

# Analysis of Comparative and Competitive Advantages of Processed Coconut Products in North Minahasa Regency

Dumais, J.N.K.a, Moniaga V.R.B.a, Kaunang, R.a \*

<sup>a</sup> joachimdumais@yahoo.com

<sup>a</sup> Lecturer at the Department of Agribusiness, Faculty of Agriculture, Sam Ratulangi University, Manado, North Sulawesi Province, Indonesia

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## Abstract

The purpose of this research is to examine and analyze the existing conditions of coconut fruit processing in North Minahasa Regency in terms of private prices and social prices, to calculate the ratio of private costs (PCR) and the ratio of domestic resource costs. (DRCR) to determine the level of competitiveness of coconut processing technology in North Minahasa Regency, and to produce policy recommendations related to types of coconut fruit processing technology with a high level of competitiveness in North Minahasa Regency.

The research results showed that both copra and coconut flour had high comparative and competitive advantages, because copra had a PCR value of 0.6662 and a DRCR value of 0.5099, while coconut flour had a PCR value of 0.8728 and a DRCR value of 0.7558.

Keywords: Comparative and Competitive Advantage; Processed Coconut Fruit Products

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## 1. Background

North Minahasa Regency is the second largest coconut plantation center in North Sulawesi with an area of 36,642 Ha (Biro Pusat Statistik Sulawesi Utara, 2020). Coconut plantations in North Minahasa Regency are traditional people's plantations.

One of the weaknesses of processed coconut products at the farmer level is that coconut tree rejuvenation has not yet developed, resulting in a decrease in the production of coconuts produced by farmers. As a result, the absorption capacity of raw materials from the coconut processing industry is greater than the production capacity of coconut raw materials. Coconut fruit processing industries, including the copra and coconut flour industries in North Minahasa Regency, compete to get raw materials for coconuts from farmers (Hutabarat et.al., 1993; Kaunang et. al., 2020).

The existence of this competition will benefit coconut farmers because traders of processed products will tend to increase the purchase price of processed coconut products at the farmer level.

The income of coconut farmers is influenced by production, production costs and prices of processed coconut products, both at the private and social levels. The study of the comparative and competitive advantages of coconut processed products will produce policy recommendations on the input or output side of production to increase the income of coconut farmers.

## 2. Method

### 2.1. Time and Place of Research

This research was conducted for 12 months in North Minahasa Regency. The selection of the location was chosen purposively based on the consideration of the sub-districts that produced the largest coconuts and then from each sub-district the largest coconut-producing villages were selected.

### 2.2. Data Collection Methods

The types of data to be collected in this study include primary data and secondary data. Primary data collection was obtained by distributing questionnaires to the respondents of the largest coconut-producing coconut farmers by direct interviews with coconut farmers and the copra and coconut flour processing industries in North Minahasa Regency. Secondary data were obtained from agencies related to research problems such as the Central Statistics Agency, the Regional Agriculture Service of North Minahasa Regency and research journals that have been carried out as well as related books.

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### 2.3. Sampling Method

Respondents used in this study are coconut farmers in North Minahasa Regency. By purposive sampling, 5 sub-districts were taken with the largest production in North Minahasa Regency. In each sub-district, 6 farmers were chosen as the largest coconut producers, so the number of samples was 30 farmers. From each farmer, the processing of coconuts into copra and coconut flour products was traced.

### 2.4. Variabel Measurement

1. A general overview of respondents: age (years), education level (elementary, junior high, high school, university), length of coconut farming (year)

2. Basic variables

- a. Land area, namely the area of land planted with coconut (ha)
- b. Land status and ownership if proprietary or not proprietary
- c. Production costs at private prices are costs incurred by farmers during the coconut production process for one harvest consisting of:

- tradable input costs, namely the cost of seeds and fertilizers (Rp/kg)
- Non-tradable input costs, namely labor costs (Rp/HOK), land rent (Rp), transportation (Rp) and equipment depreciation (Rp)
- d. Total coconut production in one harvest (kg copra/ha)
- e. Private price of coconut at farmer level (Rp/kg equivalent to copra)
- f. Social price of copra, or coconut flour abroad (cif price) (Rp/kg equivalent to copra).

## 2.5. Data Analysis Method

The data analysis used in this research is the Descriptive Analysis Method and Policy Matrix Analysis. The Policy Analysis Matrix (PAM) analysis method developed by Monke and Pearson (1995) is used to determine comparative and competitive advantages.

## 3. Result

This research was conducted in North Minahasa Regency. The sub-districts selected as samples with the largest production amounts are Dimembe Sub District, Kauditan Sub District, Talawaan Sub District, Wori Sub District and Airmadidi Sub District. From each of these sub-districts, the villages with the largest production quantities were selected.

### 3.1. Type and Area of Cultivated Coconut Land

There are 2 types of coconut monoculture farming that are cultivated by coconut farmers, namely coconut plant that its fruit processed to be copra and coconut plant that its fruit processed to be coconut flour.

In general, the area of land greatly affects the amount of production that will be produced and thus also affects the income of farmers. Based on the results of the study, the area of land cultivated by coconut farmers with the largest production in the sample villages varied from 2 to 30 hectares with an average of 8.93 hectares.

### 3.2. Coconuts Processed into Copra

#### 3.2.1. Use of Production Facilities

Production facilities play an important role to achieve the desired production. Coconut seeds are taken from productive coconuts where the seeds planted by farmers come from their own businesses. Farmers in North Minahasa Regency do not use fertilizers and pesticides in maintaining coconuts.

#### 3.2.2 Use of Labor

Labor is an important factor in determining a copra processing activity. In managing an agricultural business, it is easy for farmers to find labor because most of the population in North Minahasa Regency are farmers. The use of labor for copra farmers includes picking, collecting, transporting, splitting coconuts, removing coconut flesh from the shell, smoking to drying. Transportation is a means used to transport produce from the farm. In North Minahasa Regency, transportation uses their own cart pulled by cow and some farmers use a rental system.

### 3.2.3. Production Cost of Copra Farmer

Production cost of copra farmer was shown in Table 1.

The average tax issued by copra farmers is quite different, the tax per hectare is Rp. Rp.96,503 per growing season. The biggest cost is fumigation, which is Rp. 363,287. The second biggest cost is the cost of climbing is Rp.208,392 per hectare per growing season.

The depreciation value of the equipment every year uses the capital recovery cost method and through this method the opportunity cost of depreciation is taken into account because it is in accordance with the interest rate'

Table 1. Production Cost of Copra Farmer

No	Type	Cost (Rp/Ha)
1	Fixed Cost	
	a. Tax	96,503
	b. Shrinkage of tool	7,799
2	Variable Cost	
	a. Copra processing :	
	Weeding	300,000
	Climbing	208,392
	Collecting	120,559
	Peeling off	35,245
	Smoking/packageging	363,287
	<b>Total Cost</b>	<b>1,131,785</b>

### 3.2.4. Production

The production in this research is the production in the form of copra. From the research results obtained that the average copra production per hectare for the growing season is 290.63 Kg/ha.

### 3.2.5. Price

The selling price at the farm level for copra production varies. Based on the results of the research, the selling price of copra at the farm level is Rp. 10.900/kg.

### 3.2.6. Farmer Revenue

Revenue is production multiplied by the price received by farmers, which is very different when viewed from the production of the farm. The average copra revenue per hectare per growing season is Rp. 3,167,860.8,670,434,80.

### 3.2.7. Social Pricing

Monke et.al. (1995), suggest that the social prices for tradable outputs are world prices, namely and export prices for export commodities (exportables). World prices are the best measure of the social opportunity costs of tradable commodities.

FOB is a method of evaluating goods sold in international trade, where the cost of transportation and insurance costs from the port of loading to the buyer's warehouse is borne by the buyer.

### 3.2.8. Financial and Economic Efficiency

The main difference between financial efficiency (in this study measured by the ratio of private costs or Private Cost Ratio, PCR) and economic efficiency (in this study approached by the cost of domestic resources or Domestic Resource Cost Ratio, DRCR), lies in the difference in the assessment of the elements of factor costs. domestic and tradable elements of value added factors (inputs). In financial efficiency, the assessment is based on the actual price paid or received by farmers. Whereas in economic efficiency, the valuation is based on the price that would occur if the input and output markets were perfectly competitive or the social price (Monke et. al (1995); Gerungan et.al. 2013) .

Table 2. Private Cost Ratio and Domestic Resource Cost Ratio

PCR	0,6662
DRCR	0,5099

Table 2 showed that the size of the copra processing business is financially efficient because the coefficient value of the private cost ratio (PCR) is smaller than one, namely 0.6662; while the coefficient value of the domestic resource cost ratio (DRCR) is also smaller than one, namely 0.5099. Therefore, the copra commodity in North Minahasa Regency has competitiveness in financial value and competitiveness in economic value or has competitive advantage and comparative advantage.

## 3.3. Coconuts Processed into Flour

### 3.3.1. Use of Labor

The use of labor for copra farmers includes picking, collecting, transporting, splitting coconuts, removing coconut flesh from the shell. Transportation is a means used to transport produce from the farm.

### 3.3.2. The cost of producing coconut without coir per hectare plus processing it into coconut flour

The cost of producing coconut without coir per hectare plus processing it into coconut flour was shown in in Table 3.

Table 3. The cost of producing coconut without coir per hectare plus processing it into coconut flour

No	Jenis	Cost (Rp/Ha)
1	Fixed Cost	
	a. Tax	85,315
	b. Shrinkage of tool	5,395
2	Variable Cost	
	a. Copra processing :	
	Weeding	300,000
	Climbing	208,392
	Collecting	120,559
	Peeling off	35,245
	b. Coconut flour processing	6,815,525
	<b>Total Cost</b>	<b>7,570,431</b>

The average tax issued by non-coir coconut farmers is quite different, the tax per hectare is Rp. Rp.85,315 per harvesting season. The biggest cost is processing coconut without coir into coconut flour, which is Rp. 6,815,525. The second largest cost is the cost of climbing, which is Rp. 202,392 per hectare per harvesting season.

### 3.3.3. Production

The production in this research is the production in the form of coconut flour. From the results of the research obtained and the overall data processing that the average production of coconut without coir per hectare for the growing season is 2,624 kg/ha which will be processed by the coconut flour factory into 328 kg of coconut flour.

### 3.3.4. Price

The selling price at the farm level for copra production varies. Based on the results of the research, the selling price of coconut flour at the factory level is Rp. 29,400/ kg.

### 3.3.5. Farmer Revenue

Revenue of coconut flour products is Rp. 9,643,200.

### 3.3.6. Financial and Economic Efficiency

The financial efficiency is measured by the ratio of private costs or Private Cost Ratio, PCR) and economic efficiency is measured by the cost of domestic resources or Domestic Resource Cost Ratio, DRCR).

Table 4. Private Cost Ratio and Domestic Resource Cost Ratio

PCR	0,8728
DRCR	0,7558

Table 4 showed that coconut flour processing is said to be financially efficient because the coefficient value of the private cost ratio (PCR) is smaller than one, namely 0.8728; while the coefficient value of the domestic resource cost ratio (DRCR) is also smaller than one, namely 0.7558. Thus the coconut flour commodity in North Minahasa Regency has competitiveness in financial value and competitiveness in economic value or has competitive advantage and comparative advantage.

#### 4. Conclusion

Both copra and coconut flour have high comparative and competitive advantages, because copra has a PCR value and DRCR value less than one, as well as coconut flour has a PCR value and DRCR value smaller than one.

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