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BOGOR REGENCY: EVALUATING ECONOMIC SECTOR POTENTIAL USING THE LQ METHOD AND KLASEN TYPOLOGY

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ABSTRACT

The aim of this research is to analyze the economic sectors of a region that utilize the base sector or leading sector and to obtain an overview of the pattern and structure of regional economic growth. The data used is secondary data obtained from BPS Bogor Regency, and the analysis techniques used are Location Quotient and Klassen Typology. The research results show that the 40 sub-districts have different potential for each economic base. Six sectors are included in the underdeveloped sector quadrant (requiring special attention): eight developing sectors, two potential sectors, and one prime sector. Nanggung sub-district is a sub-district that is growing rapidly with the mining sector. At the same time, Ciseeng and Sukamakmur sub-districts have not experienced significant changes from year to year and should be of concern to the Bogor Regency government. Things that the Bogor Regency government can do include improving basic infrastructure, improving education and health facilities, and providing capital and training for village communities.

ABSTRAK

Tujuan dari penelitian ini adalah menganalisis sektor – sektor ekonomi suatu wilayah yang memanfaatkan sektor basis atau leading sector dan untuk mengetahui gambaran tentang pola dan struktur pertumbuhan ekonomi daerah. Data yang digunakan adalah data sekunder yang diperoleh dari BPS Kabupaten Bogor dengan teknik analisis yang digunakan adalah Location Quotient dan Tipologi Klassen. Hasil penelitian menunjukkan bahwa dari 40 kecamatan memiliki potensi yang berbeda untuk setiap basis ekonomi. Terdapat enam sektor yang termasuk dalam kuadran sektor terbelakang (perlu perhatian khusus), delapan sektor berkembang, dua sektor potensial dan satu sektor prima. Kecamatan Nanggung menjadi kecamatan yang berkembang pesat dengan adanya sektor pertambangan, sedangkan Kecamatan Ciseeng dan Sukamakmur menjadi kecamatan yang tidak mengalami perubahan signifikan dari tahun ke tahun dan harus menjadi perhatian pemerintah Kabupaten Bogor. Hal yang dapat dilakukan oleh pemerintah Kabupaten Bogor antara lain perbaikan infrastruktur dasar, peningkatan fasilitas pendidikan dan kesehatan, pemberian modal dan pelatihan bagi masyarakat desa.

INTRODUCTION

The Gross Regional Domestic Product (GRDP) of Bogor Regency is projected to increase by 5,21% in 2022 (Bogor Regency Central Statistics Agency, 2022). It is supported by the increase in several economic sectors in several districts. GRDP is one of the benchmarks for regional development and a measure of the prosperity of a region. In the Gross Regional Domestic Product, the level of GRDP is influenced by several economic sectors. Each economic sector in the business field contributes a different amount of money. Based on calculations by Bogor Regency Central Statistics Agency (2020), there are 17 business fields in GRDP and each category is further detailed into subcategories. In the 17 categories, there are categories A (agriculture, forestry, and fisheries); B (mining and quarrying); C (processing industry); D (electricity and gas procurement); E (water supply, waste management, waste, and recycling); F (construction); G (wholesale and retail trade (car and motorcycle repair)); H (transportation and warehousing); I (accommodation and food provision); J (information and communication); K (financial services and insurance); L (real estate); M,N (company services); O (government administration, defense, and mandatory social security); P (education services); Q (health services and social activities); R,S,T,U (other services).

Regional development must be in accordance with the potential conditions and aspirations of the growing and developing community. If the implementation of regional development priorities is not in line with the potential possessed by each region, then the utilization of existing resources will be less than optimal. This condition can affect the slow process of economic growth in the region concerned. Economic growth is one of the benchmarks that can be used to increase regional development from various economic sectors that indirectly describe the level of economic change. Bogor Regency is a region whose position is close to that of DKI Jakarta province, and it has become a buffer zone for it. This becomes its advantage because it becomes an overflow of the expansion of economic activity from DKI Jakarta province to the buffer zone (Naufal & Sumiyarti, 2019).

The sectors that are the basis of Bogor Regency are agriculture, forestry, and fisheries; mining and quarrying; processing industry; water supply; waste management; waste and recycling, but its development is still slow. (Hakim et al., 2022; Fitria, 2022; Naufal & Sumiyarti, 2019). Meanwhile, Setiyawan (2019) and Prasetya (2018) mentioned that the progressive basis sector in Bogor Regency is the mining and quarrying sector and the construction sector. The Bogor Regency government must increase economic growth by adjusting regional potential to achieve regional economic development goals. This becomes a major policy that must be implemented with maximum effort so that economic development priorities are in line with the potential possessed by Bogor Regency so that it can compete with other regions. As one of the supporting regions for Jakarta's Special Capital Region, Bogor Regency should have priority economic development sectors. This study aims to determine the economic sectors of a region that utilize the basis or leading sectors and to provide an overview of patterns and structures of regional economic growth.

LITERATURE REVIEW

Local Government Revenue

Kitchen et al. (2019) discussed the suitability of different types of taxes and charges for local governments in their revenue theory. According to the benefit principle, local governments should finance their services from sources that reflect the benefits received by users or residents. This suggests that user charges, fees, and property taxes are more appropriate for local governments than income taxes, sales taxes, or value-added taxes, which are more related to the ability to pay principle. However, in practice, local governments often rely on a mix of revenue sources depending on various factors such as legal and fiscal autonomy, administrative capacity, political preferences, and economic conditions. Several studies have analyzed the advantages and disadvantages of different revenue sources for local governments, including

property taxes (Bird & Slack, 2004), sales taxes (Liu et al., 2017), income taxes (Blöchliger & Nettley, 2015), and user charges (Kitchen & Slack, 2003).

Another important issue in local government revenue theory is the design of intergovernmental transfers from central or regional governments to local governments. Intergovernmental transfers are often necessary to ensure fiscal equalization, vertical balance, and horizontal equity among local governments with different fiscal capacities and needs. However, intergovernmental transfers may also create fiscal incentives or disincentives for local governments to raise their own revenues, provide public services efficiently, or borrow prudently. Therefore, the design of intergovernmental transfers should take into account the objectives, criteria, formulas, conditions, and mechanisms of allocation and distribution. Several studies have examined the impact of intergovernmental transfers on local government fiscal behavior, including tax effort (Boadway & Shah, 2009), expenditure efficiency (Plaček et al., 2020), and debt accumulation (Foremny et al., 2017).

Gross regional domestic product (GRDP)

Gross regional domestic product (GRDP) measures a region's economic output, such as a state, province, or district. It is similar to gross domestic product (GDP), which measures the economic output of a country, but it focuses on the production units that are located or resident in a specific region. GRDP can be used to compare the size, growth, and structure of different regions within a country or across countries (Fajar & Winarti, 2021). A high GRDP indicates a region's strong economic growth and potential for generating revenue (An & Wan, 2019). There are three main approaches to measuring GRDP: the production approach, the expenditure approach, and the income approach. The production approach calculates GRDP as the sum of gross value added (GVA) of all regional production units, where GVA is the difference between output and intermediate consumption. The expenditure approach calculates GRDP as the sum of final consumption expenditure, gross capital formation, and net exports of the region. The income approach calculates GRDP as the sum of compensation of employees, operating surplus, mixed-income, and taxes fewer subsidies on production and imports of the region (Rochmatullah et al., 2020).

However, the production approach is the most commonly used method to estimate GRDP because it is easier to collect output and intermediate consumption data than final expenditure or income components. Moreover, data on regions' net exports are often unavailable or unreliable, making the expenditure approach impractical. The income approach is also challenging to apply, especially for the household sector, where no distinction between the compensation of employees and operating surplus can be made (Abera et al., 2021).

GRDP can provide helpful information for policymakers, researchers, and the public about regions' economic performance and potential (Feriyanto, 2014). It can help identify the sources of growth, the contribution of different sectors and activities, and the regional disparities and inequalities (Ratnasari et al., 2022). It can also help design and evaluate regional development policies, such as fiscal decentralization, intergovernmental transfers, infrastructure investment, and regional integration (Rochmatullah et al., 2020). However, GRDP also has some limitations and challenges that need to be addressed. For example, GRDP does not capture regions' quality of life, well-being, or environmental sustainability (Lhutfi & Sugiharti, 2023). It may also be affected by measurement errors, conceptual differences, and data gaps across regions and countries. Therefore, GRDP should be complemented by other indicators and statistics reflecting regional development's social, environmental, and institutional aspects.

METHODS

The data collection process was carried out from March to December 2022. This research was conducted in the 40 districts using 17 categories as indicators. The data obtained is primary and secondary data,

namely GRDP data. The 17 GRDP categories are agriculture, forestry, and fisheries; mining and quarrying; processing industry; procurement of electricity, gas, and steam/hot water and cold air; water supply, waste, and water recycling management, waste and garbage disposal and cleaning; construction; wholesale and retail trade, car and motorcycle repair and maintenance; transportation and warehousing; accommodation and food provision; information and communication; financial services and insurance; real estate; company services; company administration, defense, and mandatory social security; education services; health services and social activities; other services.

The data analysis used in this study is the Location Quotient (LQ). This analysis is essentially a procedure for measuring the concentration of an activity or industry in a region by comparing its role in the region's economy with the role of that activity or industry in the national economy. Thus, the general formula for the Location Quotient is as follows.

$$LQ_s = (V_i/V_t) / (V_i/V_t) \qquad (1)$$

The rules of the Location Quotient (LQ) are (Tarigan, 2014) as follows: (1) LQ > 1, meaning that that sector's role is greater in the region than nationally; (2) LQ < 1, meaning that the role of that sector is smaller in the region than nationally; (3) LQ = 1, meaning that the role of that sector is the same both regionally and nationally; (4) Vi is GDRP value of sector *i* at the lower level of the region; (5) Vt is total GDRP at the lower region level.

An analysis is carried out using the Klassen Typology analysis tool to get an overview of the patterns and structures of regional economic growth (Kuncoro & Aswandi, 2002). There are four criteria in the Klassen typology, namely as follows. Quadrant I (first) is a fast-growing region (high income and high growth) with higher economic growth and per capita income, also called the primary sector. Quadrant II (second), which is a developed but depressed region (high income but low growth), is a region that has higher per capita income but a low growth rate or is also called the potential sector. Quadrant III (third), which is a rapidly developing region (high growth but low income), is a region that has a high growth rate but low-income level or is also called the developing sector. Quadrant IV (fourth) is a relatively left-behind region (low growth and low income) with low economic growth and per capita income or is also called the backward sector.

RESULTS AND DISCUSSION

Sectoral Classification (LQ)

LQ analysis is one method used to determine the leading categories in a region. It looks at the contribution/shared of a category in the analysis region, namely districts, to the contribution/shared of that category in a wider reference region, namely Bogor Regency. Table 2 shows the LQ analysis results in the Bogor Regency districts for 17 business field categories. In Table 1, numbers 1 - 17 are presented which indicate the business sector in the following order.

Agriculture, Forestry, and Fisheries

In 2022, the Agriculture, Forestry, and Fisheries sectors will be a basic sector for several districts. This can be seen from the LQ values in several districts, such as Ciseeng, Sukamakmur, and Sukajaya, which have very large LQ values. In addition, there are also several districts that have good LQ values so that they can become the basic sector in their respective regions, including Tanjungsari, Pamijahan, Tenjolaya, Kemang, and others. However, there are also several districts where the agricultural sector cannot become a basis sector and must be supplied from other regions. The LQ values of these districts are smaller than 1, including Nanggung, Sukaraja, Babakan Madang, Cileungsi, Klapanunggal, Gunung Putri, Citeureup, Cibinong, and Bojonggede.

The agriculture, forestry, and fisheries sector in Ciseeng, Sukamakmur, and Sukajaya districts has high productivity due to factors such as geographical and climatic conditions that support plant and animal

growth, availability of natural resources, and adequate infrastructure, as well as potential and community traditions in the field. This region has a large land area with suitable elevation for various crops, sufficient rainfall, as well as good irrigation infrastructure and road networks. The productive age population in this region is mostly engaged in agriculture, forestry and fisheries sectors, supported by traditions and potential for further development through improving product quality and commodity diversification.

Mining and Quarrying

In this category, there are 5 districts with LQ values above 1 (>1) and become the basis sector in the region, namely Nanggung, Klapanunggal, Gunung Sindur, Rumpin, and Cigudeg. This is in line with the potential of the region in these areas which have mining areas. This is also due to factors such as potential mineral resources, good infrastructure and technology, and supportive policies. This sector became the main economic base in Bogor Regency in 2022, especially in those districts. Rich geological and mineral resources, adequate infrastructure, and regulatory support are the main factors driving productivity and self-reliance of the mining sector in this region.

Processing Industry

In general, category C is the category with the largest contribution to the creation of GRDP in Bogor Regency. More than half of the total GRDP is created by this category, with its contribution to the total GRDP being 52.83 percent. This shows that the Processing Industry Business Field has a very large share in creating added value for Bogor Regency's GRDP. However, the processing industry is not evenly distributed throughout Bogor Regency, there are several regions that have the potential to make the processing industry a basis sector in their respective regions, including Klapanunggal, Citeureup, Cileungsi, Gunung Putri, and Sukaraja. As is known, these regions are districts that have capital-intensive processing industries. The districts that contribute the most to the industrial category are Klapanunggal District and Citeureup, with LQ values of 1.6 and 1.5, respectively. The third rank is Cileungsi District with a value of 1.4, the fourth rank is Gunung Putri District with a value of 1.2 and fifth is Sukaraja with a value of 1.1.

One phenomenon seen in the distribution map of industries in several districts is the existence of economic agglomeration, which is a condition where certain industries gather in certain locations (He et al 2019). This happens because these industries consider various factors that can increase their efficiency and productivity in the long run, such as geographical conditions, climate, natural resources, infrastructure, and markets (Haryono et al., 2022). Manufacturing industries, for example, tend to be located in areas that have potential and ability to meet their needs for raw materials, labor, capital, technology and distribution, as well as benefit from positive externalities due to proximity to other similar or related industries (Thisse, 2019). Thus, industrial agglomeration can create a conducive environment for economic growth for the industry and the surrounding community.

Electricity and Gas Procurement

Electricity and Gas Procurement is a public utility. This business field is supporting in the production unit, so an increase or decrease in the production field will impact the increase or decrease in demand for this business field. The electricity and gas procurement business field contributes a relatively small role, only 0,17 percent to the economy of Bogor Regency in 2022. The district with the largest LQ value that can be used as a base sector for Electricity and Gas is Sukajaya District with an LQ value of 6,7. Then followed by Ciomas District with an LQ value of 5,7. Districts with processing industries as leading sectors influence the value of LQ in this category to be large. Electricity consumption is proportional to the number of medium and large scale processing industries. The formation of Added Value in this category is not based on production but on a distribution approach. This means that there may be no electricity production

business in one district, but its added value exists. This is due to the distribution approach in creating added value for this category.

Districts with processing industries as leading sectors influence the value of LQ in this category to be large. A leading sector is a sector that has high growth and contribution to the economy of a region. The processing industry is one of the leading sectors in Bogor Regency because it has large added value and employment opportunities. The processing industry is also one of the main consumers of electricity and gas, so districts with processing industries tend to have a high demand for electricity and gas.

The added value formation in this category is based not on production but on a distribution approach. This means that there may be no electricity production business in one district, but its added value exists. This is due to the distribution approach used to create added value for this category. The distribution approach is a method of calculating added value based on income distribution to production factors (Liu et al., 2020), namely labor wages, land rent, capital interest, and business profits. With a distribution approach, the added value of a business can be obtained by adding up all income received by these production factors (Magdalena & Suhatman, 2020). So, even though there is no electricity production business in a district, if labor, land, capital, or businesses are involved in distributing electricity to that district, they will receive income from the electricity business and contribute added value to that district.

Water Supply, Waste Management, Waste and Recycling

The Water Supply, Waste Management, Waste, and Recycling category is a business category engaged in the provision of clean water, collection, and processing of waste, waste, and recyclable materials. This business is included in public utilities, which are types of businesses that provide essential goods or services to the community. This business is usually regulated by the government or an authority to maintain its quality, price, and availability. The role of this category in the economy of Bogor Regency in 2022 is relatively small at 0.14 percent. This means that the added value generated by this business is only 0.14 percent of the total added value of all businesses in Bogor Regency. Added value is the difference between the output value (production result) and the input value (production cost) of a business. Added value shows the contribution of a business to national income or Gross Domestic Product (GDP).

The distribution of Added Value for the Water Supply, Waste Management, Waste and Recycling Category with the largest and can be used as a base is from Ciomas District with an LQ value of 5.3. Next in second place is Sukajaya District with an LQ value of 5.1 and in third place is Bojonggede District with an LQ value of 4.8. This means that in these three regions this sector is a basis sector. A basis sector is a sector that has an LQ value greater than 1, which is the ratio between the proportion of a sector in a region and the proportion of the same sector at the national level. The LQ value indicates the level of specialization of a region in a sector. The basis sector has a comparative advantage in that sector and can attract income from outside the region. The basis sector can also be a source of economic growth for that region.

Construction

In 2022, category F, or the construction category, contributed 10,36 percent to the total economy of Bogor Regency. The construction category is a business category engaged in constructing and improving buildings, both civil and non-civil buildings. Civil buildings are buildings related to public interests, such as roads, bridges, irrigation, dams, airports, ports, and others (Jaselskis & Talukhaba 1998). Non-civil buildings are buildings related to private or group interests, such as houses, apartments, office buildings, shopping centers, and others.

The increase in the Construction category is supported by various infrastructure developments financed by the government (Central, Provincial and Regency) and private parties. Infrastructure is basic

facilities needed to support economic and social activities in a region. Infrastructure development aims to improve connectivity, accessibility, mobility, productivity, and community welfare (Sambodo & Novandra, 2019). Infrastructure development can also stimulate the growth of other sectors that are related or dependent on infrastructure (Prus & Sikora 2021). The growth of the Construction category is driven by the construction and improvement of road, irrigation, and bridge infrastructure in several districts, the development of trade centers, and the construction of housing and apartments. The construction and improvement of road, irrigation, and bridge infrastructure aims to improve transportation and agricultural conditions in Bogor Regency. The development of trade centers aims to increase trade activity and marketing of local products in Bogor Regency. The construction of housing and apartments aims to meet the increasing housing needs of the community along with population growth and urban development.

In 2022, the construction category began to move again after experiencing a slowdown due to the COVID-19 pandemic that hit the world in 2020. The COVID-19 pandemic has caused a decline in demand, project delays, supply chain disruptions, labor difficulties, and economic uncertainty that affects the performance of the construction category. However, with mass vaccination, strict implementation of health protocols, fiscal and monetary government stimulus, and adaptation from construction business actors, the construction category can recover and grow again in 2022. Of the 40 districts, there are 16 districts with LQ values above 1, which means that development is still ongoing and evenly distributed in several regions. The LQ for infrastructure development and construction in Bogor Regency is Babakan Madang District, with an LQ value of 4,4, followed by Tajurhalang District, with an LQ value of 3,2. Next followed by Cigombong District (2,7) and Gunung Sindur District (2,4).

Wholesale and Retail Trade, including Car and Motorcycle Repair

The wholesale and retail trade, car and motorcycle repair category is a business category engaged in the sale of goods or services wholesale or retail, either directly or through intermediaries, as well as businesses engaged in the repair and maintenance of cars and motorcycles. This business is included in the service sector, which is a sector that produces intangible goods that can meet the needs or desires of consumers. In 2022, the contribution of the wholesale and retail trade, car and motorcycle repair category was 11,72 percent to the added value of this category's contribution in Bogor Regency. Added value is the difference between a business's output value (production result) and the input value (production cost). Added value shows the contribution of a business to national income or gross domestic product (GDP). The contribution of the wholesale and retail trade; car and motorcycle repair category shows that this business has a significant role in the economy of Bogor Regency.

The increasing ease of shopping online on social media such as Facebook and Instagram and online shopping sites such as Bukalapak, Shopee, and others has significantly affected trade traffic. Online shopping is the activity of buying goods or services via the Internet using electronic devices such as computers, laptops, tablets, or smartphones. Online shopping has several advantages: easy access, product variety, competitive prices, and fast delivery. Online shopping can also save time, transportation costs, and energy for consumers. Online shopping has become a popular trend among people, especially during the Covid-19 pandemic which limits mobility and social interaction. The Wholesale and Retail Trade; Car and Motorcycle Repair category has the second largest contribution to creating added value in Bogor Regency after Processing Industry. Table 1 presents the results of LQ analysis in Bogor Regency in 2022. This table shows that the LQ for Wholesale and Retail Trade Car and Motorcycle Repair is the highest created by Megamendung District. This district ranks first in creating added value for this category at 3.6. Then in second and third place are Cisarua District and Cariu District with the same LQ value of 3.5. This means that in these three regions, this sector is a basic sector.

Transportation and Warehousing

Transportation activities include the movement of passengers and goods from one place to another using transport or vehicles, both motorized and non-motorized. Meanwhile, transportation support services include activities that support transportation activities such as terminals, ports, warehouses, and others. In 2022, this category contributed 3,22 percent of the total GRDP of Bogor Regency. This growth is supported by the increase in online-based transportation modes (Go-Jek, Grab, Uber) and the delivery of goods based on online buying and selling. Dramaga District has an LQ value of 3,6. The second and third positions are Cibinong District, with an LQ value of 2,2, and Sukaraja District, with an LQ value of 2,1.

An LQ value of 3,6 indicates that Dramaga District has a comparative advantage in the Transportation and Transportation Support Services category. This means that this district has a larger proportion of businesses in this category than the proportion of businesses in this category at the national level. One factor supporting Dramaga District's comparative advantage in the Transportation and Transportation Support Services category is the presence of the largest university in Bogor, namely Bogor Agricultural Institute (IPB), which has around 27.000 students. IPB's presence in Dramaga District increases demand for transportation and transportation support services from students, lecturers, staff, and visitors. IPB also positively impacts the development of other businesses in Dramaga District, such as trade, services, and industry.

The second and third positions in terms of LQ value for the Transportation and Transportation Support Services category are Cibinong District, with an LQ value of 2,2, and Sukaraja District, with an LQ value of 2,1. Cibinong District is the capital of Bogor Regency, which has government, trade, and service centers. Cibinong District has many public facilities such as bus terminals, train stations, traditional markets, shopping centers, hospitals, schools, etc. Cibinong District has several industrial areas, such as Sentul City, Cibinong City Center, and Cibinong Science and Technology Park. Sukaraja District is located in the eastern part of Bogor Regency and has agricultural and plantation potential. Sukaraja District has several public facilities such as bus terminals, traditional markets, shopping centers, hospitals, schools, and others. Both districts have a high demand for transportation and transportation support services from local residents and outside the region.

Accommodation and Food Provision

This category includes the provision of short-term accommodation and food and drink for immediate consumption. In 2022, the Accommodation and Food Provision category contributed 2.5 percent to Bogor Regency's GRDP. Cisarua and Megamendung Districts have LQ values of 4.9 and 4.8, respectively. This is due to the resurgence of tourism in Bogor Regency after a long hiatus due to restrictions on activities due to COVID-19. Cisarua and Megamendung Districts have attractive natural tourism potential, such as Taman Safari, Curug Cilember Waterfall, Mount Salak, Taman Wisata Matahari, and others. This potential supports comparative advantage in the Accommodation and Food Provision category. After a hiatus due to Covid-19 restrictions, tourism in Bogor Regency has revived. Restriction and prohibition policies, including PSBB and PPKM, have had a negative impact on tourism. However, with mass vaccination, strict health protocols, fiscal stimulus, monetary stimulus, and adaptation of tourism businesses, this sector recovered in 2022.

Information and Communication

The Information and Communication category plays a pivotal role in all fields, serving as a window to the world, fostering knowledge and news dissemination, and promoting societal unity. The development of information and communication is a key indicator of a nation's progress. In 2022, the Information and Communication category contributed 4.25 percent to the total GRDP of Bogor Regency, marking significant growth compared to previous years. This growth is fueled by increased mobile subscribers,

data packages, pay TV, and the expansion of 4G broadband service networks in several regions in Bogor Regency. In addition, the significant impact of the COVID-19 pandemic has forced most people to carry out their daily activities using information and communication technology. Dramaga and Cibinong Districts appear to have the most significant LQ values in Bogor Regency at 3.5 and 2.5, respectively. The high LQ value in these regions makes this sector a basic sector that can be used as a leading sector.

Financial Services and Insurance

While the Financial Services and Insurance category may contribute relatively little to the Bogor Regency economy, its role in driving real categories through injections of funds from credit borrowing and service facilities cannot be overstated. In 2022, this category contributed 0.57 percent. The districts with the largest LQ values, Ciawi and Leuwiliang Districts, each contributed 7.6 and 5.9, respectively. Cibungbulang and Dramaga Districts followed closely, becoming the third and fourth districts in contributing to Bogor Regency for this category, with contribution values of 3.8 and 3.3, respectively.

Real Estate

The Real Estate category contributes relatively stable to Bogor Regency's GRDP with a role of less than 1 percent, which is 113 percent in 2022. Table 1 describes the distribution of Added Value of the Real Estate Category in Bogor Regency in 2022. Ciawi District has an LQ value of 6,9 in this category in Bogor Regency. While Leuwiliang District ranks second with a contribution value to Bogor Regency of 6,0. The large contribution of districts that are relatively far from the center of Bogor Regency indicates that the spread of housing development and population dispersal from the regency center to the outskirts is beginning to occur. This is suspected to be due to the increasingly crowded housing and population in urban areas in Bogor Regency. This encourages the development of Real Estate as a supporting business field.

Company Services

This category combines categories M (Professional, Scientific, and Technical Services) and N (Company Services, leasing without option rights, employment, travel agents, and other business support). Professional, scientific, and technical services include all types of headquarters and management consulting activities. Company services and leasing without option rights, employment, travel agents, and other business support include all kinds of activities that support business or business operations in general.

Government Administration, Defense, and Mandatory Social Security

This category includes governmental activities, generally carried out by government administration, including legislation and legal translation related to courts and according to regulations. Table 1 presents the distribution of Added Value for this category in each district. In 2022, the contribution of this category was 1.36 percent of the total GRDP of Bogor Regency. If we look at the LQ values in each district in Bogor Regency, it can be seen that Bojonggede District ranks highest in creating added value for the Government Administration, Defense and Mandatory Social Security category with a value of 4.6, followed by Leuwisadeng District and Tajurhalang District with the same LQ value of 4.1. As a district that is relatively far from the position of the regency capital, this district provides the largest contribution to creating added value for the Government Administration, Defense, and Mandatory Social Security category, giving a new nuance to the sectoral base in Bogor Regency. However, it should be noted that a high enough sectoral base means that this region is quite dependent on the government.

Education Services

During 2022, the Education category contributed 2,03 percent to the total GRDP of Bogor Regency. In 2022, the largest LQ value for Education Services was created by Bojonggede District with a contribution of 4,7, followed by Tajurhalang District with a contribution of 4,0. A significant LQ value means that Education Services can become a basic sector in that district. So far, Cibinong has tended to have the highest value due to the relatively large number of public and private schools with the largest number of students in Bogor Regency.

Health Services and Social Activities

This category includes the provision of Health Services and Social Activities, which have a wide scope. This health service is specifically for humans, while animal health services are not included in this category. Based on the table above, it can be seen that the largest LQ value for Health Services and Social Activities was created by Bojonggede District, with a value of 4.3. Meanwhile, Tajurhalang District is the district with the second largest LQ value of 4.0. Cibinong District, as the capital of Bogor Regency, was only able to create an added value of 1.5 percent in this category, with various health facilities currently available in Cibinong. However, with this value, it can be interpreted that health services and social activities can become a basic sector in several regions. Ideally, the LQ value should also be above 1 for regions far from the city center, meaning that health services are running well in that region. Of the 40 districts, only 7 have LQ values below 1, meaning that regionally, health services are already running well in 33 districts with LQ values greater than 1.

R, S, T, U (Other Services)

This category is a combination of categories R (arts, entertainment, and recreation), S (other service activities), T (individual services serving households, activities producing goods and services by households used for their own needs), and U (activities of international bodies and other extra international bodies). Other Services' contribution to Bogor Regency's economy is relatively small at 1,86 percent in 2022. The value of this category's contribution tends to be relatively unchanged significantly every year. Table 1 presents LQ values that are evenly distributed, with values greater than 1 in 31 districts and 9 districts with LQ values less than 1. This means this sector is quite alive and has become an evenly distributed basis in Bogor Regency.

Several studies conducted using the same method have shown that the agriculture, forestry, fisheries; mining; processing industry, water supply, waste management, and recycling sectors play a very important role in economic development in Bogor Regency (Hakim et al., 2022; Fitria et al., 2022; Hakim et al., 2023). In addition, the processing industry sector is highly competitive. Meanwhile, Husni & Nasution (2022) concluded that the processing industry, provision of accommodation, food and drink, wholesale and retail trade, and agriculture, forestry, and fisheries have high potential in Bogor Regency.

Klassen Typology Analysis

Klassen typology is an analysis that groups a sector in a region by comparing the economic growth of the region with the economic growth of a larger region and comparing the sector's share with its average value at a more significant level. The results of the Klassen Typology analysis will show the position of growth and economic share and sectoral contribution of business fields in Bogor Regency in 2022, as presented in Figure 1, while the complete calculation results for each sector per sub-district and quadrant results are presented in Figure 2.

Table 1. Sectoral Classification (LQ)

No	Kecamatan	1	2	3	4	5	6	7	8
1	Nanggung	0,6	23,3	0,5	0,4	0,3	0,1	0,5	0,2
2	Leuwiliang	1,1	0,4	0,4	1,6	1,4	0,5	3,3	0,4
3	Leuwisadeng	1,9	0,2	0,2	2,4	2,1	0,8	2,6	0,7
4	Pamijahan	7,7	0,1	0,1	2,4	2,1	0,1	1,7	0,9
5	Cibungbulang	3,9	0,0	0,2	3,4	2,9	0,1	2,6	1,2
6	Ciampea	2,2	0,1	0,4	1,9	1,5	0,5	2,6	0,6
7	Tenjolaya	7,5	0,1	0,2	3,1	2,5	0,2	1,8	0,5
8	Dramaga	2,3	0,0	0,2	2,1	1,9	1,4	1,7	3,6
9	Ciomas	1,1	0,0	0,8	5,7	5,3	1,3	1,4	0,6
10	Tamansari	2,4	0,1	0,7	2,3	2,0	1,0	1,4	1,4
11	Cijeruk	2,3	0,0	0,7	2,1	1,7	1,3	1,2	0,8
12	Cigombong	2,2	0,1	0,4	2,6	2,3	2,7	1,5	0,7
13	Caringin	1,6	0,0	0,6	1,8	1,6	0,5	2,0	1,0
14	Ciawi	1,3	0,0	0,7	1,1	1,0	2,0	0,9	0,4
15	Cisarua	1,2	0,0	0,0	2,1	1,7	1,2	3,5	0,7
16	Megamendung	3,1	0,0	0,0	1,7	1,5	1,2	3,6	0,5
17	Sukaraja	0,1	0,0	1,1	1,3	1,3	1,0	0,9	2,1
18	Babakan Madang	0,1	0,0	0,7	1,7	1,6	4,4	0,5	0,1
19	Sukamakmur	12,1	0,2	0,0	4,2	3,3	0,1	1,3	0,3
20	Cariu	4,4	0,4	0,1	2,3	2,2	0,3	3,5	0,6
21	Tanjungsari	8,4	0,3	0,2	3,2	2,9	0,1	1,7	0,8
22	Jonggol	3,4	0,5	0,1	2,5	2,3	1,2	2,8	0,9
23	Cileungsi	0,1	0,0	1,4	0,7	0,6	1,1	0,4	0,1
24	Klapanunggal	0,2	1,8	1,6	0,2	0,2	0,5	0,1	0,1
25	Gunung Putri	0,0	0,0	1,2	0,4	0,6	0,6	1,1	1,9
26	Citeureup	0,1	0,5	1,5	0,3	0,4	0,7	0,4	0,1
27	Cibinong	0,3	0,0	0,8	0,7	1,0	1,2	0,9	2,2
28	Bojonggede	0,8	0,0	0,0	5,5	4,8	1,5	2,3	1,9
29	Tajurhalang	2,8	0,0	0,0	4,3	3,6	3,2	1,3	0,7
30	Kemang	7,4	0,0	0,1	1,9	1,6	0,9	1,6	0,7
31	Rancabungur	6,1	0,0	0,0	4,0	3,6	0,5	2,2	1,9
32	Parung	5,5	0,0	0,4	1,1	1,0	1,1	1,4	0,4
33	Ciseeng	13,1	0,0	0,1	1,2	1,1	0,1	1,0	0,4
34	Gunung Sindur	1,7	2,3	0,8	1,2	1,0	2,4	0,5	0,4
35	Rumpin	2,0	13,8	0,1	1,8	1,5	0,7	1,9	0,6
36	Cigudeg	1,8	17,2	0,3	1,5	1,1	0,1	1,5	0,6
37	Sukajaya	10,2	0,7	0,1	6,7	5,1	0,2	1,9	0,4
38	Jasinga	3,8	0,9	0,2	2,0	1,6	0,1	3,4	0,6
39	Tenjo	4,9	0,4	0,1	3,0	2,3	0,3	2,7	1,5
40	Parung Panjang	1,7	0,5	0,3	3,5	3,3	0,1	3,1	1,3

Table 1. Sectoral Classification (LQ) - Continue

No	Kecamatan	9	10	11	12	13	14	15	16	17
1	Nanggung	0,5	0,1	0,2	0,2	0,1	0,5	0,4	0,5	0,4
2	Leuwiliang	2,7	0,3	5,9	6,0	5,6	1,7	1,6	2,4	1,5
3	Leuwisadeng	2,7	0,8	2,8	2,8	2,4	4,1	3,0	3,5	3,2
4	Pamijahan	1,8	1,0	0,6	0,6	0,6	3,3	2,8	3,3	3,1
5	Cibungbulang	2,9	1,3	3,8	3,9	4,0	2,5	2,3	2,6	2,7
6	Ciampea	2,2	0,8	2,2	2,4	2,3	2,6	2,4	2,3	2,6
7	Tenjolaya	2,1	0,6	1,2	1,3	1,2	2,8	1,9	2,7	3,0
8	Dramaga	1,8	3,5	3,3	3,3	3,3	1,5	1,4	1,6	1,5
9	Ciomas	1,5	0,7	0,7	0,7	0,7	2,2	1,8	2,3	2,0
10	Tamansari	1,4	1,4	1,0	1,0	1,0	1,6	1,5	1,6	1,5
11	Cijeruk	1,2	0,9	0,5	0,6	0,5	2,2	1,8	1,9	2,3
12	Cigombong	1,8	0,7	0,1	0,1	0,1	1,8	1,7	1,8	1,7
13	Caringin	2,4	1,3	2,6	2,6	2,6	2,2	2,1	2,3	2,1
14	Ciawi	1,0	0,3	7,6	6,9	7,3	1,0	1,1	1,3	1,0
15	Cisarua	4,9	0,8	2,6	2,5	2,4	2,6	2,5	2,2	2,4
16	Megamendung	4,8	0,5	0,6	0,7	0,6	1,5	1,4	1,3	1,4
17	Sukaraja	0,9	2,2	0,2	0,2	0,2	1,0	1,0	0,9	1,0
18	Babakan Madang	1,0	0,1	0,9	0,9	0,9	0,8	0,9	0,9	0,8
19	Sukamakmur	1,2	0,3	0,3	0,3	0,2	1,9	1,6	1,8	1,7
20	Cariu	3,3	0,5	1,0	1,1	1,0	1,8	1,7	1,6	1,8
21	Tanjungsari	1,5	0,7	0,6	0,6	0,6	2,3	2,1	2,2	2,1
22	Jonggol	3,0	0,8	1,0	1,1	1,0	2,4	2,5	2,8	2,4
23	Cileungsi	0,4	0,1	1,1	1,1	1,1	0,6	0,6	0,6	0,6
24	Klapanunggal	0,1	0,1	0,7	0,7	0,7	0,2	0,2	0,2	0,2
25	Gunung Putri	0,8	1,8	0,3	0,4	0,3	0,4	0,4	0,4	0,4
26	Citeureup	0,4	0,1	0,5	0,5	0,5	0,6	0,5	0,5	0,5
27	Cibinong	1,0	2,5	1,6	1,6	1,7	1,5	1,7	1,5	1,5
28	Bojonggede	2,5	1,8	1,1	1,1	1,3	4,6	4,7	4,3	5,1
29	Tajurhalang	1,3	0,7	0,1	0,1	0,1	4,1	4,0	4,0	5,1
30	Kemang	1,8	0,7	0,4	0,4	0,4	3,0	2,9	2,9	3,4
31	Rancabungur	2,4	1,9	0,1	0,1	0,1	2,4	2,4	2,3	2,6
32	Parung	1,6	0,4	0,6	0,6	0,5	1,9	1,9	1,7	2,7
33	Ciseeng	0,7	0,4	0,2	0,4	0,7	1,2	1,2	1,6	0,9
34	Gunung Sindur	0,5	0,4	0,2	0,2	0,2	0,7	0,7	0,8	0,7
35	Rumpin	2,1	0,5	0,3	0,3	0,3	1,7	1,5	2,1	1,7
36	Cigudeg	1,2	0,6	0,7	0,8	0,8	1,2	1,1	1,0	1,1
37	Sukajaya	1,4	0,4	0,6	0,2	0,1	1,5	1,0	1,1	1,7
38	Jasinga	2,8	0,6	0,5	0,6	0,5	2,1	1,9	2,0	1,9
39	Tenjo	2,2	1,5	0,3	0,3	0,3	2,9	2,7	2,7	2,7
40	Parung Panjang	3,3	1,3	2,2	2,1	2,3	2,9	2,8	3,0	2,7

Figure 1 shows that there are six sectors in the backward sector quadrant (Quadrant IV) or sectors with special attention. The financial and insurance services sector shows that this sector has experienced a decline in performance compared to the previous year. Factors affecting this include low public access to financial and insurance services, high operational costs, and the impact of the Covid-19 pandemic on economic activity. Similarly, Baluch et al. (2011) explained that during a global crisis, there are structural challenges faced by the insurance industry, including the impact of low interest rates on financial services in mature markets and the struggle to maintain growth and improve performance. The agriculture, forestry, and fisheries sectors show that this sector has experienced a decline in productivity and competitiveness compared to the previous year. Factors affecting this include natural disasters such as floods and landslides, climate change, pest and disease attacks, and low-quality human resources and technology (Maulu et al., 2021). The other services sector has experienced a decline in demand and revenue compared to the previous year. Factors affecting this include social and mobility restrictions due to the COVID-19 pandemic, competition with other service sectors, and low quality and variety of services offered (Xiang et al., 2021).

The transportation and warehousing sector has experienced a decline in the volume and frequency of freight and passenger transport compared to the previous year. Factors affecting this include travel restrictions and economic activity due to the COVID-19 pandemic, traffic congestion, and lack of adequate transportation and warehousing infrastructure and facilities (Sudan & Taggar 2021). The Corporate Administration, Defense, and Mandatory Social Security sector shows a decline in efficiency and effectiveness in providing public services compared to the previous year. Factors affecting this include budget adjustments due to the COVID-19 pandemic, low-quality human resources and information technology, and high levels of corruption and bureaucracy (Pedrosa et al., 2020). The Education Services sector shows a decline in the quality and accessibility of formal and non-formal education compared to the previous year. Factors affecting this include distance learning due to the COVID-19 pandemic.

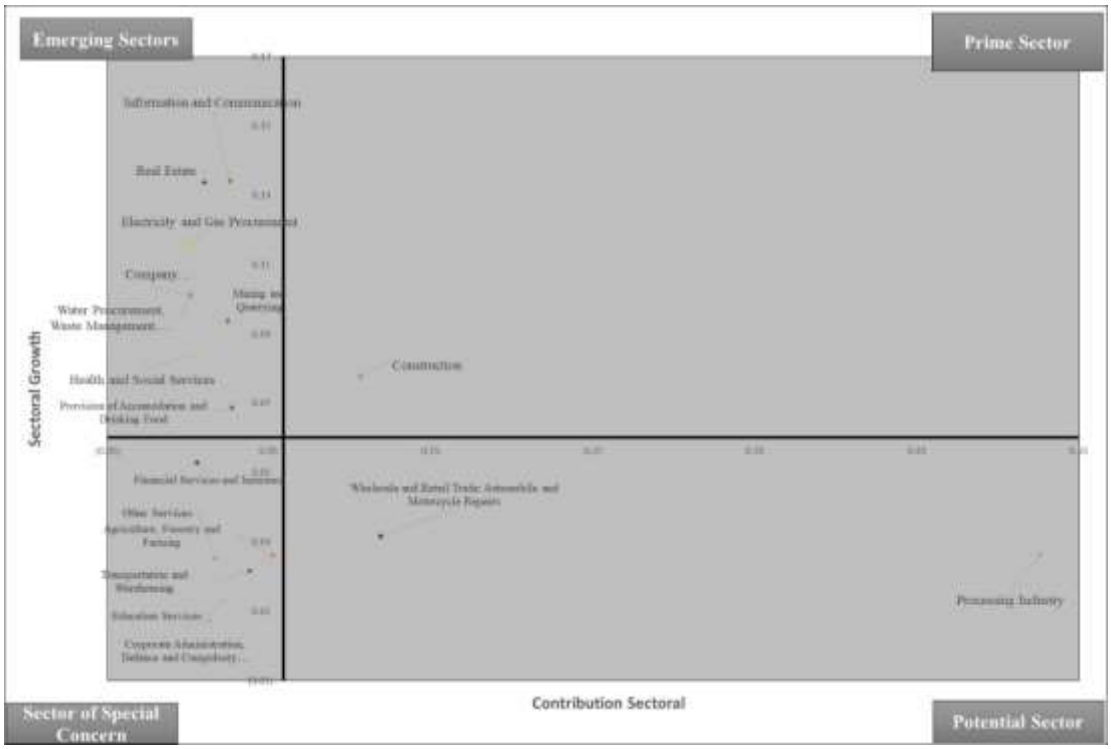

Figure 1. Typology of Sectoral Classes in Bogor Regency in 2022

The sectors included in the six groups of backward sectors above are suspected to be not free from the impact of the COVID-19 pandemic that hit Indonesia and even the world from the beginning of 2000 until it is still felt today. Almost all of the six sectors mentioned above practically stopped/ vacuumed during the pandemic, but now they are starting to grow; as seen from the Klassen condition, in 2022, there were eight backward sectors, but this year, they decreased to 6, meaning there was an improvement after the pandemic began to run. The flattening of COVID-19 cases in Indonesia and the loosening of community activities due to the impact of the pandemic is expected to continue to provide fresh air and comfort in maintaining the stability of various economic sectors in the future. Sectors directly affected by the 6 sectors above that were forced to reduce activities (via WFH) or even stop activities during the pandemic can now start to move. The loosening of community activities has made sectors such as education start doing PTM, corporate service sectors start doing WFO, financial and insurance service sectors start to become active normally, and the transportation sector no longer has strict restrictions (such as odd-even), restrictions or even cessation of mining and excavation business activities have become active again, and the property/real estate sector is also expected to be able to start moving actively again.

The efforts and movements that will and are being carried out by these economic sectors (especially the six backward sectors) must receive special attention from the district and Bogor Regency governments. So that a harmonious synergy is created in the future to improve these six backward sectors and can enter at least into the category of developing sectors later, the role of government at a higher level (regency) towards each sub-district affected by this sector must be clearer and measurable. For example, for the financial and insurance services sector, the regency government can collaborate with LKB and/or LBKBB to jointly create a program to create low credit interest rates and increase relatively high savings interest rates. So, the performance of the financial sector and its impact on society shows more significant benefits.

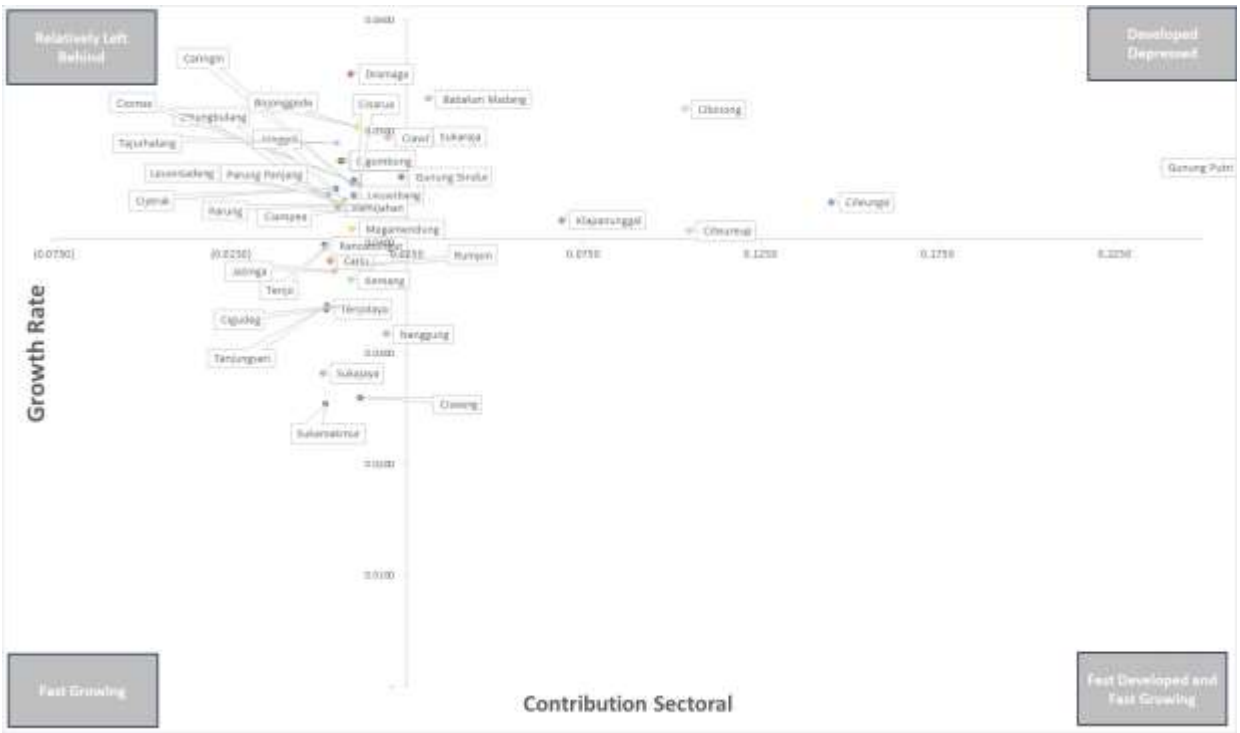

Figure 2. Classen Typology per District in Bogor Regency 2022

The results in Figure 2 show that 16 Districts in Bogor Regency fall into the Relatively Left Behind group. These districts are Ciomas, Leuwisadeng, Rancabungur, Cibungbulang, Parung Panjang, Ciampea, Cariu, Parung, Tenjo, Jasinga, Kemang, Tenjolaya, Tanjungsari, Pamijahan, Ciseeng and Sukamakmur. The inclusion of these 16 Districts into the relatively left-behind group is due to several factors. According to Hakim et al. (2023), factors affecting economic growth are the area, population, number of cooperatives, and the competitive advantage of several sectors in Bogor Regency. Therefore, the Government has an important role in addressing the problem of left-behind villages in Bogor Regency. Some steps that can be taken include the following. First, improving basic infrastructure such as roads, electricity, clean water, education and health facilities. This aims to improve rural communities' quality of life and welfare and facilitate access to economic and social centers (Olayiwola & Adeleye, 2005).

In addition, basic infrastructure can also support the development of other sectors, such as agriculture, industry, and services (Abbasi et al., 2022). Second, providing training and capital assistance to villagers to develop micro, small, and medium enterprises. This aims to increase rural communities' income and economic independence and reduce poverty and inequality. In addition, economic empowerment can also increase the diversification of local products and services and strengthen the village's economic value chain (Maksum et al., 2020). Third, access to quality education and adequate health services should be improved. This aims to improve the capacity and potential of rural human resources and reduce illiteracy rates, dropout rates, and maternal and child mortality. In addition, education and health can also increase awareness and participation of rural communities in matters related to human rights, democracy, gender, environment, etc. (Parsons et al., 2020). Fourthly, conducting training programs, education, and community participation in village development decision-making. This aims to improve the capability and involvement of rural communities in determining the direction and priorities of village development according to their needs and aspirations. In addition, community empowerment can also increase a sense of ownership and responsibility for the results of village development (Kumar et al., 2023).

If left-behind villages in Bogor Regency districts are able to overcome challenges and develop their potential, the positive impact that can be expected is an improvement in community welfare. This will happen through increased access to education, health care, and economic opportunities, directly improving residents' quality of life (Indraningsih et al., 2021). In addition, through economic empowerment, these villages have the potential to become new economic growth centers with the creation of various business opportunities and jobs, which in turn will reduce unemployment rates and increase residents' income (Stimson et al., 2006). Infrastructure development will also have a positive impact in terms of improved accessibility and quality of basic services such as better transportation access and more accessible health services (Du et al., 2022). Improvements in environmental conditions, as well as better access to health care and education, will also have an impact on improving the overall quality of life in these villages (Rezvani & Mansourian, 2013). Finally, villagers will be more actively involved in development processes and decision-making through community empowerment, increasing community participation and enabling them to shape their future. The contribution of economic activity to the company services category has not changed much, which is 0,22 percent in 2022. This also shows that the role of this category is minimal compared to the role of other sectors in the Bogor economy. In 2022, the district with the largest contribution to the formation of LQ for Company Services is Ciawi District, with a value of 7,3, followed by Leuwiliang District, with a value of 5,6, and Cibungbulang District, with the same LQ value of 4,0. This means that although this sector is small, it can become a basic sector in that region.

CONCLUSION

The analysis results on the economic potential in Bogor Regency, which involves the Location Quotient (LQ) and Klassen Typology, provide guidance that can be used as a basis for formulating strategic steps in

economic and social development in various districts. From these results, several important suggestions emerge. First, local governments and related stakeholders need to develop economic sectors identified as potential bases in each district. For example, Nanggung District, with an economic base in the Mining and Quarrying sector, and Cisarua and Megamendung Districts, with a focus on the Provision of Accommodation and Food and Drink, need to be given special support according to their economic characteristics. Second, economic diversification should be prioritized to reduce the risk of economic instability and encourage innovation in various sectors. The development of supporting infrastructure, such as transportation and information technology, also needs to be a priority to improve connectivity and accessibility between regions. In addition, sectors identified as backward in the Klassen Typology, such as financial and insurance services, agriculture, forestry and fisheries, other services, transportation and warehousing, corporate administration, defense, and mandatory social security, as well as education services, require special attention through development programs that support growth and quality improvement. Improving education and training is also key to advancing human resources in supporting sustainable economic growth. Finally, collaborative efforts between regency governments, district governments, and communities are an important foundation in formulating and implementing development programs that align with each region's potential and needs. By responding appropriately to these analysis results, Bogor Regency has a better opportunity to achieve equitable, sustainable development that positively impacts all levels of society.

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