

IDENTIFICATION OF SUPERIOR COMMODITY IN AGRICULTURE SECTOR IN MAGELANG REGENCY

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ABSTRAK

Penentuan komoditas unggulan diperlukan untuk mengetahui potensi dan peluang komoditas yang dapat dikembangkan di suatu daerah. Komoditas unggulan diharapkan dapat memberikan pemasukan yang lebih besar dibandingkan dengan komoditas lainnya. Penelitian ini bertujuan untuk mengetahui subsektor pertanian unggulan yang memiliki potensi untuk dikembangkan sebagai penggerak roda perekonomian di suatu wilayah dan menganalisis kecenderungan pola pertumbuhan subsektor dan komoditas pertanian unggulan di Kabupaten Magelang. Metode yang digunakan dalam penelitian ini adalah metode deskriptif. Data yang digunakan adalah data runtun waktu (time series) yaitu data sekunder PDRB Kabupaten Magelang dan Provinsi Jawa Tengah tahun 2013-2017 dan data jumlah produksi komoditas pertanian selama kurun waktu 7 tahun (2011-2017). Alat analisis data yang digunakan adalah Analisis Location Quotient (LQ), Dynamic Location Quotient (DLQ), dan Analisis Klassen Typology. Hasil penelitian diketahui bahwa sektor pertanian Kabupaten Magelang tanaman hortikultura, peternakan, serta kehutanan merupakan subsektor basis/unggulan. Pola dan struktur pertumbuhan subsektor tanaman pangan termasuk yang berkembang cepat. Sedangkan subsektor hortikultura dan peternakan termasuk subsektor yang maju tetapi tertekan. Komoditas tanaman pangan yang maju dan berkembang cepat adalah ubi jalar. Komoditas hortikultura kelompok tanaman sayuran yang maju dan berkembang cepat adalah kubis, cabai rawit, tomat, kembang kol, ketimun, bawang daun, dan wortel. Komoditas hortikultura kelompok buah-buahan yang maju dan berkembang cepat adalah rambutan dan salak. Komoditas peternakan yang berkembang cepat adalah sapi, kerbau, babi, ayam kampung, dan itik. Komoditas yang maju tetapi tertekan adalah kambing dan ayam pedaging.

Kata kunci: analisis location quotient, Kabupaten-Magelang, komoditas unggulan, pertanian

ABSTRACT

Determination of leading commodities is essential to know the potential and prospective commodities that can be developed in an area. Leading commodities are expected to provide more significant revenue compared to other commodities. This study aimed to determine the leading agricultural subsector and analyze the growth patterns of subsector and leading agricultural commodities in Magelang district. The method used in this study was descriptive. This study used time-series data, i.e. the GRDP of Magelang and Central Java Provinces in 2013-2017 and agricultural commodity production over seven years (2011-2017). Then the data were analyzed using Analysis of Location Quotient (LQ), Dynamic Location Quotient (DLQ), and Klassen Typology Analysis. The result of the study shows that horticultural plants, livestock, forestry, and natural resources are categorized to the leading subsectors of the agricultural sector in Magelang District. The growth pattern and structure of the food crop subsector were among those that are rapidly developing, while the horticulture and livestock were among the advanced but depressed subsectors and the most advanced and fast-growing food crops were sweet potatoes. On the other hand, the fast-growing group of horticultural commodities of vegetables were cabbage, cayenne pepper, tomatoes, cauliflower, cucumber, scallion, and carrots,

whereas horticultural commodities in advanced and fast-growing fruit groups were rambutan and salak. Besides, the rapidly growing livestock commodities were cows, buffaloes, pigs, native chickens, and ducks. Finally, advanced but depressed commodities were goats and broilers.

Keywords: *agriculture, leading commodities, location quotient, Magelang District*

INTRODUCTION

Agriculture becomes the main livelihood in some regions in Indonesia, especially regions that have vast agricultural land. Agricultural products vary, thus each agricultural commodity has a different quantity and quality in each region. Based on this case, the role of each agricultural commodity for each region also varies.

Indonesia is well-known as an agricultural country that relies on the agricultural sector to support development as well as a source of livelihood for the people. The agricultural sector provides food for most of the population in developing countries, including Indonesia, as well as widely available employment for almost the entire workforce. The agricultural sector is also a provider of raw materials for the industrial sector that is currently growing rapidly and contributing greatly to the growth of GRDP, thus, this sector is considered to have a very dominant role in the Indonesian economy (Oktavia et al., 2015).

Agriculture plays a very important and strategic role in human life. It is as community food providers to create national food security. The development of the agricultural sector has been encouraged by rapid technological advances in the industrial (chemical and mechanical) and transportation sectors. Agriculture is becoming increasingly advanced and complex, characterized by higher productivity per hectare thanks to the use of agricultural production facilities produced by industry (fertilizers and pesticides). Agricultural activities are increasingly specialized based commodities and activities (Maulidah, 2012).

A region can develop through the development of leading sectors in the region that can encourage the development of other sectors. One sector that often obtains

considerable attention from the government due to its very important role in economic development is the agricultural sector. The agricultural sector can be the basis for describing rural economic activities through agriculture-based enterprises, namely agribusiness. Agribusiness is an activity related to the handling of agricultural commodities in a broad sense covering one or all of the production chains (Dewi and Santoso, 2014).

Agribusiness can develop in Indonesia due to profitable regional conditions, such as: its location on the equator, the availability of facilities and infrastructure to support the development of agribusiness, and the political will of the government to give priority. The obstacles of agribusiness development in Indonesia lie in various aspects, including: production patterns are located in scattered locations, inadequate facilities and infrastructure outside Java, higher transportation costs, concentration of agro-industry in big cities, and the institutional system that does not support the development of agribusiness activities. The agricultural sector will always be endeavored to develop because the availability of human food depends on this sector. However, efforts in agriculture that are often equated with agribusiness still have obstacles. The existence of intense competition regarding the marketing of agricultural products in the world market demands the role of product quality, and the ability to penetrate the world market is becoming increasingly important. To maintain the continuity of the ability to break through this market, the continuity of agricultural raw materials needs to be guaranteed, not only in the amount (quantity) of raw materials needed but also the quality and continuity (Bintoro, 2010).

This research aims to find out the leading agricultural sub-sector in Magelang Regency, identify superior agricultural sub-

sector commodities that have the potential to be developed as a driving force for the economy in the Magelang Regency and analyzes the trend of growth patterns in the sub-sectors and lead agricultural commodities in Magelang Regency.

RESEARCH METHOD

In this research, the basic method used descriptive method by emphasizing the analysis on numeric data that were proceeded by statistical methods. The data used were time series data, such as secondary data on GRDP (Gross Regional Domestic Product) of Magelang Regency and Central Java Province in 2013-2017 and data on the amount of production and production value of agricultural commodities for a period of 7 years (2011-2017). The data analysis tools used were Location Quotient Analysis (LQ), Dynamic Location Quotient (DLQ), and Klassen Typology Analysis.

Imelia (2011), Alhowaish et al. (2015), Akliyah (2014), Dewi and Santoso (2014), and several previous studies had used the LQ analysis method to determine which commodities/sub-sectors are superior/basis. Location Quotient (LQ) analysis is an index to compare the share of sub-regions in agricultural activities with the total share of these activities in total regional activities. In other words, LQ is the percentage ratio of total agricultural activity in the *i*-th sub-region to the percentage of total activity in the observed area. The LQ value was obtained using the formula below:

$$LQ = \frac{v_i/v_t}{V_i/V_t}$$

Information:

1. v_i : GRDP sub-sector value/amount of agricultural commodity production in the Regency.
2. v_t : GRDP sector value/total production at the regency level.
3. V_i : GRDP sub-sector value/amount of agricultural commodity production in province level.

4. V_t : GRDP value of the sector/amount of agricultural production at the provincial level.
5. $LQ > 1$, it means that level of certain sub-sector/commodity in Regency level is bigger than the same sub-sector/commodity at the province level. It means that the sub-sector/ commodity is a sub-sector/commodity/ base in the district and has the potential to be developed as a driver of the district economy.
6. $LQ < 1$, It means that the level of a certain sub-sector/commodity at the regency level is smaller than the same sub-sector/commodity at the province level. It means that the sub-sector is not a leading sub-sector/commodity/basis and it is less potential to be developed as a driver of the district economy.

LQ analysis based on the the formula is simple and if it is used in the form of one shot analysis, the benefit is not significant. It is only finding out whether the LQ is above 1 or not. Yet, LQ analysis becomes interesting when it is conducted in the form of a time series/trend. It means that it is analyzed for a certain period of time. Based on Kusmiati and Windiarti (2011), the assumption used in the LQ analysis is that the pattern of population demand is homogeneous. It means that every population in the research area is considered to have the same demand pattern as the national demand pattern. The production of the area is first used to meet the needs of the region and the rest is exported outside the region.

Dynamic Location Quotient (DLQ) analysis was then used to determine certain subsectors and commodities in the future. Using this analysis will be able to determine whether in the future certain sub-sectors and commodities can survive as superior sub-sectors/commodities or not. Or sub-sectors/commodities that were previously not superior have potential as leading sub-sectors/commodities in the future. The DLQ value was obtained using the formula below:

$$DLQ_{ij} = ((1 + g_{ij})(1 + g)) / ((1 + G_i)(1 + G))^t$$

Where:

- 1 g_{ij} : Average growth rates for sub-sectors/ agricultural commodities in Regency.
- 2 g_j : Average growth rates for sector/ agricultural commodities in Regency.
- 3 G_i : Average growth rates for sub-sectors/ agricultural commodities in Province.
- 4 G : Average growth rates for sector/ agricultural commodities in Province.
- 5 t : time frame analysis
- 6 $DLQ > 1$, Subsectors/commodities can still be expected for the future.
- 7 $DLQ < 1$, Subsectors/commodities can't be expected for the future.

Furthermore, criteria of LQ and DLQ analysis result were combined. Thus, repositioning of certain superior sub-sectors or commodities in the future is with the following criteria:

- a $LQ > 1$ and $DLQ > 1$, sub-sector/ commodity have not yet had a reposition, it means that that the current leading sub-sector will still be superior in the future.
- b $LQ > 1$ and $DLQ < 1$, the sub-sector/ commodity has had repositioning and it can't be expected to become a superior sub-sector/commodity in the future.
- c $LQ < 1$ and $DLQ > 1$, sub-sector/ commodity has had a repositioning from the non-superior sub-sector/commodity to being superior.
- d $LQ < 1$ and $DLQ < 1$, the sub-sector/ commodity has not had repositioning and it remains a non-leading sub-sector/ commodity.

Klassen typology analysis depicts the growth pattern and structure of agricultural commodity production that is divided into

four parts, such as advanced and fast growing commodities, advanced but depressed commodities, rapidly developing commodities and relatively lagging commodities. This analysis is dynamic because it depends on the development of development activities in the districts and cities concerned (Sjafrizal, 1998). The use and interpretation of typology class analysis tools can be seen in Table 1.

Information:

1. R_b : The growth rate in the value of GRDP of agricultural sub-sectors/commodities in Regency level.
2. R_p : The growth rate in the value of GRDP of agricultural sub-sectors/commodities in Province level.
3. Y_b : The contribution of GRDP of the agricultural sub-sector to the agricultural sub-sector in Regency Level
4. Y_p : Contribution of agricultural sub-sectors/commodities to the agricultural sector/sub-sector in province level.

In which:

$$R_b = \frac{P_{ikt} - P_{iko}}{P_{iko}} \times 100\%$$

$$R_p = \frac{P_{it} - P_{io}}{P_{io}} \times 100\%$$

$$Y_b = \frac{P_{ik}}{P_{ik}} \times 100\%$$

$$Y_p = \frac{P_i}{P_t} \times 100\%$$

Where:

- 1 P_{ikt} : production value (GRDP) of sub-sector/agricultural commodity at district level in year t .

Table 1. Klassen Typology Analysis

Growth rate	Contribution	
	$Y_b > Y_p$	$Y_b < Y_p$
$R_b > R_p$	Quadrant I The sub-sector/commodity is developed and developing quickly	Quadrant II The subsector/commodity is growing fast
$R_b < R_p$	Quadrant III Sub-sectors/commodities are advanced but depressed.	Quadrant IV The sub-sector/commodity is relatively left behind

- 2 Piko: production value (GRDP)/ agricultural commodity in Regency level at the beginning of the year.
- 3 Pit: production value (GRDP) sub-sector/agricultural commodity at the province level in year t.
- 4 Pio: production value (PDRB) of agricultural subsectors/commodities at the provincial level at the beginning of the year.
- 5 Pik = production value (GRDP) of agricultural commodities/subsectors in Regency level
- 6 Ptk = total production value of the agricultural sector/subsector in the Regency level.
- 7 Pi = the production value of the agricultural sub-sector/subsector in province level.
- 8 Pt = total production value of the agricultural sector/subsector at the province level.

RESULT AND DISCUSSION

Analysis of Superior Agribusiness Sub-sector

Analysis result in Table 2 shows that each year, The horticultural crops and livestock sub-sectors as well as the forestry and logging sub-sector have an index value of more than 1. the largest LQ value in the horticultural crops sub-sector occurred in

2013 of 1.51. Based on the results of the analysis, it can be concluded that the amount of GRDP from the horticulture and livestock sub-sectors as well as the forestry and logging sub-sector in Magelang Regency is the base sector affecting the total GRDP of the agricultural sub-sector in Central Java.

This result should be this way because Magelang Regency, especially the horticulture sub-sector, is one of the sectors that affects the total amount of GRDP in the area. The horticulture sub-sector is part of the agricultural sector. Thus, it can be seen that one of the largest contributions from the agricultural sector comes from the horticulture sub-sector. Based on production data per type of plant and livestock each year, it will be obtained that commodities are included in the basic and non-basic categories.

DLQ analysis result is found that superior sub-sector in the future will be sub-sectors of food crops (1.03), agricultural and hunting services (1.01), and forestry (1.02). The sub-sectors that are included as non-superior in the future are the plantation sub-sector (0.98), horticultural crops (0.99), livestock (0.99), and fisheries (0.99).

By combining the results of LQ and DLQ analysis, it can be seen that the forestry and logging sub-sectors have not had repositioning and it remains the leading/superior sub-sectors. The food crop

Table 2. Results of LQ Analysis of GRDP of Agriculture Subsector in Magelang and Central Java Regencies Based on Constant Prices in 2010

Description	2013	2014	2015	2016	2017	Average	Basis/Non Basis
Agriculture, Livestock, Hunting and Agricultural Services							
a Crops	0,83	0,87	0,85	0,87	0,88	0,86	Non Basis
b Horticulture	1,51	1,46	1,48	1,47	1,46	1,48	Basis
c Plantation	0,56	0,55	0,56	0,55	0,55	0,55	Non Basis
d Livestock	1,09	1,06	1,08	1,07	1,06	1,07	Basis
e Agriculture and Hunting Services	1,01	0,98	1,00	0,99	0,98	0,99	Non Basis
Forestry and Logging	1,16	1,13	1,15	1,17	1,16	1,15	Basis
Fishery	0,41	0,40	0,41	0,40	0,40	0,40	Non Basis

Source: Analysis Results, 2018

and agricultural service sub-sector will have a non-superior repositioning to become superior in the future. The plantation and fisheries sub-sectors do not have repositioning and it remains non-superior.

Analysis of Agricultural Superior Commodity

Calculation result of LQ analysis shows that superior commodity in the food crop sub-sector is sweet potato/yam (4.45). In the horticultural sub-sector, the vegetable crop group is long beans (6.23), cabbage (5.10), cayenne pepper (2.04), tomatoes (4.83), garlic (1.48), green beans (5.22), eggplant (5.66), mustard greens (6.30), cauliflower (8.60), cucumber (8.77), scallions (2.77), large chilies (4.47) and carrots (1, 79). In the horticultural sub-sector the fruit groups are duku (1.74), soursop (1.32), rambutan (2.10), papaya (1.20), and salak (2.68). The livestock commodities are goats (1.29) and broilers (1.30).

The DLQ analysis result shows that the future superior commodities in the food crop sub-sector are rice (1.01) and peanuts (1.01). In the horticultural sub-sector, the vegetable crop group is cabbage (1.04), shallots (1.21), cayenne (1.07), cucumber (1.01). In the horticultural sub-sector, the fruit groups are melon (1.18), siamese (1.01), avocado (1.15), duku (1.19), guava (1.11), soursop (1.20), rambutan (1.29), star fruit (1.38), large orange (2.19), durian (1.17), sapodilla (1.14), banana (1.12) pineapple (1.14), water guava (1.06), salak (1.62) and petai (1.40). The livestock commodities are cows (1.09), buffalo (1.34), goats (1.07), native chickens (1.09) and ducks (1.02).

By combining analysis results of LQ and DLQ The horticultural sub-sector of the vegetable crop group, namely cabbage, cayenne pepper, and cucumber, it didn't have repositioning and it remains superior. In the horticultural sub-sector, the fruit groups such as duku, soursop, rambutan, and salak have not had repositioning and it will remain superior in the future. The commodities of sweet potatoes, long beans, tomatoes, garlic,

beans, eggplant, mustard greens, cauliflower, leeks, large chilies, carrots and papayas had a superior reposition to be non-superior. The commodities of rice, peanuts, shallots, melons, chayote, avocado, guava, star fruit, big orange, jackfruit, durian, sapodilla, banana, pineapple, water guava and petai were repositioned from being non superior to being superior.

In livestock commodities, such goats did not have repositioning and it remains superior. Cattle, buffalo, native chickens, and ducks have been repositioned to be superior in the future. Pig commodity has not had repositioning and it will remain non-superior in the future.

Klassen Typology Analysis of Agriculture Sub-sector

Based on the pattern and structure of the growth of superior agricultural sub-sectors by using typological classification analysis, it shows that the forestry and logging sub-sectors are included in quadrant I. It means that they are classified as advanced and rapidly developing sub-sectors. The food crop subsector is included in quadrant II, it means it is a fast growing sub-sector. The livestock and horticultural sub-sector is included in quadrant III, that means it includes the advanced but depressed sub-sector, in which the livestock sub-sector contributes more but the growth rate is smaller than the livestock sub-sector at the provincial level. The plantation, agricultural and hunting services, and fisheries sub-sectors are in quadrant IV. It means they are relatively underdeveloped sub-sectors, in which the sub-sectors have below average growth and contribution rates.

Klassen Typology Analysis of Agricultural Commodity

Based on the growth pattern and structure of superior agricultural sub-sectors using typological classification analysis, it can be seen in Table 3 that the commodities that growth rate and contribution are higher than the growth and contribution of the same

Table 3. Results of Calculation Classification Analysis of Agricultural Commodities Typology

		Contribution	
		$Y_b > Y_p$	$Y_b < Y_p$
Growth Rate	$R_b > R_p$	Quadrant I Sweet Potatoes, Cabbage, Cayenne Peppers, Tomatoes, Cauliflower, Cucumbers, Green Onions, Carrots, Rambutan, Salak	Quadrant II Rice, Cassava, Peanuts, Shallots, Potatoes, Siamese, Avocado, Guava, Papaya, Big Orange, Jackfruit, Durian, Sapodilla, Banana, Pineapple, Petai.
	$R_b < R_p$	Quadrant III Long beans, green beans, eggplant, mustard greens, large chilies, duku, soursop.	Quadrant IV Water guava, mango, melinjo, star fruit, melon, spinach, corn, watermelon, water spinach, garlic.

Source: Analysis Results, 2018

commodities at the provincial level (quadrant I) are sweet potatoes, cabbage, cayenne pepper, tomatoes, etc. cauliflower, cucumber, leeks, carrots, rambutan, and salak. Commodities included in quadrant II are rice, cassava, peanuts, shallots, potatoes, chayote, avocado, guava, papaya, grapefruit, jackfruit, durian, sapodilla, banana, pineapple, and petai.

Superior commodity but pressed is relatively advanced commodity. Yet, the contribution to the production value of Magelang Regency is relatively less grouped into quadrant III, such as long beans, green beans, eggplant, mustard greens, large chilies, duku, and soursop. Commodities included in quadrant IV are corn, watermelon, kangung, garlic, spinach, melon, melinjo, star fruit, manga, and water guava.

Based on the results of typological classification calculations in the livestock sub-sector, it can be seen that the commodities included in quadrant II are cows, buffalo, pigs, native chickens, and ducks. These commodities have less contribution to the province but the growth rate is greater than the same commodities in Central Java Province. Commodities included in quadrant III are goats and broilers. This commodity has a large contribution to the

province of Central Java, but the production growth rate is slower than the same commodity at the province level.

Priority Setting of Superior Commodity

Priority setting of superior commodity can be determined by combining analyses that have been conducted namely location quotient, dynamic location quotient, and typology class. LQ analysis refers to the availability criteria, DLQ analysis referred to the future availability criteria, and typology classification was used to determine the growth patterns of commodities in Magelang Regency. Based on the results of the analysis, it can be seen that the sweet potato food commodity was a basic commodity that can be exported outside the Magelang regency and into the advanced and rapidly developing commodity category. The commodities of rice, cassava and corn were not in surplus so that they couldn't be exported outside the region. However, rice and peanuts are predicted to be superior in the future.

The growth pattern of horticultural commodities in Magelang Regency as the basis, surplus in the future, progressing and growing rapidly were cabbage, cayenne pepper, cucumber, rambutan, and salak. The commodities of melon, star fruit, and water

guava were not surplus and relatively left behind, but based on the DLQ calculation, these commodities will be the basis for the future. Meanwhile, non-basic commodities with no surplus in the future and relatively left behind are kale, spinach, melinjo, watermelon, mango.

Commodity f live-stock sub-sector was goat. It was basic commodities, surplus in the future and fall into the developed but depressed commodity category. This commodity has great potential to be developed. Cattle, buffalo, native chickens, and ducks were not basic commodities in Magelang Regency, but from dynamic analysis and typological classification, it shows that these commodities will develop rapidly and become superior/base in the future.

CONCLUSION

From the results of the research, it can be drawn the conclusion as follow:

- 1 The agricultural sector in Magelang Regency is known that horticulture, live-stock, and forestry sub-sectors are the base/superior sub-sectors. Food crops, agricultural services, and forestry sub-sectors will be superior in the future based on DLQ analysis.
- 2 Horticultural commodities of the vegetable crop group that are superior and surplus in the future are cabbage, cayenne pepper, and cucumber. Meanwhile, the horticultural commodities of the fruit group are duku, soursop, rambutan and salak. The livestock sub-sector as a leading commodity and a surplus in the future is goat.
- 3 The growth pattern and structure of the agricultural sub-sector and superior commodities in Magelang Regency are:
 - a) Forestry and logging are developed and fast growing sub-sectors. The food crop is a fast growing sub sector. Meanwhile, the horticulture and livestock are developed but depressed sub-sectors. Meanwhile, the

plantation, agricultural and hunting services and fisheries sub-sectors are the sub-sectors that are relatively underdeveloped in Magelang Regency.

- b) A food crop commodity that is developed and growing fast is sweet potato. The horticultural commodities of fast growing vegetable group are cabbage, chilies, tomatoes, cauliflower, cucumbers, leeks and carrots. The horticultural commodities of the fruit groups that are developed and growing fast are rambutan and salak.
- c) Livestock commodities that are growing rapidly are cows, buffaloes, pigs, free-range chickens and ducks. The commodities that are developed but depressed are goats and broilers.

There are suggestions that can be given below:

- 1 The government of Magelang Regency can focus on Leading agricultural sub-sectors, such as the horticultural crops, livestock, and forestry sub-sectors.
- 2 Based on DLQ analysis of agricultural commodities of sweet potatoes, long beans, tomatoes, garlic, green beans, eggplant, mustard greens, cauliflower, leeks, large chilies, carrots, and papayas as well as broiler farm commodities will have repositioning from superior/basic commodities to non superior in the future. It is necessary to do further research so that these commodities still maintain their superiority.
- 3 It is necessary to do further research about the potential and level of utilization of superior commodities as a basis for making policies related to the management and increase of agricultural production in Magelang Regency.

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