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COST EFFICIENCY ANALYSIS ON REVENUE BASED ON BUDGET PLAN AND BENEFIT-COST RATIO IN OIL PALM PLANTATION AT PABATU ESTATE PTPN IV REGIONAL II NORTH SUMATRA PROVINCE

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ABSTRACT

This research focuses on the analysis of cost efficiency in relation to income in oil palm plantations, based on data from 2021, 2022, and 2023. The analysis employs data on budget plans and actual expenditures, using the Benefit Cost Ratio (BCR) method as a tool to evaluate whether operational expenses in oil palm cultivation are managed efficiently or indicate inefficiency in relation to the income generated. The primary data used in this study consist of budget plans and actual cost realizations obtained directly from the plantation, while secondary data include literature, reports, and other relevant supporting sources. The research sample covers the cultivated area and the population of oil palm trees, namely: in 2021 with 4,400 hectares and 540,687 trees, in 2022 with 4,531 hectares and 559,654 trees, and in 2023 with 4,634 hectares and 593,086 trees .This study was conducted at the PTPN IV Oil Palm Plantation, Pabatu Estate, located in Tebing Tinggi Subdistrict, Serdang Bedagai Regency, North Sumatra Province. The research took place in December 2024.The findings show that cost efficiency based on the Budget Plan (RAB) and Benefit Cost Ratio (BCR) was 3.21% in 2021, 2.90% in 2022, and 2.22% in 2023. Since the BCR values remained above 1% for three consecutive years, the analysis concludes that the operational activities of the plantation have been running efficiently.
Keywords: Budget Plan (RAB), Cost Efficiency, Benefit Cost Ratio (BCR)

INTRODUCTION

The agricultural sector plays a crucial role in Indonesia's economy. Beyond providing essential food supplies, it also generates a significant number of employment opportunities and contributes to improving community incomes. Among the various agricultural sub-sectors, oil palm plantations stand out as one of the most prominent. Plantation commodities continue to serve as major contributors to national income and foreign exchange earnings. In terms of Gross Domestic Product (GDP), the plantation sub-sector grew by approximately 2.1% in 2024, indicating a steady recovery and a tangible contribution to the agribusiness economy. One of the leading commodities, palm oil, has shown rapid and consistent growth.

According to data from the Ministry of Agriculture, by 2024, the total area of oil palm plantations nationwide had reached around 17.2 million hectares, up from 16.8

million hectares the previous year. When broken down by management type, private large estates dominate the landscape, covering about 8.6 million hectares (50%). These are followed by smallholder plantations at approximately 6.4 million hectares (37%), state-owned estates at 0.58 million hectares (3%), and the remaining 1.6 million hectares (10%) are still under verification regarding their status (Directorate General of Plantations, 2024).

Fertilizer costs represent one of the largest components of oil palm production expenses and significantly impact total operational costs. Achieving efficiency in fertilizer management is essential, as it directly affects both plantation productivity and profitability. Variations in management strategies, land conditions, and company policies can lead to differing levels of cost efficiency among plantations (Lubis & Widanarko, 2021).

This study focuses on PTPN IV's Pabatu Estate. The aim of this research is to analyze cost efficiency in relation to revenue by applying the Benefit-Cost Ratio (BCR) method.

RESEARCH METHODOLOGY

This study was conducted at PTPN IV, Pabatu Estate, Regional II, located in Tebing Tinggi District, Serdang Bedagai Regency, North Sumatra Province. The research took place in December 2024. A quantitative approach was applied to analyze the cost efficiency in relation to palm oil production revenue.

The data used in this research consist of both primary and secondary sources. Primary data were collected through direct interviews with estate management and field observations, particularly focusing on operational costs and production revenues. Secondary data were obtained from the company's annual reports, official publications from the Central Statistics Agency (BPS), and documents from the Directorate General of Plantations.

Two methods were used in analyzing the data:

1. Budget Variance Analysis

This method compares the Budget Plan (RAB) with actual realized costs. The formulas used are:

$$\text{Variance} = |Planned\ Cost - Actual\ Cost|$$

$$\text{Efficiency} = \left(\frac{\text{Budget Cost} - \text{Actual Cost}}{\text{Budget Cost}}\right) \times 100\%$$

2. Benefit-Cost Ratio (BCR) Analysis

This approach is used to evaluate economic efficiency. The formula is:

$$\text{BCR} = \left(\frac{\text{Total Revenue}}{\text{Total Cost}}\right)$$

The evaluation criteria are as follows:

- BCR > 1: The business is profitable
- BCR = 1: The business breaks even
- BCR < 1: The business is operating at a loss

Operational definitions in this study include: Cost efficiency is defined as the ratio between total expenditures and revenue. Revenue refers to the income generated from the sale of Fresh Fruit Bunches (FFB). Production refers to the volume of harvested yield within a given period. The Budget Plan (RAB) is defined as an estimate of expenditures required for production activities, such as fertilization, harvesting, maintenance, and transportation.

RESULTS AND DISCUSSION

Analysis of 2021

Table 1. Data for 2021

Description	Amount (Rp)
Revenue	244,231,556,409
Actual Cost	76,061,134,446
Planned Budget	82,482,106,000

Budget Variance (2021):

= $|Actual\ Cost - Planned\ Budget|$

= Rp 82,482,106,000 – Rp 76,061,134,446

= Rp (6,420,971,554)

This means that actual production costs in 2021 were Rp 6,420,971,554 lower than the planned budget.

Cost Efficiency:

$= (\frac{\text{Budget Cost} - \text{Actual Cost}}{\text{Budget Cost}}) \times 100\%$

$= (\frac{82,482,106,000 - 76,061,134,446}{82,482,106,000}) \times 100\%$

= 7,78 %

Interpretation:

The calculation shows that only 7,78 % of the planned budget was used for production costs. This indicates effective cost efficiency, where the company managed to generate significantly higher revenue compared to its expenses.

Benefit-Cost Ratio (BCR):

$= (\frac{\text{Total Revenue}}{\text{Total Cost}})$

$= (\frac{244,231,556,409}{76,061,134,446})$

= 3.21

Interpretation:

The BCR value of 3.21 in 2021 indicates that for every Rp 1 spent on production, the company earned Rp 3.21 in revenue. This reflects a profitable and efficiently managed operation.

Analysis of 2022

Table 2. Data for 2022

Description	Amount (Rp)
Revenue	299,574,734,972
Actual Cost	103,475,089,368
Planned Budget	107,178,590,283

Budget Variance (2022):

= $|Actual\ Cost - Planned\ Budget|$

= Rp 103,475,089,368 – Rp 107,178,590,283

= Rp (3,703,500,915)

This indicates that actual costs were Rp 3,703,500,915 lower than the budgeted figure.

Cost Efficiency:

$= (\frac{\text{Budget Cost} - \text{Actual Cost}}{\text{Budget Cost}}) \times 100\%$

$= (\frac{107,178,590,283 - 103,475,089,368}{107,178,590,283}) \times 100\%$

= 3,46%

Interpretation:

The data shows that only 3,46% of the projected budget was used. This again suggests a high level of cost efficiency, resulting in a favorable revenue-to-cost ratio.

Benefit-Cost Ratio (BCR):

$= (\frac{\text{Total Revenue}}{\text{Total Cost}})$

$= (\frac{299,574,734,972}{104,524,713,000})$

= 2.86

Interpretation:

In 2022, a BCR of 2.86 means that for every Rp 1 spent on production, the company earned Rp 2.86 in return. This signifies continued profitability and efficient operations.

Analysis of 2023

Table 3. Data for 2023

Description	Amount (Rp)
Revenue	265,867,653 ,600
Actual Cost	119,236,489,785
Planned Budget	119,725,081,000

Budget Variance (2023):

$= |Actual\ Cost - Planned\ Budget|$

= Rp 119,236,489,785 – Rp 119,725,081,000

= Rp(488,591,215)

This shows that actual production costs in 2023 were Rp 488,591,215 lower than the budgeted amount.

Cost Efficiency:

$= (\frac{\text{Budget Cost} - \text{Actual Cost}}{\text{Budget Cost}}) \times 100\%$

$= (\frac{119,725,081,000 - 119.236.489.785}{119,725,081,00}) \times 100\%$

= 0,41 %

Interpretation:

The data shows that only 34.89% of the projected budget was used. This again suggests a high level of cost efficiency, resulting in a favorable revenue-to-cost ratio.

Benefit-Cost Ratio (BCR):

$= (\frac{\text{Total Revenue}}{\text{Total Cost}})$

$= (\frac{265.867.653\ .600}{119.236.489.785})$

= 2,22 %

Interpretation:

BCR value of 2.22 in 2023 means that every Rp 1 spent on production generated Rp 2.22 in revenue. This confirms that the company remained profitable and maintained operational efficiency.

CONCLUSION AND RECOMMENDATIONS

Based on the analysis of cost efficiency in relation to revenue, assessed through the Budget Plan (RAB) and Benefit-Cost Ratio (BCR) over the period from 2021 to 2023 at PTPN IV Regional II Pabatu Estate, several conclusions can be drawn:

1. In 2021, the company achieved a cost efficiency rate of 7,78%, with a BCR value of 3.21. This indicates that every Rp 1 spent on production yielded Rp 3.21 in revenue.
2. In 2022, cost efficiency increased to 3,46%, although the BCR dropped slightly to 2.86. Nevertheless, it remained within the efficient category.
3. In 2023, the cost efficiency rate further improved to 0,41%, even though the BCR decreased to 2.22.

Overall, across the three-year period, the company consistently demonstrated efficient financial and operational management, with revenues exceeding total production costs each year. The recurring prominence of fertilizer costs as the most significant factor affecting efficiency suggests that tighter control over this component should be a key focus in future budgeting efforts.

Given the strong performance over the past three years, PTPN IV Pabatu Estate has shown excellent capability in managing production costs while sustainably increasing revenue. Therefore, the following recommendations are proposed:

1. Maintain production cost efficiency by continuously evaluating key cost components—particularly fertilizer expenses—which have proven to be the dominant factor in cost efficiency outcomes.
2. Develop more adaptive operational strategies to respond effectively to market dynamics and fluctuations in input prices. This will help ensure that production plans remain relevant and effective.
3. Adopt innovative technologies, such as precision-based fertilization systems, to minimize waste and improve productivity across plantation operations.
4. Provide regular training for the workforce, so that operational efficiency is not solely dependent on financial measures, but also supported by enhanced human resource performance.

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