

## Analysis of Income from Areca Nut Farming in Kuala Betara District Tanjung Jabung Barat Regency

Yusma Damayanti<sup>1</sup>, Ardhiyan Saputra<sup>2</sup>, Adinda Nur Safitri<sup>3</sup>

<sup>1,2</sup> Agribusiness Department, Faculty of Agriculture, University of Jambi. Indonesia

<sup>3</sup> Students of Agribusiness Department, Faculty of Agriculture, University of Jambi. Indonesia

Yusma Damayanti : [: https://orcid.org/0009-0009-6740](https://orcid.org/0009-0009-6740)

Ardhiyan Saputra : [: https://orcid.org/0009-0009-6740](https://orcid.org/0009-0009-6740)

Adinda Nur Safitri : [: https://orcid.org/0009-0009-6740](https://orcid.org/0009-0009-6740)

\*Corresponding author : [:adindasafitri486@gmail.com](mailto:adindasafitri486@gmail.com)

### ABSTRACT

*The objectives of this study were 1) To describe the description of areca nut farming in Kuala Betara District, Tanjung Jabung Barat Regency, 2) to analyze the income of areca nut farming in Kuala Betara District, and 3) to compare the income of areca nut farming with land area <1.5 ha and land area  $\geq$  1.5 ha in Kuala Betara District. By using snowball sampling with the number of sample farmers, namely 35 farmers. Data analysis in this study used the income formula and the t-test difference. The results of this study indicate that 1) The average area of farmer's land is 1,5 ha, with land ownership status of self-owned, 2) The average income of farming is Rp. 56.655.600 / farmer, with an average total cost of Rp. 42.634.116 / farmer, and the average income of farmers is Rp. 14.021.483 / farmer. 3) The results of the comparative analysis conducted on income per hectare in farming based on land area <1.5 ha and land area  $\geq$ 1.5 ha, showed that there was no significant difference in income from areca nut farming in Kuala Betara District, West Tanjung Jabung Regency. This is because areca nut farmers who have land area  $\geq$ 1.5 ha are less than optimal in carrying out the care and maintenance of areca nut plants.*

**Keywords:** areca nut, income analysis, comparison, farming

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### INTRODUCTION

The agricultural sector has an important role in supporting the national economy, the plantation subsector consistently provides the largest contribution to the export of agricultural products such as palm oil, rubber, and areca nuts (Suharyon, 2018). Areca nut plants are one of the commodities that have a high economy, both as industrial raw materials and export products.

Jambi Province, especially Kuala Betara District, Tanjung Jabung Barat Regency, is one of the centers of areca nut production. This district has a land area of 1,355 hectares and a total production of 1,128 tons in 2022. Areca nut plants in Kuala Betara District, the areca nut planting pattern used is the intercropping pattern (polyculture) and monoculture pattern. Areca nut farming is one of the important agricultural sectors in Kuala Betara. However, the low price of areca nut is a serious problem faced by areca nut farmers in the area. The low price of areca nut has a negative impact on farmers' income and the sustainability of areca nut farming.

A part from the fluctuation factor in the price of betel nuts, the area of land as a production factor plays a role which is very important in the agricultural production process. Land area functions as a place for farming activities and is the main source of agricultural products. According to Suratiyah (2006), the larger the area of land cultivated, the higher the production and income per unit area. However, although there is a relationship between land area and income, there is no certainty whether there is a significant difference in areca nut farming income between farmers who have different land areas.

### RESEARCH METHODS

This research was conducted in Kuala Betara District, precisely in Sungai Dungun Village and Kuala Indah Village. The selection of the research location was carried out intentionally (purposive sampling) with the consideration that the Kuala Betara District area is one of the centers of areca nut production in Tanjung Jabung Barat Regency..

The object of this study is farmers who carry out areca nut farming in monoculture. This data was taken from June to July 2024. The data collected in this study include primary data and secondary data. Primary data were obtained from interviews and direct observations in the research area, while secondary data were obtained from relevant research results and

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data from agencies related to the research. Sampling in this study used the snowball sampling method with a total of 35 monoculture farmers.

The analysis method used in this study is descriptive and quantitative analysis. Descriptive analysis method is used to explain the description of areca nut farming, while quantitative analysis is used to determine income and income comparison based on land area.

There are two data analysis used in this study, namely income analysis and different t-test. The analysis formula used is:

1. Analysis of Income from Areca Nut Farming Business

a. Areca Nut Farming Costs

The total cost of farm production can be calculated using the formula:

$$TP = FC + VC$$

Information:

TP = Total Production Cost

FC = Fixed Costs

VC = Variable Cost

b. Total Revenue

Total revenue, which is the multiplication of the production produced by the selling price, can be calculated using the following formula:

$$TR = P \times Q$$

Information :

TR =Total Revenue

P =Price

Q =Production Quantity

c. Income

To see net income, use the following formula:

$$\pi = TR - TP$$

Information :

$\pi$  = Income

TR = Total Revenue

TP =Total Production Cost

2. Difference t-test

Comparative analysis was conducted to compare income between farmers with land area <1.5 ha and  $\geq$ 1.5 ha. The t-test was used to determine whether there was a significant difference in income between the two groups. The t-test was conducted using statistical software such as SPSS with a confidence level of 95% ( $\alpha = 0.05$ ).

Comparative analysis of farm income is formulated as follows:

$$= \frac{\bar{X}_1 - \bar{X}_2}{S \sqrt{\frac{S_1^2}{n_1} + \frac{S_2^2}{n_2} - 2 \cdot r \left( \frac{S_1}{\sqrt{n_1}} \right) + \left( \frac{S_2}{\sqrt{n_2}} \right)}}$$

## RESULTS AND DISCUSSION

### Land area and number of trees

Land area is closely related to the production results obtained. The type of land in the research location is thin peat and old peat, the type of thin peat and old peat land is very suitable for planting areca nut plants. The land ownership status of areca nut farmers in the research location is their own. The area of areca nut land in Kuala Betara District is as follows:

**Table 1. Distribution of Areca Nut Farmer Respondents Based on Land Area Use**

Land area (Ha)	Frequency (Person)	Presentation (%)
< 1.5	21	60
$\geq$ 1.5	14	40
<b>Amount</b>	<b>35</b>	<b>100</b>

Source: Primary Data Processing Results, 2024

Table 1 shows that the majority of areca nut farmers in the research area have relatively small land areas. That is, as many as 60% of the total respondents or 1 person have a land area of <1.5 hectares, while 40% have a land area of ≥ 1.5 hectares.

The number of areca nut trees in 1 expanse of areca nut land also influences the measurement of the amount of areca nut production, the more areca nut trees the more areca nut production will increase during harvest. The following is data on the number of areca nut trees in one expanse of areca nut land in the research area.

**Table 2. Distribution of Areca Nut Farmer Respondents Based on the Number of Productive Areca Nut Trees**

Number of Trees	Frequency (person )	Presentation (%)
400 – 800	1	2.9
801 – 1.201	20	57.1
1.202 – 1.602	3	8.6
1.603 – 2.003	8	22.8
2.004 – 2.404	0	0
2.405 – 2.805	0	0
3.206 – 3.606	3	8.6
<b>Total</b>	<b>35</b>	<b>100</b>
<b>Average (Tree/Farmer)</b>	<b>1.386</b>	
<b>Average (Trees/Ha)</b>	<b>948</b>	

Based on Table 2. Distribution of the number of areca nut trees in the research area shows that most farmers have a number of trees in the medium to high category. In the range of 801 – 1.201 dominates, while the smallest number of trees is in the range of 400 - 800 trees. The average number per farmer reaches 1.386 trees, while the average per hectare is 948 trees. This shows that farmers have a fairly diverse number of productive trees, with most of them in the medium category.

#### Use of Herbicides

The use of herbicides in areca nut farming is not intended to overcome plant diseases or repel pests, but rather the use of pesticides is carried out with the aim of eradicating weeds that inhibit plant growth and interfere with the fertilization and harvesting process of areca nut farming.

Farmers use herbicides such as kontaxon, supretox and naraxon with spraying done twice a year. The details of the maintenance of areca nut farming in the research area can be seen in table 3.

**Table 3. Dosage of Drug Use in Areca Nut Farming**

Herbicide Amount (Liter)	Number of Farmers	
	Frequency (person)	Percentage (%)
5 – 9	22	62,9
10– 14	4	11,4
15 – 19	6	17,1
20 – 24	2	5,7
25 – 29	0	0
30 – 34	1	2,9
<b>Total</b>	<b>35</b>	<b>100</b>
<b>Average (Liter/Farmer)</b>	<b>9</b>	
<b>Average (Liter/Ha)</b>	<b>8</b>	

Source: *Primary Data Processing Results, 2024*

Table 3 shows the lowest herbicide use in areca nut farming in the research area, which is 5 liters/year, and the highest use is 32 liters/year. Areca nut farmers use the most herbicides in the range of 5-9 liters/year with a percentage of 62,9% of all respondent farmers. The average use of herbicides in 1 ha of areca nut land in the research location is 8 liters/ha/year. The use of herbicides for areca nut farming is adjusted to the number of weeds around the areca nut trees, there is no provision for the recommended dose. In addition to spraying herbicides with a frequency of twice a year or once a year.

#### Use of Fertilizers

Fertilization aims to enrich the soil with nutrients. Based on the results of a study of 35 samples of areca nut farmers in Kuala Betara District, it was found that the use of fertilizer in areca nut farming is still low. Of that number, only 17 farmers

(48.57%) use NPK fertilizer, while only 1 farmer (2,86%) uses Urea fertilizer. The rest do not use fertilizer in their areca nut farming.

At the research location, areca nut farmers fertilize twice a year. The following is a table of distribution of fertilizer use in areca nut farming as seen in Table 4.

**Table 4. Distribution of Fertilizer Use in Areca Nut Farming**

<b>Types of Fertilizers (Kg/Year)</b>	<b>Number of Farmers</b>	<b>Percentage(%)</b>
NPK	17	48,57
Urea	1	2,86
Do not use fertilizer	17	48,57
<b>Amount</b>	<b>35</b>	<b>100</b>

Source: *Primary Data Processing Results, 2024*

Based on Table 4, it can be seen that most areca nut farmers use NPK fertilizer, while the proportion of Urea fertilizer use is very small, and almost half of the farmers do not use fertilizer at all.. The use of NPK fertilizer in the research area is not in accordance with the recommendations in the book entitled *Cultivation of Medicinal and Spice Plants* by Al Qamari et al (2017), in the book there is areca nut cultivation and recommendations for the dosage of NPK fertilizer for areca nut plants. The recommendation for the use of NPK fertilizer is a minimum of 250Kg/Ha.

### **Plant Age**

According to Miftahurrochman (2015), flowering in areca nut plants begins when the plant is 4-6 years old, starting fruit production when it is 7-8 years old. Peak production occurs at the age of 10-15 years and continues until the age of 40 years. Then it becomes sterile until the plant dies. The following is data on the age of areca nut plants of respondent farmers in the research area.

**Table 5. Distribution of Areca Nut Farmer Respondents Based on Plant Age**

<b>Plant Age Betel nut</b>	<b>Frequency (Person)</b>	<b>Percentage (%)</b>
5 – 9	5	14,3
10 – 14	7	20
15 – 19	16	45,7
20 – 24	5	14,3
25 – 29	2	5,7
<b>Total</b>	<b>35</b>	<b>100</b>

Source: *Primary Data Processing Results 2024*

Based on table 5, it can be seen that the most areca nut farmers are in the range of 15-19 years with a percentage of 45,7%. While the least areca nut farmers are in the range of 25-29 years or 5,7%.

The average age of the areca nut plants of the respondent farmers in the research area is 16 years. It can be concluded that the average age of the areca nut plants of the farmers has reached productive age.

### **Use of Agricultural Tools**

Agricultural tools are supporting in running farming activities. The tools used in areca nut farming activities in the research area include machetes, sickles, hoes, tarpaulins, sacks and handsprayer. The use of machetes is used as an aid in post-harvest processing. The use of sickles added with long reeds is used to harvest areca nuts that are still on the tree. Hoes are used in fertilization and weed removal activities in farming together with spraying tools, namely handsprayer.

Areca nuts that have been peeled using a machete are then dried in the sun until dry, usually lasting for 1-4 days. The drying is done under direct sunlight using a tarpaulin as a base, then the dried areca nuts are put into sacks as storage containers to be sold later. The sacks used are used chicken feed sacks with a capacity of 50 kg. The sacks also function as containers when the harvest is carried out to be transported to the farmer's house.

### **Use of Labor**

Labor is the energy expended in a process of activity to produce a product. From the results of the study, the labor used by farmers in areca nut farming activities mostly uses family labor. The use of labor in areca nut farming in the research area includes fertilization activities, weed control, harvesting, post-harvest and transportation of the harvest. The labor wage system provided is a piece rate wage, which is a wage system that is given without considering the length of time worked.

### Farming Business Overview Based on Land Area

The land area limit of 1,5 hectares in this study was obtained from the average land area of respondent farmers in the research area.

These limits were chosen to reflect the general conditions of land managed by farmers, so that they can be used as a relevant benchmark in analyzing differences in income based on variations in land area.

### Total Cost of Areca Nut Farming

Total costs are all costs incurred in areca nut farming in the research area.

**Table 6. Average Total Cost of Areca Nut Farming**

No.	Cost breakdown	Rp/Farmer/Year		Average Total Overall (Ha)
		Land Area (Ha)	Land area (Ha)	
		< 1.5 ( 21 Farmers)	≥ 1.5 ( 14 Farmers )	1.5 (35 Farmers)
<b>Fixed Costs</b>				
1.	Land Rental	14.785.714	32.678.571	21.942.857
2.	Machete	10.679	13.786	11.921
3.	Sickle	12.086	12.343	12.189
4.	Tarpaulin	216.395	287.514	244.843
5.	Hand sprayer	95.443	95.336	95.400
6.	Bag	83.751	200.861	130.487
7.	Hoe	14.186	13.629	13.963
	<b>Total Fixed Cost</b>	<b>15.218.254</b>	<b>33.302.040</b>	<b>22.451.660</b>
<b>Variable Costs</b>				
1.	Fertilizer Cost	453.333	346.429	410.571
2.	Cost of Medicines	587.619	1.281.428	865.142
3.	Labor costs	13.706.094	26.707.714	18.906.743
	<b>Total Variable Cost</b>	<b>14.747.046</b>	<b>28.335.571</b>	<b>20.182.456</b>
	<b>Total Cost (FC+VC)</b>	<b>29.965.121</b>	<b>61.637.611</b>	<b>42.634.116</b>
	<b>Total Cost (Ha/Year)</b>	<b>30.358.265</b>	<b>28.714.376</b>	<b>29.700.710</b>

source: Primary Data Processing Results, 2024

From table 6, the total costs show that areca nut farming with a land area of  $\geq 1,5$  ha requires a much higher fund allocation, namely IDR 61.637.611/Farmer/Year compared to land area  $< 1,5$  ha. Farmers with larger land areas tend to incur higher fixed costs, especially for land rent and labor. The average total cost as a whole is calculated per hectare at 29.700.710 Rp/Ha/Year.

### Areca Nut Farming Business Revenue

The income of betel nut farming is influenced by the amount of betel nut production produced and the selling price prevailing at that time. The income of the farming business is the multiplication of the production obtained by the selling price. The average selling price of betel nut in one year is Rp. 5.250. The income of betel nut in this study can be seen in table 7.

**Table 7. Average Income of Areca Nut Farming Business June 2023 – May 2024**

Description	Rp/Year		Overall Total Average
	Land Area (Ha)	Land Area (Ha)	
	< 1.5 (21 Farmers)	≥ 1.5 (14 Farmers)	(35 Farmers)
Production	7.819	15.251	10.792
Price	5.250	5.250	5.250
<b>Revenue/Farmer/Year</b>	<b>41.049.250</b>	<b>80.065.125</b>	<b>56.655.600</b>
<b>Revenue/Ha/Year</b>	<b>41.434.417</b>	<b>37.898.000</b>	<b>40.019.850</b>

Source: Primary Data Processing Results, 2024

Table 7. Shows that the income from areca nut farming varies based on the area of land cultivated. Overall, the average total income of farmers from 35 research samples was 56.655.600/year. Farmers with land area  $\geq 1,5$  hectares receive a larger total income, which is Rp 80.065.125/farmer/year compared to farmers with land area  $< 1,5$  hectares who only receive Rp 41.049.250/farmer/year. This is because a larger land area provides more production opportunities..The overall average was calculated using a weighted average due to the different number of farmers in each group, namely 21 farmers for land  $< 1,5$  ha and 14 farmers for land  $\geq 1,5$  ha.

### Income from Areca Nut Farming

Farming income is the difference between revenue and costs incurred. The income obtained by farmers in this study is the amount of areca nut production multiplied by the price then reduced by the amount of costs incurred during the production process of areca nut samples in the research area can be seen in Table 8 below:

**Table 8. Average Income in Areca Nut Farming**

Description	Rp/Year		
	Land Area (Ha)	Land Area (Ha)	Total cost
	< 1,5 (21 Farmers)	≥ 1,5 (14 Farmers)	(35 Farmers)
Reception	41,049.250	80.065.125	56.655.600
Production cost	29.965.121	61.637.,11	42.634.116
Farming Income (Rp/Farmer/Year)	11.084.129	18.427.514	14.021.483
Farming Income (Rp/Ha/Year)	11.076.151	9.183.623	10.319.140

Source: *Primary Data Processing Results, 2024*

Based on Table 8, it can be seen that the average income of areca nut farming in the research area in one year of production is IDR 14.021.483 Farmer/Year and IDR 10.319.140 Ha/Year. Farmers with land area ≥ 1,5 ha have a higher total income, but when viewed from the income per hectare, the average income of farmers with land area <1,5 ha is slightly higher, which is IDR 11.076.151 per hectare compared to IDR 9.183.623 per hectare on land ≥ 1,5 ha.

From the data it can be seen that the total income is greater than the total costs incurred, this means that farmers' income can cover all costs incurred in the production process of areca nut farming in the research area. The average income of sample farmers is good enough to be used to cover the needs and financial support of farmer households when the price of the main agricultural commodities of sample farmers in the research area falls.

### Feasibility Analysis of Areca Nut Farming

#### R/C Ratio Analysis

**Table 9. Analysis of R/C Ratio of Areca Nut Farming in the Research Area in 2024**

Description	Rp/Farmer/Year		
	Land Area (Ha)	Land Area (Ha)	Total cost
	< 1,5 (21 Farmers)	≥ 1,5 (14 Farmers)	(35 Farmers)
Reception	41.049.250	80.065.125	56.655.600
Production cost	29.965.121	61.637.611	42.634.116
R/C Ratio	1,3	1,3	1,3

Source: *Primary Data Processing Results, 2024*

Based on Table 9 of the R/C Ratio analysis, areca nut farming in the research area is said to be feasible to be cultivated with an R/C Ratio value of 1.3 indicating that  $R/C > 1$ . This means that for every expenditure of Rp. 1,000, an income of Rp. 1,300 will be obtained.

#### Comparative Analysis of Areca Nut Farming Income Based on Land Area (< 1,5 Ha and > 1,5 Ha)

Comparative analysis is used to compare the average values of two groups with a certain level of confidence. In this study, the t-test was applied to determine whether there was a significant difference between two groups of farmers: those with land area <1,5 ha and those with land area ≥ 1,5 ha.

**Table 10. Results of the T-Test for Differences in Income from Areca Nut Farming Based on Land Area**

Land Group	N	Average Income (Rp)	Standard Deviation	t-count	Sig. (2-tailed)
< 1.5 Ha	21	11.076.151	2.787.973.742	1.497	0.144
≥ 1.5 Ha	14	9.183.623	4.704.881.294		

Source: *Primary Data Processing Results, 2024*

Based on table 10, it can be seen that the average income of farmers with land area <1,5 hectares is IDR 11.076.151/Ha/Year, while farmers with land area ≥ 1,5 hectares get an average income of IDR 9.183.623/Ha/Year. The results of the t-test show a t-count value of 1.497 with a significance level of 0.144 ( $p > 0.05$ ), meaning that the decision  $H_0$  is accepted and  $H_a$  is rejected, which means there is no difference in areca nut farming income in the two groups.

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The average difference in income between the two groups reached Rp 1.892.528 with a 95% confidence interval. The large area of land owned by farmers at the research location cannot affect the amount of income obtained. This is because of the problem of the irrigation system, where suboptimal drainage causes water stagnation in the irrigation channels. As a result, the plants experience damage in the form of yellowing stems which causes decreased productivity. Another problem is that there are plants that do not bear fruit due to less than optimal care, thus reducing the level of productivity.

Based on the description above, the results of this study are in line with the research conducted by Ningtyas et al (2022) that the size of the land area does not affect farmers' income because there are some plants that do not bear fruit due to lack of care so that the plants are diseased or unproductive. This study is also in line with the research conducted by Saknaria (2020), which found that land area does not have a significant effect on the income of areca nut farmers..

## **CONCLUSION**

Description of areca nut farming in the research area, the average land area owned by farmers is 1,5 ha. The herbicides used are Kontaxon, Supretox, and Naraxon as much as 8 liters/ha/year. For the use of fertilizers, it was found that the use of fertilizers in areca nut farming is still low, only 51,43% of areca nut farmers use fertilizers. Harvesting is done 12 times a year. The results show that the average income received by farmers is Rp. 14.021.483/year. With an average income of 56,655,600/year and an average total cost of Rp. 42,634,116/year. Based on the results of the comparative analysis conducted on income per hectare in areca nut farming based on land area, it shows that  $H_0$  cannot be rejected, which means that there is no significant difference in the income of areca nut farming in Kuala Betara District Tanjung Jabung Barat Regency. This is because areca nut farmers who have land areas of  $\geq 1,5$  ha are less than optimal in carrying out care and maintenance of areca nut plants.

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