Oil

INTRODUCTION

The plantation sub-sector is currently an important part of developing agribusiness in order to increase the added value of plantation products and increase income for people working in the plantation sector. The current target of plantation development is to increase production results and quality in encouraging equity, growth and dynamics of the rural economy which will provide opportunities to improve people's lives better (Yantu et al., 2009). Eucalyptus oil is an essential oil obtained by distillation, extraction with solvents, and extraction with solid fat. This plant has the potential to produce essential oils.

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The most commercial part of the eucalyptus plant is the leaves, which are mostly used in the pharmaceutical industry, while other parts have not been utilized optimally and are still considered less useful waste, even though eucalyptus leaves contain essential oils that allow the oil contained therein to be distilled, so that the waste has a high economic value (Nuryoto et al., 2011). Steam distillation can be divided into two, namely direct distillation which uses steam and oil methods running simultaneously. Indirect distillation is a method whose principle is to separate the evaporation of water from the evaporation of the processed raw material oil (Budiwan, 2016). Eucalyptus oil began to be developed in 1960 which was used as a liniment to treat joint pain, itching due to insect bites and so on. In industrial countries, the eugenol contained in the oil is separated, used for raw materials for medicine, technical fragrances for soap and detergents (Dept. of Agriculture, 2010). Eucalyptus Oil Production Plantations are a sector that greatly supports regional income. The development of the Eucalyptus Oil Production commodity is taking place in accordance with the rate of harvest area and production. Buru Island is one of the areas producing eucalyptus oil which has been able to provide the eucalyptus oil needs of most of its people. The following is the development of eucalyptus oil production in Maluku as seen in Table 1.

The table above explains that the highest average daily eucalyptus oil production from selected small distillation industries was obtained in Buru Regency, 5.14 liters per day, followed by West Seram Regency, 4.26 l/day, Central Maluku Regency, 3.56 l/day and the lowest in Southeast Maluku Regency with a production of 3.41 l/day. This is due to differences in the area of eucalyptus trees and the number of craftsmen in each district and village. From statistical data (BPS 2015), the area and number of eucalyptus oil distillation craftsmen on Buru Island are larger than other areas. Although the area of eucalyptus land and craftsmen on Buru Island are larger than other areas, it is not in line with the quality of the eucalyptus oil products produced. The results of the study showed that the content of the main component of eucalyptus oil (cineol) is less than 50% while for Seram Bagian Barat it reaches 60% (Idrus et al 2015).

Table 1. Production of Eucalyptus Oil in Small Refining Industries in 5 Regencies/Cities in Maluku.

Regency/City	Village/Hamlet Production	Capacity (ml/day)	Workforce
Ambon	Kate-Kate	2.480	3

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Maluku Tengah	Suli	4.340	4
	Tulehu	2.400	3
	Suli 1	3.100	3
	Suli 2	4.340	4
Seram Bagian Barat	Wael, Piru	4.496	4
	Kotania	4.340	4
	Wael, Piru	5.580	5
	Ariate	3.100	3
	Kotania	4.340	4
	Tamanjaya	3.720	5
Buru	Waeperang	2.480	3
	Sawa	6.200	6
	Pilar	7.440	12
	Waeperang	6.200	6
	Jikumarasa	5.580	10
	Karangjaya	4.960	7
	Airbuaya	3.100	4
Maluku Tenggara Barat	Imrong	4.340	5
	Tepa	2.480	3

Source: BPS Maluku in figures, 2023

Specifically in the study location, the eucalyptus oil refining business in Maluku, especially in Waeapo District, Buru Regency, is a hereditary farming business that began before World War II (1843) until now and is still traditional. Because eucalyptus plants are spread almost everywhere in Maluku, eucalyptus oil then has different names for each place in Maluku, such as iren or sakelan in Piru, irano in Amahai, ai kelane in Hila, irono in Haruku, ilano in Nusa Laut and Saparua, and elan in Buru. However, the eucalyptus oil refining business in Maluku, especially in Waeapo District, can be said to be a source of livelihood that will eventually be forgotten by its residents. This is because the existing eucalyptus land is decreasing due to rapid infrastructure development. The infrastructure development includes highways, government/office buildings, and residential areas. The remaining eucalyptus land, namely land with hilly topography and not yet utilized for development, is utilized in such a way that the results are taken by the distillers. Another

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phenomenon that also affects the number of distillation business units is the emergence of mining in Waeapo District.

The existence of mining since the end of 2011 has caused most of the laborers who pick eucalyptus leaves to switch professions to become miners so that the need for raw materials for eucalyptus oil production cannot be met and ultimately results in the stagnation of eucalyptus oil refining businesses. The impact of this phenomenon can be seen from the decreasing number of eucalyptus oil refining business units as shown in Table 2.

Table 2. Number of Eucalyptus Oil Refining Business Units in Waeapo District 2019 – 2022.

Number of Eucalyptus Oil Refining Businesses					
Year	(unit)				
	Village				
	Wapsalit	Lele	Debo	Dava	Kubalahin
2019	15	48	35	40	22
2020	13	45	33	37	20
2021	10	43	28	32	18
2022	5	15	10	12	8

Source: Buru Regency in figures, 2023

Based on Table 2, it can be seen that there has been a reduction in the number of eucalyptus oil refining business units in five villages (Lele Village, Wapsalit Village, Debo Village, Dava Village and Kubalahin Village) which are the targets of the implementation of community learning and empowerment programs by PKBM (Community Learning Activity Center) Sari Arum. The percentage of reduction in the number of refining business units occurred the most in the period 2011/2012, which was an average of 42.58 percent, where the largest reduction occurred in Lele Village, which was 48.28 percent. This is due to the location of Lele Village which is close to the mining area so that people who previously worked as farm laborers picking eucalyptus leaves switched professions to become miners. Therefore, the Buru Regency Government immediately sought a policy that regulates the management of the mining so that the results can be enjoyed by the local indigenous community without having to sacrifice the sustainability of the eucalyptus

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natural forest and the eucalyptus oil refining business which has been a hereditary heritage. In addition, PKBM Sari Arum also organizes learning and empowerment programs based on agricultural potential in order to improve the welfare and income of local indigenous communities. The empowerment program is carried out by providing coaching in the form of knowledge and skills based on eucalyptus oil agribusiness so that it can change the attitudes and behavior of eucalyptus oil distilling farmers.

RESEARCH METHOD

This study aims to determine the added value of eucalyptus oil in Waeapo District, Buru Regency. This research was conducted in Waeapo District from July to August 2024. The respondents in this study were 5 villages. consisting of 3 distillers in each village, so the number of respondents was 15 people. Determination of respondents was carried out using the purposive sampling method, meaning determining respondents according to selected criteria that are relevant to the research problem (Bungin, 2007). This study uses primary data and secondary data. Primary data was obtained by conducting direct observations and interviews with the Owner and employees using a questionnaire. Secondary data was obtained from various supporting literature and agencies related to this research.

Descriptive Analysis.

Descriptive Analysis based on the first research objective, descriptive analysis is used to describe the data as it is without the intention of making conclusions that apply to the public or generalizations Sugiyono (2004).

Value Added Analysis.

The value added analysis used is the value added analysis using the Hayami method. To obtain the amount of added value of processing eucalyptus leaves into eucalyptus oil, the calculation using the Hayami method is presented in Table 2:

Table 2. Calculation of Added Value Method of Hayami et.al (1987)

No	Variable	Value
	Output, Input, and Price	
1	Output produced (Kg/production)	A

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2	Raw materials used (Kg/production)	B
3	Labor (HOK/production)	C
4	Conversion factor	D = A/B
5	Labor coefficient (HOK/kg)	E = C/B
6	Output price (Rp/kg)	F
7	Average labor wages (Rp/HOK)	G
	Income and Profit	
8	Raw material price (Rp/kg)	H
9	Other input contributions (Rp/kg)	I
10	Output value (Rp/kg)	J = D × F
11	a. Added value (Rp/kg)	K = J – I – H
	b. Value added ratio (%)	L (%) = (K/J) × 100%
12	a. Labor compensation (Rp/kg)	M = E × G
	b. Labor ratio (%)	N(%) = (M/K) × 100%
13	a. Profit (Rp/kg)	O = K – M
	b. Profit rate (%)	P (%) = (O/K) × 100%

RESULTS AND DISCUSSION

General Business Overview.

Competition is growing from time to time. Health is no longer a necessity. Eucalyptus oil is one of the important elements in the market world. It is undeniable that eucalyptus oil products are very much needed by humans, both men and women, from birth to leaving this world. These products are used repeatedly every day and throughout the body. The circulation of eucalyptus oil products is very wide and rapid in Maluku.

Waeapo District has 5 refining business villages, namely Lele Village, Wapsalit Village, Debo Village, Dava Village and Kubalahin Village. The eucalyptus oil refining business has been pioneered since ancient times. For example, the eucalyptus oil business run by Mr. Yunus using simple equipment or can be said to be very traditional in nature with a boiler capacity of 500 kg and the eucalyptus oil refining business, was pioneered since January 1997. The refining business in Kubalahin Village, the form of this eucalyptus oil refining business is individual. The eucalyptus oil refining business was established with the consideration that the area has raw materials available because it is close to eucalyptus trees so that it can minimize the cost of transporting raw materials. In

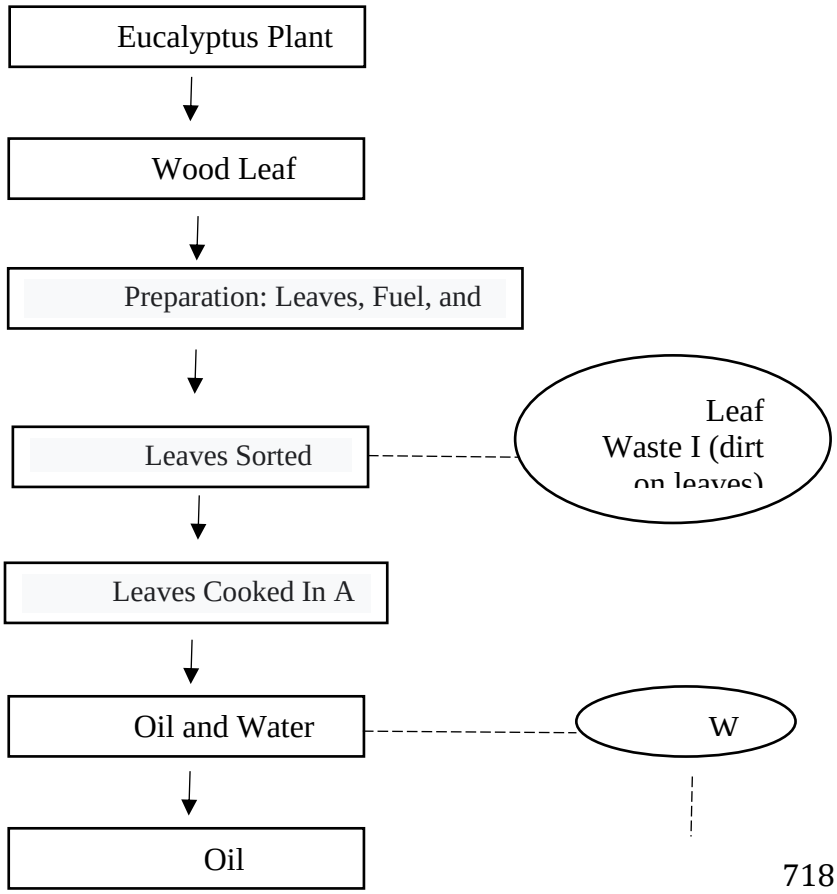
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addition, the business location is also close to a water source. Water is an input material needed in large quantities for the eucalyptus oil processing business. The water functions as a coolant in the condensation process from steam to liquid consisting of eucalyptus leaf oil and water. There are several tools and production equipment needed in the eucalyptus oil processing process. The main facilities are a boiler made of iron (plateser), furnace and cooling pool (condenser).

Eucalyptus Oil Production Process.

The production process is an activity that processes raw materials into semi-finished goods or finished goods that are ready to be marketed. Production activities in a business are a very important stage in order to produce quality products, to produce quality products requires skills and the use of appropriate technology. The Eucalyptus Oil Refining Process Diagram can be seen in Figure 1.



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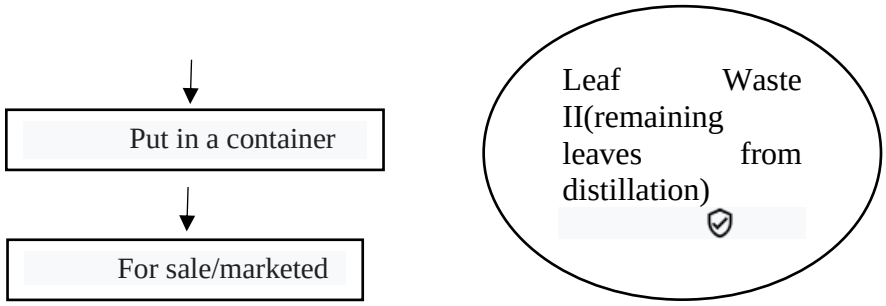


Figure 1. Diagram of the Eucalyptus Oil Refining Process

Figure 1 shows that the main raw material used in producing eucalyptus oil is eucalyptus leaves. Before the production process begins, eucalyptus is weighed according to the maximum boiler load of 500kg, 800kg and 1,000kg and then put into the distillation boiler. The distillation process is carried out for 8 hours, after one hour of the distillation process, water vapor mixed with oil vapor will come out which will flow to the cooling pool (Condenser) so that the oil mixed with water comes out not in the form of hot steam but in the form of liquid. The next stage is the separation of oil from water (Distiller) which comes out through the cooling pool pipe based on its specific gravity. The oil that has been separated from water is then collected in a plastic drum, filtered using screen printing cloth and packaged in plastic jerry cans and is ready to be marketed.

Characteristics are traits or specifications possessed by respondents in relation to the farming business they are engaged in, including age, level of education, number of family members, and so on. Respondent Age. Respondent age will affect physical work ability in cultivating their farming business. Farmers are generally young and have stronger physical abilities and higher spirits than older farmers on average. The age of respondents in the eucalyptus oil refining business in Waeapo District is classified as productive, the workforce aged 26-35 years is 50%, the workforce aged 36-45 years is 16.7% and the age of 46-55 years is 33.3%. The age of 15-64 years is a person's productive age in working (Aprilyanti, 2017).

The number of family dependents will also affect the costs incurred by farmers in supporting their families. The more dependents, the more it will affect the level of expenditure. The average number of dependents of eucalyptus oil refining respondents in Waeapo District is between 1-3 as many as 83.3% the number of family dependents 4-6 as many as 16.7%

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Table 3 shows that the output produced by the refining business in Waeapo District is 22.33. The conversion factor of the refining business is 0.02, meaning that the refining business produces different conversion factors. This is in line with the theory put forward by Ruslan in Nurhinayah (2019) that the conversion factor is the amount of physical contribution of raw materials in the form of eucalyptus leaves that can become eucalyptus leaf oil. The added value generated from the three refineries is IDR 1,938.92 or 44.9%. The average profit obtained is IDR. 1,638.92/kg or 83.75% of the average total added value of eucalyptus oil obtained.

The profit obtained is a net profit because it has taken into account labor compensation (Salsabilla, et al. 2019). A comparison of the results of research conducted by Asmara (2011), entitled "Analysis of Added Value and Efficiency of Cajeput Oil Agroindustry Business" states that the production results in one production process or for 24 hours are 23.76 kg of cajeput oil with a labor coefficient required of 0.007. The selling price of cajeput oil in Waeapo Sawahan averages IDR 137,380.95 / kg and a conversion factor of 0.02, so the average value of the product produced is IDR 2,0269.97 / kg. The added value obtained is IDR 904.76 / kg of cajeput oil raw materials or 39.86% of the production value. In addition, the large profit obtained by cajeput oil entrepreneurs is IDR 413.20 / kg with a profit ratio of 45.67%. From the results of this added value analysis, it was found that the eucalyptus oil agroindustry in Waeapo District, Buru Regency provided moderate added value ranging from 15% -40%. So, it can be concluded that the distillation of eucalyptus oil in Waeapo District has the highest added value compared to the research conducted by Asmara (2011). This is due to differences in the amount of raw materials, the price of eucalyptus oil, contributions of other inputs, and the price of raw materials used in one production. The number of workers used in this study was 1.87 with an average added value ratio of 44.9% with a high added value category (Ratio> 40%). Based on the added value ratio, a commodity can be categorized as a high, medium and low value agroindustry. The determination criteria are based on the opinions of Yoesti Silvana Arianti and Lestari Rahayu Waluyati. 2019, namely:

1.<15% : Low added value
2. 15% - 40% : Medium added value
3. >40% : High added value

The high conversion value is influenced by the quality of eucalyptus oil leaves, the higher the quality of eucalyptus oil leaves, the higher the conversion value produced by the eucalyptus oil refining business and can increase added value.

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Table 3. Results of the Analysis of Added Value of Refining in Waeapo District, Buru Regency

No	Variable	Value
	Output, Input, and Price	
1	Output produced (Kg/production)	25 kg
2	Raw materials used (Kg/production)	500 kg
3	Labor (HOK/production)	1,77
4	Conversion factor	0,024
5	Labor coefficient (HOK/kg)	0,003
6	Output price (Rp/kg)	145.000
7	Average labor wages (Rp/HOK)	150.000
	Income and Profit	2.000
8	Raw material price (Rp/kg)	50
9	Other input contributions (Rp/kg)	3.480
10	Output value (Rp/kg)	
11	a. Added value (Rp/kg)	1.430
	b. Value added ratio (%)	41
12	a. Labor compensation (Rp/kg)	450
	b. Labor ratio (%)	31,4
13	a. Profit (Rp/kg)	980
	b. Profit rate (%)	68,5

Source: Research Data Processing, 2024

CONCLUSION AND SUGGESTIONS

Conclusion

Based on the results of the study, it can be concluded that the eucalyptus oil distillation business in Waeapo District is:

1. The eucalyptus oil business is one type of essential oil that can be produced from eucalyptus plants obtained through the distillation process or eucalyptus distillation process. Eucalyptus oil distillation businesses are generally carried out with simple technology and on a small scale. The distillation process is carried out for 8 hours with an average raw material of 783.33 kg/production. Water vapor mixed with oil vapor will be channeled into the cooling pool, then the separation of water and oil that has come out

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through the cooling pool is then collected in a storage tank. Furthermore, it is filtered using screen printing cloth and packed into plastic jerry cans. 2. The output value obtained from the processing of eucalyptus oil into eucalyptus oil in distillation C is greater because the output price of distillation C is greater than distillations A and B. The profit obtained by distillation B is Rp. 1,856.77 with a profit level of 75.5%, this is influenced by the amount of added value and the wages of the workforce produced.

Suggestion

Based on the added value obtained from the refining business in Waeapo District, eucalyptus has the potential to be developed, so the owner must increase its production. To increase production, the owner can store raw materials during the dry season so that during the rainy season the company can still carry out the eucalyptus oil refining production process. To increase added value and profit, the business owner must make more efforts to expand the marketing reach.

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