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POTENTIAL FOR DEVELOPING BEEF CATTLE BREEDING IN SAMBI RAMPAS DISTRICT, EAST MANGGARAI REGENCY, EAST NUSA TENGGARA, INDONESIA

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Abstract

This study aims to determine the potential for beef cattle development in Sambu Rampas District, East Manggarai Regency, East Nusa Tenggara. The study was conducted in July 2026 in Sambu Rampas District. The subjects were 1,000 beef cattle breeders. 273 farmers were the respondents. This study was conducted using a survey method and interviews with farmers based on a questionnaire. The data obtained were analyzed descriptively. The results showed that the majority of farmers aged 31-40 years old were 38.1%. The education level is dominated by elementary school graduates as many as 63.4%, livestock farming experience > 10 years 68.9%, livestock ownership status is 100%. The main job as a farmers is as much as 72.5%, and maintenance system in general extensive 79.9%. Total availability of feed from Green Forage Production and Agricultural Waste is 60,618.94 tons of DM/year, while the total feed requirement for ruminant livestock reached 8,876.80 tons of DM/year. The conclusion of this study is that Sambu Rampas District experienced a feed surplus of 51,742.14 tons of DM/year.

Keywords: *beef cattle, development potential, feed requirements, feed surplus.*

INTRODUCTION

Background

Development of the livestock sector is part of agricultural development, aiming to achieve a resilient livestock sector, the ability to improve the welfare of livestock farmers, and the ability to drive overall growth in the related sector. Development of the

livestock sector plays a strategic role in meeting the increasing demand for food and nutritional quality in the community.

Beef cattle are a source of meat that offers significant benefits for fulfilling and improving community nutrition. Sugeng (2003) stated that beef is a source of animal protein that is essential to meet the community's food and nutritional needs. As the

population increases, Indonesia's demand for meat consumption continues to increase annually. Beef cattle farming offers promising business opportunities, driven by the increasing demand for animal-derived foodstuffs as a source of animal protein, particularly meat. Cattle typically produce a variety of needs, primarily as food in the form of meat, in addition to other by-products such as manure, compost, biogas, hides, bones, and so on. A beef cattle farming business can be considered successful if it contributes to income and meets the daily needs of farmers. This can be seen from the increasing number of livestock owned, the increase in livestock weight, and additional household income. Managing and raising beef cattle is one way to increase household income.

East Manggarai Regency, particularly Sambi Rampas District, boasts an agro-ecosystem with significant potential for beef cattle development. The majority of people in this region rely on agriculture and livestock for their livelihoods. However, the majority of beef cattle farms currently operate on a small-scale scale, employing extensive or traditional livestock systems. Projecting this region as a center for advanced beef cattle development requires an in-depth analysis of the characteristics of the farmers, their management systems, and the availability of local feed resources.

Research purposes

The aim of this study is to determine the potential for developing beef cattle farming in Sambi Rampas District, East Manggarai Regency based on natural resources and human resources.

Benefits of research

1. The results of this study are expected to provide additional knowledge, especially for the author and other parties who need information about beef cattle development.
2. As a guideline or consideration for the successful development of beef cattle businesses in the future.

MATERIALS AND METHODS

Time and Place of Research

This research was conducted in July 2026 in Sambi Rampas District, East Manggarai Regency, East Nusa Tenggara.

Research Materials

1. Materials, The materials used in this study are: Beef cattle breeders, Livestock population, Animal feed (HMT)
2. Tools: Stationery, camera, scales, sickle, meter roll, rope, questionnaire

Research methods

The sampling method used in this study is:

1. Survey

This method is used when conducting surveys using questionnaires, as an interview guide tool.

2. Sample Determination, Determination of the sampling location in this study is by looking at the data obtained through the Animal Husbandry Service of Sambi Rampas District, BPS East Manggarai Regency to find

out the number of beef cattle raised in Sambi Rampas District, East Manggarai Regency. The population at the research location is all beef cattle breeders in Sambi Rampas District, East Manggarai Regency, East Nusa Tenggara.

In determining the sample, the Slovin formula is used. $n = \frac{N}{1 + Ne^2}$

Note:

N = Population Size

n = Number of Samples

E = Error Rate (5%)

3. Data used

The data used in this study is divided into two, namely primary data and secondary data:

1. Primary data was taken, namely data from farmers including: Name, Age, Last Education, Livestock farming experience and weighing raw materials.
2. Secondary data is research data obtained from the Animal Husbandry Service, Agriculture Service and BPS of East Manggarai Regency:

Table 1. The number of livestock populations in each village in Sambi Rampas District

No	Village/Sub-district	Cattle Population (Head)
1	Nanga Baras	204
2	Nanga Mbaling	85
3	Pota	510
4	Nanga Mbaur	141
5	Nampar Sepang	99
6	Wela Pepper	5
Amount		1,044

Source: BPP Sambi Rampas District (2025)

Measured variables

- a. Land Approach: Calculate the bearing capacity value using the following formula:

$$\text{Land Carrying Capacity} = \frac{\text{Dry matter production (ton/ha/thn)}}{\text{Dry Matter Requirement (ton/UT/ha/thn)}}$$

- b. Calculating the value of the Ruminant Livestock Population Increase Capacity (KPPTTR).
- c. KPPTTR is calculated by using the difference between the carrying capacity of food crop waste feed and the current ruminant livestock population.

Data analysis

All data obtained during the research were tabulated and averaged then analyzed systematically. descriptive (Sugianto, 2009).

RESULTS AND DISCUSSION

Available Feed Potential

In Sambi Rampas District, the potential feed produced includes production from agricultural waste and green fodder production.

Table 2. Green fodder production in Sambi Rampas District

Types of livestock forage	Production Fresh (kg/m ²)	Harvest (times/year)	Land area (ha)	Fresh production (tons/year)	DM content (%)	DM Production (tons/year)
R. field	3.4	9	240	73,440	25	18,360
Leucaena	4.4	3	143	18,876	36	6,795.36
Turi leaves	3	4	246	29,520	32	9,446.40
Amount			629	121,836		34,601.76

Source: Processed primary data, 2026.

Based on table 2 above, the area of green land for animal feed in Sambi Rampas District is 629 ha and produces a total production of 121,836 tons/year in fresh weight form or equivalent to 34,601.76 tons/year in dry weight (DM).

Agricultural Waste Production

Table 3. Agricultural waste production

Types of livestock forage	Production Fresh (kg/m ²)	Harvest (times/year)	Land area (ha)	Fresh production (tons/year)	DM content (%)	DM Production (tons/year)
J. corn	4	2	872	69,760.00	22	15,347.20
K. green	3.5	1	66.5	2,327.50	28	651.70
Cassava	3.2	1	91	2,912.00	24	698.88
J. rice	2	2	931.94	37,277.60	25	9,319.40
Amount			1,961.44	112,277.10		26,017.18

Source: Processed Primary Data, 2026

From the data above, it can be seen that agricultural waste in Sambi Rampas District can produce 26,017.18 tons of DM/year of animal feed. Meanwhile, the total Fresh production reached 112,277.10 tons/year. Corn straw contributed the largest agricultural waste potential, followed by rice straw, which is abundantly available after the harvest season.

Table 4. Total availability of animal feed in Sambi Rampas District (tons/DM/year)

Feed potential	Total (DM/ton/year)
Origin of agricultural waste	26,017.18
Green Forage Production	34,601.76
Total	60,618.94

Source: Processed Primary Data, 2026

The table above shows that the total availability of livestock feed in Sambi Rampas District, both from agricultural waste and forage production, is 60,618.94 tons of dry matter per year. This amount contributes to supporting the increase in the ruminant livestock population in the region.

Calculating Ruminant Livestock Needs

To calculate the feed requirements of ruminant livestock, the main variables that must be known include the standard daily dry matter (DM) intake and the average body weight of the livestock. The standard feed requirement for ruminants is generally calculated based on a feed consumption of 2% to 3% of the livestock's body weight per day. In this study, the estimated feed requirement was calculated based on the assumed body weight of adult male and female cattle, which was converted into unique livestock units (UT).

Table 5. Total dry matter requirements for ruminant livestock.

Types of Livestock	Number of Livestock (UT)	Need DM/UT (kg/day)	Total Needs DM (ton/year)
Adult Cow	1,620	10.5 kg	6,208.65
Calf	980	3.5 kg	1,251.95
Amount	2,600		7,460.60

Source: Primary Data Processed 2026.

Based on Table 5 above, in Sambi Rampas District, there are 2,600 livestock, requiring 7,460.60 tons of dry matter per year. The amount of feed required by livestock is influenced by their age and body weight. Sugeng (2002) stated that the average ruminant requires 2.5-3.2% of its body weight in dry matter. Meeting livestock feed requirements is useful for maximizing livestock productivity.

Competitors' Animal Feed Needs

Table 6. Competitor feed requirements

Types of Livestock	Number of Livestock	Guidance and Counseling Needs (kg/day)	Total DM (tons/year)
Goat	3,880	1 kg	1,416.20
Amount	3,880		1,416.20

Source: Primary Data Processed 2026.

The total feed requirement for 2,600 UT cattle per year based on table 5 is 7,460.60 DM tons/year. Competitor feed requirement based on table 6 is 1,416.20 tons DM/year, so the total feed requirement for ruminant livestock reaches 8,876.80 tons DM/year. With the total regional feed availability of 60,618.94 tons DM/year, it can be concluded that Sambi Rampas District has a feed surplus of 51,742.14 tons DM/year.

Carrying Capacity

Table 7. Land Capacity in Sambi Rampas District

Number of Livestock (UT)	Feed Production DM (ton/year)	Feed Requirements DM (ton/year)	Left over Feed DM (ton/year)
2,600	60,618.94	8,876.80	+51,742.14

Source: Primary Data Processed 2026

Table 7 above shows that Sambi Rampas District has a feed surplus of 51,742.14 tons of dry matter per year. The livestock feed requirement for a region is calculated based on the livestock population.

CONCLUSION AND SUGGESTIONS

Conclusion

Based on research conducted in Sambi Rampas District, it can be concluded that, in terms of natural resource potential, the region's feed availability is sufficient to meet the needs of the existing livestock population. This is demonstrated by the feed balance in Sambi Rampas District, which experiences a feed surplus of 51,742.14 tons of dry matter per year.

Suggestion

1. The local government, through relevant agencies, needs to optimize the potential for this abundant feed surplus by encouraging a program to increase or add to the ruminant livestock population in Sambi Rampas District.
2. Considering the average education level of livestock farmers is still at elementary school, an active role is needed from the livestock service of East Manggarai Regency to provide guidance, training, and ongoing counseling to improve livestock farmers' skills from an extensive system to a more productive maintenance management.

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