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Identification of Ponorogo Coffee Agro-industry Supply Chain

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ABSTRACT

Coffee is one of the plantation commodities that has an important role in economic activities in Indonesia. The important role of coffee in Indonesia's economic activities are as a source of foreign exchange earnings, as a provider of employment, and as a source of income for coffee planters and other economic actors involved in cultivation, processing, and the marketing chain. One of the largest robusta coffee-producing provinces is East Java, which contributes 6.18% with an average production of 27.94 thousand tons per year, one of which is from Ponorogo. The history of coffee in Ponorogo has started since the Dutch era, this is marked by the existence of a former coffee processing factory in the Ngebel area of Ponorogo. The general condition of coffee farming in the Ponorogo area still needs to be developed because of the great potential of coffee and the distinctive taste of Ponorogo coffee. The Ponorogo coffee agro-industry supply chain is a series of chains from upstream to downstream that sequentially and cooperate in controlling, managing and improving the flow of goods, money and information from the supplier side to the end-user. The purpose of this study was to determine the supply chain structure of the Ponorogo coffee agro-industry and the respective activities of the supply chain actors involved. The results showed that the supply chain structure of the Ponorogo coffee agro-industry consisted of several actors, namely farmers, coffee shops, retailers, and final consumers.

Keywords: Coffee, Structure, Supply chain.

1. INTRODUCTION

Subtropical and tropical regions are good locations for coffee cultivation, therefore Indonesia is one of the countries that dominates world coffee production. Coffee is one of the plantation commodities that has an important role in economic activities in Indonesia. According to [1], some of the important roles of coffee in Indonesia's economic activities are as a source of foreign exchange earnings, a provider of employment, and as a source of income for coffee planters and other economic actors involved in cultivation, processing, and in the marketing chain.

The productivity of Indonesian coffee plantations of 0.77 tons per hectare (ha) is still considered very small when compared to its potential which reaches 3 tons per ha [2]. The coffee area in 2017 was 1,238,598 ha and in 2018 it was 1,252,825 ha., with a growth rate of 1.15% [3]. Coffee production in 2017 was 717,962 tons and in 2018 756,051 tons, with a growth rate of 5.31% [4].

When viewed by province, the largest coffee production produced by Big Plantations in 2018 came from East Java Province with a production of 28.87 thousand tons or 3.53 % of Indonesia's total production [5]. One of the largest robusta coffee-producing provinces is East Java, which contributes 6.18% with an average production of 27.94 thousand tons per year [6].

The coffee agroindustry has a high enough opportunity to be developed in Indonesia because it has great prospects in the domestic and international markets. The problems experienced by the coffee agroindustry are currently very complex, including the quality and continuity of coffee raw materials that are not guaranteed, cultivation techniques are still simple, the lack of availability of agro-industry facilities and infrastructure, coffee marketing networks that have not been managed properly, and the quality of human resources. inadequate [7]. Good quality coffee products can be obtained with the cooperation of each party starting from the production

process to distribution, where these parties are referred to as stakeholders.

The discipline of optimization in delivering goods, services or information linked from supplier to customer is Supply Chain Management (SCM). SCM consists of different levels, as a supplier, manufacturer, distributor and consumer, but also becomes a network of companies that influence and affect their performance among themselves [8]. Supply chain actors or stakeholders must have good cooperation and responsibility in carrying out their respective roles to maintain product quality.

Ponorogo is one of the districts in East Java that has a land height ranging from 92 to 2563 meters above sea level. This makes Ponorogo a suitable area for coffee plants to grow. Ponorogo coffee has opportunities that can be developed in the national market. Therefore, it is necessary to identify the supply chain of the Ponorogo coffee agroindustry. The purpose of this study was to determine the supply chain structure of the Ponorogo coffee agro-industry and the respective activities of the supply chain actors involved.

2. MATERIALS AND METHOD

This study uses primary data sources and secondary data. Primary data were obtained through field observations at the Ngebel coffee plantation, Ponorogo, East Java, interviews with supply chain actors and expert opinions. Meanwhile, secondary data was obtained through literature studies, scientific journals, and internal manufacturing data.

Stakeholders in the supply chain flow are respondents in this study. Determination of respondents is done by using the purposive sampling method. Purposive sampling is a non-random sampling technique, the research sample is determined by the researcher by determining special characteristics that are in accordance with the objectives of the study, it is expected to provide answers to the research problems. Respondents on the supplier side consist of three Ponorogo coffee farmers as coffee suppliers, while respondents on the manufacturing side consist of UD. Reog Coffee owners and two staff.

3. RESULTS AND DISCUSSION

The distribution of coffee commodity areas in Ponorogo Regency is seen from the area of harvest and the largest production is concentrated in the districts of Ngrayun, Pulung and Ngebel. The average coffee harvested area in the last 6 years is 211.70 Ha/Year with an average production of 571.84 quintals which means that the average coffee production is 2.76 quintal/Ha [9]. Ngebel coffee is coffee produced from plantations in Ngebel District, precisely located in Pupus Village,

Toyomerto hamlet, and Hargo Kiloso hamlet, Ngebel District, Ponorogo Regency. It has an altitude of 700 masl to 1,300 masl, the distance to get to the coffee tree plantation is about 2-3 km from the Ngebel lake location [10].

Coffee in the Ngebel area has existed since the Dutch era, starting with the clearing of forests in Ngebel to plant several plants such as pine, coffee and others. This has resulted in farmers not needing coffee seeds from outside the region. Farmers still maintain the quality of coffee from the original seeds that have been planted long ago.

The types of coffee grown in East Java are robusta, arabica, and liberica. In Ponorogo itself, the majority planted are robusta and a small proportion are arabica. Although each region grows the same type of coffee (robusta and arabica), each coffee from each region has different characteristics. So that coffee from each region has different consumers based on tastes in the characteristics of regional coffee.

The Ponorogo coffee supply chain involves various stakeholders, from suppliers to consumers which can be seen in Figure 1. Based on the results of interviews with several coffee farmers, there is a direct support institution, namely the Ponorogo Regency Plantation Office, this assistance is in the form of several tools to support processing coffee beans and some coffee plant care science, but this assistance is not working until now for several reasons.

The Ponorogo coffee supply chain begins with the fulfilment of coffee bean raw materials by coffee farmers as suppliers. Farmers prefer to plant robusta because it is easier to maintain and not easily damaged, while arabica needs more care than robusta. Coffee farming in the Ngebel area is only a side activity for farmers there because the results from coffee can only be harvested once a year and with very unstable price fluctuations in the market. Some Ngebel coffee farmers have implemented red picks in their coffee harvest, although there are still many who still don't pay attention to it and harvest indiscriminately. Harvesting indiscriminately without sorting will cause coffee beans to have low quality and ultimately have a low selling value which is only sold in traditional markets. Three farmer respondents in Ngebel have implemented red pickling and there is one farmer who already has a greenhouse for drying coffee beans so that the quality of coffee is guaranteed. But the majority are still drying them under a makeshift layer so that a lot of contaminants are mixed in the coffee beans. In accordance with the statement [11], the high physical contamination is caused by traditional drying techniques, namely coffee beans are placed on the floor or soil so that they are contaminated by stones, gravel, soil and twigs.

The red cherry that has been picked will be sorted manually, separating the red fruit and the unred fruit.

After that, soaking is done for two hours, the aim is to find out good quality fruit and bad quality fruit. The sign of the good fruit will sink and the bad fruit will float. Furthermore, the fruit will be peeled using a special machine called a huller, to separate the outer skin from the coffee beans. Furthermore, the coffee beans will be soaked again aiming to remove the mucus that is still attached to the beans, by changing the water repeatedly. The drying process ranges from 23–24 hours using sunlight for 3 days if the weather is good. The above process is often called the wet process or the wet process, namely the fruit skin, fruit flesh and mucus layer have been removed through several mechanical processes [12]. The next process is storage, currently, storage is still using sacks and arranged on pallets so that they are not directly exposed to the ground floor. Storage of dry coffee beans still uses room temperature and the average temperature in the Ngebel area is between 20-30 °C. The storage of dry coffee beans in Ngebel farmers can be seen in Figure 2.

Manual processing carried out by Ponorogo farmers has many unpredictable risks. Ngebel farmers have

experienced some damage to their coffee beans even though they have been stored in dry conditions, this can be caused by damage to the storage plastic and humidity in the Ngebel area, causing moldy coffee beans Based on [13] Small-scale farmers face unpredictable risks as environmental and economic, on such occasions must have or create contingency plans to reduce the consequences of the damage and take practical knowledge of these same.

Some of the green beans from these farmers are distributed directly to coffee shops in Ponorogo, where they also have a roaster machine so there is no need to go to the roastery. Coffee shops are said to be processors/manufacturers because they roast, grind, and even brew coffee. Products produced by processors/manufacturers are roasted beans and coffee grounds. The product is marketed to consumers directly at the shop and products in the form of roast beans and ground coffee are marketed to other coffee shops (which do not have roasters) as well as consumers outside the city.

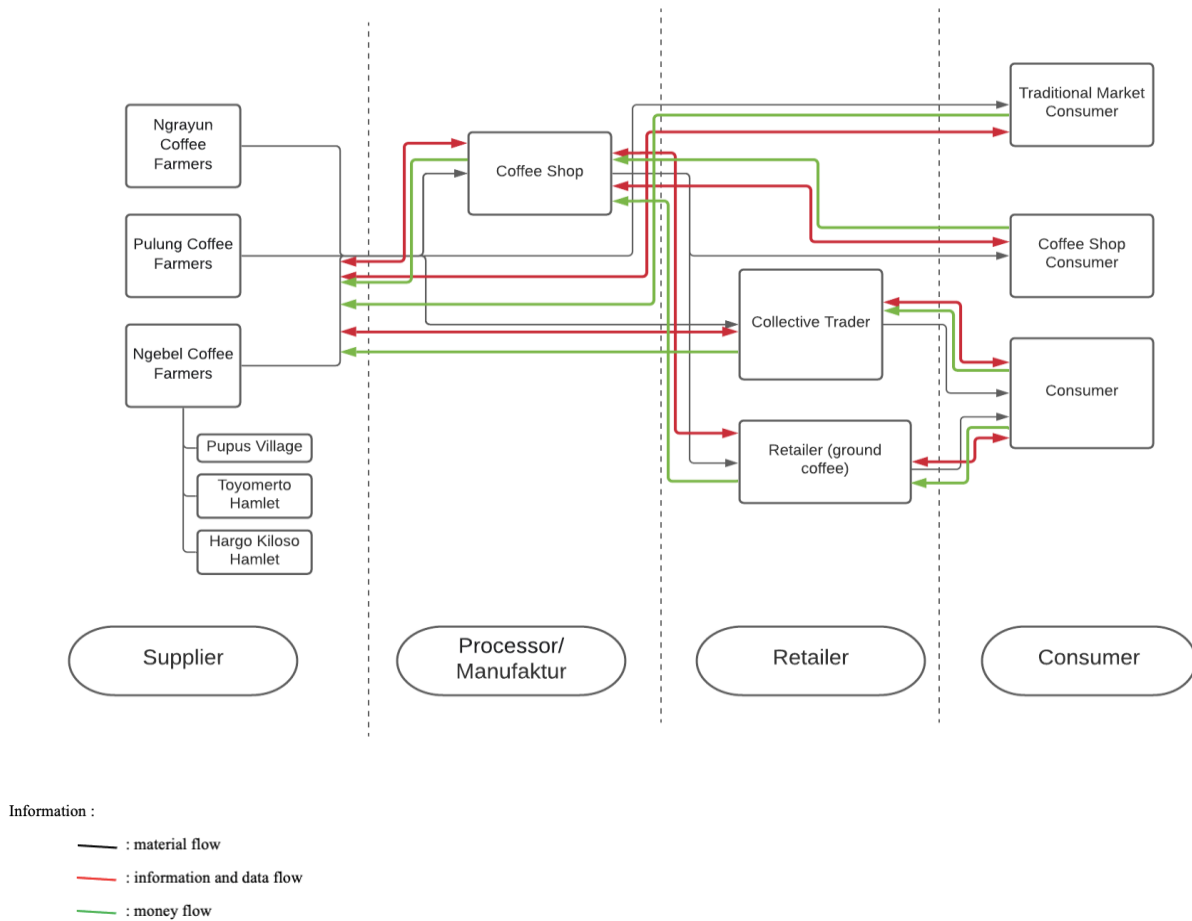


Figure 1. Ponorogo Coffee Agro-industry Supply Chain

The manufacturer of the Ponorogo coffee supply chain is UD. Reog Coffee was established in 2015. UD. Reog Coffee is a manufacturer in Ponorogo that focuses on original Ponorogo coffee. Raising the Ponorogo coffee brand is one of the goals of this manufacture. Roast beans and ground coffee products from UD. Reog Coffee has the brand 'Warok Coffee'. Reog Coffee as one of the processors/manufacturers also provides some insight to the farmers who become suppliers about the treatment of coffee beans after harvest. However, not all coffee farmers receive supervision from manufacturers, due to public awareness that they do not understand the importance of maintaining the quality of coffee beans.

Actually, the coffee from Ponorogo is sufficient to meet the needs in the city of Ponorogo, but many collectors sell it to other areas such as Malang and Semarang. So to meet the needs of local consumers, some coffee shops end up buying supplies from other regions. The main obstacle seen in the field is related to the post-harvest process. Where the post-harvest process determines the quality and taste of the coffee beans themselves. Farmers need to be guided and given more supervision starting from picking the harvest time and the right post-harvest process and can produce quality coffee beans.

In addition, farmers also directly sell green beans to traditional markets. Usually, what is sold is low quality coffee beans of low quality, so the price is much cheaper, or referred to as 'coffee perfunctory'. The direct consumers of these coffee farmers are small roadside coffee shops that sell coffee drinks at low prices. These retailers (ground coffee) buy products from coffee shops that sell roast beans and ground coffee and resell them in their own shops to end consumers.



Figure 2. Dried Coffee Beans Storage of Ngebel Ponorogo Farmers

It can be seen that the coffee supply chain in Ponorogo still has several shortcomings which result in low quality of coffee beans and lower selling prices. According to [14] supply chain management can reduce uncertainty in the amount of demand and uncertainty from suppliers. The existence of uncertainty in the supply chain system can result in agroindustry not being able to produce optimally. A good supply chain system is expected to make distribution run well too.

In the Ponorogo coffee supply chain, there is no Joint Enterprise Group (KUB) that can act as an intermediary between farmers to the next supply chain actor stage. Judging from several KUBs in other cities such as Trenggalek and Tulungagung, KUB coffee will really help farmers to get a more stable selling price of coffee. With more stable coffee prices, coffee farmers are more economically secure. In addition, the coffee KUB can act as an institution that provides education and supervision regarding the quality of coffee beans from farmers, so that the quality of coffee farmers is more maintained and uniform from certain areas. In accordance with research [15], an institution is needed that can bridge between suppliers and coffee managers so that both of them benefit equally and there is no price conflict.

In addition, there is no special place for a roastery for farmers. As a result, farmers only sell in the form of green beans or roast beans with the traditional process. Roast beans with traditional processes do not yet have the quality that can compete with roasted roast beans, due to unstable temperature, time, and frying method. It can be said that a good supply chain can be achieved if there is good cooperation between supply chain actors and each actor carries out the right process to maintain product quality.

Industry players understand that providing cheap, high-quality products and services as fast as possible cannot be performed by internal improvements of the manufacture alone. These three aspects require the participation of all parties from suppliers of raw materials, manufacturers that process raw materials into semi-finished materials and finished products, transportation companies that send products to retailers and distribution networks that deliver products to customers [16].

4. CONCLUSION

The results showed that the supply chain structure of the Ponorogo coffee agro-industry consists of several actors, namely farmers as suppliers, coffee shops as processors/ manufacture, retailers, and final consumers. The coffee supply chain in Ponorogo still has several shortcomings which result in low quality of coffee beans and lower selling prices. In the Ponorogo coffee supply chain, there is no Joint Enterprise Group (KUB) that can

act as an intermediary between farmers to the next supply chain actor stage. In addition, there is no special roastery for farmers, which causes farmers to only sell in the form of green beans or roast beans with the traditional process.

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REFERENCES

- [1] S. Widyotomo, Potential and Technology for Diversification of Coffee Waste into Quality and Value-Added Products. *Coffee and Cocoa Research Review*. Vol. 1(1), 2013, pp. 63-80.
- [2] J.E.R. Manalu, Productivity of Indonesian Coffee Farms is Still Low, <https://ekonomi.bisnis.com/read/20190312/99/898582/productivity-kebun-kopi-indonesia-masih-low>, 2019.
- [3] Ministry of Agriculture of the Republic of Indonesia, Coffee Area by Province in Indonesia, 2016-2020, <https://pertanian.go.id/>, 2020.
- [4] Ministry of Agriculture of the Republic of Indonesia, Coffee Production by Province in Indonesia, 2016-2020, <https://pertanian.go.id/>, 2020.
- [5] Sub-Directorate of Plantation Crop Statistics, Indonesian Coffee Statistics 2018, Central Bureau of Statistics, Jakarta, 2019.
- [6] T.H. Astuti, Coffee Outlook, Center for Agricultural Data and Information Systems Secretariat General - Ministry of Agriculture, Jakarta, 2017.
- [7] Y. Hariyati, Sofia, and J. Sumarno, Development of Coffee-Based Rural Agroindustry Towards Specialty Products of Jember Regency, Report on National Strategic Grant Research Results, Jember University Research Institute, 2013.
- [8] B. Bigliardi and E. Bottani, Performance measurement in the food supply chain: A balanced scorecard approach, *Facilities*, vol. 28, issue 5/6, 2010, pp. 249-260.
- [9] Department of Human Settlements, Ponorogo Regency Government, Medium-Term Investment Program Plan for Human Settlements in Ponorogo Regency for 2017-2021 (RPIJM), Ponorogo Regency Government, 2016.
- [10] Kominfo Ponorogo, Ngebel Save Potential Coffee, <https://ponorogo.go.id>, <https://ponorogo.go.id/2018/10/10/ngebel-save-potential-kopi/>, 2018.
- [11] R. Jaya, Machfud, M. Ismail, Application of ISM and ME-MCDM Techniques for the Identification of Stakeholders Position and Activity Alternatives to Improve Quality of Gayo Coffee), *Journal of Agricultural Industrial Technology*, 21(1),2011, pp. 1–8.
- [12] A. Afriliana, Latest Coffee Processing Technology, CV Budi Utama, Yogyakarta, 2018.
- [13] E.R. Palomino, S.H. Meza, D.R Montes, et al., Organic Coffee Supply Chain Management in the San Martin Region of Peru, *International Journal of Innovation, Management and Technology*, Vol. 8, No. 1, 2017, pp. 9-16. DOI: 10.18178/ijimt.2017.8.1.694.
- [14] K. Noviantari, A.I.Hasyim, N. Rosanti, The Analysis of Supply Chain and Added Value of Luwak Coffee Agroindustry In Lampung Province, *Journal of Agribusiness Sciences: Journal of Agribusiness Science (JIIA)*, Vol. 3 No. 1, 2015, pp. 10-17. DOI: <http://dx.doi.org/10.23960/jiia.v3i1.%25p>.
- [15] S. I. G. Putra, F.N.D. Nadia, E.B. Gusminto, D.P. Musmedi,. Supply Chain Performance Analysis in Coffee Agroindustry. *Journal of Modernization Economics*, 15(1), 2019, pp. 30–42. DOI: <https://doi.org/10.21067/jem.v15i1.2912>.
- [16] K.F. Kodrat, S. Sinulingga, H. Napitupulu, R.A. Hadiguna, Supply Chain Performance Measurement Model of Passion Fruit Agro-Industry for Sustainable Micro, Small, and Medium Enterprises with System Dynamics in North Sumatra Province, *International Journal on Advanced Science Engineering Information Technology*, Vol.9 No. 6, 2019, pp. 1885 – 1891, DOI: 10.18517.