

Analysis Of Financial Feasibility Community Rubber Plantations (*Hevea Brasiliensis*) In District Malinau Regency North Kalimantan

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ABSTRACT

People's rubber plantations make a big contribution to people's income. Feasibility studies are needed before starting a rubber plantation business, because every business has an uncertainty factor that needs to be considered in its operations. This study aims to determine the financial feasibility of smallholder rubber plantations in North Malinau District, Malinau Regency. The method of determining the sample in this study is purposive sampling, which is a deliberate selection with the criteria that the authors have determined, namely: Farmers who cultivate rubber plantation commodities for more than 5 years and the area of smallholder rubber plantations is 1 ha. This research uses quantitative descriptive research, namely analyzing data by describing or describing the data as they are. This study uses a financial feasibility analysis method consisting of NPV, Net B/C, IRR, PP, and BEP. The results of the financial feasibility analysis of the smallholder rubber business were declared feasible, as evidenced by a positive NPV at a discount factor of 6%, an IRR greater than the prevailing interest rate (6%), and a Net B/C Ratio value greater than one. The payback period shows that this business will return its investment within 12 years 2 months 4 days. This business will experience a major opportunity when the volume of rubber production reaches 1,987 kg per production, or with a selling price of Rp 2,245/kg.

Keywords:

Keywords:
Financial
Feasibility,
Smallholder
Plantation, Rubber
Plants

INTRODUCTION

Rubber is an export commodity that is able to contribute to efforts to increase Indonesia's foreign exchange. A number of locations in Indonesia have land conditions suitable for rubber plantations, most of which are on the islands of Sumatra and Kalimantan. This rubber plantation plays an important role in development programs, especially the development of the agricultural sector, because this subsector is a place for farmers to depend on their lives, as a branch of business that functions to

create jobs, as a source of income and non-oil and gas foreign exchange that is highly expected, and is also directly related to efforts to conserve natural resources.[1]

There are three types of rubber plantations in Indonesia, namely People's Plantations (PR), State Large Plantations (PBN) and Large Private Plantations (PBS). Of the three types of plantations, People's Plantations (PR) dominate the land area which reaches 2.84 million hectares or around 85% of rubber plantation land. With such a large area of

rubber plantations managed by the people, the relationship between the distribution of labor and as a source of income for the people is expected to be improved with integrated management[2]

North Malinau Subdistrict is one of the sub-districts in Malinau Regency that has the potential for extensive land resources for plantation development, one of which is rubber plantations. In running a rubber plantation business, there are several problems related to rubber, especially in terms of marketing. The average rubber plantation planted over a period of 5 years ago should be worth harvesting but there is no official reservoir to accommodate the rubber sap harvest. Some information from the community is already there that is bringing out the area, to Samarinda, but it has also not been structured and has not been able or able to accommodate rubber products. There is also growing information that there have been attempts by private parties to apply for or accommodate the rubber products, but so far they are still in progress.

According to BPS data from Malinau Regency, the land area of rubber commodities in 2014 - 2018 experienced an increase in land area of 184 ha with production increasing in 2014 by 2 tons, in 2015 by 10 tons, in 2016 by 8 tons, in 2017 by 8 tons and increasing significantly in 2018 with production yields of 1800 tons. [3]

Table 1. Data on land area and rubber production in North Malinau District, Malinau Regency

Year	Area (Ha)	Rubber Production (Tons)
2014	304	2
2015	488	10
2016	488	8

2017	488	8
2018	488	180

Financial analysis of agricultural enterprises needs to be carried out to make projections about the budget that will intimidate future revenues and expenses each year, including costs related to production and credit payments that must be incurred, in order to determine how much income the farmer's household receives in return for labor services, management skills, and their capital.

In North Malinau District, in general, farmers in carrying out their plantation business have never conducted a feasibility analysis of plantation business, which is done by farmers only carrying out farming activities by looking at the trend of commodities that are being favored or widely managed in the surrounding area. Based on this background, the author is interested in knowing the analysis of the Financial Feasibility of Rubber Plantations (*Hevea brasiliensis*). the purpose of the study was to **analyze** the Financial Feasibility of Rubber Plantations (*Hevea brasiliensis*) of the People in North Malinau District, Malinau Regency.

METHOD

The determination of the sample used in this study is a purposive sampling method which is a sample determination technique with certain considerations, namely farmers who try to farm rubber plantations for more than 5 years and the area of community rubber plantations is at least 1 ha. From the criteria mentioned, there were 5 respondents/informants.

The data used in this study include primary data and secondary data. Primary data is data collection carried out directly at the research location, and secondary data is data obtained or collected by other parties, including: BPS, books, the internet, and previous research.

In this study, data analysis was used as follows:

1. Revenue Analysis

$$Pd = TR - TC$$

$$TR = Q \times P$$

$$TC = FC + VC$$

Where:

Pd = Revenue (Rp)

TR = Total Receipts (Rp)

TC = Total Expenses (Rp)

Q = Production (Kg)

P = Accepted Price (Rp/Kg)

FC = Fixed Cost (Rp)

VC = Variable Costs (Rp)

2. Analysis of the Financial Key of People's Rubber Plantations

Financial feasibility analysis is used to answer the purpose of the study, namely analyzing the level of financial feasibility of community rubber plantations in North Malinau District, to determine whether community rubber plantations are feasible or unfit.

A. Net Present Value (NPV)

Net Present Value is the difference between the present value of the benefit (profit) and the current value of the cost, the amount of which can be calculated with the following formula:

Information:

$$NPV = \sum_{i=1}^n \frac{NB_i}{(1 + I)^n}$$

NB_i = Benefit – cost

I = Discount factor (%)

n = Year (time)

Criterion:

NPV > 0, then profitable and feasible plantation farming

NPV = 0, then the plantation farming business does not gain and does not lose

NPV < 0, then the plantation farming business is at a loss and it is better not to implement it.

B. Net Benefit Cost Ratio (Net B/C)

Net B/C analysis aims to find out some of the magnitudes of profits compared to expenses over their economic lifespan. Net B/C i.e. dividing the amount of present value by the positive net benefit cash flow by the sum of the present value of the negative net cash benefit flow in the early years of the project.

$$Net \frac{B}{C} = \frac{\sum_{i=1}^n NB_i(+)}{\sum_{i=1}^n NB_i(-)}$$

Information:

NB_i (+) = Net benefit positif

NB_i (-) = Net benefit negatif

The net B/C Ratio criteria are:

If Net B/C > 1, then the business is worth implementing

If Net B/C = 1, then the effort is at breakeven or worthy of Being Passed on

If Net B/C < 1, then the effort is not worth implementing

C. Internal Rate of Return (IRR)

The Internal Rate of Return (IRR) of an investment value is an interest rate value that shows that the net present value (NPV) is equal to the sum of all investment costs of plantation farming. The formulation for the IRR calculation plantation can be formulated as follows:

$$IRR = i_1 + \frac{NPV_1}{(NPV_1 - NPV_2)} (i_2 - i_1)$$

Information:

i_1 = Discount rate that results in a positive NPV

i_2 = Discount rate that results in negative NPV

NPV1 = Positive NPV

NPV2 = NPV Negative

Criterion:

IRR > interest rate, then the business is worth running

IRR = interest rate, then the effort is at the breakeven point

IRR < interest rate, then the business is not worth running

D. Payback Period (PP)

Payback Period is an investment describing the length of time it takes for the funds embedded in an investment to be fully recovered. The payback period can be calculated with the formula:

$$PP = T_{p-1} + \frac{\sum_{i=1}^n I_i - \sum_{i=1}^n B_{icp-1}}{B_p}$$

Information:

PP = Payback Period

TP-1 = Years Before There Is PP

I_i = Investment Amount Has Been Discounted

Bicp-1=Amount of Benefit That Has Been Discounted Before PP
 Bp = Amount of Benefit On PP

E. Break Event Point (BEP)

The project's Break Event Point (BEP) is the number of units that must be sold or the minimum value that must be obtained from a business idea in order to return all investments spent. The formulation of determining the break-even point by equation technique can be done in two ways, namely as follows:

$$BEP \text{ Produksi (unit)} = \frac{FC}{\text{harga jual perunit} - VC \text{ perunit}}$$

$$BEP \text{ Harga (Rp)} = \frac{\text{Total Cost}}{\text{total produksi}}$$

Information:

FC = Fixed Cost (Rp)

VC = Variable Costs (Rp)

RESULT AND DISCUSSION

To answer the formulation of the problem in this study, the analytical tools used are financial feasibility analysis tools :

1. Financial Feasibility Aspects

- Inflow

The revenue received by the farmers comes from the sale of rubber products in the 5th to the 15th year. In the harvest season, farmers produce rubber with amounts varying between 2000 kg to 4000 kg. Receipts obtained from the current prevailing price. The selling price of rubber is IDR 7,000 per kg, the details of rubber farming receipts can be seen in table 2.

Table 2. Revenue Component in Rubber Farming in North Malinau District in 2020

Year	Sum	Price (Rp)	Total Receipt (Rp)
1	-	-	-
2	-	-	-
3	-	-	-
4	-	-	-
5	2660	7.000	18.620.000
6	3442	7.000	24.094.000
7	3437	7.000	24.057.600
8	3385	7.000	23.695.000
9	3548	7.000	24.833.200
10	3734	7.000	26.138.000
11	3742	7.000	26.195.400
12	3860	7.000	27.020.000
13	3678	7.000	25.746.000
14	3670	7.000	25.687.200
15	3687	7.000	25.806.200
			271.892.600

Based on table 9, it can be seen that the total receipts in the 5th year amounted to Rp. 18,620,000, the 6th year was Rp. 24,094,000, the 7th year was Rp. 24,057,600, the 8th year was Rp. 23,695,000, the 9th year was Rp. 24,833,200, the 10th year was Rp. 26,138,000, the 11th year was Rp. 26,195,400, the 12th year was Rp. 27,020,000, the 13th year was Rp. 25,746,000, the 14th year was Rp. 25,687,200, and the 15th year of Rp 25,806,200. The highest revenue achieved by rubber farmers was in the 12th year of Rp. 27,020,000 with a total production of 3860, where the 12th year was the peak of rubber production.

- *Outflow*

Expenditure flow is the flow of cash issued on rubber cultivation activities. The flow of expenses is in the form of costs incurred when starting a business or during the course of a business. The

outflow component consists of investment costs and operational costs

Table 3. Details of Investment Costs in Rubber Farming in North Malinau District, Malinau Regency in 2020

Komponen	Satuan	Jumlah	Harga (Rp)	Jumlah (Rp)
Cangkul	Unit	2	47.000	94.000
Parang	Unit	3	88.000	264.000
Tangki Semprot	Unit	1	110.000	110.000
Senso	Unit	1	5.000.000	5.000.000
Dodos Tanah	Unit	1	60.000	60.000
Mangkok Sadap	Unit	541	3.000	1.623.000
Ring Kawat	Unit	541	2.000	1.082.000
Talang Sadap	Unit	541	2.000	1.082.000
Ember	Unit	2	15.000	30.000
Batu Gosok Sadap	Unit	1	25.000	25.000
Pisau Sadap	Unit	2	50.000	100.000
Total				9.470.000

Ket: Data Primer (2020)

Investment costs are costs incurred at the beginning of the project year or the beginning of the year and at a certain moment to obtain benefits several years later. These costs are incurred to meet the needs of the facilities and infrastructure needed to run a rubber cultivation business.

In rubber cultivation activities variable labor is labor that carries out activities that have mutual influence on output. In general, farmers use family labor in rubber cultivation. The peasants only need labor at a certain time. In the first year there are labor cost expenditures that are used to carry out land processing, making planting pits, and planting. At the time of starting to produce, if the yield is small then the amount of labor will decrease, even farmers do not use outside labor, families because farmers can carry out harvesting activities on their own. In this study, family labor costs were included

in the calculation as calculated costs. Details of labor costs can be seen on the following el tab:

Table 4. Details of Labor Costs in Rubber Cultivation on a land area of 1 Ha in North Malinau District

Kegiatan	HOK	Upah (Rp)	Total Biaya (Rp)	
				Persentase (%)
Pengolahan Tanah	14,4	100.000	1.435.000	23,91%
Pembuatan Lubang Tanam	18,4	100.000	1.837.500	30,61%
Penanaman	14,7	100.000	1.470.000	24,49%
Pemeliharaan	4,6	100.000	455.000	7,58%
Pemanenan	8,1	100.000	805.000	13,41%
Total	60,0		6.002.500	100%

Ket: Data Primer (2020)

2. Financial Feasibility Analysis

Financial analysis is used to compare the amount of costs incurred with the receipt of a production, whether the production process is worth working on and can provide profits. The assumption used is the productive life of rubber plants, namely the fifth year to the fifteenth year. Rubber plants start production at the age of 5 years, the selling price of rubber production is IDR 7,000.00 / kg and bank BRI's interest rate is 17.50%.

In analyzing the financial feasibility of rubber cultivation in North Malinau District, investment criteria are used in the form of: Net present value (NPV), net benefitcost ratio (Net B/C), internal rate of return (IRR), payback period (PP) and break event point (BEP). The results of the financial feasibility analysis of rubber cultivation can be seen in the following table 5

Table 5. Financial Feasibility Analysis of Rubber Cultivation in North Malinau District, Malinau Regency

Criterion	Value	Indicator Kelayakan	Decision
NPV	29.912.814	> 0	Proper
NET B/C	(9,82)	> 1	Proper
IRR	29,69%	> 17,50%	Proper
APP	2,55	< 9	Proper
BEP PRICE	1.052		
BEP UNIT	284		

Ket: Data Primer (2020)

a. Net Present Value (NPV)

NPV, which is the current net value of a project, is the present value of the difference between benefits and total costs at a certain discout rate of 17.50%. Net Present Value (NPV) which shows that excess benefits (benefits) are slammed with total costs (total costs). It can be seen by the formula:

$$\begin{aligned}
 \text{NPV} &= \text{PV Benefit (+)} - \text{PV Benefit (-)} \\
 &= 51.287.527 - 21.374.713 \\
 &= \text{IDR } 29,912,814
 \end{aligned}$$

Based on the calculation results, the NPV value of rubber farming is RP 2,981,120 at a discount rate of 17.50%, indicating that rubber cultivation activities in Malinau District are feasible to be carried out because they produce a positive NPV value or NPV value > 0.

The results of the NPV analysis showed that the difference between the current value of the receipts received and the current value of the costs incurred for the rubber cultivation business was positively valued at Rp 29,912,814.

According to Gray et al in Fahmi Idham (2005) Net Present Value (NPV) or net present value of a project is the present value of the value of the difference between receipts and costs at a certain discount rate. A project is said to be feasible when the $NPV > 0$. Based on this, from the analysis of investment criteria within a period of 15 years showing the NPV analysis, rubber cultivation farming produces a value of Rp. 29,912,814 with an interest rate set at 17.50% per year. This indicates that the value of a positive NPV or $NPV > 0$ so that the rubber farming business is feasible to run or develop.

b. Net Benefit Cost Ratio (Net B/C)

Net Benefit Cost Ratio (Net B/C) is a number between the number of positive present values and negative present values. The calculation of net benefit cost ratio (Net B/C) Formula dapat is seen with the formula: [4]

$$\begin{aligned} \text{Net B/C Ratio} &= \frac{\text{PV Reception}}{\text{PV Spending}} \\ &= \frac{236.522.339}{24.076.913} \\ &= 9,82 \end{aligned}$$

Based on the calculation results of the Net B / C Ratio of 9.82 which shows the Net B / C Ratio > 1 , it is declared feasible. This shows that any additional cost of 1.00 will result in a benefit of Rp 9.82 on rubber cultivation activities in North Malinau District. Net B/C Ratio generated is more than 1 (Net B/C Ratio = $9.82 > 1$). Based on the feasibility indicators of the Net B/C Ratio criteria, it can be concluded that rubber cultivation activities are feasible to carry out.

According to Keown *et al.* (2008) Net Benefit cost (Net B/C) Profit/cost ratio or profit index is the ratio of the present value of future net cash flows to initial expenses. Net B/C is a comparison number between the number of positive present values and the number of negative present values, from the calculation results of Net B/C worth 9.82 shows that the Net B/C value is greater than one, so the business is feasible to run or develop.

c. Internal Rate Of return (IRR)

According to Sasongko (2010) the internal rate of return (IRR) is an interest rate that shows the net present value (NPV) equal to all proyak investments.

Based on the results of the IRR calculation, the interest rate of 17.50% for rubber cultivation businesses is 29.69%, which means that the value of the IRR is greater than the applicable interest rate. This shows that the rubber cultivation business in North Malinau District is profitable and worthy of development.

According to Keown *et al.* (2008) internal rate of return (IRR) or internal rate of return. The internal take rate is a discount rate that equals the present value of the project's future net cash flow to the project's initial expenditure. In the IRR analysis of rubber cultivation farming business yielded 29.69%, this value is greater than the set interest rate, this means that the level of management's ability to take the capital used is at an interest rate of 29.69% then the business is financially feasible to develop. [5]

d. Payback Period (PP) Analysis

This analysis is used to determine the period of return on investment in a rubber cultivation business. If the return on investment time is shorter

than the economic life of the rubber cultivation business, then the business is feasible to run.

The payback period can be calculated by the formula:

$$\begin{aligned}
 PP &= I_{t-1} \times \frac{\sum_{t=1}^n I_t - \sum_{t=1}^n I_{t-1}}{I_t} \\
 &= (5 + (6-5)) * \frac{-8.672.392}{(- 8.672.392) + 12.206.130} \\
 &= 2,55
 \end{aligned}$$

Based on the calculation results, the analysis value of the Payback Period is 2.55. This shows that the initial investment will be returned within a period of 2 years 5 months and 5 days, so that the return period of investment capital is shorter than the economic life of the project for 15 years.

According to Mulyadi (1997) *Payback Period* (PP) or the period of return on investment after getting the present value of net profit can be determined in the year that the total investment cost can be covered by profit. The faster the rate of return on effort, the better. [6]

e. Analisis Break Event Point (BEP)

Break event point (BEP) analysis is a condition that in relation to the product, this business does not make a profit and does not experience losses or the level of business profit is equal to zero. Bep is determined based on the amount of sales receipts equal to the amount of costs incurred. The BEP calculation is reviewed based on the selling price and production volume, which is as follows:

	FC		
BEP Unit	= $\frac{\text{FC}}{\text{Harga} - \text{VC}}$	BEP Harga	= $\frac{\text{Total Cost}}{\text{Total Produksi}}$
	= $\frac{1.834.948}{7.000 - 533}$		= $\frac{3.715.448}{3.531}$
	= $\frac{1.834.948}{6.467}$		= 1.052
			= 284 Kg

The Break Event Point (BEP) analysis of rubber cultivation businesses meets the feasibility criteria. Thus, referring to the table of financial feasibility criteria, the rubber cultivation business in North Malinau District was declared feasible to run.

CONCLUSION

Based on the results of the financial analysis of the community rubber plantation cultivation business, it is proven by the positive NPV nilan of 29,912,814 at a factor discount of 17.50%, an IRR of 29.69% greater than the prevailing interest rate of (17.50%), and a Net B/C Ratio of 9.82 greater than one. His payback period indicates that this usha will return his investment within 2 years 5 months 5 days. This business will restore the basic opportunity when rubber production reaches 284 kg per production, or with a selling price of Rp. 1,052 per kg.

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