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Analysis of Factors Affecting Value Added Eucalyptus Oil Agroindustry at Eucalyptus Oil Factory Perhutani Kupang Mojokerto

Lenka Vidha Claresta[1], Syarif Imam Hidayat[2], Nisa Hafi Idhoh Fitriana[3]

[1,2,3] Agribusiness Study Program, Faculty of Agriculture, UPN "Veteran" Jawa Timur, Indonesia

ABSTRACT: The eucalyptus oil agricultural industry as a from of indusrty that processes eucalyptus leaves into eucalyptus oil contributes to increased value creation and income as well as employment. This study aims to determine what factors influence the added value of eucalyptus oil in the Eucalyptus Oil Agro-industry, Kupang, Mojokerto. The method used in this research is factor analysis using SPSS 23 software. The instrument used in collecting research data is a questionnaire using a Likert scale. Respondents in this study amounted to 50 by census method. The results of the study show that of the twelve variables that measured, there are three new factors that affect the added value of eucalyptus oil in the Eucalyptus Oil Agroindustry, Kupang, Mojokerto. The new factors that are formed are the quality of raw materials, the amount of raw materials according to needs and optimization of factory capacity.

KEYWORDS: agroindustry, eucalyptus oil, factor analysis

I. INTRODUCTION

Eucalyptus oil as a result of an agro-industry that processes eucalyptus leaves is one of the essential oil products that is well known and needed by the public for medicines and body care products that are relatively inexpensive. Eucalyptus oil is one of the most important essential oil products, especially as a main supplement for raw materials for medicines and body care products. However, in this case, there are still obstacles faced by the domestic eucalyptus oil industry. According to the Ministry of Environment and Forestry (2019), the national need for eucalyptus oil is currently around 4,500 tons/year, but domestic supply is only 2,500 tons/year. This supply shortage causes Indonesia to still import 2,000 tons of eucalyptus oil per year. Therefore the opportunity for the development of eucalyptus oil agro-industry has the potential to be developed to increase the contribution of the agricultural sector, especially to develop the amount of eucalyptus oil agro-industry production so as to reduce the sizable amount of imports. The production of eucalyptus oil is not yet optimal, which is the reason why domestic demand for eucalyptus oil has not been fulfilled, so import measures to meet the demand for eucalyptus oil are still being carried out.

Agro-industry is an activity that can create other activities and obtain added value. Because of this, it is expected that in a planned manner the development of agro-industry businesses in villages will produce various products, including products that are classified as waste so far, which will receive processing treatment so that various products with low economic value are created, even from products that have no value at all to become a product with economic value. tall. Through village-based agro-industry development efforts, it will attract the growth of the agricultural sector while increasing the economic growth of agricultural center villages. As industrialization efforts have provided broad employment opportunities for urban communities, so is the development of agro-industry built in agricultural centers including in villages that are expected to provide employment opportunities for rural communities (Kindangen, 2014).

As a State-Owned Enterprise (BUMN), Perum Perhutani is given the authority to manage eucalyptus plantation forest areas which are a source of raw material for the eucalyptus oil industry. This is in accordance with the Policy of the Ministry of Environment and Forestry (KLHK) which states that currently non-timber products and environmental services are being branched out to become the backbone of national forestry development (Ministry of Environment and Forestry, 2019).

The raw material for eucalyptus leaves is obtained from forest areas managed by Perum Perhutani KPH Mojokerto. The quantity and availability of raw materials as well as the quality of raw materials determine the success of the Kupang Mojokerto Agro-industry processing process and will certainly have an impact on achieving added value which ultimately ends in achieving revenue targets for a company. Value added can be defined as the difference between the value of the product and the value of raw materials. The greater the added value of eucalyptus oil products, of course, can play a role in increasing economic growth. Great economic growth will have an impact on increasing business fields and people's income. Through analysis of the added value of eucalyptus oil agro-industry and the factors that influence production, it can be seen how much added value is obtained by eucalyptus oil agro-industry and what factors affect eucalyptus oil production.

II. METODE PENELITIAN

This research was conducted intentionally or *purposively* located in the Eucalyptus Oil Agroindustry, Kupang, Mojokerto. The number of respondents was 50 determined by census according to the total number of employees working at the Kupang Mojokerto Eucalyptus Oil Factory. Data collection method used is a questionnaire. The method used in analyzing the factors that influence the added value of eucalyptus oil in the Kupang Mojokerto Agroindustry is factor analysis using SPSS 23 software. Factor analysis is used to find the dominant factors that affect the added value of eucalyptus oil. Factor analysis is a technique used to find factors that are able to explain the relationship or correlation between various independent indicators that are observed.

III. HASIL DAN PEMBAHASAN

Based on the data obtained in the analysis of the factors that influence the added value of eucalyptus oil in the Kupang Mojokerto Eucalyptus Oil Agroindustry with a total of 12 variables, the results of the research will be presented, namely that there are three new factors formed. The following steps are the output of factor analysis using the SPSS program.

A. Uji Validitas dan Reliabilitas

Validity test is a test of the accuracy or accuracy of a measuring instrument in measuring what is being measured. The questionnaire is said to be valid if the value of r count > r table, with an r table of 0.278 which is obtained from a significance level of 5% with a 2-tailed test and n-2 degrees of freedom. The results of the validity test can be seen in the table below.

Tabel 1. Validity Test Result

Variable	Indicator	r table	r count	Remarks
Planting Location	X1.1	0,278	0,724	Valid
Harvesting Time	X1.2	0,278	0,709	Valid
Superior Plant Types	X1.3	0,278	0,627	Valid
Eucalyptus Leaf Condition	X1.4	0,278	0,672	Valid
Eucalyptus Leaf Storage Methods	X1.5	0,278	0,539	Valid
Processing Method	X2.1	0,278	0,523	Valid
How to Fill the Kettle	X2.2	0,278	0,758	Valid
Coocking Process	X2.3	0,278	0,776	Valid
Mechine Condition	X2.4	0,278	0,525	Valid
Amount According to Needs	X3.1	0,278	0,538	Valid
Amount According to Capacity	X3.2	0,278	0,429	Valid
Availability of Raw Materials in the Werehouse	X3.3	0,278	0,539	Valid

After testing the validity of the research questionnaire, then the reliability test was carried out. The reliability test in this research model uses the condition that the Cronbach alpha value must be greater than 0.7 so that it can be said to be reliable Bahri et al., (2021). Reliability testing in this study used SPSS software.

Table 2. Reliability Test Result

Cronbach's Alpha	Cronbach's Alpha Based on Standarized Item	N of Items	Keterangan
.777	.865	12	Reliabel

Based on the table above, it is known that the overall Cronbach's alpha value of the 12 question items has a value above 0.7, which is equal to 0.777. So it can be concluded if the questionnaire in this study has a reliable classification.

2. KMO and Bartlett Test

KMO and Bartlett's Test are two data suitability tests that must be performed before interpreting the results of the factor analysis. KMO is a test conducted to determine the appropriateness of a factor analysis done.

Table 3. KMO and Bartlett Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy	.818
Bartlett's Test of Sphericity Approx. Chi-Square	429.004
Df	66
Sig.	.000

The KMO value of 0.818 > 0.50 and the Bartlett Test value of 0.429.004 <0.05 met the criteria so that factor analysis could be continued

3. Communalities

The community test shows how much a variable can explain a factor. According to Santoso (2015) the greater the *Communalities* value, the higher the role of indicators in explaining the factors that are formed.

Table 4. Communalities Test Result

Variable	Initial	Extraction
X1.1 Planting Location	1.000	.924
X1.2 Harvesting Time	1.000	.839
X1.3 Types of Superior Plants	1.000	.572
X1.4 Eucalyptus Leaf Condition	1.000	.768
X1.5 How to Store Eucalyptus Leaves	1.000	.517
X2.1 Processing Method	1.000	.444
X2.2 How to Fill the Kettle	1.000	.952
X2.3 Coocking Process	1.000	.840
X2.4 Machine Condition	1.000	.314
X3.1 Quantity As Required	1.000	.775
X3.2 Amount According to Capacitu	1.000	.819
X3.3 Availability of Raw Materials in the Warehouse	1.000	.682

Variable is considered capable of explaining a factor if the extraction value is greater than 0.50. Variable X1.1 (planting location) is able to explain 0.924 or 92.4%, Variable X1.2 (harvesting time) is able to explain 0.839 or 83.9%, Variable X1.3 (high-yielding plant species) is able to explain 0.572 or 57.2% followed by other variables which have been described in detail.The next process is knowing how many factors are formed which can be seen through the total variance explained table. Looking at the number of factors formed, you must first pay attention to the eigenvalues. Factors are said to be formed if the eigenvalues are greater than 1. The number of eigenvalues is always sorted from the largest to the smallest (Santoso, 2015). In order to find out how many factors that can be formed can be seen through the table total variance is explained below

Table 5. ***Total Variance Explained***

Component	*Initial Eigenvalues*			*Extraction Sums of Squared Loadings*		
	Total	*% of Variance*	*Cumulative %*	*Total*	*% of Variance*	*Cumulative %*
1.	5.544	46.197	46.197	5.544	46.197	46.197
2.	1.647	13.725	59.922	1.647	13.725	59.922
3.	1.256	10.468	70.390	1.256	10.468	70.390
4.	.893	7.438	77.827			
5.	.837	6.974	84.801			
6.	.551	4.594	89.395			
7.	.451	3.762	93.158			
8.	.329	2.739	95.897			

9.	.218	1.816	97.713	
10.	.167	1.393	99.105	
11.	.076	.636	99.741	
12.	.031	.259	98.585	

In the table above there are eigenvalues that are more than 1 and there are three factors that are formed. The total value of the initial eigenvalues component 1 of 5.544 is the first factor and is able to explain 46.197% of the variation. Second factor found in component 2 with a total initial eigenvalues of 1,647 and is able to explain 13,725% of the variation. The third factor is found in component 3 with a total initial eigenvalues of 1.256 and is able to explain 10 468% of the variation. The total of the three factors will be able to explain the indicators of 46.20% + 13.72% + 10.47% = 70.39% of the 12 indicators, while another 29.61% cannot be explained in this study.

4. Rotated Factor

To ensure that a variable is included in which factor group, it can be determined by looking at the largest correlation value between the variable and the factor (component) formed. Through matrix rotation, factors can be presented in a simpler form with non-zero or significant expectations.

Table 6. Rotated Component Matrix

Component 1	
X1.1 (Planting Location)	**.953**
X1.2 (Harvesting Time)	**.897**
X1.3 (Superior Plant Types)	**.738**
X1.4 (Eucalyptus Leaf Conition)	**.864**
X1.5 (Eucalyptus Leaf Storage Methods)	**.572**
X2.2 (How to Fill the Kettle)	**.963**
X2.3 (Coocking Process)	**.880**
Component 2	
X2.4 (Mechine Condition)	**.522**
X3.1 (Amount According to Needs)	**.877**
X3.3 (Availability of Raw Materials in the Werehouse)	**.813**
Component 3	
X2.1 (Processing Method)	**.629**
X3.2 (Amount According to Capacity)	**.904**

Based on the table above it can be seen that the indicators X1.1, X1.2, X1.3, X1.4, X1.5, X2.2, X2.3 have a loading factor value highest in forming component 1 factors, so that it can be called an indicator of component 1. Furthermore, indicators X2.4, X3.1, X3.2 have the highest values in forming component 2. Then indicators X2.1 and X3.2 have the highest values in form component 3.

Table 7. Component Tranformation Matrix

Component	**1**	**2**	**3**
1	**.942**	.266	.205
2	-.325	**.878**	.351
3	-.086	-.398	**.913**

The Component Transformation Matrix table above shows that in *component 1* the correlation value is 0.942 > 0.5, then in *component 2* the correlation value is 0.878 > 0.5 and in *component 3* the correlation value is 0.913 > 0.5. This means that the correlation values of all components are more than 0.5, so the three factors formed are correct in summarizing the 12 existing variables.

5. Naming New Factor

Factor rotation that has been implemented and forms three new factors that must be given a name to each factor based on the characteristics that match each factor filling indicator which can be seen as follows:

Table 8. New Factor Formed

Factor	Indicator	Mark
Quality Of Raw Materials (46.197%)	Planting Location (X1.1)	.953
	Harvest Time (X1.2)	.897
	Types of Superior Plants (X1.3)	.738
	Eucalyptus Leaf Condition (X1.4)	.864
	How to Store Eucalyptus Leaf (X1.5)	.572
	How to Fill The Kettle (X2.2)	.963
	Coocking Processe (X2.3)	.880
Jumlah Bahan Baku Sesuai Kebutuhan (13.725%)	Factory Machine Condition (X2.4)	.522
	Amount of Raw Materials as Required (X3.1)	.877
	Availability of Raw Materials in the Werehouse (X3.3)	.813
Optimalisasi Kapasitas Pabrik (13,725%)	Processing Method (X2.1)	.624
	Amount According to Capacity (X3.2)	.904

The first factor consists of 7 variables and is named raw material quality with the greatest contribution with a total explained variance of 46.197 % and an eigenvalue of 5.544. This shows that the quality of raw materials at the Kupang Mojokerto Eucalyptus Oil Factory is the most important factor in increasing the added value of eucalyptus oil. The second factor consists of 3 variables and is given a name, namely the amount of raw materials as needed with a total explained variance of 13.725% and an eigenvalue of 1.647. The third factor consists of 2 variables named namely factory capacity optimization with a total explained variance of 10,468% and an eigenvalue of 1,256

CONCLUSION

From the results of the factor analysis that has been carried out, it can be seen that the factors that influence the added value of eucalyptus oil are the raw material quality factor, the raw material quantity factor as needed, and the factory capacity optimization factor.

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