

Location Quotient Analysis of the Agricultural Sector in Yogyakarta, Indonesia

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ABSTRACT

Agricultural sector economic resources analysis is conducted to take into account the influence of the agricultural sector on the life of residents in D.I Yogyakarta Province. This analysis is conducted based on the data of calculation results using location quotient (LQ), a method to calculate the relative comparison of value-added contribution of a sector in a region to the contribution of value-added sectors at the provincial and national levels. The purpose of this research is to find out the LQ value of the agricultural sector in each regency in DIY Province, so that it can be known the areas that specialize in the agricultural sector. The LQ calculation of agricultural sector in DIY Province using descriptive analysis method with quantitative approach for data interpretation. The analysis was conducted using secondary data from the province in agricultural figures and publications issued by the Badan Pusat Statistik (BPS) DIY. The results of LQ calculation in 2010 showed that Sleman, Bantul, and Gunungkidul regencies have LQ values above 1 that fall into the category of agricultural base sector. Kulonprogo regency and Yogyakarta city has a value of less than 1 so it does not include agricultural base. The LQ value in 2019 in Sleman and Yogyakarta has a value of less than 1 (not an agricultural base), while Bantul, Kulonprogo, and Gunungkidul regencies have a value of more than 1 (agricultural base).

Keywords: Agriculture; Location Quotient (LQ); Base Sector; Economic

1. INTRODUCTION

Having the title “Agrarian Country” with its labor share in the agricultural sector being the highest, farming in Indonesia has become the keystone for its people to prosper. The agricultural sector is still the mainstay of life for more than 50% of Indonesia's population. In spite of being the leading of economic sector and absorbs the most labor, people who work in the agricultural sector have a low level of income and welfare.

The Province of Daerah Istimewa Yogyakarta (DIY) is one administrative area with such an advantageous regional configuration for productive agricultural activity due to Merapi Mountain volcanic processes leaving materials suitable for plant cultivation, covering nearly one third of the province. With diverse geographical characteristics around the region (e.g. structural, volcanic, and karstic region)

comes different kinds of dynamics in agriculture hence the impact on the regional economic development.

Regional economic development is a process carried out by local governments and their communities to manage existing resources and form a pattern of partnership between local governments and the private sector to create new jobs and stimulate the development of economic activities in the region (Arsyad, 2010). Regional economic development is very important in maintaining people's welfare because the simplest economic cycle occurs at the regional level such as regencies and cities. The primary sector is still the focus of many people's lives, especially people with the lower middle economy class, so serious government assistance needs to be done.

The agricultural sector commodities among the regencies in DIY Province is different due to the geographical characteristics. Analysis of the economic resources of the agricultural sector was conducted to

determine whether the agricultural sector is the basic sector of the regencies/cities in the Province of DI Yogyakarta and to find out how much influence the agricultural sector on the life processes of the population in the Province of DI Yogyakarta. Location Quotient Analysis (LQ) is used to evaluate the agricultural economic output in each regency in DIY.

Location Quotient (LQ) is an indirect approach that is used to measure the performance of the base sector which is the growth driver by measuring the relative concentration or degree of specialization of economic activity through a comparative approach to the economy of a region (Arsyad, 2010). It can be used as an indicator of a region's economic base (Basuki, et al., 2017). The comparison between production and consumption of a certain sector gives the information whether a region is in a state of being a net exporter or net importer (Basuki, et al., 2017).

The LQ value that is above 1 means that the sector involved in the calculation is considered as a leading sector (base sector) of the region. Leading sector or base sector is indicated by the presence of surplus in production. This allows marketing outside the region possible and gives potential to enhance regional economy. Below 1 LQ value indicates that the sector is a non-leading sector in the region, marked by its insufficiency to fulfill the region's need, making import necessary. The value of LQ that equals 1 have a meaning that the sector is only sufficient to support local regional needs (Restiatun, 2019).

Location Quotient (LQ) analysis is tool to determine the leading economic sector in a region. The leading economic sector is synthesized by comparing the proportion of certain economic sector in regencies/cities scale to proportion of certain economic sector in provincial scale (Yurliana et al., 2015). The LQ analysis is used as a determinant of the economic base of a region, especially from its contribution (Basuki, et al, 2017). The analysis is basically a useful analysis to find out whether a region is a net exporter or net importer in a particular product or sector by comparing its production and consumption (Basuki et al, 2017).

The value of $LQ > 1$ means that the sector/sub-sector is the leading sector (base sector) in the region. The base sector is a sector that has excess yields so that it can be marketed to other regions, if the sector is developed it will improve the regional economy. The value of $LQ = 1$ means that the output from the sector is only sufficient to meet the needs of the region concerned. A value of $LQ < 1$ means that the sector/sub sector is not a basic sector, because the output from the

sector is not sufficient to meet the needs of the region so it needs to be imported from other regions (Restiatun, 2009). The level of agricultural specialization can be reviewed using the specialization index, a value close to zero indicates that the two analysed regions do not experience specialization or concentration of economic activity and the opposite applies to the Krugman index value close to 2 (Hodijah, 2013 in Febriananta, 2016).

2. METHOD

The analysis of economic resources in the agricultural sector in Yogyakarta Province using descriptive analysis methods with a quantitative approach to interpret the results and discuss the available data. The analysis was conducted using secondary data from provinces in agricultural figures and publications issued by Badan Pusat Statistik (BPS) DIY. This data collection was carried out collectively by pooling economic resource data from the agricultural sector from 2010, 2015 and 2019. The three-years data were analysed to see the success rate of the government in dealing with the agricultural sector in Yogyakarta Province. The higher value of the agricultural sector shows the level of success of the government in managing economic resources in the agricultural sector.

The calculation method used in calculating LQ is based on the formula in Raqib & Rofiuddin (2018) with the following formula:

$$LQ = (X_{ir} / X_r) / (X_{in} / X_n) \quad (1)$$

Note:

X_{ir} = number of sectors i in the region

X_r = total number of sectors in the region

X_{in} = number of sectors i at the national/province level

X_n = total number of all national/province sectors

3. RESULTS AND DISCUSSION

Location Quotient (LQ) is an indirect approach that is used to measure the performance of the base sector which is the growth driver by measuring the relative concentration or degree of specialization of economic activity through a comparative approach to the economy of a region (Arsyad, 2010). Another understanding is to calculate the comparison between the share output of sector i in the regency to the share output of sector i in the province. The LQ value > 1 indicates that a region specializes more in sector i than the other regions or sector i is the base sector. The LQ value < 1 indicates the region is a non-base sector that does not specialize in producing sector i compared to other regions with higher values on sector i .

Table 1. Agriculture Sector and Total GRDP in DIY Province

Regency/City	Agriculture GRDP (Million Rupiah)			Total GRDP (Million Rupiah)		
	2010	2015	2019	2010	2015	2019
Sleman	1,001,698	2,014,729	2,105,980	5,830,337	28,159,670	35,289,800
Yogyakarta	1,001,698	360,530	529,900	14,167,670	22,412,170	36,599,050
Bantul	1,001,698	1,961,980	2,075,620	4,353,170	15,610,510	19,154,770
Kulonprogo	467,714	1,143,120	1,217,210	4,580,530	6,281,560	8,772,580
Gunungkidul	1,268,080	2,557,400	2,753,550	4,930,661	11,151,680	13,603,400
DIY Province	3,844,302	8,037,759	8,682,260	33,862,368	83,615,590	113,419,600

Source : Badan Pusat Statistik, 2021

The analysis was conducted for each regency located in DIY province with data sourced from Provinsi dalam Angka publications from 2010 to 2019. The data required is the GRDP (Gross Regional Domestic Product) data of Sleman Regency, Bantul Regency, Kulonprogo Regency, Gunungkidul Regency, Yogyakarta City and DIY Province. GRDP data consists of several sectors, namely agriculture sector as sector i, as well as total GRDP data. The agriculture sector as the sector in this case will be examined whether the agriculture sector is a base sector or not. The results show that LQ in 2010 has varying values as shown in Figure 1. Sleman, Bantul, and Gunungkidul regencies have LQ values above 1 are included in the category of agricultural base sector. As

for Kulonprogo regency and Yogyakarta city has a value less than 1 so it does not include agricultural base. The LQ value less than one provides information that the agricultural sector is not a basic sector in Kulonprogo Regency and Yogyakarta City because other sectors contribute more to the regency's GRDP.

The LQ value of Sleman Regency from 2010-2015 decreased due to the area of agricultural land which decreased from 22,819 ha to 21,907 ha (BPS, 2020). Meanwhile, for Kulonprogo Regency from 2010-2015, there was an increase in the value of LQ due to the GRDP value which increased from 467,716 million rupiah to 1,143,120 million rupiah (BPS, 2020).

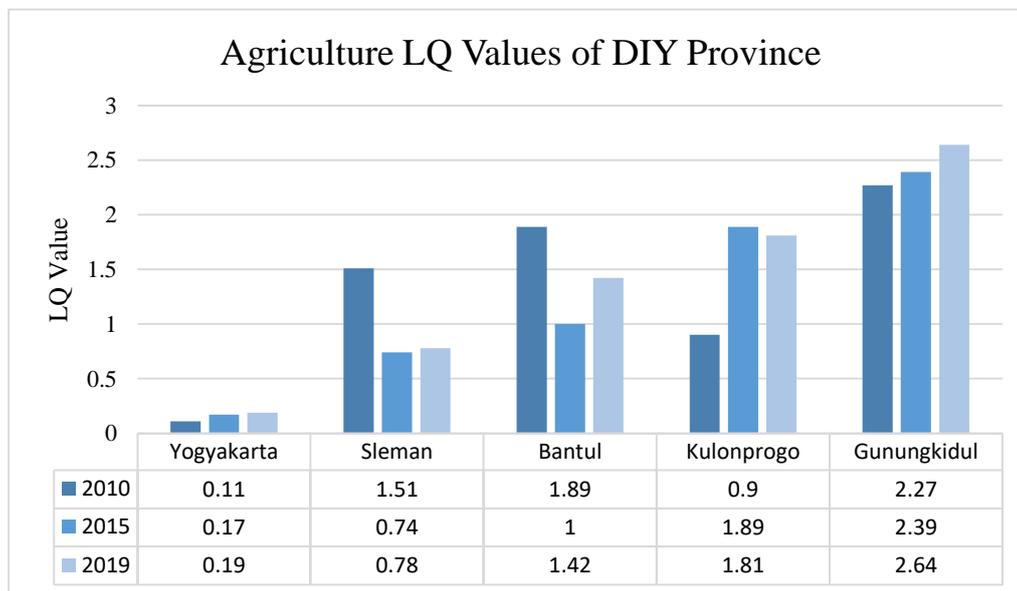


Figure 1. Agriculture LQ Values of DIY Province Graph
Source: BPS 2021 data processing result

The value of LQ in 2019 change in each regency. Sleman Regency and Yogyakarta City have a value less than 1, while Bantul, Kulonprogo, and Gunungkidul Regency have a value more than 1. Sleman regency

from 2010 to 2019 has a declining agricultural LQ value. This may be due to the rapid development of the trade, restaurant, and hotel sectors in 2019. This condition is evidenced by the increasing GRDP value

for the industrial, trade, restaurant, office, and hotel sectors in Sleman Regency. The value of Industrial GRDP in 2018 was 5,776,250.6 million rupiah to 6,244,767.3 million rupiah in 2019. The increase in the non-agricultural sector can reduce the role of the agricultural sector in its contribution to the GRDP of

Sleman Regency and the City of Yogyakarta. Another factor is that from 2018 to 2019 the harvested area of Sleman Regency and Yogyakarta City has decreased. The harvested area of Sleman Regency from 27615 ha to 24465 ha, and the City of Yogyakarta from the harvested area of 26 ha to 20 ha

Table 2. Agriculture LQ DIY Province Classification

Regency/City	LQ					
	2010	Class	2015	Class	2019	Class
Sleman	1.51	Base Sector	0.74	Non-base	0.78	Non-base
Yogyakarta	0.11	Non-base	0.17	Non-base	0.19	Non-base
Bantul	1.89	Base Sector	1	Base Sector	1.42	Base Sector
Kulonprogo	0.9	Non-base	1.89	Base Sector	1.81	Base Sector
Gunungkidul	2.27	Base Sector	2.39	Base Sector	2.64	Base Sector

Source: BPS 2021 data processing result

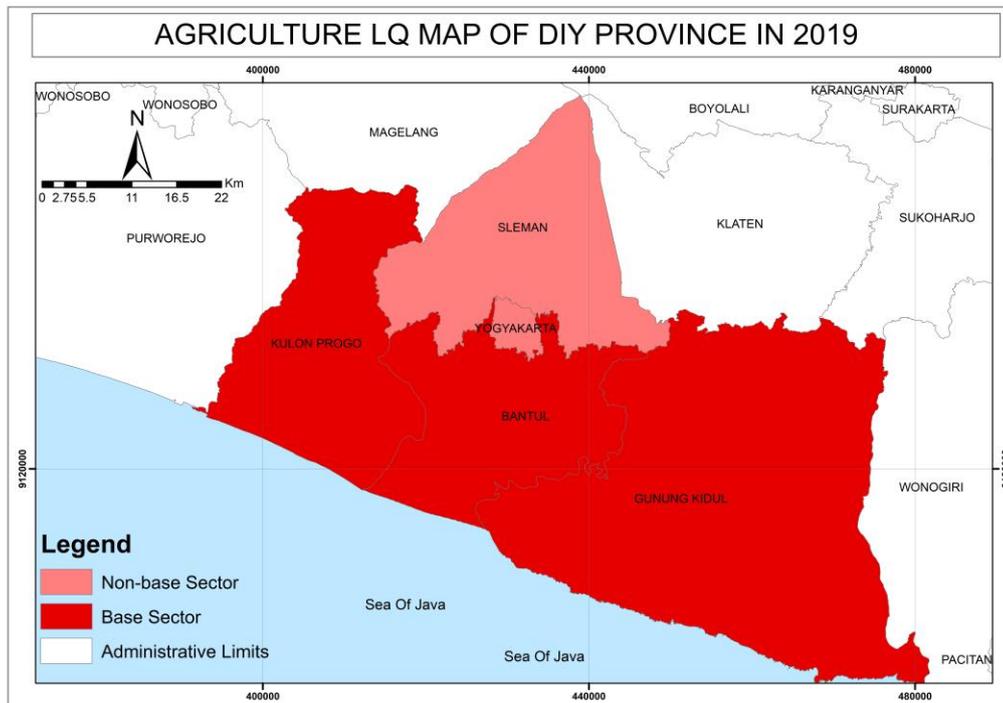


Figure 2. Agriculture LQ of DIY Province Map

The distribution of LQ values of DIY Province in 2019 can be known based on the map above (Figure 2) with the dark red color region included in the base sector while the pink color region included in the non-base sector. The value of LQ for the agricultural sector has not experienced a significant increase because the development of trade, restaurants, offices, and hotels continues to grow rapidly, while the development of the agricultural sector tends to slow. The government of Sleman Regency and Yogyakarta City is more focused on developing the non-agricultural sector because it's considered more profitable. Agricultural land is declining due to the demands of the ever-increasing population that requires shelter. Urbanization is one of

the triggering factors for agricultural land conversion. The acceleration of urbanization and urban development has implications both in environmental, social, economic and political dimensions (Harini, et al., 2013).

Kulonprogo and Gunungkidul regencies have the most superior agricultural LQ value compared to other districts, the LQ value trend of both districts shows a good upward trend, especially Gunungkidul. In 2010 Kulonprogo did not include the agricultural base sector with a value of 0.89, but managed to become a base sector in 2015 with a value of 1.89 and held at a value of 1.81 in 2019 (Table 2). The agricultural sector in

Gunungkidul Regency is closely related to the natural tourism sites that have sprung up in Gunungkidul such as Mount Nglanggeran, Pindul Cave and Baron Beach. The type of agricultural commodity produced in the form of staple crops and fruits that are commonly sold by visitors, the commodity is planted directly in the tourist attractions (Romanda & Sudrajat, 2019).

4. CONCLUSION

In the context of the analysis of the agricultural base sector. Areas with an LQ value > 1 are agricultural base areas, while areas with $LQ < 1$ are non-agricultural areas. Bantul, Gunung Kidul, and Kulon Progo regencies are areas with an agricultural base. Meanwhile, Sleman Regency and Yogyakarta City are not agricultural bases. The priority of developing the non-agricultural sector in Yogyakarta City and Sleman Regency causes these two areas to not become agricultural bases.

RECOMMENDATION

Further research can be done to find out the superior commodities in both districts of agricultural bases sector namely Gunungkidul and Kulon Progo so that the empowerment of farmers can be done in accordance with suitable crops cultivated in the area. The research can later help direct the government to be more serious in designing the marketing of local agricultural products from base sector areas in order to accelerate economic growth at the district, provincial to national levels.

AUTHORS' CONTRIBUTIONS

The contribution of each author of this paper as follows:

- a. Rizky Wahyudi was collecting data, discussing the paper, design research, making maps, and editing.
- b. Adzaniya Maghfira Sausan was collecting data, checking writing and discussing the paper.
- c. Anggi Cahyani was collecting data and making introduction.
- d. Fayyaqun Nur Ashidieq was collecting data and making abstract.
- e. Miftah Al Risqa was collecting data and writing method.
- a. Muhammad Shevaddin Al Bahri was collecting data and creating conclusion.

- b. Valen Rizki Gitanto was collecting data, making introduction, and editing.

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REFERENCES

- [1] Arsyad, L. (2010). *Ekonomi Pembangunan*. Yogyakarta : UPP STIM YKPN.
- [2] BPS. (2020). *Daerah Istimewa Yogyakarta dalam Angka 2020*. Yogyakarta : Badan Pusat Statistik.
- [3] Basuki, M., Mujiharjo, F.N. (2017). Analisis Sektor Unggulan Kabupaten Sleman dengan Metode Shift Share dan Location Quotient. *Jurnal Sains, Teknologi dan Industri*, 15(1), pp.52 - 60.
- [4] Febriananta, H. (2016). *Ketimpangan Spasial Dan Aglomerasi Pada Koridor Pembangunan Di Provinsi Jawa Timur Tahun 2009-2013*. Doctoral dissertation, Airlangga University.
- [5] Harini, R., Yunus, H.S., Kasto, Hatrono, S. (2013) *Jurnal Manusia dan Lingkungan*, 20(1), pp. 35-48.
- [6] Raqib, M., Rofiuddin, M. (2018). *International Journal of Economics, Business and Accounting Research (IJEBAR)*. 2(2), pp.107 - 118
- [7] Restiatun. (2009). Identifikasi Sektor Unggulan dan Ketimpangan Anatar Kabupaten/ Kota di Provinsi Daerah Istimewa Yogyakarta. *Jurnal Ekonomi dan Studi Pembangunan*, 10(1), pp:77 - 98
- [8] Romanda, S., Sudrajat. (2019) Analisis Produk Pertanian yang Dipasarkan di Lokasi Wisata Alam Kabupaten Gunungkidul. *Jurnal Bumi Indonesia*, 8(3).
- [9] Yurliana, Y., Rachmadi, S. (2015). Perspektif Pembiayaan dan Pembangunan Daerah. 3, 115-128