ANALYSIS OF CONTRIBUTION AND FEASIBILITY OF LOCATION-BASED SLAUGHTER GOAT BUSINESSES IN NORTH SUMATRA

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Abstract

The research aims to analyze the contribution and feasibility of location-based beef goat businesses in North Sumatra. The research was conducted in Langkat, Deli Serdang and Serdang Bedagei districts using a survey method in 3 sub-districts which were deliberately selected based on the largest goat population. The number of samples in this research was 60 samples, 20 respondents each from each research location. The analytical methods used are income analysis, R/C ratio and Location Quotient. The results of the analysis showed that the R/C Ratio value was 2.41, indicating that it was possible to continue and develop beef goat farming in the Langkat, Deli Serdang and Serdang Bedagei areas. The contribution of beef goat livestock in North Sumatra is 36.1%, which shows that income from the beef goat business can become a main business if it is managed appropriately. It is proven that side maintenance has a significant impact on the farmer's total income. The LQ value obtained at 2.60 is quite high, indicating that the population and availability of beef goats in North Sumatra, apart from being able to meet regional needs, can also provide opportunities for export based on business location.

Keywords: *goat farming, financial feasibility, contribution, LQ*

1. Introduction

One commodity in the livestock sector that has great potential to be developed is goats. Goats are very popular livestock because of their high economic value. Because of their high protein content, goat products play an important role both in increasing income and fulfilling community nutrition, whether produced by meat goats or dairy goats (Rosdiana, I et al., 2020). The contribution of goat farming to income in the agricultural sector is still less than 30%, so goat farming is only part-time as an agricultural supporting commodity. Apart from fattening livestock, the goat farming business is also being strengthened to increase family income. One of the main problems is of course the contribution of goat farming to the farmer's own income (Jakfar, M and Murdhani, K. 2020). From a socio-economic perspective, the goat farming business is still under the control of local breeders. Unlike the broiler business structure, the upstream aspects of seeds and feed as well as the downstream market for goat farming are still in the hands of the farmer. These socio-economic conditions increase the determination to develop business, including promotion through consumption of local products (Lukman, 2018).

Apart from that, the prospect of exporting goats and sheep is very wide open for neighboring countries such as Malaysia, Brunei Darussalam and the Middle East, where the government's efforts are to issue Minister of Agriculture Regulation Number 02 of 2018 concerning the Export of Small Ruminants and Pigs from the Territory of the Republic of Indonesia which is the legal umbrella for exports. sheep and goats. Nationally, North Sumatra Province has the eighth highest goat population after Central Java, East Java, Lampung, West Java, East Nusa Tenggara, West Nusa Tenggara and South Sulawesi with a population of 682,805 in 2022 or around 3.25% of the national population which reached 19,398 million tail (Livestock and Animal Health Statistics 2022). The existing goat population is able to contribute to the national meat supply of 927.47 tonnes in 2022 or 1.46% of total national goat meat production. The contribution of goat farming to the national meat supply cannot be separated

from the distribution of the district/city goat population in North Sumatra Province. The administrative regions of North Sumatra that have large numbers of goats are Langkat district with a total population of 146,075, Deli Serdang with 122,613 and Serdang Bedagai with 73,293. (North Sumatra Province in Figures for 2023). The development of the goat population in the district tends to decline from 2018 to 2022 The population decline in Langkat, Deli Serdang and Serdang Bedagei Regencies averaged 1% from the previous year. This is because the cultivation of goats, especially local goats in North Sumatra, has faced challenges and obstacles in its development, including: a). Goat rearing is still traditional.

Traditional maintenance methods only require simple skills, use traditional technology that has been passed down from generation to generation, use local seeds in relatively limited quantities and quality, and the workforce comes from the breeder's own family, b). grazing land is starting to decrease c). lack of clarity in business strategy. How does goat farming contribute to the overall income of the farmer's family, d). The health of goats is also a very important thing to pay attention to, because disease attacks on livestock greatly affect overall livestock productivity. The obstacles faced indirectly influence the interest of breeders to pursue goat breeding business which produces seedlings as an upstream aspect of the goat agribusiness itself.To further increase interest in goat farming in the community and attract potential investors, it is necessary to conduct an up-to-date study on the feasibility of goat farming. The latest information from the goat farming feasibility study is also being considered for the initiative to implement the goat farming development program in North Sumatra Province. Therefore, it is necessary to evaluate income from goat farming and its contribution to total family income to plan the development of goat farming in the future.

2. Research methods

The research was carried out in three districts, namely Langkat, Deli Serdang and Serdang Bedagei districts starting from September to November 2023. Samples were taken from three districts that manage small ruminant livestock, especially beef goats, with ownership of 5 - 20 heads per person. Sampling was carried out in accordance with standards that can reflect the population as a whole with a total sample of 60 samples consisting of 20 samples from each district. Analysis of income from goat farming businesses is used to determine the level of income of farmers from goat farming businesses which is calculated using the Soekartawi income formula (2006) as follows:

$$\mathbf{I = TR - TC}$$

Where :

I : Income (income)
TR : Total revenue (receipt)
T.C : Total cost

The contribution of goat farming business income to the farmer's family income is obtained from the percentage of income obtained from the goat farming business to the total income generated by the farmer's family, calculated using the contribution formula Suratiyah, K (2015):

$$\mathbf{C = A/Y x\ 100\%}$$

Where :

C : Contribution (%)
A : Income from goat farming business (Rp/yr)
Y : Farmer family income (Rp/yr)

For the total income of the farmer's family, the following formula is used:

$$Y = A+A1+B+B1$$

Where ;

A : Income from goat farming business (Rp/yr)

A1 : Income from other livestock businesses besides goats (Rp/yr)
B : Income from the agricultural sector
B1 : Non-farm income (Rp/yr)

Then, to calculate the financial feasibility of the goat farming business, the R/C raito calculation is used, with the formula:

$$\text{R/C ratio} = \frac{R}{C} x\ 100$$

Where:
R = Revenue (Rp/yr)
C = Cost (Rp/yr0
With the following eligibility criteria:
a. R/C > 1, is the ratio between total revenue and total costs greater than zero.
b. ∏ > 0, where the profit obtained is greater than 0
c. ∏/C x 100% > bank interest rate

To analyze the determination of livestock base areas using the Location Quotient method (Nursan, 2017) with the following calculations:

$$LQ = \frac{Xi/Xt}{Yi / Yt}$$

Where :
Xi : Regency level goat commodities
Xt : District level population
Yi : provincial level goat commodities
Yt : Province level population
Where:
If LQ > 1, then the area is a base for beef goats
If LQ < 1, then the area is not a base for beef goats

3. Results and Discussion

Rima Melati, et al (2021) stated that to find out the amount of income or profits obtained by farmers, there must be a balance between income and costs incurred. The livestock population in Langkat, Deli Serdang and Serdang Bedagei districts is the most important element in measuring the amount of income obtained by the farmers themselves. According to Prasetyo, et al (2017) that the size of livestock ownership can influence the amount of income earned by livestock each year, and generally the number of goats kept depends on the breeder's business capital. In line with the opinion of Musram, et al (2023), the scale of the livestock population owned will certainly indicate the capacity of a livestock business being carried out.

Table 1. Ownership of Beef Goats in Langkat, Deli Serdang and Serdang Bedagei Regencies.

	Step up	**Deli Serdang**	**Serdang Bedagei**	**North Sumatra**
Parent	1.16 ST	0.97 ST	0.84 ST	2.97 ST
Stud	0.62 ST	0.40 ST	0.62 ST	1.64 ST
Virgin	0.23 ST	0.29 ST	0.16 ST	0.68 ST
Cempe	0.15 ST	0.14 ST	0.13 ST	0.42 ST

Source: data processed in 2023

Livestock ownership is calculated using livestock units for mother and male (0.14 ST), heifers (0.07 ST) and cempe/kids (0.035 ST). The average ownership in North Sumatra is as follows for broodstock 2.97 ST (21 birds) while for males it is 1.64 ST (12 tails), heifers 0.68 ST (10 tails) and cempe 0.42 ST (12 tails). Where the heifers and males are > 1 year old, the heifers are 0.5 – 1 year old and the heifers are < 0.5 year old. Production costs are fixed costs

which are costs whose amount is not influenced by the level of production produced, including depreciation costs for the cage, equipment and land where the cage is built (Said et al. 2021), and variable costs whose amount is influenced by changes in production volume including labor costs. , medicines or vitamins, feed and electricity costs (Melati, R et al. 2021). Production costs for beef goat farming incurred by breeders in Langkat, Deli Serdang and Langkat districtscan be seen in table 2.

Table 2. Production Costs of Beef Goat Farming Businesses in Langkat, Deli Serdang and Serdang Bedagei Regencies

No	Cost	Average Per Period/Year (Rp.)
1.	Fixed cost	1,352,500
2.	Variable costs	7,729,150
	Total production costs	**9,081,650**

Source: primary data processed in 2023

The average fixed costs incurred by beef goat breeders in Langkat, Deli Serdang and Serdang Bedagei districts are IDR. 1,352,500.- is the cost of depreciation of cages and equipment in one maintenance period. The variable costs incurred by goat farmers in Langkat, Deli Serdang and Serdang Bedagei districts are IDR. 7,729,150.- which was obtained from calculating the prices of feed, medicine, electricity, labor and other costs. Production costs were obtained at Rp. 9,081,650.- where according to Suratiyah, K (2015) that to calculate the amount of total costs is obtained by adding up fixed costs with variable costs.

Lilis Ariyanti's research (2023) shows that the fixed costs obtained by goat farmers in Prafi District are IDR. 1,250,441 is obtained from cage depreciation costs, cage equipment depreciation costs and tax costs in one maintenance period. The variable costs incurred are Rp. 21,872,178 was obtained from calculating seed prices, feed prices, medicine prices, electricity, labor and other costs. In line with the research results of Posumah, et al (2021), the total production cost of peanut goats in Pusomaen District was Rp. 64,805,000. The cost of purchasing goat livestock seeds has the largest amount, namely Rp. 33,650,000 per year. Meanwhile the cost of feed is IDR 30,276,000, the cost of medicine and health checks is IDR. 879,000. The labor used in peanut goat farming in Pusomaen District is family labor. According to Pirngadi (2022), the high fixed costs and variable costs incurred have a big impact on the income obtained, so that efficient use of costs is needed in the production or business process.

The amount of revenue from a production process can be determined by multiplying the amount of production produced by the price of that production (Mardiandi, et al. 2020). Revenue from the results of this research is the total income obtained by farmers from raising beef goats, adding livestock value and selling manure/feces during the one year rearing period in table 3.

Table 3 Acceptance of Beef Goat Farmers in Langkat, Deli Serdang and Serdang Bedagei Regencies.

	Description	Total Receipts
1.	Livestock sales	7,646,666
2.	Dirt/fertilizer	4,400,000
3.	Value of livestock	5,700,000
Amount		**17,746,666**

Source: Primary Data Processed 2023

From table3 above that the receipts from livestock sales during a 1 year period amount to Rp. 7,646,666.- sale of manure/fertilizer amounting to Rp. 4,400,000.- and additional livestock of Rp. 5,700,000. This revenue is influenced by the selling price of goats in the three research locations, where the majority of livestock farmers determine the selling price based on gender, body shape and weight of the goat, not the age of the goat, so that the larger the size of the goat,

the more expensive it is. price. According to Abadi et al (2021), there is a correlation between the body size of goats and the selling price of the goats, where potential consumers assess the appearance or body size of the goats, whereas according to Haki (2019) the larger the body size of the livestock, the more expensive the selling price. The research results of Musram, et al (2023) show that the income obtained from goat farming businesses in Kabawo District, Muna Regency during one maintenance period (6 months) was obtained from the sale of goats, the sale of feces and the addition of inventory value. The average income obtained from the goat farming business is IDR 9,898,000/period.

In line with research conducted by Posumah et al. (2021), that the receipt of goat livestock in Pusomaen District through total sales of goats within a year amounted to IDR. 210,850,000, with the average income earned by each farmer during the year being Rp. 3,653,344,828 where there were no other receipts. Analysis of goat farming business income is needed to determine the difference between the production volume achieved and the costs incurred during one sales period. So that farmers can make a plan regarding the development of the business they manage, Ebim, et al (2023). This is in line with the opinion of Muslimah & Nuzabah (2023) that income is a measure of the difference between income and expenditure. If the difference generated in a certain period is positive, it means net profit is received, and if it is negative, it means a loss. The net income obtained by goat breeders in Langkat, Deli Serdang and Serdang Bedagei districts can be seen in the following table:

Table 4 Average Income from Beef Goat Farming in Langkat, Deli Serdang and Serdang Bedagei Regencies.

	Step up	**Deli Serdang**	**Serdang Bedagei**	**Total**	**North Sumatra**
Revenue (Rp)	18,750,000	17,670,000	16,820,000	53,240,000	17,746,666
Total Cost (Rp)	7,870,000	6,750,000	7,250,000	21,870,000	7,290,000
Income (Rp)	10,880,000	10,920,000	9,570,000	31,370,000	10,456,666

Source: Primary Data on Sports 2023

The average cost incurred by beef goat breeders in Langkat, Deli Serdang and Serdang Bedagei districts with a total of 60 breeder respondents in running their business in one year of maintenance period is IDR. 21,870,000.- and the revenue received was Rp. 53,240,000.- and this is gross income. The net income of goat breeders in Langkat, Deli Serdang and Serdang Bedagei districts is IDR. 31,370,000-.The results of the income analysis show that the goat farming business in Langkat, Deli Serdang and Serdang Bedagei districts is financially profitable (table 6). Dirman's research (2019) explains that the level of income earned by farmers when running their livestock business is influenced by the scale of the livestock business being kept.

The more livestock raised, the more profits the farmer will receive. In farming analysis, the income earned by farmers is a very important indicator because it is the main source for meeting daily needs. The highest income from the goat farming business is obtained from raising livestock with a scale of ownership of 1-4 livestock, amounting to Rp. 3,910,743 per each breeder in one year of maintenance period with profits on a scale of 1-4 birds amounting to Rp. 65,029 per head in research conducted by Yusuf (2017). The average income of goat breeders in the Kababo area, Muna Regency is IDR 3,212,775/rearing period. The farmer's income level is influenced by the number of livestock kept and the ability to sell livestock products within a certain period of time (Musram et al (2023). The contribution of goat farming business income to farmer family income is a comparison between income from goat farming business and farmer farmer family income/other income (Suhartina et al, 2017). The contribution of goat farming businesses in Langkat, Deli Serdang and Serdang Bedagei districts can be seen in the following table:

Table 5 Average Contribution of Goat Farming Businesses in Langkat, Deli Serdang and Serdang Bedagei Regencies

		Goat Farming Business Income (Rp/Year)	Farmer Family Income (Rp/Year)	Contribution (%)
1.	Step up	10,880,000	27,537,500	39.5
2.	Deli Serdang	10,920,000	29,087,500	37.5
3.	Serdang Bedagei	9,570,000	26,520,000	36.1

Source: Processed Primary Data, 2023

Beef goat research in North Sumatra provided a significant contribution of 37.5%. This contribution illustrates that income from the beef goat business can become a main business if it is managed appropriately. It is proven that side maintenance has a significant impact on the total income of farmers/livestock. The largest contribution was in Langkat Regency at 39.5%, while Deli Serdang had a contribution of 37.5% and Serdang Bedagei at 36.1%. The goat farming business in these three districts is included in the livestock category as a branch of business.

Livestock can be grouped into four groups, namely: 1) livestock as a part-time business, namely farmers cultivate agricultural commodities, especially food crops, while livestock is only a part-time business to meet household needs (subsistence) with a level of business income from livestock < 30%, 2) animal husbandry as a business branch, namely the farmer operates mixed farming with livestock and the income level from the livestock business reaches 30-70%, 3) animal husbandry as the main business, namely the farmer operates livestock as the main business with an income level ranging between 70-100%, and 4) animal husbandry as an industry by cultivating livestock specifically (specialized farming) and the income level from animal husbandry reaches 100% (Tribudi et al. 2017).

The results of this research are almost the same as research conducted by Suhartina et al (2017) which resulted in a result of 25.54% which was carried out in Majene Regency with ownership of 10 birds. This shows that the opportunity to raise beef goats is the main source of income even though it is not the only business. Because breeders still rely on other businesses for their total household income. Ahmad Utomo et al (2017) obtained a contribution of 30% and was a by-product. In this research, the beef goat business is not yet a dominant business, but has led to side income which is prioritized for development. The beef goat business in North Sumatra is feasible to run based on the revenue obtained in Langkat, Deli Serdang and Serdang Bedagei districts which can be seen in the table6.

Table 6 Feasibility Analysis of Beef Goat Farming Business in Langkat, Deli Serdang and Serdang Bedagei Regencies.

No	Feasibility Analysis	Average/period (Year)
1.	Reception	17,746,666
2.	Total cost	7,290,000
R/C Average		**2.43**

Source: Primary Data on Sports 2023

In this research, it was obtained that revenue from North Sumatran beef goats was IDR. 17,746,666 with a total cost of Rp. 7,290,000 so R/C > 1 (R/C = 2.43). When compared with research by Lilis Iriyanti, et al (2023) with an average R/C value of 1.75. The feasibility of beef goat business in North Sumatra is higher. This shows that North Sumatra is superior from a regional perspective. So it is related to the LQ (location question) which shows that the carrying capacity of the North Sumatra location is the base area. The financial feasibility of the goat business was also carried out by Rima Melati, et al (2021) with a net B/C of 2.5. However, this business is on a large scale, meaning that a business market analysis has been carried out on a company scale by looking at the NPV and IRR values. Business feasibility is said to be feasible if it meets the following three components:

R/C>1, that is, the ratio between revenue and costs must be more than one.
$\pi > 0$, meaning the profit obtained must be greater than zero.

Location Quotient (LQ) analysis is used to see whether or not the base area is for the goat farming business. The LQ results can be seen in table 6. To determine whether the location is a base or not, it is determined by the LQ value, if LQ > 1 it means the area is said to be a base. This means being able to meet needsarea according tolocation. It is said to be a base area if the area is able to meet the need for beef goats and is able to export to other areas.

Table 7 LQ results for Langkat, Deli Serdang and Serdang Bedagei districts

	District Level Goat Population	Population at District Level	Provincial Level Goat Population	Province Population	LQ
Step up	146,075	1,098,660	580,000	15,115,206	3.46
Deli Serdang	122,613	1,953,986	580,000	15,115,206	1.64
Serdang Bedagei	69,724	667,998	580,000	15,115,206	2.72

Source: Data processed 2023

For North Sumatra, the LQ value for beef goats is 2.60, which is quite high, indicating that the population and availability of beef goats in North Sumatra, apart from being able to meet regional needs, can also provide opportunities for export based on business location. This is supported by the availability of forage and natural geography which is quite supportive which shows that North Sumatra has a comparative advantage supported by available natural resources. Based on the existing feed capacity in North Sumatra Province (table 10), the number of goat livestock commodities is as follows: Langkat district with a total of 1,448,983 head, Deli Serdang district 1,826,022 head and Serdang Bedagei district 1,148,331 head (Food Security Service and North Sumatra Province Animal Husbandry, 2021). Research conducted by Asnath Maria Fuah (2023) covered around 46.6 percent of the arearesearch in Central Lampung is said to be the basis for goat farming or LQ> 1. So that in this area the need for beef goats can be met. The results of research by Natsir Sandiah et al, (2021), from 5 sub-districts, three sub-districts were obtained that had an LQ value > 1, namely: Southeast Wawonii sub-district 2.40, North Wawonii sub-district 1.63, and Northeast Wawonii sub-district 1.14.

4. CONCLUSION

Beef goat farming in North Sumatra contributed 37.7%, which shows that income from the beef goat business can become a main business if it is managed properly. The R/C ratio obtained was 2.43, meaning that the income obtained by North Sumatra beef goat breeders was very feasible for development. Then the LQ of North Sumatra beef goat livestock for Langkat, Deli Serdang and Serdang Bedagai Regencies is the base area which is indicated by an LQ value greater than 1. Therefore, strengthening production base areas through the introduction of technology and an efficient livestock management system through a regional approach , both nursery areas, cultivation areas, and livestock processing (downstream industry) areas, as well as strengthening the role and institutional function of breeders and coordination between related agencies to increase production and sustainability of livestock businesses.

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