ANALYSIS OF PINOGU COFFEE SUPPLY CHAIN IN BONE BOLANGO

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ABSTRACT

This research affords an analysis to (1) define the mechanism of pinogu coffee supply chain by product, information, and money flows, (2) examine the value-added of pinogu coffee in Bone Bolango, and (3) identify the efficiency of pinogu coffee supply chain in Bone Bolango. This research is made in Bone Bolango using survey and descriptive analysis methods. The results demonstrate (1) a modern mechanism of pinogu coffee supply chain, in which the product flow is based on the availability of pinogu coffee and its derivative products. The information flow is considerable facile, and the money flow is using a cash payment transaction system and a consignment payment system, i.e., selling deposit, (2) the highest value-added, namely IDR138,000/kg, at a ratio of the value-added of 82.14% of the product value, and the profit of IDR137,984.3 at a profit rate of 82.13%, is acquired from the process of processing coffee beans into coffee powder, and (3) the low marketing efficiency values of pinogu coffee powder in Bone Bolango are in Line 1 (12.00%), Line 2 (28.23%), and Line 3 (30.0%). Marketing Line 1 constitutes an efficient marketing line, whereas Lines 2, 3, and 4 are inefficient marketing lines.

Keywords: *Pinogu Coffee, Mechanism, Supply Chain*

INTRODUCTION

The plantation is an important subsector sustaining the economy of Indonesia. One of the most noteworthy plantation commodities is coffee. The mean volume of coffee exported by Indonesia per year is 350 tons, covering robusta (85%) and arabica (15%). Indonesia, in the ASEAN territories, is the second-largest coffee producer and exporter after Vietnam. Meanwhile, at the global level, it is the fourth-largest coffee exporter after Brazil, Vietnam, and Columbia. Coffee production in Indonesia increased in 1980-2016, at a mean increase of 2.44%. The increase is still considered disproportionate to the increase in coffee farmers' income. It is engendered by some inabilities exhibited by farmers, especially in optimizing plant productivity, optimizing technology, manifesting product quality, which is in correspondence with trade standards, performing an appropriate process, and amplifying weak institutional roles. Moreover, several productivity efforts are promoting cultivation techniques, augmenting quality by developing post-harvesting and processing, developing diversification, and developing marketing (Ministry of Agriculture, 2016).

To date, Indonesia is one of the largest coffee producers and consumers, and domestic coffee consumption is increasing every year. Coffee, with its distinguished aroma, flavor, and advantages for the body, is everyone's favorite. Increased coffee consumption

is prevalent owing to not only community habits or traditions but also changes in lifestyles/trends, where all community layers, especially senior people and adolescents, find coffee favorable. It is proven by augmented small and medium-sized enterprises, notably in the agribusiness area, which sells local coffee, traditional coffee stalls, and modern coffee shops.

Gorontalo Province, although less competitive in coffee production, has potentials at both national and international market levels. The land area of the coffee plantations in Gorontalo is 1,759 ha, producing 474 tons per year. Bone Bolango is one of the districts producing the most coffee in Gorontalo Province. The district has a coffee land area of 708 ha and produces 210 tons per year (Directorate General of Plantation, 2017). The amount of production in 2017, 2018, and 2019 were 750, 1,094.40, and 1,213.5 tons/year, respectively (Department of Agriculture and Livestock in Bone Bolango, 2019). Based on the data indicating Pinogu coffee production trend, farmers make the coffee an advantageous commodity and a response to the rocketing market demand for pinogu coffee.

Pinogu coffee largely contributes to the agricultural economy because of its easy sale and production and high sale prices. However, the price rates of the coffee depend on how producers process it and maintain quality. As pointed out in data from the Directorate General of Plantation 2017, Bone Bolango had the highest coffee production potentials. Of diverse types of coffee, pinogu coffee is preferable and regarded as an organic, natural, and original product.

Motivating entrepreneurs and young people to be active in developing, the Bone Bolango local government constitutes the Committee of Creative Economy for the target people who run the five Bs program (Bela, Beli, Buatan Bone Bolango: Defend for, Buy from, and Made in Bone Bolango). Furthermore, pinogu coffee has become an icon of Bone Bolango and a well-known product in both domestic and international markets. The coffee has developed into an origin coffee, the characteristics of which are a jackfruit-like flavor, medium acidity level, and slightly bitter taste.

Pinogu is considered prospective, but many issues come with it, e.g., the weather factor. Coffee beans will likely shrink during the long dry season yet fall and rot during the rainy season. Two other issues are old coffee trees and marketing-related issues. The commodity marketing is still conventional, and the marketing process is still not professional too. In addition, there is no modern coffee processing tool. Producers roast dried coffee beans using a soil-based wok and grind them.

A supply chain constitutes a concept of implementing an integrated logistic system (Marimin and Magfiroh, 2013). It is a concept of the supply chain of goods from raw materials to finished goods (Indrajit and Djokopranoto, 2002). A supply chain is sustained by producers, suppliers, distributors, warehouses, retailers, and customers (Vorst, 2006). In one period, a business process in an agricultural supply chain

may be parallel and sustainable so we may find several business processes in one supply chain (Vorst, 2006).

In agroindustry, supply chain management is a reliable, efficient, and effective system. Accordingly, an agroindustry supply chain is a group of business organizations which make a commitment to producing and marketing products in a business chain. Besides, an agroindustry supply chain is a complex system integrated with other system components (Hadiguna, 2015).

Pinogu coffee has procured acknowledgment as quality and distinguished coffee through the certification for geographic indication. The flavor of pinogu coffee has been tasted by *Pusat Penelitian Kopi dan Kakao* in Jember, which confers a score of 80.75-81.75 to the coffee. The score is indicative of excellence. The coffee is also distinguished for its cacao-like flavor. Some farmers living in Pinogu are members of *Masyarakat Indikasi Geografis Kopi Robusta Pinogu Bone Bolango* (MIG-KRPBB). Different from other farmers, farmers joining MIG-KRPBB must sell coffee products at defined standards. Also, coffee cherries picked must lack defects. Quality coffee in the form of green beans is sold using the available line, i.e., using the geographic indication label at IDR90,000-IDR100,000. Meanwhile, defective ones, in the form of coffee powder, are sold to middlemen at a low price, namely IDR20,000. Besides, pinogu coffee farmers do not earn a big margin because of the unmanaged pinogu coffee supply chain, which starts from farmers, small sellers, collectors, wholesalers, distributors, stores or markets, and finally to consumers.

Pinogu coffee supplies are unpredictable. The more unpredictable the coffee supply, the higher the risk (Farid and Subekti, 2012). Hence, a supply chain matters in enhancing pinogu coffee competitiveness. Such enhancement can be undertaken using resources and managing the supply chain, from upstream to downstream, well.

RESEARCH METHOD

This is descriptive research using a survey research method. The respondents selected are the representatives of the whole population (Singarimbun, 1982). Supply chain data collection commences at the wholesaler level as it enables us to collect data at the wholesaler, retailer, and farmer levels. The respondents are composed of 30 pinogu coffee levels, ten collectors, and nine small sellers. Research data are collected using observation, interviews, conducted to all respondents using questionnaires of observing aspects researched, and documentation. The descriptive analysis is used to study the mechanism of pinogu coffee supply chain pertinent to the material, information, and money flows, as well as pinogu coffee supply chain performance implications in Bone Bolango.

RESULT AND DISCUSSION

A. Mechanism of Pinogu Coffee Supply Chain

The mechanism of an agricultural product supply chain is either traditional or modern. A traditional mechanism means farmers selling products directly

in the market or to middlemen, while the modern one engages manufacturers, supermarkets, and wholesalers (Marimin and Magfiroh, 2013). Bone Bolango has a modern mechanism of pinogu coffee supply chain as the mechanism has involved farmers as the pinogu coffee suppliers, collectors, wholesalers, and retailers as customers, as well as agroindustry as the processor. The pinogu coffee supply chain in Bone Bolango has both primary and secondary members. Primary members are those directly engaged with supply chain business activities. Meanwhile, secondary members are those indirectly related to production activities but having influences on business activities (Subarkah, 2009).

The primary members of pinogu coffee supply chain are farmers, collectors, retailers, agroindustries (Small and Medium-sized Enterprises), service industries, outside city sellers, and consumers. Coordination among members builds on the awareness of a strong supply chain contingent upon the strength of all elements inside.

The product flow embarks upon farmers, who harvest pinogu coffee beans. They pick red coffee cherries and process them into coffee beans using wet and honey processing. Pinogu coffee production output comes at a high quantity during a big harvest period. Several farmers maintain the husks of coffee beans to add the weight of the beans. Coffee is dried for two-five days, depending on the amount of coffee harvested. Farmers then execute the sorting, grading, and drying processes, and process the beans into coffee powder using a simple production tool, which is a clay-based wok, to restrain the distinguished aroma of the coffee. Coffee powder is packed in plastics before being distributed. Coffee powder is directly sold to consumers, avoiding other coffee addition and coffee forgery committed by those seeking advantageous from the pinogu coffee brand. Additionally, MIG-KRPBB members and the Department of Industry, Trade, Cooperatives, Small and Medium Enterprises perform internal supervision, and the Ministry of Law and Human Rights undertake internal supervision.

Asserted by Indriani (2019), information flow is classified into two, horizontal and vertical. The horizontal information flow, e.g., at the farmer level, is sharing opinions regarding cultivation technique and preeminent seed selection, whereas the vertical one, e.g., at the farmer level, is sharing information with a marketing institution.

1. **Between Pinogu Coffee Farmers and Marketing Institutions**

   Pinogu coffee farmers and marketing institutions establish a bidirectional information flow. They share information related to pinogu coffee products and the sale transaction mechanism. Other information shared are quality coffee beans by grades, coffee roasting methods, prices by grades or quality, and prices of coffee per kilogram. The information is shared by phone or by a face-to-face meeting. Information delivery via mobile

phones is not smooth because of poor signals or networks.

2. **Between Collectors (UPH) and Retailers**

   Collectors (UPH) share information related to the quantity of coffee ordered and pinogu coffee delivery time with retailers. Information is oftentimes delivered using communication media assistance, *inter alia* mobile phones, considering the far distance between retailers and Pinogu, i.e., 41 km, damaged accessing roads, and costly transportation fees.

3. **Between Agroindustry and Service Industries (Coffee Stalls, Hotels, and Restaurants)**

   Information shared here is the amount of pinogu coffee which will be ordered, delivery time, and payment transaction mechanism.

4. **Between Agroindustry and Outside City Sellers**

   Agroindustry share information with respect to the amount of coffee ordered pursuant to the package content weight with outside city sellers.

A money flow is the distribution of values in the form of Rupiah. A financial flow consists of the components of costs and profits received by each supply chain involved (Kurniawan *et al*., 2013). The money flow in the pinogu coffee supply chain in Bone Bolango is made up of two forms, namely the cash payment system applied between farmers and other marketing institutions, collectors, retailers, and market sellers. Farmers apply a consignment payment system or selling deposit to make a transaction with service industry business actors, such as gift shops. Pinogu coffee prices are determined by collectors and agroindustries. Pinogu coffee selling prices at the farmer level may vary.

B. Analysis of Pinogu Coffee Value-Added

A value-added constitutes a difference in the product value after and before a production process. A value-added is obtained by reducing the end product value by an intermediate cost, composed of staple and complementary material costs spent on a production process (Tarigan, 2004).

The value-added analysis used is a one-shot analysis using the Hayami method based on the activity of processing coffee beans into coffee powder. Table 1 indicates the values of each variable.

Table 1. Values of Each Variable

No.o	Variable	Value
	Output and Input	
1	Output (kg)	1.6
2	Staple material	2.0
3	Direct workers (HOK)	4.5
4	Conversion factors	0.8
5	Direct worker coefficient (HOK)	2.2
6	Output price (Rp/kg)	210,000
7	Direct worker wage (Rp/HOK)	15,000
	Acceptance and Profit	

8	Staple material price (Rp/kg)	20,000
9	Other input price (Rp/kg)	10,000
10	Output price	168,000
11	a. Value added (Rp/kg)	138,000
	b. Value added ratio (%)	82.14
12	a. Direct worker income (Rp/kg)	15.75
	b. Direct worker share (%)	0.011413
13	a. Profit (Rp/kg)	137984.3
	b. Profit rate (%)	82.13

A value-added of IDR138,000/kg, at a ratio of the value-added of 82.14% of the product value, and the profit of IDR137,984.3 at a profit rate of 82.13%, is acquired from the process of processing coffee beans into coffee powder. It is elicited by processing coffee powder through several processing stages and contributions to the stages from other inputs, i.e., water, weighing, packing, and package, increasing the output price.

According to the testing criteria by Hubeis (1997) in Priantara (2016), the ratio of value-added is low if having a percentage of <15%, medium if having a percentage of 15%-40%, and high if having a percentage of > 40%. Accordingly, the value-added in pinogu coffee is high as it has a percentage of > 40%.

C. Marketing Efficiency

Marketing efficiency is, by definition, an increase in the ratio of output-input. Efficient marketing is a product of operational and price efficiencies (Rahim and Hastuti, 2007). The marketing margin of each supply chain member is the difference between the product sale and purchase prices. Additionally, a marketing margin reflects costs spent by each supply chain member and profits earned as a reward for their contributions (Fajar, 2014). The results demonstrate that pinogu coffee marketing costs in Bone Bolango cover transportation, packing, and package costs.

Table 2. Marketing Efficiency

Marketing Lines	Sale Price from Farmers (IDR)	Sale Price at the End Level (IDR)	Marketing Margin (IDR)	Marketing Cost (IDR/gr)	Marketing Efficiency (%)
1	25,000	25,000	0	3,000	12
2	20,000	42,500	22,500	12,000	28.2
3	20,000	43,000	23,000	12,900	30.0
4	25,000	48,000	23,000	20,000	41.9

Line 1 exhibits the smallest marketing efficiency value (12%). We can identify the most efficient supply chain by comparing the efficiency marketing values of each line, i.e., the smaller the efficiency value, the more efficient the marketing value. Hence, Line 1 is an efficient marketing line. It has a low marketing cost, namely IDR3,000 and a direct marketing line. Meanwhile, Lines 2, 3, and 4 are not efficient as they have a marketing margin

of IDR22,500, IDR23,000, and IDR 23,000, respectively, and a marketing cost of IDR12,000, IDR12,900, and IDR20,000, respectively.

1. Farmer's Share

Farmer's share poses a marketing efficiency indicator, in addition to a marketing margin. This indicator gauges the portion received by coffee farmers as a reward for their contribution to the end sale price of pinogu coffee in a marketing line. A farmer's share contradicts a marketing margin value. The higher the farmer's share, the smaller the marketing margin value (Fajar, 2014). If the farmer's share is > 70%, the marketing is therefore efficient. Meanwhile, if it is < 70%, the marketing is inefficient (Prayitno et al., 2013; Indriani et al., 2018). Table 3 manifests the result of the analysis of pinogu coffee farmer's shares.

Table 3. Pinogu Coffee Farmer's Shares

Marketing Line	Sale Price from Farmers (IDR/kg)	Sale Price at the End Level (IDR/kg)	Farmer's Share (%)
1	25,000	25,000	100.00
2	20,000	42,500	47.06
3	20,000	43,000	46.51
4	25,000	48,000	52.08

Table 3 points out that Line 1 (100%) has a farmer's share of > 70%. That being so, in Line 1, pinogu coffee farmers' share is 100% as a reward for their contribution to direct sale prices. Farmers' share in Line 2 is 47.06%, whereas Line 3 has the lowest one, namely 46.51% of the pinogu coffee sale price to retailers of IDR43,000. Farmers' shares in Lines 2, 3, and 4 are < 70% since Lines 2, 3, and 4 engage with intermediating institutions. Farmers' shares in Lines 2, 3, and 4 are smaller than that in Line 1 as farmers in Lines 2, 3, and 4 do not have access to sellers from other areas, allowing each pinogu coffee supply chain member to take profits and interfere with marketing costs.

2. Ratio of Profits and Costs

The ratio of profits and costs constitutes a comparison of costs spent and profits earned. The ratio of profits is used to investigate profit distribution and marketing costs spent by each marketing institution marketing robusta coffee. Table 4 presents the ratio of profits.

Table 4. Ratio of Profits

Marketing Line	Profits Earned by Marketing Institutions (IDR/kg)	Marketing Costs at the Institutional Level (IDR/kg)	Ratio (R/c)
1	5,000	3,000	1.67
2	8,000	12,000	0.67
3	5,000	12,900	0.38
4	15,000	20,000	0.75

Table 4 shows that the highest marketing cost is spent by agroindustry marketing institutions (IDR12,900/kg), while the lowest one is spent by farmers (IDR3,000/kg). Moreover, the highest profit is earned by agroindustry marketing institutions, or MSMEs (Fay Grade) (IDR8,000/kg), while the lowest one is earned by Line 1 (direct sale to consumers). The ratio of profits is identified by dividing profits earned by each marketing institution with marketing costs spent by each marketing institution which markets robusta coffee. If $\pi i/Ci > 1$, marketing activity is profitable. And yet, if $\pi i/Ci < 1$, marketing activity is not profitable (Asmarantaka, 2012). Of the three marketing Lines, Line 1 is the most profitable since $\pi i/Ci > 1$, which is 1.67.

CONCLUSION

Based on the results of the analysis of pinogu coffee supply chain in Bone Bolango, the conclusions are:

1. The mechanism of pinogu coffee supply chain in Bone Bolango is modern, in which the product flow is based on the availability of coffee beans and powder. The information flow is considerable facile, and the money flow is using a cash payment transaction system and a consignment payment system, i.e., selling deposit. There are two flow patterns or marketing flows, which are direct and indirect. The latter involves some institutions, i.e., collectors (UPH), retailers, agroindustry, and service industries.
2. The highest value-added, namely IDR138,000/kg, at a ratio of the value-added of 82.14% of the product value, and the profit of IDR137,984.3 at a profit rate of 82.13%, is acquired from the process of processing coffee beans into coffee powder.
3. Line 1 has an efficient pinogu coffee marketing value (12%) because of a low marketing cost, whereas Lines 2 and 3 have a marketing efficiency value of 28.23% and 30.0%, respectively. Marketing lines 2, 3, and 4 are inefficient marketing lines as they involve different intermediating institutions.

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