Analysis of Arabica Coffee Marketing Efficiency

Nendah Siti Permana1, Endeh Masnenah1, Euis Dasipah1, Yayah Haeriah2, Asep Najmudin2, Ahmad Fatoni2, Tuti Gantini1

1Faculty of Agriculture, Winaya Mukti University, Indonesia
2Faculty of Agriculture, Bandung Raya University, Indonesia

*Corresponding E-mail: ade_nendah@yahoo.com

Abstract. The purpose of this study was to determine the form of channels, functions, and marketing efficiency of Arabica Coffee. Knowing an efficient marketing channel makes it easy for farmers to choose coffee marketing channels in order to obtain a more rational selling price. The research method used is a survey method with qualitative and quantitative descriptive analysis approaches. The location selection was done purposively with consideration in Sindangkerta Subdistrict, West Bandung Regency, there are two types of Arabica Coffee cultivated by farmers, namely Arabica Coffee and Geographical Indications. Based on the research results, it can be revealed that there are four Arabica Coffee marketing channels: Two Geo- and two non Geo-graphical Indications marketing channels, respectively. In terms of efficiency, channel I in Arabica Coffee marketing is the most efficient geographical indication, because the lowest total Margin value is 69,700, the highest value of marketing efficiency is 2.88 and the Farmer’s Share value is greatest at 10%.

1. Introduction
Plantation is one of the sub-sectors that has the opportunity to dominate the international market. Coffee commodity is one of the important commodities (one of the foreign exchange earner) in the plantation sub-sector. Based on the Agriculture Data and Information System Center of the Ministry of Agriculture, national coffee consumption has increased from 249,000 tons in 2016 to 314,000 in 2018 [1]. This is related to the phenomenon of the emergence of various coffee shop businesses in major cities in Indonesia that promise high profits. This is began with a change in the lifestyle of millennials who like to gather over coffee. However, changes in this phenomenon have not had an impact on improving the welfare of coffee farmers.

Currently the decline in global coffee prices is at its lowest level in the past 13 years. So the question arises whether the coffee is worth growing by farmers? It is feared that farmers will leave coffee in bulk [2]. Consumers still buy the same price for a cup of coffee or latte in shops and cafes, even though the price of coffee in farmers has dropped. While the price of coffee in farmers has gone down, the price of coffee for consumers has actually gone up [3].

Most farmers are interested in growing coffee because there is demand from the domestic market and for export. Coffee is now a part of the rural farming system. But the performance of coffee farmers has not been well documented [4]. One of the coffee problems that afflicts Ethiopia is that most of the coffee is exported in the form of green coffee (Unroasted bean). While the next process
that can increase the greatest value-added products occurs in importing countries where people consume coffee [2].

Various problems afflict coffee farmers in Indonesia. Among the location of coffee plantations with consumer centers, causing the marketing must go through the help of intermediary traders. Difficult information, the existence of market power and asymmetric price transmission in agricultural marketing are common and are already acute [5]. For this reason, a level of efficiency research in coffee marketing channels is needed. Thus farmers can choose marketing channels that are considered efficient to get a more rational selling price.

The research was conducted in Sindangkerta Subdistrict which is one of the coffee-producing areas in West Bandung Regency of Indonesia. In this sub-district, there are two types of Arabica coffee that farmers work on, namely geographic indication Arabica coffee and non-geographical Arabica coffee. Geographical Indications is a coffee uniqueness term, one of which is coffee grown at an altitude area [6]. Arabica Coffee Geographical Indications grown in areas with an altitude of 1,000 m above sea level, have cool, and dry air and rainfall between 2,000 - 3,000 mm / year and wet months between 6-7 months each year. Agricultural marketing is all activities that add value to agricultural products as they move from the production area to the point of consumption [7]. Agricultural marketing includes activities from harvesting, drying, cleaning, sorting, assessing, processing, packaging, labeling, transporting, storing, promoting and selling products [7]. Marketing margins are an important tool in analyzing the performance of a marketing system. Marketing costs, margins and benefits can be indicators of the efficiency or inefficiency of a marketing system [8]. Farmer's Share is a percentage of the price the farmer receives from the price that applies to retailers. The size of the Farmer's Share value is determined by the length of the marketing channel and the level of processing performed. Farmer's share value can determine the efficient level of marketing channels.

2. Methods
In this research, a survey method with qualitative and quantitative analysis approaches is used. Determination of the sample is done by Proportional Stratified Random Sampling, which is a technique used if the population consists of non-homogeneous members. To determine the sample size for each stratum, a proportional allocation is performed with the following calculation:

\[
\text{Number of samples for each stratum} = \frac{\text{Number of samples}}{\text{Number of populations}} \times \text{Number of populations of each stratum}
\]

The population of Arabica Coffee farmers in Sindangkerta Subdistrict, West Bandung Regency is 58 farmers, consisting of 59 Arabica Coffee farmers, of which 40 are Geographical Indications and 19 are Non-Geographical Indications. For the farmers, 50% of the population of coffee farmers is determined by 29 farmers. Based on the calculation results obtained a sample size of 20 Geographical Indications and 9 Non Geographical Indications. Calculation of sample size is presented in Table 1.

| Strata of Arabica Coffee Farmers | Calculation | Number of Sample Farmers (person) |
|----------------------------------|-------------|----------------------------------|
| Arabica Coffee Farmers           | 29 \times 40 | 20                               |
| Geographical Indications         | 58 \times 18 | 9                                |
| Arabica Coffee Farmers Non       | 29 \times 18 |                                  |
| Geographical Indications         |             |                                  |

For other respondents determined purposively using the snowballs method, 4 village collector traders, 1 dealer, 2 retailers, 2 large coffee processing traders, 1 cooperative and 1 exporter. Furthermore, a qualitative analysis is carried out to obtain clear and concrete information on the phenomenon of
problems found at the research location. The number of samples above 30 fulfils the normal distribution criteria and will provide a good estimate of the distribution of respondents' responses [9].

Other research data were a quantitatively analyzed using the following mathematical formula:

Partial Trading Margin = Selling Price - Buying Price
Total Trading Margin = Retail Price - Producer Price
Benefits = Total Margins - Total Costs
Efficiency of marketing channels = Total channel profits / costs

The Farmer's Share calculation technique is $FS = \frac{PF}{PR} \times 100\%$ with FS is Farmer's hare, PF is Farmer Prices, and PR is Retail Price.

3. Results and Discussions

Currently in Sindangkerta district (research location), most farmers still sell coffee fruit in the form of cherries (fresh red coffee fruit). Selling in the form of cherries is considered the easiest and does not require additional cost to process. The costs required are only in the form of picking wages, simple packaging and transportation costs at a relatively close distance, namely to the location of the collecting traders or to the location of the Cooperative office. There are differences in marketing channels between Arabica Coffee farmers in geographical and non-geographical Arabica Coffee farmers. Farmers who grow Arabica Coffee geographical indications sell coffee through the Cooperative, while non-geographical Arabica Coffee farmers sell freely to any trader who is considered to be able to provide better prices. In marketing Arabica Coffee geographical and Non Geographical Indications, respectively each of which has two types of marketing channels which are presented in Figure 1.

**Figure 1.** Arabica Coffee marketing channel Geo- and Non Geo-graphical Indication

For physical functions, especially coffee processing, each institution in each channel carries out a different processing. In the marketing of Arabica Coffee geographical indications of channels I, the cooperative process coffee from cherries to green beans before it is sold to exporters. While in channel II the cooperative carries out coffee processing from cherries to roasted beans before it is sold to retailers. Retailers normally processing the coffee from roasted beans to ground coffee. Exporters
do not do processing. The functions performed by the Arabica Coffee marketing agency Geographical Indications are presented in Table 2.

Table 2. Functions of Arabica Coffee Marketing Channels Geographical Indications

| Marketing Institution | Marketing Functions |
|-----------------------|---------------------|
|                       |                      |
|                       | **Function Exchange** |
|                       | **Physical function** |
|                       | **Facility Function** |

|                           | Purchase | Selling | Transport | Storage | Packaging | Processing | Sorting | Risk management | Financing |
|---------------------------|----------|---------|-----------|---------|-----------|------------|---------|-----------------|-----------|
| Channel I                 |          |         |           |         |           |            |         |                 |           |
| Cooperative               | ✓        | ✓       | ✓         | ✓       | ✓         | ✓          | ✓       | ✓               | ✓         |
| Exporter                  | ✓        | ✓       | ✓         | ✓       | ✓         | ✓          | ✓       | ✓               | ✓         |
| Channel II                |          |         |           |         |           |            |         |                 |           |
| Cooperative               | ✓        | ✓       | ✓         | ✓       | ✓         | ✓          | ✓       | ✓               | ✓         |
| Retailer                  | ✓        | ✓       | ✓         | ✓       | ✓         | ✓          | ✓       | ✓               | ✓         |

Data source: primary data processing results
Note: the ✓ sign indicates the function performed by a marketing agency

In the marketing of Arabica Coffee non geographical indications, most of the marketing functions are processed by all involved marketing institutions. Only Middleman and exporters do not process coffee. Collectors buy cherry coffee from farmers and sell it directly to the city. Exporters buy green bean coffee from Wholesaler processing, then export it. The marketing functions of Arabica Coffee non geographical indication are presented in Table 3.

Table 3. Functions Performed by Coffee Marketing Institutions Arabica Non Geographical Indications

| Marketing Institution | Marketing Functions |
|-----------------------|---------------------|
|                       |                      |
|                       | **Function Exchange** |
|                       | **Physical function** |
|                       | **Facility Function** |

|                           | Purchase | Selling | Transport | Storage | Packaging | Processing | Sorting | Risk management | Financing |
|---------------------------|----------|---------|-----------|---------|-----------|------------|---------|-----------------|-----------|
| Channel I                 |          |         |           |         |           |            |         |                 |           |
| Middelman                 | ✓        | ✓       | ✓         | ✓       | ✓         | ✓          | ✓       | ✓               | ✓         |
| Wholesaler                | ✓        | ✓       | ✓         | ✓       | ✓         | ✓          | ✓       | ✓               | ✓         |
| Wholesaler processing     | ✓        | ✓       | ✓         | ✓       | ✓         | ✓          | ✓       | ✓               | ✓         |
| Retailer                  | ✓        | ✓       | ✓         | ✓       | ✓         | ✓          | ✓       | ✓               | ✓         |
| Channel II                |          |         |           |         |           |            |         |                 |           |
| Wholesaler                | ✓        | ✓       | ✓         | ✓       | ✓         | ✓          | ✓       | ✓               | ✓         |
| Whole                      | ✓        | ✓       | ✓         | ✓       | ✓         | ✓          | ✓       | ✓               | ✓         |
| Eksporter                  | ✓        | ✓       | ✓         | ✓       | ✓         | ✓          | ✓       | ✓               | ✓         |

Data source: primary data processing results
Note: the ✓ sign indicates the function performed by a marketing agency

Cost is one important component in marketing. The costs incurred by each coffee marketing agent in the study area are different, this is because each marketing agency performs a different function.
The average marketing costs per kilogram of Arabica coffee geographical indications of channels I and II are presented in Table 3. In channel I, the Exporter issued the highest marketing cost which was about 81.44% of the total marketing cost (because the Exporter had to pay export costs which included 93% of the total costs incurred by the Exporter). In channel II, the highest marketing cost is spent by Retailers, which covers 53.59% of the total marketing costs. Retailers must incur transport and processing costs. Functions and Marketing Costs of Arabica Coffee Geographical Indications are presented in Table 4.

### Table 4. Functions and Average Costs of Marketing Arabica Coffee Geographical Indications on Channels I and II

| No. | The functions performed by the Marketing Institution | Average cost (IDR per kg) | Amount (IDR per kg) |
|-----|------------------------------------------------------|---------------------------|---------------------|
|     | Arabica Coffee Geographical Indications             |                           |                     |
| 1   | Cooperative                                          |                           |                     |
|     | Processing cherries to green bean                    | 800                       |                     |
|     | Transportation                                       | 2,000                     |                     |
|     | Packaging                                            | 100                       |                     |
|     | Sorting                                              | 100                       |                     |
|     | Depreciation                                         | 100                       |                     |
|     | Farmer's bonus                                       | 100                       |                     |
|     | Total Cost of Channel I                              | 14,500                    |                     |
| 2   | Exporter                                             |                           |                     |
|     | Transportation                                       | 1,000                     |                     |
|     | Packaging                                            | 1,500                     |                     |
|     | Sorting                                              | 500                       |                     |
|     | Depreciation                                         | 500                       |                     |
|     | Export costs                                         | 11,000                    |                     |
|     | Total Cost of Channel I                              | 17,700                    |                     |
| Channel II                             |                                                       |                         |
| 1   | Cooperative                                          |                           |                     |
|     | Processing coffee form rice to roasted coffee        | 13,300                    |                     |
|     | Packaging                                            | 500                       |                     |
|     | Sorting                                              | 250                       |                     |
|     | Depreciation                                         | 500                       |                     |
|     | Total Cost of Channel II                             | 14,550                    |                     |
| 2   | Retailer                                             |                           |                     |
|     | Transportation                                       | 8,000                     |                     |
|     | Processing from roasted coffee to ground coffee      | 6,500                     |                     |
|     | Packaging and labeling                               | 1,300                     |                     |
|     | Depreciation                                         | 1,000                     |                     |
|     | Total Cost of Channel II                             | 16,800                    |                     |

In the marketing Arabica Coffee Non-geographical indication, the highest incurred cost by retailers was in Channel I. Retailers spend 57.7% of the total marketing costs for channel I. Retailers incur
relatively high transportation costs due to their location outside the province. In channel II, the Exporter spent the highest cost, namely 47.12% of the total marketing costs. The highest incurred costs by exporters are export costs. The functions performed and the incurred costs by each non-geographical indication Arabica Coffee marketing Institute are presented in Table 5.

Table 5. Functions and Average Costs of Marketing Arabica Coffee Non-Geographical Indications

| No. | The functions performed by the Marketing Institution | Average Cost (IDR per kg) | Amount (IDR per kg) |
|-----|-----------------------------------------------------|--------------------------|--------------------|
| 1   | Arabica Coffee Non-Geographical Indications Channel I |                         |                    |
|     | Middleman                                           | 300                      | 450                |
|     | Transportation                                      |                          |                    |
|     | Packaging                                           | 150                      |                    |
| 2   | Wholesaler                                          |                          |                    |
|     | Transportation                                      | 350                      |                    |
|     | Processing coffee form cherries to rice coffee      | 800                      |                    |
|     | Packaging                                           | 500                      |                    |
|     | Sorting                                             | 500                      |                    |
|     | Depreciation                                        | 1000                     |                    |
|     |                                                     | 3.150                    |                    |
| 3   | Processor Wholesaler                                |                          |                    |
|     | Processing coffee form rice to roasted coffee       | 13,300                   |                    |
|     | Packaging                                           | 500                      |                    |
|     | Sorting                                             | 500                      |                    |
|     | Depreciation                                        | 500                      |                    |
|     |                                                     | 14,800                   |                    |
| 4   | Retailer                                            |                          |                    |
|     | Transportation                                      | 8000                     |                    |
|     | Processing coffee from roasted to ground coffee     | 12,500                   |                    |
|     | Packaging                                           | 1,300                    |                    |
|     | Depreciation                                        | 300                      |                    |
|     |                                                     | 22,100                   |                    |
|     | Total Cost of Channel I                             |                          | 40,500             |
| 1   | Wholesaler                                          |                          |                    |
|     | Transportation                                      | 250                      |                    |
|     | Processing cherries coffee to rice                  | 800                      |                    |
|     | Packaging                                           | 200                      |                    |
|     | Sorting                                             | 200                      |                    |
|     | Depreciation                                        | 750                      |                    |
### The functions performed by the Marketing Institution

| No. | Average Cost (IDR per kg) | Amount (IDR per kg) |
|-----|--------------------------|---------------------|
| 2   | Processor Wholesaler     |                     |
|     | Coffee processing from rice to roasted coffee |                     |
|     | Packaging                | 300                 |
|     | Sorting                  | 500                 |
|     | Depreciation             | 500                 |
| 3   | Exporter                 |                     |
|     | Transportation           | 1.000               |
|     | Packaging                | 1700                |
|     | Sorting                  | 500                 |
|     | Depreciation             | 500                 |
|     | Export Cost              | 11.000              |

Total Cost of Channel II 31.200

Channel II marketing of Arabica Coffee Geographical Indications have the highest margin value of IDR100,420 per kg. In this channel, retailers carry out advanced coffee processing which results in increased marketing costs so that the margins are even greater. The lowest margins and costs are obtained in Channel I of Arabica Coffee Geographical Indications Marketing, with a margin of IDR69,700 per kg. In the first Channel, the marketing of Arabica Coffee Geographical Indications are considered as the most efficient since it has the highest efficient value about 3.18.

### Table 6. Buying Prices, Selling Prices, Margins, Costs and Profits of Marketing in The Marketing Channels of Arabica Coffee Geo- and Non-Geographical Indications

| Marketing channel | Purchase price (IDR/kg) | Selling Price (IDR/kg) | Margin (IDR/kg) | Cost (IDR/kg) | Profit (IDR/kg) | Efficiency |
|-------------------|-------------------------|------------------------|----------------|--------------|----------------|------------|
| Arabica Coffee Geographical Indications |
| Channel I |
| Cooperatif         | 8.000                   | 38.400                 | 30.400          | 3.200         | 27.200         |
| Exporter           | 38.400                  | 76.800                 | 38.400          | 14.500        | 23.900         |
| Amount             | -                       | -                      | 68.800          | 17.700        | 51.100         | 2.88       |
| Channel II |
| Cooperative        | 8.000                   | 76.800                 | 68.800          | 14.550        | 54.250         |
| Retailer           | 76.800                  | 107.520                | 30.720          | 16.800        | 13.920         |
| Amount             | -                       | -                      | 100.420         | 31.350        | 68.170         | 2.17       |
| Arabica Coffee NonGeographical Indications |
| Channel I |
| Middleman          | 6.000                   | 7.000                  | 1.000           | 450           | 550            |
| Wholesaler         | 7.000                   | 20.000                 | 13.000          | 950           | 12.050         |
Marketing channel | Purchase price (IDR/kg) | Selling Price (IDR/kg) | Margin (IDR/kg) | Cost (IDR/kg) | Profit (IDR/kg) | Efficiency
--- | --- | --- | --- | --- | --- | ---
Processor | 20.000 | 53.760 | 33.760 | 14.800 | 18.960 | 
Wholesaler Retailer | 53.760 | 81.920 | 28.160 | 22.100 | 6.060 | 2.04
Amount | - | - | 76.720 | 18.410 | 37.620 | 
Channel II Wholesaler Processor Wholesaler Exporter | 6.500 | 20.000 | 6.000 | 13.500 | 2.200 | 11.300
Amount | 70.300 | 31.200 | 39.100 | 900 | 2.600 | 1.25

Farmer’s Share value or share of the price received by coffee farmers <50% on all channels. This is in accordance with the theory that agricultural products with a low Farmer’s Share value means expensive marketing costs. That is the case with coffee. Coffee requires several stages of processing before it can be consumed. Thus the marketing costs are relatively expensive compared to other agricultural products. Farmer’s Share value of Arabica Coffee Farmers is highest at 10%. Coffee farmers in Sindangkerta Subdistrict, normally sell their coffee in a fresh condition (cherries coffee). If farmers have started to do simple processing on the coffee that has been picked, it is expected to increase the selling price and value of Farmer’s Share coffee farmers in the future. The Farmer's Share value is presented in Table 7.

Table 7. Farmer's Share Value of the Arabica Coffee Geo- and Non-Indications Geographical

| Institution | Average Selling Price of Arabica Coffee Geographical Indications (Rp per kg) | Average Selling Price of Arabica Coffee Non Geographical Indications (Rp per kg) |
| --- | --- | --- |
| Coffee Farmers | I (8.000) | II (8.000) |
| Retailer | I (76.800) | II (107.520) |
| Farmer’s Share | 10% | 7.4% |

4. Conclusion
There are four Arabica Coffee Marketing channels in Sindagkerta District, West Bandung Regency. Two channels that market Arabica Coffee Geographical Indications: I) Farmers, Cooperatives, Exporters; II) Farmers, Cooperatives, Retailers, Consumers. While the channels that market Non Geographical Indications Arabica Coffee are: I) Farmers, Collector Traders, Dealers, Processor Wholesalers, Retailers, Consumers; II) Farmers, Wholesale Processor Wholesalers, Exporters. Channel I: Marketing of the Arabica Coffee Geographical Indications is concluded as the most marketing channel, because it has the highest marketing Efficiency value about 3.18; has the lowest margin value of about 69,700 and has the highest Farmer's Share value about 10%.

References
[1] Central Bureau of Statistics. 2017. Indonesian Coffee Statistics
[2] Mousho Aaron, Nigel Hunt. 2019. Coffee Price Slump Leaves Farmers Earning Less Than a Cent a Cup. Company News. Discover Thomson Reuter.
[3] Settembre Jeanette. 2019. Why The Price of Your Morning Coffee Could Get More Expensive. Market Watch. https://www.marketwatch.com/story/why-your-latte-costs-nearly-5-despite-plummeting-coffee-bean-prices-2019-04-26

[4] Karki Yogendra Kumar, Punya Prasad Regmi, Resham Bahadur Thapa 2018. Coffee Production in Kavre and Lalitpur District Nepal. Journal of Nepal Agricultural Research Council Vol. 4 :72-78, http://dx.doi.org/10.3126/jnarc.v4i1.19692

[5] Yovo Koffi. 2017. Market Information Service and Spatial Asymmetry Price Transmission in Togolese Maize Market. Journal of Agricultural Economic and Rural Development Vol. 3(3), pp. 259-269, October 2017. www.premierpublisher.org

[6] Ram A. Santa. 2017. Geographical Indication on Coffee. First Binchuan Zhukula International Coffee Forum. Zhukula, China. https://www.researchgate.net/publication/323014375_Geographical_Indications_on_Coffee

[7] Ghafoor Abdul, Hammad Badar, Asif Maqbool. 2017. Marketing of Agricultural Product. University of Agriculture. Faisalabad. Pakistan.

[8] Geoffrey O Ekoja. 2018. Economics Analysis of Beans Production for Marketing Profitability. Nort West. Nigeria

[9] Kwak Sang Gyu, Jong Hae Kim. 2017. Central Limit Theorem : The Cornerstone of Modern Statistics. Korean Journal of Anesthesiology. 2017 Apr; 70(2) : 144-156. http://ekja.org

Acknowledgement
Praise me for Allah SWT because for His blessings we can finish this paper entitled Analysis of Arabica Coffee Marketing Efficiency. We do not forget to thank the Government, especially the Ministry of Research, Technology and Higher Education, the Rector of Unwim, the Chairperson and all levels of LPPM Unwim as well as to all those who helped during the research until the writing of this paper.