



## IDENTIFYING LEADING AND POTENTIAL ECONOMIC SECTORS IN LANGKAT REGENCY: A LOCATION QUOTIENT AND KLASSEN TYPOLOGY APPROACH

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### ABSTRACT

This study aims to identify leading and potential economic sectors in Langkat Regency using Location Quotient (LQ) and Klassen Typology. A quantitative descriptive approach is applied using sectoral Gross Regional Domestic Product (GRDP) data from 2021 to 2025. The LQ method is used to identify base sectors, while Klassen Typology classifies sectors based on their growth rates and contributions relative to North Sumatra Province. The results show that agriculture, mining and quarrying, and electricity and gas are classified as base sectors. However, only the mining and quarrying sector demonstrates relatively high growth and contribution, placing it in the advanced and rapidly growing category. Most other sectors are classified as developing or relatively underdeveloped, indicating a structural imbalance in the regional economy. These findings highlight the absence of a strong leading sector that simultaneously exhibits high growth and high contribution. Therefore, this study suggests the need for policies that promote sectoral diversification and strengthen the development of potential sectors to achieve more balanced and sustainable regional economic growth.

**Keywords:** location quotient; klassen typology; leading sectors; langkat regency

### INTRODUCTION

Regional economic development is a key factor in driving sustainable economic growth, particularly in the face of global dynamics and regional development challenges. In recent years, a development approach based on local potential has been increasingly emphasized as a strategy to enhance regional competitiveness and reduce disparities among economic sectors (Wang, 2023). Therefore, identifying key economic sectors is a strategic step in determining the direction of development policies that are more effective and targeted.

Langkat Regency, as part of North Sumatra Province, has an economic structure comprising various sectors, such as agriculture, mining, manufacturing, and services. However, the development of these sectors reveals disparities, both in terms of their contribution to the Gross Regional Domestic Product (GRDP) and their growth rates. This situation reflects that not all sectors possess the same capacity to drive regional economic growth, thus requiring a more in-depth analysis to identify sectors with high potential (Zhang et al., 2024)

In regional economic analysis, a quantitative approach is needed to identify core sectors and group sectors based on their economic performance. The Location Quotient (LQ) is one method used to identify core sectors by comparing a region's level of specialization with that

of a broader area. Additionally, the Klassen Typology is used to classify economic sectors based on their growth rates and contributions to the regional economy. The combination of these two methods is considered capable of providing a more comprehensive picture in determining a region's leading and potential sectors (Nusantari, 2025).

Previous studies have shown that sectors with a comparative advantage do not always exhibit high growth rates, indicating disparities in sectoral performance within a region (Bakhri et al., 2025). However, most studies tend to apply these analytical methods separately, which limits the ability to simultaneously capture both specialization and growth dynamics. In the case of Langkat Regency, studies integrating Location Quotient and Klassen Typology to assess both dimensions remain limited. As a result, there is still a lack of comprehensive understanding regarding which sectors are not only relatively superior but also have strong development prospects.

Based on this gap, this study aims to identify leading and potential economic sectors in Langkat Regency using the Location Quotient (LQ) approach and Klassen's typology. The results of this study are expected to contribute to the formulation of more targeted regional economic development policies and to promote the creation of a more balanced and sustainable economic structure.

## METHODS

This study employs a quantitative descriptive approach to examine the structure and performance of economic sectors in Langkat Regency. The analysis utilizes secondary data in the form of Gross Regional Domestic Product (GRDP) by sector, obtained from the Central Bureau of Statistics (BPS) of Langkat Regency and North Sumatra Province for the period 2021–2025 (BPS, 2026a, 2026b). The analytical tools used in this study are Location Quotient (LQ) and Klassen Typology to identify leading sectors and classify sectoral performance.

Klassen Typology is used to classify economic sectors based on their growth rate and contribution relative to the provincial level. In this study, sectoral growth is calculated using GRDP at constant prices to capture real economic growth, while sectoral contribution is measured using GRDP at current prices to reflect the economic structure. The growth rate of each sector in Langkat Regency ( $r_i$ ) is compared with the provincial growth rate ( $r$ ), while sectoral contribution ( $y_i$ ) is compared with the provincial contribution ( $y$ ). Based on these indicators, sectors are classified into four categories: Quadrant I (advanced and rapidly growing), Quadrant II (advanced but declining), Quadrant III (developing sectors), and Quadrant IV (relatively underdeveloped sectors). The classification matrix is presented in Figure 1.

Sectoral Contribution Sectoral Growth Rate	Great Contribution ( $y_i > y$ )	Small Contribution ( $y_i < y$ )
FAST GROWING ( $r_i > r$ )	Quadrant I	Quadrant III
SLOW GROWING ( $r_i < r$ )	Quadrant II	Quadrant IV

**Figure 1.** Classification Matrix of Economic Growth Based on Klassen Typology  
Source: (Maulana & Maulana, 2023)

Location Quotient (LQ) is used to measure the relative specialization of economic sectors in Langkat Regency compared to the provincial level. This analysis is based on GRDP at current prices. The LQ formula is expressed as follows (Liu et al., 2019):

$$LQ = \frac{(X_i/X)}{(Y_i/Y)}$$

where:

$X_i$ = GRDP of sector  $i$  in Langkat Regency

$X$ = total GRDP in Langkat Regency

$Y_i$ = GRDP of sector  $i$  in North Sumatra Province

$Y$ = total GRDP in North Sumatra Province

The interpretation of LQ values is as follows:

$LQ > 1$ : the sector is classified as a base sector

$LQ = 1$ : the sector has the same level of specialization as the province

$LQ < 1$ : the sector is classified as a non-base sector

## RESULTS AND DISCUSSION

### Klassen Typology

Table 1 presents the average growth rate and contribution of each economic sector in Langkat Regency (as the analysis region) and North Sumatra Province (as the reference region). The results show that the three sectors with the largest contributions to Langkat Regency's economy are Agriculture, Forestry, and Fishing (9.40%); Manufacturing (3.22%); and Wholesale and Retail Trade (2.29%). Meanwhile, the sectors with the highest average growth rates in Langkat Regency are Transportation and Storage (9.00%), Human Health and Social Work Activities (7.59%), and Accommodation and Food Service Activities (7.26%).

In North Sumatra Province, the three sectors with the largest contributions are Agriculture, Forestry, and Fishing (23.97%); Wholesale and Retail Trade (18.94%); and Manufacturing (18.86%). The fastest-growing sectors in the province are Transportation and Storage (12.62%), Accommodation and Food Service Activities (9.55%), and Business Activities (8.69%).

**Table 1.** Average Growth Rate and Sectoral Contribution in Langkat Regency and North Sumatra Province, 2021–2025

No.	Industry	Langkat Regency		North Sumatera Province	
		Average Growth Rate	Average Contribution	Average Growth Rate	Average Contribution
1	Agriculture, Forestry, and Fishing	5.51	9.40	4.43	23.97
2	Mining and Quarrying	3.98	1.87	3.10	1.21
3	Manufacturing	3.73	3.22	3.56	18.86
4	Electricity and Gas	3.92	0.04	3.39	0.10
5	Water Supply; Sewerage; Waste Management, and Remediation Activities	1.76	0.01	3.61	0.09
6	Construction	4.50	1.49	4.19	12.66
7	Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles	5.30	2.29	6.25	18.94
8	Transportation and Storage	9.00	0.50	12.62	4.77
9	Accommodation and Food Service Activities	7.26	0.42	9.55	2.13

No.	Industry	Langkat Regency		North Sumatera Province	
		Average Growth Rate	Average Contribution	Average Growth Rate	Average Contribution
10	Information and Communication	5.03	0.22	8.18	2.30
11	Financial and Insurance Activities	5.52	0.38	4.32	2.80
12	Real Estate Activities	3.97	0.60	5.88	4.72
13	Business Activities	4.71	0.11	8.69	1.07
14	Public Administration and Defence; Compulsory Social Security	3.11	0.62	1.67	3.10
15	Education	5.79	0.22	6.06	1.76
16	Human Health and Social Work Activities	7.59	0.10	6.77	0.97
17	Other Services Activities	6.33	0.04	7.77	0.55

Although the Agriculture, Forestry, and Fishing sector contributes significantly to both Langkat Regency and North Sumatra Province, its growth rate in the regency (5.51%) is higher than that of the province (4.43%). This suggests that Langkat Regency has managed to optimize its agricultural potential more effectively. The agricultural sector plays a strategic role in regional economies, not only as a source of employment but also as a driver of rural development (Kusumaningrum, 2019; Sayifullah & Emmalian, 2018).

Based on the Klassen Typology analysis (Figure 2), no sectors in Langkat Regency fall into Quadrant I (advanced and fast-growing sectors). This indicates that no sector simultaneously has both high growth and high contribution relative to the provincial average. This condition may be influenced by limited infrastructure, suboptimal inter-sectoral linkages, or regional policy constraints.

Sectoral Contribution / Sectoral Growth Rate		Great Contribution ( $y_i > y$ )	Small Contribution ( $y_i < y$ )
FAST GROWING ( $r_i > r$ )		Mining and Quarrying	<ul style="list-style-type: none"> <li>Agriculture, Forestry, and Fishing</li> <li>Manufacturing</li> <li>Electricity and Gas</li> <li>Construction</li> <li>Financial and Insurance Activities</li> <li>Public Administration and Defence; Compulsory Social Security</li> <li>Human Health and Social Work Activities</li> </ul>
		(No sectors)	<ul style="list-style-type: none"> <li>Water Supply, Sewerage, Waste Management, and Remediation Activities</li> <li>Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles</li> <li>Transportation and Storage</li> <li>Accommodation and Food Service Activities</li> <li>Information and Communication</li> <li>Real Estate Activities</li> <li>Business Activities</li> <li>Education</li> <li>Other Services Activities</li> </ul>
SLOW GROWING ( $r_i < r$ )			

**Figure 2.** Klassen Typology of Economic Sectors in Langkat Regency, 2021 – 2025

Two sectors are classified into Quadrant II (advanced but depressed sectors): Agriculture, Forestry, and Fishing; and Manufacturing. These sectors have high contributions to the regional economy but grow more slowly than the provincial average. This finding is similar to that of (Adevia & Napitupulu, 2023) in West Pasaman Regency, where the same two sectors were identified as needing performance improvements to stimulate economic growth. In Langkat Regency, these sectors require strategic interventions such as technology adoption, supply chain strengthening, and value-added product development.

Quadrant IV (relatively lagging sectors) includes Water Supply, Sewerage, Waste Management, and Remediation Activities; and Public Administration and Defence. These sectors have both low growth and low contribution. The remaining 13 sectors fall into Quadrant III (potential and still developing sectors), meaning they have opportunities for significant future growth if supported by appropriate investment, infrastructure, and human resource development.

### Location Quotient (LQ)

Table 2 presents the LQ values for 17 sectors in Langkat Regency from 2021 to 2025. The results show that only three sectors are classified as base sectors ( $LQ > 1$ ): Agriculture, Forestry, and Fishing (average  $LQ = 1.49$ ); Mining and Quarrying (average  $LQ = 6.20$ ); and Electricity and Gas (average  $LQ = 1.39$ ). These sectors have a higher specialization level in Langkat Regency compared to North Sumatra Province.

The Agriculture, Forestry, and Fishing sector has consistently maintained an LQ above 1.80 from 2022 to 2025, indicating a strong comparative advantage. This aligns with findings from (Irwandi, 2024) that the agricultural sector is the leading sector in West Pasaman Regency. In Langkat Regency, this advantage is likely driven by abundant natural resources, a high proportion of the workforce employed in agriculture, and supportive local policies.

**Table 2.** Results of Location Quotient (LQ) Analysis in Langkat Regency, 2021–2025

No.	Industry	2021	2022	2023	2024	2025	Average	Category
1	Agriculture, Forestry, and Fishing	0.18	1.80	1.82	1.82	1.81	1.49	Base
2	Mining and Quarrying	0.75	7.83	7.98	7.48	6.98	6.20	Base
3	Manufacturing	0.08	0.81	0.79	0.78	0.77	0.64	Non-base
4	Electricity and Gas	0.17	1.69	1.72	1.69	1.70	1.39	Base
5	Water Supply; Sewerage; Waste Management, and Remediation Activities	0.04	0.36	0.35	0.35	0.32	0.28	Non-base
6	Construction	0.05	0.57	0.58	0.55	0.55	0.46	Non-base
7	Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles	0.06	0.57	0.56	0.56	0.55	0.46	Non-base
8	Transportation and Storage	0.05	0.48	0.46	0.48	0.48	0.39	Non-base
9	Accommodation and Food Service Activities	0.10	0.96	0.94	0.91	0.88	0.76	Non-base
10	Information and Communication	0.05	0.46	0.45	0.44	0.42	0.37	Non-base
11	Financial and Insurance Activities	0.06	0.63	0.62	0.63	0.63	0.52	Non-base
12	Real Estate Activities	0.06	0.59	0.59	0.57	0.59	0.48	Non-base
13	Business Activities	0.05	0.53	0.51	0.50	0.46	0.41	Non-base
14	Public Administration and Defence; Compulsory Social Security	0.09	0.92	0.96	0.96	0.95	0.78	Non-base
15	Education	0.06	0.60	0.59	0.57	0.58	0.48	Non-base
16	Human Health and Social Work Activities	0.05	0.50	0.49	0.48	0.47	0.40	Non-base
17	Other Services Activities	0.04	0.37	0.35	0.35	0.35	0.29	Non-base

The Mining and Quarrying sector shows a very high average LQ of 6.20, although its contribution to regional GRDP is relatively small (1.87%). This indicates that while the sector is highly specialized in Langkat Regency compared to the province, its overall economic weight remains limited. This may be due to the sector's capital-intensive nature and limited employment absorption.

The Electricity and Gas sector also qualifies as a base sector with an average LQ of 1.39. However, its contribution to GRDP is very small (0.04%), suggesting that although Langkat Regency is relatively specialized in this sector, its absolute scale is minimal.

The remaining 14 sectors are non-base sectors ( $LQ < 1$ ), meaning their contribution to the local economy is lower than the provincial average. This includes Manufacturing ( $LQ = 0.64$ ), which, despite being a major contributor in other regions, has not yet developed into a base sector in Langkat Regency. This finding differs from Adevia et al. (2023), where manufacturing was a base sector in West Pasaman Regency. The difference may be attributed to variations in industrial infrastructure, access to raw materials, and regional development policies.

The combination of Klassen Typology and LQ analysis provides a comprehensive understanding of Langkat Regency's economic structure. The Agriculture, Forestry, and Fishing sector is both a high-contribution sector (Klassen Quadrant II) and a base sector ( $LQ > 1$ ). This indicates that although the sector is specialized and important, its growth is currently slower than the provincial average. Therefore, policies should focus on accelerating growth through technology adoption, market access improvement, and post-harvest value addition.

The Manufacturing sector, despite being a base sector in other regions, is non-base in Langkat Regency and falls into Quadrant II. This suggests an urgent need for industrial revitalization, including support for small and medium enterprises (SMEs), particularly in food processing and agro-industry, which can be linked to the dominant agricultural sector. The Mining and Quarrying and Electricity and Gas sectors, although highly specialized (high LQ), have low contributions and growth, placing them in Quadrant III. These sectors have potential but require significant investment and regulatory support to become more impactful.

## CONCLUSION

The findings of this study highlight that the economic structure of Langkat Regency remains concentrated in a limited number of sectors. Although several sectors are identified as having a comparative advantage, only the mining and quarrying sector shows strong performance in both growth and contribution. The absence of sectors in the advanced but declining category, along with the dominance of sectors in developing and underdeveloped groups, reflects an imbalanced pattern of regional economic development. Therefore, policy efforts should focus on strengthening the growth of potential sectors while reducing dependence on extractive industries, in order to promote a more diversified and sustainable regional economy.

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