

The Influence of the Number of Collection Centers, Areca Nut Prices in Jambi, and Production Volume on Areca Nut Exports in Jambi Province

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Abstract

This study aims to analyze: (1) the development of the number of collection centers, areca nut prices in Jambi, and production volume in relation to areca nut exports in Jambi Province; and (2) the influence of the number of collection centers, areca nut prices, and production volume on areca nut exports in Jambi Province. The research uses secondary data obtained from the Central Bureau of Statistics (BPS) of Jambi Province and the Jambi Provincial Plantation Office for the period 2005–2023. The analytical method employed is multiple linear regression with the assistance of Eviews 10 software. The results show that areca nut exports experienced fluctuations with an average growth rate of 17.58%, the number of collection centers by 6.51%, areca nut prices by 7.39%, and production volume by 19.24%. The regression results indicate that the number of collection centers and areca nut prices have a significant effect on areca nut exports, while production volume has no significant effect.

Keywords: Number of Collection Centers, Areca Nut Price, Production Volume, Areca Nut Export

INTRODUCTION

International trade serves as one of the main pillars of economic development, particularly for developing countries such as Indonesia, which relies heavily on exports as a source of foreign exchange. One of Indonesia's leading agricultural commodities that

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makes a significant contribution to non-oil and gas exports is areca nut. This commodity is widely used in various industrial sectors such as pharmaceuticals, cosmetics, and food, and has a relatively high economic value in the international market. Jambi Province is one of the main producers of areca nut in Indonesia, particularly in the districts of Tanjung Jabung Barat and Tanjung Jabung Timur. The export potential of areca nut from Jambi shows a fluctuating trend from year to year, influenced by several factors such as price, number of collection centers, and production volume.

According to data from the Central Bureau of Statistics (Badan Pusat Statistik - BPS, 2024), the export value of areca nut from Jambi Province in 2021 reached approximately US\$141 million, contributing nearly 40% of Indonesia's total areca nut exports. However, data from 2019–2023 show that the export volume of areca nut declined from 109,105 tons in 2019 to only 70,441 tons in 2023. This phenomenon indicates the existence of complex dynamics between production and distribution factors at the local level, which may affect export performance. The declining number of collection centers, fluctuations in domestic areca nut prices, and changes in production volume are factors that need to be further examined to understand the export patterns of areca nut in the region.

This study aims to analyze the development of these three variables and to examine the extent of their influence on areca nut exports during the 2005–2023 period. Furthermore, this research seeks to provide empirical evidence that can serve as a basis for formulating regional policies in developing the agricultural export sector, particularly areca nut commodities. The main research question addressed in this study is how the development of the number of collection centers, areca nut prices in Jambi, and production volume affects areca nut exports in Jambi Province, as well as the extent to which these variables influence export performance.

LITERATURE REVIEW

Theory of International Trade: According to Maimunah (2020), in her “diamond model” concept, a country's competitiveness in international trade is influenced by four main factors, one of which is supporting industries and infrastructure. The availability of supporting infrastructure such as transportation, information, and distribution systems plays an important role in enabling a product to compete globally.

Theory of Supply: One of the theories based on the concept of supply is the Heckscher–Ohlin (H–O) Theory, which explains that a country's trade patterns and goods supply are strongly influenced by the composition and abundance of its production factors.

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This theory assumes that a country will export goods that utilize abundant and relatively cheap production factors, while importing goods that require scarce or expensive production factors.

Theory of Export: Based on Nopirin (1999), international trade is an economic interaction between one country and another that involves the buying and selling of goods, services, and financial transactions with the aim of generating profits and fostering international cooperation.

Theory of External Support: According to Ramadhan (2021), external support such as favorable fiscal policies, export facilitation, and stable international trade relations play a crucial role in ensuring the smooth flow of goods to foreign markets.

THEORETICAL FRAMEWORK AND RESEARCH HYPOTHESIS

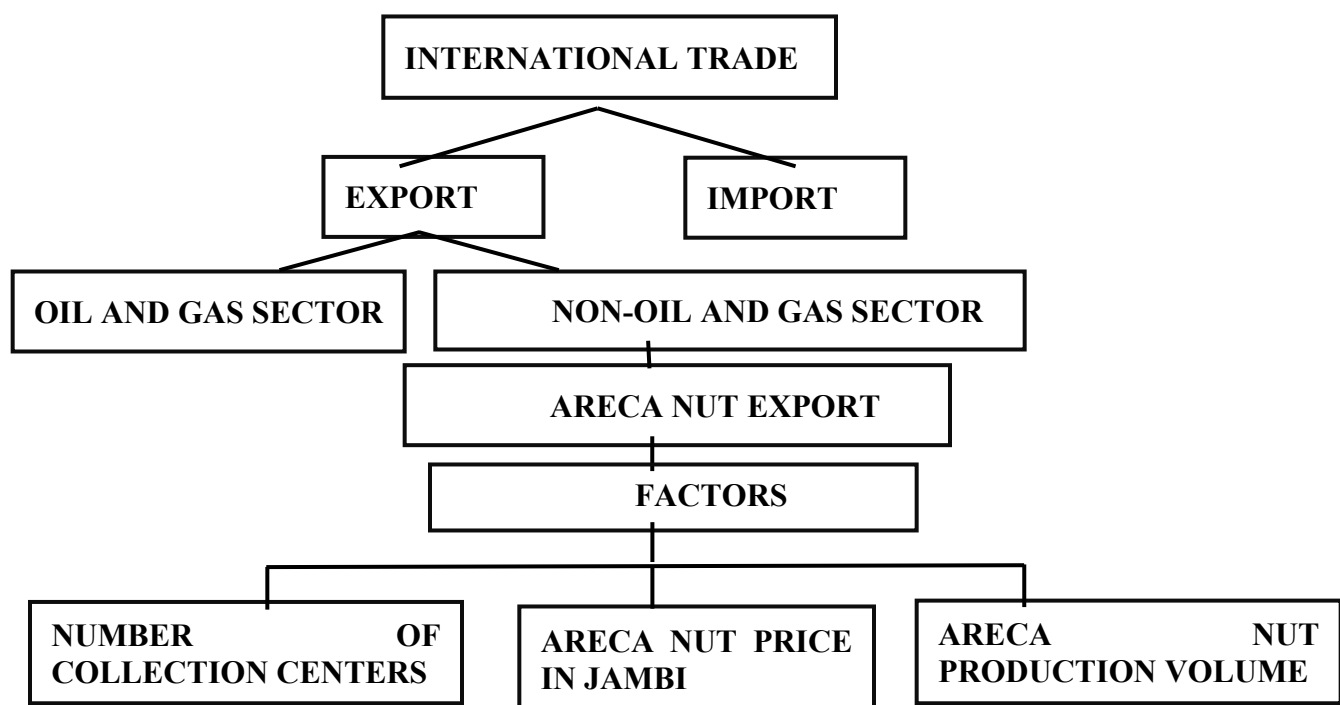


Figure 1. Conceptual Framework Diagram

HYPOTHESIS

It is hypothesized that the number of areca nut collection centers, areca nut prices in Jambi, and areca nut production volume have a significant effect on areca nut exports in Jambi Province.

RESEARCH METHODOLOGY

This study employs time series data covering the period from 2005 to 2023. The research uses secondary data obtained from the processed publications of the Central Bureau of Statistics (*Badan Pusat Statistik* – BPS), the Plantation Office of Jambi Province (*Dinas Perkebunan Provinsi Jambi* - DISBUN), international trade reports, and previous research as supporting references. The data were analyzed using Eviews 10 software. Data analysis was conducted in two stages: **descriptive analysis** and **multiple linear regression analysis**.

Descriptive analysis was used to provide an overview of the development of the number of areca nut collection centers, areca nut prices in Jambi, production volume, and areca nut exports during the study period. This analysis also helps to identify trends or patterns in the changes of each variable from year to year. The percentage growth of each variable is calculated using the following formula:

$$\Delta x_n = \frac{x_n - x_{n-1}}{x_{n-1}} \times 100\% \quad (1)$$

Where:

- x : Research variable
- Δx_n : Percentage change (growth) in year n
- x_n : Data value in the current year
- x_{n-1} : Data value in the previous year

Through this descriptive analysis, the direction of change for each variable can be identified, whether it shows an increase or a decrease from year to year, thereby providing a foundational understanding of the dynamics of areca nut exports in Jambi Province.

Furthermore, to analyze the relationships among variables and to test the research hypotheses, a multiple linear regression model was employed. This model was chosen because it is capable of explaining the effect of more than one independent variable on a single dependent variable simultaneously. The general form of the multiple linear regression equation used in this study is as follows:

$$EKS = \beta_0 + \beta_1 JPP + \beta_2 HPJ + \beta_3 VPP + e \quad (2)$$

Where:

- EKS = Export (Dependent Variable)
- β_0 = Constant
- JPP = Number of Areca Nut Collection Centers



HPJ = Areca Nut Prices in Jambi
 VPP = Areca Nut Production Volume
 e = Error Term
 $\beta_1, \beta_2, \beta_3$ = Regression Coefficients

RESULT

Development of Areca Nut Exports in Jambi Province

The highest increase occurred in 2011, when the growth rate of export volume reached an exceptional level of 72.67 percent compared to the previous year. Meanwhile, the sharpest decline occurred in 2009, with a negative growth rate of -33.38 percent. The average growth rate of areca nut exports during the period 2006–2023 was approximately 17.58 percent.

Development of the Number of Areca Nut Collection Centers in Jambi Province

The highest growth occurred in 2006, amounting to 25 percent. In contrast, the largest decline or negative growth occurred in 2021, at -12.00 percent. This decrease in the number of collection centers was caused by the decline in areca nut export volumes in previous years, fluctuations in international market prices, and the impact of the COVID-19 pandemic. The average annual growth rate was 6.51 percent.

Development of Areca Nut Prices in Jambi

In 2016, areca nut prices in Jambi experienced a sharp increase of 44.22 percent. However, a significant decline occurred in 2021, at -30.74 percent, which can be associated with the global COVID-19 pandemic, leading to a drop in areca nut prices. The average growth rate of areca nut prices over the 19-year period was 7.39 percent.

Development of Areca Nut Production Volume in Jambi Province

The highest surge occurred between 2007 and 2008, when production volume increased from 9.13 thousand tons to 17.89 thousand tons, or approximately 96 percent. Conversely, the sharpest decline occurred between 2016 and 2017, at -32.9 percent, when production fell from 19.97 thousand tons to 13.4 thousand tons. The average annual growth rate was 19.29 percent.



Classical Assumption Tests**1) Normality Test**

The probability value of the Jarque–Bera test is 0.110 (> 0.05), indicating that the data are normally distributed, and thus meet the normality assumption.

2) Multicollinearity Test

The Variance Inflation Factor (VIF) values for all independent variables are < 10.00 , indicating that the model is free from multicollinearity.

3) Heteroscedasticity Test

The probability value of Obs*R-Squared is 11.952 (> 0.05), suggesting that the heteroscedasticity assumption is fulfilled, and the data are free from heteroscedasticity problems.

4) Autocorrelation Test

The Obs*R-Squared value of 2.724 (> 0.05) indicates that there is no autocorrelation problem in the model, and thus the data pass the autocorrelation test.

Regression Results**Table 1. Results of Multiple Linear Regression Analysis**

Dependent Variable: EKS				
Method: Least Squares				
Date: 08/03/25 Time: 20:38				
Sample: 2005 2023				
Included observations: 19				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-38887418	8429717.	-4.613134	0.0003
JPP	2526521.	619782.3	4.076465	0.0010
HPJ	3142.426	1711.859	1.835681	0.0863
VPP	6985.691	4144.689	1.685456	0.1126
R-squared	0.909172	Mean dependent var		53981169
Adjusted R-squared	0.891006	S.D. dependent var		31937673
S.E. of regression	10543966	Akaike info criterion		35.36467
Sum squared resid	1.67E+15	Schwarz criterion		35.56350
Log likelihood	-331.9644	Hannan-Quinn criter.		35.39832
F-statistic	50.04905	Durbin-Watson stat		1.708847
Prob(F-statistic)	0.000000			



Hypothesis Testing

F-Test

The F-test, or simultaneous significance test, was conducted to examine whether all independent variables collectively have a significant effect on the dependent variable. Based on the regression results, the **Prob (F-statistic)** value is **0.000000 < α (0.05)**. Therefore, it can be concluded that the number of areca nut collection centers, areca nut prices in Jambi, and areca nut production volume have a **positive and significant effect** on the volume of areca nut exports in Jambi Province.

T-Test

The t-test, or partial significance test, was conducted to determine whether each independent variable (number of areca nut collection centers, areca nut prices in Jambi, and areca nut production volume) has a significant effect on the dependent variable (volume of areca nut exports) individually. The test of each regression coefficient was carried out using the t-table with a significance level of **$\alpha = 10\%$** and a confidence level of **90%**.

1. Number of Areca Nut Collection Centers

Based on the results of the t-test, the calculated t-value for the number of collection centers variable is **4.076**, with a significance value of **0.001**, which is below $\alpha = 10\%$ ($0.001 < 0.10$). Thus, **H_0 is rejected and H_a is accepted**, indicating that the number of areca nut collection centers has a **positive and significant effect** on areca nut export volume in Jambi Province.

2. Areca Nut Prices in Jambi

Based on the results of the t-test, the calculated t-value for areca nut prices in Jambi is **1.835**, with a significance value of **0.086**, which is below $\alpha = 10\%$ ($0.086 < 0.10$). Therefore, **H_0 is rejected and H_a is accepted**, meaning that areca nut prices in Jambi have a **positive and significant effect** on the volume of areca nut exports in Jambi Province.

3. Areca Nut Production Volume

Based on the results of the t-test, the calculated t-value for the production volume variable is **1.685**, with a significance value of **0.112**, which is above $\alpha = 10\%$ ($0.112 > 0.10$). Hence, **H_0 is accepted and H_a is rejected**, indicating that the areca nut production volume has **no significant effect** on areca nut export volume in Jambi Province.



Coefficient of Determination (R^2)

The coefficient of determination (R^2) was used to measure the contribution of the independent variables to the dependent variable. The R^2 value obtained was **0.9091**, indicating that **90.92 percent** of the variation in areca nut export volume in Jambi Province is explained by the number of areca nut collection centers, areca nut prices in Jambi, and areca nut production volume. The remaining **9.08 percent** is explained by other variables not included in the regression model.

DISCUSSION***The Effect of the Number of Areca Nut Collection Centers on Areca Nut Exports in Jambi Province***

In this study, the proposed hypothesis states that the number of areca nut collection centers has a significant effect on the volume of areca nut exports. Based on the data analysis, the regression coefficient for the number of collection centers variable is **2.526521**, which means that a 1% increase in the number of collection centers leads to a **2.52%** increase in export volume, assuming other factors remain constant. This finding indicates that the number of collection centers significantly affects the volume of areca nut exports in Jambi Province. Therefore, the results support the initial hypothesis that the number of collection centers has a significant influence on areca nut export volume in Jambi Province.

These findings are consistent with the study conducted by **Nofrizal, Y. (2021)**, which found that the number of collection centers had a positive and significant impact on areca nut exports. The greater the number of collection centers, the more efficient the distribution and market access. Similarly, **Sari, D. A., & Ramadhan, F. (2020)** concluded that collection centers play a significant role in shortening the distribution chain of agricultural products, including areca nuts and palm oil.

Thus, if the analysis shows that the number of collection centers (JPP) has a significant effect, it means that a higher number of collection centers helps farmers distribute their harvests more easily to exporters, thereby increasing exports. However, if the result is insignificant, it implies that existing collection centers have not been fully optimized—possibly due to limited facilities, long distances, or inefficient distribution coordination.



The Effect of Areca Nut Prices in Jambi on Areca Nut Exports in Jambi Province

In this study, the proposed hypothesis suggests that areca nut prices in Jambi significantly affect the volume of areca nut exports. Based on the data analysis, the regression coefficient for this variable is **3.142426**, indicating that a 1% increase in areca nut prices in Jambi leads to a **3.14%** increase in export volume, assuming other factors remain constant. This finding shows that areca nut prices in Jambi have a significant effect on the export volume of areca nuts in Jambi Province. Therefore, this result supports the initial hypothesis that areca nut prices significantly influence areca nut exports in Jambi Province.

This finding aligns with the research by **Natassia (2016)**, who found that prices had a positive and significant effect on the export values of areca nuts and palm oil during 2000–2022, indicating that higher export prices correspond to higher export values of these commodities. It is also consistent with the study by **Wasilaine (2014)**, which found that areca nut export values were significantly influenced by price and production volume. That study analyzed leading plantation commodities such as rubber, palm oil, and areca nuts in Jambi using time-series regression analysis.

The Effect of Production Volume on Areca Nut Exports in Jambi Province

According to the data analysis, the regression coefficient for the production volume variable is **6.985691**. The results indicate that production volume does **not have a significant effect** on areca nut exports in Jambi Province, which means the finding does not support the initial hypothesis. The insignificant effect of areca nut production volume may be attributed to several factors influencing distribution channels and trade decisions. Although production levels may increase, not all harvested areca nuts are allocated for export, as a substantial portion may be absorbed by domestic markets for direct consumption or local industrial use. Moreover, product quality plays a crucial role—high production levels without meeting international quality standards may prevent the commodity from being absorbed in the export market.

This finding is consistent with the study by **Safitri (2024)**, which stated that production has a negative and insignificant effect on the export volume of potential plantation commodities. Despite large production volumes, exports do not automatically increase due to constraints in distribution and quality. Similarly, **Hartono (2021)** found that the production variable had no significant effect, indicating that microeconomic quality and global prices have a stronger influence than production volume availability.



CONCLUSION AND SUGGESTIONS

Conclusion

The development of areca nut exports in Jambi Province during the period 2005–2023 showed an average growth rate of 17.58 percent. The development of the number of areca nut collection centers also fluctuated, with an average growth of 6.51 percent. Similarly, the development of areca nut prices in Jambi fluctuated with an average of 7.39 percent, and the volume of areca nut production experienced fluctuations with an average growth of 19.24 percent. Based on the regression results, the variables number of collection centers and areca nut prices in Jambi have a significant effect on areca nut exports in Jambi Province, while the production volume variable does not have a significant effect on areca nut exports in the province.

Suggestions

The Department of Trade and the Department of Industry as relevant institutions should make efforts to stabilize and strengthen the areca nut export market. This can be achieved by establishing long-term trade partnerships with export destination countries, maintaining supply continuity, and ensuring compliance with international quality standards. The Department of Plantations and the Department of Trade should not only focus on increasing the quantity of production but also pay attention to the quality and international standards of areca nut products. The government should provide training and technical assistance to farmers and entrepreneurs regarding export-oriented areca nut cultivation practices.

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