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SUPPLY OF CASSAVA IN MAGELANG DISTRICT CENTRAL JAVA PROVINCE

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Abstract

Cassava is a commodity that has the potential to be developed into a regional superior product. Cassava can be processed into other forms of food that are consumed by the community and one of the centers is in Magelang Regency. This study aims to analyze what factors influence the supply of cassava in Magelang Regency. The data used comes from secondary data. The data used from 2008 to 2022 comes from the Central Bureau of Statistics. The results of the study stated that the supply of cassava in Magelang Regency was jointly influenced by the previous year's cassava price, the previous year's sweet potato price, the previous year's cassava production, the harvested area of the previous year's cassava, the previous year's corn price. Meanwhile, partially the supply of cassava in Magelang Regency was influenced by the price of sweet potatoes in the previous year and the cassava harvested area in the previous year. Based on the results of the analysis, the price elasticity of cassava in the previous year on cassava supply in Magelang Regency was inelastic for both short-term elasticity (0.701) and long-term elasticity (0.02).

***Keywords*:** *Cassava, Magelang, Supply*

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INTRODUCTION

One of the potential food crop commodities to be developed is cassava. The advantages of cassava when compared with other food crop commodities are that it can be cultivated on dry and infertile land, its resistance to disease is relatively high, apart from that it has a high carbohydrate content so that it can substitute rice as the main source of food for the people of Indonesia. Cassava has the potential to support food security. Processed products from cassava can be used as a food buffer stock (Asriani, 2010).

Magelang Regency is one of the cassava producing areas in Central Java Province. The harvested area for cassava in Magelang Regency is 1,152 ha with a production of 27,656 tons (Ministry of Agriculture, 2022). Production of cassava in Magelang Regency tends to decrease from year to year, even though Magelang Regency is famous for its processing industry centers with cassava raw materials. As a result, business actors experience difficulties in supplying raw materials. The decline in cassava production was caused by several things including land conversion, post-harvest losses which were still high, price fluctuations during the main harvest, changes in the commodities planted (Mustafa, 2016).

Production and productivity of cassava will have an impact on the amount of cassava offered on the market (Pratiwi, et.al., 2018). Apart from that, the selling price of cassava also tends to fluctuate. The instability of cassava selling prices is caused by several things, such as fertilizer prices, pesticide prices, labor wages, production and post-harvest processing (Putri, et.al., 2022). Fluctuations in cassava production and prices will affect the supply of cassava in Magelang Regency. So that, this study was carried out to analyze what factors influenced the supply of cassava in Magelang Regency.

THEORETICAL BASIS

Supply

Supply is a value that indicates the maximum number of products offered in the market or at what price level (minimum price) where producers are willing to offer their products to consumers. The relationship between the price of a product and the number of products offered is called the law of supply (Hanafie, 2010).

Supply Elasticity

The elasticity of supply determines the quantitative relationship between the product offered and the price of the product. Therefore, the elasticity of supply can be expressed by changes in numbers in the supply of changes in the price of a product using the concept of elasticity (Maulana, et.al., 2021). The degree of sensitivity or elasticity of supply is very useful for knowing the response of supply to changes in product prices. The elasticity of supply can be perfectly elastic, elastic, unitary elastic, inelastic, and perfectly inelastic (Arnawa, 2008).

Cassava

Cassava (Manihot esculenta Crantz) is a staple food besides rice and corn. Cassava plants are usually used as a source of food by consuming the tubers. Cassava tubers have a variety of nutritional content, including carbohydrates, fat, protein, magnesium and others (Oluwaniyi and Oladipo, 2017). Cassava is not only used as a food ingredient but has begun to be used as a raw material for making bioethanol and also as a raw material for animal feed (Hartanti, et.al., 2019).

Supply Factors

The willingness of sellers to offer their products at various price levels is influenced by several factors including (Hidayat, 2013):

1. Product Prices
   When the product price rises, the seller will increase the product sold to get a bigger profit.
2. Production Costs
   Production costs greatly affect the number of products offered when production costs rise, producers will tend to reduce the number of products offered.
3. Production Technology
   The use of technology in production will affect the number of products offered. Technology can produce production activities more effectively and efficiently.
4. Seller Exepectation
   If the seller or producer predicts the price of the product being sold will increase, the seller will increase the number of products offered
5. Desired Profit
   The greater the profit, the higher the price level applied and the more goods sold or offered.
6. Number of Competitors
   The number of competitors affects the implementation of marketing strategies, so that it will affect the number of goods offered.

RESEARCH METHODS

This research uses the basic method in the form of descriptive analytic so that it systematically describes the facts and characteristics of the object or subject being studied accurately.

Types of Research

This study uses a quantitative approach, namely data in the form of numeric or numbers so that it can be analyzed using statistical methods.

Time and Place of Research

The research was conducted in February-March 2023 at Magelang Regency.

Research Subject

The method of selecting the research location was carried out purposively, namely in Magelang Regency with the assumption that Magelang Regency is one of the centers for producing processed food made from cassava such as gethuk as a special food, pothil, slondok, and so on.

Data, Instruments and Data Collection Techniques

The data used in this study is secondary data from 2008-2021 which is presented annually. Secondary data sources come from the Central Statistics Agency for Magelang Regency, namely the Regency in Figures and Statistics on Agricultural Producer Prices in the Food Crops, Horticulture, and Smallholder Plantation Subsectors as well as data from the Agricultural Statistics Database of the Ministry of Agriculture.

Data Analysis Technique

1. Supply Function

   The supply function can be used to estimate the amount of cassava supply used through a multiple linear regression model as follows:

   Y = a + b1X1 + b2 X2 + b3 X3 + b4X4 +...+ μ

   Information

   Y = cassava production

   X1 = price of cassava in the previous year

   X2 = the price of sweet potatoes in the previous year

   X3 = cassava production in the previous year

   X4 = cassava harvested area in the previous year

   X5 = previous year's corn price

   a = intersep

   b = estimated regression coefficients

   μ = error

   The effect of price changes or price inflation can be eliminated using the deflated price formula, namely the magnitude of the change in the prevailing price compared to the base year. The base years used in this study are 2000, 2010 and 2020, with the consideration that in these years the economic conditions in Indonesia were relatively stable. The following is the deflated price method, namely: (Wardhani, 2011)

$$H_x = \frac{IHK_d}{IHK\ t} \times H_t$$

   Information :

   H_x = deflated prices

   IHK_d = base year consumer price index

   $IHK\ t$ = consumer price index year t

   H_t = price before deflation

2. Supply Elasticity

   The elasticity of supply is used to determine the response of price changes to changes in the amount of production or quantity supplied. The following is a formula for finding short-term and long-term supply elasticity (Sundari, 2006):

$$E_{pd} = b_i \frac{X_i}{Y}$$

   Information :

   E_{pd} = short-run elasticity of supply

   b_i = independent variable regression coefficient

   X_i = the average value of the

independent variables

Y = the average value of the dependent variable

$$E_{pj} = \frac{short-run\ elasticity}{adjustment\ coefficient}$$

The adjustment coefficient is obtained from k = 1 - b_i where b_i is the regression coefficient of cassava harvested area in the previous year.

Supply is said to be inelastic when $0 \leq |E_s| \leq 1$, every percent change in price will be followed by a relatively small change in the quantity of goods supplied.

Supply is said to be elastic when $1 < |E_s| \leq \infty$, every percent change in price will be followed by a relatively large change in the quantity of goods supplied.

Supply is defined as elastic when $|E_s| = 1$, every percent change in price will be followed by a proportional change in the quantity of goods supplied.

RESEARCH RESULTS AND DISCUSSION

Cassava is one of the food crops consumed by the people of Indonesia, either as a staple food to replace rice or as a raw material for the processed industry. Moreover, there are suggestions from the government to diversify local food. The use of cassava for example as a raw material for making mocaf flour, flour gaplek whose purpose is to substitute wheat flour. Apart from that, it is also used to make processed food that is ready for consumption, for example the raw material for making Chips Gethuk, Lemet, Gatot, Tiwul, and so on. Usually food made from cassava or cassava is a traditional food or local food of a certain area or can also be called a regional specialty, so it is usually for souvenirs after traveling to that area. Cassava in the Magelang area used for various things, for example as a food substitute for rice, basic ingredients for food processing, and there are certain types that are used as animal feed.

Table 1. Harvested Area and Production of Cassava in Magelang Regency in 2008-2022

Year	Harvested Area	Production
2008	3.305	72.101.000
2009	3.707	82.310.000
2010	2.898	65.830.000
2011	2.779	67.383.000
2012	2.628	59.397.000
2013	2.102	50.673.000
2014	2.070	48.095.000
2015	1.606	36.899.000
2016	1.958	45.112.000
2017	1.656	35.818.000
2018	1.226	28.300.000
2019	1.072	24.919.000
2020	1.199	49.185.000
2021	1.152	27.656.000
2022	875	21.940.000

Source: Indonesian Agriculture Ministry, 2023

Based on table 1, it can be seen that during the last 15 years the cassava harvested area in Magelang Regency has continued to decline. Likewise, the level of production, even though it fluctuates, tends to decrease from year to year. The decline in cassava production according to Mustafa (2006) was caused by several things including land conversion, high post-harvest losses, price fluctuations during the main harvest, changes in the commodities planted. Farmers in

Magelang Regency currently tend to change their farming commodities from food to horticultural crops such as vegetables. This is because in terms of prices the prices of horticultural commodities are higher when compared to the prices of food crop products. As a result of changes in the commodities cultivated, the area and production of cassava in Magelang Regency continues to decline.

Table 2. Results of Regression Analysis of Factors Influencing Cassava Supply

Variable	Coefficient	Std. Error	t-Statistic	Prob.
X1	24,901	21,667	1,149	0,283
X2	-28,574	13,758	-2,076	0,071
X3	-0,661	0,431	-1,533	0,163
X4	33,431	9,175	3,643	0,006
X5	12,479	10,091	1,236	0,251
C	-3560,993	15790,960	-0,225	0,827
R-squared	0,873	Mean dependent var		49548,43
Adjusted R-squared	0,794	S.D. dependent var		17912,61
S.E. of regression	8113,383	Akaike info criterion		21,13794
Sum squared resid	5,27E+08	Schwarz criterion		21,41183
Log likelihood	-141,965	Hannan-Quinn criter.		21,11259
F-statistic	11,07323	Durbin-Watson stat		3,029777
Prob(F-statistic)	0,001954			

Source: Primary Analysis

Information

Y : cassava production

X1 : price of cassava in the previous year

X2 : the price of sweet potatoes in the previous year

X3 : cassava production in the previous year

X4 : cassava harvested area in the previous year

X5 : previous year's corn price

Based on the regression results table above, it can be seen that the models in cassava supply in Magelang Regency are as follows

Y=-3560,993+24,901X1-28,574X2-0,661X3+33,431X4+12,479X5.

Factors Influencing Cassava Supply

Based on the results of the regression analysis to estimate the parameters of cassava supply in Magelang Regency, it was shown that the factors that significantly influenced the supply of cassava in Magelang Regency were the price of sweet potatoes in the previous year and the harvested area of cassava in the previous year. Meanwhile, the variables of cassava production in the previous year, the price of cassava in the previous year and the price of corn in the previous year had no significant effect on the supply of cassava in Magelang Regency. Below is an explanation of each of the factors that significantly affect the supply of cassava in Magelang Regency:

1. The price of sweet potatoes in the previous year

   Based on the results of the analysis, it is known that the variable price of sweet potatoes in the previous year had a significant effect on the supply of cassava in Magelang Regency. The significance value of t for cassava prices in the previous year was 0.071 so that Ho was rejected and it can be concluded that there is a significant relationship between the total price of sweet potatoes and the supply of cassava in the previous year. The coefficient resulting from the variable price of sweet potato in the previous year is negative so that the higher the price of

sweet potato in the previous year will cause a decrease in the supply of cassava in that year. The variable price of sweet potato in the previous year was -28.574 so that it can be said that if there is a change of 1 unit price of sweet potato in the previous year it will result in a decrease in the supply of cassava in the following year by 28.574 units. These results are in line with research conducted by Pratiwi et al., (2018) which stated that cassava supply was significantly influenced by cassava prices in the previous year. Prices for agricultural commodities will indeed affect how much the quantity of commodities offered. The offer is also related to the maximum amount that one wants to sell at a certain price level so that the seller will offer the goods.

The price of sweet potato in the previous year had a negative correlation with the supply of cassava in Magelang Regency. This is because cassava with sweet potatoes is a substitute, meaning that when the price of sweet potatoes rises, producers will be more massive in offering sweet potatoes and this will result in a decrease in cassava supply.

2. The cassava harvested area in the previous year

   The cassava harvested area in the previous year had a positive influence on cassava supply in Magelang Regency. And it is significant at the 95% level of confidence in the supply of cassava in Magelang Regency which is shown by the significance value of 0.006 and with a regression coefficient of 33.341. This illustrates that every time there is an addition of 1 unit of cassava harvested area in the previous year, it will result in an increase in the supply of cassava in the following year in Magelang Regency by 33,341 units. So it can be concluded that the cassava harvested area in the previous year had a positive correlation with the supply of cassava in Magelang Regency that year. Research conducted by Boansai (2017) also states the same thing that there is influence and relationship between the area of land harvested and the results offered. This is also the case with research conducted by Sundari (2006) in Wonogiri Regency which showed that cassava harvested area in the previous year had a significant effect on cassava supply. This is because the expansion of cassava land area is the main choice to increase cassava production. This is because the economic value of cassava tends to be lower compared to other commodities so that farmers can only increase their income in terms of the amount of production through expanding the area of land planted with cassava (Sundari, 2006).

Elasticity of Cassava Supply

The short-term elasticity value between the cassava price in the previous year

and the cassava supply was (0.701) which indicates that it is inelastic. A positive elasticity value means that the price of cassava in the previous year has a positive correlation with the supply of cassava in the following year in Magelang Regency and if there is an increase in the price of cassava in the previous year by 1 unit it will result in an increase in the supply of cassava by 0.701 units in next assuming ceteris paribus.

The long-term elasticity of cassava prices in the previous year was (0.02) which indicated inelasticity. This illustrates that when there is an increase in the price of cassava in the previous year by 1 unit, it will result in an increase in the supply of cassava by 0.02 units in the following year assuming cateris paribus.

CONCLUSIONS AND SUGGESTIONS

Conclusions

The supply of cassava in Magelang Regency is jointly influenced by the previous year's cassava price, the previous year's sweet potato price, the previous year's cassava production, the previous year's cassava harvested area, the previous year's corn price. Meanwhile, partially the supply of cassava in Magelang Regency was influenced by the price of sweet potatoes in the previous year and the cassava harvested area in the previous year.

Based on the results of the analysis, the price elasticity of cassava in the previous year on cassava supply in Magelang Regency was inelastic for both short-term elasticity (0.701) and long-term elasticity (0.02).

This study uses the latest data on production, harvested area and prices to provide an up-to-date picture of cassava supply in Magelang Regency. But the variables used are still limited to 5 variables, so further research is needed to perfect this research.

Suggestion

Variables that have a significant effect on cassava supply are the price of sweet potatoes in the previous year and the area harvested in the previous year, so it is necessary to have a policy that regulates the trade system between substitute commodities. Besides that, the expansion of the cassava planting area needs to be done through an intercropping cropping model or by optimizing marginal land and unproductive land for cassava planting.

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