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Feasibility Analysis of Rubber and Oil Palm Farming in Sekernan District, Muaro Jambi Regency

Nurlina[1], Ira Wahyuni[2], Yusma Damayanti[2]

1) Student of the Agribusiness Study Program, Faculty of Agriculture, University of Jambi, Jambi-Indonesia
2) Lecturer of the Agribusiness Department, Faculty of Agriculture, University of Jambi, Jambi-Indonesia

ORCIDs:
Nurlina : http://orcid.org/0009-0004-6380-9410
Ira Wahyuni : http://orcid.org/0000-0003-2264-2381
Yusma Damayanti : http://orcid.org/0009-0001-9834-1975
*Corresponding author : nurlinasinar3@gmail.com

ABSTRACT

This research aims to (1) Describe the general condition of rubber and oil palm farming in Sekernan District, (2) Analyze the income generated from these farming activities, and (3) Evaluate the feasibility of rubber and oil palm farming in Sekernan District, Muaro Jambi Regency. The research location was chosen purposively in Bukit Baling and Suak Putat villages. A total of 68 farmers were selected using simple random sampling. The data collected include primary and secondary data, analyzed using descriptive analysis, farm income analysis, Revenue-Cost Ratio (R/C Ratio), and Capital Productivity (π/C Ratio). The results showed that: (1) Oil palm farming had higher land area, input use, and production compared to rubber farming. (2) Farmers' income from oil palm was higher than from rubber farming, although both types of farming were still profitable. (3) Both rubber and oil palm farming were feasible based on R/C Ratio > 1 and π/C values above the current bank interest rate. Thus, farming activities are more profitable than saving in the bank.

Keywords: Farm Feasibility, Farming Income, Rubber, Oil Palm

INTRODUCTION

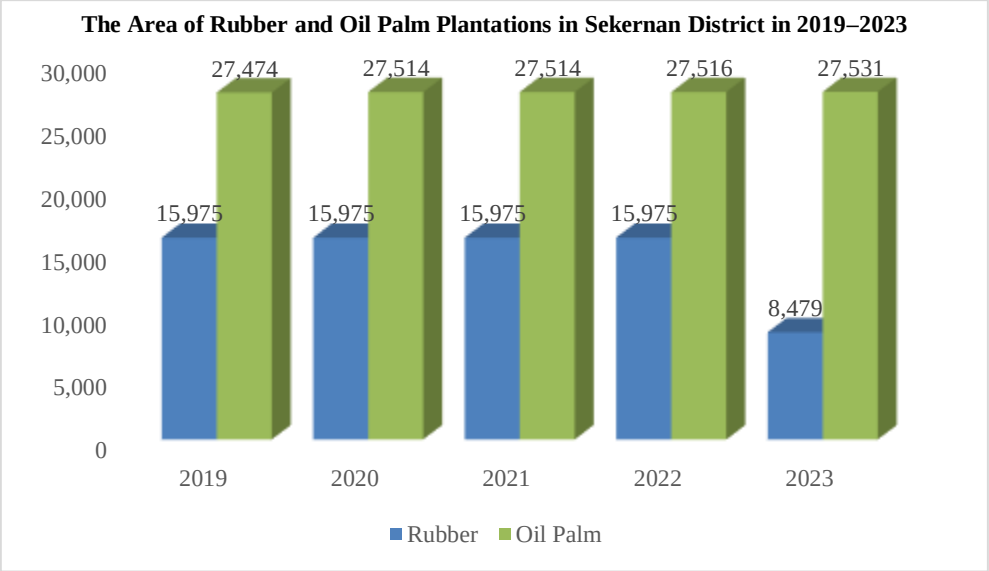
The plantation sector plays a vital role in the local economy, especially rubber and oil palm which are the main income sources in Sekernan District, Muaro Jambi Regency. These two commodities are widely cultivated but their productivity remains below the provincial and national averages, affecting farmer income and farm feasibility.

Table 1. Area, Production, and Productivity of Smallholder Rubber and Oil Palm by Sub-District in Muaro Jambi Regency in 2023

Sub-District	Rubber			Oil Palm		
	Area (ha)	Production (tons)	Productivity (tons/ha)	Area (ha)	Production (tons)	Productivity (tons/ha)
Mestong	14,675	10,535	0.72	3,651	7,051	1.93
Sungai Bahar	150	193	1.28	26,443	35,003	1.32
Bahar Selatan	60	53	0.88	9,021	7,590	0.84
Bahar Utara	20	18	0.90	8,014	6,000	0.75
Kumpeh Ulu	93	64	0.69	17,364	45,351	2.61
Sungai Gelam	5,134	3,902	0.76	10,585	19,724	1.86
Kumpeh	644	329	0.51	15,077	28,915	1.92
Maro Sebo	1,575	888	0.56	9,836	22,861	2.32
Taman Rajo	1,680	1,074	0.64	1,257	1,560	1.24
Jambi Luar Kota	5,776	2,588	0.45	10,718	18,470	1.72
Sekernan	8,479	4,872	0.57	27,531	60,050	2.18
Total	38,286	24,516	7.96	139,497	253,175	18.69

Source: Muaro Jambi Regency Plantation Office, 2024

In 2023, Sekernan District recorded 8,479 ha of rubber plantations and 27,531 ha of oil palm plantations. However, rubber productivity was only 0.57 tons/ha, below the provincial average of 0.72 tons/ha and the national average of 1.05 tons/ha. Similarly, oil palm productivity was 2.18 tons/ha, still lower than the national average of 3.04 tons/ha.



Source: Muaro Jambi Regency Plantation Office, 2024

The rubber plantation area in Sekernan District declined significantly from 15,975 hectares in 2019 to 8,479 hectares in 2023, a 47% decrease. This was mainly due to aging, unproductive trees and farmers shifting to oil palm, which offers higher economic value and market stability. Meanwhile, oil palm plantations showed steady growth, increasing from 2020 to 2023, reaching 27,531 hectares in 2023. Moreover, price fluctuations further affect farmer income.

Therefore, it is important to analyze the economic viability of these farming activities.

The objectives of this study are: (1) to describe the general overview of rubber and oil palm farming in Sekernan District; (2) to analyze the income from rubber and oil palm farming; and (3) to evaluate the feasibility of these farming activities based on R/C Ratio and π/C Ratio.

RESEARCH METHOD

This research was conducted in Sekernan District, Muaro Jambi Regency, which consists of sixteen villages. The selection of Bukit Baling Village and Suak Putat Village as research locations was carried out purposively, considering that oil palm is the main commodity with an expanding plantation area, while rubber plantations have been decreasing in area every year. In addition, both commodities experience annual price fluctuations (Sugiyono, 2017).

The total population in the research area consisted of 4,343 farmers. The number of samples was determined using the Slovin formula with a 12% margin of error (Sugiyono, 2017). Furthermore, the number of samples in each village was calculated proportionally based on the total population in each village (Nazir, 2014). In total, 68 respondents were selected, consisting of 38 rubber farmers and 30 oil palm farmers who met the criteria of having productive plantations (TM). The sampling process was conducted using the Simple Random Sampling technique, where every individual in the population had an equal chance of being selected (Sugiyono, 2017).

The data in this study consisted of primary and secondary data. Primary data was obtained through direct interviews with farmers using structured questionnaires. Meanwhile, secondary data was collected from related institutions, namely the Agricultural Extension Agency of Sekernan District, the Muaro Jambi Plantation Office, and the Central Statistics Agency (BPS) (Sugiyono, 2017).

The data analysis method used in this research is descriptive analysis. This method aims to provide a clear description of the farming conditions of rubber and oil palm in the research area. Additionally, this analysis includes

calculations of production costs, revenues, and incomes, as well as profitability comparisons between rubber and oil palm farming to assess their financial feasibility.

- **Farm Revenue Analysis**

Farm revenue refers to the total income obtained from the sale of farming products. According to Soekartawi (2016), farm revenue is calculated by multiplying the total production by the selling price per unit. The formula is as follows:

$$TR = Y \times Py$$

Where:
TR : Total farm revenue (Rp)
Y : Total production (kg)
Py : Selling price per kilogram (Rp/kg)
This formula was applied to both rubber and oil palm farmers to determine their respective revenues.

- **Farm Cost Analysis**

Farm costs represent all expenditures incurred during the farming process. Based on the classification by Suratiyah (2015), farm costs are divided into fixed costs and variable costs. The total farm cost (TC) is calculated by the formula:

$$TC = FC + VC$$

Where:
TC : Total farm cost (Rp)
FC : Fixed costs (Rp)
VC : Variable costs (Rp).

- **Farm Income Analysis**

Farm income is the difference between total revenue and total costs incurred. According to Soekartawi (2016), farm income can be calculated using the formula:

$$\Pi = TR - TC$$

Where:
π = Farm income (Rp)
TR = Total farm revenue (Rp)
TC = Total farm cost (Rp)
This formula was applied to calculate the income from both rubber and oil palm farming in the research area.

- **Revenue-Cost Ratio (R/C Ratio) Analysis**

The R/C Ratio is used to measure the level of efficiency and feasibility of farming by comparing total revenue and total costs. According to Soekartawi (2016), the R/C ratio is calculated using the following formula:

$$R/C = \frac{TR}{TC}$$

Where:
R/C = Revenue-Cost Ratio
TR = Total farm revenue (Rp)
TC = Total farm cost (Rp)

The decision criteria are:
If R/C > 1, the farm is profitable.
If R/C < 1, the farm incurs losses.
If R/C = 1, the farm breaks even.

- **Profitability Ratio (π/C) Analysis**

The profitability ratio (π/C) is used to measure the proportion of net income relative to total production costs. It serves as an indicator of profit efficiency. According to Suratiyah (2015), the formula is:

$$\frac{\pi}{C} = \frac{TR - TC}{TC} \times 100\%$$

Where:
π/C = Profitability ratio (%)
TR = Total farm revenue (Rp)
TC = Total farm cost (Rp)

The decision criteria are:
If π/C > bank interest rate, the farm is economically feasible.
If π/C < bank interest rate, the farm is not feasible.
If π/C = bank interest rate, the farm reaches the break-even point.

RESULTS AND DISCUSSION

Farm Characteristics

Rubber farms in the study area had smaller land area and lower productivity compared to oil palm farms. Farmers allocated more land and resources to oil palm due to its better market price and lower fluctuation risk.

Feasibility Analysis

- **Total Cost**

Table 2. Average Farming Costs for Rubber and Oil Palm in Sekernan District

Description	Average Rubber Farming Costs (Rp/Farmer/Year)	Average Oil Palm Farming Costs (Rp/Farmer/Year)
Fixed Costs (FC)		
1. Equipment Depreciation	423,256.58	795,042.00
Variable Costs (VC)		
1.Fertilizer Costs	3,887,447.37	60,245,724.67
2.Pesticide Costs	1,090,150.00	4,351,100.00
3.Labor Costs	13,656,052.53	17,923,264.52
Total (FC + VC)	19,056,907.47	83,315,131.19
Average (Rp/ha/year)	7,646,472.53	14,550,768.69

Source: Processed Primary Data, 2025

Based on Table 2, the average total production cost of rubber farming in the study area is Rp19,056,907.47 per farmer per year, with the largest portion coming from variable costs, especially labor. For oil palm farming, the average total production cost is Rp83,315,131.19 per year or Rp14,550,768.69 per hectare per year, Total dominated by variable costs as well, particularly fertilizer expenses.

- **Revenue**

Table 3. Average Revenue of Rubber Farming and Oil Palm Farming in the Research Area in 2024

Description	Rubber Farming	Oil Palm Farming
Production (Kg/year) (Y)	4,264	71,848.83
Price (Rp/year) (P)	9,582	2,923
Revenue (Rp/Farmer/year) (Y × P)	40,804,664.58	213,328,790.00
Revenue (Rp/ha/year)	16,199,720.32	39,344,120.45

Source: Processed Primary Data, 2025

Table 3 presents the average revenue of rubber and oil palm farming in the research area in 2024. The table shows that the average production of oil palm farming reached 71,848.83 kg per year, much higher than rubber farming at 4,264 kg per year. Although the selling price of rubber is higher than oil palm, the total revenue per farmer and per hectare is greater for oil palm farming. This is due to the considerably larger production volume, which results in higher overall revenue for oil palm farmers compared to rubber farmers.

- **Π (Income)**

Table 4. Average Farm Income of Rubber and Oil Palm Farming in the Research Area in 2024

Description	Rubber Farming	Oil Palm Farming
Revenue (Rp/Year) (TR)	40,804,664.58	213,328,790.00
Total Cost (Rp/Year) (TC)	19,056,906.47	83,315,131.19
Farm Income (Rp/Year) (TR − TC)	21,747,758.11	130,013,658.81
Farm Income (Rp/Ha/Year)	8,553,247.79	24,793,351.77

Source: Processed Primary Data, 2025

Based on the data in Table 25, the average farm income from rubber farming obtained by the sample farmers in the research area was Rp 21,747,758.11 per year, with an average income per hectare of Rp 8,553,247.79/Ha/Year. Meanwhile, the average farm income from oil palm farming was Rp 130,013,658.81 per year, with an average income per hectare of Rp 24,793,351.77/Ha/Year.Oil palm farming yielded higher income than rubber farming. Despite the higher input costs in oil palm farming, the revenue was still significantly larger, leading to higher net income.

- **R/C Ratio**:

Table 5. R/C Ratio Analysis of Rubber and Oil Palm Farming for Sample Farmers in the Research Area in 2024

Description	Rubber Farming	Oil Palm Farming
Revenue (Rp/Ha/Year) (TR)	16,199,720.32	39,344,120.45
Total Cost (Rp/Ha/Year) (TC)	7,646,472.53	14,550,768.69
R/C Ratio	2.12	2.70

Source: Processed Primary Data, 2025

Based on the business feasibility criteria using the R/C ratio, where a value greater than 1 indicates that the revenue exceeds the total cost incurred, both types of farming can be categorized as feasible to be operated in the research area.

- **π/C Ratio**:

Table 6. π/C Ratio Analysis of Rubber and Oil Palm Farming for Sample Farmers in the Research Area in 2024

Description	Rubber Farming	Oil Palm Farming
Income (Rp/Ha/Year) (π)	8,533,247.79	24,793,321.77
Total Cost (Rp/Ha/Year) (TC)	7,646,472.53	14,550,768.69
π /C Ratio	1.12	1.70

Source: Processed Primary Data, 2025

At the time of the study, the prevailing bank interest rate was 6.00%. Based on the analysis, the π/C ratio for rubber farming was 1.12 (or 112%), indicating that it is profitable and feasible to be cultivated in the research area. Likewise, the π/C ratio for oil palm farming was 1.70 (or 170%), also indicating profitability and feasibility. According to business feasibility criteria, a farm is considered feasible if the π/C ratio exceeds the bank interest rate, meaning farmers will gain higher returns by investing in farming rather than saving their capital in a bank.

CONCLUSION

Based on the results of the research and analysis, it can be concluded that Sekernan Subdistrict is one of the largest plantation areas for rubber and oil palm in Muaro Jambi Regency, with most farmers cultivating their own land. The average land area for rubber farming is smaller than that for oil palm, and the use of fertilizers, pesticides, and equipment is more intensive in oil palm farming. The income obtained from oil palm farming is significantly higher

than that from rubber farming due to greater production volumes, despite higher production costs. In contrast, although rubber has a relatively high selling price, its lower production volume results in lower total revenue and income. Feasibility analysis shows that both types of farming are financially viable, as their revenue-to-cost ratios exceed one. Furthermore, the profitability of both rubber and oil palm farming surpasses the prevailing bank interest rate of 6.00%, indicating that investing capital in these farming activities provides farmers with greater returns than saving in a bank, with oil palm farming offering notably higher efficiency and profitability compared to rubber farmin

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