



ARABICA COFFEE PRODUCTIVITY IMPROVEMENT STRATEGY WITH VALUE CHAIN ANALYSIS APPROACH (CASE STUDY: SAPAN VILLAGE, NORTH TORAJA)

Sapta Asmal¹, Syarifuddin M. Parenreng², Erly Setyawati Paerunan³, Widi Astutik⁴

Department of Industrial Engineering, Faculty of Engineering, Hasanuddin University¹⁻⁴

Axis Malino Street km.6, Bontomarannu, Gowa Regency, South Sulawesi, Indonesia¹⁻⁴

E-mail: saptaasmal68@gmail.com¹, syarifmp@gmail.com², widi.astutik2@gmail.com⁴

ABSTRACT

Coffee is a farm commodity that has an important role in economic activities in Indonesia. The Indonesian coffee sector is dominated by small producers. North Toraja Regency, including in Sapan Village, is known as a producer of high quality coffee but low production. This study aims to examine the strategy of increasing coffee productivity in Sapan Village using value chain analysis. Data were collected through observation and interviews with cultivators in the value chain. This study shows that the productivity of coffee produced is still relatively low. The basic cause of low coffee productivity is that cultivation techniques are not good because information on good agriculture practices is still limited and there is a thought that the selling price of coffee is still low. To increase productivity, farmers need the role of the government. Farmers need counseling on coffee cultivation techniques that are in accordance with the application of GAP and price transparency from the government. If farmers have applied coffee cultivation techniques well, coffee productivity will increase so that farmers' income will also increase.

Keywords: productivity of coffee, value chain analysis

Article history:

Submitted 5 July 2022

Revised 12 July 2022

Accepted 3 August 2022

Available online 20 December 2022

Published By:

Fakultas Teknologi Industri
Universitas Muslim Indonesia

Address :

Jl. Urip Sumoharjo Km. 5 (Kampus II UMI)
Makassar Sulawesi Selatan.

Email :

Jiem@umi.ac.id

Phone :

+6281341717729

+6281247526640

Licensed by: <https://creativecommons.org/licenses/by-nc-sa/4.0/>

DOI : <http://dx.doi.org/10.33536/jiem.v7i3.1243>



1. INTRODUCTION

Production is the activity to add value to an object or create a new object, so it is more useful in comply needs. Production is not only limited to manufacture but also storage, distribution, transportation, retail, and repackaging or others¹. In forming a product there is an analysis that can be used, it's value chain analysis. This value chain comes from the activities, like from raw materials to the hands of consumers, including after-sales services². Value chain identifies and connects various activities in the company³. Value chain activities are grouped into two, primary activities and support activities. The primary activities consist of incoming logistics, operations, outbound logistics, marketing and sales, and service. While secondary activities consist of procurement, human resource management, technology development, and infrastructure⁴.

The development of the agricultural sector in Indonesia is greatly benefited by the development results that have been achieved so far. This is undeniable considering that Indonesia has a very large capital wealth of natural resources and provides opportunities for the development of agricultural businesses. In addition to the agricultural sector, the farm sector is also one of the contributors to the development that has been achieved. One of the natural resources of the farm sector is the coffee plant which is widely cultivated by farmers and private companies. Coffee plants have high economic value and strategy, both for increasing farmers income and even increasing foreign exchange for the country. In addition, history records the discovery of coffee as nutritious and beneficial drink energy. And its attractive taste and aroma, coffee can also reduce the risk of disease cancer, diabetes, stonebile, and various heart diseases⁵.

According to Indonesian Estate Crops Statistics, in 2015 Indonesia exported 502,021 tons of coffee to various countries worth US\$ 1,197,735 or around 16 billion rupiah⁶. Coffee has also been known by the public for a long time. Coffee is a farm commodity that has an important role in economic activities in Indonesia. The coffee commodity has contributed significantly to the country's foreign exchange, and has become a non-oil and gas

export, besides that it can be a provider of employment and a source of income for coffee planters as well as for other economic actors involved in cultivation, processing, and in the marketing chain. Coffee is also a type of tropical plant that can grow anywhere.

There are two species of coffee plants that are generally developed in Indonesia, arabica coffee and robusta coffee⁷. Arabica coffee is a traditional type of coffee, considered the most delicious in taste, and Robusta coffee, which has higher caffeine content, can be grown in an environment where Arabica coffee cannot grow, with a bitter and sour taste. Arabica coffee in Indonesia is generally grown in Aceh, North Sumatra, South Sulawesi, Bali, and East Nusa Tenggara.

One of the best arabica coffee producing areas in the province comes from the Toraja area. Arabica coffee beans produced by farmers in Toraja are exported to several countries in Asia, Europe, and America. Even Japan has always surveyed coffee plants and believes that coffee from Toraja can develop and dominate the international market, which then invests in Arabica coffee cultivation in one of the companies, namely PT. Toarco Jaya.

2. METHODS

The study was in Arabica coffee farmers located in Sapan Village, Buntu Pepasan District, North Toraja Regency, South Sulawesi, Indonesia. The research was using the observation technique which aims to obtain the activities of the farmers, such as how to harvest coffee, how to produce coffee, the number of coffee farmers, and so on The study was in Arabica coffee farmers located in Sapan Village, Buntu Pepasan District, North Toraja Regency, South Sulawesi, Indonesia. The research was using the observation technique which aims to obtain the activities of the farmers, such as how to harvest coffee, how to produce coffee, the number of coffee farmers, and so on.

In addition, data collection techniques with interviews where respondents were coffee farmers by asking questions related to coffee,

such as total production, number of workers, land area, use of fertilizers, and farmers' income.

After data collection activities, then data processing by analyzing the production of Arabica coffee farmers, creating and analyzing the Arabica coffee value chain that has been formed using value chain analysis, analyzing problems that cause low productivity, and formulating strategies to increase the productivity of Arabica coffee farmers in Sapan village.

3. FINDINGS AND DISCUSSION

Arabica coffee production in Sapan Village reaches 17% of the total production in the district. As one of the leading commodities in North Toraja district, Arabica coffee production and productivity fluctuated over the last 4 years (2012-2017). The production of arabica coffee from year to year has increased which is inversely proportional to the productivity of arabica coffee which decreases every year. Several factors cause this and one of them is the erratic weather/climate.

3.1. Farmer's Income

The costs incurred by farmers for 1 hectare with a total production of 200 kg of dry parchment can be seen in the following table :

Table 1. Coffee Production Costs Per Hectare

Production Cost Per Hectare					
No	Production cost	Cost Per Unit (IDR)	Units Per Hectare	Needs (Time)	Total (IDR)
1	Weeding (Labor)	100,000	10 people	2	2,000,000
2	Herbisida Supremo	70,000	5 bottles	2	700,000
3	Pulper Rental	50,000	1 unit	8	400,000
4	Transportation costs	10,000	1 liter	5	50,000
Total Cost per Hectar		-	-	-	3.150.000
Total Cost per Kg		-	-	-	15,750

The farmers' income in 1 hectare with a marketed production of 180 kg of coffee can be seen in the table below :

Table 2. Coffee Business Revenue Per Hectare

Revenue Per Hectare			
Production cost	Cost Per Unit (Rupiah/kg)	Units Per Hectare (kg)	Total (Rupiah)
Revenue from Collectors (70%)	31,050 per kg	125	3,881,250
Receipts from processing factories/exporters (30%)	32,190 per kg	55	1,770,450
Total Receipt	-	-	5,651,700

The total production cost incurred by the farmer for 1 hectare is Rp. 3,150,000,- and the income is Rp. 5,651,700,-. Thus, the income that farmers get from coffee production from one hectare is IDR 2,501,700,-.

3.2. Return Cost Ratio

$$\begin{aligned}
 R/C &= TR/TC \\
 &= \text{IDR } 5,651,700 / \text{IDR } 3,150,000 \\
 &= 1.8
 \end{aligned}$$

The results of the analysis show that the R/C value of coffee farming is more than 1, which is 1.8. This means that every one rupiah spent by coffee farmers can generate a revenue of 1.8. This shows that coffee farming is profitable and feasible to implement.

3.3. Margin

The advantages that farmers get from their coffee business are :

Table 3. Profit Margin

No	Value Chain	Coffee Production Cost (Rupiah/kg)	Selling Price of Coffee (Rupiah/kg)	Profit (IDR)	Margin (Percent)
1	Farmer to collector	15,750	31.050	15,300	48
2	Farmers to coffee processing factories/exporters	15,750	32.190	16,440	51

From the table above, the margin obtained by farmers from value chain 1 is 48%, while in the value chain 2 farmers get a margin of 51%. So farmers get a bigger profit when selling their coffee to coffee processing factories/exporters than when selling to collectors.

The following picture is the Arabica coffee value chain in Sapan village. The value chain map shows the process of coffee movement from the farmer to the consumer.

3.4. Coffee Market and Value Chain Map

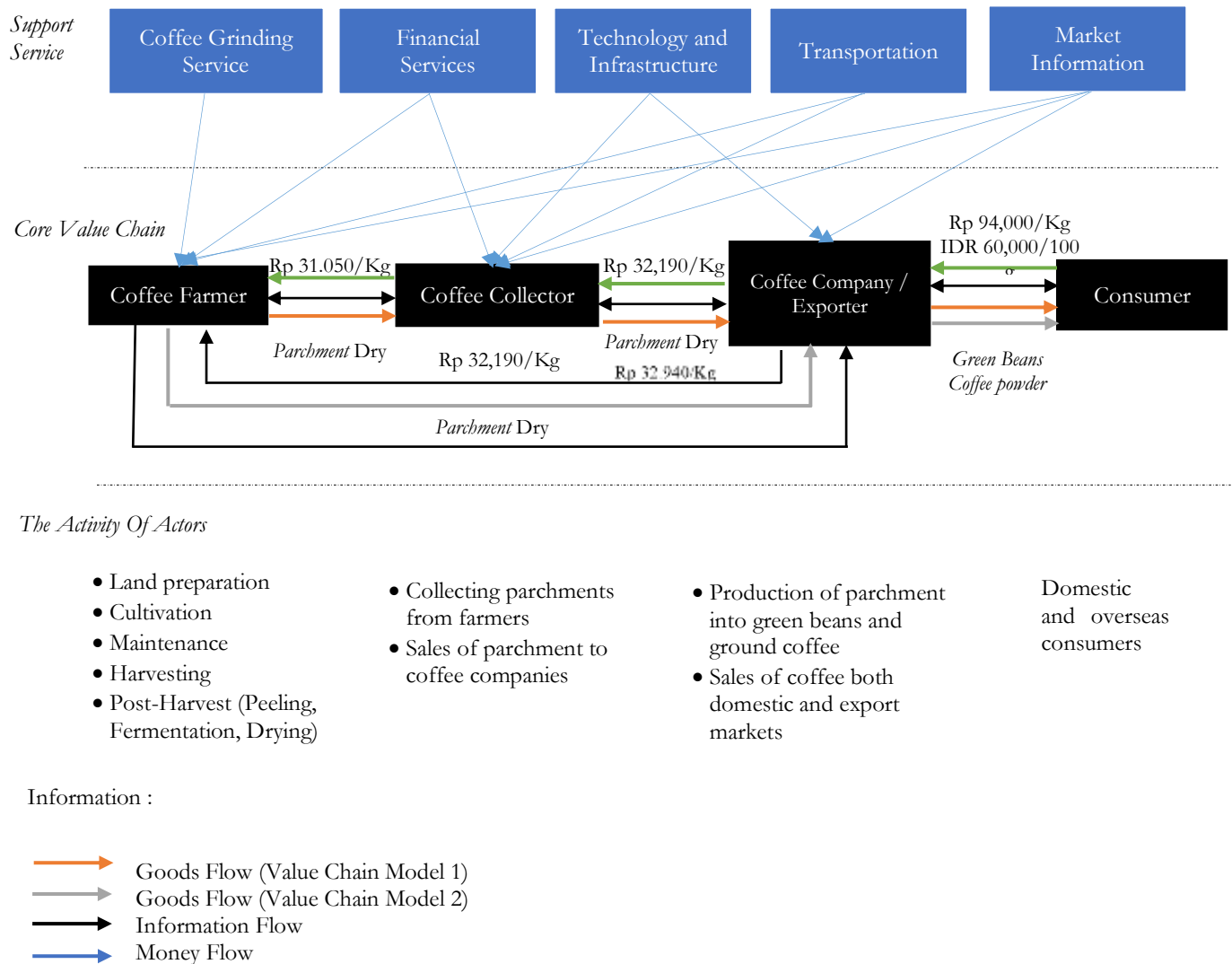


Figure 1. Market Chain and Value Chain Map

The efficiency values of the Arabica coffee value chain actors in Sapan village are as follows:

Table 4. Profit Margin

Value Chain Actors	Marketing Cost (Rp/kg)	Selling Value (Rp/kg)	Efficiency Value
Coffee farmer	-	31.050	-
Coffee collector	350	32.190	0.011
Exporter	3.850	94,000	0.041

Based on the table above, the efficiency of the Arabica coffee supply chain in Sapan village, shows that the efficiency value for coffee

farmers does not exist, for coffee collectors it is 0.011 while for exporters it is 0.041. The efficiency value in the supply chain model II is 0.052 while the model II is 0.041. The efficiency values obtained in models I and II are smaller than 1 so that both supply chain models are efficient. However, the supply chain model II is a more effective supply chain model compared to model 1 according to the Soekartawi method indicator, namely the lowest efficiency value is the most efficient model.

The analysis is carried out on the important process stages in the coffee processing business. The analysis is shown in the following figure :

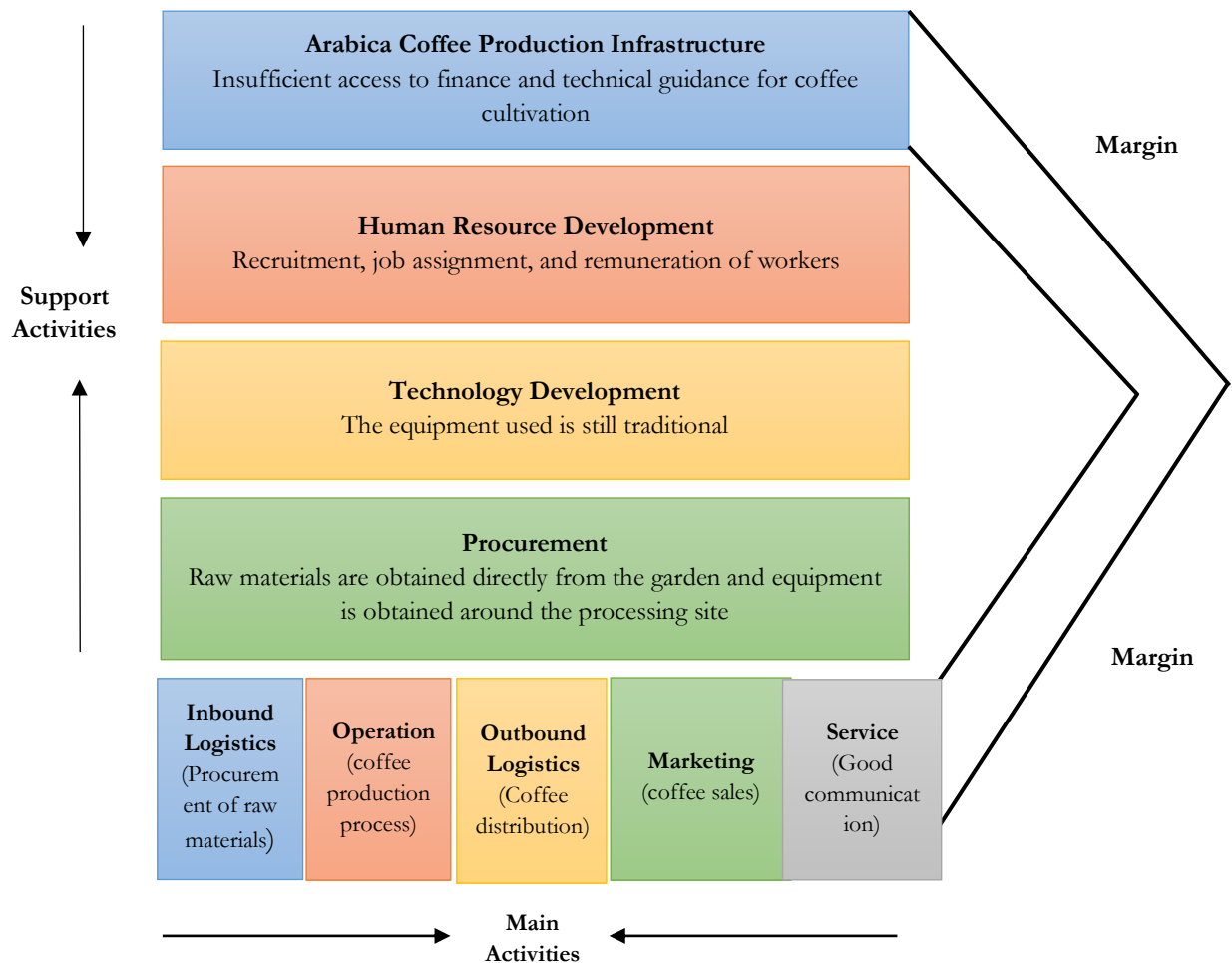


Figure 2. Sapan Village Arabica Coffee Processing Value Chain

Several activities have weaknesses that make coffee productivity from Sapan village low, including incoming logistics activities,

operations, infrastructure, and the equipment used is still simple. Weaknesses in incoming logistics activities are found in the process of

procuring coffee plant seeds to be planted. The seeds selected by farmers are not necessarily of good quality and will have an impact on the quality and productivity when the coffee plants are fruitful. In operating activities, weaknesses are found in the maintenance process. The treatment carried out by farmers is not maximized. The cleaning/weeding of coffee plantations by farmers is not intensive so it causes pests and diseases in coffee plants which causes the quality and productivity not optimal. And fertilization is only done once a year and the only fertilizer used is fertilizer. Another weakness is supporting activities, the application of good coffee cultivation techniques has not been maximized in infrastructure activities caused of the lack of information obtained by farmers about good coffee cultivation techniques and the equipment used is still simple. The weaknesses of the above activities can reduce the productivity of coffee produced by coffee farmers in Sapan village.

The weakness of some activities in the Sapan coffee value chain analysis diagram above causes high productivity of arabica coffee in Sapan. Weak incoming logistics activities (planting and maintenance), infrastructure (cultivating techniques that are not yet good), human resource variables, technology, and the role of the government cause low productivity of coffee plants. The factors that cause low coffee productivity in Sapan village are: implementation of Good Agricultural practices for coffee plants has not been maximized, there is a mindset about the selling price of coffee is still low, and farmers are more dependent on income outside the coffee plantation.

3.5. Discussion

The findings of this study indicate, that there is a considerable opportunity to increase agricultural income through increasing agricultural productivity (process improvement). To increase productivity, there are several things that farmers must do :

1. Agricultural practices with Good Agriculture Practices (GAP)

Land selection, nursery garden, planting, fertilizing, weeding, coffee harvesting, and post-

harvest handling must be implemented in accordance with good agriculture practice.

2. Coffee plantation regeneration

Regeneration of coffee can be done by pruning stems/branches that are no longer productive.

3. Pest and disease control

These coffee pests and diseases must be prevented by routine maintenance and care of coffee plantations and the use of substances that can kill pests.

4. Eliminate the mindset of low coffee prices among farmers

To eliminate this mindset, the government should inform farmers about coffee prices.

5. Increasing added value by quality improvement and supporting downstream industrialization

Improving product quality is another way that can be done to increase added value. Efforts like this should be done by farmers in Sapan village. Downstream industrialization (roasting) is a form of increasing added value functionally in the value chain and is considered one of the most strategic economic goals.

The above strategies can be implemented by farmers if there is a role and support from the government. Counseling on coffee cultivation techniques in accordance with good agriculture practices (GAP) and price transparency from the government is very much needed by farmers in Sapan village.

4.CONCLUSION AND SUGGESTION

1. The value chain formed in this research is the relationship between suppliers (coffee farmers), coffee collectors, and coffee companies/exporters to create value. There are 2 value chain models and both models are efficient but the second model value chain is more efficient and effective with an efficiency value of 0.041 compared to the first model with

an efficiency value of 0.052. The value chain of the second model has a larger margin value with a value of 38% compared to the first model with a value of 33%. Farmers prefer to sell coffee to collectors rather than to exporters, even though the second value chain is more efficient and has higher margins.

2. The problems that cause low coffee productivity in Sapan village are the implementation of Good Agricultural Practice coffee is not maximized. The mindset of selling coffee prices is still low and farmers are more dependent on income from outside the plantation. This is due to the weak variable of human resources (in this case coffee farmers), technology, and the lack of government's role in helping farmers.

3. Strategies to increase coffee productivity in Sapan village are agricultural practices in accordance with Good Agriculture Practices (GAP), regeneration of coffee plantations, controlling pests and diseases, eliminating the mindset of low coffee prices among farmers, increasing added value by quality improvement and supporting downstream industrialization, and improving coffee cultivation techniques by farmers. These strategies can be implemented by farmers if there is a role and support from the government.

References

- RL Miller and ER Meiners. 2000. Intermediate Microeconomic Theory, translated by Haris Munandar. Jakarta : PT. Raja Grafindo Persada
- ME Porter. 2001. Competitive Strategy, Technical Analysis of Industry and Competitors. Jakarta : Erlangga.
- DR Hansen and MM Mowen. 2000. Cost Management, Accounting and Control, 3rd Edition. Australia : South-Western College Publishing.
- ME Porter. (1985). Competitive Advantage (The Free Press. New York.
- Danarti and Najayati. 2004. Cultivation and Post-Harvest Handling. Jakarta: Swadaya Spreader.
- Directorate General of Plantation, Indonesian Plantation Statistics 2015-2017
<http://ditjenbun.pertanian.go.id/tinymcpuk/image/fi/le/statistik/2017/Kopi-2015-2017.pdf>.
 (Accessed 3 August 2018)
- B. Cahyono. 2012. Successful Coffee Gardening. Jakarta : Mina Publisher.
- Sulselprov, Recapitulation of Land Areas and Production of People's Plantations
https://sulselprov.go.id/pages/potensi_area/komoditi-kopi. (Accessed 3 August 2018).