

# FEASIBILITY ANALYSIS AND CAPITAL SOURCES OF ARABICA COFFEE FARMING IN PERBAJI VILLAGE, TIGANDERKET, KARO DISTRICT, NORTH SUMATERA

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## Abstract

*This study aims to analyse the sources of capital and feasibility of Arabica coffee farming in Perbaji Village, Tiganderket District, Karo Regency. The research method used was survey with data collection techniques through interviews using questionnaires. The analysis used included cost analysis, revenue, income, break-even point, and R/C ratio. The results showed that all coffee farmers in Perbaji Village used their own capital (100%). Total production costs averaged Rp 13,693,429 per year, with average revenue of Rp 29,760,000 and net income of Rp 16,066,571 per year. The production break-even point is at 38.52 kg per harvest season, while the price break-even point is IDR 616,319. The R/C value of 2.17 indicates that Arabica coffee farming in this area is feasible.*

## Keywords:

: Farm viability, Arabica coffee, sources of capital, R/C ratio, break-even point

## INTRODUCTION

Agriculture is one of the primary sectors that support the Indonesian economy, because it turns out that the agricultural sector is more resistant to economic crises than other sectors. In addition, the agricultural sector plays a role in meeting the needs of the population, increasing farmers' income, providing industrial raw materials, providing business opportunities and employment opportunities, and supporting national food security. One of the plantation subsectors that plays an important role in Indonesia is the coffee plantation. (Margaretha, 2019).

Coffee is a plantation commodity that plays an important role in the Indonesian economy. This commodity is estimated to be the main source of income for no less than 1.84 million families, most of whom live in rural areas in remote areas. In addition, approximately 1 million families rely on their income from the downstream industry and coffee trade. Coffee is an important export commodity for Indonesia, contributing considerable foreign exchange (Ministry of Agriculture, 2013).

There are two types of coffee developed in Indonesia, namely robusta coffee and arabica coffee, but the type of coffee that is widely developed in Indonesia is the arabica type. Arabica coffee is one of the commodities prioritised for development by the current Indonesian government. Arabica coffee exports from Indonesia are mostly marketed to the specialty market segment (specialty coffee) because of its distinctive flavour quality and favoured by coffee connoisseurs in major consumer countries. In the speciality segment, coffee prices are more expensive and fluctuate less sharply, which certainly has an impact on farmers' income and foreign exchange (Wahyudi, 2008).

The development of coffee in Indonesia experienced a rapid increase in production, in 2007 coffee production reached around 676.5 thousand tonnes and in 2013 coffee production was around 691.16 thousand tonnes. So that coffee production in Indonesia from 2007-2013 has increased by about 2.17% (Central Bureau of Statistics, 2015). The success of coffee agribusiness requires the support of all parties involved in the production process of coffee processing and marketing of coffee commodities. Efforts to increase coffee productivity and quality continue so that the competitiveness of coffee in Indonesia can compete in the world market (Risnandar, 2019).

Of the several regions that are generally the centre of arabica coffee production such as Aceh, South Sulawesi, Bali and Flores, North Sumatra occupies the second position in terms of productivity after Aceh. Arabica coffee production in North Sumatra has increased every year, as well as the land area of both immature plants (TBM), producing plants (TM) and non-producing plants (TTM) every year.

Of the 33 districts/cities in North Sumatra, one of the Arabica coffee producers is Karo Regency. Karo Regency has 17 sub-districts with 17 of these sub-districts are arabica coffee producers, one of which is Tiganderket Sub-district. Agricultural commodities continue to strive to increase their productivity. The majority of the population of Tiganderket District earns a living as farmers and has arabica coffee as their main commodity and other crops as intercrops such as chillies, mustard greens, cabbage, carrots and others.

Tiganderket District has production data of arabica coffee commodities that have increased in the past two years. This is because Arabica coffee in Karo Regency is grown at an altitude of 1,000 metres above sea level. In general, coffee plants grow at an altitude of 500 to 2000 metres above sea level with an average temperature of 21-

24 O C with rainfall of 2000 - 3000 mm, and supported by good soil structure with 3% organic matter content and Ph 5.5 - 6.5. The higher the surface of the coffee plant, the higher its quality and production.

Perbaji village is one of the villages in Tiganderket sub-district, Karo Regency. About 80% of the people in Perbaji village are coffee farmers who use the land around the village. The existence of coffee land conversion in villages around Perbaji village makes researchers want to know the feasibility of coffee farming in this village. Therefore, this study aims to determine the sources of capital and feasibility of coffee farming in Perbaji Village, Tiganderket District, Karo Regency, North Sumatra.

## **METHODS**

This research was conducted in Perbaji Village, Tiganderket Subdistrict, Karo Regency, North Sumatra. The selection of the research location was carried out purposively with the consideration that Karo Regency is the centre of Arabica coffee production in the North Sumatra region. This research was conducted in October 2020 until completion. With the consideration that the sample used is homogeneous. then according to (Arkunto, 1992) if the subject is less than 100 it is better to take all, then if the number of subjects is greater than 100 then it can be taken between 10-15% or 20-30% or even more. then the study took a magnitude of 15%. This research data collection consists of primary data and secondary data. Primary data is obtained by conducting surveys and direct interviews with Arabica coffee farmers assisted by a questionnaire guide which will be given to respondent farmers in Perbaji Village, Tiganderket District, Karo Regency. Secondary data were obtained from the Central Statistics Agency (BPS), Director General of Horticulture, Research Agency and others.

Data Analysis Method Identification of problem one, the analysis method used in this research is descriptive analysis, namely by calculating the percentage of capital sources used by coffee farmers in Perbaji Village, Tiganderket District, Karo Regency. According to (Sugiyono, 2008) the formula for finding the percentage of questionnaire results is as follows:

$$p = f/n \times 100$$

Where: p : Retrieved from  
f : Frequency  
n : Number of Respondents

The total cost of coffee farming is the sum of fixed costs and variable costs, including all costs incurred for coffee farming during one growing season calculated in rupiah units. (Soekartawi, 2002).

$$TC = FC + VC$$

Where: TC = Total Cost  
FC = Fixed Cost  
VC = Variable Cost

Problem identification three, Revenue of coffee farming is the amount of production multiplied by the selling price per unit of production, which is mathematically formulated (Putri, et al, 2017) as follows:

$$TR = Q \times P$$

Where: TR = Total Revenue  
Q = Production Quantity  
P = Product Price

And coffee farming income is the difference between revenue and costs incurred, which can be formulated as follows:

$$PD = TR - TC$$

Where: PD = Farm Income  
TR = Total Revenue  
TC = Total Cost

Problem identification four, to find out the break-even point of coffee can be analysed by BEP analysis with the formula:

$$BEP \text{ unit} = \frac{FC}{P-VC} \qquad BEP \text{ harga} = \frac{FC}{1-VC/P}$$

Where: FC: Fixed Cost  
VC: Variable Cost  
P: Product Price

Identification of problem five, to determine the feasibility of coffee farming in this study can be analysed with the analysis of R / C ratio (Return Cost Ratio) or known as the ratio (Ratio or ratio) between revenue and cost.

$$R/C \text{ Ratio} = TR/TC$$

R/C Ratio = farm feasibility or efficiency

TR = Total Revenue

TC = Total Cost

The decision criteria for the calculation of the R / C ratio are

R/C >1 = Farm profit (feasible) R/C < 1 = Farm loss (not viable) R/C =1 = Break-even farming



## RESULTS AND DISCUSSION

### Sources of Working Capital Funding

From the results of research conducted in Pesa Perbaji, it is known that the source of working capital used by respondent farmers comes from their own capital. This can be seen from the results of interviews with respondents regarding the source of capital used by farmers. In addition, the location of the village which is quite far from urban areas and the absence of facilities in the form of supporting institutions such as banks or cooperatives that can provide loan capital for farmers make Arabica coffee farmers in Perbaji village inevitably have to use their own capital in running their farms. Data on sources of coffee capital in Perbaji Village, Tiganderket District, Karo Regency in 2020 can be seen in Table.1.

**Table. 1. Capital Source of Arabica Coffee Farming in Perbaji Village, Sub-district Tiganderket Karo Regency in 2020**

No	Source of Capital	Number (Person)	Percentage (%)
1	Own capital	26	100
2	Loan Capital	-	0
Total		26	100

Source: primary data processed, 2020

Looking at the results of interviews with respondents shows that the positive impact obtained by farmers if they use their own capital sources is that there is no burden in the form of instalments that must be paid every month and farmers can fully benefit. Respondents in Perbaji Village have given their opinions on the negative impacts of using their own sources of working capital funding in running Arabica coffee farms. According to the respondents, the negative impact of using own working capital funding sources is that the amount of capital (money) is limited according to the funding capabilities of the farmers. Farmers who use their own capital find it difficult to develop or try new things in running their farms due to the limited capital they have.

Arabica coffee farming analysis is a process of calculating the amount of all costs (expenses) required in the process of Arabica coffee production, revenue and income that will be and or obtained from the production that can be generated from the Arabica coffee business.

### Production Costs

Production costs are costs incurred by coffee farmers in coffee farming activities. From the data obtained through interviews with respondent farmers, the costs required in running a coffee farm include equipment costs, fertilizer costs, pesticide costs, labour costs, and transportation costs used. Equipment depreciation costs can be seen in Table. 2.

**Table. 2. Depreciation Cost of Coffee Farming Equipment in Perbaji Village Tiganderket Sub-district, Karo Regency in 2020.**

Description	Equipment Cost		
	Total Cost	Depreciation (IDR)	Average (IDR)
Hoe	4.240.000	2.120.000	81.538
Parang Babat	2.925.000	1.462.500	56.250
Bucket	2.460.000	2.460.000	94.615
Sprayer	4.000.000	1.166.667	44.872
Angkong	2.800.000	800.000	30.769
<b>Total</b>		<b>8.009.167</b>	<b>308.045</b>

Source: primary data processed, 2020

Based on the data obtained from sample farmers, it can be seen that the amount of depreciation costs of agricultural equipment used by sample farmers in running their farms such as Hoes, Machetes, Buckets, Sprayers and Angkong is IDR 8,009,167 with an average value of IDR 308,045. Furthermore, the costs that must be incurred by farmers in carrying out their farming activities are the costs of fertilisers and pesticides to support the success of farming. Data on fertiliser and pesticide costs can be seen in Table 3.

**Table.3. Fertiliser and Pesticide Costs of Coffee Farming in Perbaji Village Tiganderket Sub-district, Karo Regency in 2020**

Description	Biaya Pemupukan dan Pestisida	
	Total Cost (IDR)	Average (IDR)
Compost	44.280.000	1.703.077
Urea	2.400.000	177.778
Npk	12.495.000	480.577
Tsp	4.500.000	173.077
Ponska	2.920.000	112.308
Pestisida	2.645.000	101.731
<b>Total</b>	<b>69.240.000</b>	<b>2.748.547</b>

Source: primary data processed, 2020

Based on the results of interviews with sample farmers conducted in perbaji village, most farmers only use manure (compost) and Urea fertiliser. In addition, only a small proportion of sample farmers sprayed using pesticides due to the lack of capital owned by farmers. From the data obtained, it can be seen that the cost of fertiliser and pesticides incurred by all sample farmers is Rp 69,240,000 with an average of Rp 2,748,547.

In addition to the cost of fertilizers and pesticides, coffee farmers also have to spend costs in the form of labour costs in carrying out their farming activities. Labour costs can be seen in Table.4

Description	Biaya Tenaga Kerja					
	HK (P)	HK (W)	Wages (P)	Wages (W)	Total Cost (IDR)	Average (IDR)
Weeding	117	14	80.000	70.000	10.340.000	397.692
Trimming	117	36	80.000	70.000	11.880.000	456.923
Fertilisation	116	74	80.000	70.000	14.460.000	556.154
Spraying	42	8	80.000	70.000	3.920.000	150.769
Harvest	1.176	1.966	80.000	70.000	231.700.000	8.911.538
<b>Total</b>					<b>272.300.000</b>	<b>2.094.615</b>

Source: primary data processed, 2020

Labour costs obtained from interviews with sample farmers are costs calculated in units of Working Days (HK) in one year. From the table above, it can be seen that there is a difference in wages/HK between male (P) and female (W) labour, namely Rp 80,000/HK for male labour and Rp 70,000/HK for female labour. So, the total labour cost incurred by coffee farmers in Perbaji village is IDR 272,300,000 with an average of IDR 2,094,615 in one year. The cost of seeds is not incurred by sample farmers in Perbaji Village because farmers only obtain coffee seeds or seedlings from coffee beans that have fallen and grown around plants in the same land. In addition, coffee plants in Perbaji Village have an average age of 5 to 10 years, which means that the costs of land cultivation and planting seeds are no longer counted in production in the last year. And finally, the costs incurred by coffee farmers in Perbaji Village in carrying out their farming activities are transport costs. Transport equipment is needed to facilitate farmers' access to bring their products from one place to another. Transportation costs for coffee farming in Perbaji Village can be seen in Table 5.

Description	Transport Costs	
	Jumlah	Total Biaya
Motorbike	20	4.800.000
Goods Rickshaw	7	1.440.000
<b>Total</b>	<b>27</b>	<b>6.240.000</b>
<b>Average</b>		<b>249.231</b>

Source: primary data processed, 2020

Transport tools used by farmers in carrying out farming activities include motorbikes and Becak barang. Farmers incur fuel costs of Rp 10,000 in one harvest. In one year farmers can harvest 24 times, so the total transportation costs incurred by farmers is Rp 6,240,000 with an average cost of Rp 249,231/year. Fixed costs and variable costs can be seen in Table 6.



**Table.6. Fixed and Variable Costs of Arabica Coffee Farming in Perbaji Village, Tiganderket District, Karo Regency in 2020**

Fixed Cost (FC)	Amount (IDR)	Variable Cost (VC)	Amount (IDR)
Equipment Cost	8.009.167	Fertiliser	66.595.000
		Pesticides	2.645.000
		Labour	272.300.000
		Transport	6.480.000
<b>Total</b>	<b>8.009.167</b>		<b>348.020.000</b>
<b>Total Production Cost</b>	<b>356.029.167</b>		
<b>Average</b>	<b>13.693.429</b>		

Source: primary data processed, 2020

From the data obtained, it can be seen that the fixed cost of coffee farming in Perbaji village is IDR 8,009,167 and the variable cost is IDR 248,020,000. Then the total production costs incurred by Arabica coffee farmers in Perbaji Village, Tiganderket District, Karo Regency is IDR 356,029,167 with an average of IDR 13,693,429 / year.

#### Coffee Farm Revenue

Revenue is income that has not been reduced by the total costs in farming that farmers spend in producing coffee. This revenue is the selling price multiplied by the total production. Data on coffee farm receipts can be seen in Table.7.

**Table.7. Revenue of Arabica Coffee Farming in Perbaji Village, Tiganderket District, Karo Regency in 2020**

	Production (Kg)	Price (IDR)	Reception (IDR)
<b>Total</b>	48.360	16.000	<b>773.760.000</b>
<b>Rata-rata</b>	1.860	16.000	<b>29.760.000</b>

Source: primary data processed, 2020

Based on the data obtained in the research conducted in Perbaji Village, Tiganderket District, Karo Regency, it is known that the average production per year is 1,860 kg of coffee produced in the form of dry grain at a price of IDR 16,000 so that the total average revenue is IDR 29,760,000 / year.

The farmer with the largest revenue is sample number 22 named Mrs Nur Laila Tarigan with a land area of 2 hectares, production of 4,800 Kg of dry grain per year and revenue of Rp 76,800,000. While farmers with the smallest revenue are farmers with sample number 21 named Mr Harmonis Ginting with annual production of 720 Kg of dry grain with a revenue of Rp 11,520,000.

#### Revenue

Income is the amount of revenue earned by sample farmers from the sale of coffee which has been reduced by the production costs incurred by farmers. Arabica coffee farming income data in Perbaji Village can be seen in Table.8.

**Table.8. Income of Arabica Coffee Farming in Perbaji Village, Tiganderket District, Karo Regency in 2020**

	Reception	Production Costs	Revenue
<b>Total</b>	773.760.000	356.029.167	<b>417.730.833</b>
<b>Average</b>	29.760.000	13.693.429	<b>16.066.571</b>

Source: primary data processed, 2020

Based on the data obtained, it can be seen that the average income of sample farmers is Rp 16,066,571 / year Farmers per year with the highest income is sample farmer number 22 named Mrs Nur Laila Tarigandengan income level of Rp 39,940,000 / year.

#### Break Even Point

Break Even Point is a condition where the level of capital spent and the sales proceeds obtained by farmers are in the same position. In other words, the break-even point occurs when total revenue is equal to total production costs. From the data obtained, it can be seen that the BEP/unit value of existing farms in Perbaji Village is 38.52 or it can be said that the farm run can break even if farmers can produce 38.53 Kg in one harvest season. Furthermore,

the BEP/price of farming in Perbaji Village is 616.319, which means that farming can break even if farmers can generate income of Rp 616,319 in one harvest season. Feasibility of Arabica Coffee Farming By analysing the feasibility of farming, it can be seen whether the coffee farming activities carried out are feasible or not. R / C Ratio is a division made to determine whether the farm is feasible or not. If the R / C ratio is smaller than one then the farm is said to be not feasible, if the R / C ratio is equal to one then the farm is said to break even and if the R / C ratio is greater than one then the farm is said to be feasible. Based on the results of the study, it was found that the R / C was 2.17, which means that every Rp. 1.00 cost expenditure, Arabica coffee farmers will receive Rp. 2.17 so that farmers get a profit of Rp. 1.17, which means that it can be said that coffee farming by coffee farmers in Perbaji village is feasible to cultivate. The greater the R / C value will provide greater profits to farmers in running their farms.

## **CONCLUSION**

Based on the results of the study, several conclusions can be drawn, namely; The source of capital used by farmers in Perbaji Village comes from their own capital with a percentage of 100% where farmers consider the use of their own capital in farming more profitable because farmers feel more free in running their farms. The average total production cost used by Arabica coffee farmers in Perbaji village in running their farms is IDR 13,693,429 with an average Fixed Cost (FC) of IDR 308,405 and the average Variable Cost (VC) is IDR 13,385,385. The total revenue of Arabica coffee farmers in Perbaji Village on average is Rp 29,760,000/year. While the total income earned by coffee farmers on average is IDR 16,066,571 / year. The Breakeven Point (BEP) / unit of the coffee farm run by coffee farmers in Perbaji village is 38.52 or it can be said that the farm run can break even if farmers can produce 38.53 Kg in one harvest season. Meanwhile, the Breakeven Point (BEP) / price is 616,319, which means that farmers will break even if farmers earn an income of Rp. 616,319. Farming in Perbaji Village can be said to be feasible to cultivate because the R / C ratio value is greater than 1, namely 2.17, which means that every farmer spends capital of Rp 1.00, the farmer will get a profit of Rp 1.17. The higher the R/C value, the greater the profit obtained by farmers.

## **Advice**

From the aspect of technical feasibility and management, it still needs development from both the farmers and the government so that the production of coffee farms in Perbaji Village, Tiganderket District, Karo Regency is more feasible and efficient.

## **REFERENCES**

- Central Bureau of Statistics, 2018. Area and Production of PR Crop Arabica Coffee by City District 2017.
- Deviyanti, Margaretha Lifari, 2019. Development Strategy for Arabica Coffee Processing in Segamit Village, Semendo Darat Ulu District, Muara Enim Regency. Bachelor Thesis. Agribusiness Study Programme, Faculty of Agriculture, Sriwijaya University.
- Kopipedia, 2019. History And Types Of Coffee World And Indonesia. Accessed online via <http://www.sasamecoffee.com/kopipedia/history-and-types-of-coffee/>. Accessed on 9 June 2020 at 08.00 WIB. Medan.
- Masse, Abdul and Afandi, 2017. Analysis of Income and Feasibility of Coconut Farming in Kasoloang Village, Bambaia District, North Mamuju Regency, North Sulawesi Province. Agribusiness Study Programme, Faculty of Agriculture, Tadulako University. e-J Agrotekbis February 2017, Vol. 5, No. 5.
- Megayani, Dana, 2019. Feasibility Study of Coffee Farming and Characteristics of Coffee Farming Households in South Ogan Komering Ulu Regency. Central Bureau of Statistics of South Sumatra Province. Journal of Agribusiness-Minded Scientific Society Thought, January 2019, Vol. 5, No. 1.
- Risnandar, Cecep, 2019. History of Coffee. Accessed online via <http://jurnalbumi.com/sejarah-kopi/>. Diakses on 8 June 2020. at 10.00 WIB. Medan.
- Soekartawi, 1995. Farming Science. Brawijaya University Press
- Suiyono, 2002. Agricultural Marketing. UMM-Press. Malang
- Wahyudi, 2008. Analysis of Coffee Marketing in Humbang Hasundutan Regency, North Sumatra Province. North Sumatra Agribusiness Journal.
- Wikipedia, 2020. Coffee Arabia. Accessed online via [http://id.m.wikipedia.org/wiki/kopi\\_arabika](http://id.m.wikipedia.org/wiki/kopi_arabika) .Accessed on 8 June 2020 at 13.00 WIB. Medan.
- Yasha, Ade Fitria, Iskandarini, Emalisa. Analysis of Working Capital Needs of Rice Paddy Farmers. Alumni of Agribusiness Study Programme, Faculty of Agriculture, University of North Sumatra.
- Zakaria Akhmad, 2019. Financial Feasibility Analysis of Arabica Coffee Farming in Suntenjaya Village, Lembang District, West Bandung Regency. Faculty of Agriculture, Ghifari University.

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