Journal of Smart Agriculture and Environmental Technology
e-ISSN:3021-8802
Vol. 4, No. 1, April 2026
https://josaet.com | https://doi.org/10.60105/josaet.2026.4.1.41-45

Research Paper

Analysis of Tea Plant (*Camellia Sinensis*) Farming in the PTPN 7 Regional 1 Gunung Dempo Pagar Alam, South Sumatra, Indonesia

Supli Effendi Rahim[1], Mustofa Marli Batubara[1], Lucyana[2], Rosita[2], Anita Natalia[2], Fitriani Azahrah[2], Eka Fitriani[2], Deddy Permana[2], Rahmad Basuki[2], Ari Siswanto[2], Herlianto[2], Muhammad Yusup[2], Yudha Pratama[2], Dina Badriah[1]

[1] *Postgraduate Program of Agricultural Sciences, Universitas Muhammadiyah Palembang, Palembang, South Sumatra, Indonesia*
[2] *Postgraduate Student of Agricultural Sciences, Universitas Muhammadiyah Palembang, Palembang, South Sumatra, Indonesia*,

*__Corresponding author__: suplirahim31760@gmail.com

Article History: Received: February 22, 2025, Accepted: June 6, 2025

Abstract
The low selling price of tea in the country by PTPN 7 Regional 1 Gunung Dempo Pagar Alam is currently causing the selling price of tea plant shoots to be increasingly cheaper as indicated by the decreasing number of farming revenues and the low farming income received by the state-owned company. The aim of this research is to describe the farming performance carried out by PTPN 7. Apart from that, the main aim of this research is to analyze the value of tea farming starting from the value of farming revenues, farming costs and farming income. The research results show that that tea farming is still feasible and profitable to continue to be developed. This is evidenced by the B/C ratio value which exceeds 1, which indicates that each unit cost incurred still generates profit. In addition, the R/C ratio value in all PTPN 7 plantation divisions ranges from, which means that for every IDR 1 of total farming costs incurred, the company earns revenue of Rp 1,24. Thus, tea farming at the research location still makes a positive contribution to the company's income and has good sustainability prospects.

Keywords
Tea Farming; Agricultural Economics; Sustainability

1. INTRODUCTION

Tea is a drink that has a significant role in the Indonesian economy. As a plantation commodity, tea is not only the main consumption within the country but is also exported to various countries, making it one of the country's foreign exchange earners after oil and gas. The main support for this comes from the extensive tea plantations spread across a number of major tea producing areas, as well as the high volume of tea production produced. Tea has a strategic position in the plantation sector, with an important contribution to state income and job creation. According to Setyamidjaja (2001), the existence and development of the tea industry in Indonesia is greatly influenced by interrelated natural, social and economic factors, making it one of the leading commodities in the global market (Rahim et al., 2016).

Tea is made from the tops of the leaves of the tea plant (*Camellia sinensis*) through a certain processing process. Based on the processing method, tea is divided into three types, namely green tea, oolong tea and black tea. In Indonesia, black tea is the most widely produced type, and this country is recorded as one of the largest exporters of black tea in the world, ranking fifth (Ghani, 2002). This is supported by Indonesia's tropical climate and favorable agroecological conditions in regions such as West Java and North Sumatra (Nurunisa and Baga, 2012).

PTPN 7 Regional 1 Gunung Dempo Tea Plantation is one of the largest tea plantations in South Sumatra. Tea farming in this area has significant economic potential, especially in its contribution to the agricultural and export sectors. Based on the results of an initial observation by the study Program of Agricultural Sciences, Muhammadiyah University of Palembang, it was discovered that the selling price of tea in the country is much lower than the production costs. This condition is an interesting topic to research, namely regarding the analysis of tea farming in the tea plantation owned by PTPN 7 Regional 1 Gunung Dempo, Pagar Alam, South Sumatra. The research objective is to evaluate the financial feasibility and profitability of tea farming operations at PTPN 7 Regional 1 Gunung Dempo, Pagar Alam, South Sumatra, by analyzing the Benefit-Cost (B/C) Ratio.

2. EXPERIMENTAL SECTION

3. RESEARCH METHODS

This study examines the tea farming process activities, from maintenance to the tea shoot sales process, over a period of one year in a tea plantation owned by PTPN 7 Regional 1 Gunung Dempo, Pagar Alam, South Sumatra. The research design used is a combination of qualitative and quantitative approaches. The quantitative approach is applied to analyze the value of tea farming through analysis of production costs, revenues, and income. Meanwhile, the qualitative approach is used to provide an in-depth understanding of the current condition and performance of tea farming at PTPN 7. In this case, descriptive analysis is used as a tool to process and analyze the data obtained, so that it can clearly describe the condition of the tea farming business.

The research technique used is a case study, which aims to understand a problem in depth with a focus on certain individuals or groups (Rahim et al., 2016; Sugiyono, 2002). Researchers conducted a case study through a descriptive survey, namely an explanatory survey that aims to connect the phenomena that occur and explain the causes and effects. This descriptive survey is also a follow-up to the quantitative data that has been collected for further analysis regarding tea farming activities.

Figure 1. Map of location of tea plantation of PTPN 7 regional 1 Gunung Dempo, Pagar Alam, South Sumatra

Primary data collection was conducted through direct observation and interviews with respondents and informants relevant to this study. Primary data were obtained from direct interviews with key informants and supporters, as well as field observation results. Meanwhile, secondary data were collected through literature review, both from scientific journals and sources from the internet. For data processing and analysis, this research aims to assess the financial feasibility and profitability of tea farming operations at PTPN 7 Regional 1 Gunung Dempo, Pagar Alam, South Sumatra, by analyzing the Benefit-Cost (B/C) Ratio. In addition to descriptive analysis, the study includes an income analysis using the farm income formula, which accounts for both variable and fixed costs.

4. RESULTS AND DISCUSSION

4.1 Tea Farming Performance

Farm performance describes the extent to which a farming business can be successfully run. In general, farm performance explains how production factors or inputs in a business unit can affect its success. Farm performance conditions can vary in each plantation (Afdeling), even though the commodity products being cultivated are the same. Area of Afdeling 1 is 306 ha, Afedeling 2 is 309 ha, Afdeling 3 is 298 ha, Afedeling 4 is 290 ha and Afdeling 5 is 319 ha (PT Perkebunan Nusantara VII, 2025).

Indicators that affect farm performance come from two main factors: internal factors and external factors. Internal factors are directly related to the farmers and the plantation itself, such as plantation characteristics, land area, and capital available for production facilities, such as fertilizers and herbicides. External factors, on the other hand, include elements that come from outside the plantation, such as the quality of tea plant seeds, the use of fertilizers and pesticides, labor, harvest results, and tea shoot marketing activities.

Figure 2. Map of Afdeling 1-5 of tea plantation of PTPN 7 (Source: PTPN 7, 2025)

Some external factors that need to be considered in tea cultivation and farming activities include: 1). Procurement and Use of Production Inputs: The availability and use of quality production inputs, such as fertilizers and herbicides, greatly affect the tea harvest. Efficiency in the use of these inputs is important to reduce production costs and increase yields. 2). Tea Plant Cultivation Techniques: The techniques applied in tea cultivation, from planting to plant maintenance, can affect the quality and quantity of the harvest. Proper garden management will increase plant resistance to pests and diseases, as well as improve the quality of tea shoots. 3). Harvesting and Post-Harvest Activities: The timely harvest process and good post-harvest techniques play a major role in maintaining the quality of tea. In addition, post-harvest tea drying and storage factors must

also be considered so that the quality of the tea produced remains optimal. By considering these factors as a whole, success in tea farming can be achieved, both in terms of quality and quantity of the results obtained.

4.2 Efficiency and Feasibility Analysis of Farming Business

Efficiency and feasibility analysis of farming business is very important to determine whether tea farming in PTPN 7 is in a feasible and profitable condition. Therefore, it is necessary to look comprehensively at the income, production costs, and potential profits generated by the tea plantation.

4.2.1 Farming Business Income

Farming business income refers to the total value obtained from production results within a specific period. In the context of tea cultivation at PTPN 7, income is calculated based on the total production of tea shoots during 2024, multiplied by the average price of tea shoots applicable in that period. According to Soekartawi (2002), farm income is a critical indicator of agricultural business performance.

In 2024, PTPN 7 produced a total of 1,500 KG of dry tea shoots per hectare from plantations spread across Afdeling (AF) 1 to AF 5. Income is determined by multiplying the total production with the average selling price of tea shoots set for that year. The calculation is as follows:

- Total Production: 2,283 tons of dry tea shoots, with 1,142.5 tons allocated for the local market and 1,142.5 tons for export.
- Average Price for Local Market: IDR 19,000,000 per ton
- Local Market Income: 1,142.5 tons × IDR 19,000,000/ton = IDR 21,707,500,000
- Average Price for Export: IDR 37,500,000 per ton
- Export Income: 1,142.5 tons × IDR 37,500,000/ton = IDR 42,843,750,000

Grand Total Income: IDR 64,551,250,000

With an overall gross production cost of IDR 45,660,000,000, the overall net production value is IDR 64,551,250,000 and the net production per hectare per year is IDR 12,412,122. This income will be compared to production costs to evaluate the profitability of the tea farming business. It provides an initial overview of PTPN 7's potential profits, which can be further analyzed by comparing income with production costs and other operational expenses to assess the efficiency and feasibility of tea farming (Sugiyono, 2002).

4.2.2 Farming Costs

Farming costs in tea cultivation at PTPN 7 Regional 1 Gunung Dempo (Table 1) encompass all inputs utilized throughout the production process. According to USDA Economic Research Service (2023), the costs can be classified into two main categories: cash costs and calculated costs.

Labor wages are calculated based on applicable wage standards at the research location. In the case of tea farming at PTPN 7, expenditures include purchasing agricultural inputs such as fertilizers (Urea, KCL, TSP) and herbicides. Additionally, costs account for labor (both paid and family workers) and depreciation of agricultural equipment used in plantation operations. Labor costs are based on prevailing wages in Pagar Alam, while equipment depreciation is calculated according to the age and condition of the tools used.

The distinction between cash and calculated costs provides a clearer picture of the total expenses involved in tea farming, aiding in the analysis of business efficiency and feasibility. The total farming costs incurred by each plantation from Afdeling 1 to 5 per hectare annually vary significantly. The operating costs across the divisions vary, with the lowest recorded at IDR 2,319.84 million and the highest reaching IDR 2,553.92 million (see Table 2). This variation indicates differences in operational scale, input usage, and efficiency among the respective Afdelings.

4.2.3 Profitability Analysis

The income from tea farming at PTPN 7 Regional 1 Gunung Dempo Pagar Alam is derived from the difference between revenue and total costs. This analysis highlights the role and contribution of tea farming activities across Afdeling 1 to 5. By examining the cost structure and income, we gain a comprehensive understanding of the profitability of tea farming (Hutzi, 2007).

Additionally, this analysis offers insights into factors affecting total income, such as the density of tea plant populations, plantation age, and consistent fertilization and maintenance practices. Plantations with intensive care tend to achieve higher productivity, directly impacting income. Variations in results across different divisions can be attributed to these influencing factors, as observed in the performance of each Afdeling (Daton, 2008; Herdiman, 2008).

4.2.4 Farming Efficiency Analysis (R/C)

R/C (Revenue/Cost) analysis is a tool used to describe the efficiency condition of a farming business by comparing the income obtained with the costs incurred in farming activities. In the context of the PTPN 7 Regional 1 Gunung Dempo Pagar Alam tea plantation, R/C analysis is used to evaluate how efficient the tea farming business is run throughout Afdeling 1 to Afdeling 5.R/C analysis is divided into two types:

4.2.5 R/C Ratio on Total Costs

The R/C (Revenue-Cost) Ratio on Total Costs measures the efficiency of tea farming by comparing total farm income with total farm costs incurred over a year. These total costs include both cash costs (such as expenses for fertilizers, herbicides, and labor) and calculated costs (including

Table 1. Farming costs in tea plantation at PTPN 7 Regional 1 Gunung Dempo

Category	Cost type	Description	Examples	Basic calculation
Cash costs	Direct expenditure	Costs paid directly in cash for inputs and services	Fertilizers (Urea, KCl, TSP)	Market process
			Paid labor (harvesting, maintenance)	Wage standards in Pagar Alam
Calculated costs	Non-cash or imputed	Costs used to determine actual income, not necessarily paid in cash	Family labor (unpaid labor)	Imputed using local wages rates
			Equipment depreciation	Based on tool age
			Land tax and other fixed charges	Based on government / tax office rates

Table 2. Variation in the B/C ratios among afdelings

Afdeling	Area (ha)	Oprating cost (IDR mill)	B/C ratio	Remarks
Afdeling 1	306.42	2,553.50	1.20	Still profitable
Afdeling 2	309.30	2,416.41	1.28	Highly profitable
Afdeling 3	297.73	2,440.41	1.22	Profitable
Afdeling 4	289.98	2,319.84	1.25	Profitable
Afdeling 5	319.24	2,553.92	1.25	Profitable
Average	-		1.24	Overall financially viable

equipment depreciation and labor wages). This comprehensive analysis offers a clearer understanding of the financial performance of tea farming, as it accounts for both direct and indirect costs (Soehardjo and Patong, 1977).

In the context of tea cultivation at PTPN 7, the Revenue-Cost (R/C) ratio serves as an essential indicator of the farm's profitability and long-term viability. As presented in Table 3, all tea plantations across the five Afdelings recorded an average R/C ratio of 1.24, derived from a revenue of IDR 12,420,000/ha and cash costs of IDR 10,000,000/ha. Since the ratio exceeds 1, it confirms that the income from tea farming operations surpasses the expenses incurred. This demonstrates that PTPN 7's tea business remains economically sound and supports continued investment and development.

The positive R/C ratio highlights the significant potential of tea plantations to contribute to PTPN 7's overall income. With continuous improvements in operational efficiency and plantation management, tea farming can generate even higher returns in the future. This reflects strong prospects for expanding the business and optimizing profitability through better resource allocation and management practices.

Table 3. Profitability Analysis of Tea Cultivation at PTPN 7

Component	Value	Explation
Revenue per hectare	IDR 12,420,000	Total income generated from tea farming per hectare
Cash costs per hectare	IDR 10,000,000	Total operating expenses per hectare
B/C Ratio	1.24	Revenue ÷ Cost = 12.42 ÷ 10 = 1.24

4.2.6 Farming Business Feasibility Analysis (B/C)

The Benefit-Cost (B/C) Ratio analysis is a key tool for evaluating the feasibility of a farming business. It compares the total income generated by the company with the total costs incurred in managing tea farming operations. Unlike the R/C (Revenue-Cost) Ratio, which focuses on gross revenues, the B/C analysis emphasizes the net benefits or profits derived from each unit of cost. The main objective of this analysis is to assess the contribution of tea cultivation to the overall profitability of the company. Calculations show that the Benefit-Cost (B/C) ratio across Afdeling 1

to Afdeling 5 at PTPN 7 averages around 1.24 (Table 4). Since this value exceeds 1, it confirms that all tea plantations are operating profitably. This indicates that tea farming at PTPN 7 remains financially sustainable, supporting the rationale for continued investment and development. Furthermore, the results highlight significant potential to increase company revenue through enhanced management, greater operational efficiency, and optimized resource use.

Table 4. The variations of the B/C Ratios among afdelings

Afdeling	Area (ha)	B/C ratio	Remarks
Afdeling 1	306.42	1.20	Still profitable
Afdeling 2	309.30	1.28	Highly profitable
Afdeling 3	297.73	1.22	Profitable
Afdeling 4	289.98	1.25	Profitable
Afdeling 5	319.24	1.25	Profitable
Average	-	**1.24**	Overall financially viable

5. CONCLUSION

Based on the results of the feasibility analysis of tea farming at PTPN 7 Regional 1 Gunung Dempo, Pagar Alam, South Sumatra, it can be concluded that tea farming is still feasible and profitable to continue to be developed. This is evidenced by the B/C ratio value which exceeds 1, which indicates that each unit cost incurred still generates profit. In addition, the R/C ratio value in all PTPN 7 plantation divisions ranges from , which means that for every Rp 1 of total farming costs incurred, the company earns revenue of IDR 1.24. Thus, tea farming at the research location still makes a positive contribution to the company's income and has good sustainability prospects.

REFERENCES

Daton, A. R. (2008). Analysis of Cashew Farming Income (Case Study in Ratulodong Village, Tanjung Bunga District, East Flores Regency, East Nusa Tenggara Province)

Ghani, A. (2002). *Budi daya tanaman teh*. Penerbit Pertanian, Bandung

Herdiman, F. (2008). Analysis of Sweet Potato Farming Income in Gunung Malang Village, Tenjolaya District, Bogor Regency

Hutzi, A. A. (2007). Analysis of Farm Income and Marketing Channels of Smallholder Tea Plantations (Case Study of Smallholder Tea Plantations, Sukanagara Subdistrict, Cianjur Regency, West Java Province)

Nurunisa, V. F. and L. M. Baga (2012). Analisis Daya Saing dan Strategi Pengembangan Agribisnis Teh Indonesia. *Forum Agribisnis*, **2**(1); 33–50. https://doi.org/10.29244/fagb.2.1.33

PT Perkebunan Nusantara VII (2025). Data luas areal dan pembagian afdeling kebun Gunung Dempo. Laporan internal, Unit Gunung Dempo

Rahim, S. E., M. M. Batubara, R. Basuki, D. Permana, and M. Yusup (2016). Land Suitability for Various Types of Plants in Agroforestry Development at PTPN 7 Regional 1 Gunung Dempo Tea Plantation, Pagar Alam. *Journal of Smart Agriculture and Environmental Technology*

Setyamidjaja, D. (2001). *Budidaya tanaman perkebunan*. Kanisius, Yogyakarta

Soehardjo, R. and Patong (1977). *Farm Business Analysis*. Bogor Agricultural University, Bogor

Soekartawi (2002). *Farm Business Analysis*. UI Press, Jakarta

Sugiyono (2002). *Quantitative, Qualitative, and R& D Research Methods*. Alfabeta, Bandung