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COMPETITIVENESS ANALYSIS AND FACTORS THAT AFFECTING INDONESIA'S EXPORT OF MANGOSTEEN IN THE INTERNATIONAL MARKET

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ABSTRACT

Tropical fruits are one of Indonesia's leading horticultural products, where mangosteen fruit contributes the largest export to Indonesia's total fruit exports. However, Indonesia's mangosteen export share is still very low and this should be maximized. This study aims to analyze the competitiveness of Indonesian mangosteen exports in the international market and compare with other mangosteen exporting countries in the international market and find out the factors that affect the competitiveness. The data used is in the form of secondary data from 2003 to 2022. The analysis methods used are ECI, ISP and multiple regression analysis. The results of the ECI analysis show that Indonesian mangosteen has a competitive advantage and experiences an increasing export trend with a value of 1.217 and ISP shows that Indonesia tends to be a mangosteen exporting country and is at the maturity stage with a value of 0.903. However, Indonesia's competitive position is still below other countries such as Thailand, India, Peru and Kenya. Factors that affect Indonesia's ECI significantly are export volume of Thailand's mangosteens and harvest area of Indonesia's mangosteens.

INTRODUCTION

Soil fertility in Indonesia is one of the gifts that can be used to cultivate various agricultural commodities. The agricultural sector has an important role in the economic development of countries and regions (Yudha et al., 2022). Based on records from Kementerian Pertanian (2022a), from 2018 to 2021 the agricultural business sector in general (including forestry and fisheries) was ranked second after the processing industry sector with an average contribution of 13.22 percent to Indonesia's Gross Domestic Product (GDP), with the contribution of narrow agriculture (without forestry and fisheries) was 9.82 percent. One of the agricultural subsectors is horticulture, namely fruit, vegetables, biopharmaceutical plants, and ornamental plants (Badan Pusat Statistik, 2022). Indonesia's position on the equator means that Indonesia has good horticultural potential, including tropical fruit commodities. Indonesia's leading tropical fruit commodities include bananas, durian, pineapples, mangosteens, mangoes, and oranges. Badan Pusat Statistik (2022) states that this commodity has a large contribution to the annual horticultural production of fruit and vegetables.

One of Indonesia's favorite fruit commodities is mangosteen. Mangosteen fruit (*Garcinia mangostana* Linn) is an agricultural commodity belonging to the Clusiaceae family and is nicknamed the queen of fruits because it has an exotic taste, the beauty of the fruit skin and the flesh is whitish red and clean, and also has many benefits. such as a source of antioxidants, anticancer, and anti-inflammatory and can control blood sugar levels (Kementerian Kesehatan, 2022). Mangosteen fruit also has high economic value and high market demand. CNN Indonesia (2020) in an interview with the Head of Barantan (Badan Karantian Pertanian), Ali Jamil, said that during the Covid-19 pandemic, world demand for mangosteen increased because more and more countries recognized the benefits of this mangosteen fruit. This can be seen in the volume of Indonesian mangosteen exports increasing by 73 percent in 2020, followed by total Indonesian mangosteen production which continues to increase in 2017-2020 with the production of 161,750; 228,150; 246,480; and 322,414 tonnes respectively (Badan Pusat Statistik, 2023b).

Currently, mangosteen is in first place as a fruit commodity with the largest export volume in Indonesia (Badan Pusat Statistik, 2023a). The largest mangosteen production centers in Indonesia are West Sumatra, East Java and West Java. Judging from the level of production in the world, Indonesia's mangosteen fruit production is in 5th position after India, China, Kenya and Thailand (Suindiantarini & Aswitarit, 2019). Even though Indonesia is the fifth largest producer of mangosteen in the world, the fact is that the contribution of

the volume of mangosteen exports is still small compared to the total production of Indonesian mangosteen. The percentage share of Indonesian mangosteen exports from the total mangosteen production produced in 2018-2022 is only 17.5 percent, which is the highest. in 2018. The large production of Indonesian mangosteen should provide large export potential opportunities. Apart from that, the demand for mangosteen is also increasing because many people are aware of the benefits of mangosteen in the field of medicine (Nuraniputri, 2016). The Heckscher-Ohlin theory states that each country will export goods that have abundant production factor intensity. Halwani (2002) also states that "A country will export goods whose production factors are abundant and will import goods whose production factors are scarce". The existence of other exporting countries for mangosteen commodities encourages the Indonesian industry to improve the quality of mangosteen and its ability to compete in international markets. Indonesia's position as a mangosteen exporting country is quite competitive with other mangosteen exporting countries.

The most important factor that determines exports is the country's ability to produce goods that can compete in foreign markets, for this reason, an exported good or commodity must have competitiveness (Rianda, 2020). Competitiveness is a factor that determines whether a commodity will survive in international trade. Competitiveness depends on the competitive advantage possessed by creating relative resource levels of a company or country. Competitiveness will show the position of a company or country compared to other companies or countries that carry out the same activities (Yudha & Noerbayinda, 2023). The existence of competing countries producing mangosteen means that the development of mangosteen exports in the long term is largely determined by improving the quality of the commodity and its competitiveness. The strength of a commodity's competitiveness can be determined using competitive advantage analysis (Yudha et al., 2022). The competitive ability of mangosteen is very important to determine mangosteen specialization so that it has a high level of competitiveness so that Indonesian mangosteen commodity exports have a strong presence at regional and international levels.

Competitiveness can be influenced by several factors such as land area, natural conditions, exchange rates, and the presence of competitors (Gunawiredja, 2022). Yanita et al. (2019) researched factors that influence the competitiveness of Crude Palm Oil competitively for the independent variables of land area, exports of competing countries, soybean oil prices, and exchange rates and obtained results that land area, soybean oil prices, and exchange rates influence competitiveness. Based on the background above, this research aims to analyze the competitiveness and factors that influence Indonesian mangosteen exports in the international market.

1. To determine the level of competitive advantage of Indonesian mangosteen exports in the international market.
2. To determine the competitive position of Indonesian mangosteen exports compared to other exporting countries in the international market.
3. To determine the effect of the independent variable on the dependent variable, namely the Export Competitiveness Index (ECI) of Indonesian mangosteen.

RESEARCH METHODS

Method of Collecting Data

This research uses secondary data and the object of research is the competitiveness of mangosteen and the factors that influence the competitiveness of mangosteen in the period 2003 to 2022. The HS code used in this research is HS code 080450. The research uses library study data collection techniques where the method of data collection comes from previous research and relevant official agencies that can be accounted for. Data will be processed using Microsoft Excel 2016 Software, Eviews Program.

Data Analysis Method

A. Export Competitiveness Index (ECI)

Export Competitiveness Index (ECI) is a method that shows the comparison of the ratio of a country's exports in a market for commodities and a certain period with the ratio of a country's exports in a market for commodities and the previous period. ECI is a method used to measure the level of competitiveness of a commodity. The ECI calculation formula is as follows (Wahyuningsih et al., 2022):

$$ECI = \frac{(^{Xij}/_{Xiw})_t}{(^{Xij}/_{Xiw})_{t-1}} \text{ .....(1)}$$

Information:

Xij = Export value of the country's mangosteen commodity (j)
Xiw = World export value of mangosteen commodities
t = Current period
t-1 = Previous period

Criteria:

ECI > 1 = commodity has a competitive advantage and faces the trend of increasing competitiveness.

ECI < 1 = commodity has no competitive advantage or facing a downward trend in competitiveness.

B. Trade Specialitation Index (TSI)

The Trade Specialization Index (TSI) is used to analyze export competitiveness position and can be formulated as follows:

$$ISP = \frac{(Xij-Mij)}{(Xij+Mij)} \text{ …….(2)}$$

Information:
Xij = Export value of mangosteen commodities from the country (j)
Mij = Import value of mangosteen commodities from the country (j)
Criteria:
Positive ISP = Strong competitiveness/exporting
Negative ISP = Weakly competitive/importing
TSI will identify the growth rate of a product within trading into 5 stages, namely as follows:

1. Introduction Stage (-1 < ISP ≤ -0.5)
2. Import Substitution Stage (-0.51 < ISP ≤ 0)
3. Growth Stage (0.01 < ISP ≤ 0.8)
4. Maturity Stage (0.81 < ISP ≤ 1)
5. Return to import stage (1 > ISP ≤ 0) (Yudha & Malau, 2022).

C. Multiple Regression Analysis

Multiple linear regression analysis is used to determine the effect of the independent variable on the dependent variable. In this study, the factors influencing the ECI of Indonesian mangosteen were examined. With the following regression model:

$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + \beta_6X_6 + \beta_7X_7 + \mu$ …….(3)

Information:

Y	= ECI of Indonesia's Mangoesteen
β_0	= Constant
$\beta_1,\beta_2....\beta_7$	= Coefficient of Regression
X_1	= Harvest Area of Indonesia's Mangosteen (Ha)
X_2	= Export Volume of Thailand's Mangosteen (Ton)
X_3	= Export Volume of India's Mangosteen (Ton)
X_4	= Exchange Rate of Rupiah to Dollar AS (Rp)
X_5	= Farmer's Exchange Rate (%)
X_6	= Temperatur (^oC)
X_7	= Dummy of Rainfall
μ	= error term

RESULT AND DISCUSSIONS

General Description of Indonesian Mangoesteen

Mangosteen is one of the prospective fruit commodities in the national economy. The market potential is quite broad, both for foreign and domestic markets. This can be seen from the increasing volume and value of mangosteen exports to foreign countries every year. Indonesia's mangosteen harvest area in 2003-2022 fluctuates although it tends to experience an upward trend with an average growth of 3.52 percent and the average harvest area over the last 20 years is 17,023 hectares. The highest harvest area was achieved in 2020 with 31,052 hectares and the lowest harvest area was achieved in 2006 with 8,275 hectares. The high harvest area in 2020 was caused by the high demand for mangosteen on the world market as a result of Covid-19, namely public awareness of the importance of healthy living and the benefits of mangosteen fruit so that the government began to make mangosteen a superior commodity both at the domestic level and as an export requirement (Suindiantarini & Aswitarit, 2019).

Indonesian mangosteen production fluctuates but experiences an upward trend as does the development of Indonesia's mangosteen harvest area. The average production of Indonesian mangosteen over the last 20 years was 159,730 tons with an average growth of 4.7 percent. The highest production occurred in 2022 with 343,663 tons, while the lowest production occurred in 2004 with a total production of 62,117 tons. One of the reasons for this low production is the low harvest area in 2004, namely only 8,473 hectares. The highest mangosteen production occurred in 2022, an increase of 13.07 percent (39.73 thousand tons) from 2021. This was partly due to the fairly high harvest area, namely 27,425 hectares and high productivity, namely 125.31 quintals/hectare, while in 2021 productivity will only be 112.34 quintals/hectare (Kementerian Pertanian, 2022b).

Dynamics Export-Import of Indonesian Mangosteen

The volume of Indonesian mangosteen exports tends to increase although it is not stable every year and has even experienced significant increases and decreases. A significant decrease occurred in 2017 from 35,660 tons to 10,039 tons or a decrease of 71.85 percent, while a significant increase occurred in 2018 from 10,039 tons to 39,817 tons or an increase of 296.62 percent. This happened because in 2017 there was an import ban by the Chinese government on Indonesian mangosteen which had an impact on decreasing the volume of Indonesian exports, but in 2018 the import faucet was reopened by the Chinese government which caused an increase in the volume of Indonesian exports because as is known, China is one of the one of the main export markets for Indonesian mangosteen. The Chinese government stopped imports because it considered that Indonesian mangosteen contained pests and metals and

therefore did not comply with China's health requirements (Widhiyoga et al., 2023).

The increase in demand for mangosteen is influenced by the many research results which show that mangosteen has many benefits and is a raw material for the medicine and cosmetics industry. Nuraniputri (2016) said that the increase in mangosteen exports was not followed by an increase in mangosteen quality. The problem of low export-quality mangosteen needs to find a solution. One of the quality requirements for exported mangosteen is that the fruit is of good quality, has no defects, is free of pests and diseases and has a traceability guarantee from the garden to the packaging house. Meanwhile, mangosteen is a fast-perishable fruit so it requires specific handling so as not to cause high levels of damage and reduced quality during handling and shipping (Hanafi et al., 2023). The low quality of the mangosteen produced is due to the processing of people's mangosteen gardens which have not been well maintained. Mangosteen farming activities are still carried out traditionally and cultivation techniques are poor, however, mangosteen farming still needs to be developed considering the large demand for mangosteen in domestic and foreign markets. Apart from being consumed as fresh fruit, mangosteen is also used as an industrial raw material which makes demand for consumers abroad continue to increase. This shows that the mangosteen commodity can compete in the international market (Mamondol, 2019).

The volume of Indonesian mangosteen imports has tended to decline over the last 20 years. The volume of Indonesian mangosteen imports tends to decrease from thousands of tons or around 1000 tons to only tens of kilograms or around 14 kg in 2022. Kementerian Pertanian (2020) said that domestic consumption of mangosteen fruit is sufficient for domestic production. The excess supply of Indonesian mangosteen has become an export commodity to several countries, so the government has also begun to reduce the volume of mangosteen imports. Import volume fell drastically in 2015 with only 9 kg, although it increased in 2018 to 246 kg and fell again until 2022 with no more than 14 kg. The main export share of Indonesian mangosteen in 2022 based on data from Kementerian Pertanian (2022b) is China with an export value of US$ 48.67 million (16.17 thousand tons). Based on Figure 4, it can be seen that the export volume of mangosteen from 2003 to 2022 shows an increasing trend. It can be concluded that mangosteen is a fruit commodity that has good potential for development.

Export Competitiveness Index (ECI)

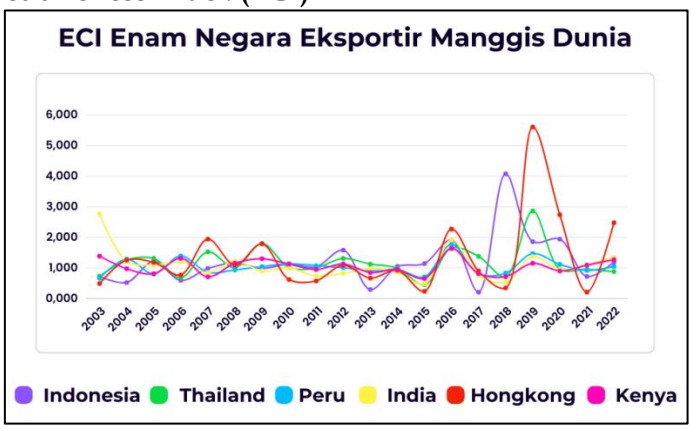

Figure 1. ECI Chart of Six Mangosteen Exporting Countries (2003-2022).

The Export Competitiveness Index (ECI) is an analytical tool used to determine the competitiveness of mangosteen commodities in terms of their competitive advantages. ECI shows the ratio of a country's export market share in the international market for a particular commodity in a certain period to the ratio of a country's export market share in the international market for a particular commodity in the previous period. The results of ECI calculations show that the average value for the six countries for the 2003-2022 period is not much different from around one. This means that the six countries have a competitive advantage and are facing an increasing export trend. Figure 1 shows that the ECI values for the six countries are not much different, as shown by the overlapping graphs. The comparison between the six countries in the 2003-2022 period which can also be seen in the graph shows Hong Kong as the country with the highest average ECI value at 1.390 followed by Indonesia with 1.217; Thailand at 1,180; India with 1,105; then Kenya with 1,045; and finally Peru 1,037

Indonesian mangosteen exports show competitive competitiveness and have an increasing export trend in the world's international market share.

Based on the calculation results, the average ECI value for Indonesia for the 2003-2022 period was 1.217, which shows that Indonesian mangosteen exports in the international market have a competitive advantage and the export trend is increasing so that Indonesia can compete with other exporting countries in the international market. This value is only lower than Hong Kong so this increasing export trend needs to be maintained. The high value of Indonesia's ECI is also supported by the growth in export value every year which tends to increase, namely by an average of 40.32 percent. The export volume which tends to increase is also one of the reasons for Indonesia's high ECI because the ECI compares the export value of a certain period to the previous period, so the higher the export volume and value in the following period, the higher the ECI value will be. Rahmadhani's research (2018) also

produced an ECI value of more than one, namely 1.155 in the 2001-2015 period. The ECI value is influenced by the export volume of a commodity so the quantity of exports can affect export competitiveness. A country has a competitive advantage if it can sell products that can meet foreign demand requirements so that it can generate more profits. Increasing export volume can increase the ECI value and vice versa (Pangestu et al., 2022).

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The government, through the DPR Commission IV team, also inspected one of the mangosteen packing houses in West Java to ensure that mangosteen exports run smoothly because mangosteen only has a two-week shelf life, more than that time, it will be difficult to market the mangosteen and exporters will be fined to compensate for lost products. expired. This is related to gathering input and information to help support the export of horticultural products, namely mangosteen. As is known, generally agricultural products are very vulnerable to time because the product will expire. The chairman of Barantan will use this as input because Indonesia's mangosteen production level is good and increases every year also exports (DPR RI, 2023).

Trade Specialization Index (TSI)

Competitive advantage can also be measured by the Trade Specialization Index (TSI). The TSI value is obtained from a comparison between the difference between the export value and import value of a country compared to the total value of that country's exports and imports (Yudha & Malau, 2023).

The TSI calculation results show that the average value for the four countries, namely Indonesia, Thailand, India and Kenya for the 2003-2022 period, is not much different, with a figure in the range of 0.9. Peru has a stable TSI value of one every year, while Hong Kong has a negative TSI value. This means that the five countries except Hong Kong tend to be exporting countries, while Hong Kong tends to be importing countries of mangosteen. Figure 2 also shows that Hong Kong has a negative TSI during 2003-2022. A comparison between the six countries in the 2003-2022 period shows Peru as the country with the highest average ISP value with 1.000 followed by India with 0.994; Kenya with 0.981; Thailand with 0.957; then Indonesia with 0.903; and finally Hong Kong with -0.334.

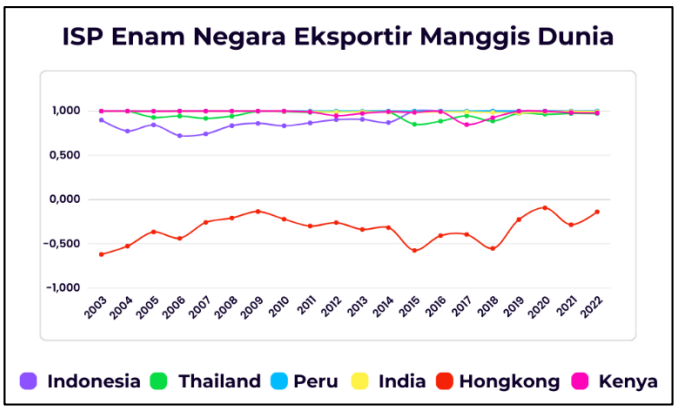

Figure 2. The TSI Chart of Six Mangosteen Exporting Countries (2003-2022).

The TSI value for Indonesian mangosteen in 2003-2022 is quite stable with an average of 0.903, which means that Indonesia feels at the maturity stage and tends to become a mangosteen exporting country. This is in line with research conducted by Rahmadhani (2018) on the world market in 2001-2015, namely that the TSI value of Indonesian mangosteen was at the maturity stage and was an exporting country with a value of 0.898. Indonesia's TSI value is in the range of 0.7 to 1, which means that Indonesia has only been in the growth and maturity stage. Indonesia was in the growth stage for three years, namely in 2004, 2006 and 2007. The tendency for Indonesia to be at the maturity stage and to be an exporting country is proven by the high value of Indonesian mangosteen exports compared to its imports. This shows that the Indonesian mangosteen commodity has strong competitiveness and is strengthened by the ECI value which shows that Indonesia has a competitive advantage and an increasing export trend. During the 2003-2022 period, based on the identification of TSI values from the six countries compared in this research, five of them, namely Indonesia, Thailand, Peru, India and Kenya, have strong mangosteen competitiveness, tend to be exporters and are at the maturity stage. At this maturity stage, a country has high trade in a commodity and high demand. Another country, namely Hong Kong, is at the import substitution

stage where production levels are not high enough to meet domestic demand so it tends to be an importing country and has weak competitiveness (Riswanda, 2023).

Multiple Regression Analysis

Analysis of the factors that influence the competitiveness of Indonesian mangosteen exports in the international market with the help of multiple linear regression is used to determine the variables that influence competitiveness in terms of competitive advantage (ECI). The output for the dependent variable ECI is as follows:

Table 1. Multiple Regression Analysis Output

Method: Least Square
Sample: 2003 2022
Included observations: 20

Variabel	*Coefficient*	*Probability*
C	6,469643	0,5385
X_1	0,000195	0,0021
X_2	-0,0000088	0,0180
X_3	-0,0000027	0,6391
X_4	-0,000012	0,9275
X_5	0,018915	0,3448
X_6	-0,324419	0,3076
X_7	0,491089	0,4414
R-Squared		0,665132
F-Statistics		3,405000
Prob (F-statistics)		0,030367

$Y = 6{,}469643 + 0{,}000195\ X_1 - 0{,}0000088\ X_2 - 0{,}0000027X_3 - 0{,}000012X_4 + 0{,}018915X_5 - 0{,}324419X_6 + 0{,}491089X_7 + 0{,}29035$

The results of the analysis show that the R-Squared value obtained is 0.665, which means that 66.5 percent of the level of competitiveness of Indonesian mangosteen exports in the international market (ECI) is influenced by variables in the model while the remainder is influenced by other variables outside the model. The results of the F test analysis obtained a probability value (F-Statistic) of 0.0303 with a confidence level of 95 percent. This means that the value is less than (0.05), so it can be concluded that the independent variables have a joint and significant effect on the dependent variable.

1) Harvest Area of Indonesia's Mangosteen (X_1)

Based on Table 1, the probability value for the harvest area variable is 0.0019 at the 95 percent confidence level, where this value is smaller than α (0.05), so Ho is rejected. This means that the harvest area has a significant effect on the ECI of Indonesian mangosteen. The coefficient value of this

variable is 0.000205, which means that if there is an increase in harvested area by 1 unit, the ECI value of Indonesian mangosteen will increase by 0.000205 from the previous amount. This is also in line with the research results of Yanita et al. (2019) where harvested area has a significant and positive effect on the ECI of Indonesian CPO. The results of research conducted by Surya & Hasmarini (2023) also stated that the harvest area variable had a positive and significant influence on the competitiveness of Indonesian tea exports. This means that the higher the harvested area will have a positive influence on competitiveness, and vice versa.

Harvested area is usually related to planted area. The planting area is the area of land that will be planted with a commodity. The larger the area of land planted, it is hoped that the larger the harvest area obtained will be, but the harvest area obtained is not necessarily the same as the planting area used and because crop failure may occur (Saputri & Amalita, 2020). The recommended planting distance for mangosteen is 10-12 m x 10-12 m. Plant spacing needs to be designed in such a way that the plants are formed regularly, there is no competition between plants and they are easy to manage. Therefore, a large planting area is needed so that the recommended planting distance can be applied by farmers so that the quality of the fruit can be maintained and improved (Martias et al., 2021).

2) Export Volume of Thailand's Mangosteen (X_2)

Based on Table 1, the probability value for the Thai export volume variable is 0.0180 at the 95 percent confidence level, where this value is smaller than α (0.05), so Ho is rejected. This means that Thailand's export volume has a significant effect on the ECI of Indonesian mangosteen. The coefficient value of this variable is -0.0000088, which means that if there is an increase in Thailand's export volume by 1 unit and the values of other variables are considered constant, the ECI value of Indonesian mangosteen will decrease by 0.0000088 from the previous amount. This means that if the export volume of Thai mangosteen in the international market is high then the competitiveness of Indonesian mangosteen (ECI) is low because it cannot compete with Thai mangosteen. On the RCA dependent variable examined in this study, the independent variable Thailand's export volume also has a significant effect. This means that Thailand's export volume affects the competitiveness of Indonesian mangosteen from a comparative and competitive perspective. Thailand itself has the same market share as Indonesia, namely China. Thus, Indonesia and Thailand compete in the Chinese market where products with quality that are preferred by the market will survive in that market.

To be able to maintain its market, Indonesia must be able to increase not only quantity but also quality. This is also supported by an article published by the Purwakarta Government portal that "The competitor for

Indonesian mangosteen exports is Thailand, so product quality must be maintained because Purwakarta Mangosteen is accepted in China and other mangosteen export destination countries. To be able to exceed Thailand, Purwakarta mangosteen must be able to exceed Thailand so that farmers are required to continue to improve and maintain its quality and production (Pemerintah Kabupaten Purwakarta, 2019).

3) Export Volume of India's Mangosteen (X_3)

Based on the results of the t test analysis, the probability value for the Indian export volume variable is 0.6391 at the 95 percent confidence level, where this value is greater than α (0.05), so Ho is accepted. This means that India's export volume does not have a significant effect on the ECI of Indonesian mangosteen. India itself has several market shares in common with Indonesia, namely the United Arab Emirates and China. However, China is not India's main market, in contrast to Indonesia where China is the main market. The United Arab Emirates itself is India's main market and not Indonesia's main market. Thus, Indonesia and India do not compete in the same main market so India's export volume does not have a significant effect on Indonesia's competitiveness (Trade Map, 2023).

4) Exchange Rate (X_4)

Based on Table 1, the probability value for the exchange rate variable is 0.9275 at the 95 percent confidence level, where this value is greater than α (0.05), so Ho is accepted. This means that the exchange rate does not have a significant effect on the competitiveness (ECI) of Indonesian mangosteen. This is in line with research by Subekti (2020) which states that the exchange rate does not have a significant effect on the competitiveness of Indonesian mangosteen because whether the exchange rate has increased or decreased, if the country importing mangosteen still needs mangosteen fruit, it remains the routine of the exporting country to do so. Ratnasari et al.'s research. (2020) also found that the exchange rate had no effect on the competitiveness of Indonesian tea. The exchange rate does not have a significant effect on competitiveness, this could also be because the mangosteen importing country does not pay attention to the exchange rate, so whatever the exchange rate is, it will not affect the importer's purchasing power. According to Rahman (2020), the exchange rate is closely related to inflation. When the exchange rate depreciates, inflation increases. In this situation, farmers' welfare will actually decrease, because when inflation is high, the prices of agricultural goods are expensive, as well as the prices of agricultural production factors also increase. The increase in prices of raw materials and other production factors will reduce farmers' production and profits, thereby impacting farmers' ability to increase the quantity and quality of production.

5) Farmer's Exchange Rate (X_5)

Based on Table 1, the probability value for the farmer exchange rate variable is 0.3448 at the 95 percent confidence level, where this value is greater than α (0.05), so Ho is accepted. This means that the farmer's exchange rate does not have a significant effect on the ECI of Indonesian mangosteen. However, the low exchange rate for farmers will affect farmers' intensity in increasing agricultural productivity optimally in the long term. Such conditions can reduce the rate of increase in production relative to the rate of increase in domestic consumption (Aulia et al., 2021). The results of the research show that the farmer's exchange rate does not have a significant effect. It can be concluded that the level of welfare of fruit farmers in Indonesia is good as evidenced by the average NTP value being above 100. When the condition of the farmer's exchange rate is above 100 (NTP > 100) and shows that the price index received by farmers (It) is greater than the price index paid by farmers (Ib), then this condition can be said to mean that farmers experience a surplus and are more prosperous (Amri & Ikhsan, 2023).

6) Temperatur (X_6)

Based on Table 1, the probability value for the temperature variable is 0.4247 at the 95 percent confidence level, where this value is greater than α (0.05), so Ho is accepted. This means that the temperature variable does not have a significant effect on the ECI of Indonesian mangosteen. Environmental factors such as climate, rainfall and appropriate temperatures can also influence the success of plant growth (Wahyuningsih et al., 2022). The research results show that temperature does not have a significant effect on the competitiveness of Indonesian mangosteen because Indonesia is a tropical country with a temperature or air temperature that is favored by mangosteen. This appropriate temperature must be maintained and as explained above, if the temperature is too high it will affect plant development (Martias et al., 2021).

7) Dummy of Rainfall (X_7)

Based on Table 1, the probability value for the rainfall dummy variable is 0.6082 at the 95 percent confidence level, where this value is greater than α (0.05), so Ho is accepted. This means that rainfall does not have a significant effect on the ECI of Indonesian mangosteen. The rainfall required by mangosteen plants throughout the year is around 1,500-2,500 mm with the desired climate being wet but a dry atmosphere is required for 1-3 months, especially before flowering (Martias et al., 2021). The results of the research show that the rainfall dummy does not have a significant effect on the competitiveness of Indonesian mangosteen because the condition of Indonesia is a tropical country with rainfall which is also by the requirements for growing mangosteen.

The Ministry of Agriculture provides facilities in the form of coaching farmers to improve product quality, establishing packaging houses, and quarantine services to maintain and improve the quality of Indonesian mangosteen products to increase the competitiveness of mangosteen in the international market (Widhiyoga et al., 2023). Currently, only around 15 percent of mangosteen production meets export standards, while the rest is sold in traditional markets. Export market opportunities are still wide open, but this requires a better understanding of cultivation and marketing strategies. Intensive cultivation can increase mangosteen production to meet domestic and foreign needs. Opportunities in the export market also determine what specifications must be included in mangosteen fruit, including the price of mangosteen fruit and quality. For this reason, the requirements of the export destination country must be met to fill the export market. The export market wants mangosteen fruit with high-quality standards, including smooth skin without defects, spots and yellow sap. In addition, the fruit must have fresh green leaf ears. To be able to meet export market demand, the government has set quality standards for mangosteen fruit for fresh consumption which are regulated in SNI 3211-2009, which include quality, size, tolerance, appearance, packaging, labeling, recommendations and hygiene of mangosteen fruit (BISIP, 2023).

CONCLUSIONS AND SUGGESTIONS

Conclusions

Based on the research that has been carried out and the results of the discussion that has been explained, the following conclusions can be drawn:

1. The average ECI value of Indonesian mangosteen from 2003 to 2022 is 1.217, indicating that Indonesian mangosteen has a competitive advantage and is experiencing an increasing export trend, while the average ISP value of Indonesian mangosteen from 2003 to 2022 is 0.903, indicating that Indonesian mangosteen has an advantage. competitive and at the maturity stage.
2. The six countries have competitive advantages and are experiencing an increasing export trend. Indonesia is ranked second after Hong Kong with an ECI value of 1.217. The ISP value shows that Hong Kong is an importing country and is at the substitution stage, while the others are exporting countries and are at the maturity stage, including Indonesia with an ISP value of 0.903; but the ISP value is still below Thailand, Peru, India and Kenya.
3. Based on multiple regression analysis, it can be concluded that the factors that significantly influence the ECI of Indonesian mangosteen are the Indonesian mangosteen harvest area and the export volume of Thai

mangosteen, while the exchange rate, farmers' exchange rate, temperature, rainfall and the volume of Indian mangosteen exports do not have a significant effect on the competitiveness of Indonesian mangosteen in terms of competitive advantage (ECI).

Suggestions

Based on the results of the research that has been carried out and the conclusions that have been explained, the suggestions that can be given are as follows:

1. The harvested area and export volume of Thai mangosteen have a significant influence on competitive competitiveness so efforts that can be made to encourage improvements in the quality of Indonesian mangosteen include maximizing existing land area, implementing innovative cultivation technology, providing assistance and guidance to farmers regarding cultivation and post-harvest techniques. so that the quality of the mangosteen fruit produced can be better. This can be done in connection with the application of cultivation techniques according to Good Agricultural Practices (GAP) from capable parties such as experts from the Ministry of Agriculture so that the availability of existing mangosteens becomes of better quality and can compete with mangosteens. Thailand.
2. Collaborative relations with export destination countries must continue to be maintained and strengthened to facilitate the export process, increase market access, and minimize obstacles imposed on Indonesia, especially for the mangosteen commodity.
3. Data limitations make the variables in the model limited, so in future research it is necessary to examine other variables that have not been studied in this research such as land area, fertilizer use and planting distance and update the data according to the latest year.

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