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ANALYSIS OF LEADING FOOD CROP COMMODITIES IN BULUNGAN DISTRICT NORTH KALIMANTAN

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ABSTRACT

The development of the economic and agricultural sectors is important in utilizing resources to increase regional potential in the economic development of a region. Bulungan is a district with great potential in utilizing its regional advantages as an industry-based food center and is currently one of the districts that must be ready to develop and sustain the food of the New Capital City, which is the background for this research to be carried out. This study aims to analyze the leading sectors using the LQ method, trends, and shift shares in food crop commodities in Bulungan Regency. This study uses quantitative data (time series) in the form of data from 2018-2022 (5 years). The data analysis method used is descriptive analysis with a quantitative approach, including Location Quotient (LQ) Analysis, Trend Analysis, and Shift Share Analysis. Based on the LQ analysis results, commodities with an average value of LQ > 1 are rice and corn commodities, which means that Bulungan Regency is a base commodity with potential/superiority. In contrast, peanuts, cassava, and sweet potatoes have an average value of LQ < 1, meaning they are non-base commodities. 1, which means that they are non-base and non-potential commodities in Bulungan Regency as a result of trend analysis to determine the development of rice commodity forecasting in Bulungan Regency in 2023 - 2027. The results of the calculation were obtained using the analysis of the least square method so that the trend equation was obtained as follows: Y = -830.50X + 13,724.20, and it can be known that the results of trend analysis on rice commodities have decreased and have a negative value with an annual decrease of -830.50.

Keywords: commodities; featured; location quotient (LQ); shift share; trend.

INTRODUCTION

Economic growth in a region can be achieved if the local government and the community manage existing resources well. This includes forming partnerships between local governments and the private sector to encourage the development of economic activity and, thus, new jobs in the area (Zulhafandi et al., 2023). To achieve economic development in the region, each district must maximize its resource potential with leading sectors in the area. Local governments and local communities work together to encourage regional economic development and improve the conditions of their communities. This is done by utilizing and managing the best available natural resources (Novita & Gultom, 2017).

The community must be concerned about utilizing available resources to build an adequate and long-term economic system to improve regional development. The main priorities needed to carry out regional economic development are sectors that have the potential to be developed. (Zulhafandi & Hendris, 2022) The growth of leading industrial sectors can be utilized as a driving force for regional economic growth to accelerate the rate of regional economic growth and increase its contribution to the creation of gross regional domestic product (GRDP). Currently, development goals are directed at leading regional sectors, so it is hoped that the leading sector can accelerate the rate of economic growth, thereby creating resilient and competitive economic stability and producing success and prosperity for the wider community (Kherunnisa et al., 2023) (Novita & Gultom, 2017).

The results of the economic growth in Bulungan Regency can be less developed because of all the economic sectors that have grown. Not all of them experience stable growth that always increases yearly, according to the data found in Bulungan Regency based on the analysis of Economic Growth conducted by BPS Bulungan Regency. The latest data produces an Economic Growth graph with the lowest growth rate 2020 based on Bulungan Regency GRDP data at Constant Prices by Business Field (BPS Bulungan, 2018-2022).

The distribution of GRDP can reflect the economic structure of a region or area. Therefore, each government region should be able to improve and develop industries that have the potential to affect GRDP significantly. All economic activities in the region generate gross value added, producing this GRDP. GRDP includes any regional economic activities. In this case, analyzing the GRDP data of the region in question is the best way to determine which sectors are the most significant. Some uses of analysis that can be done using GRDP data include estimating the economic potential of a region based on its natural resource base (Nur, 2022). One of the leading economic sectors in Bulungan Regency is the agricultural sector, which still has sufficient natural resources to be projected for future development.

Agricultural development today is about increasing productivity, and policies can place farmers in the development process by expanding human resources and encouraging sustainable growth in the system (Sidharta et al., 2021). Based on the opinion (Daryono, 2022), efforts in regional development in terms of welfare levels and economic growth must be addressed through integrated regional development initiatives through superior product mapping and spatial planning. Opportunities for growth and development vary across locations by natural and manufactured means and the strategic importance of agriculture for economic growth. The first stage in realizing sustainable agricultural development based on efficiency to achieve comparative and competitive advantage in the face of globalization trade is identifying leading national and regional commodities (Hendayana, 2003).

According to Heriono (Heriono et al., 2018), superior commodities generally refer to products produced sustainably by producers. According to specific criteria, a commodity is considered superior if it makes a minimal contribution to the producer. Comparative advantage is a distinguishing factor that characterizes a region and can be interpreted as all the naturally available resources. On the other hand, competitive advantage requires more effort to generate so that it can be superior to others (Bashford-Fernández & Rodríguez-Álvarez, 2024).

In addition to focusing on the development of the economic sector, agricultural development is one of the important elements in supporting the economic growth of a region and maintaining environmental balance. Efforts to increase the production and efficiency of agricultural products without harming farmers or damaging the environment present their challenges. One of the main obstacles is the government's lack of attention to fundamental aspects when formulating policies, which can make it challenging to increase the productivity and efficiency of agricultural commodities (Mujiburrahmad et al., 2021).

Bulungan Regency, one of the regions of Kalimantan, is preparing to launch together in the development of the New State Capital located in East Kalimantan (Zulhafandi et al., 2024). Based on the results of interviews conducted with the regent who proclaimed that Bulungan Regency is ready to develop and assist in supporting food for the New Capital City, recently the Ministry of Agriculture (Kementan) has revealed 12 districts in Kalimantan that have the potential to become food buffers for the new National Capital City, where Bulungan is one of them along with Nunukan and Malinau for North Kalimantan. Bulungan Regent H.Sudjati, SH said that along with determining the East Kalimantan region as the new national capital, the Kalimantan region, including Bulungan Regency, needs to develop a food buffer zone development strategy. He emphasized that Bulungan Regency is also severely developing agriculture following the regional vision of realizing Bulungan Regency as an Industry-Based Food Center by opening agricultural areas, increasing agricultural production, and cooperation between regions in the transmigration program. Three districts in North Kalimantan are planned as rice and corn production centers, namely Bulungan, Malinau, and Nunukan (Kaltara, 2019).

Bulungan is one of the districts in the North Kalimantan Province with great potential to utilize all its advantages. The district, with a population of 160,757 people in 2023 and an area of 13,181.92 km, has significant comparative and competitive advantages, both in terms of natural resources that can be developed (*Renewable Natural Resources*) and those that cannot be improved (*Non-Renewable Natural Resources*). Apart from the diversity of natural resources, the regency also has other potential resources that are specific to differentiate this region from other regions, such as its social and cultural local wisdom (Franconi et al., 2024).

Identifying leading commodities and sectors in food crops in Bulungan Regency is an important stage to focus on regional development through commodities and sectors that can have a significant impact, especially in the regional economy and being unique to the region. This research aims to analyze the leading sectors using the LQ, trend, and shift share methods on food crop commodities in Bulungan Regency.

MATERIALS AND METHODS

This research was conducted in Bulungan Regency because this area is considered geographically strategic and has the potential for natural resources that support the Nusantara Capital Region in East Kalimantan. This research utilizes quantitative, primarily secondary data based on time series data from 2018-2022. The data used includes the Gross Regional Domestic Product (GRDP) of Bulungan and North Kalimantan districts, as well as the production value of the agricultural sector (food crops, horticulture, and plantations) during this period, which was obtained from the Central Statistics Agency of Bulungan and North Kalimantan districts. In addition, this research also involved primary data collected from informants, including the Head of the Bulungan District Agriculture Office, the Head of the Food Crops and Horticulture Division, and five Agricultural Extension Officers in the Bulungan District. Data was collected through various sources from related agencies and literature studies, then compiled, processed, and analyzed to provide a picture of the area. Interviews with informants were also conducted as part of the data collection. The research method used was descriptive with a quantitative approach with the following data analysis:

1. Analysis of Base and Non-Base Economic Sector and Agricultural Sector in Bulungan Regency

The analysis used to determine the basis of each economic sector and agricultural sector in Bulungan Regency is the *Location Quotient* (LQ) analysis. *Location Quotient* (LQ) is formulated as follows:

$$LQ = \frac{Eij/Ej}{Ein/En} \quad (1)$$

Description: LQ : *Location Quotient* (LQ) Value, Eij: GRDP value of sector/commodity i of Bulungan Regency, Ej : Total GRDP of Bulungan Regency, Ein: GDP value of sector/commodity i North Kalimantan, En : Total GRDP of North Kalimantan

The decision criteria that can be taken for the *Location Quotient* (LQ) value are: If the LQ value is > 1, the sector or commodity has potential or superiority in Bulungan Regency. In other words, the sector can meet local needs and has an excellent opportunity to be exported to other regions. If the LQ value is <1, the sector or commodity is not a leading sector in Bulungan Regency. Thus, the sector does not have the potential to be exported to other regions and even tends to require imports from other regions to fulfill shortages in specific sectors or commodities.If the LQ value = 1, the sector's role in Bulungan Regency is comparable to that of the same sector in other regions. In this condition, the sector tends to be closed because it is not involved in export or import activities with other regions. However, this kind of situation is rare in a region's economy. It can be concluded that the region is self-sufficient in a particular sector (Chiang, 2009).

2. *Trend* Analysis of Economic Sector Development in Bulungan Regency

The trend is the average change that can occur each year over a long period. *Trend* analysis aims to determine the future projection and development of economic sectors by using Bulungan Regency GRDP indicators for all economic sectors and the production value of the agricultural sector to know the potential that exists in Bulungan Regency in the future. *The trend* is the long-term movement of data in time interpreted as a straight line or smooth curve. One is a *linear trend, meaning constant changes over time*

Trend analysis is performed using the *Least Square Method*. This method determines the trend equation of data involving Time Series analysis for even and odd data. An alternative technique of scoring or coding is often applied to calculate X values. This approach involves dividing the data into two groups, namely: Even data, then scoring the x value : . . . , -5, -3, -1, 1, 3, 5, . . . Ganji data, then the x value score is: . . . , -3, -2, -1, 0, 1, 2, 3,. Linear *trend* analysis is formulated as follows:

$$Y = a + bX \quad (2)$$

Description: Y = *Trend of* economic sector production in Bulungan Regency, X = period data of economic sectors in Bulungan Regency at the time (year i), a = Intercept, b = Coefficient value

The value of the time variable (X) is needed to perform the calculation, while the time used is for 5 years (odd), so the X value is used for odd data. X values: ...., -3, -2, -1, 0, 1, 2, 3, ... to get the values of a and b are determined by the formula:

$$a = \frac{\Sigma Y}{n} \text{ and } b \frac{\Sigma XY}{\Sigma x^2} \quad (3)$$

Description: Y = periodic data value, N = number of periods, X = time variable

3. Analysis of Changes in the Economic Structure of a Region

Shift Share analysis is used to study changes in various indicators of economic activity, such as employment opportunities and aspects of production. The results of this analysis measure a region's development compared to other regions. The indicators analyzed include the National Growth Component (NTC), the change in production, and employment opportunities in a region due to changes in the overall national workforce or production. Furthermore, the Proportional Growth Component (PPP) arises from sectoral differences in final product demand. Meanwhile, the Regional Share Growth Component (KPPW) occurs due to an increase or decrease in GRDP or employment opportunities compared to other regions. (Nur & Safaringa, 2019). *Shift Share* analysis is formulated as follows:

KPN : (Nt'/Nt)-1 (4)
KPPW : ri(ri'/ri - nt'/nt) (5)
KPP : ri (nt'/nt - Nt'/Nt) (6)
PB : KPPW + KPP (7)

Description: ri = GRDP of sector i of Bulungan Regency in the initial year, ri' = GDRP of sector i of Bulungan Regency in the final year, nt = GDP of sector i of North Kalimantan in the initial year, nt' = GDP of sector i of North Kalimantan in the final year, Nt = Total GRDP of North Kalimantan in the initial year, Nt'= Total GRDP of North Kalimantan in the final year

The decision criteria that can be taken for the *Shift Share* Analysis value are PPW > 0 = economic sector has good power, PPW < 0 = economic sector has poor competitiveness, PP > 0 = economic sector has rapid growth, PP < 0 = economic sector has slow growth, PB ≥ 0 = Economic sector growth is progressive (advanced), PB < 0 = Economic sector growth is sluggish.

RESULTS AND DISCUSSION

Overview of Bulungan Regency

Bulungan Regency is one of the regions that originated from the division of East Kalimantan Province into North Kalimantan based on Law No. 20/2012. Astronomically, Bulungan Regency is located between 2°09' 19" - 3°34' 48" North latitude and 116° 04' 41" - 117(o)57' 56" East longitude. Five regions and cities flank Bulungan Regency. Based on its geographical position, Bulungan has the following boundaries (Kabupaten, 2023): North: Tana Tidung Regency and Nunukan Regency; South: Berau Regency; West: Malinau Regency; East: Sulawesi Sea and Tarakan City.

Bulungan Regency is the capital of North Kalimantan Province, which has considerable potential for agricultural resources. As one of the buffer zones for the national capital, Bulungan district has the potential for a relatively large area of lowland land that can support the potential development of food barns in the North Kalimantan region. Among the commodities that can be developed and become the flagship of Bulungan Regency are rice, cocoa, rubber, oil palm plantations, and some horticultural crops. The development of this area is supported not only by extensive land but also by water resources that support irrigation systems for agricultural lands, with the Kayan River as the primary water source that crosses the Bulungan area. (Kabupaten, 2023).

Analysis of Basis and Non-Basis of Food Crop Sector in Bulungan Regency

1. LQ Analysis

LQ analysis was used to analyze the bases and non-bases in the agricultural sector. Included in the analysis for the agricultural sector in the study are food crops (rice, corn, peanuts, sweet

potatoes, and cassava). Food crops that produce food commodities include rice, secondary crops, and other cereals. All of these commodities are included in the group of annual crops, with the form of production at harvest time or other forms of raw production that are still included in the scope of the agricultural category (Agang et al., 2024). Among the forms of agricultural production of food crops include rice, which produces Milled Dry Grain (GKG), corn in the form of dry beans, and cassava in the form of wet tubers.

Table 1. LQ calculation results of food crops

Plant Type	LQ					Average
	2018	2019	2020	2021	2022	
Rice	0,95	1,37	1,91	1,86	2,75	**1,77**
Corn	1,66	2,25	0,47	0,68	0,52	**1,11**
Peanuts	2,05	2,84	-6,49	-5,21	-2,22	-1,81
Cassava	0,90	0,54	0,36	0,31	-0,49	0,32
Sweet Potatoes	2,56	2,00	-8,09	-10,45	-1,62	-3,12

Source: Secondary data (processed, 2023)

From the results of the *LQ* analysis contained in the table above, commodities that have an average value of LQ > 1 are rice and corn commodities, which means that Bulungan Regency is a base commodity that has potential/excellence and can meet the needs of the region for the available supply and has the potential to be able to export in other regions. Meanwhile, the commodities of cassava, peanuts, and sweet potatoes have an average LQ value of <1, which means that they are non-base commodities and have no potential in Bulungan Regency. This can be due to several problems that often occur, including the capacity of most farmers who are still not good at handling pests and diseases and the large number of land use changes that have begun to be practiced by several farmers in Bulungan Regency. (Zulhafandi. Arbain, 2023) In addition, the results of discussions with several informants in 2019-2020 during the COVID-19 pandemic decreased the production of several food commodities in Bulungan Regency due to limited farmer and extension activities. Annisa and Santoso (2020) said that factors in developing farmer production can be considered internal, social, and economic aspects of farmers (Annisa & Santoso, 2020).

2. *Trend* Analysis of Food Crops

a. Trend of Rice Production

The development of rice commodity production in Bulungan Regency in the next five years, namely from 2023 - to 2027, is estimated to experience a decrease in production, which can be seen in the following figure

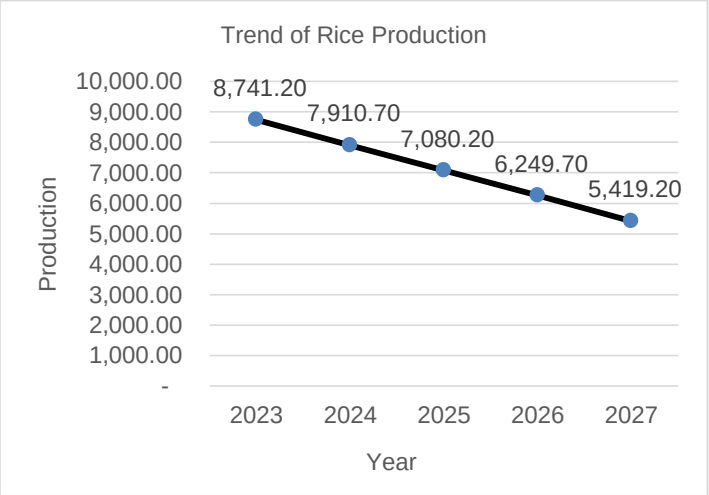

Figure 1. Graph of projected trend in rice production value from 2023 - 2027

Based on the results of *trend* analysis to determine the development of rice commodity forecasting in Figure 2 in Bulungan Regency in 2023 - 2027 obtained the results of calculations using the analysis of the method of least squares (*Least Square*), based on data on the development of

production values in Bulungan Regency in 2023 - 2027, to obtain *trend* equation as follows: Y = -830.50X + 13,724.20. It can be seen that the results of the *trend* analysis on the rice commodity have decreased and are negative, with a decrease each year of -830.50 quintals. This decline in rice production occurred because many shifting cultivation fields began to be abandoned by farmers, and the level of production in the land area also decreased.

b. Trend of Maize Production

The development of corn commodity production in Bulungan Regency in the next five years, from 2023 - 2027, is estimated to experience a decline in production, as seen in Figure 2.

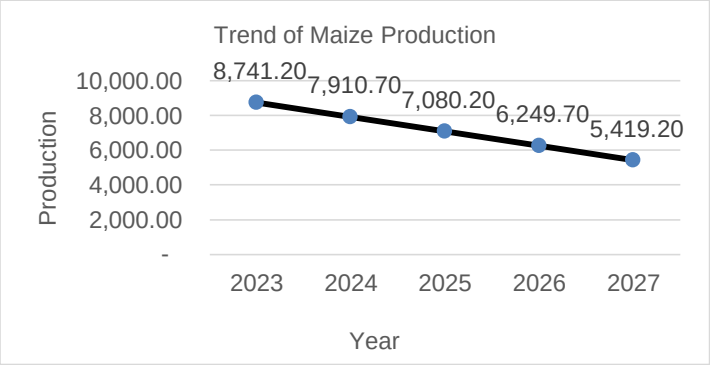

Figure 2. The projected trend of maize production value 2023-2027

Based on the results of *trend* analysis to determine the development of corn commodity forecasting in Figure 2 in Bulungan Regency in 2023 - 2027, the results of calculations using the *Least Square* method analysis, based on data on the development of production values in Bulungan Regency in 2023 - 2027, so that the *trend* equation is obtained as follows: Y = -494.60X + 2,030.30. It can be seen that the results of the *trend* analysis on the corn commodity have decreased and are negative, with a decrease each year of -494 quintals.

c. *Shift Share* Analysis of Food Crops

The results of the *Shift Share* calculation for food crops are divided into four groups, each of which consists of an analysis of the National Growth Component (KPP), Proportional Growth Component (KPP), Regional Share Component (KPW), and Net Growth (PB).

Table 2. *Shift Share* calculation results of food crops

Plant Type	KPN (nij)	KPP (mij)	KPPW (cij)	PB (Dij)
Rice	4,15	-9,37	-11,49	-20,86
Corn	4,15	**12,81**	-291,21	-278,40
Peanuts	4,15	-0,28	**113,73**	**113,45**
Cassava	4,15	-0,51	-119,71	-120,22
Sweet Potato	4,15	-2,65	**84,20**	**81,55**

Source: Secondary Data (processed, 2023)

Based on the results of data analysis using the Proportional Growth Component (PPP) with the results of the analysis contained in the table above, this component shows the ratio between the growth of each commodity to the total growth at the North Kalimantan Province level and its impact on the growth of other commodities. In food crops, only corn is included in commodities with rapid growth and positive values (Aliyu et al., 2023).

Then, the Regional Share Growth Component (KPPW) shows the competitiveness of each commodity at the Bulungan Regency level against the same commodity at the North Kalimantan Province level. The assessment of competitiveness shows the criteria if KPPW> 0 or positive value, then the commodity is included in the commodity that has good competitiveness against the same commodity at the provincial level is peanuts and sweet potatoes, and vice versa if the KPPW value < 0 negative value indicates the commodity does not have competitiveness against the same commodity at the provincial level. Geographical support with ample land and climate is one of the factors that support the competitiveness of this food commodity, and this condition is in line with the

results of Susanto's research (2014), which reveals that geographical conditions are a key factor in increasing corn crop production in Grobokan Regency (Susanto, 2014).

The Net Growth Component (PB) aims to obtain commodities with progressive growth, which means that they have positive growth, which can be seen from the summation of KPP + KPPW. From the results of these calculations, peanut, and sweet potato commodities are included in progressive commodities and have a positive net growth value.

CONCLUSIONS

Based on the LQ analysis results, commodities with an average value of LQ> 1 are rice and corn commodities, which means that in Bulungan Regency, they are essential commodities with potential / excellence. In contrast, peanuts, cassava, and sweet potatoes have an average value of LQ < 1, meaning they are non-basic and non-potential commodities in Bulungan Regency. The results of *trend* analysis to determine the development of rice commodity forecasting in Bulungan Regency in 2023 - 2027 obtained the results: Y = -830.50X + 13,724.20, and it can be seen that the results of the *trend* analysis on the rice commodity have decreased and are negative with a decrease each year of -830.50 quintals while corn has decreased and is negative with a decrease each year of -494 quintals. In the Proportional Growth Component (PPP), with the analysis results, only corn is included in the commodity with fast growth and positive value, and the Regional Share Growth Component (KPPW) shows good competitiveness in peanuts and sweet potatoes. Net Growth (PB) can be seen from the summation of KPP + KPPW there are peanut and sweet potato commodities that are included in progressive commodities and have a positive net growth value. Further research requires analysis involving external variables such as local government policies.

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