





## ANALYSIS OF THE LEADING SECTOR IN UNDERDEVELOPED AREAS OF WEST SUMATERA, INDONESIA

 Alpon Satrianto<sup>1\*</sup>

 Syamsul Amar<sup>2</sup>

 Akmil Ikhsan<sup>3</sup>

<sup>1,2,3</sup> Faculty of Economy, Universitas Negeri Padang, Indonesia.

<sup>1</sup> Email: [alponsatrianto@fe.unp.ac.id](mailto:alponsatrianto@fe.unp.ac.id)

<sup>2</sup> Email: [syamsul\\_amar3@yahoo.co.id](mailto:syamsul_amar3@yahoo.co.id)

<sup>3</sup> Email: [akmilikhsan@gmail.com](mailto:akmilikhsan@gmail.com)



(+ Corresponding author)

### ABSTRACT

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Based on Presidential Regulation Number 63 of 2020, there is still one underdeveloped area in West Sumatera Province, namely the Kepulauan Mentawai Regency. This study aims to find and analyze the common leading sector in underdeveloped areas in West Sumatera Province. The criteria for the leading sectors in this study are placed in Quadrant I based on Klassen Typology, have a location quotient (LQ) value  $> 1$ , the sum of the proportional shift and differential shift is positive according to the shift-share method, the growth ratio of the reference area (GRRA) and the growth ratio of the study area (GRSA) are positive according to the growth ratio method (GRM), and the LQ and GRSA values are positive according to the overlay method. Based on the Klassen Typology method, two leading sectors were identified, the LQ method showed three leading sectors, the shift-share method identified 10 sectors, the GRM showed five leading sectors, and the overlay method identified four leading sectors. Construction was the leading sector that was found by all five methods. The regional government of the Kepulauan Mentawai Regency must commit to developing this sector in the future as a mainstay leading sector in the economic development of the region.

**Contribution/Originality:** There are very few studies that have determined the same leading sectors in each method. This is considered important because each of the five methods have their disadvantages. To overcome the weaknesses of each method, the common leading sectors in all five methods should be determined.

## 1. INTRODUCTION

Underdeveloped areas are defined as areas that have low accessibility to growth centers due to the lack of transportation facilities and infrastructure, or geographical locations that are difficult to reach. In addition, underdeveloped areas generally have a low level of economic growth indicated by the condition of the community (pre-prosperous community) with inadequate social services and public facilities needed to improve the quality of life. Underdeveloped areas are usually geographically located in the interior, mountains, coasts and small islands with limited populations and are dominated by livelihoods based on natural resources, such as agriculture and fisheries. Community customs are also still strong so it is difficult for inhabitants of these areas to accept influences or cultures from outside, which results in low mastery of technology among local communities (Salim & Faoziah, 2020).

Regional development is the responsibility of local governments, both provincial and district/city governments, where they function as a facilitator in accelerating the development of underdeveloped areas.

Development of underdeveloped areas is an effort to overcome economic and social problems and aims to encourage these areas to become more advanced and transform both in terms of infrastructure and quality of life. Development is a dynamic process to achieve the welfare of society at a higher level. Growth-oriented development has achieved success in various areas. However, in reality, the high growth has resulted a wider inequality gap between groups of people and between regions caused by the absence of equitable development (Adisasmita, 2005).

One of the causes of underdeveloped areas is policies that rely on sectoral dimensions. This is evident from the dominant role in the implementation of de-concentration and sectoral orientation from the central government. Regional development with a spatial dimension approach has not become a reference for overcoming lags between regions, so development is still determined by a market mechanism that tends to choose areas with profitable potential compared to other regions. As a result, lagging regions will have difficulties achieving progress (Kuncoro, 2012). Disparities in the quality of human resources between regions, the state of economic capacity between regions, and the unequal quality of infrastructure between regions supports the fact that there are gaps, causing some regions to be left behind (Djuwendah, Hapsari, Renaldy, & Saidah, 2013). Gaps and lags between regions are issues that must be addressed in line with national development goals. The reasons for these gaps are varied. The development gap is aimed at the existence of regions whose development level is still lagging compared to other regions, in other words, the existence of underdeveloped regions is an indicator of gaps in development.

People not having education and skills and lack of business capital, among others, hinders development and makes it difficult for underdeveloped regions to achieve prosperity. To overcome this problem, a spatial planning program, population settlements, facilities, and infrastructure are needed so that community welfare can be improved. Differences in the ability of regions to manage and develop resources create complex problems and lead to lagging regional development, which can have a negative effect on the welfare of local communities and lead to increased dependence on the central government. This situation will certainly affect the implications of policies that are expected to overcome the problem of underdeveloped regions so that regional independence can be achieved (Syahza & Suarman, 2012).

Based on Presidential Regulation Number 63 of 2020 on April 29, 2020, regarding the Determination of Underdeveloped Regions for 2020–2024 in Indonesia, there is still one district in the Province of West Sumatera, Indonesia, classified as an underdeveloped area, namely the Kepulauan Mentawai Regency. Previously, the underdeveloped areas determined by the central government from 2015–2019 were West Pasaman Regency, South Solok Regency and Kepulauan Mentawai Regency (Presidential Regulation Number 63 of 2020, 2020). For this reason, the one task remaining for the West Sumatera regional government is removing the Kepulauan Mentawai Regency's backward status. According to Presidential Decree No. 63 of 2020, underdeveloped areas are defined as districts whose areas and communities are less developed than other regions on a national scale. The government determines underdeveloped regions every five years based on specific criteria, indicators and sub-indicators of lagging regions. An evaluation is carried out every year on how to prevent the area from being left behind.

One of the efforts to improve the status of the Kepulauan Mentawai Regency is to optimize the region's leading sector. By knowing the leading sector of the region, the local government can map which sectors will be prioritized in development without ignoring the other sectors (Armstrong & Taylor, 2010; Capello, 2007; McCann, 2013; Sjafrizal, 2018; Tarigan, 2010). Therefore, the region will be able to optimize its advantages to encourage development. At the regional level, economic development must be encouraged to drive the economy and bring added value to various economic sectors. It is necessary to remember that the implementation of development must pay attention to the mechanism of the background in encouraging the pattern of economic growth of a region. The economy of a region can prioritize various sectors that have different regional dynamics and structures in terms of social, educational, health, cultural and geographical conditions that form the basis for economic development.

Several methods have been used by previous researchers in determining the leading sector. These include Klassen's Typology (Basuki & Utari, 2009; Hajeri & Dolorosa, 2015; Hariyanti & Utha, 2016; Wahyuningtyas,

2013), location quotient (LQ) (Amalia, 2012; Basuki & Utari, 2009; Billings & Johnson, 2012; Chen, Nie, Chen, & Peng, 2021; Gajdová, Krechovská, & Dubcová, 2016; Hajeri & Dolorosa, 2015; Hariyanti & Utha, 2016; Hidayat & Darwin, 2017; Mangilaleng, Debby, & Wensy, 2015; Neori, 2011; Wahyuningtyas, 2013; Wijaya, Ilmi, & Darma, 2020), shift-share (Amalia, 2012; Basuki & Utari, 2009; Dogru & Sirakaya-Turk, 2017; Goschin, 2014; Hajeri & Dolorosa, 2015; Hidayat & Darwin, 2017; Mangilaleng et al., 2015; Vu & Turner, 2011; Wahyuningtyas, 2013; Wijaya et al., 2020)), the growth ratio model (GRM), and overlay (Wahyuningtyas, 2013). However, these researchers only determined the leading sectors of an area based on certain methods. To overcome the disadvantages of each method, it is necessary to determine which sector has the same advantages in all five methods. To get a truly reliable result, this study focuses on analyzing the same leading sectors of underdeveloped areas in West Sumatera Province.

Research from Faisal (2014) used the Klassen Typology method to analyze the leading sectors in Banda Aceh City. The results showed that the sectors that had grown rapidly were classified in Quadrant I, including electricity and clean water, trade, hotels and restaurants, transportation, communication, finance, and rental and housing services. Sectors included in Quadrant II are developed but depressed, such as service sectors. Sectors in Quadrant III had potential to be developed, such as the manufacturing and construction industries. Quadrant IV contains underdeveloped sectors, including the agricultural sector.

Restiatun (2009) identified the leading sectors among regencies/cities in the Province of the Special Region of Yogyakarta using the Klassen Typology method. The results showed that the area belonging to Quadrant I is the city of Yogyakarta, which has the highest average economic growth and per capita income. There are no areas classified in Quadrant II. Areas classified in Quadrant III are Sleman Regency and Gunung Kidul Regency, which have high economic growth but have lower per capita income than other regions. Regions classified in Quadrant IV are Bantul Regency and Kulon Progo Regency, which have lower economic growth and per capita income than other regions. Chen et al. (2021) used the location quotient (LQ) method to analyze regional industrial synergies in China. Industrial development in several areas is seen in primary sectors, such as agriculture, forestry and fisheries. Secondary sectors include mining, processing, textiles, manufacturing, media and printing. Tertiary sectors include wholesale trade, transportation and trade, water management, environment, and public facilities. The results showed that in the Xiamen region, the primary and secondary industries were not the leading sectors because the LQ values were less than 1. Meanwhile, the tertiary industry was the leading sector because the LQ value was more than 1. The secondary industry was the leading sector because the LQ value was more than 1. In the Zhangzhou area, secondary and tertiary industry were not leading sectors because the LQ values were less than 1. Meanwhile, the primary industry was a leading sector because the LQ value was more than 1.

In addition, Gajdová et al. (2016) used the LQ method to identify clusters and initiatives of tourism industry clusters in Slovakia from Bratislava, Trnava, Trencin, Nitra, Zilina, Banská Bystrica, Prešov and Košice. In 2014, the Bratislava and Košice regions had good opportunities for tourism development because the LQ values were more than 1. In 2015, the Bratislava region had good opportunities for tourism development because the LQ values were more than 1. On the other hand, Trnava, Trencin, Nitra, Zilina, Banská Bystrica, Prešov and Košice did not develop well because the LQ values were less than 1.

Yin, Lin, Jiang, Qiu, and Sun (2020) used the LQ method to analyze the intensity of land use and identify the dominant industry in urban areas in China. The primary sectors were agriculture, forestry and fisheries. The secondary sectors were mining, manufacturing, gas, electricity, water and construction. The tertiary sectors were retail and trade, transportation, hotel and catering, housing and the financial industry. Zhenjiang, Welnan, Guangzhou, Tonghua, Longyan, Tongliao, Liaocheng and Zhuzhou were more dominant regions for tertiary industrial development. The Taiyuan region relied on primary industry, while, the Puyang area optimized the secondary industry in urban development. Morrissey (2014) analyzed the production of the marine sector in Ireland, such as aquaculture, oil and gas, seafood processing, shipbuilding, water construction, marine retail,

maritime transportation, marine engineering and water-based activities with the LQ approach. The results showed that the aquaculture sector, marine retail, maritime transportation and water-based activities were the leading sectors because the base value was more than 1. Meanwhile, the oil and gas sector, seafood processing, shipbuilding, water construction and marine engineering were not the leading sectors because the base value was less than 1.

Mařátková (2012) analyzed industrial clusters in several cities in the Czech Republic, including Hradec, South Bohemian, South Moravian, Liberec and Moravian-Silesian using the shift-share method. The results showed that the Hradec area had potential in the electrical and optical equipment industrial sectors as well as the transportation equipment industry. The South Bohemian region had advantages in wholesale and retail trade, motor vehicle repair, motor vehicles, household personal goods, and the machinery and equipment industry. The South Moravian region's leading sectors are manufacturing, the rubber and plastic equipment industry, the electrical and optical equipment industry, wholesale and retail trade, motor vehicle repair, motor vehicles, household personal goods, housing and rental, and business activities. The Liberec region had advantages in the manufacturing and conveyance industries, as well as housing, rental and business activities. The Moravian-Silesian region had advantages in the manufacturing sector, the electrical and optical equipment industry and the transport equipment industry. Dogru and Sirakaya-Turk (2017) analyzed the performance of the tourism sector from level 1 (developing tourism sector, or a tourism sector that persists when there is tourism activity), and level 2 (an advanced or developed tourism sector, or a sector that persisted despite the lack of tourism activities) with a shift-share approach. Level 1 consisted of land, sea and air transportation, tour packages and accommodation. Level 2 consisted of camera and photography equipment, souvenir shops, sports and art shows, museums, restaurants and catering. The results showed that the development of the tourism industry at level 2 is better than level 1. There is evidence from the Carolinas in the US that the tourism sector at level 2 has the potential to continue to move forward because this sector will continue to grow with relatively stable tourist arrivals and maintain the characteristics of the tourism sector. Research by Goschin (2014) analyzes the employment sector by region and economic sector with a shift-share approach in Romania, which is divided into several regions, such as North-West, Central, North-East, South-East, South Muntenia, Bucharest-Ilfov, South-Western and western Oltenia. The results show that sectoral labor growth has shifted positively in the Bucharest-Ilfov region. Regionally, labor growth is positive in the Bucharest-Ilfov region, and the northwest and southeast, which have high worker competitiveness. Meanwhile, other regions have slow labor growth. Bucharest-Ilfov's high employment growth is in housing, trade, financial services and other services. In the manufacturing sector, labor growth is found in the northern, western, central and eastern regions. In agriculture, labor growth is found in the northern, eastern, southern and western regions.

Nasution (2020) analyzed the leading sectors in Labuhanbatu Regency using the growth ratio method (GRM). The results showed that the sectors that had a positive growth ratio of the reference area (GRRR) and a positive growth ratio of the study area (GRSA) were the mining, quarrying and construction sectors, wholesale and retail trade, car and motorcycle repairs, provision of accommodation, information and communication, as well as housing, education and corporate services. Sectors that have a positive GRRR and a negative GRSA include agriculture, forestry and fisheries, water supply, waste management, waste and recycling, government administration, defense and mandatory social security, health services, and social activities and other services. Sectors that have a negative GRRR and a negative GRSA include the manufacturing, transportation and warehousing sectors as well as financial services and insurance.

Rizani (2019) analyzed the leading sectors for Bandung City development planning using the GRM. The results show that sectors with positive GRSA and positive GRRR values include construction, transportation and warehousing, accommodation, food and drink, information and communication, corporate services, education services, health services, and social activities and other services. Sectors with positive GRRR and negative GRSA values include water supply, waste treatment, waste and recycling, wholesale and retail trade, car and motorcycle repair, financial services, insurance and housing. Sectors with negative GRRR and negative GRSA values include

agriculture, forestry and fisheries, mining and quarrying, manufacturing, electricity and gas procurement, government administration, and defense and mandatory social security.

Dede and Yutika (2016) analyzed the leading sectors of agriculture, forestry, fisheries and mining in Pantura, West Java, using the overlay method. The results showed that the agriculture, forestry and fisheries sectors lacked competitiveness and were comparatively superior to other sectors in West Java. Mining and quarrying is a leading sector and specializes in economic activity. These results prove that the Pantura region still relies on natural resources in building the economy compared to other less developed sectors.

Ferderika et al. (2017) analyzed the leading sector of Halmahera Regency with the overlay method. The results of the study indicate that there is no sector that has a positive LQ value and a negative GRSA, which indicates that it is no dominant sector in this region. Sectors that have a positive LQ and a negative GRSA include electricity and gas supply, water supply, waste treatment, waste and recycling, construction, wholesale and retail trade, repair and motorcycles, transportation and warehousing, accommodation provision, food and drink, information and communication, financial and insurance services, housing, corporate services, government administration, defense and compulsory social security as well as health services and social activities. Sectors that have a negative LQ and a positive GRSA include the mining and quarrying sector. Sectors that have a negative LQ and a negative GRSA include agriculture, forestry and fisheries, manufacturing, education services and other services.

2. METHODOLOGY

The data in this study is secondary data from the Central Statistics Agency of West Sumatra Province and the Kepulauan Mentawai Regency. The data of this research are in the form of gross regional domestic product (GRDP) data of West Sumatra and Kepulauan Mentawai Regency based on constant prices in 2010 from 2010-2020. The data analysis technique in determining the leading sector uses the Klassen Typology, location quotient, shift-share, growth ratio, and overlay methods. Klassen Typology is a method of determining the output of a particular sector produced by a region based on the growth and contribution of the output of that sector compared to the growth and contribution of the average output of a region. If the growth and contribution of the output of a sector is greater than the growth and contribution of the average output of a region, then that sector is the leading sector (developed countries).

Table 1. Classification of leading sectors according to Klassen Typology.

	Growth	Growth above average (si > s)	Growth below average (si < s)
Contribution			
Above Average Contribution (ski > k)		Developed Sector	Stagnant Sector
Below Average Contribution (ski < k)		Potential Sector	Underdeveloped Sector

Note: Sjafrizal (2018).

Information:

si = sector i growth in the GRDP of the Kepulauan Mentawai Regency.

s = the average growth of all sectors in the GRDP of the Kepulauan Mentawai Regency.

ski = contribution of sector i to the GRDP of the Kepulauan Mentawai Regency.

sk = the average contribution of all sectors to the GRDP of the Kepulauan Mentawai Regency.

Location quotient (LQ) is used to determine the superior sector or base in a particular area. The LQ approach in research is calculated by Equation 1 as follows:

$$LQ = \frac{Y_{ij}/Y_j}{Y_i/Y} \tag{1}$$

**Information:**

$Y_{ij}$  = sector GDP  $i$  in Kepulauan Mentawai Regency.

$Y_j$  = GRDP of Kepulauan Mentawai Regency.

$Y_i$  = sector GDP  $i$  in West Sumatra.

$Y$  = GRDP of West Sumatra.

Based on the above formula, there are two possible LQ values that can be obtained:

- 1) If the value of  $LQ \geq 1$ , it means that the role of sector  $i$  in the Kepulauan Mentawai Regency is greater than the role of sector  $i$  in the province of West Sumatra. This is called the superior or base sector.
- 2) If the LQ value  $< 1$ , it means that sector  $i$  in the Kepulauan Mentawai Regency has a smaller role than sector  $i$  in West Sumatra Province. This is called the non-superior or non-base sector.

According to the shift-share method, a sector is said to be leading if the sum of the proportional shift and differential shift is positive. The proportionality shift symbolizes the sectoral potential of the region, and the differential shift shows the special potential of the region.

To determine the shift-share value for each sector, Equations 2–5 are used:

$$D_{ij} = N_{ij} + M_{ij} + C_{ij} \quad (2)$$

$$N_{ij} = Ra \cdot Y_{ij} \quad (3)$$

$$M_{ij} = (Ri - Ra) \cdot Y_{ij} \quad (4)$$

$$C_{ij} = (ri - Ri) \cdot Y_{ij} \quad (5)$$

**Information:**

$D_{ij}$  = shift-share value.

$N_{ij}$  = regional share.

$M_{ij}$  = proportionality shift.

$C_{ij}$  = differential shift.

While  $Ra$ ,  $Ri$ , and  $ri$  can be determined by the Equations 6–8 :

$$Ra = \frac{Y' - Y}{Y} \quad (6)$$

Where:

$Y'$  = GRDP of West Sumatra year end (2020).

$Y$  = West Sumatra GRDP in early 2011.

$$Ri = \frac{Y'_i - Y_i}{Y_i} \quad (7)$$

Where:

$Y'_i$  = GRDP sector  $i$  West Sumatra year end (2020).

$Y_i$  = GRDP sector  $i$  West Sumatra in early (2011).

$$ri = \frac{Y'_{ij} - Y_{ij}}{Y_{ij}} \quad (8)$$

Where:

$Y'_{ij}$  = GRDP sector i Kepulauan Mentawai Regency final year (2020).

$Y_{ij}$  = GRDP sector i Kepulauan Mentawai Regency early year (2011).

The growth ratio method (GRM) approach is divided into two ratios, namely the growth ratio of the reference area (GRRR), and the growth ratio of the study area (GRSA). The GRRR in this study compares the GRDP growth of sector i in the reference area (West Sumatra) with the GRDP growth of the reference area. The GRRR is calculated in Equation 9:

$$GRRR = \frac{Y'_i - Y_i / Y_i}{Y' - Y / Y} \quad (9)$$

Information:

$Y'_I$  = GRDP sector i West Sumatra year end (2020).

$Y_i$  = GRDP sector i West Sumatra in early (2011).

$Y'$  = West Sumatra GRDP at the end of the year (2020).

$Y$  = West Sumatra GRDP in early 2011.

If the GRRR value is  $\geq 1$  or positive (+), it means that the growth of sector i in West Sumatra is higher than the total GRDP growth in West Sumatra. If the GRRR value  $< 1$  or negative (-), it means that the growth of sector i in West Sumatra is smaller than the total GRDP growth in West Sumatra.

GRSA in this study is a comparison between sector i GRDP growth in the study area (Kepulauan Mentawai Regency) and sector i GRDP growth in the reference area (West Sumatra). The GRSA calculation is shown in Equation 10:

$$GRSA = \frac{Y'_{ij} - Y_{ij} / Y_{ij}}{Y'_i - Y_i / Y_i} \quad (10)$$

Information:

$Y'_{ij}$  = GRDP sector i Kepulauan Mentawai Regency final year (2020).

$Y_{ij}$  = GRDP sector i Kepulauan Mentawai Regency early year (2011).

$Y'_i$  = GRDP sector i West Sumatra year end (2020).

$Y_i$  = GRDP sector i West Sumatra in early (2011).

If the value of GRSA  $\geq 1$  or positive (+), it means that the growth of sector i in the Kepulauan Mentawai Regency is higher than the growth of sector i in West Sumatra. If the value of GRSA  $< 1$  or negative (-), it means that the growth of sector i in the Kepulauan Mentawai Regency is lower than the growth of sector i in West Sumatra.

The results of this GRM analysis can be classified as follows:

1. Classification 1: the GRRR (+) and GRSA (+) values indicate that the sector, both at the provincial and district/city levels, has a dominant growth. This activity is hereinafter referred to as dominant growth.
2. Classification 2: the GRRR (-) and GRSA (+) values indicate that the sector at the provincial level shows non-dominant growth, while at the district/city level it is dominant.
3. Classification 3: the GRRR (+) and GRSA (-) values indicate that the sector at the provincial level shows dominant growth, but not at the district/city level.
4. Classification 4: the GRRR (-) and GRSA (-) values indicate that the sector, both at the provincial and district/city levels, has non-dominant growth.

### 2.1. Analysis Overlays

This is intended to determine potential economic sectors or activities based on growth criteria and contribution criteria by combining the results from the location quotient (LQ) and the growth ratio method (GRM). However, the GRM only uses the GRSA component.

This method has four classifications, namely:

1. Classification 1: if the LQ and GRSA of a sector are positive (+), then this sector can be said to be a very dominant sector both in terms of contribution and growth.
2. Classification 2: if a sector's LQ is negative (-) but the GRSA is positive (+) then this sector can be said to have a small contribution but dominant growth.
3. Classification 3: if the LQ of a sector is positive (+) but the GRSA is negative (-) then this sector can be said to have a dominant contribution but small growth.
4. Classification 4: if a sector has a negative contribution (-) and growth (-) this shows that the sector has no potential.

### 3. RESULTS AND DISCUSSIONS

Table 2 shows the calculation results of determining the leading sector of the Kepulauan Mentawai Regency based on the Klassen Typology approach. These results are obtained by averaging the growth and contribution of each sector to the GRDP of the Kepulauan Mentawai Regency from 2011–2020.

**Table 2.** Calculation results of growth and contribution of the development sector in Kepulauan Mentawai Regency from 2011–2020.

No.	Sector	Growth (%)	Contribution (%)
1	Agriculture, forestry and fisheries	3.72	48.86
2	Mining and excavation	3.12	1.69
3	Processing industry	2.68	3.36
4	Electricity and gas supply	6.94	0.02
5	Water supply, waste management, waste and recycling	8.28	0.00
6	Construction	7.54	11.90
7	Wholesale and retail trade; car and motorcycle repair	6.00	12.69
8	Transportation and warehousing	2.94	9.55
9	Provision of accommodation and food and drink	5.70	0.63
10	Information and communication	9.20	1.03
11	Financial services and insurance	4.36	0.12
12	Real estate	4.55	0.94
13	Company services	6.02	0.05
14	Government administration, defense and mandatory social security	4.66	6.81
15	Education services	8.21	0.99
16	Health services and social activities	7.16	0.60
17	Other services	5.75	0.75
	Average	5.70	5.88

From the results of these calculations, two sectors were found to be in Quadrant I, or sectors that are categorized as “advanced” (see Table 3). These sectors are categorized as advanced because they have above average growth and contribution. These sectors are: 1) construction, and 2) wholesale and retail trade, and car and motorcycle repair. There are three sectors in Quadrant II, or sectors that are categorized as “developing”. This sector is categorized as developing because the growth of this sector is below the average, while the contribution of this sector to the GRDP of the Kepulauan Mentawai Regency is above the average. These sectors are: 1) agriculture, forestry, and fisheries, 2) transportation and warehousing, and 3) government administration, defense and mandatory social security. There are eight sectors in Quadrant III, or sectors that are categorized as having potential. These sectors have potential because they have above-average growth but their contribution is below the average. These sectors are: 1) electricity and gas procurement, 2) water supply, waste management, waste and recycling, 3) accommodation and food and drink provision, 4) information and communication, 5) enterprise services, 6) educational services, 7) health services and social activities, and 8) other services. There are four sectors in Quadrant IV that are categorized as underdeveloped. These sectors are categorized as underdeveloped because



their growth is below average. These sectors are: 1) mining and quarrying, 2) manufacturing industry, 3) financial services and insurance, and 4) real estate.

Therefore, based on the results of the Klassen Typology calculation, the two sectors in Quadrant I (categorized as advanced) are the leading sectors in the Kepulauan Mentawai Regency. The two leading sectors, if considered, include the secondary sector.

In other words, the economic sector of the Kepulauan Mentawai Regency is dominated by secondary sectors.

**Table 3.** Classification of development sectors in Kepulauan Mentawai Regency based on the Klassen typology method from 2011–2020.

<b>Growth</b> <b>Contribution</b>	<b>Growth above average (<math>s_i &gt; s</math>)</b>	<b>Growth below average (<math>s_i &lt; s</math>)</b>
Above average Contribution ( $s_{ki} > k$ )	1. Construction 2. Wholesale and retail trade; car and motorcycle repair Leading Sector	1. Agriculture, forestry and fisheries 2. Transportation and warehousing 3. Government administration, defense and mandatory social security Stagnant Sector
Below average Contribution ( $s_{ki} < k$ )	1. Electricity and gas supply 2. Water supply, waste management, waste and recycling 3. Provision of accommodation and food and drink 4. Information and communication 5. Company services 6. Education services 7. Health services and social activities 8. Other services Developing Sector	1. Mining and excavation 2. Processing industry 3. Financial services and insurance 4. Real estate Underdeveloped Sector

This means that the dominant sector in the Kepulauan Mentawai Regency based on the Klassen Typology method is the secondary sector, especially construction, as well as wholesale and retail trade, and car and motorcycle repair. The area of the Kepulauan Mentawai Regency, which reaches 6,011.35 km<sup>2</sup>, or about 14.31% of the total area of West Sumatra, makes transportation and trade activities high in the area due to high demand. That's why this sector has high growth from year to year and has resulted in the greater contribution of this sector to the economy of the Kepulauan Mentawai Regency.

Satrianto and Sasongko (2019); Basuki and Utari (2009); Amalia (2012); Tristanto and Afrendi (2013); Hajeri and Dolorosa (2015); Mangilaleng et al. (2015); Hariyanti and Utha (2016); Kharisma and Hadiyanto (2018) also found that there are sectors that are included in the four quadrants based on the Klassen Typology method. As Basuki and Utari (2009) showed, there is one sector in Quadrant I as a leading sector. Hajeri and Dolorosa (2015) followed the same method and determined the leading sector in Kubu Raya Regency. Based on the Klassen Typology, there are three sectors in Quadrant I, which are referred to as superior sectors.

The Klassen typology has been widely used by previous researchers in determining the leading sector in an area. However, this method contains a weakness because it only looks at the determination of the leading sector based on the growth criteria and the output contribution in the same area. Therefore, a combination is needed to determine the same leading sector in an area based on other methods.

Table 4 shows the calculation results of the LQ method. It can be seen that there are three sectors that are categorized as leading sectors and 14 sectors that are categorized as non-leading sectors. These three sectors are categorized as leading sectors because they have an LQ value greater than 1. This means that these sectors have a greater role than the same sector at the West Sumatra Province level. These sectors are: 1) agriculture, forestry, and fisheries, 2) construction, and 3) government administration, defense and mandatory social security.

**Table 4.** Average LQ value of each development sector in the Kepulauan Mentawai Regency from 2011–2020.

No.	Sector	Average LQ	Criteria
1	Agriculture, forestry and fisheries	2.08	Leading Sector
2	Mining and excavation	0.39	Non-Leading Sector
3	Processing industry	0.31	Non-Leading Sector
4	Electricity and gas supply	0.23	Non-Leading Sector
5	Water supply, waste management, waste and recycling	0.04	Non-Leading Sector
6	Construction	1.35	Leading Sector
7	Wholesale and retail trade; car and motorcycle repair	0.81	Non-Leading Sector
8	Transportation and warehousing	0.84	Non-Leading Sector
9	Provision of accommodation and food and drink	0.61	Non-Leading Sector
10	Information and communication	0.15	Non-Leading Sector
11	Financial services and insurance	0.04	Non-Leading Sector
12	Real estate	0.48	Non-Leading Sector
13	Company services	0.11	Non-Leading Sector
14	Government administration, defense and mandatory social security	1.18	Leading Sector
15	Education services	0.27	Non-Leading Sector
16	Health services and social activities	0.44	Non-Leading Sector
17	Other services	0.46	Non-Leading Sector

Meanwhile, there are 14 non-leading sectors that have an average LQ value from 2011–2020 that is smaller than 1. This means that these sectors have a smaller role compared to the same sector in the province of West Sumatra. These sectors are: 1) mining and quarrying, 2) processing industry, 3) electricity and gas procurement, 4) water supply, waste management, waste and recycling, 5) wholesale and retail trade; car and motorcycle repair, 6) transportation and warehousing, 7) accommodation and food and drink, 8) information and communication, 9) financial and insurance services, 10) real estate, 11) corporate services, 12) educational services, 13) health services and social activities, and 14) other services.

Based on the LQ method, it can be seen that the number of basic sectors in the Kepulauan Mentawai Regency is much lower than the non-leading sectors. It was recorded from the calculation results that there were only three basic sectors in the Kepulauan Mentawai Regency. These sectors are: 1) agriculture, forestry, and fisheries, 2) construction, and 3) government administration, defense and mandatory social security. These sectors are also the leading sectors in the Kepulauan Mentawai Regency. They are also called the basic or superior sectors because these three sectors play a greater role in the economy of the Kepulauan Mentawai Regency compared to the role of the same sectors in the economy of the province of West Sumatra.

If viewed in more detail, the three leading sectors according to the LQ method consist of the primary, secondary and tertiary sectors. The primary sectors are agriculture, forestry, and fisheries. The secondary sector is construction. The tertiary sector is government administration, defense and mandatory social security. This means that, according to the LQ method, the leading sectors in the Kepulauan Mentawai Regency are each contributed to by the primary, secondary and tertiary sectors. This is because the increasingly dynamic economic development of the Kepulauan Mentawai Regency makes the community's economic activities more diverse. This is also evident from the high role of these three sectors in the economy of the Kepulauan Mentawai Regency.

Islam et al. (2016) used the location quotient (LQ) method in six regions in Bangladesh, including Barisal, Chittagong, Dhaka, Khulna, Rajshahi and Sylhet.

The results showed that, in the Barisal region, the basic sectors are agriculture and forestry, fisheries, mining and quarrying, education, health and social activities. Chittagong's basic sectors are fisheries, mining and quarrying, manufacturing, hotels and restaurants, communication and information, health and social activities. Dhaka's basic sectors are manufacturing, electricity, gas and water, wholesale and retail trade, public administration and defense. Khulna's basic sectors include agriculture and forestry, fisheries, construction, hotels and restaurants, education, community and personal services.

Rajshahi's basic sectors include agriculture and forestry, construction, housing, education, health and social activities. Sylhet's basic sectors include agriculture and forestry, fisheries, mining and quarrying, electricity, gas and water, construction and health.

The LQ is the method most used by previous researchers in determining the leading sector in an area because this method compares the GRDP value of sector  $i$  in an area with the same sector in the area above it. However, this method also contains a weakness because it only compares the GRDP value of sector  $i$  in an area with the same sector in the area above it. For this reason, it is necessary to determine the leading sector with other methods and confirm which leading sectors are the same.

The results of the shift-share calculation for each development sector in the Kepulauan Mentawai Regency from 2011–2020 can be seen in Table 5. In the table, it can be seen that the highest regional share ( $N_{ij}$ ) values are in the agriculture, forestry, and fisheries sectors.

The  $N_{ij}$  value of this sector is 534,006.04 million rupiah. This means that changes in production in this sector are caused by the highest contributions from production in West Sumatra compared to production in other sectors in the Kepulauan Mentawai Regency. The largest proportionality shift ( $M_{ij}$ ) value is in the construction sector with a value of 53,068.47 million rupiah.

This means that the change in production in this sector compared to the total production of each sector in West Sumatra is the highest compared to other sectors in the Kepulauan Mentawai Regency. Meanwhile, the highest differential shift ( $C_{ij}$ ) value is also in the agriculture, forestry and fisheries sectors, with a value of 50,445.13 million rupiah. This means that the highest special potential of the Kepulauan Mentawai Regency is in the agriculture, forestry, and fisheries sectors.

There are 10 leading sectors in the Kepulauan Mentawai Regency according to the shift-share method. These are leading sectors because they have a total proportional shift ( $M_{ij}$ ) and a differential shift ( $C_{ij}$ ) that are positive. The sum of these two components is a combination of regional sectoral potential and regional special potential. These sectors are: 1) electricity and gas procurement, 2) water supply, waste management, waste and recycling, 3) construction, 4) wholesale and retail trade; repair of cars and motorcycles, 5) provision of accommodation and food and drink, 6) information and communication, 7) corporate services, 8) educational services, 9) health services and social activities, and 10) other services.

If viewed in detail, these 10 sectors include the secondary and tertiary sectors. The six secondary sectors are: 1) electricity and gas procurement, 2) water supply, waste, waste and recycling management, 3) construction, 4) wholesale and retail trade; repair of cars and motorcycles, 5) provision of accommodation and food and drink, 6) information and communication.

The four tertiary sectors include: 1) corporate services, 2) education services, 3) health services and social activities, and 4) other services.

It can be seen from these results that the sectors with potential and the highest regional special potential contribute to the secondary and tertiary sectors. Meanwhile, the province of West Sumatra is still the highest contributor to production in the primary sector. This is due to the development and the shift in community economic activity, which has made the economy of the Kepulauan Mentawai Regency more dynamic. The low return from the primary sector makes people switch to developing the secondary and tertiary sectors. These sectors bring in high returns that bring prosperity. This can be seen from the increasing changes in this sector from year to year.

For Bangladesh, Islam et al. (2016) used the shift-share method. In the Barisal region, the leading sectors were found to be fisheries, construction, wholesale and retail trade. Meanwhile, in the Dhaka region, the leading sectors consisted of manufacturing, construction, wholesale and retail trade, hotels and restaurants, communications and information, financial intermediaries, public administration and defense.

**Table 5.** The shift-share component value of each development sector in Kepulauan Mentawai Regency from 2011–2020 (million Rupiah).

No.	Sector	Nij	Mij	Cij	Mij + Cij
1	Agriculture, forestry and fisheries	534,006.04	-191,468.52	50,445.13	-141,023.39
2	Mining and excavation	18,391.91	-4,246.75	-3,009.42	-7,256.17
3	Processing industry	36,439.27	-19,061.72	-910.66	-19,972.39
4	Electricity and gas supply	210.27	22.85	102.29	125.13
5	Water supply, waste management, waste and recycling	33.36	-6.35	39.42	33.07
6	Construction	105,797.47	53,068.47	30,298.32	83,366.78
7	Wholesale and retail trade; car and motorcycle repair	123,804.73	28,490.98	13,368.60	41,859.58
8	Transportation and warehousing	97,909.26	-7,377.54	-58,436.35	-65,813.89
9	Provision of accommodation and food and drink	6,057.23	-355.88	1,653.81	1,297.93
10	Information and communication	8,951.53	12,195.04	453.90	12,648.95
11	Financial services and insurance	1,232.77	-141.13	-41.31	-182.44
12	Real estate	9,761.74	-89.03	-60.68	-149.70
13	Company services	437.01	9.93	112.71	122.65
14	Government administration, defense and mandatory social security	73,365.95	-23,853.23	15,764.03	-8,089.21
15	Education services	8,868.92	7,967.65	812.10	8,779.75
16	Health services and social activities	5,663.88	5,156.48	-1,250.28	3,906.20
17	Other services	7,178.79	1,605.81	90.21	1,696.03

The results of the GRM calculation are shown in Table 6. These results show that there are five sectors with positive GRRA and GRSA values (+). This means that these sectors have potential both at the provincial level and at the district/city level because they have a growth value that stands out from other economic sectors. These sectors are: 1) Electricity and gas procurement, 2) construction, 3) enterprise services, 4) educational services, and 5) other services.

There are the sectors with positive GRRA values (-) and negative GRSA (+). This condition means that the growth of this sector at the provincial level is lower than the growth of the total GRDP of the province, but this sector has growth at the regional level, which is higher than the growth of the same sector at the provincial level. This means that the sector at the provincial level shows non-dominant growth, while at the district/city level it is dominant. These sectors are: 1) agriculture, forestry, and fisheries, 2) mining and quarrying, and 3) government administration, defense and mandatory social security.

There are three sectors with a positive GRRA value (+) and a negative GRSA value (-). This condition indicates that the growth of this sector at the provincial level is higher than the growth of the total GRDP of the province, but this sector has growth at the regional level, which is lower than the growth of the same sector at the provincial level. In other words, these sectors have potential at the provincial level but not yet at the district/city level. These sectors are: 1) wholesale and retail trade; repair of cars and motorcycles, 2) transportation and warehousing, and 3) provision of accommodation, and food and drink.

Furthermore, as seen in Table 6, there are six sectors with negative GRRA and GRSA values (-). This means that this is a sector lacks potential because the growth value is equally negative at the provincial and district/city levels.

These sectors are: 1) processing industry, 2) water supply, waste management, waste and recycling, 3) information and communication, 4) financial and insurance services, 5) real estate, and 6) health services and social activities. The division of development sectors according to the Kepulauan Mentawai Regency GRM from 2011–2020 is shown in quadrant form in Table 7.

When viewed in detail, these leading sectors include the secondary sector and the tertiary sector. This secondary sector or industrial sector consists of two sectors, namely 1) electricity and gas procurement, and 2) construction.

The tertiary sector, or service sector, consists of three sectors, namely 1) corporate services, 2) educational services, and 3) other services. This is because the Kepulauan Mentawai Regency is an area that has experienced development, and a shift in economic activity has made the community more dynamic. Dynamic developments have enabled people to develop economic activities that have higher returns. This higher return of economic activity was created in the secondary and tertiary sectors. Therefore, these sectors have developed in the last ten years.

**Table 6.** GRM calculation results for development sector Kepulauan Mentawai Regency from 2011-2020.

No.	Sector	GRR		GRSA	
		Score	Sign	Score	Sign
1	Agriculture, forestry and fisheries	0.50	-	1.30	+
2	Mining and excavation	0.80	-	1.10	+
3	Processing industry	0.50	-	0.78	-
4	Electricity and gas supply	1.48	+	1.32	+
5	Water Supply, waste management, waste and recycling	0.82	-	0.53	-
6	Construction	1.43	+	1.13	+
7	Wholesale and retail trade; car and motorcycle repair	1.10	+	0.95	-
8	Transportation and warehousing	2.19	+	0.99	-
9	Provision of accommodation, and food and drink	2.15	+	0.97	-
10	Information and communication	0.86	-	1.00	-
11	Financial services and insurance	0.72	-	0.79	-
12	Real estate	0.81	-	0.90	-
13	Company services	1.18	+	1.01	+
14	Government administration, defense and mandatory social security	0.77	-	4.09	+
15	Education services	1.01	+	1.04	+
16	Health services and social activities	0.70	-	0.90	-
17	Other services	1.85	+	1.00	+

Note: GRR (+) if score  $\geq 1$ , GRR (-) if score  $< 1$ , GRSA (+) if score  $\geq 1$ , GRSA (-) if score  $< 1$ .

Supriadi (2022) conducted research in Tasikmalaya with growth ratio method. The results showed that there were five sectors in the first classification. The values of GRSA and GRR were more than one, indicating that at the city and provincial levels, these sectors had the same potential.

These sectors consisted of construction, provision of accommodation, food and beverages, health services and social activities, housing and other sectors. In the second classification, the GRSA value was more than one and the GRR was less than one, indicating that the sector was prominent at the city level.

**Table 7.** Division classification of the GRM development sectors in Kepulauan Mentawai Regency from 2011-2020.

GRSA \ GRR	GRR (+)	GRR (-)
	GRSA (+)	1. Electricity and gas procurement 2. Construction 3. Company services 4. Education services 5. Other services <i>Classification 1</i>
GRSA (-)	1. Wholesale and retail trade; car and motorcycle repair 2. Transportation and warehousing 3. Provision of accommodation and food and drink <i>Classification 3</i>	1. Processing industry 2. Water supply, waste management, waste and recycling 3. Information and communication 4. Financial services and Insurance 5. Real estate 6. Health services and social activities <i>Classification 4</i>

Note: GRR (+) if score  $\geq 1$ , GRR (-) if score  $< 1$ , GRSA (+) if score  $\geq 1$ , GRSA (-) if score  $< 1$ .

Table 8. Development sector overlay calculation results for Kepulauan Mentawai Regency from 2011–2020.

No.	Sector	LQ		GRSA	
		Score	Sign	Score	Sign
1	Agriculture, forestry and fisheries	2.08	+	1.30	+
2	Mining and excavation	0.39	-	1.10	+
3	Processing industry	0.31	-	0.78	-
4	Electricity and gas supply	0.23	-	1.32	+
5	Water Supply, waste management, waste and recycling	0.04	-	0.53	-
6	Construction	1.35	+	1.13	+
7	Wholesale and retail trade; car and motorcycle repair	0.81	-	0.95	-
8	Transportation and warehousing	0.84	-	0.99	-
9	Provision of accommodation and food and drink	0.61	-	0.97	-
10	Information and communication	0.15	-	1.00	-
11	Financial services and insurance	0.04	-	0.79	-
12	Real estate	0.48	-	0.90	-
13	Company services	0.11	-	1.01	+
14	Government administration, defense and mandatory social security	1.18	+	4.09	+
15	Education services	0.27	-	1.04	+
16	Health services and social activities	0.44	-	0.90	-
17	Other services	0.46	-	1.00	+

Note: LQ (+) if score  $\geq 1$ , LQ (-) if score  $< 1$ , GRSA (+) if score  $\geq 1$ , GRSA (-) if score  $< 1$ .

These sectors consisted of manufacturing industry, wholesale and retail trade, car and motorcycle repair, transportation and trade, corporate services, government administration, defense and social security. In the third classification, the GRSA value was less than one and the GRRA value was more than one, indicating that the sector stands out at the provincial level. These sectors comprise water supply, sewage treatment, waste and recycling, information and communication, and education services. In the fourth classification, the GRSA value was less than one and the GRRA value was less than one, indicating that there are certain sectors that are more prominent, but not too dominant. These sectors consist of agriculture, forestry and plantations, mining and quarrying, electricity and gas, as well as financial services and insurance.

From the results of the overlay analysis in Table 8, there are three sectors with positive LQ (+) values and a positive GRSA (+). This condition means that there are three dominant sectors that contribute to the GRDP of the Kepulauan Mentawai Regency, and their growth is high. These sectors are: 1) agriculture, forestry, and fisheries, 2) construction, and 3) government administration, defense and mandatory social security.

Meanwhile, there are five sectors with negative LQ values (-) and a positive GRSA (+) value. This means that these sectors have a small contribution to the GRDP of the Kepulauan Mentawai Regency but the growth is large. These sectors are: 1) mining and quarrying, 2) electricity and gas procurement, 3) enterprise services, 4) educational services, and 5) other services.

There is no sector in the Kepulauan Mentawai Regency with a positive LQ value (+) and a negative GRSA value (-). This means that there are no sectors in the Kepulauan Mentawai Regency whose contribution is large but the growth is small.

On the other hand, there were nine sectors with negative LQ and GRSA values. These sectors had no potential because their growth and their contribution to GRDP were very low. These sectors are: 1) processing industry, 2) water supply, waste management, waste and recycling, 3) wholesale and retail trade; repair of cars and motorcycles, 4) transportation and warehousing, 5) provision of accommodation and food and drink, 6) information and communication, 7) financial and insurance services, 8) real estate, and 9) health services and social activities. In the form of a quadrant, the division of the development sectors of the Kepulauan Mentawai Regency from 2011–2020 based on the overlay method is shown in Table 9.

Table 9. Development sector overlay classification division in Kepulauan Mentawai Regency from 2011–2020

GRSA \ LQ	LQ (+)	LQ (-)
GRSA (+)	1. Agriculture, forestry and fisheries 2. Construction 3. Government administration defense and mandatory social security <i>Classification 1</i>	1. Mining and excavation 2. Electricity and gas procurement 3. Company services 4. Education services 5. Other services <i>Classification 2</i>
GRSA (-)	<i>Classification 3</i>	1. Processing industry 2. Water supply, waste management, Waste and recycling 3. Wholesale and retail trade; car and motorcycle repair 4. Transportation and warehousing 5. Provision of accommodation and food and drink 6. Information and communication 7. Financial services and insurance 8. Real estate 9. Health services and social activities <i>Classification 4</i>

Note: LQ (+) if score  $\geq 1$ , LQ (-) if score  $< 1$ , GRSA (+) if score  $\geq 1$ , GRSA (-) if score  $< 1$ .

From the calculation results of the leading sectors in the Kepulauan Mentawai Regency based on the overlay method, there were four sectors with positive LQ and GRSA values. This means that these sectors had dominant contribution and growth compared to other sectors in the Kepulauan Mentawai Regency. These sectors are: 1) agriculture, forestry and fisheries, 2) construction, and 3) government administration, defense and mandatory social security. Thus, these sectors should be prioritized by the Kepulauan Mentawai Regency government for future development.

Furthermore, these sectors included the primary, secondary and tertiary sectors. The primary sector was agriculture, forestry and fisheries. The secondary sector was construction. The tertiary sector was government administration, defense and mandatory social security. According to the overlay method, the leading sectors in this area were in the primary, secondary and tertiary sectors. This is because the increasingly dynamic economic development of the Kepulauan Mentawai Regency made the community's economic activities more diverse. This is also evident from the high role of these three sectors in the economy of the Kepulauan Mentawai Regency.

Supriadi (2022) conducted research in Tasikmalaya with the overlay method. The results showed that in the first classification, the GRSA and GRRR values were positive. These sectors include construction, the provision of accommodation and food and beverages, housing, health services and social activities, and other services. The five sectors had high growth and a greater contribution in Tasikmalaya compared to the province of West Java. This showed that the sector was competitive because it had advantages at the city and provincial levels and must be developed. The second classification was the sector with a negative GRRR value and positive LQ and GRSA values. These sectors consisted of the wholesale and retail trade sector, repair of cars and motorcycles, the field of transportation and warehousing, the field of corporate services, and the field of government administration, defense and compulsory social security. This sector can be interpreted as having low sectoral growth in West Java but high sectoral growth and contribution in Tasikmalaya. It can be said that this sector is a specialization of economic activity in Tasikmalaya. This sector had low growth compared to the total GRDP growth of West Java. The third classification with negative LQ, GRSA and GRRR values, consisted of agriculture, forestry, and fishery sectors, mining and quarrying, and electricity and gas procurement. These three sectors may have low sectoral growth in both Tasikmalaya and the province of West Java. These sectors had a lower contribution in Tasikmalaya than in

West Java. It can be concluded that the two industries have low competitiveness because they do not have advantages both in Tasikmalaya and in West Java, and thus are included in the sector that does not have a competitive advantage.

From the five methods used to determine the leading sectors in the Kepulauan Mentawai Regency in the previous section, it can be identified that there was one sector that is the same or intersects. In other words, there was one sector that consistently appeared in the determination of the leading sector in each method. This sector was construction.

This intersecting sector can also be called the flagship sector, which can be relied on for economic progress and development in the Kepulauan Mentawai Regency. This is because it was selected as the best in determining the leading sector to overcome the weaknesses in the Klassen Typology, LQ, shift-share, growth ratio and overlay methods. With the success of this sector being identified as a mainstay leading sector, it means that the construction sector of Mentawai Island Regency can increase the development progress of the Kepulauan Mentawai Regency with the best contribution and growth. For this reason, the Kepulauan Mentawai Regency government must have a commitment to develop this sector in the future. In addition, the local government of the Kepulauan Mentawai Regency should improve the performance of each sector, and many leading sectors will emerge as a result.

## 4. CONCLUSION AND RECOMMENDATION

### 4.1. Conclusion

Construction was found to be the superior sector that was common among all five methods. This sector was in Quadrant I of the Klassen Typology, it was the leading sector according to the LQ method, it had a positive sum of  $M_{ij}$  and  $C_{ij}$  according to the shift-share calculation, it had a positive GRRA and GRSA according to the GRM method, and it had positive LQ and GRSA values based on the overlay method.

### 4.2. Recommendations

Based on the results, this research can provide suggestions as follows:

1. The regional government of the Kepulauan Mentawai Regency must commit to developing this sector in the future as a mainstay leading sector in the economic development of the region.
2. The regional government should prioritize development in this flagship sector because this sector has a high contribution and growth to the GRDP of the Kepulauan Mentawai Regency. This policy can be implemented by increasing investment and facilitating business licensing in these sectors, thus their role and contribution to the economy of the Kepulauan Mentawai Regency can continue to increase. This situation does not ignore development in other sectors.
3. In addition, the local government of the Kepulauan Mentawai Regency should improve the performance of each sector, which will result in the emergence of many leading sectors. With the increasing number of these sectors, it is expected that the Kepulauan Mentawai Regency can eradicate the clustering of underdeveloped areas in Indonesia.

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