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Spatial-Based Livestock Development Strategy in Berau Regency: An Integration of Location Quotient (LQ) and GIS Analysis

Dede Aprylasari¹, Yoga Toyibulah²

¹Department of Animal Science, Faculty of Agriculture, Mulawarman University

²Department of Agroecotechnology, Faculty of Agriculture, Mulawarman University

yoga@faperta.unmul.ac.id

Abstract

This study aims to map the potential of the livestock sector in Berau Regency using the Location Quotient (LQ) and Geographic Information System (GIS) approaches to identify basic commodities and their spatial distribution patterns. A quantitative approach was used to analyze secondary data from the Animal Husbandry Service and related agencies. At the same time, spatial analysis was conducted to visualize the distribution of livestock populations and regional development zoning. The results of the LQ analysis indicate that goats ($LQ = 1.76$), buffalo ($LQ = 1.40$), and cattle ($LQ = 1.18$) are basic commodities with significant contributions to the regional economy. Meanwhile, native chickens and ducks serve as complementary sources of food, supporting local food security. The results of the spatial mapping show a contrasting distribution pattern between inland and coastal areas. Talisayan, Biatan, Segah, and Gunung Tabur Districts are the primary centers for ruminant development, whereas Derawan and Maratua Islands focus more on local poultry production due to limited forage land. The integration of LQ and GIS resulted in a livestock development zoning consisting of: (1) a ruminant base zone in the central-southern region, (2) a poultry base zone in coastal and island areas, and (3) a support zone in non-base areas such as Tabalar and Teluk Bayur. These findings confirm that the development of the livestock subsector in Berau Regency requires a spatial and evidence-based planning approach to encourage land efficiency, economic equity, and environmental sustainability. Therefore, the results of this study can serve as a basis for strategic planning in the development of competitive and sustainable livestock areas at the regional level.

Keywords: Berau Regency, GIS, Livestock, Location Quotient

1. Introduction

Regional economic development is essentially a continuous process aimed at improving community welfare by optimizing local resource potential, increasing community capacity, and strengthening regional economic structures. In the context of regional autonomy, the government has broad authority to manage and develop financial resources in accordance with local characteristics and advantages. According to Stimson et al (2006), the success of regional economic development depends heavily on a region's ability to identify, utilize, and develop leading sectors with comparative and competitive advantages. Therefore, a development approach based on local potential is key to creating an effective and sustainable regional development strategy. The agricultural sector, including the livestock industry, is a key contributor to both national and regional economies. The livestock sector plays a strategic role in supporting food security, providing animal protein, absorbing labor, and increasing community income, particularly in rural areas. According to Shah et al. (2025), the livestock sector also plays a crucial ecological role, as it contributes to integrated agricultural systems by utilizing agrarian waste as animal feed and livestock byproducts as organic fertilizers. Therefore, developing the livestock sector based on regional potential can be a key driver of an inclusive and sustainable local economy.

Berau Regency is one of the regions in East Kalimantan Province that holds significant potential for developing the livestock sector. Geographically, Berau Regency has a varied topography, ranging from lowlands and hills to coastal areas, supporting a variety of livestock activities. Its tropical climate, extensive land availability, and abundant natural resources are crucial for the development of large ruminant livestock, such as beef cattle and buffalo, as well as poultry, including broiler chickens, free-range chickens, and ducks. According to data from the Central Statistics Agency (BPS) of Berau Regency in 2024, the populations of beef cattle, goats, chickens, and ducks were 11,948, 12,573, 189,899, and approximately 23,898, respectively. This data suggests that the livestock sector has significant potential to develop into one of the region's leading sectors, capable of supporting food

security and enhancing community welfare. However, this enormous potential has not been fully utilized. The development of the livestock sector in Berau Regency still faces various obstacles, both structural and technical. The limited availability of local feed ingredients is a primary obstacle to increasing livestock productivity. Supporting infrastructure, such as production roads, livestock transportation, processing facilities, and livestock markets, remains limited.

Furthermore, the adoption of modern livestock technology by livestock farmers remains low due to limited capital, knowledge, and access to information. This situation has implications for low productivity and the competitiveness of local livestock products in an increasingly competitive market. Furthermore, most livestock farmers in Berau Regency still operate small-scale, traditional businesses with inefficient production systems and are not yet integrated into modern supply chains. Consequently, the added value of local livestock products remains low, and their contribution to the regional economy is suboptimal.

To address these challenges, a data-driven and regionally-based development approach is needed to determine the direction of policies for developing the livestock sector in a more targeted manner. One strategic step in this effort is to identify and map the potential of superior livestock commodities in each sub-district (Santoso & Prasetyono, 2020). This mapping is crucial for determining the basic commodities that make a significant contribution to the regional economy and the areas with the most potential for development. In this context, Location Quotient (LQ) analysis is used to measure the level of specialization of livestock commodities in a sub-district compared to the provincial level. This analysis provides a quantitative overview of the key sectors that have the potential to drive the local economy (Ramadhani et al., 2022). To make the analysis more informative and applicable, a spatial approach based on Geographic Information Systems (GIS) is employed to map the LQ calculation results visually. Through thematic maps, the distribution of livestock potential can be visualized geographically, making it easier for policymakers to identify priority areas for development (Salehi et al., 2017). The integration of LQ analysis and spatial analysis yields a more comprehensive understanding of the condition and potential of the livestock sector in Berau Regency, both from an economic and spatial perspective. This approach aligns with national agricultural development policies, which emphasize regional development based on regional superior potential, commodity diversification, and increased production efficiency to achieve food security and local economic independence.

Thus, this research is highly urgent because its results can serve as the basis for formulating a sustainable livestock development strategy based on regional potential. This study aims to identify basic and non-basic livestock commodities in Berau Regency using Location Quotient (LQ) analysis, analyze the spatial distribution of livestock potential using a Geographic Information System (GIS) approach, and provide recommendations for policy directions to develop the livestock sector based on regional potential in Berau Regency. Through this research, it is hoped that a comprehensive picture of the actual conditions, potential, and direction of livestock sector development in Berau Regency will be obtained, as well as providing a scientific basis for strengthening the role of the livestock sector as a central pillar of competitive and sustainable regional economic development.

2. Research Methods

Research Location and Approach

This research was conducted in Berau Regency, East Kalimantan Province, which is administratively comprised of several sub-districts with diverse regional characteristics, including topography, natural resources, and the economic activities of their communities. The location was selected by purposive sampling, considering that Berau Regency has significant potential in the livestock sector. Still, it has not been optimally utilized as a basic sector driving the regional economy. Furthermore, the livestock sector in this region offers a variety of high-quality commodities, including beef cattle, broiler chickens, free-range chickens, and ducks, which play a vital role in supporting food security and enhancing the welfare of rural communities. The research approach employed was a descriptive, quantitative method, supported by Geographic Information System (GIS)-based spatial analysis (Naves et al., 2015). The quantitative approach aims to measure and compare the economic potential of the livestock sector in each sub-district, based on population and livestock production indicators, thereby identifying the level of contribution and relative advantage between regions (Barua et al., 2021). Meanwhile, spatial analysis is used to visualize the results in the form of thematic maps, which provide a spatial overview of the distribution of leading livestock commodities in Berau Regency. Thus, this study not only describes the actual condition of the livestock sector but also analyzes the relative position between sub-districts in terms of comparative and competitive advantage.

Data Types and Sources

This study utilizes quantitative secondary time series data collected over the past several years to illustrate the development and dynamics of the livestock sector in Berau Regency. Secondary data were chosen because they

provide broad, measurable coverage and consistency across time periods (Dale et al., 2025). The primary data sources are official agencies, including the Berau Regency Statistics Agency (BPS), the East Kalimantan Provincial Statistics Agency (BPS), and the Berau Regency Animal Husbandry and Animal Health Service. Supporting data is also obtained from regional planning documents, annual reports, and scientific literature related to local potential-based economic development. The data collection method involved library research, which entailed collecting and reviewing various relevant documents, statistical publications, and scientific journals. According to Sherif (2018), secondary data analysis is an effective method for obtaining valid empirical data when researchers face limited access to primary data. The data used in this study include livestock population, livestock production volume, and the administrative area of each sub-district in Berau Regency. All of this data is used as the basis for calculating the Location Quotient (LQ) and conducting GIS-based spatial analysis.

Data Analysis Methods

1. Location Quotient (LQ) Analysis

Location Quotient (LQ) analysis is used to identify basic and non-basic livestock commodities in each sub-district in Berau Regency. This method compares the contribution of a commodity at the sub-district level to the total contribution of the same commodity at the regency level (Perwitasari et al., 2024). The LQ value indicates the level of economic specialization of a region. An LQ value greater than one ($LQ > 1$) suggests that the commodity is a basic sector, meaning an industry with a comparative advantage and the potential to drive the regional economy. Conversely, an LQ value less than one ($LQ < 1$) indicates that the commodity is a non-basic sector, focusing more on meeting local needs.

The formula used to calculate the LQ is as follows:

$$LQ_i = \frac{Y_{ij}/Y_j}{Y_i/Y}$$

Information:

LQ_i: Location Quotient Index of commodity *i* in sub-district *j* of Berau Regency

Y_{ij}: Production value or population of commodity *i* in the sub-district *j*

Y_j: Total production value or population of all commodities in the District *j*

Y_i: Production value or population of commodity *i* in Berau Regency

Y: Total production value or population of all commodities in Berau Regency

2. GIS-Based Spatial Analysis

Geographic Information System (GIS)-based spatial analysis was employed to map and analyze the distribution of potential livestock commodities in Berau Regency, utilizing the results of LQ calculations and regional spatial data. The analysis stages included collecting spatial data in the form of sub-district administrative boundary maps, land use maps, topographic maps, road networks, and settlement distribution, obtained from the Geospatial Information Agency (BIG) and other relevant agencies. The analysis process was carried out through several stages, including georeferencing and data digitization. This involved equalizing the coordinate system and converting non-spatial data into digital data, enabling analysis in GIS software such as ArcGIS or QGIS (Zhu, 2024). Next, an overlay and spatial join process was carried out between attribute data (such as LQ values and livestock populations) with sub-district area maps. Based on these results, each sub-district was classified into one of three categories: very high potential, high potential, and low potential for livestock sector development. The final result of this analysis was a thematic map of the distribution of Berau Regency's leading livestock commodities, which provides a visual depiction of strategic locations for livestock business development. This map serves as a decision support tool for local governments, planning agencies, and businesses in formulating development policies based on local potential (Ammons & Roenigk, 2021). Thus, spatial analysis serves not only as a descriptive tool but also as an analytical basis for formulating strategies for developing a sustainable and competitive livestock sector in Berau Regency.

3. Results and Discussions

1. Potential Areas for Livestock Development in Berau Regency

Berau Regency is a strategic region in East Kalimantan Province with significant potential in the livestock sector. Geographically, Berau Regency is located at coordinates 1°33'–2°55' North Latitude and 116°00'–119°00' East Longitude, with an area of 34,127.17 km². The regency is divided into 13 sub-districts, with the administrative center located in Tanjung Redeb District. The geographical and topographical conditions of Berau Regency are very diverse, ranging from lowlands and hills to coastal and island areas. This diversity of landscapes makes Berau a region with potential ecological zones for the development of various types of livestock, based on land suitability, availability of feed sources, and patterns of land use. The majority of people in Berau Regency still depend on the

agricultural and livestock sectors for their livelihoods. Based on data from the Food Crops, Horticulture, and Animal Husbandry Service (2024), dry land and shrubland areas, spread across sub-districts such as Talisayan, Biatan, Segah, and Gunung Tabur, are highly supportive of the development of large ruminant livestock, including cattle and buffalo. These areas have abundant natural forage (HPT) and are supported by an active community livestock farming system. Meanwhile, coastal areas like Derawan and Maratua Islands are more suitable for the development of local poultry, such as native chickens and ducks, which are adaptable to tropical environments and have potential for culinary tourism in marine tourism destinations.

From a regional economic perspective, the livestock sector in Berau Regency plays a strategic role in providing animal protein and providing an alternative livelihood outside the mining sector. Based on the Location Quotient (LQ) analysis, five basic commodities have the potential for further development: cattle, buffalo, goats, sheep, and native chickens. These commodities are predominantly distributed in areas supported by agrarian ecosystems and good transportation accessibility. Talisayan and Gunung Tabur Districts, for example, have the largest cattle and goat populations and are centers for the development of smallholder livestock farming. Biatan and Sambaliung Districts have local economic structures that rely on mixed agriculture, with significant contributions from the livestock sector. In addition to ecological and economic factors, the potential for livestock development in Berau is also supported by social and institutional aspects. The availability of fostered livestock groups, support from field extension workers, and community involvement in hereditary livestock raising activities create substantial social capital for the sustainability of this sector (Aprylasari et al., 2024). The local government, through programs aimed at strengthening food security and developing livestock areas, continues to encourage increased productivity by providing superior seeds, training in feed management, and implementing appropriate technologies (Aprylasari et al., 2022).

From a spatial perspective, Geographic Information System (GIS) analysis results indicate that the distribution of livestock activities in Berau Regency forms a concentration pattern in the central and southern parts of the region. Talisayan, Biatan, and Gunung Tabur sub-districts are the primary clusters for ruminant development, owing to their high suitability for land use based on topography, road access, and water availability. Conversely, coastal areas such as the Derawan and Maratua Islands show high poultry potential, although the scale of the business remains household-based. This spatial pattern provides a crucial foundation for sustainable livestock development zoning planning, integrated with regional spatial planning. Overall, the livestock potential in Berau Regency represents a significant opportunity to improve regional food security and expand the non-mining economic base. Optimization of base areas, such as Talisayan, Gunung Tabur, Sambaliung, and Biatan, should be directed through a region-based approach, which strengthens the value chain and implements biosecurity measures. With the synergy between ecological, economic, social, and spatial aspects, the livestock sector in Berau Regency has the potential to become a major driver of rural economic transformation in East Kalimantan.

2. Location Quotient (LQ) Analysis: Basic and Non-Basic Commodities in the Livestock Sector in Berau Regency

The livestock sector plays a vital role in supporting the economy of Berau Regency. In addition to providing animal protein and creating jobs in rural areas, this sector also contributes to the stability of the non-mining economy, which is the focus of regional economic diversification. Based on data from Berau Regency in Figures 2025 and the Berau Regency Food Crops, Horticulture, and Livestock Service (2024), the types of livestock raised include large livestock (cattle and buffalo), small livestock (goats and sheep), and poultry (native chickens and ducks). Based on the conversion of livestock populations into livestock units (ST), beef cattle are the commodity with the most significant number, followed by goats and native chickens.

The distribution of livestock populations across sub-districts indicates that Talisayan, Biatan, Sambaliung, and Gunung Tabur are the main livestock centers in Berau Regency. These areas have favorable land conditions, the availability of forage (HPT), and active community participation in smallholder livestock businesses. Based on total livestock population data, there are 17,400 livestock herds across Berau Regency, consisting of 11,948 cattle herds, 1,796 goat herds, 1,899 native chickens, and the remainder comprising other livestock, such as buffalo, sheep, pigs, horses, and ducks. The distribution of livestock populations per sub-district is shown in Table 1.

Table 1. Livestock Population (Livestock Unit/ST) in Berau Regency in 2024

Subdistrict	Cattle	Buffalo	Horse	Goat	Sheep	Babi	Chicken	Duck
Kelay	240	34	-	76	-	160	46	-
Talisayan	2.487	117	-	370	-	39	118	14
Tabalar	707	15	3	83	-	-	170	35
Biduk-Biduk	705	2	-	86	-	-	36	10
Pulau Derawan	56	-	1	39	-	-	507	17

Maratua	-	-	-	-	-	-	58	86
Sambaliung	1.665	7	-	138	3	59	59	6
Tanjung Redeb	245	-	1	85	-	-	69	10
Gunung Tabur	1.296	160	3	102	4	93	687	24
Segah	1.176	461	-	46	-	75	20	13
Teluk Bayur	684	11	-	115	17	36	9	-
Batu Putih	1.129	93	-	189	-	28	83	10
Biatan	1.558	61	-	467	-	34	39	13
Berau	11.948	961	8	1796	25	524	1899	239

Livestock Population (Livestock Unit/ST) in Berau Regency in 2024

The results of converting the livestock population into livestock units (LS) provide a more objective picture of the economic weight and potential of each type of livestock. The total livestock population in Berau Regency in 2024 reached 17,400 LS, comprising 11,948 cattle, 1,796 goats, 1,899 native chickens, and the remainder consisting of buffalo, sheep, pigs, horses, and ducks. The distribution of the livestock population per sub-district shows that Talisayan, Biatan, Sambaliung, and Gunung Tabur are the largest centers of livestock activity, characterized by extensive land, availability of green fodder, and community support for smallholder livestock businesses.

Location Quotient (LQ) analysis was employed to identify the base sector of the livestock sector in Berau Regency. The base sector is defined as one that makes a relatively higher contribution compared to the reference region (East Kalimantan Province), meaning that these commodities not only meet local needs but also have export potential between areas. Conversely, the non-base sector plays a role in meeting the community's internal consumption. The results of the calculation of the LQ value based on the proportion of livestock units (ST) are shown in Table 2 below.

Table 2. Results of the Location Quotient (LQ) Analysis of the Livestock Sector in Berau Regency in 2024

Commodity	Livestock Unit (ST)	Si/S	LQ	LQ Criteria	X (Σ basis)	Y (Σ non basis)
Cattle	11.948	0,6867	1,18	Basis	16.629	771
Buffalo	961	0,0552	1,40	Basis		
Horse	8	0,0005	0,53	Non Basis		
Goat	1.796	0,1032	1,76	Basis		
Sheep	25	0,0014	1,15	Basis		
Pig	524	0,0301	0,58	Non Basis		
Chicken	1.899	0,1091	1,01	Basis		
Duck	239	0,0137	0,44	Non Basis		
Total	17.400	1,0000			Multiplier Effect (Q) = 1.03	

Source: Secondary Data Processed in 2025

Based on the calculations in Table 2, there are five basic commodities in Berau Regency: cattle (LQ 1.18), buffalo (LQ 1.40), goats (LQ 1.76), sheep (LQ 1.15), and native chickens (LQ 1.01). Meanwhile, three other commodities—horses (LQ 0.53), pigs (LQ 0.58), and ducks (LQ 0.44)—are classified as non-basic. Goats have the highest LQ (1.76), indicating a high level of economic specialization in several sub-districts, particularly Gunung Tabur, Sambaliung, and Tanjung Redeb. This shows significant potential for developing small-scale livestock businesses, both for local meat production and for supplying seeds to local markets. Furthermore, goats are relatively easy to raise because they require less feed and capital than cattle, making them an essential source of livelihood for small-scale livestock farmers.

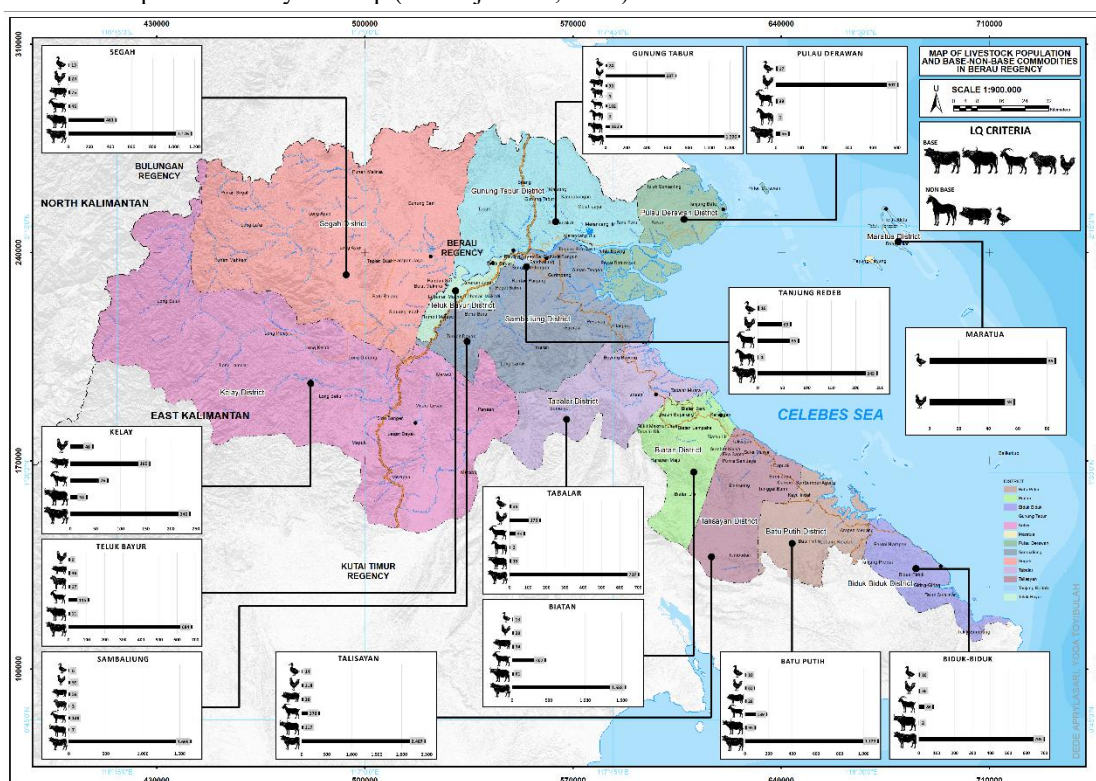
Beef cattle, with an LQ of 1.18, serve as the backbone of the livestock sector in Berau Regency. This advantage is supported by the presence of livestock groups fostered by the Animal Husbandry Service, the availability of forage land (HPT), and transportation infrastructure connecting production centers with markets in Tanjung Redeb and surrounding areas. This significant potential for beef cattle can form the basis for the development of downstream industries, such as meat processing and interregional livestock distribution. Buffalo and sheep, with LQs of 1.40 and 1.15, respectively, demonstrate potential for growth in specific areas such as Segah, Biatan, and Gunung Tabur Districts. However, their populations are still relatively small, necessitating support in the form of breeding, feed management training, and strengthening the local market.

Meanwhile, native chickens, with an LQ of 1.01, are also classified as a strategic staple commodity. Although their LQ is close to 1, native chickens play a significant role, as nearly all rural households in this region operate this type of livestock. Furthermore, native chickens contribute to the local supply of animal protein and often serve as a source of additional income for the community. Conversely, non-basic commodities such as horses, pigs, and ducks have LQs below 1. These three livestock species still play limited economic roles, primarily focusing on household consumption or local traditions.

Nevertheless, the development of the non-basic sector remains crucial as part of livestock diversification at the household level, particularly in coastal areas such as Derawan and Maratua Islands. A multiplier (Q) of 1.03 indicates that the livestock sector in Berau Regency has a positive impact on the regional economy. This means that every one-unit increase in output from the livestock sector can have a multiplier effect of 1.03 on other sectors such as trade, transportation, and services. However, this multiplier is still relatively low, necessitating the optimization of the value chain through the integration of livestock production, processing, and marketing activities.

3. Spatial Analysis (GIS) of Population Distribution and Livestock Commodities

Geographic Information System (GIS)-based spatial analysis was used to strengthen the results of the Location Quotient (LQ) analysis using a spatial-based approach. This approach aims to map the distribution of livestock populations and identify areas with livestock commodity bases in each sub-district in Berau Regency. Through GIS analysis, the quantitative information obtained from the LQ results can be visualized in the form of thematic maps, facilitating the interpretation of distribution patterns and identifying potential areas for livestock development (Shi et al., 2024). Spatial analysis also helps in understanding the relationship between regional biophysical characteristics, accessibility, and community economic activities that influence livestock population concentration in the field. Based on the mapping results on the Berau Regency Livestock Population and Commodity Base & Non-Base Map (Figure 1), it is clear that the distribution of livestock populations in Berau Regency shows quite significant spatial variation between the central-southern mainland and the eastern coastal-island regions. Generally, the central and southern mainland regions exhibit a higher concentration of ruminant livestock, whereas the coastal and island regions tend to focus on poultry. This pattern indicates ecological and socio-economic differentiation between regions, which influences the types of livestock commodities that local communities predominantly develop (Houndjo et al., 2018).



(Source: GIS Analysis Results, 2025)

The spatial analysis results indicate that Talisayan, Biatan, and Segah Districts are the leading centers for beef cattle development in Berau Regency. These areas have high land suitability for grazing, supported by the availability of natural forage (HPT) and adequate surface water sources. Furthermore, these three districts also have a strong tradition in livestock farming, with a semi-extensive livestock system based on natural grasslands. Other supporting factors include good transportation access to Tanjung Redeb, a livestock distribution center, and the availability of potential land for cluster-based farming. These conditions categorize these areas as large ruminant base zones, with LQ values indicating a comparative advantage in cattle, buffalo, and goats.

Meanwhile, Gunung Tabur and Teluk Bayur Districts occupy a transitional position, combining ruminant and poultry farming activities. These two areas play a significant role in the local supply chain due to their proximity to the primary market in Tanjung Redeb. The livestock farming pattern in these areas is mixed, with cattle and goats being raised in homesteads and poultry for daily consumption. The relatively advanced socio-economic conditions of the community, combined with the support of road and market infrastructure, make this area potentially suitable for development as a production buffer zone for livestock centers in the southern region.

In contrast to inland areas, coastal districts such as Derawan and Maratua Islands are dominated by poultry, particularly native chickens and ducks. Limited land and forage resources in coastal areas force local communities to rely on small-scale, household-based poultry farming systems (Aprylasari & Azizah, 2025). Poultry production in these areas not only meets local consumption needs but also supports the tourism sector, given the high demand for animal food products in marine tourism areas like Derawan and Maratua. These conditions make these two areas a local poultry base zone, characterized by coastal areas and intensive farming systems that produce relatively fast yields. Additionally, some areas serve as supporting and development zones, also known as non-base zones, including the districts of Tabalar, Batu Putih, Teluk Bayur, and Kelay. These areas have the potential to support both upstream and downstream livestock activities, including feed supply, fattening, and livestock product processing. The strategic role of these non-base areas is crucial for strengthening the livestock sector's value chain, particularly in supporting stable feed supplies and inter-regional distribution of livestock products within Berau Regency.

The integration of LQ analysis and GIS results resulted in the division of primary livestock development zones in Berau Regency, consisting of a ruminant-based zone, a local poultry-based zone, and a non-base support zone. This zoning illustrates the ecological suitability and economic potential differences between regions, thereby serving as a basis for local governments to plan more targeted and sustainable livestock sector development. The spatial analysis map shows that livestock development in Berau Regency can be directed zoning based on the ecological, social, and economic characteristics of each region. By utilizing GIS technology, development planning can be carried out in an evidence-based and synergistic manner across regions. This approach supports the principles of sustainable livestock development through land efficiency, economic equity, and improved welfare for local livestock farmers.

4. Conclusion

The results of the research on Mapping the Potential of the Livestock Sector Based on Location Quotient (LQ) and Spatial Analysis (GIS) in Berau Regency show that the livestock sector plays a significant role in strengthening the regional economy and is one of the strategic sectors outside of mining. Based on the results of the LQ analysis, five commodities are classified as basic sectors: cattle, buffalo, goats, sheep, and native chickens, which have LQ values above one ($LQ > 1$). Goats occupy the highest position with an LQ value of 1.76, followed by buffalo 1.40 and cattle 1.18. This suggests that these three commodities have significant potential to become the primary drivers of the local economy. Meanwhile, non-basic commodities such as horses, pigs, and ducks serve to complement the diversification of small-scale livestock businesses at the household level. The results of GIS-based spatial analysis indicate a distinctive geographic distribution pattern of livestock activities in Berau Regency. The central and southern regions, including Talisayan, Biatan, Segah, and Gunung Tabur Districts, are the primary centers for extensive ruminant livestock development, supported by the availability of land, water resources, and good transportation accessibility. Meanwhile, coastal and island areas, such as Derawan and Maratua Islands, are more focused on developing local poultry to meet the demands of the marine tourism market. The integration of LQ and GIS results shows that the livestock potential in Berau Regency not only has high economic value but also possesses a strong spatial dimension, serving as a basis for regional planning based on superior commodities. Thus, the livestock sector can play a key role as a pillar of competitive, inclusive, and sustainable non-mining economic development in Berau Regency.

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