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# CAPITAL BUDGETING ANALYSIS ON DECISION MAKING FOR THE ESTABLISHMENT OF A NEW SHEEP LIVESTOCK BUSINESS IN THE JEMBER REGENCY

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## Abstract

***The livestock sector encourages the growth of a populist economy to increase the income and welfare of the community, especially the livestock community. The sheep farming business is in great demand by investors, but so far, no investment assessment analysis has been carried out on the project's feasibility. This study aims to assess whether the project to establish a new sheep farming business in Jember Regency is feasible. This study uses 6 investment assessment criteria, namely Payback Period (PP), discounted payback period (DPP), Net Present Value (NPV), Internal Rate of Return (IRR), Modified Internal Rate of Return (MIRR), and Profitability Index (PI). Based on the investment assessment criteria, the payback period and discounted payback period are 6.17 years and 9.40 years or under the investment age (10 years). The NPV value is Rp. 217,369,579.67 or more than zero. The IRR and MIRR values are 12.58% and 11.10% or above the 9% interest rate. Meanwhile, the Profitability Index value is also greater than 1 or 1.38. So based on the six investment evaluation criteria that have been carried out, it can be said that establishing a new sheep farming business in Jember Regency is feasible.***

***Keyword: sheep livestock, capital budgeting, Investment Evaluation***

## 1. INTRODUCTION

The development of the livestock sector is one of the five national strategic commodities. The strategy is basically for providing Safe, Healthy, Whole, and Halal (SHWH) animal food. It will also play a role in

encouraging the quality improvement of human resources in terms of nutritional fulfillment through the provision of consumption. Animal protein comes from livestock, namely meat, eggs, and milk. In addition, the livestock sector encourages the growth of a populist economy to increase the income and welfare of the community, especially the livestock community.

The government, together with ISGBA (Indonesian Sheep-Goat Breeders Association), is improving the strategic role of sheep and goat farming development which is directed at 5 (five) aspects that are the advantages of sheep and goats. These advantages include: (1) sheep and goat farming as an activity relevant to empowering and driving the economy of rural communities, (2) sheep and goat meat as an alternative source of animal protein and an alternative for chicken and beef, and (3) development of community-based culture-based livestock, (4) create a sheep and goat farming corporation to increase population and productivity to ensure the sustainability of sheep and goat farming, as well as provide the community's food needs, (5) fill supplies for export markets to ASEAN regional countries (Ministry of Agriculture, 2020:1).

Although the population of sheep and goats in Indonesia is quite extensive, the increasing demand has made the supply of this small ruminant commodity experience problems. Demand comes not only from the hospitality industry (hotels, restaurants, catering) but also from religious activities such as aqiqah and qurban. In the submission of the National Working Meeting (NWM) and the Inauguration of the CLC (Central Leadership Council), RLC (Regional Leadership Council), and IAEA (Indonesian Aqiqah Entrepreneurs Association) for the 2019-2021 period in Lembang, West Java in 2019, it was conveyed that the aqiqah service



business has very promising prospects. Suppose we refer to the birth rate of around 2.9 million children from Muslim parents who are able to perform aqiqah, for example, around 87%. In that case, there is a potential need for around 2.6 - 2.7 million sheep or goats for aqiqah services with a transaction value of around IDR 5 trillion. Meanwhile, the market share and turnover of IAEA members have only reached Rp 860 billion. This means that many potentials can still be achieved (Safari, 2020: 24).

In regional coverage, East Java province is one of the top 3 provinces with the largest population of sheep and goats. Each district in East Java has a population potential that differs from the total population of goats or sheep. The distribution map of sheep and goats differs in each district depending on climate, geography, potential natural food sources, and community culture. As many as 71.25% of the people's livestock in East Java are goat commodities, and the remaining 28.75% are sheep commodities.

Sheep dominate the number of small ruminant livestock populations in Jember Regency compared to goats. One is due to the success of the East Java government's breeding and genetic engineering program through the Livestock Breeding and Forage for Livestock (LBFL) UPT by the Department of Animal Husbandry and Dairying. With new varieties and quality improvements, sheep in Jember Regency have advantages in increasing growth rates and easily adapting to new environments and feed conditions. This is one of the factors considered by breeders in the Jember region who prefer to raise sheep compared to goats, which are known to require dominance of ramban forage types, and take relatively longer to adapt to environmental changes or feed compared to sheep.

The establishment of a new livestock business aims to obtain a number of benefits from market opportunities and economic potential in the sheep farming agro-industry in the Jember regency. It takes the role of long-term investment and capital budgeting in establishing a livestock business, including purchasing or leasing land, construction of cages, livestock facilities and infrastructure, purchase of livestock, feed, labor costs, and business operations.

This study simulates of livestock business namely sheep fattening. Capital budgeting analysis is carried out by including all aspects of risk in the establishment of a new livestock business, namely the risk of livestock

cultivation such as death, wrong seed selection, failure of supplier selection, and risks in marketing and selling livestock products where both of these risks will be faced by new livestock businesses. This study also simulates how to analyze business feasibility if the subject of the implementation of the activity is carried out alone by establishing a new independent livestock business.

## 2.LITERATURE REVIEW

The sheep breeding business aims to produce profitable offspring in quantity and quality. This business requires genetically good broodstock. The business determinants are periodic treatment in a certain frequency to maintain livestock health and productivity, sources of forage or nutritional feed, and climatic conditions. The business options above can be carried out by maintaining loose grazing in the field or staying in cages (Ratnasari & Hakip Nurdiansyah, 2016: 120).

According to Bungaran & Sipayung (2000:22), the sheep agribusiness system must be built by four main sub-systems, namely: (1) upstream off-farm sub-system that provides production facilities, (2) on-farm sub-system that carries out cultivation activities, (3 ) downstream off-farm sub-system that processes and trades products, (4) supporting service sub-system that provides services for the smooth running of sheep agribusiness. With the above system, the sheep-based economic development is to build a comprehensive and sustainable agribusiness system.

According to Clauss (2009:363), capital budgeting is a method used to analyze (identify and select) the feasibility of a project or type of investment in the long term that will be carried out by the company and is expected to generate benefits for more than one year. Capital budgeting decisions involve using limited company resources for a long-term commitment. When the decision is implemented, the company must be able to determine the current conditions and the possibility of spending funds in the future. Capital budgeting is divided into four stages: project definition and cash flow estimation, project analysis and selection, project implementation, and project review.

Six most common criteria can be used to determine whether a project should be accepted or rejected in capital budgeting: payback period, discounted payback period, net present value, profitability index, internal



rate of return, modified internal rate of return (Clark et al., 1989:67).

### 3. RESEARCH METHOD

The new livestock business consists of 3 business scenarios, namely (1) sheep fattening business, (2) sheep breeding business, and (3) a combination of fattening and sheep breeding business. Meanwhile, the establishment of a Joint Business Group (JBG), which was carried out through the formation of a smallholder sheep group, was carried out with one type of business scenario, namely sheep breeding. In these various business scenarios, a capital budgeting analysis will be carried out using the following five criteria:

1. Payback Period (PP) : Payback period can be calculated by dividing the investment value (cost of investment) by the annual net cash flow. Payback Period calculation is as follows (Hidayat, 2019:28):

$$\text{Payback Period} = \frac{\text{Investment Value}}{\text{Net Cash In}}$$

2. Discounted Payback Period (DPP) :According to Ross et al. (2007:146), a discounted payback period is the period until the sum of the discounted cash flows of an investment equals its cost.

$$\text{DPP} = \text{PV} \frac{1}{(1+i)^n}$$

Description :

i = Discounted rate

n = Year of cash inflow period

3. Net Present Value (NPV) : The Net Present Value (NPV) of a project or business is the difference between the present value of the benefits and the flow of costs. Mathematically the formula for calculating NPV is as follows (Nurmalina et al., 2018:99):

$$\text{Net Present Value} = \sum_{t=1}^T \frac{C_t}{(1+r)^t} - C_0$$

Description :

C<sub>t</sub> = Cash flow in period t

t = Time period year t

C<sub>0</sub> = Amount of initial investment

r = Interest rate

4. Internal Rate of Return (IRR) : IRR is the average annual internal profit rate for companies that make

investments and is expressed in percent. The formula for calculating IRR is (Nurmalina et al., 2018:102):

$$\text{IRR} = i + \frac{\text{NPV}}{\text{NPV}^+ - \text{NPV}^-} (i^- - i^+)$$

Description :

i<sup>+</sup> = Discount rate that produces a positive NPV

i<sup>-</sup> = Discount rate that produces a negative NPV

NPV<sup>+</sup> = Positive NPV

NPV<sup>-</sup> = Negative NPV

5. Modified Internal Rate of Return : MIRR is a discount rate that causes the percent value of costs to be equal to the present value of the terminal value, where the terminal value is the future value of cash inflows multiplied by the cost of capital and prevailing interest rates to determine if the project is not feasible to implement. The formula for calculating MIRR is (Margaretha, 2005:48):

$$\text{PV Cost} = \frac{\text{terminal value}}{(1 + \text{MIRR})^n} = \frac{\sum \text{CIF}_t (1 + k)^{n-t}}{(1 + \text{MIRR})^n}$$

Description :

CIF<sub>t</sub> = Cash inflow in period t

MIRR = Modified IRR

n = Project age

k = Project cost of capital / desired level of profit

terminal value = the future value of the cash inflows multiplied by the desired cost of capital/return.

6. Profitability Index (PI) : PI is the cash value of all cash inflows received after the initial investment divided by the initial investment. The general formula for the profitability index (Ross et al., 2007: 181) is as follows :

$$\text{PI} = \frac{\text{PV of cash flows after initial investment}}{\text{Initial investment}}$$

### 4. RESULTS AND DISCUSSION

This research uses capital budgeting analysis using 6 criteria to assess whether the investment project for establishing a new livestock business is feasible. namely, Payback Period, Discounted Payback Period, Net Present Value (NPV), Internal Rate of Return (IRR), and Modified Internal Rate of Return. (MIRR), and Profitability Index (PI). The use of assumptions is needed in the analysis of capital budgeting. These assumptions were obtained



through a study of the sheep livestock business in Jember Regency, including:

1. Implementation of the construction of the cage is the 0th year in the period of Sep 2022 to Dec 2022
2. Fattening activities start in the 1st year of Jan 2023 to Dec 2023
3. The total capacity of the feedlot cage is 300 sheeps (capacity for 2 feedlot cage), with 100 sheeps filling every month, divided into 25 sheeps per week
4. 1 year of production carried out 3 times female fattening and 1-time male fattening program for Eid al-Adha
5. The age of the feeder lamb is between 5-8 months
6. Each fattening period is 90-100 days with a target of increasing the sheep's weight by 10-12 kg from the initial weight of the entry
7. Assuming 4 types of feeder sheep prices, with an initial weight between 12-18 kg
8. Based on information in the field about new farms, generally, there are obstacles at the beginning of cultivation that pose a risk to sheep farming, so it is assumed as follows:

Mortality/death rate:

- Harvest I : 15%
- Harvest II : 8%
- Harvest Eid al-Adha : 0%
- Harvest III : 5%
- Harvest IV etc : 2%

9. The entry price for feeder sheep is assessed at the *jogrok* price (price per head), while the selling price for fattening sheep is Rp. 55,000/kg

The investment cost required to establish a new sheep farming business in Jember Regency is Rp. 565,925,000. In more detail, the investment costs are presented in Table 1.

Table 1. Investment Costs for Establishing a New Sheep Livestock Business in Jember Regency

Description	Amount (Rp)
Land Size 3,000 m2	105,000,000
Water Installation	500,000
Electrical Installation 1300 w	1,500,000
Sheepfold	170,000,000
Support Building	75,000,000
Office Furniture	5,000,000

Plumbing Installation	4,000,000
Electrical Line Installation	1,500,000
Fence Construction	4,500,000
CCTV and Installation	6,000,000
Pick-up Truck	170,000,000
Drum	4,000,000
Chopping Machine	5,500,000
Shaving Machine	2,550,000
Water Reservoir	2,200,000
Dipper / Tub Drink	300,000
Feeding Tub	150,000
Tarpaulin	400,000
Broom Stick	50,000
Shovel	400,000
Artco Carts	650,000
Scale	650,000
Feed Plastic	700,000
Used Sack	200,000
Feeding Pedestal Wooden Pallet	1,800,000
Sickle	100,000
Knife	60,000
Scissor	30,000
Slap 1 Roll	150,000
Raffia Rope 1 Roll	10,000
Livestock Recording Rope	175,000
Cattle Recording Tog	750,000
Bamboo curtain	150,000
Banner	500,000
Lamp	525,000
Cable	500,000
Water Hose 100 m	425,000
<b>Total Investment Cost</b>	<b>565,925,000</b>

Source: Primary data processed, 2022

Details of operational costs are presented in Table 2, which include variable and fixed costs.

Table 2. Operational Costs of Establishing a New Sheep Livestock Business in Jember Regency

Description	Amount (Rp)
<b>Fixed Cost</b>	
Electricity	4,200,000
Water	600,000
Feedlot Cage Employee Salary	30,000,000
Night Guard Salary	6,000,000
Communication	2,400,000
CCTV Credit	1,200,000





Community Fund	600,000
Employee Holiday Allowance (THR)	1,000,000
Social Activities	2,500,000
Property Taxes (PBB)	125,000
<b>Total Fixed Cost</b>	<b>48,625,000</b>
<b>Variable Cost</b>	
Drugs	12,200,000
Vitamin	2,950,000
Transportation	11,800,000
Feeder Lamb	1,017,800,000
<i>Qurban</i> Feeder Sheep	110,500,000
Complete Feed	324,858,750
Used Sacks	1,200,000
<b>Total Variable Cost</b>	<b>1,481,308,751</b>

Revenue from the new sheep farming business in Jember Regency comes from the harvest of female sheep fattening, ram fattening, and sheep dung from 300 sheep.

**Table 3. New Sheep Livestock Business Revenue in Kabupaten Jember**

Description	Amount (Rp)
Sales	
- Female Sheep Fattening	875,029,786
- Male Sheep Fattening	147,000,000
- Sheep Dung	12,000,000
<b>Total Revenue</b>	<b>1,034,029,786</b>

The results of the investment feasibility analysis are presented in Table 4 with 6 criteria.

**Table 4. Value of New Sheep Livestock Investment Assessment Criteria in Jember Regency**

Description	Value
Payback Ratio (PP):	6.17 years
Discounted Payback Ratio (DPP)	9.40 years
Net Present Value (NPV)	217,369,579.67
Internal Rate of Return (IRR)	12.58%
Modified Internal Rate of Return (MIRR)	11.10%
Profitability Index (PI)	1.38

The results of the investment calculation based on the table above show that CV Satari Farm is feasible to be operational. This can be seen from the Payback Period (PP) value of 6 years 2 months and the Discounted Payback Ratio of 9 years 4 months. These payback period values are lower than the investment age of ten years, with the Net Present Value (NPV) of Rp. 217,369,579 is greater than zero. The IRR and MIRR criteria show that the amount of return obtained from the investment is 12.58% on the IRR and 11.10% on the MIRR. Both of these values are greater than the interest rate of 9%. Likewise, the Profitability Index value is 1.38, which is above zero and close to 1. Based on the six investment assessment criteria that have been carried out, it can be said that the establishment of a new sheep livestock business in Jember Regency is feasible

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