

FEASIBILITY ANALYSIS OF TOMATO FARMING IN THE GOTALA FARMERS GROUP, WALI VILLAGE, LANGKE REMBONG DISTRICT, MANGGARAI REGENCY

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Abstract: The objective of this research is to analyze the performance of tomato farming and to analyze the feasibility of tomato farming in the Gotala Farmers Group, Wali Village, Langke Rembong District, Manggarai Regency. The sampling method used a census method for 20 members of the Gotala Farmers Group. The analytical methods used were cost analysis calculated based on cash and non-cash costs, income analysis, feasibility analysis calculated based on cash and total costs, and sensitivity analysis of cash costs. This research was conducted at the Gotala Farmers Group, Wali Village, Langke Rembong District, Manggarai Regency, from May 7 to June 7, 2024.

The results of the study indicate that the average costs incurred during one planting season for 3 months amounted to Rp3,793,412 in cash costs and Rp1,502,000 in non-cash costs. Income from cash costs was Rp5,606,588 and from total costs was Rp4,104,588. The results of the feasibility analysis of the R/C ratio value for cash costs of 2.48 and non-cash costs of 1.78 indicate a figure greater than one, which means that the tomato farming business in the Gotala Farmers Group is feasible to run. The results of the BEP analysis_{unit}49 and BEP Price of Rp4,742 for cash costs and total costs shows that the BEP unit value of 67 and BEP Price of Rp6,619 is smaller than the production and selling price of tomatoes, meaning that the tomato farming business in the Gotala Farmers Group is feasible to run. The results of the sensitivity analysis show that the tomato farming business in the Gotala Farmers Group is not sensitive to changes in the selling price decrease of 15%, the cost increase of 41% and the production decrease of 38%.

Keywords: *Cost, Farming Feasibility, Income, Sensitivity, Tomatoes.*

INTRODUCTION

Tomatoes (*Solanum lycopersicum*) are a horticultural crop native to the Americas, found everywhere and widely consumed by the public. The high consumption of tomatoes is inseparable from the public's habit of using tomatoes as a culinary ingredient, used as a seasoning or consumed as a vegetable. Tomato consumption in Indonesia in 2021 reached 677.97 thousand tons, a 6.48% increase from 634.01 thousand tons in 2020 (Horticultural Statistics, 2022). According to data from the Statistics Indonesia (BPS) of Manggarai Regency, tomato production decreased in 2024. This decrease in tomato production was caused by several factors, including changes in the area of agricultural land used for tomato cultivation (BPS Manggarai Regency, 2024). Furthermore, it was caused by fluctuating tomato prices (Mahyudi and Husinsyah, 2019). Research conducted by Asriani (2021) shows that pest and disease attacks, as well as unpredictable weather conditions, are among the factors that determine the production results of ongoing farming businesses. Unpredictable farming conditions require sensitivity analysis to determine the level of sensitivity of a farming business to changes. Research conducted by Awaliyah and Rostwentivaivi (2021) shows that tomato prices are inherently volatile or experience unpredictable fluctuations. Farmers in running their farming businesses require high expenditures in the form of farming costs, but it is known that farmers have never conducted a feasibility analysis of their tomato farming operations. The results of this feasibility analysis can be used to determine the level of profit obtained from tomato farming and to determine alternatives for continuing tomato farming or choosing other commodities that can be cultivated more efficiently (Pati and Wadu, 2023).

METHOD

The type of research used was descriptive quantitative. This study was conducted for one month in the Gotala Farmers Group, Wali Village, Langke District, Rembong Regency, Manggarai Regency. The sample was determined using a census method of 20

members of the Gotala Farmers Group. According to Sari et al. (2021), several analytical tools were used to analyze the data, namely:

1. Revenue Analysis

Farm income is the difference between revenue and all costs incurred in running the farm. Revenue is the product of the quantity of product produced multiplied by the unit selling price, while costs refer to the value of the use of production facilities and other costs in the production process. In this study, income is calculated using two cost components: cash costs and non-cash costs. The equation used is:

$$I = TR - TC$$

Information:

I = Income

TR = Total Revenue (Total Income)

TC = Total Cost

Total costs can be calculated based on cash costs and non-cash costs using the following formula:

$$TC = TFC + TVC$$

Information:

TC = Total Cost

TFC = Total Fixed Cost (Fixed Cost)

TVC = Total Variable Cost (Variable Cost)

Revenue can be calculated using the following formula:

$$TR = PXQ$$

Information:

TR = Total Revenue (Total Income)

P = Price (Price)

Q = Quantity (Production Quantity)

2. Feasibility Analysis

Soekartawi (2016), to find out the R/C ratio for cash costs and non-cash costs, it can be calculated using the equation:

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

Information:

R/C = Revenue and cost ratio

TR = Total revenue (Rp)

TC = Total cost (Rp)

The decision criteria are as follows:

If $R/C > 1$, the farming business is profitable and worth developing because the income is higher than the costs.

If $R/C = 1$, the farm experiences neither profit nor loss.

If $R/C < 1$, the farm experiences losses because revenue is less than costs.

3. BEP (Break Even Point) Analysis

Break Even Point (BEP) is a condition that indicates that in running a farming business there is no profit and no loss or in other words, income and costs are in the same condition, so that the resulting profit is equal to zero (Ulfah, et.al. 2020).

According to Suswadi et.al. (2023), BEP is calculated based on the BEP of cash costs and non-cash costs using the following formula:

3. BEP (Break-Even Point) in Production:

$$BEP_{\text{Production}} = \frac{\text{Fixed Costs}}{\text{Selling Price per Unit} - \text{Variable Cost per Unit}}$$

This formula calculates the *break-even point in terms of production volume*, or the number of units that must be produced and sold for total revenue to equal total costs (no profit and no loss). The numerator represents fixed costs, which do not change with production level, while the denominator represents the contribution margin per unit (the difference between selling price and variable cost per unit). The result shows how many units must be sold to cover all costs.

$$BE_{\text{Price}} = \frac{\text{Total Costs}}{\text{Total Production}}$$

This formula determines the *break-even price per unit*, or the minimum price that must be charged per unit of product to cover all production costs. Here, total costs include both fixed and variable costs, and total production refers to the total output produced. The result shows the lowest price per unit that ensures no financial loss for the producer.

4. Sensitivity Analysis

According to Amin et al. (2020), sensitivity analysis is conducted to assess the sensitivity of tomato farming to changes in cost or profit calculations. The analysis will be based on the level of price changes using various approaches and assumptions that approximate the reality in the field.

Yuniarsih and Halil (2020), sensitivity analysis can be seen from 3 predetermined scenarios, namely:

- 1) Selling price down 30%
- 2) Costs increase by 30%
- 3) Production down 30%

RESULT

a. Cost Analysis Results

Costs are sacrifices in the form of money calculated in rupiah units to carry out farming activities with the aim of making a profit. Costs are analyzed based on the costs.tcash and feesaNon-cash. The cost analysis used is the costs incurred by farmers during a three-month tomato growing season. Costs are classified into three categories.ttype,ynamely coststfixedccost), costvvariable (variablelcost) and coststtotal (totalccost). The average cost of tomato farming in the Gotala Farmers Group can be seen in Table 1.

Table 1. Average Cash and Non-Cash Costs of Tomato Farming in the Gotala Farming Group.

No	Description	Value (Rp)	
		Cash	Non-Cash

1	Fixed Costs		
	a. Depreciation of Agricultural Equipment	366,000	10,000
2	Variable Costs		
	a. TKLK	1,215,750	
	b. TKDK		1,492,000
	c. Production Facilities	2,211,662	
3	Total Cost	3,793,412	1,502,000

Source: Processed primary data, 2024

Table 1 presents the average cash and non-cash costs of tomato farming in the Gotala Farming Group. The data show that the total cash cost incurred by farmers amounts to Rp 3,793,412, while the non-cash cost reaches Rp 1,502,000. Cash costs primarily consist of variable expenses such as hired labor (TKLK) at Rp 1,215,750 and production facilities (inputs such as seeds, fertilizers, and pesticides) at Rp 2,211,662, along with a smaller component of fixed costs from the depreciation of agricultural equipment (Rp 366,000). Non-cash costs, on the other hand, include unpaid family labor (TKDK) valued at Rp 1,492,000 and the non-monetary depreciation of equipment estimated at Rp 10,000.

These findings indicate that tomato farming in the Gotala Farming Group is labor- and input-intensive, with variable cash expenditures forming the largest proportion of total costs. The relatively high proportion of non-cash costs, particularly from family labor, reflects the subsistence-oriented nature of smallholder farming systems where household labor contributes significantly to production without direct monetary compensation. This cost structure suggests that while farmers incur substantial out-of-pocket expenses, the inclusion of non-cash costs provides a more comprehensive picture of the true economic value of tomato production. Therefore, assessing profitability or efficiency in such contexts requires considering both cash and non-cash components

to accurately represent the economic performance and sustainability of the farming operation.

b. Results of Revenue and Income Analysis

The average income and revenue from tomato farming in the Gotala Farmers Group can be seen in Table 2.

Table 2. Average Income and Revenue of Tomato Farming in the Gotala Farmers Group.

Description	Mark
Cash costs (Rp)	3,793,412
Non-cash fees (Rp)	1,502,000
Revenue (Rp)	9,400,000
Income on cash costs (Rp)	5,606,588
Revenue over total costs (Rp)	4,104,588
R/C cash costs	2.48
R/C total cost	1.78
BEP cash price (Rp)	4,742
BEP cash unit	49
BEP total price (Rp)	6,619
Total unit break-even point	67

Source: Processed primary data, 2024

Table 2 presents the average income and revenue of tomato farming in the Gotala Farmers Group. The data show that the total revenue from tomato production reaches Rp 9,400,000, while the total cash and non-cash costs amount to Rp 3,793,412 and Rp 1,502,000 respectively. Based on these figures, the income over cash costs is Rp 5,606,588, and the income over total costs is Rp 4,104,588, indicating that tomato farming provides a positive profit margin even after accounting for both cash and non-cash expenses. The R/C ratios further support this finding, with an R/C ratio of 2.48 for cash costs and 1.78 for total costs, meaning that for every Rp 1 spent, farmers earn Rp 2.48 and Rp 1.78 respectively – values greater than 1, which signify that the farming activity is economically feasible.

The break-even point (BEP) analysis shows that the BEP cash price is Rp 4,742 per kilogram with a BEP production level of 49 kilograms, while the total BEP price is Rp 6,619 per kilogram with a BEP of 67 kilograms. These results suggest that as long as farmers sell their tomatoes above Rp 6,619 per kilogram and produce more than 67 kilograms, their operations remain profitable, indicating that tomato farming in the Gotala Farmers Group is both efficient and financially sustainable.

c. Feasibility Analysis Results

The results of the feasibility analysis of tomato farming in the Gotala Farmers Group can be seen in Table 3.

Table 3. Results of the Feasibility Analysis of Tomato Farming Business Based on Cash Costs and Total Costs in the Gotala Farmers Group

Description	Mark
Cash costs (Rp)	3,793,412
Non-cash fees (Rp)	1,502,000
Revenue (Rp)	9,400,000
Income on cash costs (Rp)	5,606,588
Revenue over total costs (Rp)	4,104,588
R/C cash costs	2.48
R/C total cost	1.78
BEP cash price (Rp)	4,742
BEP cash unit	49
BEP total price (Rp)	6,619
Total unit break-even point	67

Source: Processed Primary Data, 2024

Table 3 presents the results of the feasibility analysis of tomato farming in the Gotala Farmers Group, evaluated based on cash and total costs. The findings show that the total revenue from tomato production is Rp 9,400,000, while cash and non-cash costs are Rp 3,793,412 and Rp 1,502,000 respectively. Consequently, the income over cash costs is Rp 5,606,588 and income over total costs is Rp

4,104,588, indicating that tomato farming generates a considerable profit margin even after accounting for both types of expenditures. The R/C ratios, which measure economic efficiency, are 2.48 for cash costs and 1.78 for total costs. Since both values are greater than 1, this confirms that tomato farming is economically viable and profitable for the Gotala Farmers Group. Furthermore, the break-even point (BEP) analysis reveals that the BEP cash price is Rp 4,742 per kilogram with a BEP production of 49 kilograms, while the BEP total price is Rp 6,619 per kilogram with a BEP production of 67 kilograms. These results imply that farmers will start earning profits when production exceeds 67 kilograms and the selling price surpasses Rp 6,619 per kilogram. Overall, these findings demonstrate that tomato farming in the Gotala Farmers Group is a financially feasible and sustainable agricultural enterprise.

d. Sensitivity Analysis Results

A sensitivity analysis was conducted to evaluate the responsiveness of the tomato farming business in the Gotala Farmers Group. The sensitivity analysis was calculated based on cash costs. This study considered three possible changes: a 15% decrease in selling price, a 41% increase in costs, and a 38% decrease in production. The results of the sensitivity analysis are shown in Table 4.

Table 4. Sensitivity Analysis of Tomato Farming in the Gotala Farmers Group

No	Description	Normal Condition	Scenario I	Scenario II	Scenario III
			Selling price down 15%	Costs Up 41%	Production Down 38%
1	Tomato Price per Kg (Rp)	11,750	9,165	11,750	11,750
2	Production Amount (Kg)	800	800	800	640
3	Production Cost (Rp)	3,793,412	3,793,412	4,893,501	3,793,412
4	Revenue (Rp)	9,400,000	8,047,375	9,400,000	5,828,000
5	Income (Rp)	5,606,588	4,253,963	4,051,289	2,034,588
6	R/C	2.48	2.12	1.76	1.54
7	BEPPrice	4,742	4,742	6,686	7,648
8	BEPUnit	49	64	90	76

Source: Processed Primary Data, 2024

Table 4 presents the sensitivity analysis of tomato farming in the Gotala Farmers Group under three different scenarios: a 15% decrease in selling price, a 41% increase in production costs, and a 38% reduction in production quantity. Under normal conditions, tomato farming shows strong profitability, with revenue of Rp 9,400,000, income of Rp 5,606,588, and an R/C ratio of 2.48, indicating that every rupiah invested yields Rp 2.48 in returns. However, when the selling price decreases by 15% (Scenario I), revenue declines to Rp 8,047,375, and income drops to Rp 4,253,963, reducing the R/C ratio to 2.12, though the business remains feasible. In Scenario II, where production costs increase by 41%, income further decreases to Rp 4,051,289, and the R/C ratio falls to 1.76, showing reduced profitability but still indicating economic viability. In the most critical condition—Scenario III, where production decreases by 38%—revenue plunges to Rp 5,828,000, and income declines sharply to Rp 2,034,588, with the R/C ratio dropping to 1.54. The break-even price and production volume also increase significantly across the three scenarios, particularly in Scenario III (Rp 7,648 and 76 kg), highlighting greater financial vulnerability to production shocks. Overall, the sensitivity analysis suggests that tomato farming in the Gotala Farmers Group remains feasible under

moderate economic pressures but becomes less resilient when production volume decreases significantly, underscoring the importance of maintaining stable yields and efficient cost management for sustained profitability.

DISCUSSION

a. Farming Performance

The calculated costs represent the costs for a three-month tomato growing season. There are two types of costs in the tomato farming business at the Gotala Farmers Group: cash costs and non-cash costs. Cash costs include depreciation of agricultural equipment, labor costs outside the family, and production facility costs. Non-cash costs, on the other hand, include depreciation costs and labor costs within the family. Mahyudi and Husinsyah's (2019) research also classifies costs into two types: cash and non-cash. Non-cash costs are calculated in rupiah units based on the value of the cash cost components. Cash costs incurred by farmers at the Gotala Farmers Group are greater than non-cash costs.

Income is the result obtained by farmers from the selling price multiplied by total production. Based on Table 4.3, the average income in one planting season for 3 months of tomato farming in the Gotala Farmers Group is IDR 9,400,000. The income of the tomato farming business in the Gotala Farmers Group is obtained by multiplying the production yield (Kg) in one planting season by the selling price of tomatoes (IDR/Kg).

Income is obtained from the difference between revenue and total costs incurred by tomato farmers. The greater the income earned by farmers, the more successful their farming business is. The average income from cash costs in a three-month planting season is IDR 5,606,588, while income from total costs is IDR 4,104,588. Income from cash costs is greater than income from non-cash costs. The results of this study are similar to those conducted

by Saragih (2021) and Normansyah et al. (2014), which stated that income from cash costs is greater than income from total costs.

b. Farming Business Feasibility Analysis

Based on the feasibility analysis of tomato farming in the Gotala Farmers Group, the cash and non-cash costs obtained an R/C value of >1 , indicating that tomato farming is feasible. This study's results are similar to those of Fitria and Permana (2023), where the R/C analysis value for tomato farming among members of the Sejahtera Farmers Group was >1 , indicating that both farms are feasible.

BEP analysis is used to determine the condition of a farm that is neither experiencing profit nor loss. BEP is also commonly called farm break-even point. BEP The price of cash costs is Rp4,742/kg, meaning the break-even point for tomato farming capital in the Gotala Farmers Group is at Rp4,742/kg. While BEP The price of total costs is Rp6,619/kg, meaning the break-even point for tomato farming capital in the Gotala Farmers Group is at Rp6,619/kg. Based on Table 4.3, the calculation results of BEPU unit cash costs are 49 kg, meaning the break-even point for tomato farming in the Gotala Farmers Group is obtained when the production results are equal to 49 kg. While the analysis results of BEPU unit for total costs are 67 kg, meaning the break-even point for tomato farming in the Gotala Farmers Group is when production is equal to 67 kg. This study shows the difference in the calculation results of BEPU unit and BEP Price cash costs and total costs.

The results of the sensitivity analysis of tomato farming affect the cost level, production volume, revenue, income, and feasibility of tomato farming in the Gotala Farmers Group. Although there was a change in the results of the overall sensitivity analysis, the R/C analysis value of tomato farming in the Gotala Farmers Group showed a figure >1 , which means that tomato farming in the Gotala Farmers Group is feasible to run. A farming business is said to be sensitive if changes in prices, costs, and production will incur losses. Conversely, if changes in prices, costs, and production do not cause

losses, the farming business is not sensitive (Yuniarsih and Halil, 2020). The results of the study indicate that tomato farming in the Gotala Farmers Group is not sensitive to changes in prices, costs, and production.

CONCLUSION

Based on the results of the analysis and discussion, the following conclusions can be drawn:

The average cash costs incurred by tomato farmers in the Gotala Farmers Group were Rp3,793,412 and non-cash costs were Rp1,502,000 per tomato growing season. The average tomato farming income in the Gotala Farmers Group from cash and non-cash costs was Rp9,400,000 per growing season. The average income obtained by tomato farmers in the Gotala Farmers Group from cash costs was Rp5,606,588 and from total costs was Rp4,104,588.

The R/C analysis value of cash costs and total costs in tomato farming in the Gotala Farmers Group has a value of >1 , namely 2.48 and 1.78. The results of this analysis indicate that tomato farming in the Gotala Farmers Group is feasible to run. The results of the BEP Price calculation for cash costs and total costs in tomato farming in the Gotala Farmers Group are Rp4,742 and Rp6,619, BEP Unit for cash costs and total costs are 49 kg and 67 kg.

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