

## Study of the things that affect the income of coconut farmers

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### ABSTRACT

*The objective of this research is as follows: The objective is to identify and examine the variables that impact the earnings of coconut growers in the Mentaya Hilir Selatan District. The research findings indicate that the variables of land area (X1), productivity (X2), and pricing (X3) have a simultaneous impact on the income variable (Y). This implies that the independent variables have a concurrent and tangible impact on income or variable (Y) as a whole. The recommendations that can be derived from the findings of this research to enhance outcomes are: The aim is for the findings of this study to serve as a reference and assessment for enhancing coconut business management. Particularly while initiating a coconut cultivation enterprise in Sebamban Village, Mentaya Hilir Selatan District.*

*Keywords: Income, land area, production, and prices.*

### I. INTRODUCTION

Indonesia is recognized as an agrarian nation whose economy is closely tied to the agricultural sector. It serves as a crucial source of food for the entire population and plays a pivotal role in facilitating industrial expansion by supplying raw materials for industries. The agricultural sector comprises the subsectors of food crops, horticulture, fisheries, livestock, and forestry. Agriculture is a prominent sector in Indonesia, as the majority of the population is engaged in farming and it plays a significant role in their income (Zakiah et al., 2023). Nevertheless, agricultural productivity remains much below anticipated levels. Insufficient human resources in the processing of agricultural land and its yields is a contributing cause to the low agricultural output. Most farmers in Indonesia continue to employ manual methods for cultivating agricultural land. Economic development is a key indicator of the presence of economic growth in a certain location. In other words, economic growth serves as evidence of economic development (Bawono, 2021)

Agricultural growth in Indonesia is deemed crucial for comprehensive national progress. Several key factors contribute significantly to agricultural development in Indonesia, including its abundant and diverse natural resources, substantial contribution to the national income and exports, the significant number of Indonesians who rely on this sector for their livelihoods, its crucial role in ensuring food security, and its contribution to the growth of rural areas. The coconut (*Cocos nucifera* L) plays a crucial role in Indonesian society and is considered a valuable social commodity. This is due to the fact that coconuts are one of the nine essential dietary items for the community. The significance of this strategic

position is seen in the vast expanse of coconut plantations in Indonesia, which covers a total area of 3,712 million hectares (31.4%), making it the largest coconut plantation area globally. Indonesia is the second largest producer of coconuts in the world, accounting for 12,915 billion units (24.4% of global production) (Alouw & Wulandari, 2020).

A significant portion of the untapped potential of coconut remains unutilized because to numerous barriers, namely technological limitations, lack of funding, and uneven market penetration (Sabirin et al., 2021). In addition to serving as a vegetable oil source, coconut plants also generate income for farming families, contribute to foreign exchange for the country, create employment opportunities, stimulate the establishment of new economic centers, and drive the growth and development of downstream industries that rely on coconut oil and its by-products in Indonesia (Zainol et al., 2023). Nevertheless, the regions where production is concentrated include Aceh, North Sumatra, Riau, Lampung, West Java, Central Java, East Java, North Sulawesi, Central Sulawesi, South Sulawesi, NTT, and Maluku. The vast potential must be used in order to elevate farmers' income levels as well (Haryanto et al., 2022).

The economic importance of coconuts lies in their versatility since they can be processed into many products such as coconut oil, coconut sugar, and dried coconut flesh, all of which have significant market value (Sigiro et al., 2023). It has attained a significant value and is now traded as a commodity known as copra. Copra refers to the freshly extracted meat of a coconut that can be dehydrated through different techniques, such as exposure to sunshine or smoking. Copra processing involves the removal of water from coconut flesh. The drying process reduces the original water content of fresh coconut flesh, which is typically around 50%, to a water level of approximately 57% (Aulia et al., 2020).

According to the available data, the total land area occupied by coconut plantations in East Kotawaringin in the year 2019 was approximately 15,392.13 hectares. The coconut production in this region amounts to 4,559.77 tons, with a productivity rate of 375.50 kg per hectare. The largest garden area is located in the Mentaya Hilir Selatan District, measuring 1,371.74 hectares. Additionally, there are gardens in Sampit Bay spanning 4,528 hectares and Hanaut Island covering 1,706 hectares. The remaining are distributed across 14 other sub-districts. The number of planters has witnessed an increase, specifically from 13,671 families in 2018 to 13,861 families in 2019. The current price of coconuts is at its minimum level of Rp. 500 per unit, while in favorable conditions, the price can reach as high as Rp. 2,500 per unit. During periods of elevated prices, only inferior and diminutive coconuts are utilized for copra production, while superior quality coconuts are sold in their whole. Serabut Village in Mentaya Hilir Selatan District is renowned for its exceptional coconut production, characterized by large yields and coconuts with substantial flesh content (Naya et al., n.d.).

Developing a business in Mentaya Hilir Selatan District that involves processing coconuts into copra is a promising opportunity, given the substantial annual coconut yield in the area. The expectation is that coconut processing can yield higher revenue and generate additional value for farmers. The author was motivated to do study in order to gain further insights into copra farming as a processed coconut product in the Mentaya Hilir Selatan District.

## II. LITERATURE REVIEW

Added value is acquired from the value of the finished product minus intermediate costs which consist of the costs of raw materials and auxiliary materials in carrying out the production process. Agricultural goods, typically in their unprocessed form, are perishable and so require prompt consumption. Processing agricultural products can enhance the utilization of agricultural commodities. An widely utilized idea for discussing the processing of this commodity is the notion of added value (Heikal et al., 2022).

Added value as the output of a business after subtracting intermediary expenses/costs, the increase in the number of final units of a product at each production stage, and the reduction in output value due to the purchase of raw materials and depreciation set aside by the company. Added value refers to the net sales value obtained after subtracting the costs of raw materials and other internal

expenses (Erokhin et al., 2023). Added value refers to the disparity between the value of manufacturing output generated by a company and the input costs (intermediate costs) incurred.

Expenses as the total amount of money expended in the process of conducting an activity. During the production process, costs typically encompass the expenditure on inputs or raw materials, the reduction in value of fixed assets, and additional expenses that are not accounted for in the price of raw materials and depreciation costs. In trading organizations, costs often include the prices of merchandise, transportation expenses, treatment expenses, punishment expenses, and long-term asset depreciation expenses (Ajmal et al., 2022).

The correlation between these two categories of expenses and the quantity and kind of products or output will vary in terms of both quantity and type, as well as in terms of the structure of the cost equation or function. Farming production costs as the total expenses incurred in planning and executing the production process. This includes the capital, inputs, and services utilized in the production process and their incorporation into the final output (Siagian & Soetjipto, 2020). Production costs can be categorized into four distinct groups, which are as follows:

1. Fixed costs refer to expenses that are not fully consumed during a single manufacturing period. The magnitude of fixed costs is contingent upon the level of output generated and must be borne regardless of whether production occurs or not. The fixed costs consist of several components such as land tax, water tax, depreciation of agricultural equipment and buildings, livestock maintenance, water pump maintenance, tractor maintenance, credit/loan fees, and other similar expenses. Family labor can be classified as fixed costs when there are no additional expenses associated with its utilization, and when there is a limited availability of labor, particularly in the context of agriculture or non-agricultural activities.
2. Variable costs, also known as non-fixed costs, refer to costs that fluctuate based on the level of production or sales. The size is contingent upon the costs associated with the scale of production. The variable cost components encompass fertilizer, seeds/seedlings, pesticides, hired labor, harvesting, processing, land, and land rent. Production costs, often known as total costs, are the aggregate of fixed costs and variable costs.
3. Fixed costs might manifest as financial expenses such as land tax and water tax, whereas variable costs encompass expenditures for seeds, fertilizers, insecticides, and non-family labor (wage labor).
4. Non-cash costs (computed) encompass fixed expenses such as land leasing, agricultural equipment depreciation, credit interest, and other related expenses. Meanwhile, variable costs encompass labor costs, expenses related to harvesting and land processing, as well as the quantity of manure utilized.

Costs as the monetary value that is given up or expended in order to generate income or revenue, resulting in a decrease in overall earnings. Costs refer to the relinquishment of economic resources, quantified in monetary units, that have been, are currently being, or are expected to be incurred for specific objectives (Aulia et al., 2020). The expenses incurred during production can be categorized into two types: Explicit costs refer to the actual payments made by producers for external inputs used in the manufacturing process, such as hiring external labor and utilizing production facilities. Implicit costs refer to the expenses associated with the production elements that are directly involved in the manufacturing process to create the output (Zakiah, 2022). The costs encompassed in these figures consist of depreciation expenses, land rental fees, remuneration for family work, and interest payments on personal capital. As the quantity of products manufactured increases, the price per unit of the specific product also rises, resulting in a larger total revenue for the producer. Conversely, when the product output is limited and the price is reduced, the overall revenue obtained by the producer would be diminished. The total revenue spent will result in net income, which represents the profit earned by the producer.

Farming revenue refers to the aggregate worth of all the output generated by a farm, which is calculated by multiplying the quantity of output by the price per unit. Practically, farmers engage in

multiple types of farming, resulting in money derived from various sources. Various cultivation methods exist, including monoculture, intercropping, and integrated cultivation. Therefore, the revenue acquired by farmers comprises the whole of all earnings derived from their agricultural endeavors conducted on their own property (Purnawan et al., 2021). Income refers to the amount of money earned after deducting all incurred expenses. An individual's income mostly relies on employment in either the service or production industry, along with the number of hours worked and the rate of hourly compensation received.

Income refers to the total amount of money earned by individuals for their labor throughout a specific timeframe, such as daily, weekly, monthly, or yearly. Business activities will ultimately generate revenue by subtracting the incurred costs from the value of money obtained from product sales. Income refers to the total amount of money that individuals earn for their employment within a specific time frame, such as on a daily, weekly, monthly, or yearly basis (Salima et al., 2020). Income serves as a metric for assessing the well-being of individuals and societies, thereby reflecting the economic advancement of a civilization. Income analysis as the subtraction of all production costs from revenue. Land Area: The significance of land production variables extends beyond its size and extent. It encompasses additional characteristics such as soil fertility, forms of land usage (such as rice fields or moors), and topography (including coastal plains and lowlands (Fachriyan & Wijaya, 2019). The topics covered in the text include highlands, land ownership, land value, land fragmentation, and land consolidation.

Costs associated with the production process, expenses play a crucial role in determining the efficiency of the production process (Pirmana et al., 2021). Production costs are categorized into distinct types:

1. Fixed costs refer to expenses that are not fully utilized within a single production period, such as land tax and depreciation of agricultural and heavy equipment (tractors).
2. Variable costs refer to expenses that arise directly from the production process, such as the cost of fertilizers, labor or hired workers, and expenses related to harvesting.
3. Labor is quantified by the quantity of labor employed, specifically the quantity of productive work utilized.

The magnitude of an agricultural enterprise will impact the manpower requirements and also dictate the specific sort of workforce required. Labor is a crucial element in agricultural productivity (Trigo et al., 2021). The utilization of labor will serve as a motivating factor if the labor input can yield maximum advantages in the production procedure and is capable of operating on a scale equivalent to the size of the land possessed. The labor services utilized are remunerated through wages. Family labor is typically undervalued and challenging to quantify in terms of its utility, or it can be referred to as non-monetized labor.

### III. METHODS

The research employs a sophisticated quantitative analytic method to ascertain the income level of coconut (copra) farmers and identify the elements that impact their revenue. The research utilizes both quantitative and qualitative data (Sugiyono, 2017).

1. Quantitative data refers to numerical information, such as the count of coconut farmers, income generated from coconut farming, and profits obtained from coconut farming. This data is specifically relevant to study conducted in Sebamban Village, Mentaya Hilir Selatan District.
2. Qualitative data refers to non-numerical information, specifically the personal details of respondents and the issues that arise in Sebamban Village, Mentaya Hilir Selatan District.

The data was gathered utilizing the subsequent data collection methodologies:

1. Observation is a method of gathering data by directly observing the ongoing copra processing processes in the Mentaya Hilir Selatan District.
2. The interview approach involves posing questions and receiving replies from respondents/coconut (copra) farmers in Mentaya Hilir Selatan District in order to gather information for this research,

utilizing a questionnaire sheet.

3. The task involves documenting information by capturing photographs in the Mentaya Hilir Selatan District.

The research use the multiple linear regression analysis approach to ascertain the income level of coconut (copra) farmers and identify the elements that impact their revenue. Regression analysis is a statistical technique employed to examine the association between variables. The relationship can be represented by an equation that links the independent variables  $X_1, X_2, X_3, \dots, X_n$ . The regression analysis was conducted using a sample dataset. This study employs a multivariate regression analysis technique based on the Cobb-Douglas production function.

#### IV. RESULTS AND DISCUSSION

The t statistical test is employed to quantify the extent of the relationship between the independent variable and the dependent variable separately. The presence of a significant or insignificant influence can be determined by applying the t statistical test to the findings of regression data analysis. Decision making as the process of selecting choices or reaching conclusions based on careful analysis and evaluation (Flores-Garcia et al., 2021).

1. If the p-value is less than 0.05, the null hypothesis ( $H_0$ ) is rejected, indicating a significant relationship between the dependent variable and the independent variables individually.
2. If the p-value is greater than 0.05, the null hypothesis ( $H_0$ ) is accepted, indicating that there is no statistically significant relationship between the dependent variable and the independent variables separately.

According to the findings, the impact of each independent variable on the dependent variable can be elucidated as follows:

1. Relationship between land area ( $X_1$ ) and income ( $Y$ )

The statistical analysis of the relationship between the capital variable ( $X_1$ ) and income ( $Y$ ) reveals a very significant result of 0.000. The p-value is 0.05, indicating statistical significance, while the calculated t-value is 4.986. These findings indicate a strong and statistically significant positive relationship between land area ( $X_1$ ) and farmers' income ( $Y$ ).

2. Conversion of production ( $X_2$ ) into income ( $Y$ )

The statistical analysis revealed a substantial correlation coefficient of 0.025 between the production variable ( $X_2$ ) and income ( $Y$ ). The p-value is less than 0.05, indicating statistical significance, and the calculated t-value is 30.929. This demonstrates a strong and positive correlation between production ( $X_2$ ) and farmers' income ( $Y$ ).

3. Comparison between Price ( $X_3$ ) and Revenue ( $Y$ )

The empirical analysis of the capital variable ( $X_3$ ) on income ( $Y$ ) reveals a coefficient of 0.368. The p-value is 0.05, indicating statistical significance, and the t-value is computed to be 19.988. The data demonstrates a significant positive correlation between capital ( $X_3$ ) and farmers' income ( $Y$ ).

The F statistical test is employed to determine the adequacy of the regression model and ascertain whether the collective independent variables exert an influence on the dependent. The decision-making provisions as follows:

1. If the count of F is greater than the table value of F, or the probability is less than the significance value of 0.05, then it can be concluded that the independent variable model as a whole is related to the dependent variable.
2. If the count of F is less than the value from the F table or the probability is greater than the significance value of 0.05, then it can be concluded that the independent variable model as a whole does not have a relationship with the dependent variable.

Based on the test findings it is evident that the significance value in this study is 0.000, which is less than 0.05. This indicates that there is a simultaneous influence between variable X and variable Y. Referring to the table 4.13 provided, the  $R^2$  (R Square) value is 0.956484, which is equivalent to 95.64%.

The analysis reveals that the independent variables, namely land area (X1), production (X2), and pricing (X3), collectively account for 95% of the variation in the dependent variable, income. The statistical tests yielded an f-value of 49,887 at a 95% confidence level ( $\alpha = 0.05$ ). Thus, if the count value (f count) is greater than the table value (f table), namely  $49,887 > 2.98$ , it indicates acceptance or rejection. These findings indicate that the independent factors, namely land area (X1), production (X2), and price (X3), collectively exert a substantial impact on farmer income.

The purpose of this partial test is to determine the impact of each independent variable on the dependent variable. This study employs a partial test to determine the impact of land (X1), production (X2), and selling price (X4) on farmer income. The SPSS algorithm yielded a T table value of 2.060 at a 95% confidence level. This text provides an elucidation of the correlation between land (X1), production (X2), selling price (X3), and revenue.

#### 1. Area of land (X1)

The statistical analysis conducted using multiple linear regression in the appendix yielded an estimated t value of 4.939. Thus, with a t count value of 4.939, which is greater than the t table value of 2.060, and a significance level of 0.000, which is less than 0.05 at the 95% confidence level, we can conclude that the null hypothesis (H0) is accepted. The null hypothesis H1 is partially rejected. There exists a substantial correlation between the size of land and the revenue of farmers. The correlation between the size of cultivated land and the productivity of a farming enterprise is directly proportional. In other words, as the land area increases, so does the agricultural output. The substantial increase in production will result in a corresponding rise in farmers' income.

#### 2. Manufacturing (X3)

The statistical tests conducted using multiple linear regression yielded an estimated t value of 30.929. Thus, the calculated t value of 30.929 is greater than the critical t value of 2.060, and the significance level of 0.00 is less than the predetermined threshold of 0.05 at a 95% confidence level. Therefore, the null hypothesis (H0) is accepted. The null hypothesis H1 is rejected, indicating a statistically significant relationship between the level of production and the income of the farmer. The primary objective of farming is to achieve production outcomes. Farming activities will yield substantial revenues through high output outcomes. Similarly, in the realm of coconut growing endeavors. The substantial degree of output will significantly impact the income that business actors will receive.

#### 3. Cost (X3)

The statistical analysis conducted in the appendix using multiple linear regression yielded an estimated t value of 19.988. Thus, the calculated t value of 19.988 is greater than the critical t value of 2.060, and the significance level of 0.000 is less than the predetermined threshold of 0.05 at a 95% confidence level. Consequently, the null hypothesis (H0) is accepted. The null hypothesis H1 is rejected, indicating a statistically significant relationship between the selling price of coconut and the income level of farmers in the research area. Price is the monetary worth assigned to each individual product that is generated through the process of production. The level of revenue for farmers is significantly impacted by prices, as higher or more costly product prices directly correlate with increased farmer income.

The F statistical test is employed to determine the suitability of the regression model and ascertain whether the collective independent variables have an impact on the dependent variable (the decision-making provisions as follows:

1. If the count of F is greater than the table value of F, or the probability is less than the significance value of 0.05, then it can be concluded that the independent variable model as a whole is related to the dependent variable.
2. If the count of F is less than the value from the F table or the probability is greater than the significance value of 0.05, then it can be concluded that the independent variable model as a whole does not have a relationship with the dependent variable.

Table 1. Statistical Test (F Test)

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	7.067E12	4	1.767E12	49886.648	.000 <sup>a</sup>
Residual	8.854E8	25	3.542E7		
Total	7.068E12	29			

From the test results from the table above, it can be seen that the significant value in this study is  $0.000 < 0.05$ , which means that there is an influence between variable X and variable y simultaneously (together).

The coefficient of determination test quantifies the degree to which the independent variable can account for the variation in the dependent variable. The coefficient of determination can take on values of either zero or one. The criteria for determining the coefficient of determination as follows:

1. When the value of R2 is close to zero or small, it indicates that the independent variable has a very restricted or weak ability to explain the relationship with the dependent variable.
2. If the value of R2 is close to or larger than one, it indicates that the independent variables provide nearly all the necessary information for predicting the dependent variable.

Table 2. Coefficient of Determination (R2)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.978 <sup>a</sup>	0.956484	0.979	5951.22108

Based on the calculations presented in the table above, the coefficient of determination (R square) is determined to be 0.97. Consequently, the variables land area (X1), output (X2), and price (X3) have a significant impact on 97% of farmers' income. Additionally, this research does not account for other variables that may impact 3% of farmers' income.

The statistical tests indicate that the land area variable (X1), productivity variable (X2), and price variable (X3) partially have a significant impact on income (Y). This research demonstrates a negative correlation between the land area (X1) and income (Y) of coconut producers, as indicated by the results of partial hypothesis testing. The obtained t-value is 4.986, which exceeds the critical t-value of 2.06. Therefore, the hypothesis is rejected. The findings of this study are further supported by the research before (Hajiali et al., 2022; Wei et al., 2020)

There is a positive correlation between the size of land (X1) controlled by coconut farmers and the income (Y) they earn. Significant expanse of land leads to a substantial increase in a farmer's revenue (Rahmi et al., 2023). This research demonstrates a positive and statistically significant correlation between the production (X2) and income (Y) of coconut producers, based on the findings of partial hypothesis testing. If the estimated t value is 30.929, which is less than the critical t value of 2.06, then the hypothesis is accepted. The findings of this study are further reinforced by the research before (Hajiali et al., 2022; Wei et al., 2020)

As the level of output (X2) grows, coconut farmers in Sebampan Village will earn a higher revenue (Y). Conversely, when farmers produce less (X2), coconut farmers receive a lower revenue (Y). hypothesis testing demonstrates that the price variable (X3) exhibits a positive correlation and exerts a statistically significant impact on income (Y). The computation results indicate that the calculated t value is 19.988, surpassing the t table value of 2.06. Therefore, it was determined that the price (X3) had a favorable and substantial impact. Therefore, it can be inferred that the hypothesis is accepted. The findings of this study are consistent with the research before which indicates that prices exert a substantial and important impact on farmers' income (Dewianawati & Asyik, 2021; Subianto et al., 2023).

## V. CONCLUSION

Based on the findings of the analysis and investigation, the following conclusions can be derived. The statistical tests were conducted to assess the combined impact of the independent variables area

(X1), production (X2), and pricing (X3) on the income variable (Y). This implies that the independent variables have a concurrent and tangible impact on income or variable (Y) as a whole. The partial testing of land area (X1) on income (Y) reveals a significant and negative impact on income (Y). Partial testing of the production (X2) on income (Y) demonstrates a notable and favorable impact on income (Y). Conducting a partial test on the price variable (X3) with respect to income (Y) reveals a statistically significant positive impact on income (Y).

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