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Comparative Advantage Analysis of Indonesia's Clove (*Syzygium aromaticum*) Export in International Market

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ABSTRACT
The plantation sub-sector has a role in the national economy. Clove is one of the leading commodities of the plantation sub-sector, so Indonesia has the potential as an exporter country of this commodity. This study aims to analyze whether Indonesian cloves have a comparative advantage in the international market or not. This research is quantitative-descriptive research with a case study method. The type of data in this study is secondary data with the data collection method using the documentation method originating from relevant international agencies and government agencies regarding Indonesian clove export data in the form of time series from 2010 to 2019. Secondary data was processed using software Microsoft Excel 2010. The commodity in this study was cloves with HS code 0907 (whole, flower and stalk). The study was carried out in February-March 2021. The methods used are Revealed Comparative Advantage (RCA) and Revealed Symmetric Comparative Advantage (RSCA) analysis approaches. The results of the RCA and RSCA analysis show that Indonesian clove commodity for the 2010-2019 period has a comparative advantage in international market with an average RCA value greater than 1, the value is 12,88 and an average value of RSCA is positive, the value is 0,76.

***Keywords**: Export, Clove, Comparative advantage.*

1. INTRODUCTION

The plantation sub-sector has a role in national economy, when viewed from its contribution to Indonesia's Gross Domestic Product (GDP), so that it can support increased economic development. Data from (Statistics Central Agency of Indonesia, 2020), shows that the GDP of Plantation Crops at constant prices in 2010, is increasing when viewed in the period 2013-2019. In 2013 the GDP of plantation crops reached 319.5 billion rupiah and in 2019 it increased to 405.2 billion rupiah.

The 2015-2019 Ministry of Agriculture's Strategic Plan explains that there are 15 main plantation commodities that production wants to stimulate. Based on this number, there are 12 commodities whose development shows a positive pattern. Clove is one of the leading commodities which has an average growth rate showing a positive pattern every year and is offered as a commodity that is exported to other countries, because it has potential in the export market.

Table 1. Productivity of clove's Indonesia 2014-2018

Year	Production (tonne)	Land Area (ha)	Productivity (Kg/Ha)
2014	122.134	510.174	391,00
2015	139.641	535.694	441,00
2016	139.611	545.027	426,00
2017	113.178	559.566	345,00
2018	131.014	569.052	400,00

Source: Ministry of Agriculture, 2020.

According to data from the Ministry of Agriculture 2020, the area of clove community plantations in 2014-2018 tends to increase with an average increase of 2.8 percent. However, increasing the area of clove community plantations does not cause increasing the productivity of clove. The productivity of Indonesian cloves from year to year tends to fluctuate during the period 2014-2018. According to the Directorate General of Plantation (2019), the decline in national clove productivity is due to a climate that does not support production development and most smallholder plantations in the use of cultivation and post-harvest techniques still

do not use technological innovation. Indonesia's clove commodity experienced an increase in exports from 2018 to 2019. In 2018, the export value of this commodity increased by 255.95 percent to US$95.8 million. Furthermore, the value of clove exports increased again in 2019, which was 11.77 percent to reach US$107.1 million (Statistics Central Agency of Indonesia, 2020).

Indonesia is the country with the largest clove production in the world in 2019 (FAO). However, this does not make Indonesia the largest clove exporting country. Indonesia occupies the second position in clove exports after Madagascar. The existence of this potential causes the need for proper handling in developing clove export competitiveness.

The concept of competitiveness is the ability of a commodity to enter foreign markets and the ability to survive in those markets. A product that has competitiveness is in great demand by consumers. The level of competitiveness of a country in the international trade arena is determined by two factors, namely the comparative advantage factor and the competitive advantage factor. The comparative advantage factor can be considered as a natural factor and the competitive advantage factor is considered a development factor (Tambunan, 2004). According to Heung-Sik and Narae (2010) in Sari and Widanta (2018) knowing comparative advantage in the economy provides a foundation for countries to specialize in production and enter into international trade to maximize a country's economic welfare.

Research on cloves was conducted by Nurhayati et al. (2018), stated that Indonesian clove is one of the Indonesian commodities that has potential to improve Indonesia's export performance. The results of the RCA analysis show that Indonesian cloves have a comparative advantage and strong competitiveness in main destination market during period 2002-2016, except for the Vietnam market in 2002.

The research conducted by Dewi et al. (2021), which is the result Indonesian cloves in the international market have a comparative advantage during the period 2013-2016 in international market. This is indicated by the RSCA value of 0.811959236 (positive value). Indonesian clove commodities has advantages in terms of natural resource factors, and weaknesses in human resources, science and technology resources, capital resources and infrastructure resources. Indonesia also has advantages in terms of demand conditions, supporting industries and company competition. Then all of this is supported by external factors, there are government factors and opportunity factors.

Research of Sari and Widanta (2018), regarding the comparative advantage of Indonesian cloves to ASEAN countries, show that Indonesian cloves when compared to other countries of ASEAN member, have a comparative advantage in terms of exports and imports in the period 2000 to 2015. This is evidenced from 2000 until 2015 the RCA index of Indonesian clove products was above 1, except in 2004 Indonesian clove products had an RCA index of 0.98 because in that year there was a crop failure. Based on the RTA (Relative Trade Advantage) analysis, Indonesian clove products have an RTA value more than 0 and in the last five years the RTA value of Indonesian cloves is superior to Malaysia and Singapore. So it means that Indonesian cloves have a comparative advantage in terms of exports and imports.

Increasing the competitiveness of a country is largely determined by its export performance (Hadianto, 2010). On the basis of this concept, an analysis of the comparative advantage of clove exports as one of Indonesia's mainstay export commodities is important in order to improve Indonesia's competitive position in the global scope. Therefore, this study aims to analyze whether Indonesian cloves have a comparative advantage in the international market or not during the period 2010 until 2019. The difference between the previous research and this research are the year of analysis and the series of analytical methods.

2. RESEARCH METHODS

The study entitled Analysis of the Comparative Advantage of Indonesian Clove Exports in the International Market used a quantitative-descriptive approach. Quantitative-descriptive research is research that explains, summarizes various conditions, situations or various variables that arise, which become the object of the research based on what happened (Bungin, 2017). The research method used in this research is using a case study approach. The case study is a research method by focusing on a particular unit of various variables (Bungin, 2017).

The type of data used is secondary data. Secondary data is data that has been available in various forms, obtained from indirect sources such as literature which includes reference books, research journals, theses and the internet as well as official documents and related institutions as well as various libraries that help provide information about the problems to be studied. The secondary data used is export data in the form of export value, import value and total export value of clove commodities with HS code 0907 for clove commodities (whole, flower and stalk) and all commodities in US$ units. The data used is in the form of a time series during the years 2010-2019.

The data collection method in this study was carried out using the documentation method through recording time series obtained from the Ministry of Agriculture of the Republic of Indonesia, Directorate General of Plantations, the Ministry of Trade of the Republic of Indonesia, Statistics Central Agency of Indonesia, United Nations Commodity of Trade (UN COMTRADE), and Food and Agriculture Organization (FAO). Data collection and data processing were carried out in February 2021 - March 2021. The data obtained were processed using software Microsoft Excel 2010.

2.1. Data Analysis

The Revealed Comparative Advantage (RCA) analysis according to Wibowo and Kusrianto (2010), aims to measure the comparative advantage of a product in a particular country or region in the study, namely clove products. The RCA method was compared with the three main clove exporting countries to the world's market, there are Madagascar, Singapore and Comoros. The selection of the three countries was based on the consideration that these countries are the countries with the largest average number of clove commodity exports according to data obtained from Un Comtrade. RCA can be formulated as follows (Saboniene, 2009):

$$RCA = \frac{Xij\ /Xit}{Wj/Wt} \quad (1)$$

Explanation :
Xij : Export value of clove commodity from country j
Xit : Total export value of the country j
Wj : World's export value of clove commodity
Wt : Total value of world export

If the RCA value for a commodity is greater than one (RCA > 1), it can be said that Indonesia has a comparative advantage compared to other exporting countries. On the other hand, if the RCA value of a commodity is less than 1 (RCA < 1), it can be said that Indonesia does not have a comparative advantage over other exporting countries. The higher the RCA value, the higher the country's level of comparative competitiveness (Sukmaya and Perwita, 2018).

According to Chairudin (2003) in Tambunan (2004), RCA alone cannot fully describe the competitiveness of a product from a country. The RCA formula by Laursen was refined to overcome the problem of not symmetrical RCA values, namely by making the RCA value symmetrical with a value interval between -1 and +1 which is known as Revealed Symmetric Comparative Advantage (RSCA). The RSCA method aims to make a comparison of the competitiveness of a commodity with various countries. This formula is formulated as follows (Ikhtiari, 2018):

$$RSCA = \frac{RCA-1}{RCA+1} \quad (2)$$

A positive RSCA value indicates that the product or commodity has a high comparative advantage in the market. Conversely, if the RSCA value is negative, then the commodity is not eligible to compete because it is inefficient and does not have a comparative advantage.

3. RESULT AND DISCUSSION

Analysis of comparative advantage using the RCA (Revealed Comparative Advantage) indicator is carried out by comparing the competitiveness of Indonesian clove exports with world exporting countries, there are Madagascar, Singapore and Comoros. The RCA formula is refined to reduce the upward-biased problem of the RCA value, by making the RCA value symmetrical with a value interval between -1 and +1 which is known as Revealed Symmetric Comparative Advantage (RSCA). A positive RSCA value indicates that the product or commodity has a comparative advantage in the market. Conversely, if the RSCA value is negative, then the commodity is not eligible to compete because it is inefficient and does not have a comparative advantage.

Based on the results of the calculation of the RCA and RSCA values, it can be seen that in general the four clove exporting countries have more than one RCA. This indicates that Indonesia, Madagascar, Singapore and Comoros have a comparative advantage over cloves in trading on the international market. As for the RSCA value, the four clove exporting countries each had a positive average value during the 2010-2019 period. This means that clove exports from the four exporting countries have a comparative advantage in the international market.

Madagascar is the largest clove exporter in the world. The average RCA and RSCA values of Madagascar's cloves are greater than Indonesia, because the value of Indonesian clove exports is smaller than Madagascar's each year during the 2010-2019 period. This is because Indonesia, as one of the largest clove producers in the world, uses most of its production to meet domestic industry demand. The demand itself comes mostly from the cigarette industry, which uses cloves as one of its raw materials. It is these priorities that hinder Indonesia's clove exports (Dewi, *et al*, 2021). In addition, the value of Indonesia's clove exports is also influenced by the fluctuating volume of cloves exported, depending on the different clove yields each year (Un Comtrade, 2021).

The RCA value of Comoros for clove exports in the international market during the 2010-2019 period had an average of 25458.94. Although the average export value of Comoros's cloves in that period was lower than Indonesia, Madagascar and Singapore, the Comoros RCA value could beat the RCA value of Madagascar, Indonesia and Singapore. This is because the total export value of all commodities from Madagascar, Singapore and Indonesia is greater than the total export value of Comoros countries. Therefore, cloves are the leading export product for the Comoros country, indicating that the competitiveness of the Comoros clove commodity is also quite high, as can be seen from its RCA value, which is more than one.

The results of the calculation of RCA and RSCA are presented in the following table:

Table 2. The results of RCA and RSCA values of the world's clove exporting countries

Year	Madagascar		Indonesia		Singapore		Comoros	
	RCA	RSCA	RCA	RSCA	RCA	RSCA	RCA	RSCA
2010	2715,45	0,9993	7,3949909	0,7618	7,38	0,76	52851,36	0,99996
2011	3092,57	0,9994	1,9515022	0,3224	23,7	0,92	17899,77	0,99989
2012	5906,9	0,9997	5,6198939	0,6979	11,9	0,85	33496,33	0,99994
2013	2988,88	0,9993	7,757713	0,7716	5,71	0,7	25408,93	0,99992
2014	226,002	0,9912	8,7297917	0,7944	10,5	0,83	22511,95	0,99991
2015	3288,45	0,9994	13,615263	0,8632	4,96	0,66	19239,08	0,9999
2016	2666,97	0,9993	11,577541	0,841	10,2	0,82	26272,89	0,99992
2017	2751,03	0,9993	5,8904131	0,7097	9,4	0,81	19319,5	0,9999
2018	2070,07	0,999	25,052945	0,9232	8,57	0,79	19612,93	0,9999
2019	1781,23	0,9989	41,201713	0,9526	4,51	0,64	17976,62	0,99989
Average	2748,76	0,9985	12,879177	0,7638	9,69	0,78	25458,94	0,99991

Source: *Un Comtrade*, 2021 (Processed).

Singapore's RCA value for clove commodities tends decrease during 2017 to 2019. In the 2010-2019 period, the Singapore clove RCA value has an average of 9.69 with the highest RCA occurring in 2011 at 23.7 and the lowest RCA value occurring in 2019 of 4.51. Although it tends to decrease over the last three years, the RCA value of Singapore cloves shows a value of more than 1 every year. The RSCA value during the period 2010-2019 shows a positive value every year with an average of 0.78. This shows that Singapore's clove exports in the international market have a comparative advantage, although the average RCA value of Singapore is still below Indonesia and Madagascar. Singapore is different from Madagascar and Indonesia, which are among the largest clove producing countries. Singapore does not produce cloves, but imports cloves which are then re-exported to international markets.

Singapore is not a clove producing country. Thus, to meet the domestic demand for cloves and used for export, Singapore imports cloves to several countries such as Madagascar, Indonesia and Tanzania. Even though it is not a clove producing country, Singapore is the third largest clove exporter in the world and Singapore's clove market share in the international market reaches 21.7 percent, which ranks second after Madagascar during 2010-2019. This is because Singapore has the advantage of being a country that has a good logistics system. According to the Chairman of the Association of Indonesian Food and Beverage Entrepreneurs (GAPMMI), Adhi Lukman, Singapore is able to build a good logistics system and become one of the world's logistics centers.

Based on the average of RCA value for 2010-2019, Indonesian cloves are competitive in the international market and can compete with other exporting countries by comparative advantage of Indonesian clove. The comparative advantage of Indonesian cloves is also shown by the RSCA value. The RSCA value during the period 2010-2019 shows a positive value every year with an average of 0.76. This means that Indonesian cloves have a comparative advantage for clove exports in the international market and can compete with other exporting countries.

Table 3. Development of land area, production and productivity of major clove exporting countries in 2010-2019

Year	Land area (ha)			Production (tons)			Productivity (Kg/ha)		
	Indonesia	Madagascar	Comoros	Indonesia	Madagascar	Comoros	Indonesia	Madagascar	Como-ros
2010	470.041	37.949	9.207	98.386	10.356	2.524	322	272,9	274,1
2011	485.191	43.821	8.823	72.207	12.460	2.421	238	284,3	274,4
2012	493.888	50.900	6.200	99.890	14.916	1.702	325	293	274,5
2013	501.378	57.572	8.503	10.9694	17.276	2.337	350	300,1	274,8
2014	510.174	69.062	7.683	12.2134	20.697	4.900	391	299,7	637,8
2015	535.694	71.302	8.173	13.9641	21.864	3.900	441	306,6	477,2
2016	545.027	74.580	18.274	13.9611	23.245	6.700	426	311,7	366,6
2017	559.566	78.500	16.592	11.3178	24.866	6.300	345	316,8	379,7
2018	569.052	73.433	17.840	13.1014	23.634	6.900	400	321,8	286,8
2019	569.416	70.717	16.428	13.4792	23.120	6.471	410	326,9	393,9
Average	523.943	62.784	11.772	11.6055	19.243	4.416	365	303	364

Source : FAO and Ministry of Agriculture Republic Indonesia, 2020

The land area of Indonesian clove plantations increase during the period 2010 to 2019, but productivity tends to fluctuate. This shows that the clove plantation area has not been optimized properly. The advantage of Indonesia, which has the largest clove plantation area compared to competing countries, can be used by Indonesia as a potential to increase exports and meet domestic clove needs.

According to Dewi et al. (2021), to increase comparative advantage, strengthen specialization and Indonesia's competitive position on clove commodities, it is necessary to increase productivity and quality, so that Indonesia not only meet domestic demand but also export market demand. One of them is to increase production factors in clove cultivation in several ways they are including rehabilitation of non-producing or damaged plants and Introduction of technology that supports the plantation management process from pre-harvest to post-harvest.

4. CONCLUSION

Calculation of RCA and RSCA values, it can be seen that in general the four clove exporting countries, Indonesia, Madagascar, Singapore and Comoros have a comparative advantage over cloves. For Indonesia's clove, the results of the RCA and RSCA analysis show that Indonesian clove commodity for the 2010-2019 period has a comparative advantage in international market with an average RCA value greater than 1, the value is 12,88 and an average value of RSCA is positive, the value is 0,76. This means that clove exports from Indonesia can compete in internatinal market with other exporting countries with its comparative advantage.

5. SUGGESTION

Indonesian clove production has good potensial to be improved, because supported by the vast area of clove plantation that has not been well optimized. To increase the comparitive advantage of Indonesian clove, as can be done by increasing production, with the policy such as intensification and rehabilitation of non productive clove plantation. So that, Indonesia not only fulfill the domestic needs but also can increase the export and increase the competitiveness by its comparative advantage.

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