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Study on Development of Virgin Coconut Oil Agroindustry System in North Sulawesi, Indonesia

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Abstract

The development of virgin coconut oil (VCO) agro-industry products has been studied. Research objectives are; 1). Analyzing the added value of VCO processing agroindustry on the scale of UMKM in North Sulawesi Province 2). Determining the factors that influence the added value. This study uses the Hayami value added analysis method. The results of the study found that for every use of 1 kg of raw coconut meat processed into VCO products, UMKM business actors received a profit of Rp. 19.771.71, meaning that from agricultural activities in processing VCO products, UMKM actors get a significant economic value added. The conclusions of this study are: 1). Analysis of the added value of the Virgin Coconut Oil (VCO) agroindustry in North Sulawesi, the output value is Rp. 31,428.57/liter, the added value generated is Rp. 21,428.57, - with a ratio of 68.18%, labor compensation work amounting to Rp 1,656.86/liter or 7.73%, and a profit margin of Rp 21,428.57/liter or 92.27%; 2). The factors that influence the added value are raw materials, product prices, labor coefficient, conversion factors and the average wage of labor.

Keywords
Agroindustry; VCO products; SME; Develompent

I. Introduction

Indonesia is one of the largest coconut producing countries in the world, with an area of coconut plantations until 2019 of ± 3,413,316 ha. This data is reinforced by the report of the International Coconut Community (ICC), of the 61 billion coconuts produced in the world per year, about 14.6 billion coconuts per year are produced from Indonesia.

North Sulawesi Province is one of the provinces located in the eastern part of Indonesia, which is known as an agrarian or agricultural area. Based on a report from the Indonesian Central Statistics Agency (BPS), the area called palm flank, has an area of coconut plantations until 2020 of 260.8 thousand hectares, with coconut fruit production of 245.5 thousand tons. So that in 2019, coconut fruit processing significantly contributed to the export value of plantation commodities for North Sulawesi Province of 120,056,050,21 USD or 91.35% of the total export value of 131,430,909.08 USD.

Processing of coconut flesh at the farmer level in general in Indonesia, especially in North Sulawesi Province, is mostly still limited to being processed into copra, ready-to-use cooking oil. In fact, most of them are directly sold in the form of whole coconuts at relatively low prices to coconut oil processing companies. From the results of interviews of researchers with representatives of farmers, the selling price of whole coconuts to coconut oil companies or their representatives is Rp. 8000 per grain for super coconut and Rp. 5000/ordinary coconut. Farmers do this, in order to meet the economic needs of the family.

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Meanwhile, some groups of farmers already have diversified processing of coconut flesh into products of high economic value, namely virgin coconut oil (VCO).

VCO product processing activities are carried out in synergy between farmers and local entrepreneurs to form an agro-industry processing VCO products on the scale of Micro, Small and Medium Enterprises (UMKM). Based on strong motivation and passion to develop VCO product processing in a synergistic manner utilizing all the resources it has. The understanding of forming UMKM is believed to make it easier to obtain raw materials, facilitate the procurement of processing equipment and product packaging, so that they can produce quality VCO and all market demand quantities, as well as their vision and belief for the future to make the VCO product agro-industry continue to develop into a profitable company that applies the principles of good corporate governance. The population of the agro-industry processing Virgin Coconut Oil (VCO) products in the last 7 years has continued to grow and spread across districts and cities in the Province of North Sulawesi, Indonesia.

Agro-industry development can be defined as a business system that utilizes agricultural raw materials, which can increase agricultural efficiency to become a very productive activity, through the process of agricultural modernization. Agroindustry as a process of agricultural modernization, maximizing the use of production inputs, such as superior seeds, fertilizers, cultivation machinery to machine tools for product processing, can increase the added value of the economy and the competitiveness of the products it processes. Agro-industry development can also be interpreted as taking advantage of opportunities to increase production and expand markets by product promotions and increasing VCO product diversification , another part of engineering is based on base flow inventory and product flow through the design of environmentally friendly plant energy input processes without fossil fuels.

In 2019, the world community was faced with the transmission of the Corona Virus, causing many people to suffer from dissociation and many to die. In these conditions, humans try to find ways to strengthen their resistance or immunity (immunity) according to the World Health Organization (WHO) appeal to continue to survive. On the other hand, the incessant print and electronic media continue to publish research results on VCO products containing lauric acid (C12), as a liquid supplement that is processed naturally from coconut meat as the main raw material, without the use of chemicals, and functions to strengthen endurance (immunity). body during the Covid 19 pandemic. This opinion is reinforced by the results of research, which explains that Virgin Coconut Oil (VCO) products function as antiviral and can be a phytopharmaca antidote to COVID 19. This process causes VCO lauric acid content is the highest compared to the others 2 oils, namely 53.70-54.06%, while regular coconut oil is 2.81% and palm oil is 0.45%. The high lauric acid content makes VCO beneficial for health, including increasing endurance and speed up the healing process. Furthermore, there were clinical results for patients who had contracted COVID 19, given VCO as a liquid supplement, the result was an increase in body immunity and accelerated the healing process. This momentum had negative impacts such as a decrease in the economic business of farming communities and UMKM. Meanwhile for agro-industry business actors processing Virgin Coconut Oil (VCO) products on an UMKM scale. In the conditions of the COVID-19 pandemic, this is the momentum that encourages UMKM actors to continue carrying out agro-industry activities for processing VCO products, as a liquid supplement which can scientifically function as a supplement to strengthen immunity and human health and provide significant added value to the economy in the current era the COVID-19 pandemic.

The agro-industry of processing Virgin Coconut Oil (VCO) products is seen as a system, so that in its development, various problems are still found. The problems faced by UMKM in the agro-industry of Virgin Coconut Oil (VCO) products in North Sulawesi Province are: venture capital alone or jointly, so that the use of processing equipment, VCO packaging equipment and labor is limited [9]. So the number of VCO products produced is adjusted to demand. local markets, such as: supermarkets, drugstores, pharmacies and delivered online (e-commerce), but there are also groups of UMKM that have sold VCO products to national and even foreign markets. The efforts of UMKM in the agro-industry of VCO products to continue to develop their business in a sustainable manner This is done by looking for financial institutions such as government and private banks, constrained by several administrative requirements, because it is not yet known how much economic value added is obtained in each producing VCO products. This factor is the main requirement in proposing loan assistance programs from financial institution n government and private.

From the description of the problems above, it can be concluded that the formulation of the problem from this research is: "How much added value from each agro-industry activity of processing Virgin Coconut Oil (VCO) products on an UMKM scale in North Sulawesi Province?"

The aims of this research are 1. Analyzing the added value of the existence of UMKM-scale Virgin Coconut Oil (VCO) processing agro-industry activities in North Sulawesi Province.

Previous studies have focused more on calculating the added value of VCO agroindustry on a farmer or family scale and the object of research is outside the province of North Sulawesi. So that this research becomes State of the art with previous research, because this research calculates the added value (value added) of VCO processing agro-industry on the scale of Micro, Small and Medium Enterprises (UMKM) in North Sulawesi Province.

The benefits of the results of this study are as information for coconut farmers and UMKM in the agro-industry processing VCO products to continue to develop their business. The results of this study are also to provide information on the number of UMKM Agroindustry VCO products to the Department of Agriculture and the Office of UMKM and Cooperatives of the North Sulawesi Provincial Government.

II. Research Methods

This research was conducted in North Sulawesi Province, with the object of research being coconut flesh derivative products, namely virgin coconut oil. The location selection was carried out by purposive sampling method, taking into account that North Sulawesi Province as one of the regions in Indonesia, every year the 2nd largest producer of coconuts. The study was conducted for 6 months, from May to October 2022

The type of data used in this study consists of 2 types, namely, 1). Primary data and 2). secondary data. Primary data is data obtained from interviews in the field with groups of coconut farmers and UMKM actors in the VCO product agro-industry. Secondary data is data obtained from libraries or references (books, journal publications) related to this research.

Primary data collection methods are carried out in several ways, namely: observation, interviews using a questionnaire (containing a number of questions) and recording.

This study uses several stages, namely starting with identifying the problem, formulating the problem, setting goals, analyzing the results and discussing and drawing conclusions. The research data were analyzed using Hayami's value added analysis method. Furthermore, the results of the calculation analysis are presented in tabular form and described.

III. Result and Discussion

3.3 Existing Conditions of Coconut Fruit Production in North Sulawesi Province of Indonesia

Existing conditions of coconut fruit production and development of processing agro-industry virgin coconut oil (vco) products in north sulawesi province of indonesia. North Sulawesi Province is one of the regions that contributes to the high production of coconuts for Indonesia. The highest coconut production occurred in 2020, amounting to 111,707.63 tons with a coconut production area of 113,057.97 hectares. Meanwhile, the lowest coconut production occurred in 2019 at 81,184.96 tons with a production area of 114,948.39 Ha. Based on the report from the plantation office of North Sulawesi Province, that is, until the end of 2020, there are 5 (five) regencies that have the largest coconut plantation area and production of coconut raw materials, which can be seen in table 1.

Table 1. The Largest Production Area of Coconut Fruit Raw Materials in North Sulawesi Province

Number	Regency	Coconut Fruit Production (Tons)	Productivity (Kg/Ha)	Involvement of Farmer Family Groups (KK)
1.	South Minahasa	48.167.70	1.237.99	27.273
2.	North Minahasa	38.467.50	1.312.39	19.931
3.	Southeast Minahasa	37.017.09	1.493.83	18.671
4.	Bolaang Mongondow	31.798.22	1.263.37	25.792
5.	Minahasa	20.381.80	1.496.79	18.053

Furthermore, to see a general description of coconut cultivation, supply of raw materials, production and production facilities supporting Virgin Coconut Oil (VCO) agro-industry activities in North Sulawesi Province can be seen in table 2.

Table 2. Overview of Coconut Cultivation, Provision of Raw Materials, Production, and Production Facilities

	Primary data					Central bureau of statistics Data	
Year	Number of VCO Production UMKM	VCO production	Amount of Raw Materials Used	Number of Production Facilities	VCO Raw Materials Farmers Group	Coconut Production	Coconut Land Area
	(Unit)	(Liter)	(Ton)	(Unit)	(Unit)	(Ton)	(Ha)
2016	13	25450.00	498.82	57	12	97549.76	122116.15
2017	13	28044.00	549.66	57	12	106368.61	126334.75
2018	13	30292.00	593.72	57	12	86175.75	118029.51
2019	18	35756.33	700.82	132	17	81184.96	114948.39
2020	19	42100.00	825.16	147	18	111707.63	113057.97
2021	22	43964.67	861.71	166	21	107312.11	116079.28

In table 2, it is explained that the highest coconut production occurred in 2020, amounting to 111,707.63 tons with a coconut production area of 113,057.97 hectares. Meanwhile, the lowest coconut production occurred in 2019 at 81,184.96 tons with a production area of 114,948.39 Ha.

The increase in the number of UMKM that produce VCO has increased significantly in 2019. This increase was due to the assistance from the Bitung City government to people who have the desire and ability to start VCO agro-industrial businesses in the form of production sites and production facilities. Until 2021 the number of UMKM has reached 22 business units. With this number, UMKM are able to produce as much as 43,964.67 liters of VCO in 2021. To produce this amount of VCO, 861.71 tons of coconut are needed and the number of VCO production facilities is 166 production facilities.

The existence of Virgin Coconut Oil (VCO) agro-industry in North Sulawesi periodically, Micro, Small and Medium Enterprises (UMKM) has not developed much in all regencies and cities in North Sulawesi Province. Based on the results of the study, it was found that the agro-industry activities of VCO products on the scale of Micro, Small and Medium Enterprises (UMKM) were only found in 3 regencies and 2 cities, namely North Bolaang Mongondow Regency, South Minahasa Regency, North Minahasa Regency, Bitung City and Manado City, which can be seen in table 3.

Table 3. Number of Agro-Industry Products of Virgin Coconut Oil (VCO) in Micro, Small and Medium Enterprises (UMKM) in North Sulawesi Province in 2021

Number	Region of North Sulawesi Province	Number of UMKM (Units)
1.	North Minahasa Regency	3
2.	Bitung City	8
3.	Southeast Minahasa Regency	9
4.	North Bolaang Mongondow Regency	2
5.	Manado City	1
	Total	22

From table 3, it can be explained that the area with the most growth of agro-industrial activities for Virgin Coconut Oil (VCO) products on a UMKM scale is Bitung City. This is because the city of Bitung is designated by the government as an integrated industrial area, based on the use of agricultural raw materials, especially coconuts. The attention of the local government is shown by the construction of a VCO agro-industry center on an UMKM scale. The perpetrators of UMKM Agroindustry VCO products in the city of Bitung in addition to receiving assistance for office space, processing facilities, provision of raw materials, were also given assistance with representative VCO processing and packaging equipment. While the lowest is the city of Manado, amounting to 1 unit. This is because the city of Manado as one of the marketing areas for VCO products produced by UMKM in North Minahasa Regency, South Minahasa Regency, Bolaang Mongondouw Regency and Bitung City. The management of the VCO product agroindustry for the 4 regions, makes more use of the available resources, such as some processing plants that still use their homes and private areas, limited processing and packaging equipment, but the enthusiasm to continue to run the processing agroindustry to the sale of VCO products. This effort is made to cover a number of costs in production and gain economic benefits for business development.

The development of agro-industry for Virgin Coconut Oil (VCO) products on an UMKM scale in North Sulawesi Province is strongly influenced by the availability of VCO

raw materials. The availability of raw materials is significantly influenced by coconut production and the number of farmer groups providing raw materials. Coconut production itself is determined by the area of coconut production. The increase or decrease in the need for raw materials is determined by the production of VCO. Meanwhile, VCO production is influenced by the number of UMKM producing VCO, where the number of UMKM producing VCO will increase along with the increase in the availability of VCO production facilities. VCO availability is also affected by VCO sales. VCO sales are influenced by three sales groups, namely sales through drug stores and pharmacies, sales through supermarkets and e-commerce, and sales through distributors and direct consumers.

Analysis of the added value of virgin coconut oil (VCO) agroindustry in North Sulawesi. Analysis of the added value of a business's products generally uses the Hayami method. Calculation of the added value (value added) of Virgin Coconut Oil (VCO) production on the Agro-industrial Micro, Small and Medium Enterprises (UMKM) scale in North Sulawesi can be seen in table 4.

Table 4. Value Added Calculation Results of Virgin Coconut Oil (VCO)

Variable	*Value*	Unit	Notation
	Output		
Output	713.91	Liters/week	A
Raw material	4997.39	Kg/week	B
Labor	69.00	HOK/Sunday	C
Conversion factor	0.1429		D=A/B
Labor coefficient	0.0138	HOK/Kg	E=C/B
Output price	Rp 220,000.00	/Liter	F
Labor average wages	Rp 120,000.00	/HOK	G
	Revenue and Value Added		
Raw material prices	Rp 10,000.00	/Kg	H
Contribution of Other Inputs	Rp -	/Kg	I
Output Value	Rp 31,428.57	/Kg	J=DxF
Value-added	**Rp 21,428.57**	**/Kg**	**K=J-I-H**
Value Added Ratio	68.18%		L=(K/J)x100%
Labor Rewards	Rp 1,656.86	/Kg	M=ExG
Labor Section	7.73%		N=(M/K)x100%
Profit	Rp 19,771.71	/Kg	O=K-M
Profit Section	92.27%		P=(O/K)x100%
	Remuneration for Factors of Production		
Profit Margins	Rp 21,428.57	/Kg	Q=J-H
Profit	92.27%		R=(O/Q)x100%
Labor	7.73%		S=(M/Q)x100%
Other Inputs	0.00%		T=(I/Q)x100%

Based on the results of the calculations in Table 4. shows that the added value of Virgin Coconut Oil (VCO) is obtained from the processing of coconut into VCO. In a week, of the 22 UMKM business units that act as VCO producers, they are able to produce an average of 713.91 liters/week with 4 production times a week. To produce this amount of VCO, 4997.93 kg of coconuts are needed per week with a workforce of 69 HOK/week. These workers are given a daily wage of Rp. 120,000, - with the ability to work 0.0138 Days of Work (HOK)/kilogram. The average price of raw materials per kilogram is IDR 10,000. Virgin Coconut Oil (VCO) is then sold at an average price of IDR 220,000/liter. The added value produced per liter of Virgin Coconut Oil (VCO) products in North Sulawesi is Rp. 21,428.57 after deducting the price of raw materials per kilogram of Rp.

10,000. The ratio of the resulting added value to the output value of Rp. 31,428,- is 68.18%. This value is then distributed as remuneration for workers in the amount of Rp. 1,656.86/kg or 7.73% so that the profit obtained by UMKM producing VCO is Rp. 19,771.71/kg. Added value is the added value of a commodity that undergoes processing, transportation or storage in a production process. The difference between the output value and the input value can also be interpreted as the meaning of added value. Value added analysis is carried out to determine the amount of added value that is given as compensation for production actors. The value of the compensation obtained is then known for the distribution (margin) to workers, company contributions, and profits to business owners. The selling price of VCO products affects consumers in making decisions to buy VCO products .Based on the results of the research that has been done, the average selling price of VCO in North Sulawesi is Rp. 220,000,-/liter

IV. Conclusion

Analysis of the added value (value added) of Virgin Coconut Oil (VCO) agro-industry in North Sulawesi, obtained an Output value of Rp. 31,428.57/liter, the added value produced was Rp. 21,428.57, - with a ratio of 68.18%, labor benefits of Rp. 1,656..86 per liter or 7.73%, and a profit margin of Rp 21,428.57/liter or 92.27%.

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