Comparison of *Value-Added* Analysis of Coffee Processing with Different Market Orientations: (Case Study on Cooperative of Producer Coffee Margamulya)

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Comparison of *Value-Added* Analysis of Coffee Processing with Different Market Orientations: (Case Study on Cooperative of Producer Coffee Margamulya)

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Abstract. Cooperative of Producer Coffee Margamulya (CPCM) consists of 140 members who produced Arabica java preanger coffee with an average of 70 tons green bean per year. The cherry coffee is first processed into green bean using wet processing method before being sold. Eighty percent of green beans are marketed to exporters (PT. Taman Delta Indonesia/ PT. TDI) while 10% to Indocom and the other 10% to various markets with various products. This study was more focused on the analysis of difference of added value obtained by cooperatives from the dominant market for green bean, i.e., to exporters and Indocom. Also, this study aimed to determine the factors that influence market selection. The method used was a case study, with Hayami value-added analysis technique. The result showed that the added value of cherry processing became green bean for the export market was 19% while the value added for Indocom was 34%. The reason for choosing the market to exporters is that PT. TDI receives a large number of green beans, and provides UTZ (utilize) certification assistance. On the contrary, Indocom only bought smaller volumes than PT. TDI with non-fixed frequencies.

1. Introduction

West Java has great potential in coffee development as it is supported by its coffee plantation area of 12,000 ha in 2016. The West Java Provincial Government seeks to develop West Java specialty coffee which since 2012 has obtained geographical indication by the name of java preanger. Java preanger coffee is categorized as a specialty coffee with a good taste and distinctive.

The widest area and the biggest coffee production in West Java are in Bandung Regency with the type of arabica coffee. This is because Bandung Regency has some plains area with altitude over than 1,000 m a.s.l. which is suitable for arabica coffee [1]. One of the largest coffee plantations in Bandung Regency is located in Pangalengan District It is 3% of West Java [2] and 10.24% of Bandung Regency coffee

plantations [3]. Initially, through the village community forest institutions program, farmers and Perhutani then cooperate and plant coffee in the land of Perhutani. After realized that coffee is profitable, the farmers plant the coffee in their own land. The existence and increased enthusiasm of farmers to grow this coffee strongly support the conservation forest protection program, thereby reducing and diverting farmers to grab the forest. This land grabbing is an indication of the carrying capacity of land to meet the needs of farmers who do not live a decent life [4]. The fact that coffee is profitable and can alleviate farmers around the forest from poverty. In Pangalengan District, a cooperative under the name of cooperative of producer coffee margamulya (CPCM) was formed in 2014. CPCM currently has 140 members of coffee farmers. This cooperative holds and distributes coffee beans to PT. Taman Delta Indonesia (PT. TDI) as much as 80%, and for other consumers around Bandung as much as 20% of total production. Demand for PT. TDI 70 tons per year in the form of green beans. Besides, green beans are also marketed to Indocom and the cafes around Bandung. Processing coffee fruit (cherry) to green bean certainly can increase its added value. Therefore, this study tried to compare the added value of coffee after processing in cooperative from 2 different markets, and analyze the factors influencing the added value.

2. Methodology

2.1 Literature Review

2.1.1 Arabica Coffee

Arabica coffee grows at an altitude of 600-2,000 m a.s.l. This plant can grow up to 3 meters at the optimum environment condition. The optimum growing temperature is 18-26^0 C. The coffee beans are small and have green to dark-red color. West Java has a typical type of arabica coffee called java preanger. Arabica coffee java preanger is a typical arabica coffee in West Java with Geographical Indication (IG) of java preanger. It is cultivated by people in some mountainous areas of West Java such as Cikuray Mountain, Papandayan Mountain, Malabar Mountain, Caringin Mountain, Tilu Mountain, Patuha Mountain, Halu Mountain, Beser Mountain, Burangrang Mountain, Tangkuban Perahu Mountain and Manglayang Mountain [5]. All those mountains have altitude over than 1,000 m a.s.l. IG is one of the most important components of intellectual property rights in trading activities, particularly on protecting trade commodities that are firmly related to the name of the region or place of origin of the products. The existence of the IG certificate can be used at least for promotion, competitiveness and selling value of a product in the broader market. So that it will be more economically beneficial to the welfare of the local community. A label is attached to a product that has received an IG certificate. It could be names of places, regions, words, images, letters, or combinations of those elements.

Coffee plantation initially is only in Perhutani and is a form of agroforestry. Nowadays, after realizing that coffee is beneficial, coffee is not only planted in the land of Perhutani but also in private area as intercropping plant among vegetables or as the main plant. However, farmers still produce coffee and sell it directly in the form of fruits or called cherry. The process of handling coffee is still quite long, including conversion of cherry into grain, and wet or dry processing of grain into green beans. Processing from cherry to the green bean is done at cooperative level. So far, the market accepts in the form of green beans because of its durability. However, to increase the added value of coffee, processing into coffee powder is essential to get the business opportunities. While Pangalengan is one of the potential tourist destinations, and CPCM is located between the Bandung-Pangalengan routes, it fits the needs of cafes or coffee shops that are planned to be built.

2.1.2 Value-added

The purpose of the value-added analysis is to measure the rewards received by business actors and employment opportunities from derivatization of commodity. Value added is the result of reduced selling prices minus the cost of purchasing raw materials and is often used as a focal point for cost analysis [6].

According to [7], the added value created in each value chain actors due to the activity or different stages of each actor. The means of added value by [7] relates to high quality, lower cost, delivery time, innovation, and so on. According to [7], one important factor that affects the added value of agricultural products is quality. The quality of agricultural products is divided into two, namely intrinsic characteristics (such as color, physical characteristics, and taste) and extrinsic characteristics (such as fair trade and organic farming). Value added in the value chain is influenced by market objectives and the number of actors in the value chain. The common method used in measuring added value is the Hayami method. According to [8], the added value is the difference between the selling price and the cost during the process. The sources of added value are the utilization of factors such as labor, capital, human resources, and management. Term of added value means a value that occurs on a commodity because the commodity has undergone processing, transport, and storage in a production process. The Hayami method can be used in analyzing the added value of the sub-processing system or secondary production. The results obtained from the analysis of value-added Hayami is in the form of productivity, output value, added value, labor remuneration, and the benefits obtained from the processing [9]

2.2 Data Collection and Analysis

This research used qualitative research design with case study research technique and was done in CPCM. The data used in this research were primary and secondary data. Primary data were obtained through direct interviews with farmers and cooperative management. Secondary data, as complementary and supporting for primary data, were obtained through literature study, internet search, Central Bureau of Statistics and data from other related institutions and relevant to this research. The Hayami value-added analysis was used to analyze added value at sub-processing system or secondary production. Descriptive analysis was used to answer the identification of problem.

3. Results and Discussion

The first marketing channel is marketing green bean coffee to PT. TDI, which is a coffee exporter partner of CPCM. The first cooperation between the two parties is started when the Chairman of CPCM meets with the representative of PT. TDI at the coffee exhibition in Batam. PT. TDI has an obligation from the Association of Indonesian Coffee Exporters (AEKI) to conduct coaching to Small and Medium Enterprises (SMEs) coffee. Thus, PT. TDI conducts the financial training for UTZ (utilize) certification to the coffee processing of CPCM and also all farmers who are registered as CPCM members. UTZ certification assures the physical quality of sustainable products and coffee businesses [7]. UTZ certified is a requirement for exporting coffee to Japan. In the agreement of both parties, it is stated that the CPCM can only include UTZ certified on products sold to PT. TDI.

Another form of partnership with PT. TDI is member accompaniment to get UTZ certified and UTZ quality control every year. In addition, PT. TDI also provides certified coffee seeds and lends some coffee processing machines to CPCM. Delivery of coffee to PT. TDI is conducted every week with a minimum quantity of 3 tons of green beans.

To meet the qualifications set by PT. TDI, CPCM established Standard Operational Procedure (SOP) together with PT. TDI. The CPCM also implements the standard for sorting determined by AEKI.CPCM also sells green beans to local coffee companies. Green beans purchased by local coffee companies are green bean *reject* and also grade II and III of green beans. Local coffee companies such as Indocom buy the grade II and III of green beans. Currently, CPCM has developed its business in addition to selling green bean products. However, since the green bean product is the most substantial part of the output generated by CPCM, this paper only discussed the value-added analysis for green bean.

3.1 Value-Added Analysis on Processing of Chery Coffee to Green Bean Coffee

Processing cherry into green bean is the dominant activity of CPCM in order to fulfill the request of its business partner. The results of green bean value-added analysis for PT. TDI market can be seen in **Table 1**.

Table 1. Green Beans Value-Added Analysis for PT. TDI

Output, Input, Price		Value
Output (Kg)	A	500.00
Input (Kg)	B	3.000.00
Labor (Man work days)	C	17.14
Conversion Factor (A/B)	D	0.18
The coefficient of labor (C/B)	E	0.01
Price of Output per Kg (IDR)	F	62.000.00
Wage of Labor (IDR)	G	29.248.77
Receipts and Profit (IDR/Raw Material)		Value
Raw material per kg (IDR)	H	8.500.00
Price of other Input per Kg (IDR)	I	559.32
Output Value (DxF) (IDR/kg)	J	11.160.00
a. Added Value (IDR/Kg)	K=J-H-I	2.100.68
b. Added Value Ratio (%)	L=K/J	0.19
c. Labor Income (IDR/mwd)	M=ExG	167.14
d. The Share of Labor (%)	N=M/K	0,08
e. Profit (IDR/Kg)	P=K-M	1.933.55
f. Profit Rate (%)	Q=P/J	0.17
Remuneration Service Owner Factor Production		Value
Margin (IDR/kg)	S=J-H	2.660.00
a. Labor Income (%)	T=M/S	0.06
b. Share of other input (%)	U=I/S	0.21
c. Profit (%)	V=P/S	0.73

PT. TDI gives the price according to green bean's world price. When the research was done, price determined by PT. TDI was IDR. 62.000,00 per kilogram green bean. The delivery of green bean to PT. TDI is conducted once a week with quantity reaching 3 tons per shipment. In addition to processing cost of cherry, there were also other input costs. Additional input costs other than purchasing cherry by CPCM include fuel for pulping and hulling, electricity, packaging, warehousing, promotion, depreciation of equipment and machinery, and distribution costs. Processing undertaken by the CPCM adds value to the cherry of IDR 2,100.68 per kilogram of cherry. The profit gained from processing is IDR 1,933.55 per kilogram of processed cherry. It is accounted for 73% of all margins obtained from green bean processing for PT. TDI. The share of labor from horn skin processing is 8%. This indicates that 8% of the added value obtained in the processing is for labor cost. CPCM also sells green beans specialties to the local coffee company, Indocom. Green beans purchased by Indocom are specialty coffee with grade II and III. The selling price for this grade is IDR 75.000,00 per kilogram. Other input costs are same as the PT. TDI with cost of IDR 459.32 per kilogram. The green beans sold to Indocom adds value to cherry ofIDR 4,540.68 per kilogram. The profit gained from processing is IDR 4,373.55 per kilogram of processed cherry. The

profit gained is 87% of all margins earned from the processing of green beans for Indocom. The share of labor from this green bean processing is 4%. This indicates that 4% of the added value obtained in the processing is labor cost.

When compared to the increase of value-added per kg of cherry processing into the green bean with the aim of the market to Indocom higher (IDR 4,540.68) compared to PT TDI (IDR 2,100,68) because the price received by CPCM from Indocom is higher than that of PT TDI. This is because the price of green bean per kg received from Indocom is higher (IDR 75,000), while the green bean price per kg received from PT TDI is IDR 62,000. This is consistent with [8] said that factors affecting the value added of processing could be categorized into two factors, which are, technical and market factors.

The price of PT TDI follows the green bean price of the world which in turn will also affect the price of cherry paid by the cooperative to the farmers. Price to Indocom is higher because that determines it is the price of green bean competitors. However, the volume of purchases from Indocom is not as much as PT TDI.

Table 2. Green Beans Value-Added Analysis for Indocom

Output, Input, Price		Value
Output (Kg)	A	500,00
Input (Kg)	B	3.000,00
Labor (Man work days)	C	17.14
Conversion Factor (A/B)	D	0.18
The coefficient of labor (C/B)	E	0.01
Price of Output per Kg (Rp)	F	75.000,00
Wage of Labor (IDR)	G	29.248.77
Receipts and Profit (IDR/Raw Material)		Value
Raw material per kg (IDR)	H	
Price of other Input per Kg (IDR)	I	8.500,00
Output Value (DxF) (IDR/kg)	J	459.32
a. Added Value (IDR/Kg)	K=J-H-I	13.500,00
b. Added Value Ratio (%)	L=K/J	4.540.68
c. Labor Income (IDR/mwd)	M=ExG	0.34
d. The Share of Labor (%)	N=M/K	167.14
e. Profit (IDR/Kg)	P=K-M	0.04
f. Profit Rate (%)	Q=P/J	4.373.55
Remuneration Service Owner Factor Production		Value
Margin (IDR/kg)	S=J-H	5.000,00
a. Labor Income (%)	T=M/S	0.03
b. Share of other input (%)	U=I/S	0.09
c. Profit (%)	V=P/S	0.87

3.2 Factors Affecting the Selection of Marketing Channels

From the results of interviews with the chairman of the board of CPCM, it was revealed that almost 80% of coffee produced in cooperative was marketed to PT TDI. There are factors that become the reason for the occurrence of partnership with PT. TDI.

- Market guarantees and prices
  With the partnership with PT. TDI, the green beans produced by the cooperative have definite market and price. It results in high demand volume of 3 tons of green beans per week or about 17 tons in the form of red cherry.
- Risk reduction
  The existence of certainty of market, quantity, quality and price reduces the risk of unsold products.
- Transfer of knowledge
  In partnership with PT. TDI, there is a process of transfer of knowledge in the form of SOP for cultivation, harvesting, post-harvesting, and processing results. The factor of quality is very important for exporter. So by fulfilling the SOP, the quality of green beans could be maximized.The partnership of this model according to [10] is called a productive partnership.
- Improving access to financial institutions.
  Cooperatives are more trusted by financial institutions because there is market certainty from PT.TDI, so that loans given to cooperatives will be paid.
  This condition occurs in the case of mango in Cirebon where Samimulya Farmers Group get a loan from the bank after a partnership with the exporter [11]. Nevertheless, because the need of cooperatives on capital is enormous, then the investors help to loan the money.

Reasons marketing to non-exporters:

- Looking for an alternative market for unsold green beans of export market. Indocom and café are the market for those unsold green beans. Although the quantity is small, the price is higher than to the exporter.
- Providing an opportunity to expand partnerships with other companies or parties.
- Diversification of products such as producing green beans into roasted beans or grounded beans (coffee powder) with different packaging for business development.

4. Conclusions

The added value of coffee production process for Indocom market is higher than for market to PT. TDI. However, because the volume of green beans marketed to PT. TDI is larger than Indocom, it makes PT. TDI more profitable. The factors that cause the cooperative choosing the market are the certainty of market, risk reduction, transfer of technology, and increasing access to the financial institution.

The choosing to other markets such as Indocom, is more likely as an alternative market to the remaining coffee. In addition, it provides an opportunity to expand partnerships with other companies, and for business development. The amount of green beans marketed to Indicom and different market is further enhanced, but the marketing and relationship to PT. TDI is maintained steadily.

Product and market development still continue until the powdered coffee products are ready in brew form or even ready to drink. Cooperative further increases its role not only as an exporter supplier, but also to be a direct exporter.

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