MAPPING ANALYSIS OF POTENTIAL DISTRICT AGRICULTURE SECTOR IN CENTRAL JAVA PROVINCE: A SHIFT-SHARE ANALYSIS

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ABSTRACT

This study aims to map the potential location for agricultural sector in Central Java Province. The analytical tool used is Shift share analysis to find out which sectors are developing in the district compared to economic development in the province of Central Java. Then the second analysis tool is Location Quotient analysis, shift share. And Klassen Typology which is used to analyze the description of the growth pattern and structure of each economic sector. Shift-Share Analysis. Through the analysis of shift-sahre, location quotient, and klassen typology, the agricultural sector is grouped at the district/city level in the province of Central Java. The leading agricultural sectors are respectively located in Purbalingga Regency, Wonosobo Regency, Magelang Regency, Boyolali Regency, Grobogan Regency, Blora Regency, Pati Regency, and Temmanggung. Next are potential sectors located in Kebumen Regency, Banjarnegara Regency, Magelang Regency, Wonogiri Regency, Sragen Regency, Rembang Regency, Demak Regency, Kendal Regency, Batang Regency, Pekalongan Regency, Pemalang Regency, Brebes Regency, Tegal Regency, and Pekalongan City. Then there is also a developing sector located in Kab. Cilacap, Banyumas Regency, Klaten Regency, Karanganyar Regency, Kudus Regency, Jepara Regency, Semarang Regency, Semarang City, and Tegal City.

Keywords: Potential, Agricultural, Shift-Share, LQ Analysis, Klassen Typology.

INTRODUCTION

Economic development is defined as a multidimensional process that includes major changes in economic structure, unemployment, poverty levels and inequality in the scope of economic growth. Low inequality and high economic growth are benchmarks for the success of a region's development. The dimension of good economic development is a form of cooperation and coordination between local governments and the community in managing existing resources in an area, which is aimed at creating new business opportunities, employment opportunities, and structurally increasing income in every line of society to achieve prosperity (Arsyad, 2004). In line with this, the role of the government in managing the resources and potentials of the regions is their pure responsibility as stated in Law no. 32 of 2004 concerning Regional Development Schmidt et al. (2013). So that efforts to realize regional development carried out by the government must be able to investigate and know the characteristics and potentials that exist in the area (Adisasmita & Rahardjo, 2008).

Each local government must be able to map potential sectors in an area, so that existing sectors can be focused on infrastructure development and can be built and accelerate regional economic development (Tarigan, 2005). If the existing resources in an area can be managed properly, followed by the objectives and efforts to realize sustainable economic development

from the government to achieve community welfare, regional economic development will be achieved (Fikri & Fafurida, 2018). In line with this, Khusaini (2015) states that local government policies must be in line with the potential of the economic sectors in the area, so that economic development can be achieved and create a positive socio-economic impact on the wider community Fikri, & Fafurida (2018).

Each region has different characteristics and availability of resources, this results in diversification and intensity of economic activities in each region. (Manullang, 2019) Furthermore, the availability of infrastructure also plays an important role in job creation and community welfare, therefore uneven infrastructure development can trigger inequality in economic activity which results in the creation of a large gap between developed or developing regions and underdeveloped regions. Inequality is one of the impacts that arise from agglomeration. Urban agglomerations have a faster growth rate than rural areas. Inequality in an area is a common aspect that occurs in every country with a variety of different inequality problems. According to Harun (2012) the impact of these differences resulted in the ability of a region to improve the development process is also not the same, so it is not uncommon for someone to mention developed and underdeveloped regions. Quoting Kuznet's opinion, unequal income distribution is an indication of inequality (Hidayat & Darwin, 2017). The unequal distribution of income which results in inequality will have an impact on economic development. Economic development aims to improve people's welfare and catch up as a developing country.

Economic activity in Indonesia tends to be concentrated on the Java Island. This makes inequality as one of the main problems that occur in Indonesia, both between provinces and districts/ cities. According to Noegroho and Soelistianingsih (2007), it is stated that in reality inequality often occurs in the province itself. Inequality of income between regions is the result of development that is only concentrated in one region. Various programs have also been expanded to reduce disparities both regional disparities and income distribution inequalities.

In formulating a strategy or design to increase economic development, efforts to increase economic growth are also needed. The GRDP growth rate and the 2010 ADHK GRDP value can be used as indicators to measure the economic growth of a region (Masli, 2008). The following is a picture of the growth rate of GRDP on the basis of constant prices in 2010 according to business fields in Central Java Province in 2015–2019.

Table 1 GRDP GROWTH BASED ON CONSTANT PRICES IN 2010 BY BUSINESS FIELD OF CENTRAL JAVA PROVINCE IN 2015 – 2019 (%).		
Years	GDRP Total (Juta)	GDRP Growth (%)
2015	805.107.512	5,47
2016	849.077.576	5,25
2017	893.726.882	5,26
2018	940.920.606	5,31
2019	990.253.404	5,41

Source: Indonesian statistics, 2020

Based on data from Table 1 Central Java's economic growth is relatively stable in the range of 5.2% - 5.4%, even better than the national economic growth. Central Java's economic growth in 2019 was (5.41%) increased compared to 2017 (5.31%), and better than the national (5.17%). This is inseparable from the contribution of various economic sectors in Central Java Province, especially the industrial sector, services and agriculture.

In this case, Central Java Province is the highest contributor to GRDP in Java, but the level of disparity in Central Java also indicates a significant number. If seen based on table 1 the rate of economic growth in Central Java has always increased in the last 5 years, this is because Central Java Province has the ability to develop the potential of natural resources in accordance with the capabilities of its people so that it can be one of the efforts in increasing regional development.

The GDRP or Central Java Province always increases every year. The highest contributor to the GRDP value in Central Java Province in 2019 was Semarang City, which was 140,209,393 million rupiah and the smallest GRDP value in the last year of 2019 was 6,472,450 million rupiah in Magelang City. So based on the data above, it can be seen that the difference in the value of GRDP is very striking in each district/ city, this shows that there is an inequality that occurs in Central Java Province.

One sector that has a major contribution to GRDP in Central Java Province is the agricultural sector. Based on data from BPS 2020, the agricultural sector in Central Java contributed 123,214.20 billion to Central Java's GRDP, or it can be said that the agricultural sector contributed 13.5% to the total GRDP of Central Java. The agricultural sector is the second highest contributor to GRDP after the industrial sector in Central Java. In addition, Central Java is also known as Indonesia's food barn, this is evidenced by the land area which reached 1,821,983.17 ha in 2019. In addition, Central Java Province also received an award as the area with the highest level of rice production in Indonesia in 2019, by producing 9,655,653 tons of milled dry grain (Gabah Kering Giling), in 2019. This amount is equivalent to the production of 5,539,448 tons of rice. So that this sector is very potential and can be used as a sector that can play an important role in distributing income so that it can reduce economic inequality that occurs in Central Java.

RESEARCH METHOD

This study aims to calculate the leading location for agriculture sector. The analytical tool used is Shift share analysis to find out which sectors are developing in the district compared to economic development in the province of Central Java. Then the second analytical tool is the Location Quotient analysis to measure the export capacity of the regional economy and the degree of self-sufficiency of a sector, as well as expand the shift share analysis. And the last is the Klassen Typology analysis which is used to analyze the description of the growth pattern and structure of each economic sector.

The next analysis is LQ (Location Quotient). This analysis is a technique used to expand shift share analysis. This technique helps to determine the export capacity of the regional economy and the degree of self-sufficiency of a sector. In this technique, the economic activities of an area are divided into 2 groups, namely Industrial activities that serve the market in the area itself and outside the area concerned. Industries like this are called basic industries. LQ value is greater than one. And the second is economic activities or industries that serve the market in the area, this type is called non-basic industry or local industry. LQ value less than one.

Coefficient LQ $= \dfrac{y_i/y_t}{Y_i/Y_n}$

Where:

y_i = Regency economic sector income
y_t = Regency revenue
Y_i = Provincial economic sector income

Yt=Provincial income

In this study, we use shift-share analysis which can determine which sectors are developing in a particular region compared to economic development in a larger region (province). This approach compares the growth rate of the district sectors with the economic growth rate of the province and its economic sectors, and looks for deviations from the comparison.

This technique compares the growth rate of sectors in the district with the rate of economic growth in the province and its sectors, and observes deviations from these comparisons. Thus, it can be seen that there is a shift in the results of district economic development if the district makes progress in accordance with its position in the provincial economy. If the deviation is positive, it indicates the competitive advantage of a sector within the district.

The shift-share analysis technique divides growth as a change (D) of a variable in the district such as employment opportunities, added value, income or output, over a certain period of time into influences: provincial growth (N), industry mix (M) and excellence competitive (C). The influence of provincial growth is called the share effect, the industrial mix effect is called the proportional shift or mix composition, and the competitive advantage effect is called the differential shift or regional share.

For industry or sector i in district j:

(1) $D_{ij} = N_{ij} + M_{ij} + C_{ij}$

If the above analysis is applied to employment, E, then

(2) $D_{ij} = E^*_{ij} - E_{ij}$

(3) $N_{ij} = E_{ij} . r_n$

(4) $M_{ij} = E_{ij} (r_{in} - r_n)$

(5) $C_{ij} = E_{ij} (r_{ij} - r_{in})$

Where:

r_{ij}, r_{in} and r_n representing the growth rate of the district and province, each of which is defined as follows:

(6) $r_{ij} = (E^*_{ij} - E_{ij}) / E_{ij}$

(7) $r_{in} = (E^*_{in} - E_{in}) / E_{in}$

(8) $r_n = (E^*_n - E_n) / E_n$

While E_{ij}=employment opportunities in sector i in the district area j, E_{in} = employment opportunities in sector i in the province, and E_n=employment opportunities in the province, all measured in a base year. Superscript* shows job opportunities in the year of analysis.

For a district, provincial growth (3), industry mix (4) and competitive advantage (5) can be determined for sector i or added up for all sectors in the entire district.

The shift-share equation for sector i in district j is:

(9) $D_{ij} = E_{ij} . r_n + E_{ij} (r_{in} - r_n) + E_{ij} (r_{ij} - r_{in})$

This shift-share equation assigns each district sector a growth rate equivalent to the rate achieved by the provincial economy during the analysis period. This is reflected in equation (3), which shows that the sectors in the district should grow at least at the provincial rate of r_n. After determining the size of the growth of the province, the growth of the remaining variable in the district is a net gain or net loss (or shift) for the district concerned. In other words, the difference between the real change in employment opportunities (as a district variable) and the influence of the growth in the province (equation 3) is called the net shift of sector i in district j. This net shift is also equal to the total of the influence of the industry mix (equation 4) and the effect of competitive advantage (equation 5).

The effect of the industry mix for sector i will be positive in all districts if employment opportunities in sector i grow faster than overall employment opportunities in the province (rin > rn). Similarly, the effect of the industry mix becomes zero if (rin=rn), or negative if (rin<rn). Furthermore, the competitive advantage of sector i in district j can be positive if the growth of employment opportunities in the sector in the district is faster than growth in the same sector in the province (rij>rin), zero if (rij=rin), or negative if (rij<rin). A positive (negative) competitive advantage has the implication that the share of a district in the province's employment opportunities in a particular sector increases (decreases) during the period of analysis.

If each component (influence) of shift-share is added up for all sectors, then the sign of the result of the summation indicates the direction of change in the share of the district in employment opportunities in the province. The effect of the total industry mix will be positive (negative) in districts with an above-average proportion of employment opportunities in sectors with rapid growth (static or declining) at the provincial level. Likewise, the effect of total competitive advantage will be positive (negative) in districts where job opportunities develop faster (slower) than industry mix structures or employment opportunities Liu et al. (2021).

KLASSEN TYPOLOGY

Klassen Typology has been used to create a picture of the sequence and structure of growth in each economic sector, which in this case was analyzed using Klassen Typology as the framework. This analysis yielded four classifications of economic sectors with distinct characteristics, namely the developed and fast-growing sectors, the advanced but depressed sectors, the rapidly developing sectors, and the relatively backward sectors (Katti et al., 2019). The classification of economic sectors can be seen in Table 2.

Table 2 CLASSIFICATION OF ECONOMIC SECTORS ACCORDING TO KLASSEN'S TYPOLOGY		
	$y_i > y$	$y_i < y$
$r_i > r$	Sector that is developed and growing rapidly (featured)	Sector Developed but depressed (Developing)
$r_i < r$	Sector with potential or still developing rapidly (Potential)	Relatively Lagging (Lagging)

ri=The rate of growth in sector i,
r= GRDP growth rate
yi=Sector i contribution to GRDP
y=Average contribution of sectors to GRDP

RESULTS AND DISCUSSION

The comparative and competitive advantages of each economic sector in a region can be used to explain the focus of potential sector investment. Location Quotient analysis can be used to determine the base sector or sectors that have a comparative advantage, which in their classification has an LQ value of more than 1. While those whose LQ value is below 1 are classified as non-basic sectors because they do not have a comparative advantage. Table 3 shows the results of the Location Quotient analysis of the agricultural sector in Central Java.

No	Regency/ City	Competitive and comparative advantages	
		Location Quotient	Shift Share
1	Cilacap Regency	0,52	100,516.806
2	Banyumas Regency	0,94	39,617.636
3	Purbalingga Regency	2,08	7,203.705
4	Banjarnegara Regency	2,19	-17,040.547
5	Kebumen Regency	1,79	-287,052.932
6	Purworejo Regency	1,71	2,961,381.995
7	Wonosobo Regency	2,34	76,760.837
8	Magelang Regency	1,56	-45,409.959
9	Boyolali Regency	1,60	83,085.921
10	Klaten Regency	0,86	3,564.807
11	Sukoharjo Regency	0,64	-36,537.155
12	Wonogiri Regency	2,13	-30,988.696
13	Karanganyar Regency	0,98	24,148.513
14	Sragen Regency	1,16	-82,349.584
15	Grobogan Regency	1,09	134,812.356
16	Blora Regency	1,73	-890.263
17	Rembang Regency	2,04	-59,507.368
18	Pati Regency	1,80	240,202.195
19	Kudus Regency	0,16	17,631.360
20	Jepara Regency	1,01	3,704,992.705
21	Demak Regency	1,68	-99,635.613
22	Semarang Regency	0,81	46,512.739
23	Temanggung Regency	1,69	7,911.548
24	Kendal Regency	1,53	-79,443.255
25	Batang Regency	1,57	-55,151.186
26	Pekalongan Regency	1,22	-61,124.974
27	Pemalang Regency	1,83	-44.779,356
28	Tegal Regency	1.01	-36,182.549
29	Brebes Regency	2,71	-30,988.696
30	Magelang City	0,15	-4,095.255
31	Surakarta City	0,03	-6,700.190
32	Salatiga City	0,35	-1,599.129
33	Semarang City	0,07	108,707.521
34	Pekalongan City	1,21	-6,112,497.361
35	Tegal City	0,35	1,053.619

Table 3
ANALYSIS OF LOCATION QUOTIENT AND SHIFT SHARE OF AGRICULTURE SECTOR

Source: Data processed, 2021

Based on the results of the Location Quotient analysis above, it was found that regencies/cities that have a basic agricultural sector indicated by an LQ value of more than 1, include: Purbalingga Regency, Wonosobo Regency, Magelang Regency, Boyolali Regency, Grobogan Regency, Blora Regency, Pati Regency, and Temmanggung, Kebumen Regency, Banjarnegara Regency, Magelang Regency, Wonogiri Regency, Sragen Regency, Rembang Regency, Demak Regency, Kendal Regency, Batang Regency, Pekalongan Regency, Pemalang Regency, Brebes Regency, Tegal Regency, and Pekalongan City. Meanwhile, the non-basic agricultural sector in Central Java Province includes: Kab. Cilacap Regency, Banyumas Regency, Klaten Regency, Karanganyar Regency, Kudus Regency, Jepara Regency, Semarang Regency, Semarang City and Tegal City, Sukoharjo Regency, Magelang City, Surakarta City, and Salatiga City.

Based on the results of the shift share analysis above, it can be classified which districts/cities have the leading agricultural sector that has a competitive advantage. The sector that has a competitive advantage can be seen through the Shiftsahre Value which shows a positive value, otherwise if the value is negative, the agricultural sector does not have a competitive advantage. Agricultural sectors that have competitive advantages include: Purbalingga Regency, Wonosobo Regency, Magelang Regency, Boyolali Regency, Grobogan Regency, Blora Regency, Pati Regency, and Temmanggung, Kab. Cilacap, Banyumas Regency, Klaten Regency, Karanganyar Regency, Kudus Regency, Jepara Regency, Semarang Regency, Semarang City, and Tegal City. While the agricultural sector that does not have a competitive advantage include: Kebumen Regency, Banjarnegara Regency, Magelang Regency, Wonogiri Regency, Sragen Regency, Rembang Regency, Demak Regency, Kendal Regency, Batang Regency, Pekalongan Regency, Pemalang Regency, Brebes Regency, Tegal Regency, and Pekalongan City, Sukoharjo Regency, Magelang City, Surakarta City, and Salatiga City.

Table 4 THE KLASSEN TYPOLOGY RESULT		
	LQ > 1	**LQ < 1**
SS +	Purbalingga Regency, Wonosobo Regency, Magelang Regency, Boyolali Regency, Grobogan Regency, Blora Regency, Pati Regency, and Temmanggung.	Regency. Cilacap, Banyumas Regency, Klaten Regency, Karanganyar Regency, Kudus Regency, Jepara Regency, Semarang Regency, Semarang City, and Tegal City.
SS -	Kebumen Regency, Banjarnegara Regency, Magelang Regency, Wonogiri Regency, Sragen Regency, Rembang Regency, Demak Regency, Kendal Regency, Batang Regency, Pekalongan Regency, Pemalang Regency, Brebes Regency, Tegal Regency, and Pekalongan City.	Sukoharjo Regency, Magelang City, Surakarta City, and Salatiga City.

Source: Data processed, 2021

The Klassen typology classification table (Table 4) is a combination of the results of the location quotient and shift-share analysis so that it can determine the leading, potential, developing, and underdeveloped sectors. The agricultural sector which is the leading sector in Central Java is located in Purbalingga Regency, Wonosobo Regency, Magelang Regency, Boyolali Regency, Grobogan Regency, Blora Regency, Pati Regency, and Temanggung. This sector has competitive and comparative advantages, so this sector is a sector that has a positive growth trend and makes a major contribution to the regional economy.

Then for sectors that have comparative advantages but do not have competitive advantages are classified as potential sectors. Based on the classification analysis table above, the potential agricultural sectors in Central Java are located in Kebumen Regency, Banjarnegara Regency, Magelang Regency, Wonogiri Regency, Sragen Regency, Rembang Regency, Demak Regency, Kendal Regency, Batang Regency, Pekalongan Regency, Pemalang Regency, Brebes Regency, Tegal Regency, and Pekalongan City.

Next is the sector that has a competitive advantage but does not have a comparative advantage, or is classified as a developing sector. In Central Java the agricultural sector which is classified as an agricultural sector that is still developing is located in Kab. Cilacap, Banyumas Regency, Klaten Regency, Karanganyar Regency, Kudus Regency, Jepara Regency, Semarang Regency, Semarang City, and Tegal City.

The last is the underdeveloped sector which is a sector that does not have a comparative and competitive advantage caused by the lack of business activity in this sector, lack of

infrastructure, and other factors. In Central Java, there are several regencies/cities that are classified as underdeveloped agricultural sectors, including: Sukoharjo Regency, Magelang City, Surakarta City, and Salatiga City.

CONCLUSION

Provincial income the agricultural sector is one of the most potential sectors in the Indonesian economy, this is because the contribution of this sector is very large in the Gross Domestic Product of the State. The island of Java has the largest contribution to the country's agricultural sector, especially in food crop commodities, which has earned Java the nickname National Rice Barn because it accounts for more than 40% of rice production in Indonesia. Mapping potential sectors is one of the government's efforts to reduce inequality and create community welfare. Through the analysis of shiftsahre, location quotient, and klassen typology, the agricultural sector is grouped at the district/city level in the province of Central Java. The leading agricultural sectors are respectively located in Purbalingga Regency, Wonosobo Regency, Magelang Regency, Boyolali Regency, Grobogan Regency, Blora Regency, Pati Regency, and Temmanggung, this sector needs to be continuously developed in order to remain able to become the main driver of the regional economy. Next are the potential sectors located in Kebumen Regency, Banjarnegara Regency, Magelang Regency, Wonogiri Regency, Sragen Regency, Rembang Regency, Demak Regency, Kendal Regency, Batang Regency, Pekalongan Regency, Pemalang Regency, Brebes Regency, Tegal Regency, and Pekalongan City. this sector requires government assistance in the development of supporting infrastructure and a good market network in order to be able to become a leading sector in the future. Then there is also a developing sector located in Kab. Cilacap, Banyumas Regency, Klaten Regency, Karanganyar Regency, Kudus Regency, Jepara Regency, Semarang Regency, Semarang City, and Tegal City, basically this sector also has potential but there are still many adjustments that must be made in this sector beyond the existing government role through sustainable infrastructure development. And the last one is the underdeveloped agricultural sector which is located in Sukoharjo Regency, Magelang City, Surakarta City, and Salatiga City. This sector has a very small contribution to the economy, generally due to the unavailability of agricultural land which generally occurs in cities because the focus of their industrial development is services and manufacturing.

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