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Analysis of the Potential of Beef Cattle Farming in Muara Badak District, Kutai Kartanegara

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Abstract
This study analyzes the potential for beef cattle development in Muara Badak District, Kutai Kartanegara Regency, East Kalimantan. The research method used is descriptive qualitative with a field study approach through interviews with livestock breeders, community leaders, village officials, and secondary data analysis from relevant agencies. The results show that Muara Badak has potential resources, including extensive land, agricultural and plantation waste as alternative feed, and a deeply rooted cattle farming tradition within the community. Extensive and semi-intensive patterns with limited adoption of modern technologies, such as artificial insemination and fermented feed processing, still dominate beef cattle farming systems. Market opportunities are considered very promising given the high demand for local and regional beef, mainly from Samarinda and Balikpapan, as well as the seasonal spike in demand during Eid al-Adha. However, beef cattle development faces challenges such as limited livestock breeders' knowledge of health management and biosecurity, restricted access to capital, fluctuations in feed prices, and weak institutionalization of livestock groups. Therefore, strategies are needed to strengthen the capacity of livestock farmers, innovate in the use of local feed, and promote multi-stakeholder synergy between the government, financial institutions, and the private sector to encourage the modernization of livestock systems. With proper management, beef cattle farming in Muara Badak has the potential to drive the local economy and significantly contribute to food security, increased competitiveness, and sustainable livestock development at the regional and national levels.

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1. Introduction

The livestock sector significantly contributes to Indonesia's economic development, particularly in rural areas. In addition to providing nutritious animal food, livestock provides a source of income, employment, and savings for farming households. Within the context of regional development, livestock even serves as a driver of the local economy because it utilizes available rural resources, including land, labor, and agricultural by-products (Chisoro et al., 2023). Among various livestock commodities, beef cattle occupy a strategic position. Beef demand in Indonesia continues to increase yearly, driven by population growth, increased purchasing power, and shifting consumption patterns that demand higher levels of animal protein. However, domestic beef production has not yet fully met national demand, so Indonesia remains dependent on imports. This situation indicates a gap between the potential of local livestock resources and the realization of their fulfillment to meet market needs.

Kutai Kartanegara Regency in East Kalimantan Province is one of the regions with significant potential for beef cattle development. This region is known for its vast land area and diverse ecosystems, ranging from agricultural land and plantations to grasslands that can be utilized as feed sources. Muara Badak District, as part of Kutai Kartanegara, has geographical and socio-economic conditions that are relatively supportive of smallholder livestock farming. The availability of agricultural waste such as rice straw, corn, and cassava, as well as by-products from oil palm plantations such as fronds and oil cake, opens up significant opportunities to meet livestock feed needs (Ilham, 2015). For the Muara Badak community, raising beef cattle is nothing new. Cattle farming has been a hereditary tradition, serving as a life savings account, a social asset, and a source of additional family income. Beef cattle are often used for traditional and religious ceremonies or sold to meet local consumption needs (Azizah et al., 2023). The dual role of cattle as both an economic and cultural asset demonstrates that beef cattle development in Muara Badak has a strong social foundation.

However, the potential is not yet fully utilized. Most farmers traditionally manage their livestock businesses, using extensive or semi-intensive systems. Frequently encountered problems include limited access to quality feed, a lack of knowledge about reproductive management, animal health, and biosecurity, and the minimal application of appropriate technologies such as artificial insemination or fermented feed processing. Weaknesses in the institutional aspects of livestock groups also hinder farmers from strengthening their bargaining position in the market and accessing capital (Aprylasari et al., 2025). In addition to internal factors, external challenges also influence the development of beef cattle in Muara Badak. Fluctuating beef prices in the local market, competition with imported products, and limited distribution networks make it difficult for smallholder livestock businesses to develop optimally. If this potential is not immediately managed with appropriate strategies, beef cattle in Muara Badak will remain traditional and contribute less to improving food security and the regional economy.

Therefore, analyzing the potential of beef cattle farming in Muara Badak District is crucial. This analysis aims to identify local strengths, challenges, and potential development opportunities. This study is expected to formulate a more targeted, participatory, and sustainable livestock development strategy, thereby improving livestock farmers' welfare, supporting regional economic development, and strengthening national food security.

2. Method

This research employed a qualitative descriptive method with a field study approach. This method was chosen because it provides a comprehensive overview of the current state of beef cattle farming in Muara Badak District, including aspects of resources, husbandry practices, and development opportunities. The qualitative approach also enabled researchers to gather in-depth information regarding local cattle breeders' experiences, perspectives, and practices (Nurhayati et al., 2024). Data collection was conducted through two main sources: primary and secondary data. Primary data were obtained directly from the field through in-depth interviews with beef cattle breeders, community leaders, and village officials involved in livestock management. These

interviews aimed to obtain factual information regarding livestock husbandry patterns, feed utilization, reproductive systems, and cattle breeders' challenges in running their businesses. Meanwhile, secondary data were obtained from official documents and related literature, such as reports from the Kutai Kartanegara Regency Agriculture and Livestock Service, publications from the Central Statistics Agency (BPS), and scientific journals and books on beef cattle development.

The collected data was then analyzed descriptively, focusing on identifying potential and challenges in the field. The analysis focused on four main areas: the potential resources supporting livestock farming, the institutional framework for collaboration, the applied husbandry practices, and market opportunities that could be optimized (Asai et al., 2018). This research is expected to provide a clear picture of the current state of beef cattle farming in Muara Badak and provide a foundation for formulating sustainable development strategies.

3. Result and Discussion

3.1. Resource Potential

Muara Badak District has excellent resources for beef cattle development. Land-wise, the region still has extensive areas, including unused land and remaining unproductive oil palm plantations. These lands have significant potential for grazing, reducing livestock farmers' dependence on relatively expensive commercial concentrate feed. Furthermore, this land also has the potential to be planted with superior forage crops (HPT) such as elephant grass (Pennisetum purpureum), indigofera, and calliandra, which have high nutritional value. Targeted land management can support year-round feed availability, ensuring a sustainable feed supply during the dry season (Mayulu et al., 2019). The following are potential local feed sources that can be utilized throughout the dry season.

Figure 1. Potential of local feed

Besides land, the availability of local feed ingredients also has significant potential. Agricultural waste, such as rice straw, corn stalks, rice bran, and palm oil plantation by-products, such as palm kernel meal, palm fronds, and palm oil sludge, can be utilized as alternative feed sources. Their abundance, coupled with the predominant agricultural and plantation activities in Muara Badak, makes these materials relatively easy for livestock farmers to obtain. Utilizing this waste reduces dependence on commercial feed and supports the principles of cost-efficiency and environmental friendliness through the zero-waste concept (Yazdani & Lakzian, 2023). With simple processing technologies, such as straw fermentation or silage production from palm fronds, the nutritional value of this waste can be increased, making it more suitable for livestock needs.

Regarding human resources, the Muara Badak community has long considered cattle farming an economic activity and a local cultural practice. Their experience in raising cattle traditionally, using both grazing and semi-intensive systems, provides a significant social capital. The community views cattle as a lifeline, a source of emergency funds, and even a symbol of social status. This

demonstrates the strong connection between cattle farming and daily life. However, the husbandry system remains rudimentary and does not fully incorporate modern management principles, such as balanced feeding, biosecurity, or reproductive technologies like artificial insemination.

This situation opens up significant opportunities for improving the capacity of livestock farmers through ongoing counseling, training, and mentoring (Mayulu & Daru, 2019). By mastering appropriate technology, optimal land use, and innovation in processing agricultural and plantation waste into feed, the Muara Badak community has the potential to develop a more productive and competitive beef cattle business. Thus, the potential of available resources is not only limited to natural capital but can also be converted into economic capital that contributes to community welfare and sustainable livestock development in this area.

3.2. Maintenance System

The beef cattle farming system in Muara Badak District remains traditional, with two main patterns: extensive and semi-intensive. In the extensive system, cattle are kept by grazing freely on open land, including grasslands, fallow land, and unproductive oil palm plantations. This system is relatively easy to implement and inexpensive because feed is obtained directly from nature. However, the lack of measurable feed management results in uneven livestock growth, low productivity, and susceptibility to nutritional deficiencies, especially during the dry season when forage is scarce.

In contrast to the extensive system, some farmers have begun implementing a semi-intensive system. In this system, cattle are housed in simple pens but grazed at specific times, usually in the morning or evening. This allows farmers to monitor their cattle's health while also controlling the provision of supplemental feed in agricultural waste or bran. This system is superior to the purely extensive system, as it offers the opportunity to increase productivity through supplemental feed management (Aprylasari et al., 2025). However, the still-modest quality of the pens and the lack of implementation of modern husbandry standards remain obstacles to optimal cattle performance. The following image shows the condition of the cattle pens at a Muara Badak District farm.

Figure 2. Condition of the cow shed

As demand for beef grows, the local government, through the Department of Agriculture and Livestock, has introduced modern reproductive technology in the form of artificial insemination (AI). This technology aims to improve the genetic quality of beef cattle, accelerate population growth, and reduce dependence on the limited number of natural bulls. However, its implementation in Muara Badak remains limited to a small number of farmers who receive direct assistance from field officers. Poor understanding of the benefits of AI, limited insemination personnel, and the lack of adequate supporting facilities have prevented this technology from being widely adopted.

In addition to reproductive aspects, livestock health management is also still minimal. Most farmers are not accustomed to vaccinations, vitamin administration, or routine medication. This makes cattle vulnerable to worms, diarrhea, and other infectious diseases. Limited access to animal health services further exacerbates the situation, as many farmers lack close contact with veterinary medical personnel.

Overall, the beef cattle farming system in Muara Badak is still in a transitional stage between traditional and modern patterns. Interventions such as counseling, technical training, and adequate facilities and services are needed to encourage change toward greater productivity. By strengthening the farming system, farmers can increase business efficiency, improve livestock quality, and expand production capacity to meet growing market demand (Aprylasari & Azizah, 2025).

3.3. Market Opportunities

The market opportunities for beef cattle in Muara Badak District can be said to be very promising. Demand for beef in this region tends to continue to increase in line with population growth, increased purchasing power, and shifting consumption patterns that emphasize the need for animal protein. Beef consumption is not only limited to household needs but also extends to local markets through butchers in traditional markets, catering industries, restaurants, and hotels (Anindyasari et al., 2025). Thus, the beef market in Muara Badak is multi-tiered, ranging from small to medium-scale, providing ample opportunities for farmers to market their livestock. Geographical advantages are another supporting factor that strengthens market opportunities. Muara Badak's proximity to two major cities in East Kalimantan, Samarinda and Balikpapan, opens up wider distribution access. Samarinda, as the provincial capital, has a dense population and high beef consumption, while Balikpapan is an industrial and business city with a significant demand for beef supplies for restaurants, hotels, and catering companies. This proximity facilitates transportation and marketing, making beef cattle from Muara Badak potentially fill the local market and meet regional demand.

In addition to routine needs, seasonal events such as Eid al-Adha significantly surge demand for beef cattle. During this period, cattle prices typically rise due to the sharp increase in demand for sacrificial animals. This presents a significant opportunity for livestock farmers to achieve higher profits, provided they can manage their production cycles and maintain cattle quality to meet consumer standards. In fact, with proper management, livestock farmers can leverage this seasonal momentum into an annual business strategy that can increase income stability (Anindyasari et al., 2025). Furthermore, the growing public awareness of food health and safety is also opening up opportunities for livestock farmers to improve their husbandry and marketing systems. Consumers are increasingly paying attention to the origins of meat products, livestock raising practices, and even halal certification and hygiene in the slaughter process. If livestock farmers in Muara Badak can meet these standards, beef products from this region will be more competitive. Going forward, market opportunities can also be expanded by leveraging digital technology through online marketing platforms, which are emerging in agribusiness. This allows farmers to rely less on traditional markets and reach consumers directly.

Given these various opportunities, it is clear that Muara Badak is strategically positioned for beef cattle development. However, capitalizing on these market opportunities depends heavily on the ability of farmers to increase productivity, maintain livestock quality, and manage production patterns consistently throughout the year. With the right development strategy, beef cattle farming in Muara Badak can become a significant pillar of beef supply in Kutai Kartanegara and East Kalimantan.

3.4. Challenge

Despite its significant resource potential, beef cattle development in Muara Badak District still faces several complex challenges. One major challenge is the limited knowledge of livestock farmers regarding livestock health management and biosecurity implementation. Most farmers still raise cattle using traditional methods without paying attention to health standards, such as vaccination, parasite control, or barn sanitation (Craighead et al., 2021). This leaves livestock vulnerable to various diseases, both infectious and parasitic, which can reduce productivity and even cause

economic losses due to cattle mortality. Furthermore, awareness of biosecurity remains low, resulting in inadequate disease prevention through animal movement management, equipment hygiene, and isolation of new livestock. Another challenge livestock farmers face is their limited access to capital and production facilities. Most livestock farmers in Muara Badak operate small-scale businesses with limited financial resources, making it difficult to invest in pen improvements, purchase quality feed, or adopt modern reproductive technologies such as artificial insemination (Azizah et al., 2021). This situation leads to stagnant productivity and makes it difficult for them to develop into more competitive businesses. The role of formal financial institutions in providing financing access to livestock farmers is also limited, as many farmers lack the collateral or administrative credentials required to access business credit.

In addition to capital, fluctuating commercial feed prices pose a significant obstacle. Dependence on feed from outside the region makes production costs unstable, especially when feed prices spike due to rising global raw material prices. This often forces farmers to reduce supplemental feed, reducing cattle growth (Müller et al., 2015). Without the support of quality feed, cattle performance struggles to meet desired market standards. This challenge highlights the need for innovation in utilizing local feed sources, such as fermented straw or silage from palm oil plantation waste, to reduce dependence on manufactured feed.

The weakness of livestock group institutions is also a significant issue. Many livestock farmers in Muara Badak still work individually without being organized into a cohesive group. This situation impacts their bargaining power in terms of obtaining favorable selling prices and accessing government assistance programs. Farmers struggle to collectively procure feed, access animal health services, and establish partnerships with the private sector without strong institutions. Strengthening livestock groups is crucial for farmers to improve their managerial capacity, expand their marketing networks, and strengthen their competitiveness in an increasingly competitive market. Given these challenges, it is clear that developing beef cattle farming in Muara Badak requires targeted intervention. Synergy between breeders, local governments, financial institutions, and the private sector is needed to provide technical assistance, access to capital, and strengthen livestock institutions. These efforts aim not only to address existing obstacles but also to build a foundation for a sustainable and highly competitive beef cattle business in the future.

4. Conclusion

An analysis of the potential of beef cattle farming in Muara Badak District shows that this region has significant potential to be developed as a cattle production center in Kutai Kartanegara and East Kalimantan. The availability of natural resources in the form of vast land and agricultural and plantation waste that can be used as alternative feed is a crucial asset to support the sustainability of livestock businesses. Furthermore, the community's long-standing tradition of cattle raising serves as a social strength that can serve as a foundation for developing businesses based on local wisdom. However, the beef cattle farming system is still dominated by traditional practices, resulting in low productivity and low livestock quality. Modern technology, such as artificial insemination, has only been implemented on a limited basis, resulting in suboptimal growth in the cattle population and genetic quality. Wide-open market opportunities, both locally and regionally, including seasonal demand during Eid al-Adha, should be strategically utilized by livestock farmers. Geographical proximity to major cities such as Samarinda and Balikpapan also strengthens the distribution competitiveness of beef products from Muara Badak.

On the other hand, the challenges faced are significant, ranging from farmers' poor understanding of health and biosecurity management, limited access to capital, fluctuating commercial feed prices, and weak livestock group institutions. These obstacles can potentially reduce competitiveness if not addressed promptly through strategies to strengthen farmer capacity, innovate in the use of local feed, and build solid institutions. Therefore, developing beef cattle farming in Muara Badak requires an integrated approach involving local governments, financial institutions, universities, and the private sector. This synergy is expected to encourage modernization of the husbandry system, strengthen farmers' bargaining position, and create a

highly competitive and sustainable livestock business. Proper management will make beef cattle a driving force for the local economy and a significant contributor to national food security.

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