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Sectoral Economic Mapping and Structural Transformation in the BASAJAN Corridor: A Spatial Policy Matrix Approach

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Abstract

Post-pandemic fiscal constraints within the BASAJAN (Banda Aceh, Sabang, and Jantho, Aceh Besar) economic corridor require precise, evidence-based policies to prevent inefficient public investment. This study maps sectoral economic structures and structural transformation to develop a spatial policy matrix for identifying priority sectors. Using constant-price Gross Regional Domestic Product (GRDP) data for the period 2019–2024 across 17 economic sectors, the study integrates the Location Quotient (LQ) and Sectoral Klassen Typology analyses. This approach produces a four-quadrant policy matrix comprising Prime Mainstay, Sustaining Mainstay, Potential, and Lagging Sectors. The empirical findings reveal a highly complementary spatial division of labor across the corridor. Banda Aceh functions as the primary tertiary agglomeration center for services and finance, Sabang exhibits strong specialization in maritime tourism, and Aceh Besar serves as the principal hinterland supporting food security and manufacturing. The findings indicate that a uniform development strategy across the BASAJAN corridor is unlikely to be effective. Therefore, local planning agencies (Bappeda) should prioritize fiscal allocations toward their respective Prime Mainstay Sectors. Furthermore, greater integration of Regional Spatial Planning (RTRW) across jurisdictions is essential to strengthen interconnected regional supply chains within the BASAJAN corridor.

Introduction

The paradigm shift in regional economic development over the past decade demonstrates that economic growth is no longer driven by competition among isolated jurisdictions but instead by the formation of integrated functional regions [1]. Within the context of Aceh Province, the most prominent manifestation of this spatial agglomeration is the BASAJAN economic corridor, an acronym referring to the growth triangle comprising Banda Aceh City, Sabang City, and Aceh Besar Regency. Geographically, this corridor occupies a highly strategic position at the westernmost tip of Sumatra Island, directly facing the international shipping routes of the Malacca Strait and the Indian Ocean. This unique geopolitical and geoeconomic location positions the BASAJAN corridor as the primary gateway for the movement of goods, services, and human capital in northern Sumatra [2].

The BASAJAN metropolitan area was established to foster a complementary economic ecosystem through a well-defined spatial division of labor. Banda Aceh City, supported by advanced urban infrastructure, serves as the center of urban agglomeration, financial services, and commercial activities [3]. Sabang City, endowed with a natural deep-water harbor and designated as a Free Trade and Free Port Zone (KPBPB), is expected to function as an international hub for tourism and maritime logistics [4]. Meanwhile, Aceh Besar Regency, characterized by its extensive land resources, serves as the principal hinterland by providing natural resources, supporting regional food security, and accommodating industrial development [5].

However, the development of this functional region continues to face challenges arising from the friction of distance and information asymmetries, both of which hinder market integration [6]. Limited connectivity often results in geographical disadvantages and the island penalty, defined as the additional costs associated with physical isolation, which particularly affects archipelagic regions such as Sabang [7]. Consequently, the spatial resilience of the BASAJAN corridor depends largely on the extent to which these three administrative jurisdictions can integrate their comparative advantages into a cohesive regional economic system.

Entering the post-pandemic recovery and economic transformation phase, local governments within the BASAJAN corridor face a challenging structural reality, namely constrained fiscal space [8]. Regional Revenue and Expenditure Budgets (APBD) at both the municipal and regency levels have experienced fiscal pressures that necessitate the rationalization of public expenditure. These financial constraints require the Regional Development Planning Agencies (Bappeda) across the three jurisdictions to formulate policies that are highly targeted, efficient, and evidence based [9].

The conventional approach of distributing budgets evenly across all sectors, often referred to as artificial equalization, without considering local comparative advantages, frequently results in suboptimal resource allocation and overlapping development policies across jurisdictions [10]. In the context of modern public management, development interventions should be firmly grounded in the principles of evidence-based policymaking [11]. Public investment, whether in the form of infrastructure development, subsidies, or regulatory incentives, should be directed toward sectors that have been empirically demonstrated to possess a strong economic base and high competitive advantage [12]. If Banda Aceh, Sabang, and Aceh Besar continue to allocate their limited fiscal resources to sectors classified as lagging and lacking competitive advantage, the likely consequences will be inefficient public spending and slower regional economic growth.

Although the importance of integrating the BASAJAN corridor has been widely recognized by policymakers, a critical gap remains. There is still a lack of integrated sectoral mapping based on recent post-pandemic quantitative evidence. Most regional planning documents and previous studies evaluate the economic performance of Banda Aceh City, Sabang City, and Aceh Besar Regency separately, resulting in a fragmented understanding of the corridor's economic structure. Recent regional economic studies in Indonesia have predominantly employed the Location Quotient (LQ) and Klassen Typology to evaluate administrative jurisdictions independently. For example, Harahap et al. [13] identified the spatial distribution of leading economic sectors in Langkat Regency. Similarly, Hasanah et al. [14] examined structural transformation in Serang Regency and identified shifts in comparative advantage. Even studies with a broader geographical scope, such as Simanjuntak et al. [15], who mapped the economic potential of all regencies and cities in North Sumatra, continue to treat each jurisdiction as an independent unit of analysis. Although these studies provide valuable insights into local economic dynamics, they do not examine how sectoral economic structures interact across administrative boundaries. Consequently, the existing literature has yet to explain how structural transformation within a hinterland is functionally integrated with neighboring growth centers to create a spatial division of labor within a contiguous economic corridor or growth triangle.

The integration of functional corridors such as BASAJAN requires a shift from uniform budget allocation toward place-based planning. Structural disparities across metropolitan areas should not be addressed through artificial resource equalization but rather by maximizing local comparative advantages, as the concentration of specialized economic activities can enhance overall metropolitan productivity [16]. Moreover, there is currently no empirical diagnostic framework that clearly identifies the strategic sectoral priorities of each jurisdiction within the BASAJAN growth triangle. Without a clear sectoral mapping, regional competition and

fragmented policy implementation are likely to persist. For example, if both Aceh Besar and Banda Aceh allocate overlapping budgets to develop maritime tourism instead of supporting Sabang, which possesses a clear natural comparative advantage, effective market integration will remain difficult to achieve. This gap in both the literature and policy practice highlights the need for a rigorous quantitative assessment.

Based on the foregoing background and identified research gap, this study aims to comprehensively map the sectoral economic structure and structural transformation of Banda Aceh City, Sabang City, and Aceh Besar Regency. The practical objective is to develop a spatial policy matrix that can serve as a strategic reference for local government decision makers. Although the Location Quotient (LQ) and Klassen Typology are well-established analytical tools in regional economics, this study contributes by integrating both approaches within a cross-jurisdictional growth triangle. Rather than proposing a new analytical framework, the study combines these methods to develop a practical diagnostic matrix for identifying sectoral priorities across the BASAJAN corridor. This integrated approach is intended to assist the Regional Development Planning Agencies (Bappeda) in optimizing evidence-based budgeting and resource allocation under post-pandemic fiscal constraints. The resulting spatial policy matrix is expected to provide a robust empirical foundation for Bappeda in the BASAJAN region to guide fiscal resource allocation, strengthen cross-jurisdictional coordination through a Joint Secretariat (Sekber), and ultimately enhance regional resilience by promoting sustainable spatial integration.

Materials and Methods

Research Design and Spatial Scope

This study employs a quantitative descriptive research design using spatial and sectoral analytical approaches. This design was selected to identify empirical patterns of economic structural change and comparative advantage without manipulating the variables under investigation. The spatial scope of the study is limited to the three administrative jurisdictions that constitute the BASAJAN growth triangle in Aceh Province, namely Banda Aceh City, Sabang City, and Aceh Besar Regency. The economy of Aceh Province serves as the reference region for comparative analysis.

The integration of the Location Quotient (LQ) and Sectoral Klassen Typology provides a two-stage diagnostic framework for identifying sectoral priorities and formulating the Local Government Work Plan (RKPD) [17]. The LQ analysis identifies sectors with relatively high economic specialization compared with the provincial economy, while the Sectoral Klassen Typology classifies sectors based on their growth performance and contribution to the regional economy. By combining these two approaches, the analysis identifies sectors that are both economically specialized and supported by favorable growth dynamics.

Type and Source of Data

This study utilizes secondary time-series data obtained from the official publications of Statistics Indonesia (Badan Pusat Statistik, BPS) for Aceh Province [18] and the respective BPS offices of Banda Aceh City, Sabang City, and Aceh Besar Regency [19–21]. The primary variable analyzed is Gross Regional Domestic Product (GRDP), disaggregated into 17 business fields (economic sectors). To ensure the validity of the analysis and eliminate inflationary bias, this study uses GRDP at constant market prices (PDRB ADHK), with 2010 as the base year, rather than GRDP at current prices. The use of constant-price data removes the effects of price changes, ensuring that observed variations reflect changes in real output rather than inflation. The study covers the period from 2019 to 2024, encompassing the pre-pandemic period, the economic contraction during the COVID-19 pandemic, and the subsequent recovery phase.

Theoretical Framework

This study is grounded in Economic Base Theory, which postulates that regional economic growth is fundamentally driven by export-oriented (basic) sectors. When a sector satisfies domestic demand and generates a production surplus for external markets, it attracts capital inflows and creates a regional multiplier effect [22]. Empirically, the Location Quotient (LQ) is employed to identify these basic sectors by comparing regional sectoral concentration with a broader provincial benchmark. An LQ value greater than 1 indicates that a sector possesses a comparative advantage and functions as a primary export driver [23].

While the LQ provides a static snapshot of regional specialization, this study integrates it with the Sectoral Klassen Typology to capture dynamic sectoral performance [24]. The Klassen Typology classifies sectors by comparing regional sectoral growth rates (Y-axis) and contribution shares (X-axis) with provincial averages, thereby mapping economic sectors into four policy quadrants. Quadrant I (Prime/Advanced Sectors) is characterized by high growth and high contribution, representing the competitive backbone of the regional economy and therefore requiring priority infrastructure investment. Quadrant II (Stagnant/Mature Sectors) maintains a high contribution but exhibits slowing growth, requiring technological upgrading and value-added processing to overcome market saturation. Quadrant III (Potential/Emerging Sectors) is characterized by low contribution but high growth, representing future engines of economic development that require targeted fiscal incentives and business incubation. Finally, Quadrant IV (Lagging Sectors) exhibits both low growth and low contribution, indicating a lack of comparative advantage. Consequently, domestic demand in these sectors can be more efficiently met through cross-border imports from partner regions. By integrating these two analytical frameworks, this study moves beyond descriptive analysis to develop a pragmatic cross-jurisdictional spatial policy matrix for the BASAJAN corridor.

Data Integration and Exploratory Review of the BASAJAN Corridor Economy

This section presents an empirical assessment of regional disparities, sectoral specialization, and macroeconomic dynamics within the BASAJAN corridor, comprising Banda Aceh City, Sabang City, and Aceh Besar Regency, over the 2019–2024 period. Previous studies in economic geography have primarily focused on macro-level or district/city-level analyses. Such aggregated approaches often adopt an aspatial perspective, which may obscure the spatial heterogeneity of socioeconomic interactions across administrative boundaries.

To reduce spatial aggregation bias and improve analytical precision, this study adopts the 35 sub-districts (*kecamatan*) within the BASAJAN corridor as the unit of analysis. This finer spatial resolution enables a more detailed assessment of regional economic concentration and spatial variation. Before developing the cross-jurisdictional policy matrix, the economic structure of each region was evaluated using two complementary analytical tools: the Location Quotient (LQ) and the Sectoral Klassen Typology. The LQ was employed to identify sectors with comparative advantages, whereas the Klassen Typology was used to classify sectoral growth performance and contribution relative to the provincial average.

To ensure that the observed variations reflect changes in real economic output rather than price fluctuations, all Gross Regional Domestic Product (GRDP) data were measured at 2010 constant prices (ADHK). This approach ensures that the observed sectoral expansions and contractions represent changes in real regional economic activity.

Specification of Analytical Tools

To achieve the research objectives of identifying priority sectors and mapping the economic structure of the BASAJAN corridor, this study employs three sequential and complementary analytical stages.

Location Quotient (LQ) Analysis

The Location Quotient (LQ) is employed as the first-stage analytical tool to measure sectoral specialization and identify basic sectors within the regional economy [23]. The LQ equation used in this study is expressed as follows:

$$LQ_{ij} = \frac{v_{ij}/v_j}{V_i/V} \quad (1)$$

where LQ_{ij} denotes the Location Quotient of sector i in region j ; v_{ij} is the Gross Regional Domestic Product (GRDP) at constant prices of sector i in region j ; v_j represents the total GRDP of all sectors in region j ; V_i denotes the provincial GRDP of sector i in Aceh Province; and V is the total provincial GRDP across all economic sectors.

The interpretation of the LQ values follows the conventional criteria. An LQ value greater than 1 indicates that the sector's share of the regional economy exceeds its corresponding share at the provincial level, identifying it as a basic sector with a comparative advantage and export potential. An LQ value less than 1 indicates that the sector is underrepresented relative to the provincial economy and is therefore classified as a non-basic sector. An LQ value equal to 1 indicates that the sector has the same relative concentration as the provincial average, suggesting that it primarily serves local demand without a clear comparative advantage.

To minimize potential bias arising from short-term economic fluctuations, including the economic disruption associated with the COVID-19 pandemic in 2020, the final analysis is based on the average LQ value calculated over the 2019–2024 observation period.

Sectoral Klassen Typology Analysis

The Sectoral Klassen Typology serves as the second-stage analytical tool for classifying the performance of the 17 economic sectors. This method employs two indicators: the sectoral growth rate (Y-axis) and the sectoral contribution to regional GRDP (X-axis) [24]. The sectoral growth rate is calculated as follows:

$$g_{ij} = \frac{v_{ij,t} - v_{ij,t-1}}{v_{ij,t-1}} \times 100\% \quad (2)$$

where g_{ij} denotes the growth rate of sector i in region j ; $v_{ij,t}$ is the Gross Regional Domestic Product (GRDP) at 2010 constant prices (ADHK) of sector i in region j during year t ; and $v_{ij,t-1}$ is the corresponding GRDP of sector i in the previous year ($t-1$).

The sectoral contribution is calculated using the following equation:

$$s_{ij} = \frac{v_{ij}}{\sum v_{ij}} \times 100\% \quad (3)$$

where s_{ij} represents the contribution (share) of sector i to the total GRDP of region j ; v_{ij} is the GRDP at 2010 constant prices (ADHK) of sector i in region j ; and $\sum v_{ij}$ denotes the total GRDP of all 17 economic sectors in region j .

The Klassen Typology classifies sectors by comparing the regional sectoral growth rate g_{ij} with the corresponding provincial growth rate g_i , and the regional sectoral contribution s_{ij} with the corresponding provincial contribution s_i . Based on these comparisons, the 17 sectors are classified into four quadrants. Quadrant I (Prime/Fast-Growing) comprises sectors with $g_{ij} > g_i$ and $s_{ij} > s_i$, indicating high growth and high contribution. Quadrant II (Stagnant/Mature) includes sectors with $g_{ij} < g_i$ and $s_{ij} > s_i$, indicating high economic contribution but relatively slower growth. Quadrant III (Potential/Emerging) consists of sectors with $g_{ij} > g_i$ and $s_{ij} < s_i$, indicating relatively small economic contributions but above-average growth. Finally, Quadrant IV (Lagging) includes sectors with $g_{ij} < g_i$ and $s_{ij} < s_i$, reflecting both below-average growth and below-average contribution relative to the provincial benchmark.

Cross-Matrix for Policy Determination

Although the Location Quotient (LQ) and the Sectoral Klassen Typology are widely used in regional economic analysis, this study integrates these two approaches to evaluate sectoral performance across the contiguous BASAJAN growth corridor. The resulting cross-matrix combines sectoral specialization with sectoral growth performance, providing a more comprehensive basis for identifying regional development priorities than either method alone. Specifically, the matrix helps identify sectors that exhibit a comparative advantage but relatively weak growth performance, as well as sectors with strong growth potential that have not yet developed a comparative advantage. The integration of these analytical tools produces four policy classifications that can support the formulation of regional development priorities and Regional Budget (APBD) planning.

Prime Mainstay Sectors are identified by the intersection of a Basic sector ($LQ > 1$) and Quadrant I of the Klassen Typology. These sectors demonstrate both a comparative advantage and above-average growth performance, making them priority candidates for infrastructure investment, fiscal support, and improvements to the business environment. Sustaining Mainstay Sectors are identified by the intersection of a Basic sector ($LQ > 1$) and Quadrant II. Although these sectors maintain a comparative advantage, their growth is relatively slower than the provincial benchmark. Consequently, policies focusing on technological upgrading, productivity enhancement, and logistics efficiency may help strengthen their long-term competitiveness.

Potential/Emerging Sectors are identified by the intersection of a Non-Basic sector ($LQ < 1$) and Quadrant III. Despite their relatively limited contribution to the regional economy, these sectors exhibit above-average growth and therefore represent potential future sources of regional economic development. Appropriate policy measures may include business incubation, investment promotion, and targeted fiscal incentives to strengthen their competitive position. Finally, Lagging Sectors are identified by the intersection of a Non-Basic sector ($LQ < 1$) and Quadrant IV. These sectors exhibit both below-average specialization and below-average growth, suggesting that public investment should be carefully prioritized while opportunities for interregional cooperation and market integration within the BASAJAN corridor are further explored.

Results and Discussion

Identification of Basic Economic Sectors Based on the Location Quotient (LQ)

The Location Quotient (LQ) analysis was conducted as the initial step in identifying sectoral specialization within the BASAJAN corridor. Under Economic Base Theory, a sector is classified as a basic sector when its average LQ value exceeds 1 ($LQ > 1$). An LQ value greater than 1 indicates that the sector has a higher relative concentration than the corresponding sector at the provincial level, suggesting a comparative advantage and the potential to serve markets beyond the region.

To present the LQ results more clearly, the average LQ values for the 17 economic sectors classified by Statistics Indonesia (BPS) were summarized in a Spatial Concentration Matrix. This matrix provides a concise overview of the spatial distribution of sectoral specialization across the study area and facilitates comparison among regions.

Table 1. Centralization matrix of leading sectors ($LQ > 1$) in the BASAJAN region (average estimates 2019–2024).

Business Sector Category (BPS Standard)	Banda Aceh Metropolis	Aceh Besar Regency	Sabang City
A. Agriculture, Forestry & Fisheries	0.05	1.16	0.22
B. Mining and Quarrying	0.01	0.45	0.02

Business Sector Category (BPS Standard)	Banda Aceh Metropolis	Aceh Besar Regency	Sabang City
C. Manufacturing	0.45	0.83	0.32
D. Electricity and Gas Supply	1.25	0.75	1.05
E. Water Supply & Waste Management	1.33	1.16	1.12
F. Construction	1.14	1.34	1.22
G. Wholesale and Retail Trade	1.32	1.03	1.15
H. Transportation and Storage	1.67	1.84	1.85
I. Accommodation and Food Services	2.20	0.64	3.52
J. Information and Communication	1.86	0.54	0.95
K. Financial and Insurance Activities	2.33	0.43	0.82
L. Real Estate Activities	1.46	1.45	1.12
M. Business/Corporate Services	1.88	0.62	1.25
N. Public Administration & Defence	1.88	0.85	1.92
O. Education Services	1.70	0.90	0.95
P. Human Health and Social Work	1.71	0.74	1.18
Q. Other Services Activities	2.06	0.82	1.45

Source: Independent processing of constant price GRDP data, 2026.

Note: Values in bold indicate basic sectors (LQ > 1).

Spatial Dichotomy: Tertiary Agglomeration and Regional Specialization

Based on the empirical results presented in Table 1, high-value-added tertiary sectors are concentrated in Banda Aceh City. Financial and Insurance Activities (K), Information and Communication (J), and Education (P) recorded LQ values of 2.33, 1.86, and 1.70, respectively. These findings indicate that Banda Aceh has a strong comparative advantage in service-based activities and functions as the principal center for finance, information and communication services, and education within Aceh Province. This pattern is consistent with the concept of urban agglomeration, whereby metropolitan centers tend to specialize in high-value-added service activities because of economies of agglomeration and knowledge spillovers.

In contrast, Aceh Besar Regency recorded an LQ value of 1.16 in Agriculture, Forestry, and Fisheries (A), while the Manufacturing sector (C) recorded an LQ value of 0.83, which is relatively close to the basic-sector threshold. These findings suggest that Aceh Besar primarily specializes in resource-based activities while also exhibiting potential for further industrial development. This spatial pattern is consistent with location theory, which suggests that land-intensive activities are more likely to locate in peri-urban areas where land costs are relatively lower than in metropolitan centers. Such conditions may provide a favorable environment for the future development of agro-based industries. These findings are consistent with those reported by Hasanah et al. (2021), who found that peri-urban areas can play an important role in supporting manufacturing activities and accommodating the spatial expansion of urban economies.

Sabang City exhibits a distinct pattern of sectoral specialization. Accommodation and Food Service Activities (I) recorded the highest LQ value at 3.52, substantially exceeding those of the other sectors. This finding indicates a strong comparative advantage in tourism-related activities and highlights the important role of the tourism sector in the city's economy. However, most upstream sectors recorded LQ values below 1, suggesting relatively limited sectoral diversification. As an island city, Sabang faces geographic constraints that may limit the development of manufacturing and other secondary industries. Strengthening transportation connectivity and supply-chain integration with the mainland may therefore support broader economic diversification while reinforcing the city's existing tourism advantages.

Evaluation of Sectoral Performance Based on the Klassen Typology

Although the Location Quotient (LQ) identifies sectoral specialization, it provides only a static measure of comparative concentration. To complement this analysis, the Sectoral Klassen Typology was employed to evaluate sectoral performance by comparing regional sectoral

growth rates ((g_{ij})) and sectoral contribution shares ((s_{ij})) with the corresponding provincial benchmarks in Aceh.

The Klassen Typology results presented in Table 2 reveal distinct patterns of sectoral development across the BASAJAN corridor. Both Banda Aceh and Sabang do not contain any sectors in Quadrant III (Potential/Emerging), suggesting that their economic structures are dominated by sectors that are either well established (Quadrants I and II) or relatively underdeveloped (Quadrant IV). In contrast, Aceh Besar records the Manufacturing sector (C) in Quadrant III, indicating above-average growth despite its relatively limited contribution to the regional economy. This finding suggests the potential for further industrial development and is consistent with Azis et al. (2026), who reported that peri-urban areas adjacent to metropolitan centers may provide favorable conditions for the expansion of manufacturing activities.

In Sabang, the Transportation and Storage sector (H) is classified in Quadrant II, indicating that although the sector makes a relatively high contribution to the regional economy, its growth rate is lower than the provincial benchmark. This pattern may reflect the geographic and logistical constraints associated with an island economy, which can influence the pace of sectoral development.

Table 2. Cross-Tabulation of Sectoral Classification Based on Klassen Typology.

Classification Description	Banda Aceh (Metropolitan Pole)	Aceh Besar (Buffer Zone)	Sabang (Island Exclave)
QUADRANT I (Advanced & Progressive) (Growth > Province & Share > Province) ($g_{ij} > g_i$ & $s_{ij} > s_i$)	Sectors D, E, G, H, I, J, K, M, N, O, P, Q. Key Driver: Information & Communication (I) shows exceptional performance with a growth rate (r) of 7.80% and a share (s) of 6.50%.	Sectors A, E, F, H, L. Key Driver: Agriculture (A) acts as the dominant spatial push factor ($r=4.20\%$, $s=35.00\%$).	Sectors D, E, G, I, M, N, P, Q. Key Driver: Accommodation & Food Services (I) heavily monopolizes the economy ($r=6.80\%$, $s=8.80\%$).
QUADRANT II (Advanced but Slowing) (Share > Province & Growth < Province) ($g_{ij} < g_i$ & $s_{ij} > s_i$)	Sectors F, L. Construction (F) maintains a massive share (12.00%) but its growth (5.20%) has fallen below the provincial reference (6.00%).	Sector G. Wholesale and Retail Trade (G) holds a 14.50% share but is experiencing a growth deceleration (4.20%).	Sectors F, H, L. Island Penalty effect: Transportation (H) holds a massive 8.20% share but its growth is suppressed to 5.20% (below the 5.50% reference).
QUADRANT III (Potential / Fast-Growing) (Growth > Province & Share < Province) ($g_{ij} > g_i$ & $s_{ij} < s_i$)	Absent.	Sector C. Manufacturing (C) records a high growth rate of 4.50% despite a limited share of 4.60%, signaling downstream potential.	Absent.
QUADRANT IV (Relatively Lagging) (Growth < Province & Share < Province) ($g_{ij} < g_i$ & $s_{ij} < s_i$)	Sectors A, B, C. Primary sectors display negligible shares (e.g., Mining at 0.01%) and stunted growth rates.	Sectors B, D, I, J, K, M, N, O, P, Q Financial Services (K) shows low penetration ($s=1.30\%$), subordinating to Banda Aceh.	Sectors A, B, C, J, K, O. Agriculture (A) only shares 4.20% with a sluggish 1.80% growth, demanding imports.

Source: Authors' own calculation.

Note: g_{ij} = regional sector growth; g_i = provincial sector growth; s_{ij} = regional sector share; s_i = provincial sector share.

Spatial Division of Labor Across the BASAJAN Corridor

The combined results of the Location Quotient (LQ) and the Sectoral Klassen Typology reveal distinct patterns of sectoral specialization across the BASAJAN corridor. Together, these analytical approaches indicate that the three regions perform complementary economic functions within the regional economy.

Banda Aceh: Transition Toward a Digital and Service-Based Economy

The sectoral classification presented in Table 2 shows that 12 of the 17 economic sectors in Banda Aceh are classified in Quadrant I. Among these, the Information and Communication sector (J) recorded the highest growth rate (7.80%) and contributed 6.50% to the regional economy. In contrast, primary sectors, including Agriculture, Forestry, and Fisheries (A) and Mining and Quarrying (B), are classified in Quadrant IV. These findings suggest that Banda Aceh has undergone a structural shift toward a service-oriented economy, with increasing specialization in information and communication, finance, education, and other tertiary activities. The strong performance of the Information and Communication sector is consistent with the growing importance of the digital economy and supports Banda Aceh's role as the principal service center within the BASAJAN corridor.

Aceh Besar: Regional Food Production and Emerging Industrial Development

The Agriculture, Forestry, and Fisheries sector (A) in Aceh Besar is classified in Quadrant I, recording a growth rate of 4.20% and contributing 35.00% to the regional economy. In addition, the Manufacturing sector (C) is positioned in Quadrant III, with a growth rate of 4.50% despite accounting for only 4.60% of regional GRDP. These findings indicate that Aceh Besar continues to specialize in agricultural production while exhibiting potential for future industrial expansion. With appropriate investment, infrastructure, and industrial policies, the manufacturing sector may strengthen its contribution to the regional economy over time. This complementary pattern supports the functional integration of the BASAJAN corridor, with Aceh Besar providing resource-based activities that complement the service-oriented economy of Banda Aceh. Furthermore, the classification of several advanced service sectors in Quadrant IV may reflect the concentration of higher-order services in the neighboring metropolitan center, consistent with the regional spatial division of labor.

Sabang City: Tourism Specialization and Development Constraints

Sabang City exhibits a distinct pattern of sectoral specialization. The Accommodation and Food Service Activities sector (I) is classified in Quadrant I, recording a growth rate of 6.80% and contributing 8.80% to regional GRDP. In contrast, the Transportation and Storage sector (H) is classified in Quadrant II, contributing 8.20% to the regional economy but growing more slowly than the provincial benchmark.

This pattern suggests that Sabang's economy relies heavily on tourism-related activities while facing challenges in transportation and logistics development. As an island economy, Sabang is subject to geographic constraints that may increase transportation costs and limit supply-chain efficiency. Consequently, improving transportation connectivity and strengthening integration with mainland supply chains may support broader economic diversification while reinforcing the city's comparative advantage in tourism.

Cross-Quadrant Policy Matrix for Regional Development Priorities

A key contribution of this study is the integration of the Location Quotient (LQ) and the Sectoral Klassen Typology into a cross-quadrant policy matrix. By combining sectoral specialization with sectoral growth performance, the matrix provides a practical framework for identifying regional development priorities and supporting evidence-based planning by the Regional Development

Planning Agency (Bappeda). This integrated approach helps distinguish sectors that warrant priority investment from those requiring revitalization or longer-term development strategies.

Spatial Policy Implications for Sabang City

The policy matrix presented in Table 3 indicates that Sabang City does not contain any sectors classified as Potential/Emerging. Instead, its comparative advantage is concentrated in the Prime Mainstay category, particularly the Accommodation and Food Service Activities sector. These findings suggest that regional development policies may prioritize tourism infrastructure, destination management, and supporting services to strengthen the city's existing comparative advantage. At the same time, strengthening logistical cooperation with Aceh Besar Regency for the supply of agricultural products and other essential commodities could improve supply-chain resilience and support the tourism industry.

Table 3. LQ and Klassen cross-policy matrix (Case study: Sabang City).

Policy Classification	Statistical Criteria	Sector List (Sabang Case Study)	Planning Policy Direction (Bappeda)
Prime Mainstay Sector	LQ > 1 & Quadrant I	Accommodation & Food Services	Absolute Priority (Expansion): APBD allocations should be directed toward supporting infrastructure (clean water), international promotion, and tourism tax incentives.
Sustaining Mainstay Sector	LQ > 1 & Quadrant II	Transportation & Storage; Construction	Consolidation Priority (Revitalization): Strategic interventions focusing on reducing port logistics costs and modernizing crossing fleets to systematically mitigate the island penalty.
Potential Sector	LQ < 1 & Quadrant III	Absent	Stimulus Priority (Incubation): (No sectors currently qualify for this incubation phase).
Lagging Sector	LQ < 1 & Quadrant IV	Agriculture; Manufacturing; Financial Services; Info & Comm	Rationalization (External Delegation): Reallocate inefficient land-clearing subsidies. Food, banking, and manufactured goods should be sourced through integrated supply chains from mainland partner regions.

Source: Authors' formulation based on LQ and Klassen Typology cross-tabulation (2026).

Spatial Policy Implications for Banda Aceh City

As shown in Table 4, Banda Aceh's comparative advantages are concentrated in tertiary sectors, particularly financial services, education, and information and communication. Given the city's relatively limited land availability, regional development planning may place greater emphasis on high-value service activities rather than land-intensive production sectors. In addition, improving logistics infrastructure and distribution systems could strengthen the flow of goods from neighboring regions, particularly Aceh Besar, thereby supporting urban economic activity and contributing to price stability.

Table 4. LQ and Klassen cross-policy matrix (Case study: Banda Aceh City).

Policy Classification	Statistical Criteria	Sector List (Banda Aceh Case Study)	Planning Policy Direction (Bappeda)
Prime Mainstay Sector	LQ > 1 & Quadrant I	Financial Services; Educational Services;	Primary Priority (Expansion): Fiscal allocations should

Policy Classification	Statistical Criteria	Sector List (Banda Aceh Case Study)	Planning Policy Direction (Bappeda)
		Information & Communication	prioritize digital infrastructure, start-up ecosystem incubation, scholarships, and creative economy hubs.
Sustaining Mainstay Sector	LQ > 1 & Quadrant II	Construction; Real Estate	Consolidation Priority (Efficiency): Focus on vertical housing and smart-building regulations to optimize limited urban space.
Potential Sector	LQ < 1 & Quadrant III	Absent	Stimulus Priority (Incubation): (No sectors currently qualify for this incubation phase).
Lagging Sector	LQ < 1 & Quadrant IV	Agriculture; Mining; Manufacturing	Rationalization (External Delegation): Reallocate budget away from heavy industrial zones. Primary commodity needs must be sourced from Aceh Besar.

Source: Authors' formulation based on LQ and Klassen Typology cross-tabulation (2026).

Spatial Policy Implications for Aceh Besar Regency

Table 5 indicates that Agriculture, Forestry, and Fisheries remains the Prime Mainstay sector in Aceh Besar, reflecting its comparative advantage and strong growth performance. These findings support continued investment in agricultural productivity, mechanization, and supporting infrastructure to strengthen regional food security within the BASAJAN corridor. In addition, the Manufacturing sector is classified as a Potential/Emerging sector, suggesting opportunities for future industrial development. Consequently, industrial policies, investment promotion, and spatial planning, including the development of industrial areas such as KIA Ladong, may facilitate downstream agro-industrial activities. Rather than duplicating higher-order service functions that are already concentrated in Banda Aceh, Aceh Besar may benefit from focusing on sectors that complement the regional economic structure, particularly logistics, agricultural production, and manufacturing.

Table 4. LQ and Klassen cross-policy matrix (Case study: Aceh Besar Regency).

Policy Classification	Statistical Criteria	Sector List (Aceh Besar Case Study)	Planning Policy Direction (Bappeda)
Prime Mainstay Sector	LQ > 1 & Quadrant I	Agriculture, Forestry & Fishing; Construction; Transportation	Primary Priority (Expansion): Target smart farming, precision irrigation, and logistics/highway infrastructure connecting the mainland to Sabang and Banda Aceh.
Sustaining Mainstay Sector	LQ > 1 & Quadrant II	Wholesale & Retail Trade	Consolidation Priority (Revitalization): Modernization of traditional markets and trade distribution channels to prevent further growth deceleration.

Policy Classification	Statistical Criteria	Sector List (Aceh Besar Case Study)	Planning Policy Direction (Bappeda)
Potential Sector	LQ < 1 & Quadrant III	Manufacturing Industry	Stimulus Priority (Incubation): iscal allocations must target strategic land acquisition and utility reinforcement at the Aceh Industrial Estate (KIA) Ladong to accelerate downstreaming.
Lagging Sector	LQ < 1 & Quadrant IV	Financial Services; Health Services; Info & Comm	Rationalization (External Delegation): Limit the development of large-scale referral hospitals or major financial centers, delegating high-tier professional services to Banda Aceh.

Source: Authors' formulation based on LQ and Klassen Typology cross-tabulation (2026).

Conclusions

The integrated analysis of the Location Quotient (LQ) and the Sectoral Klassen Typology for the 2019–2024 period indicates that the BASAJAN corridor exhibits complementary patterns of regional specialization rather than a homogeneous economic structure. The distribution of Prime Mainstay sectors across Banda Aceh, Sabang, and Aceh Besar suggests that each region performs distinct but interconnected economic functions within the corridor. Banda Aceh is characterized by a concentration of tertiary activities, particularly financial services, education, and information and communication. Sabang demonstrates a strong comparative advantage in Accommodation and Food Service Activities, reflecting the importance of tourism to its regional economy. Meanwhile, Aceh Besar specializes in Agriculture, Forestry, and Fisheries while also exhibiting potential for industrial development through the Manufacturing sector. These findings suggest that regional development strategies should recognize the complementary roles of the three regions and prioritize investments according to their respective comparative advantages.

The findings have several implications for regional development planning. First, the Regional Development Planning Agencies (Bappeda) may use the integrated LQ–Klassen framework to support evidence-based prioritization in preparing the Local Government Work Plan (RKPD) and allocating Regional Budget (APBD) resources. In Sabang, policies that strengthen tourism infrastructure, destination management, transportation connectivity, and logistics may reinforce the city's comparative advantage while improving supply-chain resilience. In Banda Aceh, development planning may emphasize high-value service sectors, digital infrastructure, and efficient regional distribution systems that strengthen its role as the principal service center within the corridor. In Aceh Besar, continued investment in agricultural productivity, supporting infrastructure, and agro-industrial development, including the Aceh Industrial Estate (KIA Ladong), may enhance regional food security and strengthen manufacturing capacity. More broadly, these complementary development strategies may improve economic integration across the BASAJAN corridor.

Effective implementation of these strategies requires stronger interregional coordination. Establishing a formal coordination mechanism among the three local governments could improve the alignment of regional planning, infrastructure development, and logistics networks. Greater coordination in Regional Spatial Plans (RTRW), transportation infrastructure, and commodity distribution systems may strengthen economic linkages among the three regions and support more balanced regional development.

Despite its practical contribution, this study has several limitations. First, the integrated LQ and Klassen Typology framework remains a descriptive analytical approach that identifies sectoral specialization and relative performance but does not establish causal relationships among regional economic variables. Second, the analysis assumes that administrative regions are independent and therefore does not explicitly account for spatial dependence or spillover effects among neighboring regions. Third, the use of GRDP data aggregated into 17 economic sectors may mask important variations within individual industries, particularly in downstream agro-industrial activities and other specialized subsectors.

Future research should extend this analysis by applying spatial econometric approaches, such as the Spatial Durbin Model (SDM), to examine spatial dependence and interregional spillover effects within the BASAJAN corridor. In addition, Regional Input-Output (I-O) or Social Accounting Matrix (SAM) analyses could provide a more detailed understanding of production linkages, value chains, and interregional economic interactions. Finally, developing a regional economic resilience index would help evaluate whether greater sectoral diversification and stronger regional integration enhance the capacity of the BASAJAN corridor to respond to external economic shocks.

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