International Journal of Economy, Education, and Entrepreneurship
p-ISSN: 2798-0138 | e-ISSN: 2798-012X
Vol. 4, No. 3, December 2024
https://doi.org/10.53067/ije3.v4i3

ANALYSIS OF PRICE IMPACT AND PRODUCTION QUANTITY OF PALM OIL ON THE INCOME OF INDEPENDENT FARMERS: A CASE STUDY IN TANGGETADA DISTRICT, KOLAKA REGENCY

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Abstract

This research aims to determine the income of independent oil palm farmers in Tanggetada District, Kolaka Regency and to determine the influence of independent oil palm prices and production on farmers' income in Tanggetada District, Kolaka Regency. The research method used in this research is a quantitative method using secondary data and primary data. The results of the research show that the average income from oil palm farming in the research area with an average selling price of 1,935 kg with an average production of 60,711.92 kg/year, with total revenues of IDR 117,363,038.50/year with total cost of IDR 19,473,892.66/year. Farmer's income is IDR. 97,894,145.80/year. The price of palm oil has a significant effect on the income of independent oil palm farmers because the significance value is smaller than the confidence level (95%) namely (0.000 < 0.05), likewise production has a significant effect on the income of independent oil palm farmers because the significance value is smaller than The confidence level (95%) is (0.000 < 0.05), in Tanggetada District, Kolaka Regency.

Keywords: Palm Oil, Income, Price, Production

INTRODUCTION

Palm oil is a plantation commodity that holds significant importance in Indonesia and has a relatively promising future for its development. The third most important source of foreign exchange for the nation is the trading of palm oil commodities, which include both the raw materials and the processed products of palm oil. There are palm oil plantations in Indonesia, making it one of the countries with the largest area of palm oil plantations in the world. The exploration and development of palm oil plantations on the islands of Indonesia have made palm oil a favorite among other plantation commodities such as rubber, cocoa, and sugar cane, which are increasingly declining in popularity.(Wahab & Pamungkas, 2019).

Oil palm is the most important plantation crop in Kolaka Regency, and few farmers have carried out oil palm farming; in 2022, the area of oil palm plantations has reached 1,637.57 Ha. For the area and production of oil palm, see Table 1.1 below:

Table 1 Area of Oil Palm Land and Production in Kolaka Regency 2016-2022

Year	Land Area (Ha)	Production (Kg)	Productivity (Kg)
2016	651.95	572,412.00	878.00
2017	1,181.75	1,811,480.62	1,532.88
2018	1,283.35	7,135,759.45	5,560.26
2019	1,443.23	3,580,712.82	2,481.04

2020	1,541.23	3,679,780.50	2,387.56
2021	1,451.23	1,949,697.00	1,343.48
2022	1,637.57	3,628,507.46	2,215.79

Source: Kolaka Regency Plantation Service, 2023

Based on Table 1.1 above, it can be seen that in 2016, the area of oil palm plantations was 651.95 Ha. Its production was 572,412.00 Kg, 2017 the area of oil palm plantations was 1,181.75 Ha, and oil palm production increased by 1,811,480.62 Kg, 2018 the area of oil palm plantations was 1,283.35 Ha, and oil palm production increased by 7,135,759.45. In 2019, the area of oil palm plantations increased by 1,443.23 Ha, but production decreased by 3,580,712.82 Kg. In 2020, the area of oil palm plantations increased by 1,541.23 Ha, and production increased by 3,679,780.50 Kg; in 2021, the area of oil palm plantations and production decreased with a total land area of 1,451.23 and a total production of 1,949,697.00. In contrast to the previous year, the area of oil palm plantations and production increased, with a land area of 1,637.57 and a total production of 3,628,507.46.

Land, economic, labor, physical land, and social factors contribute to oil palm farmers' income. Farmer income is the aggregate income that farmers obtain from farming after the harvesting process. This income is calculated from the sales or exchange of production results and is valued in rupiah based on the price per unit weight at harvesting time. Production costs are deducted during the production process. The income level received by oil palm farmers is significantly influenced by the substantial amount of production produced during the harvest, which is why continuous maintenance can undoubtedly increase oil palm production. Consequently, oil palm farmers must focus on enhancing fruit quality and production. For that, maximum fertilization and maintenance are needed in the oil palm farmer's business so that the results are promising, the growth is perfect, and maximum harvests are produced to increase the income of oil palm farmers. (Minsyah, 2020).

The influence of production factors on the income of oil palm farmers is seen from the input from agriculture, including labor, agricultural land, technology, and capital. In contrast, the output from agriculture includes managed farming products, such as oil palm; in addition, production in the farming sector is also inseparable from the socio-economic factors around it. (Ramadhani, 2023). The price of palm oil dramatically affects the income of oil palm farmers. Because with high prices, income will increase. Conversely, with low prices, the income of oil palm farmers will decrease. Low prices of palm oil can affect farmers' income; if the price of palm oil is high, it will increase farmers' income. Palm oil prices, palm oil production, and farmers' income are interrelated variables. It can be proven that when the price of palm oil falls, the burden of farmers' expenses for maintaining their oil palm plants will be heavier. The phenomenon is that when the price of palm oil falls, their income will also fall because, with the same amount of production but the price of palm oil falls, their income will automatically also fall.

Vol. 4, No. 3, December 2024, pp. 741-752
https://doi.org/10.53067/ije3.v4i3.313

LITERATURE REVIEW

Palm oil

Oil palm (Elaeis guinensis Jacq.) is a type of palm plant that originates from Africa. In Indonesia, its distribution starts from the Nangroe Aceh Darussalam (NAD) region, the east coast of Sumatra, Kalimantan, Java, and Sulawesi. After the industrial revolution in the late 19th century, oil palm became increasingly popular due to the high demand for vegetable oil in the soap and food industries. The oil palm was initially mass-planted in 1911 in its native region of West Africa. Nevertheless, the plantation was relocated to the Congo due to the planting failure. In 1848, oil palm was introduced to Indonesia as an ornamental plant in the Bogor Botanical Gardens. The first palm oil exports were made in 1919, and oil palm plants were only cultivated as commercial crops in 1912. (Ritonga et al., 2021).

Income

Income is the result of production obtained in the form of material that can be reused to meet the needs of production facilities and infrastructure. This income is generally obtained from product sales results, or it can be said that income is the difference between total business income and total costs incurred in business activities.(Wahab & Pamungkas, 2019). Hartati (2021)states that personal income is income from households and businesses that are not corporations. Personal income also reduces corporate income taxes and contributions to social security.

According to(Sukirno, 2013), income is the amount of income residents receive for their work performance during a specific period. Either daily. Weekly. Monthly or annually. There are several classifications of income, namely:

1. Personal income is earned without contributing to any activity received by country residents.
2. Disposable income is personal income minus taxes that the recipients must pay. The remaining income that is ready to be spent is called disposable income.
3. National income is the value of a country's finished goods and services in one year.

In discussing income. It is necessary to know the benefits of income itself. Increasing a person's income will create prosperity. What is meant by per capita income is the average income of the population in a country or region. Per capita income is often used as a benchmark for prosperity and the level of development of a country or region; the more significant the per capita income., the more prosperous the country or region(Soekartawi, 2007)

Revenue The best way to measure revenue is by using the exchange value of the goods or services. This exchange value is the cash, equivalent, or present value of the invoices expected from the revenue transaction. In many situations, this is the price agreed upon with the customer. However, a revenue receipt must be created because the seller must wait until the cash is received.(Wahab & Pamungkas, 2019)

Measurement assigns numbers to objects or events according to specific rules without considering these limitations. Traditionally, measurement in accounting involves assigning numerical values to objects, events, or attributes in a certain way. To ensure easy implementation or disaggregation of data. (Wahab & Pamungkas. 2019)

According to(Sukirno. 2013), To calculate farm income, you must first know the total income level and expenditure pattern for a certain period. According to(Sukirno. 2013), total farm income (net income) is the difference between total income and total costs incurred in the production process. All family inputs are calculated as production costs. Total Revenue (TR) is the amount of production produced. Multiplied by the production price and income is the difference between income and total costs.

Price

Price is the monetary amount that consumers are required to pay to sellers in order to acquire desired goods or services. Consequently, prices are typically established by the seller or service provider. In the realm of commerce, purchasers or consumers may negotiate the price. A transaction will occur only upon reaching an agreement between the buyer and seller. However, bargaining cannot be done in all marketing lines. An example of a transaction that uses a bargaining system is a purchase in the market. (Nurfatriani. 2006)

Price is the amount of money charged for a product or service. Alternatively, the amount of value consumers exchange for the benefits of having or using the product or service (Kotler and Armstrong. 2010). According to Mulyadi (2001), Selling price is the price of a product or service that can cover the complete costs associated with the product or service and generate the desired profit. The selling price can be interpreted as the seller's income from payments for goods consumers purchase. Its value equals the price multiplied by the number of goods purchased. If the price changes, the sales results will automatically change if the elastic coefficient exceeds one (demand is stretchy). A price increase will reduce sales results. If the demand is not stretchy, the price increase will cause an increase in sales results. The income of agricultural producers has decreased due to declining demand. The significant reduction in income was mainly due to the very low price and not due to reduced production.

Factors Affecting Price

The factors that influence prices, according to Basu Swastha and Irawan (2005), are as follows:

1. Economic Conditions. Economic conditions significantly affect the prevailing price levels. A recession, for example, is a period when prices are lower.

2. Supply and Demand: Demand is the goods buyers purchase at a certain price level. A lower price level generally results in more demand. Supply is the opposite of demand: the amount offered by sellers at a certain price level.
3. Elasticity of Demand. The nature of market demand is influenced by its price determination, which affects the volume that can be sold for some goods. Price and sales volume are inversely proportional, meaning that if a price increases, sales will decrease and vice versa.
4. Competition. The existing competitive conditions often influence the selling price of some goods. In competition, many sellers actively face many buyers. The large number of sellers and buyers will make it difficult for individual sellers to sell at a higher price to other buyers.
5. Cost is the basis of price regulation. A price level that cannot be covered will result in losses; conversely, if a price level exceeds all costs, it will result in profits.
6. Manager's Objectives. Pricing of an item is often associated with the objectives to be achieved. Each company does not always have the same objectives as other companies.
7. Government Oversight. Government oversight is also an essential factor in determining prices. This government oversight can be realized by determining maximum and minimum prices and price discrimination. Moreover, other practices encourage or prevent businesses from moving towards monopoly. Maximum and minimum prices. Price discrimination. Moreover, other practices encourage or prevent businesses from moving towards monopoly.

Production

Production is an activity that produces goods and services. According to Ahmad (2007), production can be defined as the process of converting resources from one entirely distinct commodity to another, both in terms of resource allocation and the potential uses of the production by consumers. Based on the variety of types and qualities, agricultural production can be measured in specific units, such as the quantity and weight of goods.

Farming is not limited to just taking the results but is genuinely a production effort; in this case, land, capital, labor, and management will be utilized as the production source. If the utilization is done well, it will produce good results, and vice versa. The results cannot be relied on if the management is not running well. If the results are excellent in quality and quantity, it will produce satisfaction for the producer himself. Agricultural commodity production includes various activities and relationships between the production sources and the results or commodities. (Maranatha, 2022)

Production is a process of utilizing available resources, and the results that are owned or obtained will be greater than the sacrifices given. From an economic perspective, production utilizes available resources for good quality and quantity results. It is managed so that it is a commodity that can be traded. (Maranatha, 2022)

Production is an activity or activity that can add value and benefits to goods or services to meet human needs. In agricultural production, various kinds of resources are needed, such as natural

resources, such as climate, land, seeds, or seedlings, and human resources, such as the quality and quantity of labor, called production factors. (Festaria, 2017)

Production function

The production function is the relationship between production factors and the production level they create. The purpose of production activities is to maximize output with a certain amount of input. Furthermore, Prihandayani and Poerwono (2014) also explain the production function. The function shows the mathematical relationship between the inputs that produce a specific output level.

The production function describes how the relationship between inputs is transformed into production results/outputs in the production process. Various possible forms of input-output relationships in agriculture/farming. The agricultural production process uses several production factors in the farming production process. So, the production function can be written as follows:

$$\mathbf{Y = f (X_1 / X_2, X_3 ...Xn)}$$

Where :

Y = output/production results, or variables influenced by X

X_1, X_2. . . Xn = input/production factors or variables that affect Y

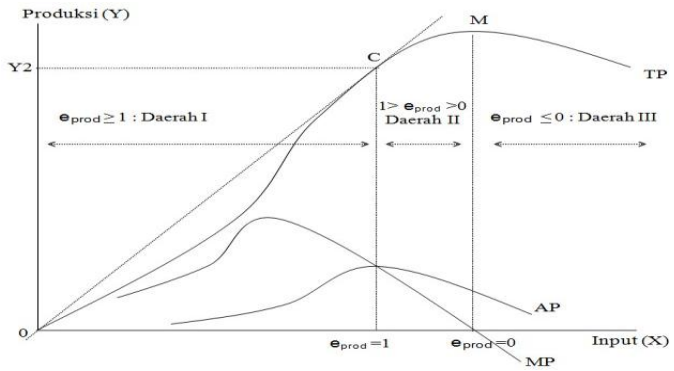

Figure 1. Relationship between Total Production, Average Production and Marginal Production.

In Figure 1, it is explained that the production area I is MP > AP (Ep> 1), which can be called an irrational area, where the elasticity value is more than one, meaning that every addition of production factors by one unit will cause an increase in production that is greater than one unit (Increasing Return to Scale). So, the production factor can still be increased by adding production factors so that currently, the maximum profit has not been achieved and the marginal product curve is above the average product curve,

The region between X_2 and X_3 (0<Ep<1) is whimsically called the rational region, meaning that every addition of production factors by one unit will cause an increase in production of at most one unit and at least zero units. However, at a certain level, this region shows that the production level and use of production factors meet the requirements for achieving maximum profit (economic

efficiency), which indicates that it is optimal. This region is also characterized by an increase in production results that are decreasing (Decreasing returns to Scale). Region III (EP<0) is usually called the irrational region due to the use of inefficient production factors because total production experiences a decrease in marginal products that have a negative value, meaning that every addition of factors X_1, X_2, X_3 Marginal Product (PM) Production input will result in a decrease in the amount of production produced, MP = 0.

Framework

Palm oil prices significantly affect the income of palm oil farmers. Because with high prices, income will increase. Conversely, with low prices, the income of palm oil farmers will decrease. Low palm oil prices can affect farmers' income; if palm oil prices are high, they will increase farmers' income. Palm oil prices, palm oil production, and farmers' income are interrelated variables. It can be proven that when palm oil prices fall, farmers' expenses for maintaining their palm oil plants will be heavier. The phenomenon is that when palm oil prices fall, their income will also fall because, with the same amount of production but palm oil prices fall, their income will automatically also fall.

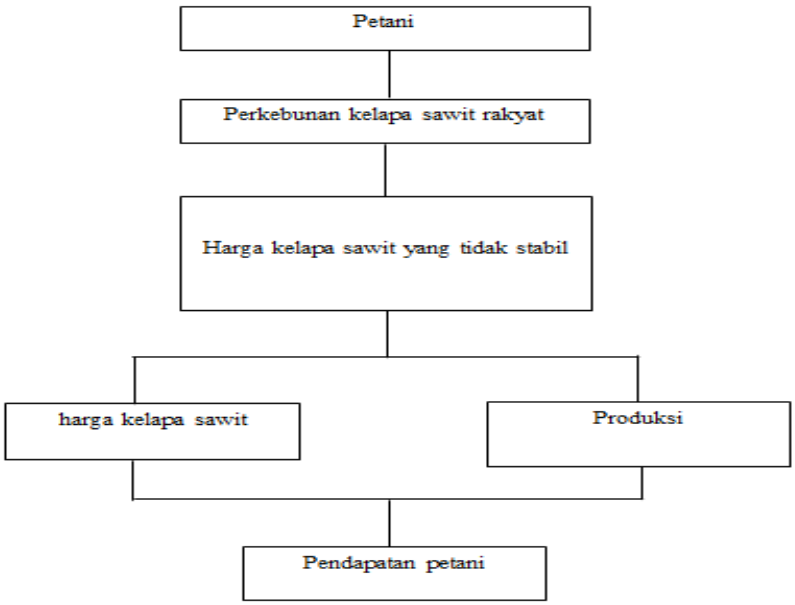

Figure 2. Framework

Source: Author (2024)

METHOD

The research method used is a quantitative method with a descriptive approach. The research paradigm used in this research is to use a descriptive approach (Noeraini & Sugiyono. 2016). Descriptive analytical research is a method that describes or provides an overview of the object being studied through data collected as it is. This type of research aims to discover the difference between existing symptoms and events and draw generalizations that explain symptoms or events.

RESULTS AND DISCUSSION

Palm Oil Farming Business Revenue

Farming income is the multiplication of the production obtained by the selling price. The income farmers receive for every rupiah spent on farming production activities is influenced by the amount of production produced and the unit price of production received. The higher the amount of production and the unit price of production produced, the greater the farm income will be; conversely, the lower the amount of production produced and the unit price of production produced, the lower the income obtained by farmers. The average amount of production, price, and income of palm oil in Tanggetada District, Kolaka Regency, shows that the average production of palm oil is 60,711.92 kg/year while the average price of palm oil is Rp. 1935, the income of palm oil farmers in Tanggetada District, Kolaka Regency, is Rp. 117,368,038.50/year.

Palm Oil Farming Costs

The cost analysis carried out by oil palm farming is all costs incurred during one year. Cost calculation: according to Soekartawi (1995), farming costs are classified into fixed and variable costs. Fixed costs are costs incurred that do not affect the amount of production produced. The fixed costs calculated are the cost of plowing the land and the depreciation of agricultural equipment with an average depreciation of Rp. 1,471,815.75. Variable costs are costs incurred each time production is carried out, and the cost depends on the amount of production. Variable costs in oil palm farming are used up in one production process calculated for one year. Variable costs include labor costs, fertilizer costs, and herbicide costs. The average use of fertilizer in independent oil palm is Rp. 1,933,269.24. The average cost of using herbicides is Rp. 1,730,192.31. The average cost of labor by type of harvester is Rp. 255,769.23, fertilization labor costs of Rp. 312,509.61, transportation costs of Rp. 26,201.92.

Palm Oil Farming Income

Farming income is the difference between total revenue and total production costs incurred. The income obtained is the amount of palm oil production multiplied by the price then minus the total costs incurred during the production process. The analysis results show the average income of palm oil farming in the research area, with an average selling price of 1,935 kg and an average production of 60,711.92 kg/year, with a total income of Rp. 117,363,038.50/year with a total cost of Rp. 19,473,892.66/year. Farmer Income of Rp. 97,894,145.80/year.

Multiple Linear Regression Analysis

The analysis used in this study is multiple linear regression to determine the extent of the influence of the independent variables (X), consisting of palm oil prices (X_1) and production (X_2), on the dependent variable (Y), namely farmer income.

Table 2.

Output Table of Multiple Linear Regression Analysis of the Influence of Price and Independent Palm Oil Production in Tanggetada District

Independent Variables	Coefficients (Beta)	count	Sign
Constantine		-2,046	0.046
Price	0.809	20,807	0,000
Production	0.238	6,122	0,000
R-square	0.955		
Adjusted R Square	0.954		
Fcount	525,850		0.000a
Ftable	3.19		
Table	1,677		
a	0.05		

Source: SPSS output, 2024

Based on Table 4.7 above, the equation can be formulated with the following formula:

$$Y = -4,100 +0.797X1 + 1.815X2 + e$$

Coefficient of Determination (R^2)

The determination coefficient test determines how much contribution or influence the independent variables have together on the dependent variable. The determination coefficient will explain how much change or variation in a variable can be explained by changes or variations in other variables.(Setiawan & Kusrini, 2010).

Based on the regression analysis results in Table 4.14, the adjusted R2 squared (Adj-R^2) value is 0.954. This value shows the percentage contribution of the influence of the independent variables of price and production, which can explain 95.3% of the variation in the dependent variable of farmer income. In comparison, the remaining 4.7% is influenced by other variables outside the model not discussed in this study.

Simultaneous Significance Test (F Test)

The simultaneous significance test (f test) is used to determine whether the independent variables of price and production simultaneously significantly affect the dependent variable of a farmer's income. Based on the analysis results, the F count value is 525.850, and the F table is 3.19 because the F count value is greater than the F table (525.850 > 3.19). The probability of significance

(0.046 < 0.05) then simultaneously, the independent variables of price and production do not significantly affect the dependent variable of farmer's income.

Partial Significance Test (T-Test)

The t-test is used to determine how much influence the independent variables of price and productivity (X) have partially on farmers' income (Y) in the research area. The results of the t-test analysis can be seen in Table 4.14 in the t Statistics section. The t-table value obtained is 1.667, with a confidence level of 95% (0.05%). The following explains the relationship between price and productivity and farmers' income.

Price (X_1)

Based on the results of data analysis, the calculated price value is 20.807, while the ttable value is 1.667. Because the calculated t value is greater than the ttable (20.807 <1.667) and the probability of significance (0.000 > 0.05), then partially, the independent price variable (X_1) has a significant effect on the variable related to farmer income (Y). The regression coefficient value of the price is 0.809, which means that if there is an increase in the cost of palm oil by 1%, it will increase the amount of income of independent palm oil farmers by 80.9% and vice versa if there is a decrease in land area by 1%, it will decrease the amount of independent palm oil production by 80.9%, assuming other independent variables remain constant.

Palm oil prices are an essential factor in the income of oil palm farmers. When the price of palm oil falls, the burden of farmers' expenses for oil palm maintenance costs will be heavier, and income will decrease because, with the same amount of production but the price of palm oil falls, farmers' income will automatically also decrease. The same is true when the price of palm oil increases. When the price of palm oil increases, farmers' income will also increase; with the rise in income, farmers will be able to meet the operational costs of oil palm maintenance. This study aligns with research(Hasan, 2022), which states that palm oil prices do not positively and significantly affect farmers' income.

Production(X_2)

Based on the results of data analysis, the t-count value of production is 6.122, while the t-table value is 1.667. Because the t-count value is greater than the t-table (6.122> 1.667), the independent variable of production (X_2) has a positive effect on the variable related to farmer income (Y) and the probability of significance (0.000 <0.05), then partially the independent variable of production (X_2) has a significant effect on the dependent variable of farmer income (Y). The regression coefficient value of land area is 0.238, which means that an increase in production of 1 kg will increase the

income of oil palm farmers by 23.8%, assuming other independent variables remain constant. This study is in line with the research of Ernawati Mappigau, 2022 which states that oil palm production has a positive and significant effect on farmer income.

Production is an essential factor influencing oil palm farmers' income. This is proven by the fact that when production increases, farmers' income will also increase, with high production being able to cover the operational costs of oil palm maintenance when prices fluctuate. Fertilization, maintenance, and pest control greatly influence the increase in oil palm production.

CONCLUSION

Based on the results of the discussion, it can be concluded that the average income of oil palm farmers in Tanggetada District, Kolaka Regency, is Rp. 98,005,297.24 per year. This amount reflects the financial outcomes of independent oil palm farming in the region. The study found that the price of oil palm has a significant influence on the income of independent farmers, with a p-value of 0.000, which is less than the 0.05 threshold, indicating a strong relationship between oil palm prices and farmers' income. Similarly, production levels also play a crucial role in determining income, as evidenced by a p-value of 0.000, which is also below 0.05. This suggests that both the price of oil palm and the volume of production are key factors driving the economic wellbeing of independent oil palm farmers in Tanggetada District, Kolaka Regency, and should be considered for sustainable agricultural policies.

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