

ANALYSIS OF LEADING STAPLE FOOD CROP COMMODITIES IN KABUPATEN NGADA

(Analisis Komoditi Pangan Pokok di Kabupaten Ngada)

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ABSTRACT

Ngada Regency is an area that has land conditions and climate potential that vary in characteristics. The diversity of physical characteristics of land will determine the types of commodities that can be cultivated and will influence the level of productivity. Therefore, determining superior commodities is very necessary for decisions on future commodity development. The objectives of this research are: 1). Knowing superior commodities for staple food crops using the Dynamic Location Quotient (DLQ) analysis approach based on harvest and production area data 2). Identify staple food crop commodities that have the potential to be developed and have competitive advantages using the Shift Share Analysis (SSA) approach. This research uses a quantitative approach using secondary data from the Central Statistics Agency (BPS) of Ngada Regency for the 2018-2022 period. The research results show that the leading commodities in Ngada Regency are Sweet Potatoes, Cassava, Rice, Corn and Peanuts, where these commodities have a progressive growth rate and are competitive. The sweet potato commodity is a commodity that has a progressive growth rate and has good competitiveness in almost all sub-districts.

Keywords: DLQ, Leading Commodities, SSA, Staple Food Crops.

INTRODUCTION

Indonesia is one of the agrarian countries that emphasizes the agricultural sector as a source of livelihood for the population and a foundation for national development (Sari et al., 2020). Development is a process of change toward improvement in various aspects such as economic growth and regional development. Regional development is a continuous effort aimed at achieving a condition in which society can be said to be better or more optimal than before. According to Anwar (2019), the regional development process focuses on achieving three main goals: economic growth, equity, and sustainability. As a development process, regional development centers on strategic planning, including planning within the agricultural sector.

Agricultural development can be advanced by determining priority commodities as a means of achieving efficiency, comparative advantage, and competitive advantage (Hendayana, 2003). This aligns with Wicaksono's (2011) argument that there are three factors influencing the growth of the agricultural sector: the potential of superior commodities, comparative and competitive advantages, and regional specialization. Agricultural commodities, especially in the food crop sub-sector, have high development potential due to their strategic role, product diversity, links to other sectors, economic value, added value, and high employment absorption (Laili & Diartho, 2018). This highlights the importance of focusing on food crop commodities in agricultural economic development in a region, including in Ngada Regency, East Nusa Tenggara Province (NTT).

Ngada Regency has diverse land conditions and climatic potential. These variations in physical land characteristics determine which commodities can be cultivated and influence productivity levels.

According to data from the Ngada Regency Department of Agriculture (2018–2022), production and harvested area data for seven major food crops show that rice had the largest harvested area and production, followed by maize. Both rice and maize experienced declines in harvested area and production from 2018 to 2022, although maize saw an increase in 2022 (production increased by 8.54% and harvested area by 19.67% from the previous year). Productivity for rice and maize fluctuated during 2018–2022, with rice yielding 6.5, 4.4, 5.6, 5.6, and 5.4 tons/ha and maize yielding 3.05, 2.6, 3.013, 3.058, and 2.773 tons/ha respectively (BPS Ngada Regency, 2023).

Soybean production and harvested area also fluctuated over the same period. In 2019, soybean production increased by 52.08%, while harvested area decreased by 84.9%. Both production and area increased again in 2020 and 2021, but declined in 2022 by 13.95% and 21.67% respectively. Productivity ranged from 0.092, 0.937, 0.181, 0.18 to 0.197 tons/ha during the period. Sweet potato showed similar fluctuations. In 2019, production decreased by 43.53% and area by 61.11%. However, from 2020 to 2022, both production and harvested area steadily increased (production rose by 74.66%, 2.82%, and 25%; area increased by 73.88%, 4.28%, and 16.67%). Productivity over the years was 0.28, 3.7, 3.854, 3.796, and 2.375 tons/ha.

Green mung bean production and harvested area also fluctuated. In 2019, production fell by 89.06% and harvested area by 75%. In 2020 and 2021, both increased again, but fell sharply in 2022 by 80.77% and 72.28%. Productivity was 2, 0.9, 1.7, 1, and 0.7 tons/ha between 2018 and 2022 (BPS Ngada Regency, 2023).

Cassava also experienced a decline in 2019 with production and area dropping by 56.12% and 50.82% respectively. Both indicators increased in 2020 and 2021 (production rose by 52.17% and 2.25%; area by 37.93% and 2.03%) but dropped again in 2022 by 5.08% and 2.84%. Cassava productivity also fluctuated: 0.61, 4.5, 5.9, 5.9, and 5.743 tons/ha from 2018 to 2022. Peanuts followed a similar pattern. In 2019, production and harvested area fell by 64.39% and 15.15%. Between 2020 and 2022, both rose steadily (production increased by 68.24%, 25.63%, and 21.03%; area increased by 40.42%, 25.98%, and 22.08%). Productivity over those years was 2, 0.8, 1.574, 1.6, and 1.582 tons/ha (BPS Ngada Regency, 2023).

The decline in production and harvested area is suspected to be due to reduced cultivation areas for each crop. Other contributing factors include limited resources, insufficient farmer knowledge and skills in crop cultivation, suboptimal soil management, and ineffective pest and disease control. Additionally, farmers face difficulties in accessing modern agricultural technology due to a lack of awareness and training.

The leading staple food crops for development in Ngada Regency should be determined based on factors such as climate, soil conditions, and local needs. In this context, rice, maize, and cassava appear to be high-potential crops. A detailed analysis of local market demand, productivity, and other relevant factors will help identify the most suitable crops for development, contributing to food security and improved community welfare in Ngada Regency.

Based on the above issues, it is essential to design appropriate policies to enhance productivity and sustainability, thereby improving the welfare of farmers in Ngada Regency. An analysis of priority staple food crops can serve as the first step in formulating concrete and sustainable improvement efforts.

RESEARCH METHODOLOGY

This research is a qualitative descriptive study. The descriptive method is a research approach that involves collecting data that accurately reflects actual conditions, then organizing, processing, and analyzing that data to provide an overview of the problems present in the area (Sugiyono, 2008). This study describes the leading staple food crop commodities in Ngada Regency by analyzing secondary data and drawing conclusions from the findings.

The data used are secondary data obtained from the Ngada Regency Statistics Agency (BPS), in the form of harvested area and production data for staple food crops in Ngada Regency for the period 2018–2022.

Data Analysis Method

The data analysis method used in this research in Ngada Regency is a quantitative method.

1. To address the first research objective, the Dynamic Location Quotient (DLQ) analysis is used. The formula for the DLQ analysis is as follows:

$$DLQ = \frac{(1 + g_{ij}) / (1 + g_j)}{(1 + G_i) / (1 + G)}$$

Keterangan:

DLQ = *Dynamic location quotient Index*

g_{ij} = Growth rate of production and harvested area of food crop commodity i in region j (subdistrict/district)

g_i = Average growth rate of production and harvested area of all staple food crop commodities in region j (subdistrict/district)

G_i = Growth rate of production and harvested area of staple food crop commodity i in the reference region (regency/district)

G = Average growth rate of production and harvested area of all staple food crop commodities in the reference region (regency/district)

Interpretation

The DLQ (Dynamic Location Quotient) value is similar to the traditional LQ but indicates how fast a commodity is growing.

1. If $DLQ > 1$, it means the growth rate of the commodity relative to the average growth rate of commodities in the subdistrict is faster than the growth rate of that commodity relative to the total commodities in the regency. This indicates that the commodity has the potential to become a future economic base.
2. If $DLQ < 1$, it means the growth rate of the commodity relative to the average growth rate of commodities in the subdistrict is slower than its growth rate relative to the total commodities in the regency. This suggests the commodity is less promising and unlikely to become an economic base in the future.
3. If $DLQ = 1$, it means the growth rate of the commodity relative to the average growth rate of commodities in the subdistrict is equal to the growth rate of that commodity relative to the total commodities in the regency.

2. To address the second objective, the Shift Share Analysis (SSA) method is used. Mathematically, the SSA method is formulated as follows:

$$SSA = \left(\frac{X_{..}(t1)}{X_{..}(t0)} - 1 \right) + \left(\frac{X_i(t1)}{X_i(t0)} - \frac{X_{..}(t1)}{X_{..}(t0)} \right) + \left(\frac{X_{ij}(t1)}{X_{ij}(t0)} - \frac{X_i(t1)}{X_i(t0)} \right)$$

Keterangan:

- a = Regional Share Component
- b = Proportional Shift Component
- c = Differential Shift Component
- $X_{..}$ = Total value of activity in the overall region
- X_i = Total value of a specific activity in the overall region
- X_{ij} = Value of a specific activity in a specific regional unit
- $t1$ = End year point
- $t0$ = Start year point

RESULT AND DISCUSION

General Overview of Ngada Regency

Ngada Regency is one of the regencies located in East Nusa Tenggara Province, with a total area of 1,620.92 km² or 162,092 hectares. The administrative boundaries of Ngada Regency are as follows: to the north, it borders the Flores Sea; to the south, the Sawu Sea; to the east, Nagekeo Regency; and to the west, East Manggarai Regency.

Astronomically, Ngada Regency lies between 8°20'24.28" – 8°57'28.39" south latitude and 120°48'29.26" – 121°11'8.57" east longitude. The regency consists of 12 districts (*kecamatan*) and 206 villages/sub-districts (*desa/kelurahan*). According to the 2023 Population Census, the total population

of Ngada Regency is 169,514 people, consisting of 82,794 males (49%) and 86,720 females (51%). The sex ratio in 2023 is 95, meaning that for every 100 females, there are 95 males. The population density in 2023 was 106 people per km².

Leading Staple Food Crop Commodities

Commodities with comparative advantages are those whose production is predominantly supported by natural resources that other regions may lack. According to Saptana (2008), the concept of comparative advantage relates to economic feasibility. Identifying leading agricultural sub-sectors helps determine which commodities should be prioritized for development. This requires analysis of each sub-sector in each region, so that commodity development can proceed effectively across regions (Drianti and Ardiyanto, 2016, in Isyanto et al., 2019).

Table 1. Recapitulation Results of Dynamic Location Quotient (DLQ) Analysis Based on Harvested Area and Production Data

Sub.	Harvested Area							Production						
	Paddy	Corn	Soy bean	Peanuts	Mung beans	Cassava	Sweet potato	Paddy	Corn	Soy bean	Peanuts	Mung beans	Cassava	Sweet potato
A	0,99	1,09	1,12	1,05	6,51	1,05	1,67	0,92	1,08	18,12	1,57	7,23	1,06	1,50
B	1,09	0,91	2,03	1,38	4,54	0,84	1,35	0,97	1,04	0,84	0,57	7,23	0,88	1,22
C	1,02	1,07	1,25	0,92	6,29	1,09	1,25	1,00	1,01	4,01	0,83	6,58	0,95	1,28
D	1,01	0,90	0,8	1,09	1,92	0,98	2,33	1,00	0,88	0,99	1,21	1,00	1,01	1,96
E	0,99	1,02	0,46	1,06	0,76	1,03	1,22	1,00	1,02	9,56	1,60	0,87	0,96	1,48
F	0,99	0,96	2,54	1,15	6,15	0,99	1,22	1,00	1,02	2,27	1,22	3,81	0,68	1,11
G	1,09	1,07	1,14	1,07	4,20	0,79	1,62	1,02	1,00	7,64	1,65	7,23	0,68	1,88
H	0,99	0,98	0,67	1,07	3,78	0,95	1,42	1,01	1,02	1,02	1,65	2,55	0,96	1,83
I	0,98	0,99	0,47	1,04	7,11	1,14	1,57	0,89	0,84	10,05	0,84	3,30	1,23	1,59
J	1,02	0,81	0,55	1,16	7,25	1,04	1,80	1,02	0,76	3,50	1,46	6,48	1,32	1,51
K	0,97	1,02	1,09	1,00	0,82	1,09	0,79	0,99	0,98	0,86	1,02	0,54	1,16	0,71
L	0,84	0,98	0,90	1,09	6,21	1,14	1,80	0,80	1,13	6,43	1,77	7,23	1,22	1,75

Source: Analysis Result, 2024

Notes:

- ☐ = A DLQ value > 1, whether based on harvested area or production, indicates that the commodity is a leading commodity.
☐ = A DLQ value < 1, whether based on harvested area, production, or either one, indicates that the commodity is not a leading commodity.

A Aimere Subdistrict
 B Bajawa Subdistrict
 C Golewa Subdistrict
 D Bajawa Utara Subdistrict
 E Riung Subdistrict
 F Soa Subdistrict

G Jerebuu Subdistrict
 H Riung Barat Subdistrict
 I Wolomeze Subdistrict
 J Golewa Selatan Subdistrict
 K Golewa Barat Subdistrict
 L Inerie Subdistrict

DLQ Analysis Results

The DLQ analysis shows that rice and soybean commodities have a comparative advantage in 4 subdistricts. Maize has a comparative advantage in 3 subdistricts, peanuts in 9 subdistricts, mung beans in 10 subdistricts, cassava in 7 subdistricts, and sweet potatoes in 11 subdistricts. This indicates that the leading commodities in each of these subdistricts are base commodities capable of meeting local demand and even supplying other areas. Staple food crop commodities show a comparative

advantage in certain subdistricts because the share of their harvested area at the subdistrict level is higher than at the regency level, resulting in a DLQ value greater than 1.

Development of Staple Food Crops

Staple food crop commodities with a **competitive advantage** are determined based on a **positive SSA (Shift Share Analysis)** value. A staple food crop commodity with a competitive advantage means that its production is carried out efficiently and effectively. Therefore, it has competitive strength in terms of quantity, quality, consistency, and price.

Table 2 Shift Share Analysis Results Based on Harvested Area Data

Subdistrict	Commodity						
	Paddy	Corn	Soy bean	Peanuts	Mung beans	Cassava	Sweet potato
A	78.75	114.12	-53.63	0.00	0.00	67.89	6.00
B	52.96	57.98	371.65	12.36	0.00	39.71	6.00
C	-66.33	363.33	-523.31	33.55	5.81	72.92	40.99
D	81.90	-436.35	-309.43	12.36	4.84	43.77	14.99
E	-102.72	611.03	-199.71	0.00	0.00	99.83	10.00
F	982.64	-946.22	-745.87	86.64	28.86	97.83	66.99
G	-7.32	52.01	-80.75	0.00	0.00	17.92	4.00
H	-210.32	454.76	-250.87	0.00	4.03	101.81	66.00
I	-47.62	-569.19	-139.88	23.27	7.22	41.81	10.99
J	230.53	-195.06	-149.78	9.73	4.22	18.92	9.00
K	-112.01	644.20	-54.52	15.73	0.81	65.83	20.00
L	0.00	-159.29	-59.17	0.00	0.00	48.88	7.00


Source: Analysis Result, 2024


Table 3 Shift Share Analysis Results Based on Production Data

Subdistrict	Commodity						
	Paddy	Corn	Soy bean	Peanuts	Mung beans	Cassava	Sweet potato
A	202.13	133.12	0.00	0.00	0.00	369.68	2.63
B	202.13	133.12	0.00	0.00	0.00	369.68	2.63
C	-202.31	364.58	-47.42	47.56	-0.70	507.07	148.64
D	724.43	-	-36.17	14.70	-4.21	231.35	27.13
E	-295.14	346.21	-12.86	0.00	0.00	494.69	18.88
F	3239.64	5002.08	-66.02	141.95	22.28	679.45	140.58
G	-20.53	94.86	-5.63	0.00	0.00	78.57	6.13
H	205.26	234.95	-16.08	0.00	-3.51	504.05	0.00
I	131.66	-	-10.86	25.03	1.19	202.57	26.82
J	1556.29	-	-17.68	11.19	-2.01	82.07	33.75
K	160.15	910.20	-10.90	21.19	-0.70	388.23	85.51
L	0.00	-381.59	-4.02	0.00	0.00	289.44	24.88

Source: Analysis Result, 2024

A	Aimere Subdistrict	G	Jerebuu Subdistrict
B	Bajawa Subdistrict	H	Riung Barat Subdistrict
C	Golewa Subdistrict	I	Wolomeze Subdistrict
D	Bajawa Utara Subdistrict	J	Golewa Selatan Subdistrict
E	Riung Subdistrict	K	Golewa Barat Subdistrict
F	Soa Subdistrict	L	Inerie Subdistrict

 = An SNij value > 0, whether based on harvested area or production, indicates that the commodity is a leading commodity.

 = An SNij value < 0, whether based on harvested area or production, indicates that the commodity is not a leading commodity.

SSA Analysis Results Based on Harvested Area and Production Data

The SSA analysis based on harvested area and production data reveals that rice has a competitive advantage in 5 subdistricts. Maize, peanuts, and mung beans each have a competitive advantage in 7 subdistricts. Soybeans have a competitive advantage in only 1 subdistrict, while cassava and sweet potatoes show a competitive advantage in all 12 subdistricts.

Commodities with a competitive advantage in certain subdistricts exhibit growth, resulting in positive values. Conversely, commodities without a competitive advantage do not show growth, thus yielding negative values. A commodity is considered to have a competitive advantage if the cumulative values of the regional share, proportional shift, and differential shift are positive.

Comparative and Competitive Advantage

Commodities with both comparative and competitive advantages are those with a DLQ > 1 and a positive SSA value.

Table 4 Recapitulation Results of DLQ and SSA Analysis Based on Harvested Area Data



Sub.	Commodity													
	Paddy		Corn		Soy bean		Peanuts		Mung beans		Cassava		Sweet potato	
	DLQ	SSA	DLQ	SSA	DLQ	SSA	DLQ	SSA	DLQ	SSA	DLQ	SSA	DLQ	SSA
A	0.99	78.75	1.09	114.12	1.12	-53.63	1.05	0.00	6.51	0.00	1.05	67.89	1.67	6.00
B	1.09	52.96	0.91	57.98	2.03	371.65	1.38	12.36	4.54	0.00	0.84	39.71	1.35	6.00
C	0.02	-66.13	1.07	363.33	1.25	-523.31	0.92	33.55	6.29	5.81	1.09	72.92	1.25	40.99
D	1.01	81.90	0.90	-436.35	0.80	-309.43	1.09	12.36	1.92	4.84	0.98	43.77	2.33	14.99
E	0.99	-102.72	1.02	611.03	0.46	-199.71	1.06	0.00	0.76	0.00	0.03	99.83	1.22	10.00
F	0.99	982.64	0.96	-946.22	2.54	-745.87	1.15	86.64	6.15	28.86	0.90	97.83	1.22	66.99
G	1.09	-7.32	1.07	52.01	1.14	-87.75	1.07	0.00	4.20	0.00	0.79	17.92	1.62	4.00
H	0.99	-210.32	0.98	454.76	-0.67	-250.87	1.07	0.00	3.78	4.03	0.95	101.81	1.42	66.00
I	0.98	-47.62	0.99	-569.19	0.47	-139.88	1.04	23.27	7.11	7.22	1.14	41.81	1.57	10.99
J	1.02	230.53	0.81	-195.06	0.55	-149.78	1.16	9.73	7.25	4.22	1.04	18.92	1.80	9.00
K	0.97	-112.01	1.02	644.20	1.09	-54.52	1.00	15.73	0.82	0.81	1.09	65.83	0.79	20.00
L	0.84	0.00	0.98	-159.29	0.90	-59.17	1.09	0.00	6.21	0.00	1.14	48.88	1.80	7.00

Source: Analysis Result, 2024

Table 5 Recapitulation Results of DLQ and SSA Analysis Based on Production Data

Sub.	Commodity													
	Paddy		Corn		Soy bean		Peanuts		Mung beans		Cassava		Sweet potato	
	DLQ	SSA	DLQ	SSA	DLQ	SSA	DLQ	SSA	DLQ	SSA	DLQ	SSA	DLQ	SSA
A	0.92	202.13	1.08	133.12	18.12	0.00	1.57	0.00	7.23	0.00	1.06	368.68	1.50	2.63
B	0.97	202.13	1.04	133.12	0.84	0.00	0.57	0.00	7.23	0.00	0.88	369.68	1.22	2.63
C	1.00	-202.31	1.01	364.58	4.01	-47.42	0.83	47.56	6.58	-0.70	0.95	507.07	1.28	148.64
D	1.00	724.43	0.88	-3035.91	0.99	-36.17	1.21	14.70	1.00	-4.21	1.01	23.35	1.96	27.13
E	1.00	-295.14	1.02	346.21	9.56	-12.86	1.60	0.00	0.87	0.00	0.96	494.69	1.48	18.88
F	1.00	3239.64	1.02	-5002.08	2.27	-66.02	1.22	141.95	3.81	22.28	0.68	679.45	1.11	140.58
G	1.02	-20.53	1.00	94.86	7.64	-5.63	1.65	0.00	7.23	0.00	0.68	78.57	1.88	6.13
H	1.01	205.26	1.02	234.95	1.02	-16.08	1.65	0.00	2.55	-3.51	0.96	504.05	1.83	0.00
I	0.89	131.66	0.84	-2727.47	10.05	-10.86	0.84	25.03	3.30	1.19	1.23	202.57	1.59	26.82
J	1.02	1556.29	0.76	-1205.79	3.50	-17.86	1.46	11.19	6.48	-2.01	1.32	82.07	1.51	33.75
K	0.99	160.15	0.98	910.20	0.86	-10.90	1.02	21.19	0.54	-0.70	1.16	388.23	0.71	85.51
L	0.80	0.00	1.13	-381.59	6.43	-4.02	1.77	0.00	7.23	0.00	1.22	289.44	1.75	24.88

Source: Analysis Result, 2024

-  = A DLQ value > 1 and a positive SSA, whether based on harvested area or production, indicate that the commodity is a leading commodity.
 = A DLQ value < 1 and a negative SSA, whether based on harvested area, production, or either one, indicate that the commodity is not a leading commodity.

- | | | | |
|---|--------------------------|---|----------------------------|
| A | Aimere Subdistrict | G | Jerebuu Subdistrict |
| B | Bajawa Subdistrict | H | Riung Barat Subdistrict |
| C | Golewa Subdistrict | I | Wolomeze Subdistrict |
| D | Bajawa Utara Subdistrict | J | Golewa Selatan Subdistrict |
| E | Riung Subdistrict | K | Golewa Barat Subdistrict |
| F | Soa Subdistrict | L | Inerie Subdistrict |

Analysis results based on harvested area and production data show that the commodities with both comparative and competitive advantages—when ranked as priorities for developing leading commodities in Ngada Regency—are:

- Sweet potato (10 subdistricts)
- Cassava (5 subdistricts)
- Maize and peanuts (4 subdistricts each)
- Rice and mung beans (2 subdistricts each)

Meanwhile, **soybeans** do not have any comparative or competitive advantage.

CONCLUSION AND RECOMMENDATION

Commodities with Faster Growth Rates at the Subdistrict Level The commodity with a growth rate that surpasses the overall growth rate of staple food commodities in Ngada Regency—based on

harvested area and production data—is sweet potato. Sweet potato shows rapid growth in nearly every subdistrict within the regency.

Staple food crops that are potential for development and possess both comparative and competitive advantages in Ngada Regency, according to harvested area and production data, include sweet potato, cassava, corn, paddy, peanuts. On the other hand, soybean shows a decline across all subdistricts in both harvested area and production.

Recommendations

For staple food crop commodities with $DLQ < 1$, efforts should be made to increase harvested area and productivity by maximizing the use of appropriate technology and production inputs. Productivity improvements require government support for farmers, particularly in the form of easier access to farming inputs, and the enhancement of agricultural infrastructure—especially irrigation and farm machinery. Additionally, initiatives should be taken to stimulate the growth of other food crops that have the potential to become leading commodities based on the specific characteristics and potential of each area.

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