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DOI : 10.32734/lwsa.v9i1.2721
Electronic ISSN : 2654-7066
Print ISSN : 2654-7058

Volume 9 Issue 1 – 2026 TALENTA Conference Series: Local Wisdom, Social, and Arts (LWSA)



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Analysis of Export Potential of Maize Crops in Toba District, North Sumatera Province

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Abstract

This study aims to determine whether the corn commodity in the food crop sub-sector in Toba Regency has export potential as information and considerations in determining the direction of regional economic development policies. This research uses secondary data on the production of corn commodities in the food crop sub-sector in the publication of figures for Toba Regency 2019-2023. The analytical tools used in this research are Location Quotient analysis and Klassen Typology. The results of the Location Quotient analysis show that $LQ > 1$, this means that the corn commodity subsector of food crops in Toba Regency is an economic base that has export potential. Where corn commodities are an economic base sector that can not only meet the needs of its own region, but also can meet the needs of other regions. The results of the Klassen Typology analysis show that the growth rate of the corn commodity in the food crop sub-sector in Toba Regency is greater than the growth rate of the corn commodity in North Sumatra Province. This means that the maize commodity in Toba Regency is a developed and fast-growing commodity.

Keywords: Maize Commodity; Export; Production

1. Introduction

As an agrarian country, agriculture is an important sector in Indonesia. This can be seen from the majority of the population who live in agricultural areas and work as farmers. Based on data from the Indonesian Central Bureau of Statistics, in August 2022 there were 40.64 million people or equivalent to 29.96% of the total population in Indonesia working as farmers. Until now, the agricultural sector has an important role in the national economy, especially in its contribution to GDP, provision of food and raw materials for industry, provision of employment, increasing community income and strengthening national food security, as well as contributing foreign exchange through exports and so on [1]. One of the world's leading agricultural commodities is corn. Maize (*Zea mays L.*) is one of the world's most important food crops, apart from wheat and rice. Based on genetic, anthropological, and archaeological findings, it is known that the origin of corn is Central America. Maize is a seasonal crop, one life cycle is completed in 80-150 days or about 4 to 5 months. Maize entered Indonesia around the 17th century, introduced by the Portuguese [2]. Maize is quite important for human life and is the second food crop commodity after rice. The national demand for maize continues to increase every year in line with the improvement of people's economic living standards and the progress of the feed industry. This leads to the need for efforts to increase production through human and natural resources, land availability and potential results and technology.

Based on data from the Central Bureau of Statistics of Toba Regency, Toba Regency has an area of 202,180 ha or 2,021.8 km². Toba Regency is located at 900-2,200 meters above sea level. With this altitude, Toba Regency has fertile soil conditions, making it very suitable for agricultural activities and has the potential to produce agricultural products. Toba Regency itself has approximately 50 crop commodities in the agricultural sector. Each of these commodities certainly has a contribution to the economy of Toba Regency. But of course there are commodities that are superior to dozens of existing commodities. Commodities that have the potential to compete with similar commodities in other regions, which in addition to having comparative advantages also have great business efficiency [3]. Superior commodities have the value of marketing opportunities or large export potential so as to provide benefits to the community and add value to the regional economy.

Table 1. Harvested Area, Production and Average Production of Food Crops in Toba Regency in 2023

Food Crops	Harvested Area (Ha)	Production (Ton)	Productivity (Ton/Ha)
Rice	17.098,27	112.970,29	6,28
Corn	10.014	57.580,93	5,74
Cassava	357	19.680	4,83
Sweet potato	-	-	-

Source: Statistics Indonesia

2. Literature Review

2.1. Corn

Maize is one of the main food crops in the world, including in Indonesia. Corn, which has the scientific name (*Zea Mays*) belongs to the grass family (*Poaceae*), being one of the important food crops besides rice and wheat. Maize originated in Mexico and Central America where it was cultivated by indigenous tribes in the region and spread throughout the world through trade and colonialism. Maize first entered Indonesia during the colonial period brought by Portuguese or Spanish traders in the 16th century [4].

2.2. International trade

International trade is trade carried out by residents of one country with residents of another country or carried out by two countries on the basis of mutual agreements and agreements. Common factors driving international trade are: natural resources, capital resources, human resources and technology. International trade makes each country specialize in limited production of certain goods so that it is possible to achieve a higher level of efficiency with a larger scale of production [5].

2.3. Theory of Absolute Advantage

Adam Smith said that trade between two countries is based on absolute advantage. Absolute advantage is defined as the advantage expressed by the number of hours or days of labor needed to make these goods. The advantage of the absolute advantage theory is that there is free trade between two countries that have different absolute advantages. The disadvantage is that if one country has an absolute advantage then international trade will not occur because there is no advantage.

2.4. Theory of Comparative Advantage

David Ricardo said in this theory that a country is predicted to export goods that can be produced by its labor relatively more efficiently and import goods that are relatively less efficient. In other words, the production pattern of a country is determined by comparative advantage [6].

2.5. Exports

Exports are goods and services produced in one country and sold to buyers in another country. Exports make up international trade. Exports are vital to modern economies as they offer people, businesses and companies more markets for their goods. One of the core functions of diplomacy and foreign policy among governments is to promote economic trade, encouraging exports and imports for the benefit of all trading parties. Exported goods are a boon to a country's economy. The profit will trigger economic growth in the exporting country [7].

3. Research Method

This type of research is descriptive research with a quantitative approach. Descriptive research is a method of conducting research on a human group, an object, a condition, a system of thought, or a class of events in the present that aims to make descriptive, systematic, factual and accurate descriptions or paintings of the facts and relationships between the phenomena investigated [8]. As stated by [9] quantitative methods are research methods based on the philosophy of positivism, used to research on certain populations / samples, sampling techniques are generally carried out randomly, data collection using research instruments, data analysis is quantitative / statistical which aims to test predetermined hypotheses. In this study, it will be how the quality of corn commodity agricultural products and the level of corn production in Toba Regency. In this scenario, the author collects information or data from many published works. Secondary data sources are pre-existing data that have been investigated and used as a reference for further study from a different perspective. The data sources used in writing this research were obtained

from the internet, BPS (Central Bureau of Statistics) of Toba Regency which includes the volume of corn production in 2019-2023 [10].

The analytical tools used to answer the existing problem formulations are:

1. Location Quotient (LQ) is used to see whether corn crops in Toba Regency have export potential.
2. Klassen's typology is used to identify whether maize crop production is a priority or superior commodity.

$$LQ = \frac{P_{i_k}/P_k}{P_{i_s}/P_{i_s}}$$

Location Quotient (LQ) is an index used to compare sectors or commodities in a smaller area with a larger area. Location Quotient (LQ) is used to show the economic base of a region.

Klasen typology is an analytical tool used to identify priority or leading sectors, sub-sectors, businesses and commodities of a region. This analysis tool is carried out by comparing the economic growth of a reference region or nationally and comparing the share of sectors, sub-sectors, businesses and commodities of a region with the average value at a higher level or nationally.

4. Results and Discussion

4.1. Location Quotient (LQ) Analysis

Corn production in Toba Regency is one of the leading agricultural commodities in the food crop sector. This can be seen in this table.

Table 2. Production of Agricultural Commodities in the Food Crop Sector of Toba Regency (tons), 2023

No	Commodities	Production (tons)
1	Rice	112.961,78
2	Corn	57.784,80
3	Groundnut	61,7
4	Cassava	19.678,40
5	Sweet Potato	-

Source: Statistics Indonesia

Based on the data presented in table 2 above, maize commodity occupies the second largest position with a total production of 57,784.80 tons in 2023. This study uses the location cuotient (LQ) analysis tool using 2019-2023 maize production data presented in table in below:

Table 3. Maize Production in Toba Regency (tons), 2010-2023

No	Years	Production (tons)	Growth Rate (%)
1	2010	33.444,00	-
2	2011	24.201,00	-27,63
3	2012	17.846,00	-26,25
4	2013	14.095,00	-21,01
5	2014	12.782,00	-9,31
6	2015	11.189,00	-12,46
7	2016	21.969,20	96,34
8	2017	33.524,00	52,59
9	2018	58.842,02	75,52
10	2019	42.004,36	-28,61
11	2020	37.250,60	-11,31

12	2021	49.446,40	32,73
13	2022	59.506,90	20,34
14	2023	57.784,80	-2,89

Source: Statistics Indonesia

If seen in the table above, the amount of corn production in Toba district has increased from 2020 to 2022. In 2020 and 2023 corn production in Toba Regency decreased, this was caused by several factors, one of which was crop failure. The highest amount of production was in 2022, which was 59,506.90 tons. The growth rate of corn production in Toba Regency does not always experience growth or increase every year. There are several growth rates of corn production that experienced a decline. This occurs due to several factors, namely: Reduction of corn farmland, crop failure caused by pests and plant diseases, climate change and inequality of superior seeds and fertilizers for farmers. This research examines corn production data for 5 years starting from 2019 to 2023.

Table 4. Location Quotient Analysis Result of Maize Commodity in Food Crop Subsector

commodity	LQ					Range	Description
	2019	2020	2021	2022	2023		
corn	1,49	1,41	1,66	2,22	1,95	1,74	export

Source: Processed Data (2024)

Based on the analysis with Location Quotient as presented in table 4 above, maize commodities in the food crop subsector in Toba Regency have $LQ > 1$. This implies that maize commodities are not only able to meet the needs of the community in Toba Regency, but are able to be exported outside the Toba Regency area.

The corn commodity shows $LQ > 1$ results consistently for 5 consecutive years in the order of 1.49; 1.41; 1.66; 2.22; 1.95 with a total average of 1.74. In Toba Regency this corn commodity has the largest harvest area in Uluan District with a harvest area of 1,272 ha, as well as the highest production yield of 7,706.77 tons. Based on the results of these calculations and information, it can be stated that the corn commodity in Toba Regency has export potential.

4.2. Klassen's Typology Analysis

Klassen typology is a combination of Location Quotient with the growth ratio model. The results of the analysis using the Klassen Typology can be seen in table 5 below.

Table 5. Results of Klassen Typology Analysis of Maize Commodities Food Crop Subsector of Toba Regency 2019- 2023

NO	Commodity	LQ	Rik	Ri	Yik	Yi	Description	Kuadran
1	Corn	1,74	-0,122251	-0,294260	-0,79170	-0,878483	Advanced commodities and fast-growing	I

Source: Processed Data (2024)

From the results of the analysis using the Klassen Typology analysis tool above, it shows that the corn crop commodity in Toba Regency can be classified into quadrant I. This is where the corn crop commodity in Toba Regency is a developed and fast-growing commodity. Where the corn crop commodity in Toba Regency is a developed and fast-growing commodity. This can be seen from the growth rate of corn commodities in Toba Regency which is greater than that of North Sumatra Province, namely -0.122251. In addition to the fast growth rate, the contribution of maize commodities to the total value of production at the Toba Regency level is greater than at the North Sumatra Province level.

Based on the results of the calculation of the growth rate of corn production in Toba Regency which shows that, the growth rate is advanced and growing fast. This indicates that the corn commodity in the food crop subsector in Toba Regency has export potential.

5. Results and Discussion

1. Based on the Location Quotient analysis conducted, the agricultural commodity corn subsector of food crops in Toba Regency is included in the leading commodity, the results showed $LQ > 1$ with an average of 1.74. Where this value indicates that the corn commodity in Toba Regency is a basic sector, the level of specialization of Toba Regency is higher than the level of North Sumatra Province. It can be stated that the corn commodity in Toba Regency has export potential.
2. Based on the Klassen Typology analysis conducted, the corn agricultural commodity in the food crop subsector in Toba Regency falls into quadrant I (developed and fast-growing commodities). This is evident from the fact that the growth rate and contribution of maize production in Toba Regency is greater than that of North Sumatra Province. Based on the growth rate of maize production in Toba Regency, it can be stated that the maize commodity in Toba Regency has export potential.

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