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Rice Commodity Impact on Regional Development in Cilacap Regency, Central Java

ABSTRACT

The primary purpose of this research is to evaluate Cilacap Regency's lowland rice production system. The second step is to examine the features of lowland rice commodity distribution in Cilacap Regency based on locality and specialization and to understand how lowland rice functions as a sector base to support the operations of the food crop agriculture sector in Cilacap Regency. This research employs a qualitative descriptive methodology with secondary data types based on Central Statistics Agency (BPS) documentation for the years 2014–2019. Excel 2010 is used to process secondary data. The output of lowland rice from 2014 to 2019 was the subject of the study. The location quotient (LQ) analysis, locality and specialization analysis, basic service ratio analysis (BSR), and regional multiplier are all used in the data analysis process (RM). The results revealed that the districts of Dayeuhluhur, Wanareja, Majenang, Kedungreja, Patimuan, Bantarsari, Kampung Laut, Adipala, Maos, Sampang, Kroya, Binangun, and Nusawungu were the primary areas for lowland rice commodities in Cilacap Regency from 2014 to 2019. Second, there are no sub-districts in Cilacap Regency that are exclusively focused on lowland rice commodities and the features of the distribution of lowland rice commodities are not concentrated in one sub-district. Third, Cilacap Regency's agricultural activities might be supported by the lowland rice commodity base sector from 2014 to 2019.

Keywords: Rice Fields, Location Quotient Analysis, Localization and Specialization Analysis, Basic Service Ratio and Regional Multiplier.

INTRODUCTION

Development is a deliberate process of transformation that is ongoing, sustainable, and progressively better and more sophisticated. To achieve this, development must be carried out in stages throughout all domains, sectors, and subsectors in a planned and systematic manner. Economic development is one method for achieving effective development. Feldman, Hadjimichael, Kemeny, & Lanahan (2014) one of the sectors in the center of national growth is agriculture, particularly those aspects related to the management and application of strategic results, particularly those pertaining to food commodities (Isbah & Iyan, 2016; Oktavia, Hanani, & Suhartini, 2016).

There are 6 cities and 29 regencies in the Central Java Province, including Cilacap Regency, which has 24 subdistricts. The largest region to produce rice in 2018 was Cilacap Regency, which produced 777.352 tons, following by Grobogan Regency (732.167 tons), and Demak Regency (689.863 tons) (Fafurida & Pratiwi, 2017; BPS Central Java, 2021).

Compared to other commodities, lowland rice has the highest yield. 2014 saw lowland rice yield 776.881,00 tons, followed by 889.991 tons in 2015, 827.168,00 tons in 2016, 876.753,00 tons in 2017, 919.317,00 tons in 2018, and 722.622,00 tons in 2019. Therefore, it is clear that the highest output occurred in 2018, while the lowest production occurred in 2019 (Ekowati, Prasetyo, & Mukson, 2020; BPS Cilacap Regency, 2020). According to BPS Cilacap Regency data, the area of lowland rice harvest tends to decline from 2014 to 2019, which indirectly affects lowland rice output in that year.

The ability of several sub-districts in Cilacap Regency to sell their crops to other sub-districts aids in the fulfillment of rice production needs in several sub-districts, ensuring that the district's rice needs may still be supplied independently. According to Elyanto & Tobari (2008), there were 12 lowland rice base regions in 2001-2005, namely the Wanareja, Kroya, Majenang, Cipari, Kedungreja, Binangun, Adipala, Sampang, Nusawungu, Kesugihan, Maos, and Patimuan districts.

Lowland rice is farmed in each subdistrict in Cilacap Regency, however because of the variance in each subdistrict's lowland rice production outcomes, it is unclear whether lowland rice is the main crop. Therefore, it is important to consider how lowland rice products contribute to regional development in Cilacap Regency. In the end, it will be possible to define lowland rice's function so that its potential may be understood and it can continue to be a valuable commodity.

This research seeks to examine: first, the fundamental area of lowland rice in Cilacap Regency. Second, the features of lowland rice commodity distribution in Cilacap Regency depending on region and specialization. Third, the importance of lowland rice as a fundamental industry for sustaining agricultural sector activities in Cilacap Regency.

RESEARCH METHODS

Purposive selection is used to select the study area. Quantitative descriptive research methodology was applied in this study. It's secondary data that was utilised. July–August 2021 saw the study's execution.

The Location Quotient (LQ) analysis method, which uses the following formula to calculate the basic and non-basic area of lowland rice commodities (Widyatami & Wiguna, 2017):

$$LQ = \frac{vi/vt}{Vi/Vt}$$

Note:
LQ = Location Quotient index of lowland rice commodity
vi = paddy rice commodity harvested production (tonnes) in sub-district-i
vt = paddy rice commodity harvested production (tonnes) in Cilacap Regency
Vi = total crop production (tons) in sub-district-i
Vt = total food crop production (tonnes) in Cilacap Regency
Criteria:
LQ 1 = region-i is the base area for lowland rice production in Cilacap Regency.
LQ < 1 = region-i is a non-basic area for lowland rice production in Cilacap Regency.

To identify the features of the distribution of lowland rice products in Cilacap Regency using location analysis and specialized (Widyatami & Wiguna, 2017).

a) Locally, used to measure the relative distribution (concentration) of agricultural activities for lowland rice commodities in Cilacap Regency using the formula:

$$LP = (Si/Ni) – (\sum Si/\sum Ni)$$

Note:
Si = paddy rice commodity production (tons) in sub-district-i
Ni = lowland rice commodity production (tonnes) in Cilacap Regency
Si = total food crop production (tons) in sub-district-i
Ni = total food crop production (tonnes) in Cilacap Regency
Criteria:
< 1 = lowland rice commodity spread over several sub-districts
1 = lowland rice commodity concentrated in a sub-district

b) Specialization, used to see regional specialization for lowland rice commodities in Cilacap Regency, namely with the formula:

$$Sp = (Si / Si) – (Ni / Ni)$$

Note:
Si = paddy rice commodity production (tons) in sub-district-i
Ni = lowland rice commodity production (tonnes) in Cilacap Regency
Si = total food crop production (tons) in sub-district-i
Ni = total food crop production (tonnes) in Cilacap Regency
Criteria:
i < 1 = an area does not specialize in one type of lowland rice commodity
i = an area that specializes in one type of lowland rice commodity

By applying Basic Service Ratio (BSR) analysis and Regional Multiplier (RM) analysis, it will be possible to assess the contribution that lowland rice commodities provide to the agricultural sector as a whole in a given region (Pertiwi, Suwandari, & Januar, 2015).

Basic Service Ratio (BSR)

Analysis of the Basic Service Ratio (BSR) is used to assess the base area's capacity to meet the needs of non-base areas in terms of development, with the formula:

$$BSR = (\sum \text{base sector})/(\sum \text{non-base sector})$$

Regional Multiplier (RM)

Analysis of the regional multiplier (RM) is used to assess the fundamental activity's invasion strength and any direct or indirect propagation consequences, with the formula:

$$RM = (\sum \text{base sector} + \text{non-base sector})/(\sum \text{base sector})$$

Note:
Base Sector : The base area's total rice production (tons)
Non-Base Sector : Total non-basic rice production (tons)
Criteria:

BSR and RM 1 = Agriculture in Cilacap Regency is not supported by the paddy rice commodities base sector.

BSR and RM > 1 = Agriculture in Cilacap Regency is supported by the paddy rice commodities base sector.

RESULTS AND DISCUSSIONS

Analysis of Rice Field Commodity Base Area

The food crop with the highest level of production in Cilacap Regency is lowland rice. Low-lying base rice is the type of lowland rice that may serve as the region's economic foundation and is capable of both meeting local demand and exporting outside of the county. It is anticipated that the region's economy will grow more quickly because to this staple rice product.

The Location Quotient (LQ) approach can be used to identify whether the lowland rice commodities produced by the sub-district are basic or non-basic commodities. LQ1 values represent non-basic lowland rice goods, whereas LQ1 values represent lowland base rice commodities (Widyatami & Wiguna, 2017). The results of the LQ value study of the lowland rice-producing districts in Cilacap Regency were achieved through calculation utilizing the LQ method, as shown in Table 1.

Table 1. LQ value of lowland rice producing sub-districts in Cilacap Regency in 2014-2019

No	District	LQ Value of Rice Field Comodity						Average
		2014	2015	2016	2017	2018	2019	
1	Dayeuhluhur	1,063	1,200	1,056	1,111	1,079	1,029	**1,090**
2	Wanareja	1,049	1,164	1,042	1,090	1,067	1,021	**1,072**
3	Majenang	1,071	1,182	1,073	1,066	1,151	0,926	**1,078**
4	Cimanggu	0,908	0,944	0,956	0,974	1,087	0,896	0,961
5	Karangpucung	0,781	1,025	0,655	0,654	0,824	0,793	0,789
6	Cipari	0,897	1,165	0,881	0,797	0,732	1,088	0,927
7	Sidareja	0,760	0,880	0,761	0,952	0,968	0,983	0,884
8	Kedungreja	1,173	1,168	1,182	1,083	1,112	0,974	**1,115**
9	Patimuan	1,047	1,046	1,052	1,033	1,129	0,915	**1,037**
10	Gandrungmangu	0,650	1,043	0,799	0,730	0,796	0,918	0,823
11	Bantarsari	1,096	0,906	1,050	1,054	1,041	1,013	**1,027**
12	Kawunganten	0,968	0,980	0,960	0,943	0,943	1,000	0,965
13	Kampung Laut	1,179	1,099	1,157	0,876	0,844	1,037	**1,032**
14	Jeruklegi	0,771	0,714	0,532	0,617	0,644	0,957	0,706
15	Kesugihan	1,061	0,604	0,998	1,043	0,901	1,157	0,961
16	Adipala	1,188	1,103	1,166	1,080	1,108	0,975	**1,103**
17	Maos	1,212	1,179	1,160	1,165	1,153	1,010	**1,146**
18	Sampang	1,191	1,176	1,174	1,158	1,117	1,037	**1,142**
19	Kroya	1,174	1,057	1,166	1,160	1,184	0,980	**1,120**
20	Binangun	1,185	0,839	1,163	1,152	1,041	1,106	**1,081**
21	Nusawungu	1,107	1,001	1,179	1,131	1,143	0,990	**1,092**
22	Cilacap Selatan	1,222	0,198	1,142	1,178	1,157	1,018	0,986
23	Cilacap Tengah	0,896	0,417	0,817	0,686	0,814	0,843	0,745
24	Cilacap Utara	1,143	0,689	0,946	1,033	1,098	0,941	0,975

Source: Secondary data processed (2021)

The results of the Location Quotient (LQ) analysis show the average value of LQ1 is found in a number of districts that serve as the foundation for lowland rice, including Dayeuhluhur District (1.090), Wanareja District (1.072), Majenang District (1.078), Kedungreja District (1.115), Patimuan District (1.037), Bantarsari District (1.027), Kampung Laut District 1.032, and Nusawungu (1,092).

Maos District has the highest average LQ value, 1.146, meaning that 1.146 is for export to other regions and 1.146 is for the region itself. Kroya District followed in at 1.120, followed by Sampang District at 1.142.

Leading commodities can accelerate the growth of other commodities if they are developed, because it is believed that the presence of superior commodities in a region will promote regional progress. A commodity that is regarded as a leading commodity in a region is one that is not just used to satisfy local demands but also has the potential to be sold elsewhere. A commodity's potential advantage increases with its LQ value relative to other commodities in that region (Zakiah, Safrida, & Santri, 2015).

Characteristics of the Distribution of Rice Field Commodities

Local Analysis of Rice Field Commodities. Locality analysis is used to determine whether lowland rice commodities are concentrated in one sub-district or spread across different sub-districts (Widyatami & Wiguna, 2017). The analysis of the locality of lowland rice commodities in the base district of Cilacap Regency is shown in table 2

Table 2. Locality coefficient values of lowland rice base sub-districts in 2014-2019

No	District	Locazation Coeficient Value						Average
		2014	2015	2016	2017	2018	2019	
1	Dayeuhluhur	0,003	0,009	0,003	0,007	0,004	0,002	0,005
2	Wanareja	0,003	0,010	0,003	0,006	0,005	0,001	0,005
3	Majenang	0,005	0,014	0,005	0,005	0,013	-0,008	0,006
4	Kedungreja	0,011	0,010	0,010	0,004	0,007	-0,003	0,007
5	Patimuan	0,003	0,002	0,003	0,002	0,007	-0,004	0,002
6	Bantarsari	0,003	-0,003	0,002	0,002	0,001	0,000	0,001
7	Kampung Laut	0,003	0,003	0,004	-0,003	-0,006	0,003	0,001
8	Adipala	0,008	0,004	0,007	0,003	0,004	-0,001	0,004
9	Maos	0,005	0,005	0,005	0,004	0,002	0,002	0,004
10	Sampang	0,005	0,005	0,004	0,005	0,002	0,003	0,004
11	Kroya	0,007	0,002	0,008	0,007	0,006	0,001	0,005
12	Binangun	0,008	-0,009	0,008	0,007	0,001	0,006	0,004
13	Nusawungu	0,005	0,000	0,008	0,007	0,005	0,002	0,005

Source: Secondary data processed (2021)

According to the criteria for the localization coefficient, it can be determined that lowland rice is concentrated in specific sub-districts in Cilacap Regency if the localization coefficient value is (α≥1). Lowland rice has spread in multiple Cilacap Regency districts if

the localization coefficient is (α≥1), in the meantime. Based on Table 2, it is clear that lowland rice is distributed among a number of subdistricts rather than being concentrated in one. This is indicated by the value of the base subdistrict locality coefficient.

Because lowland rice production providers are not restricted to one sub-district in Cilacap Regency but are available in multiple sub-districts, the spread of lowland rice commodities agriculture that is not concentrated can be advantageous. The rice commodity base area is still crucial in this situation since it can provide for the demands of other regions (Widyatami & Wiguna, 2017).

Analysis of Rice Field Commodity Specialization. Regional specialization for lowland rice products in Cilacap Regency is determined using specialization analysis (Widyatami & Wiguna, 2017). The analysis of the specialization of lowland rice commodities in the base districts in Cilacap Regency is shown in Table 3.

Table 3. The specialization coefficient value of lowland rice based sub-districts in 2014-2019

No	District	Specialization Coefficient Value						Average
		2014	2015	2016	2017	2018	2019	
1	Dayeuhluhur	0,051	0,167	0,047	0,094	0,064	0,030	0,075
2	Wanareja	0,039	0,137	0,035	0,076	0,054	0,022	0,061
3	Majenang	0,058	0,152	0,061	0,056	0,122	-0,066	0,064
4	Kedungreja	0,140	0,140	0,153	0,071	0,091	-0,020	0,096
5	Patimuan	0,038	0,038	0,044	0,028	0,104	-0,076	0,029
6	Bantarsari	0,077	-0,078	0,042	0,046	0,033	0,013	0,022
7	Kampung Laut	0,145	0,083	0,132	-0,106	-0,126	0,021	0,025
8	Adipala	0,152	0,086	0,139	0,068	0,087	-0,019	0,085
9	Maos	0,171	0,149	0,134	0,140	0,124	0,016	0,122
10	Sampang	0,154	0,147	0,146	0,134	0,095	0,040	0,119
11	Kroya	0,140	0,047	0,139	0,136	0,149	-0,013	0,100
12	Binangun	0,150	-0,134	0,137	0,129	0,033	0,095	0,068
13	Nusawungu	0,086	0,001	0,150	0,112	0,115	-0,004	0,077

Source: Secondary data processed (2021)

According to Widyatami & Wiguna (2017), the criterion for the coefficient of specialization can be demonstrated if the value of the coefficient of specialization (β≥1), in which case specific districts in Cilacap Regency specialize in lowland rice. Meanwhile,

if the coefficient of specialization has a value of (β≥1), then lowland rice is not a specialty in all of Cilacap Regency's districts. Based on Table 3, it is clear that the basic sub-districts in Cilacap Regency cultivate a variety of food crops, including highland rice, soybeans, peanuts, green beans, corn, sweet potatoes, and cassava, in addition to lowland rice. The value of the basic sub-districts' coefficient of specialization, which measures how well they specialize in lowland rice, is valuable (<1).

Lowland rice is produced in large quantities in locations that fit into the basic category, but this does not mean that lowland rice is the only good crop planted there. Several other crops are also grown to meet community needs and to prepare for crop failure in one or more regions. There are more different commodities being grown.

Subdistricts of Cilacap Regency cultivate highland rice, soybeans, peanuts, green beans, corn, sweet potatoes, and cassava in addition to lowland rice. This is consistent with Lusminah (2008) study, which found that the sub-districts in Cilacap Regency grow a variety of crops in addition to lowland rice.

The Role of Rice Field Commodities as One of the Base Sectors in Supporting Agricultural Activities

Analysis of Basic Service Ratio (BSR). The carrying capacity of the base sector area for sustaining agricultural operations in Cilacap Regency is determined using Basic Service Ratio (BSR) analysis. The LQ calculation findings are used to calculate the BSR analysis, which compares the output produced in the base area to the production produced in the non-base area.

According to Pertiwi, Suwandari, & Januar (2015), if the BSR value is larger than 1, it indicates that the lowland rice sector can support the agricultural economy in Cilacap Regency; conversely, if the BSR value is less than or equal to 1, it indicates that the lowland rice sector cannot. The Basic Service Ratio (BSR) value for lowland rice in Cilacap Regency from 2014 to 2019 is shown in Table 4.

Table 4. Value of Basic Service Ratio (BSR) for lowland rice in 2014-2019

No	Years	BSR
1	2014	2,340
2	2015	2,381
3	2016	1,813
4	2017	2,439
5	2018	2,051
6	2019	4,126

Source: Secondary data processed (2021)

According to Table 4, the greatest BSR value between 2014 and 2019 was 4.126, which was attained in that year. According to the BSR value, 1 part of lowland rice output is used to support base area development needs whereas 3.126 parts are utilized to support non-base area development needs. 2016 saw the lowest BSR value, which was 1.813.

The BSR value is a measure of how much lowland rice is produced in the base area. The higher the BSR value, the faster the base area will develop moving forward. The service capacity to non-base areas will also rise in tandem with the increase in lowland rice production. The possibility for the base area to supply low-lying rice to non-base areas increases with the BSR value, increasing the base area's ability to do so and its ability to earn more money, which in turn affects the base area's ability to drive its own development (Pertiwi, Suwandari, & Januar, 2015)

According to Mayangsari & Sunartomo (2021), farmers must maintain sustainability and increase the production of lowland rice commodities in order for the BSR value to always have more than one value. If the BSR value has more than one, the presence of lowland rice commodity business activities can support agricultural activities Cilacap Regency in Indonesia.

Use of high-quality seeds, increasing planting areas, pest and pest control of crops that damage the rice crop, and good soil management are some strategies to boost lowland rice production and sustainability. Additionally, utilizing a distance that enables plants to grow well without encountering much rivalry in terms of ideal water intake,

nutrients, and sunlight for the process of photosynthesis is another way to boost rice output using the legowo jajar system. (Ikhwani, Pratiwi, Paturrohman, & Makarim, 2013).

Regional Multiplier (RM) Analysis. Basic Service Ratio Analysis (BSR) is followed by Regional Multiplier Analysis (RM). Cilacap Regency's total lowland rice production was compared to output from a number of its sub-districts to determine the Regional Multiplier Value (RM) for lowland rice. The values of the Regional Multiplier (RM) for lowland rice from 2014 to 2019 are shown in Table 5.

Table 5. Value of Regional Multiplier (RM) for lowland rice in 2014-2019

No	Years	RM
1	2014	1,427
2	2015	1,420
3	2016	1,552
4	2017	1,410
5	2018	1,488
6	2019	1,242

Source: Secondary data processed (2021)

According to Table 5, the RM value of lowland rice in Cilacap Regency from 2014 to 2019 has a value greater than one. These calculations' findings suggest that the presence of a lowland rice base sector can aid in the economic growth of the agriculture sector in Cilacap Regency. The greatest RM value 1.552, was attained in 2016, which means that 0.552 parts of it go toward non-essential needs and 1 part goes toward fundamental needs.

The sub-district of Cilacap Regency's lowland rice commodity base can support the growth of lowland rice commodity farming activities, according to Mayangsari & Sunartomo (2021), if the RM value is greater than one. After the base sub-district area's need for lowland rice commodities is met, the surplus supply of these commodities can be used to supply non-basic regions' demand for lowland rice commodities.

Discussions

This study's Location Quotient approach is a straightforward economic development tool. However, this method can identify excellent rice products in a number of Cilacap Regency areas. The study's findings demonstrate that the rice commodities that form the foundation of Cilacap Regency in each sub-district appear to differ from one another. Which sub-districts in Cilacap Regency are part of the commodity or non-rice base can be determined using the Location Quotient (LQ) method employed in this study.

The superior commodity of rice in the base subdistrict of Cilacap Regency may be further enhanced by fostering the expansion of other commodities as well as being able to foster the development of the base region. Cilacap Regency's rice base area is projected to create excellent commodities that can both satisfy local demand and have the potential to be exported. However, the research of Ameliya (2020) and Destiningsih, Sugiharti, & Achsa (2019) emphasized that in the basic region it is vital to prevent the tendency of rampant land use change since it will cause rice output to drop.

This research also shows the potential advantages of non-concentrated lowland rice commodity cultivation. This benefit results from the basis sub-district in Cilacap Regency being able to supply lowland rice output to other districts in Cilacap Regency that are not base districts, hence reducing dependence on just one sub-district. The research by Jumiyanti (2018), Putra, Setiawan, & Suhartini (2021), and Alhowaish (2015) classified that from different sectors of the existing activity base, the stability of one commodity sector in the base area will be able to make a significant contribution to the economy in the region. This research is relevant to those studies. The growth of worthwhile basic activities will benefit many other sectors that emerge from the basic sector.

Additionally, according to the research of Haile, Kalkuhl, & Braun (2016), Widyantari & Maulany (2020), and Faqih (2021), policies must be implemented in order to sustain land availability and rice production in the base region in the future. One such

policy is concerning land conversion. Because of the high rate of land conversion, even when the farming communities in the base area make every effort to intensify their operations, it is still feasible that, in the future, food insecurity will exist in the base region without the backing of policy.

The base area produces highland rice, as this study clearly demonstrates, but lowland rice is not the only superior crop. In addition to producing food for the population, the basic area also serves as a source for a number of other crop commodities. In addition, if crop failure occurs in one, as a sort of anticipation. According to research by Morrissey (2014), Saleh, Sabir, & Darmawansyah (2021), and Crawley & Munday (2020), in order to maintain this superior commodity, an area's basic infrastructure, technology, financial institutions, and capital, as well as the transportation facilities required to speed up the processing of superior commodity products and their marketing, must be developed.

According to the research analysis, lowland rice production is expanding quickly in the base region and has the potential to supply non-base areas. By using high-quality seeds, expanding the planting area, controlling pests, and cultivating the soil, lowland rice production and sustainability have increased in Cilacap Regency's base region. As a result, Cilacap Regency's lowland rice industry contributes significantly to the growth of the agricultural sector's economy.

CONCLUSION

Based on the Location Quotient (LQ) analysis's findings, the primary production areas for lowland rice commodities in Cilacap Regency from 2014 to 2019 included Dayeuhluhur District, Wanareja District, Majenang District, Kedungreja District, Patimuan District, Bantarsari District, Kampung Laut District, Adipala District, Maos District, Sampang District, Kroya District, Binangun District, and Nusawungu District. Lowland rice commodities are distributed in Cilacap Regency in a variety of ways, and no one locality

possesses a particular lowland rice commodity specialty. Cilacap Regency's agricultural operations were supported by the lowland rice commodity base sector from 2014 to 2019.

Farmers are expected to maintain or improve lowland rice productivity in the basis sub-district in order for it to continue serving as the base sub-district in the future. In order for non-basic subdistricts to eventually become base areas, farmers participating as actors in lowland rice cultivation are expected to boost productivity.

All Cilacap Regency sub-districts, including base and non-base sub-districts, are expected to benefit from the development of lowland rice. The regional government is expected to help with this by offering subsidies for fertilizer, seeds, and production equipment.

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