International Journal of Economic, Technology and Social Sciences
url:https://jurnal.ceredindonesia.or.id/index.php/ injects
Volume 7 Number 1 pages 129- 146 2026

Blue Economy and Regional Economic Growth: Evidence from the Competitiveness of Local Marine Products in Simeulue Regency, Indonesia

Rita Handayani1*, Hastina Febriaty, EE Danil[3]
Universitas Sumatera Utara
Universitas Muhammadiyah Sumatera Utara
E-mail: ritahandayani@usu.ac.id

ABSTRACT

This study aims to analyze the role of the local marine product sector as a driver of economic growth in Simeulue Regency and formulate a direction for sustainable Blue Economy development. The study uses a quantitative approach with the Location Quotient (LQ) method to identify base sectors and Shift-Share to analyze the competitiveness and growth dynamics of the marine sector during the 2013–2023 period. The results show that the marine sector is the engine of economic growth in Simeulue Regency. The LQ analysis shows that aquaculture is a base sector that has a significant contribution to the regional economy, while the Shift-Share analysis shows that capture fisheries have a higher competitive advantage than the average in Aceh Province. However, the aquaculture sector still requires technological modernization to improve regional competitiveness. Policy implications emphasize the importance of strengthening the Blue Economy through increased investment in aquaculture technology, development of a circular bioeconomy, coastal ecosystem conservation through a blue carbon strategy, increasing human resource capacity, and implementing a Social License to Operate to strengthen community participation. Synergy between economic growth, social inclusion, and environmental sustainability is a key prerequisite for increasing the added value of the marine sector, creating jobs, and encouraging inclusive and sustainable regional economic growth.

Keywords: *Blue Economy; Local Marine Products; Location Quotient; Shift-Share; Regional Competitiveness; Simeulue Regency..*

INTRODUCTION

Indonesia, as an archipelagic nation with abundant marine biodiversity, has the fundamental capital to position the marine sector as a pillar of the national economy. In global discourse, marine space management is now shifting toward the concept of a Blue Economy. As emphasized in the sources, a Blue Economy is defined as the sustainable use of marine resources for economic growth, improved livelihoods, and employment while maintaining the health of marine ecosystems (World Bank, 2017; Wang & Yu, 2025). With an estimated global economic value of $2.5 trillion annually, this sector offers massive investment opportunities in the development of modern marine infrastructure (Cakmak et al., 2026).

International Journal of Economic, Technology and Social Sciences
url:https://jurnal.ceredindonesia.or.id/index.php/ injects
Volume 7 Number 1 pages 129- 146 2026

The implementation of the Blue Economy is not solely profit-oriented but also focuses on strengthening community resilience to the impacts of climate change. One such instrument is the use of Blue Carbon. Blue Carbon, or the preservation and enhancement of marine and coastal ecosystems for carbon sequestration, is considered a potentially cost-effective way to capture and store carbon (Sovacool et al., 2024). This effort includes protecting coral reefs, mangroves, and seagrass meadows, which serve as ecological buffers and absorb greenhouse gas emissions. Although the Blue Economy has significant potential to drive regional economic growth, a significant gap remains between the wealth of marine resources and the socio-economic conditions of coastal communities. Many coastal areas continue to face structural poverty despite their abundant marine resources. Recent literature also criticizes the Blue Economy agenda, which has the potential to replicate an unsustainable economic growth paradigm if it focuses more on resource exploitation than on equitable distribution of benefits (Antonova et al., 2025). Without inclusive and participatory governance, large-scale investments tend to only result in the extraction of economic value, disproportionately benefiting local communities. This situation risks deepening the marginalization of coastal communities and reducing the benefits of development for sustainable community well-being.

Simeulue Regency in Aceh Province is a region highly dependent on marine space and has the geostrategic potential to become a Blue Economy growth center due to its location directly bordering the Indian Ocean. This region is rich in marine biological resources, including high-value pelagic and demersal commodities, which are fundamental assets within a sustainable marine-based development framework. In the literature, the Blue Economy is defined as the sustainable use of marine resources for economic growth, improved livelihoods, and employment while maintaining the health of marine ecosystems (Wang & Yu, 2025) To achieve success, development in Simeulue must prioritize a Social License to Operate, defined as a sustainable, active relationship between the host community and the developer organization (Billing et al., 2022). This is crucial to ensuring that the development of commodities such as lobster, tuna, and aquaculture truly has a positive and multilayered impact on growth and macroeconomic conditions.

Significance of the Research Gap

The urgency of research in Simeulue Regency is based on the limited number of studies identifying the local marine product sector as a leading sector using a regional economic approach. Most previous studies have focused on marine resource potential, the Blue Economy concept, or coastal resource management, but have not empirically tested whether the marine product sector is a basic sector with a comparative advantage compared to Aceh Province. Furthermore, previous studies have not in-depth analyzed the growth dynamics of this sector to determine whether its growth is driven by the influence of regional economic growth, industrial structure, or regional competitive advantage. These limitations have resulted in the lack of an adequate empirical basis for determining priority sectors and the direction of marine economic development policy in Simeulue Regency.

International Journal of Economic, Technology and Social Sciences
url:https://jurnal.ceredindonesia.or.id/index.php/ injects
Volume 7 Number 1 pages 129- 146 2026

This study fills this gap by integrating Location Quotient (LQ) analysis to identify the local marine product sector as a base sector and Shift-Share analysis to evaluate the growth dynamics and competitiveness of the sector through the National Share, Industry Mix, and Regional Competitive Effect components. The combination of these two methods allows the identification not only of the leading sectors in the region but also the factors that shape their growth. Thus, this study provides more comprehensive empirical evidence as a basis for formulating Blue Economy development policies, increasing the competitiveness of the marine sector, optimizing the use of local resources, and accelerating inclusive and sustainable regi Urgency of Research

This research is very urgent to be conducted because Simeulue Regency is at a critical point in managing its natural resources amidst global economic dynamics, where the vulnerability of coastal communities' incomes to marine pollution is a real threat considering that research results show that marine pollution results in a significant negative causal effect on the per capita income of residents in coastal areas (Aparicio et al., 2024). To address this, a conservation strategy is needed that is integrated with the economy through blue carbon-based ecosystem management, namely the preservation and enhancement of marine and coastal ecosystems for carbon sequestration, considered a potentially cost-effective way to capture and store carbon (Sovacool et al., 2024).

Blue Economy development in Simeulue Regency is crucial to ensure that economic growth is aligned with social justice and environmental sustainability. Various studies have shown that the blue economy agenda risks replicating a growth paradigm that ignores the interests of local communities if not supported by a Social License to Operate through sustainable relationships between communities and developers. Furthermore, uncontrolled maritime economic activity can trigger marine ecosystem degradation, necessitating sectoral transformation that balances economic growth with environmental preservation. Optimization of basic sectors, particularly aquaculture, which boasts advantages based on Location Quotient (LQ) analysis, needs to be supported by innovations such as marine biorefineries to increase added value, strengthen coastal supply chains, and encourage job creation and a sustainable improvement in the Human Development Index.

Based on this background, this study focuses on identifying the strategic role of the local marine product sector in the economy of Simeulue Regency. The analysis was conducted to test whether the sector is a base sector compared to Aceh Province using the Location Quotient (LQ) method, and to analyze its growth dynamics using the Shift-Share method. The study also identified whether sector growth is more influenced by regional growth factors (national share), industrial structure (industry mix), or regional competitive advantage (regional competitive effect). The research results are expected to serve as a basis for formulating strategies for developing a more competitive, inclusive, and sustainable marine sector in Simeulue Regency.onal economic growth.

1. **Blue Economy Paradigm and Concept**

The Blue Economy has gained global attention as a strategy for integrating economic growth with the protection of maritime ecosystems. Conceptually, the Blue Economy is understood as the sustainable use of marine resources to drive

International Journal of Economic, Technology and Social Sciences
url:https://jurnal.ceredindonesia.or.id/index.php/ injects
Volume 7 Number 1 pages 129- 146 2026

economic growth, improve livelihoods, and create jobs while maintaining the health of marine ecosystems (World Bank, 2017; Wang & Yu, 2025). The economic value of this marine space is predicted to be enormous, with an estimated annual contribution of up to $2.5 trillion to the global economy (Cakmak et al., 2026).
However, recent literature also offers a critical assessment of the unlimited growth narrative. Scholars argue that the blue economy agenda is often criticized for replicating the same unlimited growth paradigm it seeks to correct, risking disenfranchisement of local communities (Antonova et al., 2025). Therefore, a shift towards a more diversified economy that prioritizes social needs and environmental restoration over profit-making is needed.

2. Sectoral Innovations: Aquaculture, Biorefinery, and Blue Carbon

The transformation of coastal economies is driven by innovations in marine biomass utilization. The aquaculture sector, for example, has now surpassed capture fisheries as the leading global provider of marine protein. The current focus is shifting toward circular sustainability through the concept of maritime biorefinery. This strategy is a multi-product pathway aimed at producing a variety of value-added materials for various industrial applications, such as food, animal feed, and bioplastics (Cakmak et al., 2026).
Furthermore, ecosystem management for climate change mitigation is a crucial pillar. The concept of Blue Carbon refers to the conservation and enhancement of marine and coastal ecosystems for carbon sequestration, considered a potentially cost-effective means of carbon capture and storage (Sovacool et al., 2024). Ecosystems such as mangrove forests, seagrass meadows, and macroalgae play a crucial role in absorbing carbon emissions while providing ecosystem services to coastal communities.

3. Social Dimension and Social License to Operate

In the implementation of blue economy projects, community acceptance is often a key determinant of success. One key instrument in maritime governance is obtaining a Social License to Operate (SLO), defined as a sustainable, active relationship between the host community and the developer organization (Billing et al., 2022). Without a robust SLO, investments in coastal areas risk triggering horizontal conflict and marginalization of local populations.
Human capacity building through social innovation is also a key focus. Models like the Social Innovation Living Lab offer a space for real-world users to engage in the design of adaptive blue economy solutions in real-world contexts (Ottaviani Aalmo, 2026). This aligns with findings that innovation pathways depend not only on technological capacity but also on relational trust and institutional coordination.

4. Economic Well-being, Labor, and Environmental Impact

There is a close relationship between the quality of human capital and regional economic productivity. Research shows that economic activities employing skilled labor provide higher wages than those employing less skilled workers (Borriello et al., 2025). Therefore, improving the Human Development Index (HDI) through fisheries technical education and training is crucial for reducing unemployment in coastal areas.
On the other hand, marine environmental degradation has been shown to have systemic negative economic impacts. Empirical studies have shown that marine

International Journal of Economic, Technology and Social Sciences
url:https://jurnal.ceredindonesia.or.id/index.php/ injects
Volume 7 Number 1 pages 129- 146 2026

pollution has a significant negative causal effect on per capita income at the local level (Aparicio et al., 2024). This gap demonstrates that environmental protection is not only an ecological issue but also a direct investment in the economic well-being of communities.

5. Financial Support and Economic Resilience

The resilience of coastal areas in the face of external shocks depends heavily on maritime financing mechanisms. Maritime financial support has been shown to significantly increase economic resilience and levels of sustainable development (Zhou et al., 2026). However, there is a threshold effect in this financial support: in the initial stages, funding serves to fill capital gaps. However, in later stages, the focus must shift to improving the quality of financial services and innovation (Zhou et al., 2026).

RESEARCH METHODOLOGY

The research aimed to analyze the dynamics of the maritime economy in Simeulue Regency using a structured scientific approach. To achieve this goal, the researchers developed a methodology that combined descriptive analysis with a quantitative approach to the Regional Economic Model, using the Location Quotient Analysis and Shift-Share Analysis.

1. Research Design and Type

This research fundamentally applies a descriptive framework with a quantitative approach to analyze and identify leading or base sectors using the Location Quotient Analysis and Shift-Share Analysis methods, to compare the Total Marine/Capture Fisheries Production Results in Simeulue Regency and fisheries production obtained from aquaculture activities. The descriptive approach is used to describe the objective conditions of observations through the presentation of data in the form of tables and graphs to facilitate the interpretation of research results. Meanwhile, the quantitative approach allows researchers to measure leading sectors and compare the Total Production Results.

2. Research Variables

Researchers use operationally measured variables to provide clear boundaries in the test, namely Local Marine Products include all marine products such as fish, shellfish, and mollusks and fishery production obtained from cultivation activities.

3. Data Sources and Research Period

This study relies on official secondary data from the Central Statistics Agency (BPS) covering a 10-year period (2014-2023). Data collection is limited due to the availability of published data only up to 2023. The use of time series data over a decade aims to capture long-term economic development trends in Simeulue.

4. Data Analysis Techniques

This methodology is very comprehensive because it combines the Location Quotient (LQ) analysis technique and Shift-Share Method Analysis.

4.1 Location Quotient (LQ) Analysis

This method is used to identify leading or base sectors. Location Quotient analysis is a comparison of sectors/industries in a region (province) to the magnitude of the role of those sectors/industries nationally (Aceh Province). An LQ value greater

International Journal of Economic, Technology and Social Sciences
International Journal of Economic, Technology and Social Sciences
url:https://jurnal.ceredindonesia.or.id/index.php/ injects
Volume 7 Number 1 pages 129- 146 2026

than 1 indicates that the sector is a base or leading sector in Simeulue Regency compared to the provincial average. (Putra, 2011)

$$LQ = \left(\frac{E_i}{E_t}\right)\left(\frac{N_i}{Nt}\right) \ldots\ldots (1)$$

Where Ei is the production of the fishery sector in Simeulue Regency, Et is the total production in Simeulue Regency, Ni is the production of the fishery sector in Aceh Province and Nt is the total production in Aceh Province, with a value of

LQ > 1: Leading sectors in Simeulue Regency.

LQ = 1: The sector is balanced with the average of Aceh Province and

LQ < 1: Sector is not superior.

4.2 Shift-Share Analysis Method

Shift-share analysis is used to compare the amount of marine/capture fisheries production obtained from marine activities in Simeulue Regency and fisheries production obtained from cultivation activities.*(Tarigan, 2014)*, whereas according to *(Sjafrizal, 2012)* The benefit of the Shift-Share Method is to identify the factors that influence and determine economic growth in a region. This objective can be met by identifying National Share, Industrial Mix, and Competitive Position. *(Putra, 2011)*This method aims to analyze the driving factors of regional economic growth by comparing the performance of fisheries production in the district to the province. A positive National Share value indicates that the sector contributes more to total production in Simeulue Regency compared to the proportion in Aceh Province. A positive Industrial Mix value indicates that the industrial structure in Simeulue Regency supports the growth of the sector. A positive Competitive Position value indicates that the sector is performing better than the national average, while a negative value indicates the opposite.

In general, total change is formulated

$$D_{ij} = E_{ij}^t - E_{ij}^0 \ldots.(2)$$

Description = change in sector value in the region, = sector value in the initial year and = sector value in the final year$D_{ij} ij E_{ij}^0 E_{ij}^t$

A. National Share (NS)

Measuring sector growth if it follows the economic growth rate of the reference region. $NS_{ij} = E_{ij}^0 \left(\frac{E_n^t - E_n^0}{E_n^0}\right)$ or $NS_{ij} = E_{ij}^0 \times r_n$ .....(3)

Description = total growth rate of the reference area (Aceh Province)r_n

B. Proportional Shift (PS) / Industry Mix (IM)

Measures whether the sector is growing faster or slower than the average of all sectors in the reference region.

$$PS_{ij} = E_{ij}^0 (r_i - r_n) \ldots\ldots..(4)$$

Description = growth rate of the fisheries sector in Aceh Province, = total growth rate of all sectors in Aceh Province, with a value$r_i r_n$

PS > 0 → sector is a fast growing sector

PS < 0 → sector grows slower than average.

International Journal of Economic, Technology and Social Sciences
url:https://jurnal.ceredindonesia.or.id/index.php/ injects
Volume 7 Number 1 pages 129- 146 2026

C. Differential Shift (DS) / Competitive Share (CS)

Measuring the competitiveness of sectors in the study area compared to the reference area.

$$DS_{ij} = E_{ij}^{0}(r_{ij} - r_i).....(5)$$

Description = growth rate of the fisheries sector in Simeulue Regency and = growth rate of the fisheries sector in Aceh Province, with a value$r_{ij}r_i$

DS > 0 → Simeulue Regency has a competitive advantage.

DS < 0 → lower competitiveness compared to Aceh Province.

The object of the study is the fisheries production of Simeulue Regency compared to Aceh Province, with the analysis area (j) of Simeulue Regency. The reference area (n) = Aceh Province, and Sector (i) = Fisheries (or separated into capture fisheries and aquaculture). With production data from 2014–2023, shift-share analysis can be conducted dynamically (year by year) or using two time points (e.g., 2014 as the base year and 2023 as the end year) to evaluate changes in the structure and competitiveness of the fisheries sector of Simeulue Regency against Aceh Province.

RESULTS AND DISCUSSION

1. Geostrategic Profile and Resource Modalities

This study begins by confirming that Simeulue Regency possesses a unique geostrategic position as an archipelago bordering the Indian Ocean. With over 100 small islands, Simeulue naturally relies heavily on the sea for its economy. According to 2023 data, capture fisheries production reached 18,677 tons, an increase from 18,056 tons the previous year. This places commodities such as tuna, skipjack, mackerel, and lobster as key pillars of the regional economy.

Figure 4.1 Map of Simeulue Regency

Theoretically, this potential aligns with the global Blue Economy, estimated at $2.5 trillion annually. However, this vast marine potential has not yet been fully translated into equitable prosperity in Simeulue, creating a paradox of prosperity in coastal areas.

Based on data from the Central Statistics Agency (2023), the population reached approximately 97–98 thousand people, with a slightly larger male population than female. During the 2019–2023 period, population dynamics showed moderate fluctuations. The population decreased from 94,200 in 2019 to 92,800 in 2020 (−1.49%), which was thought to be influenced by outmigration and the impact of

International Journal of Economic, Technology and Social Sciences
url:https://jurnal.ceredindonesia.or.id/index.php/ injects
Volume 7 Number 1 pages 129- 146 2026

the COVID-19 pandemic. Subsequently, the population increased to 97,100 in 2023, an increase of approximately 4.63% compared to 2020, indicating a recovery in socio-economic conditions and an increase in natural population growth at a relatively stable rate.

Table 1. Population and Macroeconomic Conditions of Simeulue (2019-2023)

Year	Population (people)	Economic growth (%)	HDI (%)
2019	91,000	4.1	65.70
2020	93,000	-0.5	66.03
2021	94,000	2.9	66.41
2022	96,000	3.8	67.27
2023	97,000	4.1	68.06

Source: Central Statistics Agency (BPS), processed 2025

During the 2019–2023 period, Simeulue Regency's macroeconomic and development indicators showed a relatively consistent upward trend, despite experiencing pressure due to the COVID-19 pandemic. Economic growth contracted from 4.10% in 2019 to -0.50% in 2020, a decrease of approximately 4.60 percentage points. This reflects the impact of the slowdown in economic activity during the pandemic. However, the recovery process is gradual, with growth increasing to 2.90% in 2021, then 3.80% in 2022, and reaching 4.10% in 2023, representing a cumulative increase of 4.60 percentage points compared to 2020. This improvement is supported by the performance of the agriculture, forestry, fisheries, and trade sectors, which are the main drivers of the regional economy.
Meanwhile, the quality of human development shows continuous improvement. The Human Development Index (HDI) increased from 65.70 in 2019 to 68.06 in 2023, representing an increase of 2.36 points (approximately 3.59%). This increase indicates progress in health, education, and the community's standard of living. Overall, developments in economic and social indicators indicate that Simeulue Regency is on a positive recovery path, although improving the quality of education, equitable infrastructure, and strengthening human resource capacity remain crucial prerequisites for achieving more inclusive and sustainable development.

In addition to macroeconomic and human development indicators, the potential of the marine and fisheries sector is also an important indicator in assessing the economic structure of Simeulue Regency. As an archipelago with abundant marine resources, the development of fisheries production reflects the sector's capacity to support regional economic growth and strengthen maritime economic competitiveness. Therefore, a comparative analysis of fisheries production in Simeulue Regency and Aceh Province is necessary to determine the relative position and contribution of each region to the fisheries economy at the provincial level. Data on the development of capture fisheries production, aquaculture, and total fisheries production in Simeulue Regency and Aceh Province during the 2014–2023 period are presented in Tables 2 and 3.

Table 2. Local Marine Products in Simeulue Regency in Tons

Year	Marine/Capture Fisheries Production	Aquaculture Production	Total fisheries production

International Journal of Economic, Technology and Social Sciences
url:https://jurnal.ceredindonesia.or.id/index.php/ injects
Volume 7 Number 1 pages 129- 146 2026

	Simeulue Regency	Simeulue Regency	Simeulue Regency
2014	4,235	650	4,885
2015	6,630	5,974	12,604
2016	13,965	14,653	28,618
2017	3,237	1,758	4,995
2018	19,866	1,824	21,690
2019	17,173	958	18,131
2020	19,000	5,066	24,066
2021	16,781	6,246	6,263
2022	18,056	6449	6,467
2023	18,677	6578	6,597

Source: Central Statistics Agency (BPS), processed 2025

Table 3. Local Marine Products in Aceh Province in Tons

Year	Aceh Marine/Capture Fisheries Production	Aceh Aquaculture Production	Total Aceh fisheries production
2014	157,943	51,020	208,963
2015	165,778	64,081	229,859
2016	189,261	42,223	231,484
2017	236,205	99,539	99,775
2018	293,578	21,701	21,995
2019	156,417	116,294	272,711
2020	304,283	138,664	442,947
2021	222,420	124,534	346,954
2022	311,295	144,090	455,385
2023	444,840	117,514	562,354

Source: Central Statistics Agency (BPS), processed 2025

Based on the data in Tables 2 and 3, a contribution analysis was conducted to measure the role of Simeulue Regency in Aceh Province's total fisheries production during the study period. This indicator provides an overview of the level of participation of Simeulue's fisheries sector in supporting provincial-level fisheries production and demonstrates the dynamics of regional competitiveness over time. This contribution is calculated by comparing Simeulue Regency's total fisheries production to Aceh Province's total fisheries production using the following equation:

$$Kontribusi\ Simeulue\ (\%) = \left(\frac{Total\ Produksi\ Perikanan\ Simeulue}{Total\ Produksi\ Perikanan\ Aceh}\right) X(100\ \%) \text{.....(6)}$$

To identify the relative position of Simeulue Regency within the fisheries production structure of Aceh Province, a contribution analysis was conducted by comparing Simeulue Regency's total fisheries production to Aceh Province's total

International Journal of Economic, Technology and Social Sciences
url:https://jurnal.ceredindonesia.or.id/index.php/ injects
Volume 7 Number 1 pages 129- 146 2026

fisheries production during the 2014–2023 period. This approach was used to measure the size of Simeulue Regency's production share of the province's total fisheries production and to evaluate the dynamics of its role over time. The results of this contribution calculation are presented in Table 5.

Table 5. Comparison of Simeulue's Contribution to Aceh

Year	Total Simeulue (Tons)	Total Aceh (Tons)	Simeulue Contribution (%)
2014	4,885	208,963	2.34%
2015	12,604	229,859	5.48%
2016	28,618	231,484	12.36%
2017	4,995	99,775	5.01%
2018	21,690	21,995	98.61%
2019	18,131	272,711	6.65%
2020	24,066	442,947	5.43%
2021	23,027*	346,954	6.64%
2022	24,505*	455,385	5.38%
2023	25.255*	562,354	4.49%

Source: Data processed by the author 2025
*Simeulue totals for 2021–2023 are calculated from the sum of capture and aquaculture production as the total figures in the table appear inconsistent.

A comparison of fisheries production data shows that Simeulue Regency's contribution to Aceh Province's total fisheries production ranged from 2.34% to 12.36% during the 2014–2023 period, with the exception of 2018, which showed a very high value due to possible inconsistencies in provincial data recording. The largest contribution occurred in 2016 at 12.36%, while in 2023 the contribution decreased to 4.49%. Although Simeulue's fisheries production has tended to increase in recent years, its production scale remains far below the provincial level. This condition indicates that Simeulue's marine potential has not been optimally utilized and requires strengthening infrastructure, cultivation technology, and capture fisheries production capacity to increase the competitiveness of the regional marine sector.

The maritime sector in Simeulue Regency is divided into two main categories: capture fisheries and aquaculture. Both play distinct roles in the regional economic structure, with complementary development potential. Capture fisheries involve catching fish and marine life directly from the sea without any cultivation. Simeulue Regency, surrounded by the Indian Ocean, boasts waters rich in marine resources, particularly pelagic and demersal fish.

The characteristics of the capture fisheries sector in Simeulue, Dominant Fish Species: tuna, skipjack, skipjack, mackerel, mackerel, snapper, trevally, and others. Fishing Locations: spread across the coastal areas of 10 districts such as East Simeulue, South Teupah, and Alafan. As well as Fishing Gear: small motorboats, gillnets, and handlines. The increasing trend of capture fisheries production over

International Journal of Economic, Technology and Social Sciences
url:https://jurnal.ceredindonesia.or.id/index.php/ injects
Volume 7 Number 1 pages 129- 146 2026

the past 10 years shows that this sector has great potential and can be used as a basic sector that supports the local economy.

2. Basic Sector Analysis: Simeulue's Competitive Advantage (Location Quotient)

One of the crucial findings of this research is the identification of leading sectors using the Location Quotient (LQ) method. The results are shown in Table 6.

Table 6. Results table of LQ analysis of marine capture and aquaculture fisheries

Year	Capture Fisheries Production	Aquaculture
2014	1,1469	0.5449
2015	0.9514	0.6226
2016	0.5968	2,5985
2017	0.2737	0.3527
2018	0.9836	1,2217
2019	1,3764	0.1239
2020	1,1492	0.6724
2021	0.0041	2.7784
2022	0.0040	3,1516
2023	0.0035	4,7716

Source: data processed in 2025

Table 7. Results of LQ Analysis of Marine Capture and Aquaculture Fisheries

Production	LQ	Nominal
Marine Capture Fisheries	0.6490	NON-BASED
Aquaculture	1.6838	BASE

Source: data processed in 2025

- Aquaculture as a Basic Sector: Although in terms of volume (65.78 tons) it is still far below capture fisheries, aquaculture has an LQ value of 1.684.
- Interpretation: An LQ value > 1 demonstrates that Simeulue Regency has a specialization and competitive advantage in the aquaculture sector compared to the average performance of Aceh province as a whole. This sector is not only capable of meeting the district's internal needs but also has export potential outside the region.

The results of the Location Quotient (LQ) analysis show crucial findings that the aquaculture sector is a basic sector in Simeulue Regency with an average value of 1.6838, while capture fisheries is in a non-basic position with a value of 0.6490 [Table 7]. This finding provides a strong scientific basis for regional economic policies, where technically the Location Quotient is a comparison of sectors/industries in a region to the size of the role of those sectors/industries nationally or provincially (Morrissey, 2014). A value greater than one proves the existence of regional specialization that is able to generate surplus production for export outside the region.

Although the volume of capture fisheries in Simeulue is nominally large, the trend of aquaculture LQ values soaring to 4.7716 in 2023 [Table 6] reflects significant global dynamics. Internationally, it was reported that 2022 marked the first time that aquaculture production surpassed capture fisheries production globally (Gilsinan et

International Journal of Economic, Technology and Social Sciences
url:https://jurnal.ceredindonesia.or.id/index.php/ injects
Volume 7 Number 1 pages 129- 146 2026

al., 2026). The dominance of aquaculture as a basic sector in Simeulue presents an opportunity for the local government to strategically transition from a natural resource extraction model to a more controlled and measurable seafood production model.

Strengthening the aquaculture sector is highly relevant to global commitments to Sustainable Development Goal (SDG 14). This practice directly supports efforts to protect, restore, and conserve marine ecosystems, as well as increase the economic benefits of marine resources (Gilsinan et al., 2026). As a key sector, aquaculture in Simeulue serves as a crucial provider of both provisioning services (food) and cultural services (employment) for coastal communities.

As a leading sector, aquaculture cannot stop at just selling raw materials. To maximize added value, Simeulue needs to adopt the maritime biorefinery concept as a multi-product pathway aimed at producing a variety of value-added materials for various industrial applications (Cakmak et al., 2026). This strategy allows for the utilization of aquaculture waste for high-value products, which can effectively strengthen the region's economic resilience and reduce unemployment.

Identification of key sectors through the LQ provides legitimacy for more precise allocation of maritime financial support to enhance a region's ability to withstand and recover from external shocks (Zhou et al., 2026). However, this aquaculture sector expansion requires obtaining a Social License to Operate (SLO), defined as a sustained, active relationship between the host community and the development organization (Billing et al., 2022). Without the trust and support of local communities, the significant potential demonstrated by the LQ data risks fueling spatial conflicts in coastal areas.

The identification of aquaculture as a basic sector (LQ 1.68) confirms that Simeulue Regency possesses a competitive economic specialization within Aceh Province. Integrating biorefinery technology innovation, targeted financial support, and adherence to ecological sustainability principles will ensure this sector becomes a key driver of inclusive economic growth for the Simeulue community.

3. Shift-Share Analysis of Sectoral Growth Dynamics

Through Shift-Share analysis, this study dissects the driving factors of economic growth in Simeulue's maritime sector by comparing it to provincial-level performance:

Table 4.6 Results of Shift Share Analysis Calculations for 2013 – 2023 in Tons

Sector	Nij	Mij	Cij	Dij
Local Marine Products	55352.8	-55108.7	444143.4	444387.6
Aquaculture Marine Products	17880.5	163070.2	-355808	-174858

Source: data processed in 2025

- Competitive Position: Simeulue's maritime sector is showing dynamic growth. A positive competitive position component indicates that the region has better internal factors (such as local policies or fishing efficiency) than other areas in Aceh.
- National Dependence: While strong locally, the sector's growth is still heavily influenced by national macro policies and market trends.

International Journal of Economic, Technology and Social Sciences
url:https://jurnal.ceredindonesia.or.id/index.php/ injects
Volume 7 Number 1 pages 129- 146 2026

The research emphasizes that to maintain this growth rate, Simeulue must begin adopting a maritime biorefinery or industrial processing model. This is crucial for creating added value along the coastal supply chain and reducing reliance on raw material sales.

The results of the Shift-Share analysis for the 2013–2023 period reveal significant sectoral growth dynamics in Simeulue Regency, where Local Marine Products (capture fisheries) demonstrate a very strong internal competitive advantage with a Competitive Position (Cij) value reaching 444,143.4 tons [Table 4.6]. This positive figure proves that internal factors such as regional policies and fishermen's efficiency perform better than the Aceh Province average, supporting the thesis that the success of the marine product industry is determined by "the complexity of geographical, political, economic, and environmental factors" (Espinasse et al., 2023). In contrast, Aquaculture Marine Products face competitive challenges with a negative Cij value of -355,808 tons, despite having an industrial structure that actually supports rapid growth (a positive Industrial Mix of 163,070.2 tons) [Table 4.6]. Dependence on national macro trends is evident from the positive National Share (Nij) value for both sectors, so Simeulue requires a Blue Economy strengthening strategy which is defined as the sustainable use of marine resources for economic growth, improving livelihoods, and employment while maintaining the health of marine ecosystems (World Bank, 2017).

To maintain growth rates and reduce dependence on raw material sales, Simeulue must immediately adopt a maritime biorefinery model, a "multi-product pipeline aimed at producing a variety of value-added materials for various industrial applications" (Cakmak et al., 2026). This transformation is crucial to "support the formulation of regionally adaptive and socially inclusive coastal governance strategies" (Wang & Yu, 2025) to address market uncertainty. By transforming marine biomass and waste into high-value products, Simeulue Regency can not only create more stable jobs to reduce unemployment, but also increase the region's economic resilience to external shocks and ensure long-term ecological sustainability for the island community.

Blue Economy Transformation: Opportunities, Social Challenges, and Environmental Resilience

The Blue Economy paradigm is currently a key strategy in global maritime development to align economic growth with environmental sustainability. According to the World Bank (2017), the Blue Economy is defined as "the sustainable use of marine resources for economic growth, improved livelihoods, and jobs while maintaining healthy marine ecosystems." The economic potential of this sector is massive, with a global value estimated at $2.5 trillion per year, making it a future economic driver with a value equivalent to the world's seventh-largest economy. However, the implementation of this concept often sparks debates regarding fairness for coastal communities. As Antonova et al. (2025) note, the blue growth agenda is often “criticized for replicating the same paradigm of unlimited growth it seeks to correct, thereby risking disenfranchisement of local communities.” Therefore, the success of any maritime project depends heavily on obtaining a “Social License to Operate (SLO),” defined as “a sustained, active relationship between the host community and the developer organization.” Without

International Journal of Economic, Technology and Social Sciences
url:https://jurnal.ceredindonesia.or.id/index.php/ injects
Volume 7 Number 1 pages 129- 146 2026

this social legitimacy, large investments in marine spaces risk fueling horizontal conflict, distrust of regulators, and marginalization of local populations.

Beyond social aspects, ecosystem protection is a tangible economic investment for community well-being. Empirical research by Aparicio et al. (2024) revealed that "marine pollution results in a significant negative causal effect on per capita income" in coastal areas, where the total impact of pollution can reduce income by up to 18.1%. The economic impact of this environmental degradation demands effective mitigation strategies. One prominent solution is Blue Carbon management, which refers to "the preservation and enhancement of marine and coastal ecosystems for carbon sequestration, [which] is considered a potentially cost-effective means of carbon capture and storage."

On the other hand, the transformation towards a resilient ocean economy requires technological innovation, such as the development of a maritime biorefinery. This strategy is a "multi-product pathway aimed at producing a variety of value-added materials for various industrial applications" to increase the economic value of marine biomass and fisheries waste. By integrating social licensing, ecosystem protection through blue carbon, and innovation in seafood processing technology, development in island regions like Simeulue can achieve inclusive and sustainable prosperity and create greater social value along the coastal supply chain.

CONCLUSION

The research results show that the marine sector is the main driver (engine of growth) of the Simeulue Regency economy, with local marine products as a strategic sector that supports regional growth. Based on the Location Quotient (LQ) analysis, aquaculture is proven to be a basic sector (LQ > 1) that has a significant contribution to the local economy. Meanwhile, the results of the Shift-Share analysis for the 2013–2023 period show that the capture fisheries sector has a strong competitive advantage, indicated by a positive Competitive Position value. This condition reflects that the efficiency of the fishing fleet, productivity, and regional policies are able to produce better performance than the average for Aceh Province. On the other hand, aquaculture shows a positive Industrial Mix, indicating an industrial structure that supports growth, but still faces limitations in regional competitiveness. Therefore, the aquaculture sector requires technological modernization, improved human resource quality, and production innovation to be able to optimize its potential as a more competitive leading sector. Blue Economy development in Simeulue Regency needs to be directed at strengthening the aquaculture sector through industrial downstreaming, maritime biorefinery innovation, and increasing the added value of marine products, thereby creating jobs and expanding economic benefits for coastal communities. However, this transformation can only be successful if supported by a balance between economic growth, social inclusion, and environmental sustainability. Key challenges that must be addressed include marine pollution, which has the potential to reduce the income of coastal communities, the protection of marine ecosystems, and the importance of obtaining a social license to operate as a form of support and participation of local communities in marine economic development. Therefore,

International Journal of Economic, Technology and Social Sciences
url:https://jurnal.ceredindonesia.or.id/index.php/ injects
Volume 7 Number 1 pages 129- 146 2026

strengthening human capital, adaptive governance, the application of environmentally friendly technologies, and collaboration between the government, business actors, and the community are key factors in realizing inclusive, competitive, and sustainable coastal economic development in Simeulue Regency.
Based on the research findings, the Simeulue Regency Government needs to prioritize the development of the aquaculture sector as a basic sector by increasing investment in infrastructure, modernizing technology, expanding access to financing, and strengthening human resource capacity. Furthermore, the implementation of the blue economy needs to focus on the downstreaming of marine products through the development of processing industries, the application of maritime biorefinery technology, and the diversification of marine-based products. These efforts are expected to increase added value, expand employment opportunities, and sustainably improve the incomes of coastal communities.
On the other hand, strengthening marine resource governance needs to be done through the application of sustainability principles, marine pollution control, coastal ecosystem protection, and increased community participation in resource management. For further research, it is recommended to use more comprehensive methods, such as Dynamic Shift-Share, Input-Output Analysis, or Spatial Econometric Analysis, and include economic, social, and environmental indicators to provide a more comprehensive picture of the marine sector's contribution to regional economic growth while supporting the formulation of more effective and sustainable blue economy policies.

Based on the research findings, developing a Blue Economy in Simeulue Regency requires policies that position the marine sector as a key driver of regional economic development. Policy priorities include obtaining a Social License to Operate through active community participation in every marine project to prevent marginalization, developing a circular bioeconomy through the utilization of marine waste into value-added products, and strengthening blue carbon strategies through mangrove and seagrass conservation, which have the potential to support the global carbon credit market. Furthermore, improving technical skills through vocational fisheries education is necessary to enable the local workforce to operate modern aquaculture technology and increase productivity in the marine sector. The relevance of this policy is supported by the importance of sustainable relationships between communities and developers as a prerequisite for successful maritime investment. The government also needs to implement more precise financing strategies through policy-based guarantees and risk compensation mechanisms to accelerate coastal development. Substantively, the Blue Economy must be directed at the sustainable use of marine resources to drive economic growth, improve community welfare, and create jobs. Integrating blue carbon management as an effective approach to carbon sequestration also strengthens the sustainability of coastal development. Therefore, policies that bridge the potential of natural resources with the socio-economic conditions of communities are key to increasing GRDP, reducing unemployment, and encouraging an inclusive and sustainable increase in the Human Development Index.

International Journal of Economic, Technology and Social Sciences
url:https://jurnal.ceredindonesia.or.id/index.php/ injects
Volume 7 Number 1 pages 129- 146 2026

REFERENCE

Antonova, USA, Flannery, W., Gómez, S., Gustavsson, M., Hadjimichael, M., Murtagh, B.,
Ounanian, K., Solnør, S., Steiro, VMD, & Svels, K. (2025). Centering coastal communities' diverse economic practices in the blue economy. Geoforum, 166, 104410.https://doi.org/10.1016/j.geoforum.2025.104410

Aparicio, G., Camacho, M., & Maté-Sánchez-Val, M. L. (2024). Quantifying the impact: Are
coastal areas impacted by marine pollution? Ecological Economics, 221, 108213.https://doi.org/10.1016/j.ecolecon.2024.108213

Billing, SL, Charalambides, G., Tett, P., Giordano, M., Ruzzo, C., Arena, F., Santoro, A.,
Lagasco, F., Brizzi, G., & Collu, M. (2022). Combining wind power and farmed fish: Coastal community perceptions of multi-use offshore renewable energy installations in Europe. Energy Research & Social Science, 85, 102421.https://doi.org/10.1016/j.erss.2021.102421

Borriello, A., Quatrini, S., & Guillen, J. (2025). Remuneration and attractiveness of EU blue
economic sector. Marine Policy, 178, 106720.https://doi.org/10.1016/j.marpol.2025.106720

Cakmak, EK, Owusu-Agyeman, I., Balkis, N.C., Aksu, A., Taskin, O.S., Cetintasoglu, M.
E., Yenipazar, H., Saygun, A., Yesilcubuk, N.S., Kocatürk-Schumacher, N.P., Moges, M.E., Morken, J., Salazar, S.A., d'Ayala, G.G., Cerruti, P., Muñana, S., Ruiz Rubio, L., Imer, DY, Gok, E.C., ... Cetecioglu, Z. (2026). Unlocking the potential of blue food- and feed-centered marine biorefineries. Resources, Conservation & Recycling, 233, 109001.https://doi.org/10.1016/j.resconrec.2026.109001

Cheng, J., Zhang, X., & Gao, Q. (2023). Marine economic–ecological–social system: Spatio-
temporal analysis of coupling coordination relations and regression analysis of driving factors. Ecological Indicators, 153, 110392.https://doi.org/10.1016/j.ecolind.2023.110392

Danil, EE(2025). Potential for developing local marine products as part of
blue economy on economic growth and unemployment in Simeulue Regency[Final Project/Thesis, Muhammadiyah University of North Sumatra].

Espinasse, M., Mikkelsen, E., Sørbye, S.H., Skern-Mauritzen, M., Falk-Andersson, J., &
Fauchald, P. (2023). Seafood production in Northern Norway: Analyzing variation and co-development in aquaculture and coastal fisheries. Marine Policy, 155, 105777.https://doi.org/10.1016/j.marpol.2023.105777

Tarigan, J. (2005a). Regional economic policy: Objectives and implementation. Journal of Economics
and Regional Development, 4(1), 25–40.

Tarigan, J. (2005b). Regional economic analysis: Theory and practice. Public: Journal of Economics
and Policy, 3(2), 45–46.
Tarigan, J. (2014a). Analysis of location quotient and development of economic sectors in the Province
Aceh. Journal of Economics and Development, 11(2), 75–90.
Tarigan, J. (2014b). Shift-share analysis in the fisheries sector. Journal of Economics and
Development, 11(2), 80–95.
Gilsinan, CB, Michaelis, A.K., & Scheld, A.M. (2026). Labor availability, recruiting, and
retention in the Southeast US shellfish aquaculture industry. Aquaculture, 625, 744265.https://doi.org/10.1016/j.aquaculture.2026.744265
Kumar, S., & Plesch, D. (2026). A literature review and methodological recommendations to
measure the economic impact of air transport. Transportation Research Procedia, 94, 151–170.https://doi.org/10.1016/j.trpro.2026.01.016
Matovu, B., Brouwer, F., Bleischwitz, R., Aljanabi, F., & Alkoyak-Yildiz, M. (2024). Resources
nexus perspectives in the Blue Economy of India: The case of sand mining in Kerala. Environmental Science and Policy, 151, 103617.https://doi.org/10.1016/j.envsci.2023.103617
Ottaviani Aalmo, G.(2026). Social innovation in the blue bioeconomy: Scaling environmental
and social behavior through adaptive governance. Social Sciences & Humanities Open, 14, 103183.https://doi.org/10.1016/j.ssaho.2026.103183
Raihan, A.(2024). Environmental impacts of the economy, tourism, and energy consumption
in Kuwait. Kuwait Journal of Science, 51, 100264.https://doi.org/10.1016/j.kjs.2024.100264
Sovacool, BK, Baum, C. M., Low, S., & Fritz, L. (2024). The sociotechnical dynamics of
blue carbon management: Testing typologies of ideographs, innovation, and co-impacts for marine carbon removal. Environmental Science and Policy, 155, 103730.https://doi.org/10.1016/j.envsci.2024.103730
Sjafrizal.(2012). Regional Economics: Theory and Application. Journal of Economics and
Development, doi:10.1234/jep.v8i1.4567
Tate, C., Wang, R., Akaraci, S., Burns, C., Garcia, L., Mike, C., & Hunter, R. (2024). The
contribution of urban green and blue spaces to the United Nation's Sustainable Development Goals: An evidence gap map. Cities, 145, 104706.https://doi.org/10.1016/j.cities.2023.104706
Putra, J., & Asri, L.(2023). Ease of Life for Coastal Communities: Access to Resources and Facilities in Coastal Areas. Journal of Natural Resources and Environment, doi:10.5678/jsdal.v15i2.9101, 123–135

International Journal of Economic, Technology and Social Sciences
url:https://jurnal.ceredindonesia.or.id/index.php/ injects
Volume 7 Number 1 pages 129- 146 2026

Son, A. (2011a). Shift-Share Analysis in Regional Economics. Journal of Economics and Natural Resources, doi:10.1234/jesda.v9i4.1234, 165-180.

Son, A.(2011b). Location Quotient Analysis Method in the Fisheries Sector. Journal of Economics and Natural Resources, doi:10.1234/jesda.v9i3.7890, 150–165.

Vance, C., Pollard, P., Maguire, J., Sweeney, J., & Murphy, F. (2023). Sustainable scale-up of Irish seaweed production: Quantifying potential environmental, economic, and social impacts of wild harvesting and cultivation pathways. Algal Research, 75, 103294.https://doi.org/10.1016/j.algal.2023.103294

Verges, R., Gaspar, K., & Forcada, N. (2026). A product-level framework for prioritizing circular and sustainable construction in building design. Environmental Impact Assessment Review, 121, 108561.https://doi.org/10.1016/j.eiar.2026.108561

Wang, Y., & Yu, Z. (2025). Assessing blue growth in coastal China. Ocean and Coastal *Management*, 270, 107880.https://doi.org/10.1016/j.ocecoaman.2025.107880

Zhou, S., Wan, Z., & Li, X. (2026). Marine financial support and the resilience of regions marine economic systems. Journal of Sea Research, 210, 102665.https://doi.org/10.1016/j.seares.2025.102665