

Strategic assessment of ruminant livestock development in Gunungkidul Regency

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ABSTRACT

The livestock sector is a key driver of food security and rural economic growth in Indonesia. In Gunungkidul Regency, cattle and goats dominate ruminant production and hold significant development potential. However, the sector faces numerous challenges, including limited feed availability during the dry season, low slaughter rates, inadequate infrastructure, weak farmer institutions, and limited access to modern technologies. This study examined the strengths, weaknesses, opportunities, and threats (SWOT) of Gunungkidul's ruminant livestock sector and identified strategies to boost both productivity and sustainability. The study applied qualitative approach. Data were gathered through interviews, questionnaires, and secondary sources, then analyzed using the SWOT and Critical Success Factors (CSFs) frameworks. The Eisenhower Matrix was also applied to prioritize strategies by urgency and importance. This study formulated integrated priority strategies for livestock sector development, encompassing the strengthening of farmer groups and cooperatives, the utilization of agricultural waste as alternative feed and organic fertilizer, and the adoption of technology for disease monitoring and control. In the short term, the focus is directed toward securing feed supply during the dry season, improving access to veterinary services through veterinarians and vaccination programs, and implementing modern cluster-based farming practices. In the medium term, the strategies emphasize diversifying local feed sources to reduce reliance on imports, enhancing productivity, expanding market access, and fostering greater interest among younger generations in the livestock sector. Supporting interventions, such as infrastructure development and the promotion of local products, are implemented as complementary measures to reinforce the sustainability of the livestock business ecosystem.

Introduction

The demand for ruminant meat such as beef, goat, and lamb continues to rise both globally and nationally. However, domestic production capacity has yet to adequately meet this growing demand. In Indonesia, approximately 40% of beef consumption is still met through imports, reflecting a significant dependence on foreign supply (Silalahi *et al.*, 2019). This situation poses both a challenge and an opportunity to enhance local livestock productivity as a means to strengthen national food security.

One effective approach to address the disparity between demand and production is the integration of livestock and agricultural systems. Integrated models, such as the cattle–oil palm integration system, have demonstrated improved production efficiency in a sustainable manner (Silalahi *et al.*, 2019). Similar approaches have been implemented successfully in various countries, including Portugal and Palestine (Tibério and Diniz, 2014; Istaitih and Yelboğa, 2018). In Indonesia, the development of integrated supply chains using SWOT analysis has proven effective in increasing production efficiency and enhancing business strategies based on local potential, as exemplified by cattle farming initiatives in Aceh (Us *et al.*, 2021).

A similar study on the development of livestock strategies using SWOT analysis was conducted in Pangandaran Regency, West Java. Research by Nuraeni *et al.* (2025) identified both internal and external factors influencing the development of beef cattle farming in the region. The findings highlight that Strength–Opportunity (SO) strategies—focused on utilizing agricultural land, processing agricultural waste as feed, and integrating with markets—can promote aggressive growth in livestock enterprises. These results underscore the importance of SWOT-based approaches in formulating sustainable livestock development strategies.

Furthermore, a study in Banyumas Regency revealed that beef cattle development strategies can be effectively directed by optimizing regional potential through SWOT and Location Quotient (LQ) analyses. Research

by Hidayat *et al.* (2021) showed that sub-regions with high LQ values, such as Kembaran and Kalibagor, are well-suited as livestock centers. The proposed strategies include the utilization of agricultural waste as an alternative feed source, improving farmers' knowledge of affordable and high-quality feed formulation, and the strategic placement of communal barns. This differentiated approach is considered effective in addressing external challenges such as price competition and land-use conversion, while leveraging internal strengths such as feed availability and proximity to markets.

Gunungkidul Regency possesses substantial potential for the development of ruminant livestock. According to data from the Department of Animal Husbandry and Animal Health of Gunungkidul Regency (2024), the livestock population in 2023 included 143,796 cattle, 214,860 goats, and 12,629 sheep while the total beef production in Gunungkidul reached 1,375,937 kilograms in 2023. However, this potential has not been fully optimized due to limited access to quality feed, traditional livestock management practices, and competition with imported products. Various internal and external constraints also affect the performance of the livestock sector in Gunungkidul. Internally, the underutilization of agricultural waste as alternative feed and limited technological adoption hinder progress. Externally, factors such as fluctuations in imported meat prices and the impacts of climate change further exacerbate challenges for small-holder livestock farmers.

This study aimed to identify the strengths, weaknesses, opportunities, and threats (SWOT) in ruminant livestock production in Gunungkidul Regency and to formulate competitive and sustainable development strategies for the sector. Compared to the aforementioned studies, the current study integrated Critical Success Factors (CSFs) analysis and the Eisenhower Matrix to prioritize strategic actions, enabling not only the identification of key internal and external factors but also the ranking of the most impactful and urgent strategies for implementation.

Materials and methods

This study employed a qualitative approach using strategic tools such as Critical Success Factors (CSFs), SWOT analysis, and Eisenhower Matrix to explore the effectiveness, challenges, and key drivers of ruminant production in Gunungkidul Regency.

Critical Success Factors (CSFs) Analysis

The definition of critical success factors (CSFs) is the competitive factor that most influences an industry member's ability to grow in the market, particularly the strategic elements, product attributes, resources, competencies, competitive capabilities, and market performance that represent distinguishing features between strong and weak competitors (Thompson *et al.*, 2021). There are at least three questions that help in identifying CSFs, namely: (1) What prominent attributes are offered by competitors? (2) What resource capabilities and competitive capabilities must the organization possess to face the competition? (3) What limitations cause the organization to lack competitive advantage?

Eisenhower Matrix Analysis

The Eisenhower Matrix, also known as the Urgent-Important Matrix, is a decision-making tool used to prioritize tasks based on their urgency and importance. It divides actions into four quadrants: (1) urgent and important, (2) important but not urgent, (3) urgent but not important, and (4) neither urgent nor important (Mfondoum *et al.*, 2019).

The use of CSFs provides the advantage of clearly identifying the most decisive operational priorities that directly influence livestock productivity, allowing stakeholders to focus resources on actions with the highest potential impact. This is particularly relevant for Gunungkidul, where limited resources and varying production capacities across sub-districts require precise targeting of interventions. SWOT analysis offers the strength of a holistic perspective by combining internal (strengths and weaknesses) and external (opportunities and threats) factors, enabling a more comprehensive understanding of the strategic position of ruminant farming in the region. This is important in Gunungkidul's context, where

natural resource availability, market access, and seasonal feed constraints interact with opportunities from growing meat demand and livestock development programs. The Eisenhower Matrix contributes the practical benefit of prioritizing actions based on urgency and importance, which supports efficient time and resource management in implementing livestock development policies. This is crucial in Gunungkidul, where policymakers and farmers must address immediate operational issues such as disease prevention and feed availability, while also planning for long-term improvements in breeding quality and market networks. Research locations were determined purposively, selecting Playen, Wonosari, and Ponjong Sub-districts due to their relatively high concentration of ruminant livestock, particularly cattle and goats, based on preliminary data from the agricultural office. The respondents were selected through a purposive sampling technique, involving active ruminant farmers who met specific inclusion criteria (directly managing ruminant livestock, being responsible for farm management decisions, and willing to participate in the study). Six top breeders from Gunungkidul Regency were chosen as key informants for in-depth interviews and questionnaires. Data collection methods included: (1) semi-structured in-depth interviews with key informants and selected farmers; (2) questionnaires combining closed and open-ended questions to gather demographic information, and livestock management practices.

Results

The CSFs analysis results presented in Table 1 reveal that the sustainability and productivity of the livestock sector in the region are constrained by multifaceted challenges across production, infrastructure, human capital, and governance. The results of the analysis, conducted using both secondary and primary data through questionnaires and in-depth interviews are revealed in Table 1

SWOT Analysis

Gunungkidul Regency has a substantial population of ruminant livestock, totaling 358,656 heads, comprising 143,796 cattle and 214,860 goats, with the highest concentrations found in the districts of Playen

Table 1. Critical Success Factors (CSFs) Analysis.

No.	Aspect	Sub-aspect	Information
1	Livestock Population	a) Cattle population b) Goat population c) Distribution pattern d) Scale of farming	143,796 heads – distributed across districts, with high concentration in Ponjong 214,860 heads – dominant in Playen and Ponjong Uneven – requires zoning for livestock centers Mostly small-scale/traditional household farms
2	Production & Productivity	a) Cattle slaughter numbers b) Goat slaughter numbers c) Meat production d) Production efficiency	5,994 heads – relatively low compared to total population 27,670 heads – relatively high Cattle: 1,375,937 kg, Goat: 564,050 kg Not yet optimal, especially for cattle
3	Feed & Nutrition	a) Availability of forage feed b) Feed source diversification c) Dependence on commercial feed	Still limited during dry seasons Agricultural waste underutilized Tends to be high among intensive farmers
4	Animal Health	a) Livestock diseases b) Access to veterinary services c) Vaccination programs	One of the main constraints in production Uneven – varies by district Needs to be broader in scale and better integrated
5	Supporting Infrastructure	a) Physical facilities b) Non-physical facilities c) Market access	Village roads, slaughterhouses, animal markets – some still underdeveloped Weak farmer institutions, few livestock cooperatives Local markets active, but limited access to regional/national markets
6	Institutions & Human Capital	a) Farmer organizations b) Training and mentoring c) Managerial skills	Mostly informal, few cooperatives or associations Limited in number and reach Low – dominated by traditional livestock practices
7	Waste Utilization	a) Manure as fertilizer b) Crop-livestock integration	Used, but not yet optimized commercially High potential – requires demo farms and system development
8	Policy & Government Support	a) Local regulations b) Cross-sector coordination c) Access to financing	Not yet specific or strong in supporting ruminant livestock development Needs alignment among livestock, agriculture, and trade offices Still limited, especially for small-scale farmers

(33,895), Wonosari (30,666), and Ponjong (26,159). This large livestock population significantly contributes to local food security and the economic well-being of the community. To better understand the current position and future potential of the livestock sector in the region, a SWOT analysis was conducted to identify its strengths, weaknesses, opportunities, and threats as a basis for strategic development and policy-making presented in Table 2 as follows.

In the context of this paper, the Eisenhower Matrix will serve as the next analytical step after the SWOT analysis to help categorize strategic actions for improving ruminant production in Gunungkidul Regency. By mapping identified strengths, weaknesses, opportunities, and threats into this matrix, stakeholders can prioritize initiatives that address the most pressing and impactful issues effectively. The Eisenhower matrix for this study is presented in Table 4.

Discussion

Based on the analysis of Critical Success Factors (CSFs), SWOT, and priority mapping through the Eisenhower Matrix, livestock sector devel-

opment strategies need to be directed in a measured, integrated, and area-based manner. This analysis highlighted the key factors for success, identifies strengths, weaknesses, opportunities, and threats, and classifies action plans according to their urgency and required resources.

Although livestock populations—particularly goats and cattle—are substantial, efficiency in production, animal health management, and access to markets remain far from optimal (Moll, 2005). The predominance of traditional small-scale farming systems further restricts potential for productivity and scalability (Alary *et al.*, 2011).

Feed scarcity during dry seasons, coupled with the underutilization of agricultural waste, underscores the necessity of integrated feed resource planning (Ayantunde *et al.*, 2005). Infrastructure limitations—both physical and institutional—continue to inhibit development. These are compounded by weak farmer institutions, low managerial capacity, and limited training opportunities, which impede the sector's modernization. Furthermore, the absence of robust local policies and lack of alignment among related government sectors exacerbate existing inefficiencies (Alary *et al.*, 2011).

The following Table 3 of SWOT strategy matrix presents a compre-

Table 2. Strengths, weaknesses, opportunities, and threats (SWOT) Analysis.

Strengths	Weaknesses
Large livestock population	Low cattle slaughter rate (~4%), indicating inefficient turnover.
High concentration in Playen, Ponjong, and Wonosari – potential for livestock clustering.	Predominantly small-scale, traditional household farms.
Relatively high meat production, especially for goats.	Limited forage availability during dry seasons.
Livestock supports food security and rural economy.	Underutilization of agricultural by-products as feed.
Livestock data is monitored well by technical agencies.	High dependence on commercial feed among intensive farmers.
Seasonal market demand	Uneven veterinary access and insufficient vaccination coverage.
	Inadequate infrastructure: slaughterhouses, roads, livestock markets.
	Weak farmer institutions, limited cooperatives and training services.
	Poor adoption of modern technologies and low productivity.
	Livestock waste not yet commercially optimized.
OPPORTUNITIES	THREATS
Strong demand for local, quality meat – local and regional markets.	Livestock disease outbreaks (FMD, brucellosis) with potential for rapid spread.
Government programs supporting smallholder cattle and goat farming.	Price volatility in feed and live animals.
Potential for integrated crop-livestock systems and organic fertilizer commercialization.	Competition from lower-priced imported beef.
Potential zoning and cluster development in high-population areas.	Land conversion reducing grazing and forage areas.
Utilization of crop residues and forage innovations to improve feed access.	Limited financing access for small-scale farmers.
Sustainability awareness could attract youth into livestock sector.	Weak coordination among livestock, agriculture, and trade sectors.

Table 3. SWOT Strategy Matrix.

SWOT combination	S–O (Strengths – Opportunities)	SWOT combination	W–O (Weaknesses – Opportunities)
S1, S3, S6, O1	Leverage large livestock population to meet demand for local meat.	W6, W7, W9, O2	Improve infrastructure with support from government programs.
S2, O2, O4	Develop zoned livestock clusters in areas like Playen and Ponjong.	W4, W10, O3, O5	Utilize crop residues and forage innovations to address dry season shortages.
S1, S4, O3, O5	Utilize agri-byproducts and data systems for integrated crop-livestock and organic fertilizer business.	W2, W8, O2, O4	Strengthen farmer groups and cooperatives to adopt cluster-based modern practices.
S3, S5, O6	Promote livestock as economic driver to attract youth under sustainability programs.	W3, W5, W9, O2, O3, O5	Reduce commercial feed reliance through integrated systems and local feed innovations.
SWOT Combination	S–T (Strengths – Threats)	SWOT Combination	W–T (Weaknesses – Threats)
S5, T1	Use data monitoring for early disease detection and response.	W6, W7, T1	Improve vet access and vaccination to reduce outbreak risks.
S1, S3, T3, T6	Promote local meat's freshness and traceability to compete with imports.	W9, T3	Increase productivity through tech adoption to withstand price volatility and imports.
S5, T4	Strategically manage livestock distribution to reduce impact from land conversion.	W4, W5, W10, T4 T6	Promote intensive farming to cope with limited grazing land.
S1, S3, S6, T3, T5, T6	Enhance market access to stabilize prices and utilize meat production capacity.	W8, T5, T6	Improve coordination among livestock, agriculture, and trade sectors to ease financing challenges.

Table 4. Eisenhower Matrix.

	Urgent	Not Urgent
Important	Do: Develop zoned livestock clusters in areas like Playen and Ponjong. Utilize agri-byproducts and data systems for integrated crop-livestock and organic fertilizer business Utilize crop residues and forage innovations to address dry season shortages. Strengthen farmer groups and cooperatives to adopt cluster-based modern practices. Use data monitoring for early disease detection and response. Improve vet access and vaccination to reduce outbreak risks.	Plan: Leverage large livestock population to meet demand for local meat. Promote livestock as economic driver to attract youth under sustainability programs. Reduce commercial feed reliance through integrated systems and local feed innovations. Enhance market access to stabilize prices and utilize meat production capacity. Increase productivity through tech adoption to withstand price volatility and imports. Promote intensive farming to cope with limited grazing land.
Not important	Delegate: Improve infrastructure with support from government programs. Promote local meat's freshness and traceability to compete with imports. Strategically manage livestock distribution to reduce impact from land conversion. Improve coordination among livestock, agriculture, and trade sectors to ease financing challenges.	Delete: -No strategies fall into this category

hensive set of strategic alternatives for the livestock sector, developed by aligning internal strengths and weaknesses with external opportunities and threats.

Several studies align with the strategies provided in the matrix (Table 3). For instance, there are studies underscore the importance of utilizing existing livestock assets and emerging opportunities to drive regional agricultural development. Sutiana *et al.* (2022) highlighted how leveraging large livestock populations can significantly meet local meat demands while enhancing rural income. Their study in Bali showed the capability of local livestock to meet local meat demands as a result of the abundant availability of feeds, livestock breeds, and productive age of breeders. Developing zoned livestock clusters have been shown to significantly enhance biosecurity, feed supply efficiency, and farmer coordination. Indrawan *et al.* (2018) mentioned that in Indonesia and Vietnam, centralized collection points and regulated movement within poultry supply chains have improved disease surveillance and reduced the spread of avian influenza by standardizing biosecurity practices. In Kenya, dairy hubs facilitated both horizontal and vertical integration, enhancing farmer coordination, market access, and overall sustainability, despite some governance challenges (Kilelu *et al.*, 2017). A study of Mumba *et al.* (2024) substantiates the urgency of improving infrastructure with the support from the government. The study identified poor feeder roads as a barrier to accessing markets, veterinary services, and private investment. In that case, government support by upgrading roads was highlighted as essential to unlock livestock market participation.

The results divided strategic measures into immediate actions (Do), mid-term planning (Plan), and long-term delegation (Delegate), ensuring that each intervention can be implemented effectively, sustainably, and with adaptability to local dynamics.

Immediate actions (Do) should focus on developing livestock clusters in promising zones like Playen and Ponjong, where geographic and socio-cultural conditions are favorable. Agricultural waste must also be reused for feed, organic fertilizer, or renewable energy, supported by integrated data systems to promote sustainable farm-livestock cycles. To address dry season feed shortages, innovations using crop residues and forage technology should be prioritized as over 82% of potential livestock feed in Gunungkidul comes from crop by-products—yet much remains unused (Umami *et al.*, 2021). Strengthening farmer groups and cooperatives is crucial to accelerate adoption of modern cluster-based practices. A study notes that clustering by sub-district and aligning with carrying capacity supports growth through intensive supervision and support (Siti and Hadi, 2018). Moreover, early disease detection through real-time monitoring and improved veterinary services and vaccination access are urgent to prevent major outbreaks.

Mid-term strategies (Plan) include optimizing the existing large live-

stock population to meet growing local meat demand through better productivity and supply chains. Youth engagement in livestock must be encouraged with sustainability programs, digital technology, and attractive business models. Reducing dependency on commercial feed by promoting local feed innovations and livestock-crop integration is another key priority. Expanding market access through digital platforms, partnerships, and export strategies will help stabilize prices. Additionally, adopting smart technologies and promoting intensive farming systems are essential to improve resilience, productivity, and land use efficiency.

Long-term, resource-intensive tasks should be delegated. Infrastructure developments such as roads, communal barns, and post-harvest facilities—requires government investment through technical agencies. Feed innovation and integration systems should be handled by research institutions and agricultural extension services. Local meat promotion, including branding and traceability, is best supported by trade agencies and farmer associations. Strategic livestock distribution planning must be led by spatial planning bodies, while cross-sector coordination for financing solutions can be managed by inter-agency development teams or regional economic bodies.

Conclusion

This study concludes that although Gunungkidul Regency possesses significant potential for the development of ruminant livestock—as indicated by a high livestock population and its contribution to local food security—the sector continues to face several challenges. These include feed shortages during the dry season, low production efficiency, weak farmer institutions, and limited access to technology, markets, and veterinary services. Through the application of SWOT analysis and the Eisenhower Matrix, this study formulated integrated priority strategies for livestock sector development, encompassing the strengthening of farmer groups and cooperatives, the utilization of agricultural waste as alternative feed and organic fertilizer, and the adoption of technology for disease monitoring and control. In the short term, the focus is directed toward securing feed supply during the dry season, improving access to veterinary services through veterinarians and vaccination programs, and implementing modern cluster-based farming practices. In the medium term, the strategies emphasize diversifying local feed sources to reduce reliance on imports, enhancing productivity, expanding market access, and fostering greater interest among younger generations in the livestock sector. Supporting interventions, such as infrastructure development and the promotion of local products, are implemented as complementary measures to reinforce the sustainability of the livestock business ecosystem.

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Conflict of interest

The authors declare that there is no conflict of interest regarding the publication of this paper.

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