

Analysis of Factors Affecting Cabbage Exports from Karo District to Malaysia

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Abstract: Cabbage production in Karo District has experienced fluctuations that have tended to decline over the past five years, while export demand has tended to increase. This study aims to analyze the effect of cabbage production variables in Karo District, domestic prices (Karo, Indonesia), international prices (Malaysia), exchange rate (rupiah to ringgit), Indonesian GDP, and Malaysian GDP on cabbage export volumes in Karo District in 2008;Q1-2017;Q4 with using multiple linear regression analysis methods through the SPSS 15.0 Program. The results of the analysis show that cabbage production variable has a positive and significant effect on the volume of cabbage exports in Karo District to Malaysia, domestic prices have a negative and significant effect on the volume of cabbage exports in Karo District to Malaysia, international prices have a negative and significant effect on the volume of cabbage exports in Karo District to Malaysia, exchange rate has a negative and significant effect on the volume of Karo District cabbage exports to Malaysia, Indonesia's GDP has a positive and significant effect on the Karo District cabbage export volume to Malaysia and Malaysian GDP has a negative and significant effect on the Karo District cabbage export volume to Malaysia.

Keywords: Cabbage Production, Domestic Prices, International Prices, Exchange Rate, GDP

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I. Introduction

One of the horticultural crops that have a big enough market opportunity is the vegetable commodity. Vegetables are horticultural crop commodities that have an important role in meeting human needs as a complement to staple food sources of vitamins, minerals and maintain immunity.

Cabbage (brassica oleracea) is one of the horticultural crops included in the vegetable category. Cabbage plants contain vitamins and minerals that are needed by the body as a very important source of nutrition. Cabbage has many benefits that are very important for the human body, among others, reduce levels of bad cholesterol (LDL) in the body, treat skin diseases, reduce the risk of contracting stroke and heart disease, cleanse the influence of alcohol in the blood, reduce the risk of cataracts, help digestive health and accelerate the healing of boils.

Horticultural production, especially cabbage, has grown rapidly over the past few decades. The largest cabbage production center in Indonesia with production reaching 1.2 million tons or 83.16% of the total national production, namely Central Java province at 21.09%, West Java at 20.21%, East Java at 17.8%, Sumatera Utara 12.5%, Sumatera Barat 6, 18% and Bengkulu 5.38% in Indonesian Central Statistics Agency, 2017.

When viewed from cabbage production in Sumatera Utara Province, based on data from the Sumatera Utara Province Central Statistics Agency in 2018, cabbage production in 2017 amounted to 180,371 tons. The districts with the highest production levels were Karo District with a production percentage of 54.51%, Simalungun District 38.67%, Humbang Hasudutan District 2.82%, Dairi District 1.96% and the remaining districts/cities only contributed 2.03 % of cabbage production in Sumatera Utara Province.

Table 1. Development of Cabbage Export Volume in Karo District by Country of Destination 2013-2017

Number	Country	Export Volume (Tons)				
		2013	2014	2015	2016	2017
1	Taiwan	15.328	8.307	11.273	12.170	12.232
2	Malaysia	18.825	11.349	17.174	17.340	18.645
3	Jepang	1.180	406	1.587	803	1.980
4	Singapura	1.802	752	1.281	2.134	1.503
5	Korea Selatan	1.754	1.340	2.238	2.686	2.590

Source: Karo District Koprindag Service Office, 2018

Table 1 above shows the development of the volume of cabbage exports in Karo District according to the destination country over the past five years, which has fluctuated from year to year. There are 5 destination countries for cabbage export in Karo District and Malaysia has become the largest destination for the export of cabbage commodities in the last five years, followed by Taiwan as the second largest destination for cabbage export.

The volume of cabbage exports in Karo District from 2013-2017 tends to increase from year to year. The highest export volume occurred in 2013. In 2014 the export volume decreased compared to 2013. In 2015 the export volume experienced a very drastic increase from 2014 amounted to 51.45%. Then in 2016 the volume of cabbage exports increased again compared to 2015 by 4.70%, followed by 2017 the volume of cabbage exports increased again compared to the previous years of 5.17%.

II. Theoretical Review

2.1 Cabbage

Cabbage plants or popularly known as cabbage can grow well in highland areas, namely at an altitude of 800 m above sea level and get enough rainfall. These vegetable leaves are widely used for fresh consumption as fresh vegetables or processed into various types of cuisine.

Broad cabbage plants (brassicca and raphanus) consisting of many species/varieties, each of which requires special requirements individually, but in general can be grouped into two types, namely cold temperatures (subtropics) and hot temperatures (tropics). White cabbage plants are classified as subtropical, while mustard greens tend to be tropical. From that the factors that influence and are limiting are land and climate.

Cabbage eggs, cabbage, and flower cabbage require a cool climate which means high land areas at an altitude of 1000-2000 m above sea level, whereas in caisin and mustard can be cultivated both in the lowlands and in the highlands, but in the highlands, caisin/mustard quickly flowering. In the lowlands, the cabbage eggs and Chinese cabbage plants are not able to form heads, and when they are formed they are only very small.

Fertile soil is generally favored by cabbage plants. Cabbage plants are generally resistant to high salt content, but are not very happy with the stagnant ground water. The degree of soil acidity (pH) is between 6-7, between 70-80% of the root of cabbage is found on the surface of the soil as deep as approximately 25 cm, until the grounding (tillage) to grow cabbage as deep as 30 cm. Especially soils containing high salt, earthworks should not be too deep. However cabbage plants are tolerant of high salt levels. Generally, cabbage plants are planted on high saline land, the formation of roots after planting from the nursery is rather slow. But the leaves are dark green, and the leaf edges dry, and are usually sensitive to black root disease (Sunarjono, 2013).

2.2 International Trade

The term international trade is intertwined with exchanges outside national borders in an effort to meet human needs and desires. In many forms, international trade covers everything from export-import trade to licensing, franchising, joint ventures, foreign direct investment, key loop operations, and management contracts. According to Apridar (2009), many factors cause a country to conduct international trade, including the following:

- a. To meet the needs of domestic goods and services
- b. The desire to gain profits and increase state revenue
- c. There is a difference in the ability of mastering science and technology in processing economic resources
- d. The existence of excess domestic products that need new markets to sell these products
- e. There are differences in conditions such as natural resources, climate, labor, culture and population that cause differences in production results and the existence of production limitations
- f. There is a common taste in an item
- g. The desire to open cooperation, political relations and support from other countries
- h. The era of globalization so that no single country in the world can live alone.

2.3 Theory of Demand

Demand curves are various combinations of prices and quantities that indicate the amount of goods that consumers want and can buy at various price levels and for a certain period. The lower the price of an item, the more number of items requested and vice versa.

The amount requested does not only depend on the price but is also influenced by other factors such as:

- a. Changes in income

If consumer incomes increase at the same price, consumers can buy more quantities, if other factors are considered constant.

- b. Taste

Increased consumer taste can encourage more purchases even though prices do not change.

c. Estimate

If consumers expect prices to rise in the future, consumers will tend to buy more now.

d. Number of Consumers

If the population increases, the amount bought will increase even though the price does not go down.

e. Prices of Other Goods

The relationship between one item and another can be interchangeable and complementary. If the price of substitute goods rises, consumers will buy more other goods which are goods that are the initial needs of consumers.

2.4 Gross Domestic Product (GDP)

Gross domestic product (GDP) is a calculation used by a country as the main measure of its national economic activity, but basically GDP measures the entire production volume of a region. GDP can be used to study the economy over time or to compare several economies at one time.

2.5 Theory of Production

The production factor is all the sacrifices given to plants so that the plants are able to grow and produce well (Soekartawi, 2010). Production factors determine the size of the production obtained. In various experiences show that the factors of land production, capital to buy seeds, fertilizer medicines, labor and management aspects are the most important factors of production among other factors. The relationship between factors of production with production is usually called the production function or also called the relationship factor. Farmers in farming always try to allocate inputs or factors of production as efficiently as possible to obtain maximum production.

2.6 Exports

Exports originating from domestic production are sold / used by foreign residents. Exports are injections into income streams as do investments. To meet the increase in exports, producers must increase the amount of production by increasing the use of production factors (Nopirin, 2008).

Exports will encourage economic activity because foreigners buy goods produced in the country. And a country needs to boost exports in order to increase the country's wealth, which means increasing the income per capita of the people. Export as part of trade is made possible by several conditions, including: the existence of excess production in the country so that it can be sold abroad through export policies, there is foreign demand for a product, there is a greater profit from selling abroad than selling to overseas domestic because the prices on the world market are more profitable, there are political export policies and the barter between certain products with other products that are needed and cannot be produced domestically.

Many factors affect the appearance of exports. According to Darmansyah (1986) in Soekartawi (2010), these factors include international prices, exchange rates, import export quotas, tariff policies and non-tariffs.

2.7 Domestic Prices

Prices affect simultaneously on demand and supply. Thus it can be assumed that the demand and supply of cabbage has a different effect on the price level of cabbage. If the demand for cabbage increases (*Ceteris paribus*), the price of cabbage will increase (positive), whereas if the supply of cabbage increases, it will affect the price of cabbage (negative). Price elasticity of supply contains a substitution effect and income effect. In the substitution effect a decrease in prices (for example the price of cabbage), results in farmers replacing cabbage crops with other plants that are relatively more profitable. Conversely, the increase in cabbage prices can stimulate farmers to expand their cabbage crops and reduce other crops. On the other hand, the income effect of a price change on a bid can be positive or negative.

2.8 International Prices

Theoretically, export prices will be able to stimulate an increase in exports, this is because an increase in export prices in exporters will stimulate exporters to increase their exports, so that the quantity in the domestic market will decrease and stimulate an increase in domestic prices. Thus an increase in production, will have a negative effect on domestic prices.

2.9 Exchange Rate

The exchange rate or foreign exchange rate shows the price or value of a country's currency expressed in another country's currency. Foreign exchange rates are a very important factor in determining whether goods in other countries are cheaper and more expensive than goods produced domestically. Factors affecting the exchange rate include: changes in foreign exchange demand and supply, changes in people's preferences,

changes in the prices of export and import goods, general price increases (inflation), changes in interest rates and investment returns and economic growth.

III. Research Metodology

3.1 Method of Determination of Location

The research area was chosen purposively, in Karo District, Sumatera Utara Province. This is supported by data from the Ministry of Agriculture of the Republic of Indonesia which states that Karo District cabbage is the largest horticultural commodity contributing to exports, out of 147 types of export-leading agricultural products from Sumatera Utara.

3.2 Sample Collection Methods

Determination of the sample in this study using time series data quarterly (2008; Q1-2017; Q4) in order to obtain 40 observations processed using SPSS 15.0 including cabbage production data, cabbage domestic prices, Malaysian international prices, the exchange rate of the rupiah against ringgit, Indonesian GDP and Malaysian GDP.

3.3 Data Collection Methods

Data collected in this study are secondary data. The secondary data used is time series data. In this study, 2008 quarterly data; Q1-2017; Q4. The secondary data was obtained from the Karo District Industry and Trade Cooperative Office, Belawan Agricultural Karatina Center, Belawan Customs and Excise, Central Statistics Agency, FAOSTAT, World Bank and Bank Indonesia.

3.4 Data Analysis Methods

Data were analyzed using multiple linear regression. Hypothesis testing using t test, F test., R square.

IV. Research Results and Discussion

Results of Estimation and Discussion of Factors that Influence Cabbage Exports in Karo District

Hypothesis testing is to analyze the effect of independent variables (cabbage production, domestic prices, international prices, exchange rate, Indonesian GDP and Malaysian GDP). The results of the analysis using multiple linear regression analysis can be seen in Table 1.

Table 2. Analysis Results of Factors Affecting Cabbage Exports Volume in Karo District

Description	Regression Coefficient	T _{count}	Sig.
Constant	149117,456	3,944	0,000
X ₁ : Cabbage Production	0,787	3,762	0,001
X ₂ : Domestic Prices	-19,099	-3,293	0,002
X ₃ : International Prices	-313,120	-2,868	0,007
X ₄ : Exchange Rate	-6,466	-5,210	0,000
X ₅ : GDP Indonesia	130,834	3,391	0,002
X ₆ : GDP Malaysia	-249,898	-2,504	0,017
R: 0,850			
R-Square: 0,722			
F _{count} : 14,313			
Sig. F: 0,000			

Source: Data Analysis Results

The R square value obtained was 0.722, meaning that 72.2% of the variation of the combined cabbage export variables could be explained by the variation of the independent variables in the model (cabbage production, domestic prices, international prices, exchange rate, Indonesian GDP and Malaysian GDP). The remaining 27.8% explained by other variables outside the model.

Because the significance value is less than 0.05 ($0,000 < 0,05$) then H_0 is rejected and H_1 is accepted, which means there is a linear relationship between cabbage production, domestic prices, international prices, exchange rate, Indonesian GDP and Malaysian GDP against cabbage exports in Karo District.

Partially, in Table 2 there are six variables that have a positive and significant effect on cabbage exports in Karo District at the 0.05 level. These influential variables are cabbage production, domestic prices, international prices cabbage, exchange rate, Indonesian GDP and Malaysian GDP. The description of each variable can be explained as follows:

a)Effect of Cabbage Production on the Volume of Cabbage Export in Karo District

The test results in Table 2 obtained tcount of 3.762 with a significance of 0.001. The significance value is smaller than $\alpha=0.05$, thus at the 0.05 level the hypothesis that cabbage production in Karo District has a significant effect on cabbage exports in Karo District is received. Regression coefficient obtained 0.787 means that if cabbage production increases by 1 ton, the export of cabbage in Karo District will increase by 0.787 tons. Cabbage production in Karo District is positively related to cabbage exports in Karo District.

The results of this study are in accordance with Sukirno (2010) in the law of supply and demand which states that the more the amount of production increases, the greater the number of goods offered by producers so that the cabbage exporters will try to find a better market network from domestic and abroad. Thus, it will motivate farmers to grow cabbage so that cabbage production will increase, where the demand for cabbage volume by exporters is higher.

b)Effect of Domestic Prices on the Volume of Cabbage Export in Karo District

The test results in Table 2 obtained a tcount of -3.293 with a significance of 0.002. The significance value is smaller than $\alpha=0.05$, thus at the 0.05 level the hypothesis which states the domestic price of cabbage in Karo District does not have a significant effect on cabbage exports in Karo District is rejected. Regression coefficient obtained -19,099 means that if the domestic price of cabbage rises to Rp1, then cabbage exports in Karo District will decrease by 19,099.

Domestic prices of cabbage in Karo District are negatively related to cabbage exports in Karo District. The results of this study are in accordance with Sukirno (2010) in the law of supply which states that if prices get higher, the volume of offers will increase because people will compete to sell more goods and services beyond what other people want to buy and the production of cabbage. The resulting product will be offered in advance for domestic purposes so that it will result in reduced export offers.

c)Effect of International Prices on the Volume of Cabbage Export in Karo District

The test results in Table 2 obtained a tcount of -2.868 with a significance of 0.007. The significance value is smaller than $\alpha=0.05$, thus at the 0.05 hypothesis level which states that the international price of cabbage in Karo District has a significant effect on the export of cabbage in Karo District is received. Regression coefficient obtained -313,120 means that if the international price of cabbage rises by 1 MYD, then cabbage exports in Karo District will decrease by 313,120. International prices of cabbage in Karo District are negatively related to cabbage exports in Karo District.

International prices have a significant effect on the volume of cabbage exports in Karo District, where this is due to the higher export prices or international prices of cabbage, exporters will be increasingly encouraged to increase the volume of cabbage exports and develop markets abroad. This is in accordance with Sukirno (2010) in the law of supply which states that if the price of an item rises, the volume of exports (the amount offered) will increase. The results of this study are also supported by previous research Sinuhaji (2012) in his study entitled "Analysis of Factors Affecting Cabbage Export (brassica o.capitata) from Karo District".

d)Effect of Exchange Rate on the Volume of Cabbage Export in Karo District

The test results in Table 2 obtained a tcount of -5.210 with a significance of 0,000. The significance value is smaller than $\alpha=0.05$, thus at the 0.05 level the hypothesis that the rupiah exchange rate against ringgit has no significant effect on cabbage exports in Karo District is rejected. Regression coefficient obtained -6,466 means that if the exchange rate of the rupiah against ringgit increases by 1 MYD, then cabbage exports in Karo District will decrease by 6.466 tons. The exchange rate of the rupiah against the ringgit is negatively related to cabbage exports in Karo District, meaning that if the exchange rate of the rupiah against the ringgit rises, the volume of export demand will decrease.

Currency appreciation and depreciation will affect the increase or decrease in exports to and from a country. Rupiah exchange rate is one of the factors that influence the competitiveness of export products. So for the rupiah to have a positive effect on exports, it is necessary to maintain the Indonesian currency so that it is not being appreciated, it needs to be balanced with various improvements such as efficiency of licensing bureaucracy, improvement of infrastructure and transportation both in terms of cost and length of time of transport, reduction in bank credit interest for small businesses and increase the quality of national exports and also the improvement of national industries that are able to increase the competitiveness of cabbage commodity export products to Malaysia.

e)Effect of GDP Indonesia on the Volume of Cabbage Export in Karo District

The test results in Table 2 obtained a tcount of 13,391 with a significance of 0.002. The significance value is smaller than $\alpha=0.05$, thus at the 0.05 level the hypothesis that Indonesia's GDP has a significant effect on cabbage exports in Karo District is accepted. Regression coefficient obtained 130.834 means that if

Indonesia's GDP rises by 1 unit, then cabbage exports in Karo District will increase by 130.834 tons. Indonesia's GDP is positively related to cabbage exports in Karo District.

The results of this study are consistent with Nicholson (2002) which states that if income increases, the amount of demand for goods increases. Increasing cabbage export volume will have a positive impact on Indonesia's GDP, namely increasing the amount of foreign exchange of the country, which means the Indonesian economy has increased.

f)Effect of GDP Malaysia on the Volume of Cabbage Export in Karo District

The test results in Table 2 obtained a tcount of -2.504 with a significance of 0.017. The significance value is smaller than $\alpha=0.05$, thus at the 0.05 level the hypothesis that Malaysian GDP does not have a significant effect on cabbage exports in Karo District is rejected. Regression coefficient obtained -249,898 means that if Malaysian GDP rises by 1 MYD, then cabbage exports in Karo District will decrease by 249,898 tons. Malaysia's GDP is negatively related to cabbage exports in Karo District.

Malaysia's GDP has a significant effect on the volume of cabbage exports from Karo District, where this is due to the fact that cabbage is a staple of the Malaysian state and also the taste of cabbage from the Karo District is favored by Malaysians because it tastes sweet and is not owned by other countries.

The results of this study are also supported by previous research Sinuhaji (2012) in his study entitled "Analysis of Factors Affecting Cabbage Export (*brassica o.capitata*) from Karo District". The results showed that Malaysian GDP significantly influenced the volume of cabbage exports in Karo District.

V. Conclusion and Suggestion

5.1 Conclusion

Based on the results of research and hypothesis it can be concluded as follows:

- 1.Cabbage production has a positive and significant effect on the volume of cabbage exports in Karo District to Malaysia.
- 2.Domestic prices has a negative and significant effect on the volume of cabbage exports in Karo District to Malaysia.
- 3.International prices has a negative and significant effect on the volume of cabbage exports in Karo District to Malaysia.
- 4.The exchange rate has a negative and significant effect on the volume of cabbage exports in Karo District to Malaysia.
- 5.GDP Indonesia has a positive and significant effect on the volume of cabbage exports in Karo District to Malaysia.
- 6.GDP Malaysia has a negative and significant effect on the volume of exports of Karo District to Malaysia.

5.2 Suggestion

As a logical series of research, suggestions that can potentially be discovered are:

- 1.It is expected that the government and related agencies can increase cabbage exports. Considering the variable production, domestic cabbage prices, international cabbage prices, the exchange rate of the rupiah against ringgit, Indonesian GDP and Malaysian GDP play an important role in influencing the volume of cabbage exports in Karo District so can be a guideline for making policy formulations in terms of increasing cabbage exports in Karo District in the future.
- 2.Farmers are expected to be able to increase the amount of cabbage production to meet the demand for cabbage both in the domestic market and in foreign markets in particular, so that it can thus become one of the efforts that support the increase in the volume of cabbage exports in Karo District.
- 3.For further researchers who are interested in conducting this research, it should increase the number of variables and research time that are not used in this study.

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