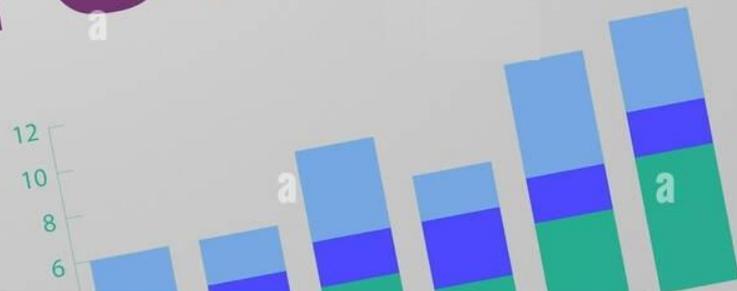


*Business Feasibility and Economic Scale*

Solvi Makandolu

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FEASIBILITY  
STUDY



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***Business Feasibility and Economic Scale of Cattle Farming running in smallholder systems in Flores Timur Mainland of Flores Timur Regency***

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### Abstract

A survey has been done in Flores Timur mainland in August 2019. The objectives are: 1) describing the characteristics and scale of cattle farm; 2) reviewing the income; 3) analyzing the feasibility status and 4) analyzing the proper scale of cattle farming. Random cluster sampling was applied. Methods of data analysis used are descriptive analysis; income analysis, financial feasibility analysis, sensitivity analysis and maintenance scale analysis that meets the minimum requirements standard of USD1,500/household/year. The results showed that the number of cattle owned is 5.75 AU where 77.4% of farmers have 1-4 AU and 22.6% have 5-10 AU. The total cash income obtained was IDR11,277,378/year or IDR1,898,804/AU/Year and financially feasible. However, when NCC decreases to 60% the feasibility becomes threatened. Further, the minimum maintenance scale is 7 AU/farmer. In summary, Bali cattle farming in Flores Timur mainland area must be maintained and continually improved

**Keywords:** *Animal Husbandry, Beef Cattle, Breeding, Fattening, Income, Financial Feasibility*

### Introduction

Beef cattle are cattle that are raised with the primary purpose of producing meat, so they are often referred to as beef cattle (Santoso, 1995). Beef cattle in Indonesia are one type of livestock which is the main source of meeting the needs of meat after chicken. This can be seen from the consumption of chicken meat 64%, beef 19%, pork 8%, other meat 9% (Director General of Animal Husbandry, 2011). To meet the demand for beef is met from three sources, namely: (1) community farming as a backbone; (2) beef cattle importers who are members of the Association of Indonesian Feedloters (APFINDO); and (3) meat importers who are members of the Indonesian Meat Importers Entrepreneurs Association (ASPIDI). Beef cattle production systems are generally grouped into two patterns based on maintenance, namely (1) breeding

and breeding patterns and (2) fattening patterns. Most of the smallholder farms in Indonesia fall into the category of breeding and enlargement patterns. Both patterns of community farming generally apply traditional maintenance systems by utilizing available human and food resources (Leng, 1987; Kansanga et al., 2018; Schioldann et al., 2018; Bisht et al., 2021; Buckland & Campbell, 2021; Munsell et al., 2021; Mdegela et al., 2021).

The profile of smallholder farming in Indonesia, where most livestock are raised by small-scale farmers with limited land and capital (Kariyasa, 2005; Suryana, 2009), traditional farming techniques, using local breeds, cages inside and or sticking outside the house, management manure waste and disease control are not good and livestock breeding is still natural (Isbandi, 2004; Barański et al., 2021; Ihsani et al., 2022), simple technology, low productivity, less guaranteed product quality, not yet fully market oriented and not sensitive to changes (Cyrilla and Ismail, 1998). Thus, the production and productivity of beef cattle is still relatively low, which in turn will affect the income of farmers and beef cattle population development. Determine the Income of Beef Cattle Farmers and Its Contribution to Household Income (Roy et al., 2018a; Roy et al., 2018b; Roy et al., 2019; Wahyuningsih et al., 2021; Maria et al., 2021;

Cow is one of the new mainstay commodities in East Flores Regency (Flores Timur) in increasing farmers' income and Regional Original Income (PAD). Flores Timur Regency has become one of the new development areas for large livestock - cattle - where the population growth in the last 5 years is very rapid at 49.40% or an average of 9.88% / year (Mahmudin Nur, et al., 2017). Thus in the future, this area can contribute as a

supplier of cattle to Java and other regions outside Java along with other regions in NTT Province such as Timor, Sumba and Alor, Rote, Sabu and other areas in Flores and Lembata. Seeing the significant development and the benefits received for both the community and the region, it is not surprising that the regional government allocates a large part of the funds through APBD II, APBD I and DAK for cattle breeding development efforts. This is possible because the potential of available resources strongly supports the business in question. The development of cattle in Flores Timur Regency shows an increase in population from year to year. In 2012 the total population was 1,788 and in 2017 it increased to 2,848 with an average development of 9.88% / year. In the past 10 years, the Regional Government, through APBD I, II and DAK, has distributed as many as 473 head of cattle to farmer groups to be developed where 69.62% are female cows and 30.38% are male.

The survey results (Mahmudin Nur, et al., 2017) show that the growth and development of cattle population in this area is quite good and promising. At the farmer-farmer level, the net birth rate can reach 80-85% and is relatively optimistic compared to the net birth rate in West Timor which only reaches nearly 60% (Ledoh, 2005). The results of the Undana Timor Cattle Research and Development Center in 2007 showed that the age of the first breed of Bali cattle in NTT was  $37.73 \pm 6.38$  months or 2.5 to 3 years. In Flores Timur Regency, based on the results of the survey the age of the first breed of Bali cattle is 31 months. The percentage of births in traditional extensive maintenance systems can reach 70-80% with a child mortality rate of less than 10% and lower than that of Balinese cattle in Timor which can reach 17-

55%. In the bonded rearing system as practiced by farmers in almost all districts, the percentage of births can reach 80% or more with a birth interval of about 16 months and a child mortality rate of  $\leq 5\%$ . In the districts of Solor Barat, Titehena, Wulanggintang and Adonara Districts with an extensive maintenance system (controlled shepherd) and the bundle of moving birth rates can reach 80% with a child mortality rate of less than 5%. Based on the description above, it can be seen that cattle in Flores Timur Regency have quite high productivity.

The report from the Agriculture, Livestock and Plantation Service Office of Flores Timur Regency said that 77% of the cattle population in Flores Timur Regency is in mainland Flores Timur which covers 8 districts namely Wulanggintang, Titehena, Ile Bura, Tanjung Bunga, Lewolema, Larantuka, Ile Mandiri and Demon Pagong. The increase in livestock population is thought to be due to a change in mindset from the community to develop a cattle breeding business through better maintenance patterns by utilizing available resources. Realizing the potential of livestock and feed resources, labor, and so on, the Flores Timur Regional Government through the Agriculture Service of Animal Husbandry and Plantation of the Regency of Flores Timur since 2008 has allocated most of the funds, both APBD II, APBD I and DAK for the development of beef cattle in Flores Timur Regency in areas that have adequate livestock resources. One of the adequate areas in Flores Timur Regency is the land Flores Timur which covers the 8 sub-districts mentioned above.

The implementation of the cattle breeding system of the people's livestock system, both breeding and enlargement patterns and fattening patterns should be able to

know the success and failure that can be measured from the profit or loss obtained; because profit is one of the main goals of every livestock business. In connection with the people's farms in Flores Timur Regency, it is necessary to know whether the business is able to provide benefits or not for these farmers. This is important because the problem often faced in developing livestock is business sustainability in the future, so that the livestock business can be used as a new source of income for farmers and families.

In connection with the above problem, the government has helped as well as motivated farmers to develop livestock business in a better direction so that farmers / ranchers are expected to be able to utilize their resources to develop their businesses in order to increase their income. The problem is whether the cattle breeding business system developed by the farmers will be sustainable or not, and what is the scale of the economy it is necessary to do an assessment of business feasibility and economies of scale.

### Research Issues

Based on the background above, the problems that can be formulated are as follows:

1. Does the cattle breeding system of the community farm that is run provide benefits or not?
2. Is the current cattle breeding business financially feasible?
3. What is the economic scale of the people's cattle breeding business that is able to provide the economic resilience of the farmer household?

### Specific Research Objectives

The objectives of this research are:

1. Describe the characteristics and scale composition of the cattle breeding business system of smallholder farming in Flores Timur Mainland.
2. Review the income of smallholder cattle farms in Flores Timur Mainland.
3. Analyzing the feasibility status of the people's cattle breeding business at each scale of the cattle breeding business in Flores Timur Mainland
4. Analyzing the proper scale of maintenance of the cattle breeding business in the context of food security for farmers' families.

#### RESEARCH METHODOLOGY

Beef cattle business as one of the new mainstay businesses in Flores Timur Regency needs to be developed in a directed and integrated manner. It is expected that these efforts can support the continued development of both capacity as a source of food and nutrition for the needs of animal protein (meat) as well as a source of income for farmers and a source of foreign exchange / regional income.

This thinking is increasingly urgent when it is associated with the rolling of regional autonomy, which inevitably the regions including Flores Timur Regency must be able to empower all development resources. One of them is livestock resources, specifically beef cattle business whose role is large enough to move the wheels of development in Flores Timur Regency.

The current development of a cattle business based on people's livestock business and familiar with the community (farmers/breeders) is an important asset for future steps. The government of Flotim Regency realizes that most of the people in rural areas depend on livestock production business, one of which is beef cattle business.

In order to increase the income of farmers, the government provides cattle breeds and is given to farmers in a revolving pattern. Receipts of farmers and local governments from a farming business depends on the amount of production (output) of the farming business and the price of the output produced.

The facts show that cattle breeders do not take into account the costs incurred and the revenue obtained. The income of farmers is very dependent on the revenue obtained and costs incurred. To find out the amount of income obtained an income analysis was conducted according to Soekartawi (2006). Income analysis becomes very important because it can find out whether the cattle farm run is successful or not.

Currently the breeders are doing / planning the development of their livestock business in the form of breeding as well as fattening. This plan requires a large enough cost so that farmers must have an alternative choice in using capital, namely loan capital from banks or outside parties. Therefore, it is necessary to formulate capital and its utilization which provide maximum benefits for farmers as entrepreneurs with a capital scenario. Changes that occur in production and input prices such as decreased production and increased variable costs need to be considered for the benefits to be gained. Therefore we need a business feasibility analysis and followed by a sensitivity analysis. This business feasibility analysis will be seen from several aspects namely market aspects, technical aspects, management aspects, social aspects, economic and environmental aspects as well as financial aspects.

#### Hypothesis

Based on the above framework, a hypothesis is proposed in this study as follows:

1. Beef cattle farming business in Flores Timur Mainland is profitable.
2. Smallholder beef cattle business in Flores Timur Mainland is financially feasible.
3. Smallholder beef cattle business in Flores Timur Mainland has not yet reached a maintenance scale that meets the minimum needs standard.

#### *Determination of Research Location and Time*

The research was carried out for 6 (six) months in Flores Timur Mainland. The data collection process was carried out for one month, namely in August 2019.

#### *Types and Sources of Data*

The type of data used in this study is qualitative and quantitative data while the data sources used are primary data and secondary data. Primary data is data sourced from observations and direct interviews with respondents involved in the study. Furthermore, secondary data is data sourced from research reports, and related agencies such as the Central Statistics Agency and the Animal Husbandry Agency which includes population, climate, topography, and others related to this research.

#### *Sampling Method*

Determination of research locations and sample farmer farmers or respondents is done through cluster random sampling on the grounds that population members are clearly divided into groups so that no population framework is needed for each sample unit (Paturochman, 2012). The first stage, the determination of five sample of districts in the Flores Timur Mainland area intentionally by considering several things, namely: 1) a sub-district with the highest concentration of beef cattle, 2) has the highest number of breeder groups and 3) the groups carry out breeding and fattening. The se-

lected sample districts are Wulanggitang, Titehena, Lewolema, Tanjung Bunga, and Demon Pagong Districts. The second stage, the determination of two selected villages in each selected district purposively because not all villages have cows. The third stage, the selection of farmer groups purposively with the same consideration. Then in the selected farmer groups all members are taken as respondents. Respondent criteria include: 1) selling cattle in the last 3 years, 2) working for cattle for a minimum of 3 years, 3) still running a breeding and fattening beef cattle. Thus in this study at the level of community farms obtained 120-150 representative respondents.

#### *Data Collection Method*

Data collection methods used in this study are: interviews, observation, and documentation. Interviews were conducted through direct interviews with respondents or sample farmer farmers based on the list of questions or questionnaires that had been prepared. Furthermore, observations were made to review the results of interviews with the actual situation, while the documentation is data taken from agencies or other institutions to support data from researchers. Besides that, the Rapid Appraisal method is used to obtain data and other information not recorded through individual interviews.

#### *Data Analysis Method*

The data collected was first tabulated and continued with descriptive analysis both qualitatively and quantitatively. To answer the objective (1) a descriptive analysis is carried out through the calculation of averages, standard deviations, coefficient of variation and percentages and cross tabulation.

To answer the objective (2), income analysis is used according to Soekartawi (2006) with the following formula:

$$Pd_{uts} = Pt_{uts} - Bt_{uts}$$

Where:  $Pd_{utb}$  : Income of Cattle business;  
 $Pt_{utb}$  : Revenue of cattle business;  $Bt_{utb}$  : total cost of cattle business

#### Net Present Value (NPV)

Net present value is the present value of the income stream generated by investment. The formula used in calculating NPV is as follows:

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

dimana :

$Bt$  = year-t Receipt (Benefit) (rupiah)  
 $Ct$  = Year-t cost (rupiah)  
 $n$  = Project economic age (years)  
 $i$  = discount rate (percent)  
 $t$  = Year

In the NPV methods there are three investment assessments, namely:

1.  $NPV \geq 0$ ; means financially feasible business to be carried out because the benefits obtained are greater than costs.
2.  $NPV \leq 0$ ; it means that financially the business is not feasible because the benefits obtained are less than the cost.
3.  $NPV = 0$ ; means that financially difficult projects are implemented because the benefits obtained are only enough to cover the costs incurred.

#### Internal Rate Return (IRR)

Internal rate of return is the average annual rate of internal profit expressed in percent. If an IRR value greater than the prevailing discount rate is obtained, the project is declared eligible for implementation. Conversely, if the value of the IRR is less than the prevailing interest rate, the project is not feasible. The formula used in calculating IRR is as follows:

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

dimana:

$i_1$  = Discount rate which results in a positive NPV (percent)  
 $i_2$  = Discount rate which results in a negative NPV (percent)  
 $NPV_1$  = NPV which is positive (rupiah)  
 $NPV_2$  = NPV which is negative (rupiah)

#### Net Benefit Cost Ratio (Net B/C Ratio)

Ratio benefits and costs are obtained when the present value of the benefit flow is divided by the present value of the cost flow. Net B/C shows the level of additional benefits at each

additional cost of one rupiah. The project is feasible if the  $B/C > 1$ . The formula used in calculating the Net B/C is as follows:

$$NetB/C = \frac{\sum_{t=1}^n Bt - Ct}{(1+i)^t}$$

dimana:

- Bt = Revenue (benefit) year t (IDR)  
 Ct = (t) year t (IDR)  
 n = Project economic age (years)  
 i = Interest rate / discount rate (percent)

Kaidah pengambilan keputusan sebagai berikut:

Net B / C > 1 means Fisible/go

Net B / C < 1 means Not fisible/no go

Net B / C = 0 means Break Event Point

#### Payback Period

Payback period is the period of return of the entire investment/invested capital. The smaller the number produced means the faster the rate of return on investment, the better the business/feasible to be endeavored. The mathematical formula of Payback period are:

$$PP = \frac{i}{AB}$$

where: PP = time needed to return the investment capital (year/month); i = amount of investment costs needed (IDR); AB = Average net benefit per year (IDR)

As long as the project can return capital / investment before the end of the project life, it means the project can still be implemented. However, if until the end of the project and can not return the capital used, then the project should not be implemented.

#### Switching Value

Financial information on beef cattle business (breeding and fattening) which is poured into cash flow only applies to one particular price without considering the changes that will occur. Factors of changes in input prices,

changes in output prices and production levels are often the main parameters that affect changes in income in the feasibility analysis of beef cattle fattening. To anticipate these changes, a sensitivity analysis is carried out using a switching value calculation method. This method is used to determine the results of calculations that make the project unfeasible to be undertaken by making changes to a variable. All assumptions do not occur simultaneously (*ceteris paribus*).

Next, to answer the objective (4), which is to find out the level of economic scale of the business or the minimum number of cattle ownership that is able to empower the community economy that is determined descriptively. The minimum number of cattle owned is obtained from the minimum standard of household needs divided by the income earned per unit of cattle. The formula used is as follows:

$$= \frac{\text{Minimum number of ownership} \times \text{Minimum standard requirements}}{\text{income} / \text{AU}}$$

## RESULTS AND DISCUSSION

**Characteristics of Cattle Breeders**

Age of cattle breeders in mainland East Flores is 47.54 years  $\pm$  8.74 years (CV = 18.39%) where the lowest age is 24 years and the highest is 70 years where 97.20% are classified as productive age. According to Barthos (2001), the level of productive age is 15-65 years, where 15-29 years is the productive I, 30-50 years is the productive II, and 51-65 is the productive III, while the unproductive age is at under the age of 15 years and over 65 years. In the productive age group, 73.6% were classified as productive age II (30-50 years), 23.6% were classified as productive age III (51-65 years) while only 0.9% were classified as productive age I (< 30 years). A phenomenon that can be seen is the interest of young people (under 30 years) to become breeders is still low. This might be due to the fact that besides the interest to become a breeder is still low but it might be because access to business capital is not available so that the opportunity is missed. The level of formal education of cattle breeders in mainland of Flores Timur is still relatively low. There are 60.4% of cattle farmers with the highest education being junior high school (9.43 years) while those with senior high school and higher education are 39.6%. For non-formal education, 17.6% had attended counseling in the field of animal husbandry, while 83.4% had attended non-formal education in agriculture, food crops, horticulture and plantations. The description above indicates that non-formal education in the field of animal husbandry, especially cattle, is still very little, so that in the production process, farmers only learn from their own experience which is not necessarily true according to the perspective of animal husbandry. Meanwhile, on the other hand in

a cattle business, a balanced education is needed, so that the output achieved in accordance with what is expected or what is intended.

The lack of special education will make the attitude of the cattle breeders become static in accepting new innovations, and slow to follow the development of knowledge, actions and skills that occur at this time. Therefore, we need a solution to address the problems that occur, namely developing non-formal special education in the form of training and counseling about cows to increase knowledge, experience and skills for further business, and change the way of breeding from traditional extensive to semi-intensive or intensive manner. According to Suranjaya et al. (2017) education will affect someone in accepting innovation. The higher the level of education, the ability owned by farmers will be better at adopting innovation.

The average number of family members owned by cattle breeders in mainland of Flores Timur is 4.18 people with a range of 2-6 people (SD = 1.17; CV = 28.0%). Facts show that the range of 2-6 most family members are only children who are still in education. Because of this the opportunity for farmers to increase the scale of their livestock business is hampered.

The main occupation of cattle breeders in mainland of Flores Timur varies, namely 88.1% of farmers, 4.76% of entrepreneurs, and 7.14% of civil servants. Thus it can be concluded that the main occupation of cattle farmers is farming. Cattle farming is only done as a side job. This is due to the lack of awareness from farmers about the benefits that can be obtained in this cattle business, in terms of raising cattle has a great opportunity to be developed and if raising cattle is used as a branch of business, it is not impossible that it will make a

significant contribution to family income in the future.

The experience of raising cattle ranges from 4-15 years with an average of 8.02 years (SD = 2.32; CV = 28.92%). This means that 71% of cattle farmers have 6 - 10 years experience while the other 31% have experience under 6 years or above 10 years. According to Sumumpang (2006), the more experience they have, the more things are known about the business being run. More and more business experience in raising livestock is expected to be able to increase the productivity of their livestock products, because from this experience farmers can make it as a guideline for the smooth running of their business.

#### *Cattle Business Profile*

**Ownership of Cattle.-** The number of cattle owned per farmer in mainland of Flores Timur is 5.75 AU with the lowest is 1.75 AU and the highest is 8.50 AU (SD = 1.78 and CV = 30.96%). Distribution of cattle ownership, if classified as 77.4% of farmers have 1-4 AU cattle and 22.6% have 5-10 AU cattle.

The number of cattle in this livestock business can be categorized as a medium-scale business because according to Daslina (2006), it states that the scale of a small business consists of 1-5 heads, the business scale is 6-10 heads and large scale > 10 heads. Cattle breeders in mainland of Flores Timur are very concerned about the sustainability of the business from the Bali cattle business because at least they have benefited from the income received from the business

**Feed.-** The types of feed used in maintaining Bali cattle in mainland of Flores Timur are generally forage in the form of natural grass, and legumes such as *Leucaena leucocephala*, *Gliricidia sepium* and *Sesbania glandiflora*. In addition, livestock

are also given banana stems, and agricultural waste such as rice straw, corn or cassava. The source of the feed comes from the farmer's forage, the farmland or is taken from the forest.

The average forage for cattle is 35 kg/day which is a combination of forage originating from legumes tree (*Leucaena leucocephala*, *Gliricidia sepium* and *Sesbania glandiflora*) as much as 20 kg/day and grass around 15 kg/day. For the cost of feed although most of it comes from the wild, the cost is still calculated with certain assumptions, with the breakdown of the price of forage per kilogram of IDR146/kg while the price of grass IDR48/kg. The average feed costs incurred is IDR1,499,144/year and is non-cash costs.

**Labor.-** Labor used in the business of raising cattle in mainland of Flores Timur generally comes from a family consisting of husband, wife and children and other family members in the family. On average, farmers in Flores Timur mainland allocate labor in Bali cattle business as much as 83.48 man day/year (SD = 20.60; CV = 24.68%). Labor costs will still be taken into account in the analysis using local labor costs of around IDR15,000/man day so that the average labor costs incurred during one year business is IDR1,252,213 ± IDR 308,954/year (CV= 25%).

**Cattle pen and equipment.-** In general 100% breeders make cattle pen for their livestock. The cattle pen is a communal cattle barn with an average area is ± 40 m<sup>2</sup>. The average cost of cattle pen issued by farmers is IDR173,208 (SD =31,761; CV = 18.34%) with the lowest range of IDR144,000 and the highest IDR222,000. In addition, breeders also provide equipment such as buckets for drinking, brooms, shovels and ropes for livestock with an economic age for each equipment is 3 years. On av-

erage, one cow needs 5-7m of rope. The total equipment costs incurred by farmers for one year is IDR585,275 (SD 151,148 and CV = 25.82%) so that the total investment cost is IDR758,483. Using the straight-line method the cost of depreciation of the cage and equipment is calculated as a fixed cost of IDR252,731/year.

**Animal Health.-** One of the important factors in efforts to increase production in animal husbandry is in terms of health care in the form of preventive measures and curative measures. Preventive action can be done through cattle vaccination while curative measures are usually carried out if the cattle show symptoms of illness. The average cost for health is IDR106,226 which consists of vaccine costs, injection costs and medicines costs.

**Marketing of livestock.-** Marketing of cattle in mainland of Flores Timur occurs through two chains of trading, namely farmers to household consumers and farmers to household consumers through intermediary traders. Usually, household consumers or livestock traders visit the farmer at the farmer's location. Farmers never sell cattle in the local market.

In general, the sales transaction process takes place at the farmer's location (100%) where the farmer acts as a price setter. Prices are determined based on estimated body weight and physical appearance of the livestock. In the process of buying and selling livestock transactions for payment is usually done in cash.

The practice of pricing in mainland of Flores Timur is based more on estimated body weight and age (100%). For body weight estimates, it was found that the accuracy of the estimation was better for intermediary traders compared to breeders. Meanwhile, if based on age, it is found that cattle that are one year older and have

good exterior appearance (not thin) are higher prices received by farmers. Conversely, older livestock but thin exterior appearance, the price received is lower.

*In connection with the process of price formation, cattle farmers in this area already have information on the prices of the products they produce because they are generally members of farmer groups. Cattle farmers in mainland of Flores Timur do not sell calves (1 year old or less) both male and female. The sale of cattle is mainly motivated by the needs of farmers such as school fees, building houses, and marriage customs.*

Farmers sell cattle at the age of 2-3.5 years with an average sales of 2.55 AU (SD 0.76 and CV 30.10%). The average price received is IDR8,391,509/head where the revenue obtained is IDR21,278,302 (SD = 6,147,427; CV = 28.89%).

#### *Cattle Business Revenues*

Revenue analysis is carried out to determine the amount of input and the number of products produced from a production process to calculate the income from the business. To find out the income required two main information, namely expenditure and revenue within a certain period. The total costs incurred by farmers during one year business is IDR 10,000,924 consisting of a total fixed cost of IDR 252,732 (2.53%) and variable costs of IDR 9,748,193 (97.24%). From the total costs incurred, 42% were non-cash costs (calculated costs) while 57% were cash costs incurred in the production process. Based on the cost description, it can be concluded that the cattle raising system in Mainland of Flores Timur is still a community livestock system where most of the production costs are calculated costs (low cost input). This is an opportunity that

can be utilized by decision makers and policy makers to create community empowerment programs in order to improve the welfare of the community by utilizing local resources that are available and inexpensive.

According to Soekartawi (2007) income is the amount of money earned after all variable costs and fixed costs are covered. For more details can be seen in Table 1.

*Table 1. Costs, Receipts and Revenues of Cattle Farming in Mainland of Flores Timur*

No	Description	Cash	Non Cash	Total (IDR)	%
<b>1</b>	<b>Investation</b>				
	Land		4000000	4000000	
	Cage	172.920		172.920	
	Cage equipment	585.275		585.275	
	<b>Total Investment</b>	<b>758.195</b>	<b>4.000.000</b>	<b>4.758.195</b>	
<b>2</b>	<b>Operating Costs</b>				
	<b>A. Fixed Costs</b>				
	Depreciation	252.731		252.731	
	Total Fixed Cost (2A)	252.731		252.731	2,53%
	<b>B. Variable Costs</b>				
	Early cattle	5.390.865		5.390.865	55,30%
	Feed		2.998.888	2.998.888	30,76%
	Health care	106.226		106.226	1,09%
	Labor		1.252.213	1.252.213	12,85%
	Total Variable Cost (2B)	5.497.091	4.251.101	9.748.193	97,47%
	<b>Total Costs (2A + 2B)</b>	<b>5.749.822</b>	<b>4.251.101</b>	<b>10.000.924</b>	
<b>3</b>	<b>Revenue</b>				
	Sales 2,56 ST@ Rp8391509.-	21.278.302		21.278.302	
	<b>Total Revenue</b>	<b>21.278.302</b>		<b>21.278.302</b>	
<b>4</b>	<b>Income</b>				
	The total cost	11.277.378			
	Average / AU	4.405.226			
<b>5</b>	<b>Analysis</b>				
	R/C	2,13			
	B/C	1,13			

Source: Primary Data, 2019 (processed)

The average sales of each cattle breeder household is 2.56 AU while the price per Livestock Unit (1 male adult cattle aged > 2 years) is IDR8,391,509. Therefore, cash receipts obtained by farmers in one year business are IDR21,278,302. The total cash income of each bali cattle farmer in Flotim Mainland in one year business is IDR11,277,378.

If the income per unit of livestock is calculated, the average income is

IDR4,405,226/AU or IDR1,898,804/AU/Year. The results of this study indicate that the income obtained by farmers is higher when compared to the research of Rouf and Munawaroh (2014) who conducted research on beef cattle fattening in Gorontalo District, namely the breakdown of the amount of profit based on the total cost per head of IDR444,079/head/period whereas profit based on farmer's cash costs is IDR2,436,579/period. The results of this

study are also higher than the research conducted by Nahak (2019) in Malaka Tengah District, Belu Regency, where the income earned by fattening cattle farmers is IDR8,822,156, or IDR922,820/AU. This is likely due to local inputs such as feed is still cheap and shorter maintenance times when compared with the two previous studies.

The result of further analysis shows that the R/C is 2.13. This figure is greater than one, which indicates that by spending IDR1,000,000 the farmer will receive an income of IDR2,130,000. In other words, the farmer earns a profit of IDR1.130.000 for every production cost of IDR1,000,000. Thus, it can be concluded that the cattle business run by farmers in Flores Timur Mainland, East Flores Regency, even though it is still a community livestock farming system, is economically feasible because it has benefited the farmers.

#### *Financial Feasibility of Cattle Breeding Business*

To assess whether the existing investment business is financially feasible, an analysis and calculation is carried out in accordance with the applicable eligibility criteria. The results of the analysis are shown in Table 2.

**Table 2.** Investment Criteria of Bali Cattle Breeding in Mainland of Flores Timur (Net Calf Crop 75%)

No.	Investment Criteria
1.	Net Present Value (NPV) (Rp)
2.	Net B/C
3.	Internal Rate of Return /IRR
4.	Return on Investment /ROI
5.	Payback Period
6.	Break Even Point
	IDR
	Unit (Head)

Source: Primary Data, 2019 (processed)

Looking at Table 2, there are two criteria used to see whether a business is financially feasible or not. The first criterion is called discounted criteria (NPV, Net B/C and IRR) while the second criterion is called non-discounted criteria (ROI, PBP and BEP).

From table 2 it can be seen that the NPV value is positive, Net B/C > 1 and IRR are higher than the social discount rate of 12%. Thus it can be concluded that the investment business of Bali cattle breeding in Flores Timur mainland, East Flores Regency is financially feasible. The non-accounting criteria obtained an ROI of 251.26%. This means that the productivity of capital invested in total assets to produce profits for investors is almost 3 times the value of the investment. Furthermore, the Payback Period obtained is 5.69 years and is shorter than the projected life of 10 years. Meanwhile a break even point can occur if the number of cattle sold is 105 with a sales value of idr540,256,925.

Based on the two general criteria above, it can be concluded that financially the cattle breeding business in the Flores Timur Mainland is feasible.

#### *Sensitivity Analysis*

In this analysis it is assumed that there is a decrease in the net calf crop (NCC) from 75% to 60% with the assumption that other factors do not change/remain. As a result of this decrease in NCC causes the number of sales to decrease which in turn will cause a decrease in profits. This change in one of the technical coefficients of production will inevitably affect a variety of investment eligibility criteria. In summary the results of the analysis can be seen in Table 3.

#### *Criteria Value*

IDR330,590,299

1.48

18%

251.26%

5.69 tahun

540,256,925

105.29

*Table 3. Investment Criteria for Bali Cattle Breeding in Flores Timur Mainland if a Net Calf Crop Decreases to 60%*

No	Investment Criteria	Criteria Value
1	Net Present Value (NPV)	IDR51,911,059
2	Net B/C	1.07
3	Internal Rate of Return /IRR	13%

Source: Primary Data, 2019 (processed)

From Table 3 it can be seen that the feasibility of the Bali cattle breeding business in Flores Timur is threatened if the NCC drops to 60%. NPV, Net B/C and IRR as business feasibility criteria are still positive but the decrease in the net value of benefits (NPV) received by around 84% to only IDR51,911,059 is a loss for the business. While the Net B/C value is only 1.07 and IRR at position of 13% becomes sensitive to changes in macro factors so that business viability is threatened.

### *Maintenance Scale Analysis*

In an effort to achieve a scale of maintenance that can meet the minimum standard of living for the family of farmers, several efforts to empower farmers are needed that are tailored to the vision, mission, goals and objectives to be achieved by the Regional Government of Flores Timur Regency. The results of the analysis show that with the scale of cattle ownership from breeders in Flores Timur Mainland, 77% are on a scale of less than 5 AU while only 23% have 5-10 AU.

The analysis shows that the NPV value obtained is IDR330,590,299 or IDR3,005,366,

/AU. The minimum standard of living needs is USD1500 or an exchange rate of IDR14,000 meaning around IDR21,000,000/year. This means the minimum maintenance scale is 7 AU for each breeders.

By comparing the NPV value of the two business scales to the minimum standard of life expected to determine the feasibility of the maintenance scale, it turns out that the two scales have not been able to meet the desired minimum standard but there are indications that the increase in business scale tends to increase revenue, so as to achieve these standards can be done by continuing to increase the scale of business until the number of livestock raising that is feasible to be cultivated by a beef cattle breeder.

There are several alternative strategies that can be done to improve the welfare of farmers including improving the ability of farmers both in technical and non-technical aspects with a variety of training, counseling and coaching continuously, conducting cooperation between farmers, government and private sector in a mutually beneficial cooperation relationship. In addition, local governments need to provide encouragement in the form of an increase in the number of livestock to help increase the scale of business to potential breeders, conducting institutional engineering through governance in order to achieve a decent scale of business. It also concentrates integrated livestock development areas according to cattle commodity development areas, making it easier to foster and make cattle markets an effort to take advantage of market opportunities.

## *CONCLUSIONS AND SUGGESTIONS*

### *Conclusion*

Based on the results and discussion, some conclusions can be drawn as follows:

- Beef cattle breeders in the study location are dominated by productive age (24 - 65 years) where the cattle business is only a side business. From the characteristics of the business it can be seen that 77% of farmers have an average ownership of 1-4 AU while 23% have livestock 5-10 AU.
- The average income earned by each breeder is IDR11,277,378 or IDR4,405,226/AU or IDR1,898,804/AU/Year. There is a tendency for an increase in income due to an increase in business scale, while analysis of the economies of scale shows that the economies of maintenance are 7AU/breeders.
- The cattle business run in Flores Timur Mainland is financially feasible because it has an NPV of idr330,590,299 > 0, Net B/C = 1.48 > 1 and IRR of 18% > social discount rate. Breed cattle business is very sensitive to changes in the decline in Net Calf crop to 60%.
- The scale of the people's beef cattle breeding business can still be increased until it reaches a scale of maintenance that meets the minimum economic and financial standards of 7 AU/breeders
- Achieving the minimum standard of living needs of farmer families does not meet expectations, so it takes various efforts such as improving management and cost efficiency and making efforts to empower farmers and their businesses, both by the government, private sector and the breeders themselves.

### Suggestion

1. Farmers need to understand the calculation of cost and income analysis to determine the condition of farmers in a state of loss or not and also to anticipate costs that cause losses.
2. There needs to be an increase in business scale through the addition of venture capital, such as establishing cooperation with financial institutions and investors, or breeders forming business groups and joining into a larger business scale.
3. The strategy of empowering beef cattle farmers is not only carried out by the government but also involves the farmers themselves and the private sector by conducting mutually beneficial cooperation.

### REFERENCES

- Aliyev, Shafa (2018). Special economic zones in the World Economy. Sumgayit: Department of Editorial and Publishing of SSU
- Barański, M., Średnicka-Tober, D., Rempelos, L., Hasanaliyeva, G., Gromadzka-Ostrowska, J., Skwarło-Sońta, K., & Leifert, C. (2021). Feed composition differences resulting from organic and conventional farming practices affect

- physiological parameters in Wistar rats—results from a factorial, two-generation dietary intervention trial. *Nutrients*, 13(2), 377.
- Bisht, I. S. (2021). Agri-food system dynamics of small-holder hill farming communities of Uttarakhand in north-western India: socio-economic and policy considerations for sustainable development. *Agroecology and Sustainable Food Systems*, 45(3), 417-449.
- Buckland, S. F., & Campbell, D. (2021). An assessment of factors influencing awareness, access and use of agro-climate services among farmers in Clarendon, Jamaica. *Geoforum*, 126, 171-191.
- Directorate General of Animal Husbandry. 2011. "Animal Husbandry Statistics in 2010".
- Gregory Forth (2022) Mountain Turtles and Giant Crabs: Cosmological Implications and Supernatural Understandings of Rare Creatures on an Eastern Indonesian Island, *Anthrozoös*, DOI: 10.1080/08927936.2021.2012338
- Ihsani, H. F., Rukmiasih, R., & Fitriati, M. (2022). Performances of Debu and Kelabu Sentul Hens in the Different Rearing System at Poultry Breeding Development Center Jatiwangi Majalengka. In *E3S Web of Conferences* (Vol. 348, p. 00034). EDP Sciences.
- Kadariah et al. 2001. Introduction to Project Evaluation. Volume 1. Faculty of Economics, University of Indonesia. Jakarta.
- Kansanga, M., Andersen, P., Kpienbaareh, D., Mason-Renton, S., Atuoye, K., Sano, Y., & Luginaah, I. (2019). Traditional agriculture in transition: examining the impacts of agricultural modernization on smallholder farming in Ghana under the new Green Revolution. *International Journal of Sustainable Development & World Ecology*, 26(1), 11-24.
- Karen Kartomi Thomas (2016) Theatrical change paralleling socio-political developments in Indonesia's Natuna archipelago in the South China Sea, *Indonesia and the Malay World*, 44:130, 327-341, DOI: 10.1080/13639811.2016.1202687
- Kariyasa, K., 2005. Plant-Livestock Integration System in Perspective of the Reorientation of Fertilizer Subsidy Policy and Farmer Income Increase. *Journal of Agricultural Policy Analysis*, Vol. 3 (1) p: 68-80.
- Ledoh, B.J., 2005. Analysis of Development of Beef Cattle with the Pattern of Gaduhan (Koppel) Breeding in Kupang Regency, East Nusa Tenggara. Thesis. Animal

- Husbandry Development Study Program Undana Kupang Postgraduate Program.
- Leng, R.A. 1987. Matching Ruminant Production System with Available Resources in the Tropics and Sub-tropics. New South Wales, Australia.
- Mahmudin Nur, et al., 2017. Region of East Flores Regency agricultural commodities .. Cooperation of East Flores Regional Government and Undana 2017. Research Report
- Maria, K., Sobang Yohanis, U. L., Lalus Matheos, F., Morin, S. U. M., & Nendissa, D. R. (2021). Innovation Of Institutions And Prohibition Re-Review Outer-Island Marketing Of Cows To Increase Value Added Of Beef Cattle.
- Mdegela, R. H., Mwakapeje, E. R., Rubegwa, B., Gebeyehu, D. T., Niyigena, S., Msambichaka, V., ... & Fasina, F. O. (2021). Antimicrobial Use, Residues, Resistance and Governance in the food and agriculture sectors, Tanzania. *Antibiotics*, 10(4), 454.
- Munsell, J. F., Bukowski, C. J., Yanez, M., & Allen, J. A. (2021). Urban food forests and community agroforestry systems. *North American Agroforestry*, 315-335.
- Ou-Yang C. & Y. D. Lin (2008) BPMN-based business process model feasibility analysis: a petri net approach, *International Journal of Production Research*, 46:14, 3763-3781, DOI: 10.1080/00207540701199677
- Roy, N. D., Charles, K., & Lika, B. (2019). The market structure of the Bali cattle in East Nusa Tenggara, Indonesia. *Russian Journal of Agricultural and Socio-Economic Sciences*, 95(11).
- Roy, N. D., Ratya, A., Nuhfil, H., & Wahib, M. A. (2018a). Beef market integration in East Nusa Tenggara of Indonesia. *Russian Journal of Agricultural and Socio-Economic Sciences*, 80(8).
- Roy, N. D., Ratya, A., Nuhfil, H., & Wahib, M. A. (2018b). Dynamics of degree of beef cattle market concentration in Kupang of East Nusa Tenggara, Indonesia. *Russian Journal of Agricultural and Socio-Economic Sciences*, 78(6).
- Santoso, U. 1995. Management of Beef Cattle Maintenance. Self-Publisher Spreaders. Jakarta. (BPS, 2011).
- Schioldann, E., Mahmood, M. A., Kyaw, M. M., Halliday, D., Thwin, K. T., Chit, N. N., ... & Peh, C. A. (2018). Why snakebite patients in Myanmar seek traditional healers despite availability of biomedical care at hospitals? Community perspectives on reasons. *PLoS neglected tropical diseases*, 12(2), e0006299.

- Soekartawi, 2007, Analysis of Farming Enterprises, UI-Press, Jakarta.
- Undana Timor Cattle Research and Development Center, 2007. Genetic Quality Assessment of Bali Cattle in NTT. Research result. Collaboration between the Center for Research and Development of Timor Bali Cattle and the Livestock Service Office of East Nusa Tenggara Province.
- Wahyuningsih, W., Susilo, S., & Anwarudin, O. (2021). Factors That Determine the Income of Beef Cattle Farmers and Its Contribution to Household Income. Journal of Hunan University Natural Sciences, 48(8).

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