



# Analysis of Income of Tamarillo Farmers in Parinding Village Nosu District Mamasa Regency West Sulawesi Province Indonesia

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**ABSTRACT:** Tamarillo is a fruit that is rich in nutrients and beneficial for body health. Even though its potential is quite large for development, Dutch Eggplant is still not very familiar to the Indonesian people, especially in Mamuju district, West Sulawesi province. Even though tamarillo has a high selling value in the domestic and international markets. This research aims to determine the amount of income and feasibility of tamarillo farming. Sampling was carried out randomly by taking 10% of the population of 130 farmers, so the number of respondents was 13 people. The analysis used is descriptive qualitative and quantitative. Descriptive analysis is used to describe the characteristics of tamarillo farmers, while quantitative analysis is used to analyze the income and costs of tamarillo farming so that it can determine the feasibility of tamarillo farming. The research results show that the revenue obtained in one harvest season is IDR 28,700,000 with production costs of IDR 15,759,975, so the income obtained is IDR 12,940,025. Thus, Dutch eggplant farming is feasible and profitable to cultivate because it provides income 1.8 times the production costs incurred by Dutch eggplant farmers.

**KEYWORDS:** Tamarillo, Agriculture, Income, Business feasibility, Characteristics

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## I. INTRODUCTION

Tamarillo is a type of eggplant that can now be found in Indonesia. As the name suggests, tamarillo is a type of eggplant that comes from the Netherlands. However, this eggplant has been successfully developed in Indonesia since 1941 in Bogor. Tamarillo in scientific language is called (*Solanum betaceum* Cav) and is a fruit plant originating from South America, mainly found in countries such as Peru, Ecuador, and Colombia. Although the name contains "Dutch," this plant has no connection to the Netherlands, but may be called that because of its spread through Dutch colonialism in several regions [1]. This fruit is also known as "tree tomato" because its shape is similar to a tomato but has various colors, such as red, orange, yellow, or purple. Tamarillo has a soft texture and flesh that is rich in water. The taste is sour-sweet with a touch of refreshing acidity. This fruit is rich in vitamin C, vitamin A, fiber, and antioxidants[2]. Tamarillo also contains iron, phosphorus, and vitamin B complex. Dutch eggplant fruit can be eaten directly after peeling or cutting into pieces. Some people also process it into juice, sauce, jam, or use it as an additional ingredient in salads, pies, or other dishes.

Even though the potential is quite large for development, Tamarillo is still not very familiar to the Indonesian people. Apart from being rich in nutrition, tamarillo also has the potential to have high selling value in domestic and international markets. This fruit has the opportunity to be developed in Mamasa Regency, which is one of the areas in West Sulawesi Province where the majority of people work in agriculture. Based on the Central Statistics Agency (BPS) of West Sulawesi Province, in 2020 Mamasa Regency had an area of 3,005.88 km<sup>2</sup> with an altitude of approximately 2000 m above sea level. These conditions illustrate that Mamasa Regency is in a mountainous area which is suitable for tamarillo plants. Tamarillo grows well in soil that is rich in organic matter, well-drained, and has a Ph of 6.7 to 7.3. Usually, Tamarillo plants can be planted in the lowlands to an altitude of approximately 1000 m above sea level with an air temperature of 220 – 300 C in hot weather and dry climates and receiving sufficient sunlight.

Tamarillo is a family of eggplants that is unique compared to other eggplants because this fruit can be eaten directly without having to be processed first. [3]. Tamarillo fruit contains ingredients that are beneficial

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for the body. Tamarillo fruit is rich in vitamin E, vitamin B 6, and vitamin A which is good for eye health, vitamin C to treat canker sores and internal heat and increases endurance and fiber which is useful for preventing cancer and constipation [4]. Even though tamarillo fruit has the potential to be developed, the problem of low farmer production is due to the inefficient production process and inadequate ability of farmers to manage tamarillo fruit farming. Production problems relate to the nature of farming which always depends on nature, supported by risk factors due to the use of input factors (such as chemical fertilizers that are not as recommended) as well as pest and disease attacks, causing a high chance of production failure [5]. This shows that there are risks in farming activities, where production risks affect production results and influence tamarillo farming income. High production greatly influences increased income [6].

Previous research on tamarillo is very limited. This research generally only examines the processing and nutritional content of tamarillo fruit with various treatments such as the following: [7]; [8]; [9]; [10]; [11]; [12]; [13]; [14]. Meanwhile, research on the analysis of tamarillo business income has never been carried out. Therefore, a study is needed on the income analysis of Dutch eggplant farming in Parinding village, Nosu District, Mamasa Regency.

## **II. RESEARCH METHOD**

This research was located in Parinding village, Nosu District, Mamasa Regency, West Sulawesi Province. This location was chosen deliberately because the land and production of tamarillo are higher than other villages. This research was carried out from October to December 2023.

The population of Dutch eggplant farmers is 130 people. According to [15], if there are less than 100 subjects, then the entire population becomes the research sample. but if the subject is more than 100 then 10-15% or 15-25% can be taken. Sampling was carried out randomly by taking 10% of the population so that the number of respondents was 13 people. The analysis used is descriptive qualitative and quantitative. Descriptive analysis is used to describe the characteristics of tamarillo farmers, while quantitative analysis is used to analyze the income and costs of tamarillo farming so that the revenue and income ratio (R/C) can be calculated to determine the feasibility of tamarillo farming.

Income according to [16], is calculated by subtracting total revenue from total costs, using the formula as follows:

$$I = TR - TC$$

Information:

I = Income/Income (Rp)

TR = Total Revenue/Total Revenue (Rp)

TC = Total Cost (Rp)

Meanwhile, efficiency is the comparison between revenue and costs where revenue is greater than total costs. According to [17], to find out the R/C ratio obtained by tamarillo farmers in Parinding village, Nosu District, Mamasa Regency is as follows:

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

Information:

R/C ratio = Comparison between revenue and costs

TR = Total Revenue/Total Revenue (Rp)

TC = Total Cost (Rp)

Decision:

R/C ratio >1= the business is economically efficient profitable.

R/C ratio <1 = the business carried out is economically inefficient or unprofitable.

R/C = 1 = Means the business breaks even

## **III. RESULT AND DISCUSSION**

### **Respondent Characteristics**

Respondent characteristics are characteristics inherent in individuals that can differentiate them from other individuals. Each individual has their characteristics that are different from each other [18]. These characteristics are several aspects that influence farmers' skills in managing their farming business. The characteristics of respondents in this study include various information about their internal conditions, including age, level of formal education, number of family dependents, and experience in farming tamarillo. For more details, see Table 1 below.

Table 1. Characteristics of Tamarillo Farmers in Parinding Village, Nosu District, Mamasa Regency

| Number | Description                     | Amount (people) | Percentage (%) |
|--------|---------------------------------|-----------------|----------------|
| 1      | Farmer's Age                    |                 |                |
|        | a. < 20 years                   | 0               | 0              |
|        | b. 20 – 50 years                | 8               | 61,5           |
|        | c. > 50 years                   | 5               | 38,5           |
| 2      | Level of education              |                 |                |
|        | a. No school                    | 2               | 15,4           |
|        | b. Completed Elementary School  | 8               | 61,5           |
|        | c. Completed Junior High School | 1               | 7,7            |
|        | d. Finished High School         | 2               | 15,4           |
| 3      | Number of Family Dependents     |                 |                |
|        | a. < 2 people                   | 2               | 15,4           |
|        | b. 2 – 5 people                 | 10              | 76,9           |
|        | c. > 5 people                   | 1               | 7,7            |
| 4      | Farming experience              |                 |                |
|        | a. < 3 years                    | 9               | 69,2           |
|        | b. 3- 5 years                   | 2               | 15,4           |
|        | c. > 5 years                    | 2               | 15,4           |
| 5      | Land Area                       |                 |                |
|        | a. <0.5 hectares                | 10              | 76,9           |
|        | b. 0.5 – 1 hectares             | 2               | 15,4           |
|        | c. >0,5 hectares                | 1               | 7,7            |

Source: Data processing results, 2023

Table 1 shows that age level influences farmer productivity because physically they still have good abilities to carry out farming activities. The average age of respondent farmers is 49.05 years with a minimum age of 29 years and a maximum of 70 years. Thus, the majority of farmer respondents were of productive age, namely 20 years to 50 years, 8 people or 61.5%. In terms of age, it can be concluded that farmers are generally already productive, and still have excellent physical and energy skills in carrying out tamarillo farming. Farmers who are of productive age generally accept new information and innovation more easily and are quicker in making decisions in determining the technology to be applied in their farming business.

Education has an important role in efforts to increase human intelligence and skills, including educating and advancing the socio-economic development of farmers. The level of education also influences success in managing the business one is involved in. The higher the level of education makes farmers more responsive in accepting and implementing innovations, and more successful in managing their business. In terms of formal education, the majority of farmers (76.9%) did not attend school and only had an elementary school education.

The average length of farmer education is 7.56 years with a minimum length of 0 years and a maximum of 18 years. Low education will affect farmers' mindset in carrying out their farming activities. Apart from that, the level of education will also influence farmers in absorbing new information and innovations as well as technology transfer that can be applied in farming activities.

Having a large number of family responsibilities for farmers will increase their motivation to try to increase their income to support their families because they are the backbone of the family. The average number of dependents in farming families is 2 to 5 people or 88 people or 50.81%. The number of family dependents usually influences farmers as heads of households to be active in farming so they can meet their household needs. So that when the tamarillo is harvested, it is immediately sold to meet daily needs.

Farmers' experience in cultivating tamarillo on average is 2 years or as much as (69.2%). Tamarillo farming is not yet familiar to farmers, so farmers prefer to plant crops that have a clear market. This shows that tamarillo farmers in Nosu District have no experience in tamarillo farming.

The average land area owned by respondent farmers in the research area is 0.63 hectares per farmer, with a maximum range of 3.0 hectares and a minimum of 0.01 hectares per farmer. The number of farmers who have a land area of less than 0.5 hectares is 10 people (76.9%). The number of farmers who have a land area of 0.5 to 1 hectare is 2 people (15.4%). The number of farmers who have a land area above 1 hectare is 1 person (7.7%). Large areas of land require a large workforce to cultivate the land, if this is not balanced with good and correct planting and processing techniques, it will not produce maximum output [19].

### Receipts, Costs, and Income of Tamarillo Farmers

In general, net income or profit is the difference between gross income and total expenses. According to [20], farming revenue is the multiplication of production and selling price. The level of revenue is influenced by the selling price and the amount of production. Meanwhile, the costs incurred by farmers are fixed costs and variable costs. The sum of fixed costs and variable costs is total costs. So agricultural business income is the difference between revenue and all costs incurred by the producer. According to [21] states that income is the difference between receipts (total revenue) and total costs (total costs). The receipts, costs, and income of tamarillo farming can be seen in the following table.

Table 2. Revenues, costs and income from Dutch eggplant farming in Parinding village, Nosu District, Mamasa Regency.

| Number | Description               | Value      |
|--------|---------------------------|------------|
| 1      | Reception                 |            |
|        | a. Production (Kg)        | 4100       |
|        | b. Price (Rp/kg)          | 7,000      |
|        | Total Receipt             | 28,700,000 |
| 2.     | Fixed Cost                |            |
|        | a. Equipment Depreciation | 134,475    |
|        | b. Property taxes         | 50,500     |
|        | Total Fixed Cost          | 184,975    |
| 3      | Variable Costs            |            |
|        | a. Seedlings              | 225,000    |
|        | b. Fertilizer             | 5,700,000  |
|        | c. Pesticide              | 1,850,000  |
|        | d. Labor Wages            | 4,800,000  |
|        | e. Gasoline               | 3,000,000  |
|        | Total Variable Cost       | 15,575,000 |
| 4      | Total Cost (2 + 3)        | 15,759,975 |
| 5      | Income (1 – 4)            | 12,940,025 |
| 6      | R/C Ratio                 | 1,8        |

Source: Data processing results, 2023

Based on Table 2, tamarillo farming revenue is IDR 28,700,000, with tamarillo production of 4,100 kilograms with a selling price of IDR 7,000 per kilogram. The amount of use of production factors will of course be related to the amount of sacrifice in obtaining these production factors. The greater the use of production factors, the higher the costs that must be incurred by tamarillo farmers. The production costs that are taken into account are the costs that come from the sum of fixed costs and variable costs. Fixed costs incurred by farmers consist of equipment depreciation costs and property taxes. The amount of fixed costs incurred is IDR 184,975. Meanwhile, the variable costs incurred amounted to IDR 15,575,000, which consisted of the costs of seeds, fertilizer, pesticides, labor wages, and the cost of fuel used to transport tamarillo eggplants for sale to markets or traders. The total costs incurred by farmers are IDR 15,759,975,-, the sum of fixed costs and variable costs.

The results of the analysis show that the income earned by tamarillo farmers with an average land area of 0.63 hectares is IDR 12,940,025 per year. The balance between revenues and costs of tamarillo farming is feasible and profitable to cultivate because the balance between revenues and costs is greater than one or 1.8.

### IV. CONCLUSION

Based on research conducted in Parinding Village, Nosu District, Mamasa Regency, it can be concluded that tamarillo cultivation has the potential to be developed intensively and sustainably. Support from the characteristics of farmers who are of productive age and on average have quite large areas of land can motivate farmers to increase their farming business. The production costs of tamarillo farming are the costs incurred during one production season amounting to IDR 15,759,975. While the income obtained was IDR 28,700,000, the income received by tamarillo farmers was IDR 12,940,025. The feasibility of tamarillo farming shows that the income obtained is 1.8 compared to the production costs incurred.

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