Value chain analysis of Toraja coffee

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Abstract. Toraja Coffee is one of the most famous coffee in the world, which was produced in the Tana Toraja Regency. Although its level of production is not too high, this coffee has a high demand from connoisseur around the world. The problems that occurs at this time is that coffee plantations are generally in poor condition because of the limitations of farmers in capital, knowledge, cultivation, and management of results. Using the Value Chain Analysis might help to find out how far the role of each stakeholder involved which is directly related to the benefits received by each stakeholder. Thus, it will be able to provide supporting data to make some policies that can be taken to improve the value chain that is still considered as an inappropriate value chain. This study aims to analyze the value chain of the Toraja coffee commodity. The study was conducted in Tana Toraja Regency, South Sulawesi in 2018. The research method used in this research is quantitative descriptive which is used to analyze the total costs, revenues, revenues, and margins obtained by each value chain actor. The analytical approach used in this research is the quantitative analysis approach. The results showed that the Toraja coffee value chain shows the highest margin of the main value chain actors are household processing industry and collector who sells coffee outside the district. It can be concluded that it is important for the farmers to broaden their knowledge about the value chain of coffee and to give added value to their product to get higher revenue.

1. Introduction

Indonesia is the third-largest coffee producer in the world with an average production of 500 thousand tons per year [1]. Indonesia has at least three main regions coffee producer namely; Java, Sumatra, and Sulawesi. The most famous coffee-growing area in Sulawesi is Tana Toraja, with its coffee planting system that still uses a traditional planting system. The process of selecting and picking coffee is conducted empty handedly that it produces very high-quality coffee. The level of production that is not too high makes this coffee has a high demand from connoisseur around the world [2].

Although included as one of the largest coffee producer region in Indonesia and a contributor to foreign exchange for the country, farmers as the main actors of this Toraja coffee agribusiness still face many problems. Coffee farmers in Tana Toraja still have problems in developing their farming businesses, such as lack of knowledge and management, weak farmers institution, limited access to capital, and low mastery of technology and postharvest [3]. Moreover, low bargaining position of farmers against traders/collectors in the value chain is also a problem that cannot be ignored because it is directly related to farmer's income. In addition to coffee farmers problems, coffee price are very volatile. Price volatility makes the life of coffee farmers difficult because they never know in
advances what the international price will be when the harvest comes, does they cannot plan their production accordingly. As coffee yields are vulnerable to both temperature and disease, the volume of production can vary widely from one year to another [4].

The concept of value chains and clusters is a concept to increase competitiveness through geographical concentration of various companies and institutions that are interconnected in certain sectors [5]. Value chain analysis on the commodity of Toraja coffee is carried out to find out the contribution or role of each actor involved in Toraja coffee agribusiness that is directly related to the profits received by each actor. The results of the value chain analysis are expected to help in taking strategic or policy steps to improve the level of the value chain that is considered unsuitable. Upgrading small farmers through value chain interventions is part of a broader agenda in international development practice known as ‘value chain development’ (VCD). However, in Toraja coffee producer communities, the effort to develop the value chain tends to fail because the farm households often respond to interventions in counterintuitive ways to how roasters might imagine [6].

Efforts in analyzing Toraja coffee agribusiness value chain are also based on changes in consumer preferences that increasingly demand more detailed and complete product attributes. As a result of changing consumer preferences, the main actors of Toraja coffee agribusiness are required to make changes from merely trying to farm to be farmers who are oriented to the processing industry. If this has been achieved, a value chain will be created that will benefit the actors involved in the agribusiness coffee of Toraja [7]. Based on the background and description of the problem, this study aims to analyze the value chain of the Toraja coffee commodity in Tana Toraja Regency.

2. Methods

This research was conducted in To ‘Sapan Sub-district, South Makale District, Tana Toraja Regency, South Sulawesi in March-April 2018. This study conducted an analysis by using the value chain analysis method according to Michael Porter which divides the two activities, namely primary activities and supporting activities. VCA is a tool used in the process of achieving collaborative allocation and management of resources within and between businesses in a chain, the purpose of which is to improve the competitiveness of the chain as a whole [8]. The sample in this study was 25 respondents selected using a purposive sampling technique. The data used in this study are primary data and secondary data. The research method used in this research is quantitative descriptive. The analytical approach used in this study is a quantitative analysis approach that is used to analyze the amount of costs, revenues, profits, and margins obtained by each value chain actor.

In calculating the total cost using a formula of:

\[ TC = TFC + TVC \]  

Information: 
\[
\begin{align*}
TC & = \text{Total Cost (IDR)} \\
TFC & = \text{Total Fix Cost (IDR)} \\
TVC & = \text{Total Variable Cost (IDR)}
\end{align*}
\]

In calculating the revenue using a formula of:

\[ TR = Q \times P \]  

Information: 
\[
\begin{align*}
TR & = \text{Total Revenue (IDR)} \\
Q & = \text{Quantity} \\
P & = \text{Price (IDR)}
\end{align*}
\]

In calculating the profit using a formula of:

\[ \pi = Pa - Pb - C \]  

Information: 
\[
\begin{align*}
\pi & = \text{Profit Received by Each Actor (IDR)} \\
Pa & = \text{Selling Price at Each Actor (IDR)}
\end{align*}
\]
Pb = Product Purchase Price (IDR)
C = Marketing Cost for Each Actor (IDR)

Marketing margins and marketing margin ratios are calculated using the formula of:

\[ M_{ji} = P_{ri} - P_{fi} \text{ or } M_{ji} = b_i + k_i \]  

(4)

Information:

\( M_{ji} \) = Marketing Margin
\( P_{ri} \) = Price at the consumer level are taken from the average price
\( P_{fi} \) = Price at the producer level are taken from the average selling price
\( k_i \) = Marketing Profit
\( b_i \) = Marketing Cost

Revenue / Cost ratio is calculated using the formula of:

\[ \frac{R}{C} = \frac{TR}{TC} \]  

(5)

Information:

\( TR \) = Total Revenue (IDR)
\( TC \) = Total Cost (IDR)

Main actor's value chain analysis according to Porter's Theory

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3. Results and Discussion

3.1. Margin and R/C Ratio of Toraja Coffee Value Chain

In analyzing the value chain, it is necessary to calculate the margin and R/C ratio first. Margin is the gap between prices at the consumer level taken from the average price and prices at the producer level taken from the average selling price. While the R/C ratio is calculated by looking at the placement of total revenue (TR) with the total cost (TC) incurred by the value chain authority. Margins obtained in table form from the main results prepared in the value chain can be seen in table 1. While the R/C value chain ratio can be seen in table 2.
Table 1. The margin of each Toraja coffee value chain actor issued by the collector traders and the coffee processing household industries in the Santung Neighborhood, To ’Sapan Sub-district, South Makale District, Tana Toraja Regency, 2017.

| Actors in the Value Chain | Production Volume (kg) | Total Production Price per kg (IDR) | Price Margin per kg (IDR) | Price Margin % |
|---------------------------|------------------------|------------------------------------|---------------------------|----------------|
| Channel 1: Farmers - Collector Traders – Household Industries and Traders inside the Regency – Consumers |
| Farmers                   | 45,000                 | 2,902,500,000                     | 64,500                    | 3,500          | 22.94 |
| Collector Traders         | 44,109                 | 2,999,412,000                     | 68,000                    | 3,000          | 24.19 |
| Household Industries      | 41,454                 | 6,168,355,200                     | 148,400                   | 80,400         | 52.78 |
| Total                     |                        | 12,070,267,200                    | 281,300                   | 89,300         | 100.00 |
| Channel 2: Farmers - Collector Traders - Household Industries and Traders outside the Regency |
| Farmers                   | 27,933                 | 1,801,678,500                     | 64,500                    | 3,500          | 42.23 |
| Collector Traders         | 27,380                 | 2,464,200,000                     | 90,000                    | 2,500          | 57.77 |
| Total                     |                        | 4,265,878,500                     | 154,500                   | 25,500         | 100.00 |

Table 2. R / C Ratio of each Toraja coffee value chain actor issued by a coffee trader and a coffee processing household industry in the Santung Neighborhood, To ’Sapan Sub-district, South Makale District, Tana Toraja Regency, 2017.

| Actors in the Value Chain | Total Revenue (IDR) | Total Cost (IDR) | R/C |
|---------------------------|---------------------|------------------|-----|
| Farmers                   | 4,704,178,500       | 87,470,900       | 53.77 |
| Collector Traders         | 5,600,512,000       | 4,808,826,050    | 1.16 |
| Household Industries      | 6,149,185,000       | 2,983,699,817    | 2.06 |

Figure 2. Margin Flow Performers of the Toraja Coffee Commodity Value Chain in the Santung Neighborhood, South Makale District, Tana Toraja Regency.
Based on figure 2, it shows that there are four main actors in two channels of Toraja coffee value chain, namely; coffee farmers, collector traders who sell to industries in the district, collector traders who sell to traders outside the district, and home coffee processing industries in the district. The figure also shows supporting actors in the Toraja coffee value chain namely; transportation services, input providers or means of production, and consumers. Figure 2 also explains each amount of production, prevailing price level, and percentage of margin obtained. The largest margin in the main value chain actors in the first channel is owned by the coffee processing household industry with a margin value of IDR 80,400/kg to produce coffee powder packaging 0.25 kg, 0.5 kg, and 1 kg with a margin percentage of 52.78%. While the biggest margin in the second channel is the value chain owned by traders outside the district with a margin of IDR 90,000/kg with a margin percentage of 57.77%.

Meanwhile, the smallest income is owned by coffee farmers as the first producer in this commodity. At the farmer level, the biggest production volume is 72,933 kg/year, but it is only sold at the lowest price level of IDR 64,500/kg. Whereas in agricultural value chains, individuals or businesses can perform more than one function, and information does not have to flow linearly. However, if each actor only knows about suppliers and customers who directly interact with them, they become vulnerable to lower returns due to problems and opportunities unknown in other parts of the chain. For farmers, this highlights the importance of making decisions based on an understanding of market opportunities and the whole chain, rather than seeing their part of the chain separately [8].

3.2. Analysis of Porter's Theory of Toraja Coffee Value Chain Actors
Toraja coffee value chain analysis uses a porter value chain that divides 2 activities, namely primary activities and supporting activities. The picture of the value chain analysis of each Toraja coffee value chain actor according to Porter's theory is shown in Figure 3, Figure 4, and Figure 5. The three pictures serve to explain the form of activities carried out by farmers, collectors, and home industries in the value chain Toraja coffee commodity.
Logistics inward (the use of fruit that falls and is planted back) | Operation (coffee plant maintenance) | Logistics outward (distribution of coffee beans) | Sales and marketing (coffee bean sales) |
|---|---|---|---|

**Main Activities**

**Figure 3.** Analysis of farmer value chains based on Porter's Theory, in the Santung Neighborhood, To 'Sapan Sub-district, South Makale District, Tana Toraja Regency 2018.

| Supporting Activities | Company Infrastructure (own capital and assistance from banks) | Human Resource Management (recruitment, technical guidance, job assignments, remuneration) | Technology Development (the use of mobile communication devices, negotiations via telephone, the use of hullers) | Procurement (supporting facilities and infrastructure for operational activities) |
|---|---|---|---|---|

| Main Activities | Logistics inward (input of Toraja coffee) | Operation (Meeting, drying and selling to the household industry) | Logistics outward (Toraja coffee shipments to traders outside the district) | Sales and marketing (fixing the selling price of a coffee per kg) | Service (good communication) |
|---|---|---|---|---|---|

**Figure 4.** Collector trader value chain analysis based on Porter's Theory, in the Santung Neighborhood, To 'Sapan Sub-district, South Makale District, Tana Toraja Regency 2018.
Logistics inward (selection of good coffee beans to be processed) | Operation - | Logistics outward (distribution of products that are ready to sell to consumers in the form of 0.25 kg, 0.5 kg and 1 kg of ground coffee) | Sales and marketing (fixing the selling price of a coffee per package, promotion through social media) | Service (Good communication with collectors and consumers) |
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**Main Activities**

**Figure 5.** Analysis of the value chain of the coffee processing home industry based on Porter’s Theory, in the Santung Neighborhood, To ‘Sapan Sub-district, South Makale District, Tana Toraja Regency 2018.

**4. Conclusion**

Based on the analysis of the Toraja coffee value chain, it was found that actors in the value chain that received the highest margins were the household industries in channel 1 and the collecting traders in channel 2 with margins of 52.78% and 57.77%, respectively. The margin processing is as a result of the additional treatment given to Toraja coffee products such as; Standardized drying, sorting, and processing into ground coffee. Meanwhile, the lowest value chain margins of value chain actors are farmers in channels 1 and 2 with a margin of 30.35%. This is because coffee farmers only carry outstripping of coffee beans into beans, and only do a quick-drying and without certain standardization, so it does not provide significant added value. As a result, the price received by farmers is only the standard price of the traders by the prevailing price level.

The Toraja coffee value chain based on the Porter’s theory explains that each major value chain actor carries out main activities and supporting activities even though the main actors of the Toraja coffee value chain in supporting activities have not implemented a cost advantages strategy. The strategy shows certain costs that can be reduced so that these costs can be allocated to other main activities or other supporting activities.

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