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Analyzing Key Economic Sectors for Sustainable Development in Kuantan Singingi

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ABSTRACT
Regional economic development is a vital aspect in creating community welfare and regional competitiveness. Kuantan Singingi Regency, Riau Province, has significant potential in sectors reliant on natural resources, such as agriculture, forestry, and fisheries. However, these sectors still face challenges in achieving optimal development. The purpose of this study is to identify key sectors in Kuantan Singingi Regency using the Location Quotient (LQ), Shift-Share, and Klassen Typology approaches, and to provide policy recommendations for development based on these leading sectors. The analysis results indicate that agriculture, forestry, and fisheries have a comparative advantage, with an LQ value of 1.80, while other sectors, such as water supply and waste management, also show significant potential. The Shift-Share analysis reveals relatively rapid growth in some sectors, while the Klassen Typology analysis categorizer these sectors based on their contributions to regional GDP and growth rates. These findings provide a foundation for policies that can enhance production capacity, reduce dependence on commodity prices, and strengthen infrastructure to support the sustainable growth of leading sectors. This study is expected to contribute to the formulation of more effective and efficient development policies, which will, in turn, improve the welfare of the people in Kuantan Singingi Regency.

Keywords: *Regional Development Policy, Location Quotient (LQ), Leading Sectors, Shift-Share, Klassen Typology*

INTRODUCTION

Regional economic development is a primary focus for local governments in their efforts to achieve sustainable and inclusive growth. This development aims not only to increase Gross Regional Domestic Product (GRDP) but also to ensure equitable welfare across all segments of society (Arsyad, 2016; Todaro & Smith, 2020) One strategic step toward achieving this goal is identifying key sectors with significant potential for driving local economic growth and their ability to create job opportunities and promote equitable welfare (Blakely & Leigh, 2013; Porter, 1990). According to Fujita et al. (1999), leading sectors play an important role in creating multiplier effects that can accelerate development and enhance regional competitiveness.

Identifying leading sectors involves considering various factors, including the sector's contribution to GRDP and its ability to stimulate growth

in other sectors (Blakely & Leigh, 2013). Krugman et al. (2017) assert that leading sectors are expected not only to improve regional economic competitiveness but also to create domino effects that impact other supporting sectors of the local economy. In this context, leading sectors can act as major drivers of growth by attracting new investments, creating job opportunities, and increasing community income (Sachs, 2005). For this purpose, data-based sectoral analyses, such as Location Quotient (LQ), can be used to identify leading sectors based on their comparative advantages (Lestari, 2017; Tarigan, 2024).

Kuantan Singingi Regency in Riau Province is an area with abundant natural resources but faces challenges in optimizing its economic performance. The potential sectors that can be relied upon, such as agriculture, forestry, and fisheries, offer great opportunities for regional economic development. However, various obstacles, such as fluctuating commodity prices and limited infrastructure, need special attention when formulating appropriate development policies (Bappenas, 2021).

One commonly used method to identify leading sectors is the Location Quotient (LQ) analysis. This method is useful for measuring the comparative advantage of regional economic sectors by comparing the sector's contribution at the regency level with its contribution at the provincial or national level. This analysis is widely used in regional economic studies due to its ability to identify sectors with significant potential for further development (Lestari, 2017; Tarigan, 2024). Using this approach, this study aims to identify leading sectors in Kuantan Singingi Regency that contribute significantly to GRDP and have the potential for further development through sector-based development policies.

This study's findings are expected to provide a significant contribution to formulating regional development policies based on leading sectors, enhancing regional economic competitiveness, and creating more job opportunities to improve the welfare of the people in a sustainable manner. Furthermore, this research will provide a deeper insight into underutilized economic potential, which could serve as the basis for developing more targeted and measurable development strategies in the future. Additionally, the study will incorporate the Shift-Share approach to evaluate the dynamics of sectoral growth and Klassen Typology to classify sectors based on their contributions to GRDP and growth rates (Arsyad, 2016; Sukirno, 2011).

RESEARCH METHOD

This research uses a quantitative descriptive-analytic approach to analyze the leading sectors in Kuantan Singingi Regency through the use of Location Quotient (LQ), Shift-Share, and Klassen Typology analyses. This approach was selected because these three methods provide a deeper understanding of the region's economic potential, comparative advantages, and the dynamics of sectoral growth at the regency and provincial levels (Arsyad, 2016; Purbata et al., 2025).

Research Location

This study was conducted in Kuantan Singingi Regency, Riau Province, which has abundant natural resources, but its economic performance needs improvement. The selection of this location is based on the regional characteristics, which include various potential leading sectors that are not yet

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fully optimized in supporting the local economy (Bappenas, 2021; Riau, 2024).

Data Sources

The study used secondary data on GRDP for Kuantan Singingi Regency and Riau Province for the period of 2019-2023, obtained from the Central Statistics Agency (BPS) of Kuantan Singingi and Riau Province. The data collected includes sectoral contributions to GRDP and other relevant sectoral data for calculating LQ, Shift-Share, and Klassen Typology (Singingi, 2024).

Metode Analisis

To achieve the research objectives, several analysis methods were used, as follows:

1. Location Quotient (LQ) Analysis

LQ analysis is used to identify the leading sectors in Kuantan Singingi Regency. LQ measures the comparative advantage of a region's economic sectors by comparing the sector's contribution at the regency level to the same sector's contribution at the provincial or national level. LQ is a popular method in regional economics for determining the comparative advantage of a sector (Lestari, 2017; Tarigan, 2024).

The formula used for calculating LQ is as follows:

$$LQ = \frac{\left(GDRP_{sector,regional} / GDRP_{total,regional}\right)}{\left(GDRP_{sector,province} / GDRP_{total,province}\right)}$$

Where:

- GDRPsector,regional = the contribution of a particular sector to the GRDP of Kuantan Singingi Regency
- GDRPtotal,regional = total GRDP of Kuantan Singingi Regency
- GDRPsector,province = the contribution of the same sector to the GRDP of Riau Province
- GDRPtotal,province = total GRDP of Riau Province

If the LQ value > 1, the sector is considered superior and has a higher comparative advantage in the regency compared to the province. Conversely, if LQ < 1, the sector does not have a significant comparative advantage.

2. Shift-Share Analysis

To deepen the understanding of sectoral dynamics in Kuantan Singingi, the shift-share analysis is used. This method evaluates the extent to which economic sector growth in Kuantan Singingi is influenced by external factors (such as national or provincial economic conditions) and how much the sector contributes to local economic growth. Shift-Share allows the separation of the effects of external factors and local factors on sector development (Blakely & Leigh, 2013; Kuncoro, 2018).

The Shift-Share formula used is as follows:

$$SS = \left(GR_{sector,regional} - GR_{sector,province}\right) + \left(GR_{sektor,national} - GR_{sektor,province}\right)$$

Where:

- GRsector,regional = growth rate of the sector in Kuantan Singingi Regency
- GRsector,province = growth rate of the same sector in Riau Province
- GRsector,national = growth rate of the same sector at the national level

The Shift-Share analysis will help identify sectors that are growing faster than others at the provincial or national level, providing insights into the competitiveness of these sectors in a broader market.

3. Klassen Typology Analysis

As a complement, this research also applies Klassen Typology to classify the economic sectors in Kuantan Singingi Regency based on their contributions to GRDP and their stage of development. Based on the LQ and Shift-Share results, sectors will be categorized into four types based on two main variables: contribution to GRDP and growth rate.

Klassen Typology is used to understand the development stages of sectors and provide further guidance on which sectors need special attention in development efforts (Arsyad, 2016; Sukirno, 2011).

Data Processing Procedure

After data collection, the next step is to process the data using statistical software such as Microsoft Excel and SPSS to calculate LQ, Shift-Share, and Klassen Typology. All calculations and analysis results will be presented in tables and graphs for easier understanding and interpretation.

Data Validity and Reliability

To ensure the validity and reliability of the data, this study uses secondary data sourced from official institutions such as the Central Statistics Agency (BPS), which has proven credibility. Additionally, the analysis methods used have been proven to provide accurate insights into sectoral advantages and economic growth dynamics at the local level (Creswell & Creswell, 2020).

RESULTS AND DISCUSSION

Overview of GRDP in Kuantan Singingi Regency

Gross Regional Domestic Product (GRDP) is the primary measure used to assess the economic performance of a region, reflecting the total value of goods and services produced within that region over a specific period (Riau, 2024). In Kuantan Singingi Regency, GRDP serves as an essential benchmark for analyzing economic growth, sectoral structures dominating the economy, and the welfare of the population based on the economic activities taking place within the region. An overview of the average GRDP growth in Kuantan Singingi Regency from 2019 to 2023 is presented in Figure 1 below:

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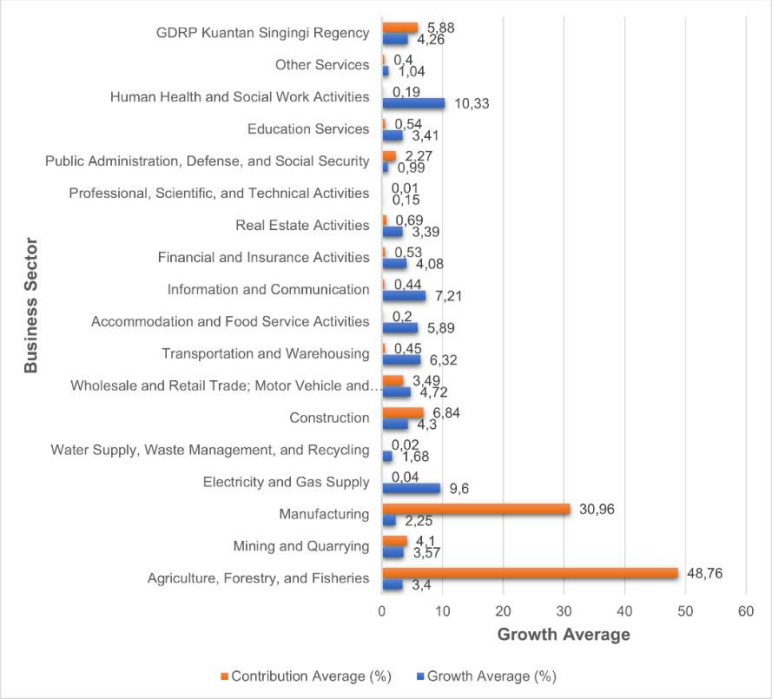


Figure 1
Average GRDP growth and distribution of GRDP in Kuantan Singingi Regency based on constant 2010 prices from 2019–2023 (%)
Source: BPS (2024), processed.

The GRDP of Kuantan Singingi Regency reflects the contribution of major sectors to the regional economy. The agriculture, forestry, and fisheries sectors contributed more than 48.76% to the GRDP during the 2019–2023 period, demonstrating the dominance of natural resource-based sectors in the region's economy. This sector plays a crucial role in the global economy, particularly in developing countries like Indonesia. In addition to meeting domestic food needs, these sectors also serve as the backbone for rural communities, providing significant contributions to Gross Domestic Product (GDP), creating job opportunities, and supporting social stability (Hasibuan et al., 2024). The manufacturing sector (30.96%) and construction (6.84%) also showed significant contributions, though their growth rates were slower compared to the agricultural sector. This highlights the need to strengthen these sectors, with a focus on innovation and capacity-building in industries, to support sustainable economic development (Fujita & Thisse, 2013).

Results of Location Quotient (LQ) Analysis

LQ analysis was conducted by comparing the GRDP of Kuantan Singingi Regency with that of Riau Province based on constant 2010 prices for the period 2017–2022. This method is used to identify the comparative advantage of an economic sector at the regency level compared to the provincial economy. Locations with LQ values greater than 1 indicate that the sector has a comparative advantage or is more dominant in the region compared to other areas (Purbata et al., 2025). Based on the LQ index calculations for Kuantan Singingi Regency from 2019–2023, sectors can be classified into two main groups: base sectors and non-base sectors, as explained below:

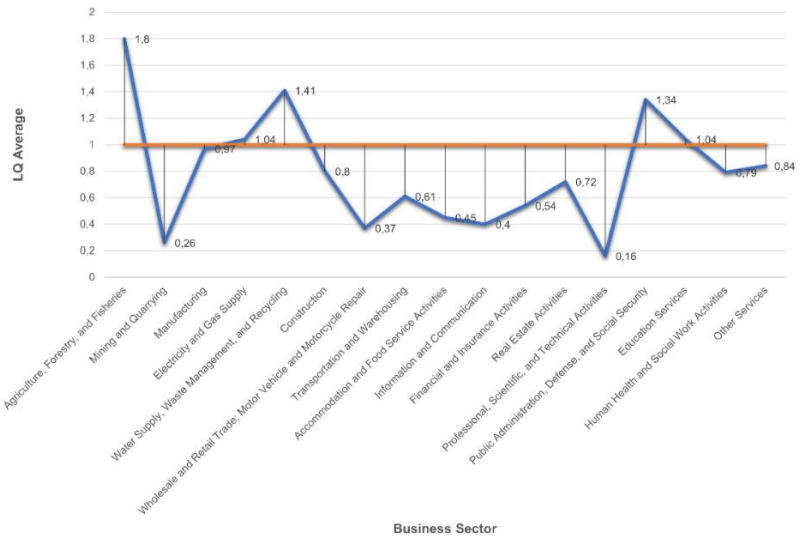


Figure 2
Average LQ of GRDP in Kuantan Singingi Regency based on constant 2010 prices from 2019–2023
Source: BPS (2024), processed.

Based on the Location Quotient (LQ) calculation, five sectors in Kuantan Singingi Regency have LQ values greater than 1, indicating that these sectors have a comparative advantage at the regency level compared to the province.

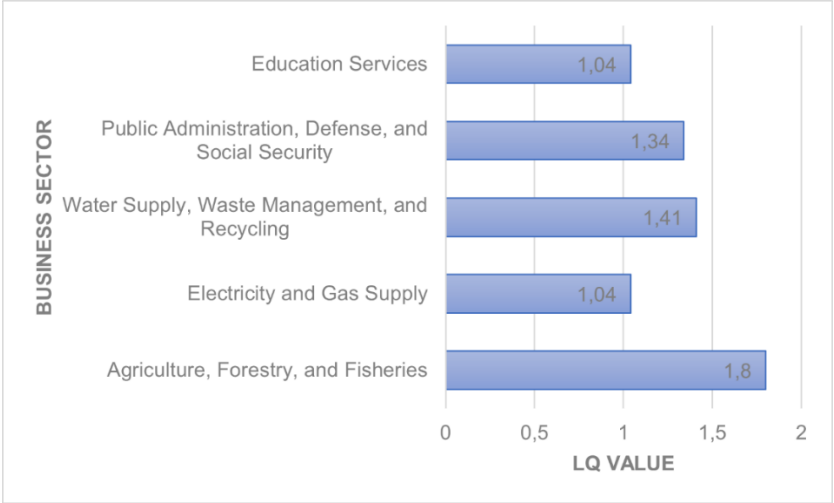


Figure 3
Average LQ of Base Sectors in Kuantan Singingi Regency 2019–2023
Source: BPS (2024), processed.

As an example, the agriculture, forestry, and fisheries sectors have the highest LQ value (1.80), which indicates a clear advantage in this sector. This comparative advantage reflects the sector's importance in supporting the economy of Kuantan Singingi Regency and presents significant opportunities to increase added value through the downstream processing of agricultural and fisheries products (Blanchard, 2021; Lestari, 2017). Additionally, the water supply, waste management, and recycling sectors (LQ = 1.41) hold great potential to improve the quality of life for the community while also creating sustainable economic opportunities.

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The public administration, defense, and social security sector (LQ = 1.34) also significantly contributes to the regional economy. The local government plays an essential role in creating basic infrastructure that supports other sectors and provides effective public services (Kuncoro, 2018). The electricity and gas supply sector (LQ = 1.04), although having a lower value than other sectors, still has potential to support other sectors, particularly in strengthening energy infrastructure, which can accelerate the growth of the industrial and construction sectors (Porter, 1990).

The education services sector, with an LQ of 1.04, shows a relatively small contribution. However, with increasing demand for better-quality education, this sector can play a significant role in supporting the development of competitive human resources ready for employment (Sachs, 2005).

Results of Shift-Share Analysis

Shift-Share analysis was performed to assess the dynamics of economic growth in Kuantan Singingi using GRDP data based on constant 2010 prices for the period 2019–2023. This method compares the economic growth of Kuantan Singingi Regency with Riau Province as a reference area. The results of this analysis are presented in Table 1.

Table 1 Shift-Share Analysis Results

No	Business Sector	(*Nasional Share*)	(*Proportional Shift*)	(*Differential Shift*)	*Shift Share*
		Nij	Mij	Cij	Dij
1	Agriculture, Forestry, and Fisheries	1288040,73	434133,12	-97877,07	1624296,78
2	Mining and Quarrying	115438,57	-173684,70	182737,63	124491,49
3	Manufacturing	837562,18	277693,80	-433315,04	681940,94
4	Electricity and Gas Supply	1063,21	30764,92	-27753,25	4074,88
5	Water Supply, Waste Management, and Recycling	531,20	243,20	-455,07	319,32
6	Construction	184820,97	37667,93	69048,52	291537,42
7	Wholesale and Retail Trade; Motor Vehicle and Motorcycle Repair	95370,35	29955,99	29063,48	154389,82
8	Transportation and Warehousing	11943,63	-10465,47	25696,42	27174,58
9	Accommodation and Food Service Activities	5391,67	-2076,13	7989,30	11304,83
10	Information and Communication	10770,23	26117,06	-6413,26	30474,03
11	Financial and Insurance Activities	13781,47	10050,03	-2783,56	21047,95
12	Real Estate Activities	18356,19	6259,90	-1641,94	22974,15
13	Professional, Scientific, and Technical Activities	24,98	-42,70	11,63	-6,09
14	Public Administration, Defense, and Social Security	64260,98	-14357,03	-27817,41	22086,54
15	Education Services	14423,47	3060,10	743,01	18226,59
16	Human Health and Social Work Activities	4537,67	12167,15	2295,13	18999,95
17	Other Services	12394,16	-15676,62	3973,80	691,34

Source: BPS (2024), processed.

Referring to Table 1, all economic sectors in Kuantan Singingi recorded a positive National Growth (Nij) value, indicating that, overall, these sectors experienced a high growth rate compared to the average growth of similar sectors in Riau Province. On the other hand, the Proportional Shift (Mij) value

during the 2019–2023 period shows variations in performance across sectors, with some sectors showing positive numbers and others negative. Sectors with positive proportional shift values indicate that they have developed rapidly in the region and have the potential to become key sectors in driving economic growth in Kuantan Singingi. Sectors showing positive proportional growth include: Agriculture, Forestry, and Fisheries; Manufacturing; Electricity and Gas Supply; Water Supply, Waste Management, and Recycling; Construction; Wholesale and Retail Trade; Information and Communication; Financial and Insurance Services; Real Estate Activities; Education Services; and Human Health and Social Work Activities. These sectors make a larger contribution to the local economy, reflecting potential that can be further exploited with policies aimed at strengthening production capacity and market development (Herath Bandara, 2024).

Additionally, an analysis of Competitive Advantage (Cij) values was conducted. Based on the analysis results, nine sectors showed positive competitive advantage values. This indicates that these sectors have relatively higher competitiveness compared to similar sectors in other regions. The sectors with a competitive advantage include: Mining and Quarrying; Construction; Wholesale and Retail Trade; Transportation and Warehousing; Accommodation and Food Services Activities; Real Estate Activities; Education Services; Human Health and Social Work Activities; and Other Services. Most sectors also exhibited positive Economic Structure Change (Dij) values, indicating that the region's economic structure has shown significant progress during the analysis period.

Results of Klassen Typology Analysis

The use of Klassen Typology aims to assess the pattern and structure of economic growth in Kuantan Singingi Regency. The results of the Klassen Typology analysis are presented in Table 2 below:

Table 2 Results of Klassen Typology Analysis

Quadrant I **Advanced and Rapidly Growing Sectors** **(Si ≥ S, Gi ≥ G)**	**Quadrant II** **Advanced but Under Pressure Sectors** **(Si ≥ S, Gi < G)**
• Education Services	• Agriculture, Forestry, and Fisheries • Manufacturing • Water Supply, Waste Management, and Recycling • Public Administration, Defense, and Social Security
Quadrant III **Potential or Rapidly Growing Sectors** **(Si < S, Gi ≥ G)**	**Quadrant IV** **Relatively Underdeveloped Sectors** **(Si < S, Gi < G)**
• Mining and Quarrying • Construction • Wholesale and Retail Trade; Motor Vehicle and Motorcycle Repair • Transportation and Warehousing • Accommodation and Food Service Activities • Professional, Scientific, and Technical Activities • Human Health and Social Work Activities • Other Services	• Electricity and Gas Supply • Information and Communication • Financial and Insurance Activities • Real Estate Activities

Source: BPS (2024), processed.

Based on Table 2, the Klassen Typology mapping results show that sectors in Quadrant I, such as Education Services, exhibit significant

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development dynamics. The growing demand for quality education, especially with advances in information technology supporting learning systems, is driving this sector to adapt and innovate in both teaching methodologies and technology-based educational services.

In Quadrant II, there are sectors that, despite being advanced, face significant obstacles. For example, the Agriculture, Forestry, and Fisheries sector, though crucial for the economy, is often hindered by external factors such as climate change and environmental degradation. The same challenges apply to the Manufacturing sector, which struggles to maintain competitiveness amid rising production costs and technological advancements. Similarly, the Water Supply, Waste Management, and Recycling sectors face challenges in efficient resource management and adequate infrastructure. To improve these sectors' performance, policies supporting downstream product development and capacity-building are essential (Blakely & Leigh, 2013). The Public Administration, Defense, and Social Security sector, while crucial in maintaining social and political stability, faces challenges in bureaucratic efficiency, transparency, budget management, and the gap between strategic needs and resource allocation. Therefore, improving governance, efficiency, and accountability is key to supporting the progress of other sectors in the economy and overcoming the existing obstacles.

Sectors in Quadrant III show significant potential and rapid development, such as Mining and Quarrying, driven by high global demand for raw materials, and the Construction sector, which is expanding with rapid urbanization. Additionally, sectors like Wholesale and Retail Trade, Transportation and Warehousing, Accommodation and Food Service Activities, Professional, Scientific, and Technical Activities, and Human Health and Social Work Activities are growing quickly due to shifts in consumption patterns and lifestyle changes.

Quadrant IV contains sectors that are relatively underdeveloped in terms of progress. The Electricity and Gas Supply sector still relies on limited infrastructure and suboptimal energy sustainability. Similarly, the Information and Communication sector, while offering great potential, is hindered by infrastructure limitations and uneven access. The Financial and Insurance Services sector faces strict regulations, and the Real Estate sector is struggling with property market fluctuations and unclear regulatory frameworks. These lower-contributing sectors need more attention in policy planning and development to promote innovation and investment in these areas (Krugman et al., 2017).

These four quadrants illustrate the varying conditions of economic sectors in the country or region, based on their level of progress and challenges faced. Quadrant I represents sectors that are highly developed and have significant potential to drive economic and social progress, while Quadrant II highlights sectors that are advanced but hindered by structural or external pressures that limit their potential. Quadrant III illustrates sectors with rapid and dynamic growth potential that can make a significant contribution to the economy in the near future. Quadrant IV, on the other hand, reflects sectors that are lagging behind and face various barriers to development, such as insufficient infrastructure or suboptimal regulations. Understanding the dynamics of these sectors can help plan more effective economic policies and industry development strategies.

Discussion

To achieve sustainable economic growth, sectoral analysis based on Location Quotient (LQ), Shift-Share, and Klassen Typology approaches provides

a deeper understanding of leading sectors in Kuantan Singingi Regency. The study found that sectors such as agriculture, forestry, and fisheries have significant potential to drive regional economic growth, as reflected in the LQ value of over 1 (LQ = 1.80). This comparative advantage can be leveraged through the development of downstream products, which will enhance added value and expand market opportunities for agricultural and fisheries products (Blanchard, 2021; Lestari, 2017).

However, despite the significant potential of these sectors, the Shift-Share analysis shows challenges regarding slower growth in sectors such as water supply, waste management, and education. Therefore, these sectors require special attention to ensure greater sustainability and competitiveness. Additionally, sectors such as trade and transportation that have experienced slower growth highlight the importance of targeted policy interventions.

It is crucial to understand that leading sectors are not only associated with their contribution to GRDP but also their role in creating job opportunities and influencing other sectors in the regional economy. Thus, environmental management must become a top priority in regional development policies.

Policy Implications

The implementation of development policies in Kuantan Singingi Regency should be based on a deep understanding of the leading sectors that have significant potential to support local economic growth. One key policy that should be implemented is the development of downstream products from the agriculture, forestry, and fisheries sectors. With these sectors having high Location Quotient (LQ) values, downstream development can increase the added value of products, expand markets, and create new job opportunities. The use of modern technologies in processing and support for the marketing of local products, both domestically and for export, is crucial to optimize this potential (Blanchard, 2021; Lestari, 2017).

In addition, strengthening infrastructure is key to supporting the development of leading sectors, particularly in transportation and distribution. Adequate infrastructure will facilitate the distribution of products from the region to broader markets, reduce logistics costs, and enhance regional economic competitiveness.

It is also essential to focus on the development of quality Human Resources (HR). Vocational education and skills training that align with the needs of local industries must be strengthened so that the workforce possesses relevant skills for the growing leading sectors. Training in construction, trade, and transportation will ensure that skilled labor is available to support these sectors (Porter, 2021).

Moreover, policies should also address sectors that show slow growth, such as trade and transportation. The local government should create more aggressive investment policies and encourage innovation in these sectors to increase production capacity and expand market access. This will accelerate growth in sectors that still hold potential but need more targeted policy support (Blakely & Leigh, 2013).

Lastly, it is essential for the local government to promote policies based on sustainability, especially in environmental management sectors. With waste management, recycling, and water supply sectors having high LQ values, policies supporting efficient waste processing, renewable energy use, and natural resource conservation will positively impact the quality of life and simultaneously

create ecologically-based economic opportunities. If implemented effectively, these policies will help Kuantan Singingi Regency achieve inclusive, sustainable, and highly competitive economic growth (Sachs, 2005)

CONCLUSION

Based on the analysis conducted through the Location Quotient (LQ), Shift-Share, and Klassen Typology approaches, it can be concluded that Kuantan Singingi Regency has leading sectors with significant potential to support regional economic growth. The agriculture, forestry, and fisheries sectors, with the highest LQ value (1.80), show a clear comparative advantage and can be further developed through downstream processing to increase added value and expand markets.

However, some sectors, such as water supply, waste management, and education, despite showing potential, require special attention due to infrastructure and production capacity challenges. Therefore, regional development policies must focus on strengthening infrastructure, enhancing the capacity of developing sectors, and improving the quality of human resources to support leading sectors.

By considering the dynamics of these economic sectors, policies based on sustainability, efficient resource management, and innovation in slower-growing non-base sectors are crucial to achieving inclusive and sustainable economic growth in Kuantan Singingi Regency.

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