# Feasibility Analysis of Beef Development Based on Local Resources

Femi Hadidjah Elly[(✉)] and Sintya J. K. Umboh

Faculty of Animal Husbandry, Sam Ratulangi University, Manado, North Sulawesi 95115,
Indonesia
`femihelly@unsrat.ac.id`

**Abstract.** The development of beef cattle farming is currently an important concern for the government due to its role in supporting the availability of beef nationally. Beef cattle developed by small farmers were expected to support the availability of the meat. The problem was whether beef cattle business was feasible to be developed by utilizing local resources. The research was conducted in North Bolaang Mongondow Regency with the aim of analyzing the financial feasibility of beef cattle farming. The research method used was a survey method of beef cattle farming. The data collected was primary data with a case study approach. Data were analyzed using financial analysis. The results showed that beef cattle in North Bolaang Mongondow Regency were developed using corn waste. The RC ratio value was greater than one. Based on the results of the study, it can be concluded that the beef cattle business was feasible to be developed to support the income of small farmers. The suggestion given was that it is necessary to optimize the potential of local resources in supporting the development of beef cattle farming.

**Keywords:** Beef Cattle · Feasibility · Local Resources

## 1 Introduction

Beef cattle farming had an important role in livestock development in Indonesia, including in North Sulawesi Province. Its development was supported by the availability of land, human and livestock resources. The available land was used to support feed for beef cattle. Based on the land potential in North Bolaang Mongondow Regency, the real population can still be increased up to 1.37 times [1]. Farmers who develop beef cattle were quite adequate [2]. There were 116 agricultural extension workers spread over six districts [3]. This condition causes beef cattle farms to had the potential to be developed as seen from the prospect of available resources. The prospect of these resources had a role in the sustainability of the beef cattle business [4, 5].

Beef cattle farming as a source of income for farmers and the government as local revenue. This fact shows that the development of beef cattle farming is currently an important concern for the government. Another strategic role was as a source of animal protein from livestock. Based on its role in supporting the availability of beef nationally, a development strategy is needed to increase population and productivity.

The problem with beef cattle farming is that most of it is managed in the form of people's livestock businesses. The development system was still traditional with a business scale of about 2–4 individuals. Even though the beef cattle business developed by small farmers was highly expected to support the availability of meat nationally, even the goal was for food security [6]. The problem is how far is the feasibility of beef cattle farming developed by utilizing local resources. Beef cattle farming business has long been known and operated in rural areas without taking into account the costs and income and even the investment provided by the farmers. Based on these problems, a study on the feasibility of beef cattle farming had been carried out. The research was conducted in North Bolaang Mongondow Regency with the aim of analyzing the financial feasibility of beef cattle farming.

## 2    Materials and Methods

The research material was beef cattle, cages, feed, labor and beef cattle waste. Beef cattle was the number of cattle owned by the farmer at the time of the study. The cage was spacious and the investment fund for beef cattle. Feed was the amount of grass and corn waste consumed. Corn waste was the residue from the corn harvest which was cultivated by the farmers themselves. Labor was the allocation of family labor in the beef cattle business. Beef cattle waste was beef cattle dung produced by fertilizer and biogas.

The research method used was a survey method of beef cattle farming. The data collected was primary data with a case study approach on the Beringin Jaya beef cattle business. The data analysis used was financial analysis using several investment criteria [7], namely Net Benefit Cost Ratio (Net B/C) (Equation 1), Net Present Value (NPV) (Equation 2), Internal Rate of Return (IRR) (Equation 3), Pay Back Period (Equation 4) and Revenue Cost Ratio (R/C) (Equation 5).

$$Net\ B/C = \frac{\sum\limits_{t=1}^{t=n} \frac{B_t - C_t}{(1+i)^t}}{\sum\limits_{t=1}^{t=n} \frac{C_t - B_t}{(1+i)^t}} \tag{1}$$

Description:
Bt = Revenue earned in year t (Rp)
Ct = Costs incurred in year t (Rp)
n = Economic life of the project (years)
i = Interest rate (percent)
t = (t= 0.1,2,…n) years.
If Net B/C $\geq$ 1 the business is feasible to continue; Net B/C $<$ 1 the business is not feasible to continue.

$$NPV = \sum_{t-1}^{n} \frac{Bt - Ct}{(1+i)^t} \tag{2}$$

Description:

If NPV $\geq$ 0 the business is feasible to continue; NPV $<$ 0 the business is not feasible to continue.

$$IRR = i_1 + \frac{NPV_1}{NPV_1 + NPV_2}(i_2 - i_1) \tag{3}$$

Information:

NPV1 = Positive NPV (Rp)

NPV2 = Negative NPV (Rp)

i1 = Positive NPV interest rate (percent)

i2 = Negative NPV interest rate (percent).

If IRR $\geq$ social discount rate then the business is feasible to continue; IRR $<$ social discount rate then the business is not feasible to continue.

$$PP = \frac{I}{A_b} \tag{4}$$

Description:

PP = Time required to generate capital (Years);

I = Amount of investment cost (Rp);

Ab = Net benefit earned each year (Rp).

$$R/C = \frac{R}{C} \tag{5}$$

Description:

R = revenue (Rp);

C = cost (Rp).

## 3   Results and Discussion

Beef cattle farming in North Bolaang Mongondow Regency was a source of income for farmers so that it is developed with a business orientation. The Beringin Jaya beef cattle business had invested in developing its business. Initial investment with the number of beef cattle as many as 8 tails. Beef cattle were kept in cages with an area of 96 m$^2$. Beef cattle were no longer grazed on agricultural land like farmers in general. In fact, most of the beef cattle farmers were still grazing on agricultural lands [8, 9]. The feed given was forage, namely dwarf grass which was cultivated by the farmers themselves. Farmers also use corn waste as beef cattle feed. Forage feed plus corn waste was given 20–60 kg per head per day. Feed was a problem that is often faced by most farmers [10, 11], so that farmers use corn waste as feed. The workforce used was the allocation of family labor for 2–3 hours per day. Beef cattle waste was feces produced by an average of 12 kg per day which was used as organic fertilizer.

Business oriented beef cattle farming needs to be analyzed for its feasibility from the financial aspect. The financial aspect is related to how to determine the amount of funds needed and their allocation efficiently, which aims to provide a promising level of profit for investors. The beef cattle business was said to be feasible if it provides financial

**Table 1.** Results of Feasibility Analysis Using Beef Cattle Farming Investment Criteria.

| Number | Investment Criteria | Value | Decision |
|--------|---------------------|-------|----------|
| 1. | Net Benefit Cost Ratio (Net B/C) | 1.30 | Feasible |
| 2. | Net Present Value (NPV) (Rp) | 9,442,373.54 | Feasible |
| 3. | Internal Rate of Return (IRR) (%) | 22.89 | Feasible |
| 4. | Pay Back Period | 2.36 | Feasible |
| 5. | Revenue Cost Ratio (R/C) | 1.42 | Feasible |

benefits. The results of the financial feasibility analysis using the investment criteria for beef cattle farming can be seen in Table 1.

Based on the data analysis in Table 1 shows that the value of the Net Benefit Cost Ratio was greater than one. This means that for each expenditure of costs of Rp 1 it provides a net benefit of 1.30. This value was obtained through an evaluation by comparing the present value of all business activities with an interest rate of 14%. This condition shows that the benefits obtained at the Beringin Jaya beef cattle farm were greater than the costs incurred, although the value was smaller than research in other areas [12].

The Net Present Value (NPV) based on Table 1 was positive which indicates that the beef cattle business was feasible to be developed and continued. This value was obtained by comparing the present value at an interest rate of 14%. This means that beef cattle farming was feasible to be developed and continued if the NPV value was positive. This value was greater than research in other areas [13].

The value of the Internal Rate of Return (IRR) was obtained at 22.89%. The IRR criteria indicate that the investment in beef cattle farming was selected if the IRR value was greater than the bank loan interest rate (10-20%). The IRR value was obtained when the NPV value was positive (+ Rp. 2,660,165) with a bank rate of 20%, and the NPV was negative (- Rp 1,015,448) when the bank interest rate was 24%. Based on this condition, it shows that the beef cattle business was feasible to be developed and continued.

The value of the Pay Back Period was 2.36, meaning that the investment used by the farmer if the funds were borrowed at the bank, the farmer was able to return it for 2 years and 4 months with a bank interest rate of 14%. This value was greater than research in other areas [14]. The RC ratio value obtained according to Table 1 was greater than one. This value indicates that the cost allocation of Rp. 1 will provide greater revenue than the costs incurred. The value of this R/C ratio was smaller than that of other researchers [15].

Based on the analysis of investment criteria, the beef cattle business was financially feasible to be developed and continued. The development and sustainability of its business was supported by available resources and policies launched by the local government. The triple helix development policy was a partnership between universities and local governments to encourage various parties to support the development and sustainability of the beef cattle business. The next step is that the strategic formulation of development needs to be reviewed in support of various government programs related to the beef cattle business [16].

## 4 Conclusions

Based on the results of the study, it can be concluded that the beef cattle business was feasible to be developed to support the income of small farmers. The suggestion given was that it is necessary to optimize the potential of local resources in supporting the development of beef cattle farming.

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