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Financial Analysis of Laying Ducks on People's Farmsin Air Batu District, Asahan Regency

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Abstract. Business productivity at the farm level is still low when compared to commercial businesses both in terms of business management, quality and quantityof production.This study aims to analyze financial aspects of laying ducks on community farms. The research was conducted in Air Batu Subdistrict, Asahan Regency in June until August 2020. The samples were determined by stratified sampling, namely dividing three business scales based on the number of livestock ownership, i.esmall-scale business (150-340 ducks), medium scale business (350- 500 ducks) and the highest scale business (550-800 ducks) with the number of respondents per business scale of 3 breeders. Parameters were production cost, income. revenue, R/C, BEP, Net B/C, Gross B/C, NPV, IRR, and PP. The results of the study showed that the average income per period per business scale was Rp. 32.792.167, - Rp. 112.390.667, - and Rp. 207.431.867. R / C value> 1, the value of BEP production is smaller than the amount of egg production, BEP price is smaller than the selling price of eggs per egg, the value of Net B / C and Gross B / C> 1, the NPV value> 0 or positive, the IRR value with an interest rate of 16.75%, respectively, is 26%, 27% and 27% greater than the interest rate and PP, respectively 4,3,2 months before the project age (5 years).

Keywords: financial, laying ducks, smallholder livestock.

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1. Introduction

Local ducks are one of the genetic resources or germplasm of poultry in Indonesia which have the advantage of being an important source of animal protein, namely producing eggs and meat and specific coat colors. The national duck egg and meat production contributed 14.64% or 2106.9 thousand tons of the national need for eggs and 1.88% or 43.2 thousand tons of the national demand for poultry meat [1].

The need for eggs that continues to increase is not matched by large egg production so that there is a shortage of egg supply which results in expensive egg prices. North Sumatra Province is one of the egg-producing areas with a sufficient amount of demand in the region itself.

Asahan Regency is one of the districts that has a large population of ducks in North Sumatra,

namely 2,909,469 tails. Among several sub-districts in Asahan district, Air Batu sub- district has the highest duck population, amounting to 98,896, while the egg population in Air batu sub-district is 515.21 items [2].

The results of the preliminary survey showed that the duck population in 2020 was only 8,469. This is due to the lack of knowledge of breeders about the technicalities of duckcultivation, so that most of the livestock die. By looking at the current population, it is necessary to consider whether the business is still feasible or not to run in Air Batu District, Asahan Regency.

Most of the duck farming in the people's farm in Air Batu District, Asahan Regency, is carried out by the people using an intensive maintenance system. Business productivity at the farm level is still low when compared to commercial businesses both in terms of business management and quality and quantity of production, so it is necessary to continue to strive in a planned, directed, integrated and sustainable manner in order to create a good maintenance and obtain optimal results and quality products. .Based on the above background, it is necessary to carry out related research on the business analysis of laying ducks on people's farms in Air Batu District, Asahan Regency.

2. Materials and Methods

2.1. Research Methods and Sampling

The research method used was a survey method, namely interviews and direct observation with laying duck breeders in Air Batu District, Asahan Regency.The sampling method used in this study is stratifed sampling, namely by dividing into three business scales based on the population of laying ducks in Air Batu District, Asahan Regency, namely low business scale (150-340 ducks), medium business scale (350-500 ducks) and high business scale (550-800 ducks). The reason for taking stratified sampling is because the respondents will be divided according to the scale of the business or the number of livestock population. Startified sampling is a sampling technique by making strata (levels / classes) within the population [3]. The data in this study processed for a period of business scale of 2 years.

2.1.1. Types and Sources of Data

The data used in this study are primary data and secondary data, Primary data collection was obtained from observations and interviews through questionnaires to respondents who were people who carried out laying duck farming in Air Batu District. Then, secondary data collection was obtained from related agencies.

2.2. Data Collection Techniques

Data collection carried out in this study was an observation that made direct observations on the

business of laying ducks on people's farms in Air Batu District. In addition, this research questionnaires and interviews, namely data collection by dividing questionnaires or a list of questions to breeders and communicating directly with respondents to obtain data. Recording is carried out to obtain secondary data, by recording existing data at agencies or institutions related to research.

2.3. Data Analysis Methods

Financial Analysis of Laying Ducks in Smallholder Farms:

Economic Aspects

Fixed Costs (Fixed Cost)

Fixed costs is a cost where total amount remains constant unaffected by changes in the volume of activities up to a certain level [4]. These fixed costs include depreciation costs for cages, depreciation of equipment and total taxes.

Variable Cost

Variable costsl incurred repeatedly [5] Costs included in variable costs are initial livestock costs, drug and vaccine costs, transportation costs and feed costs.

Production Costs

Production costs are compensation costs received by the owners of production factors or costs incurred by farmers in the production process, bothcash or non-cash method [6] The formula for production costs is as follows:

$$TC = FC + VC$$

Note :

TC: Total Cost (IDR)
FC: Fixed Cost (IDR)
VC: Variable Cost (IDR)

Income

Income is the multiplication of production produced by the selling price. The acceptance formula is as follows:

$$Pd = TR - TC$$

Information:
Pd : Income (IDR)

TR : Total Revenue (IDR)
TC : Total cost (IDR)

Total Revenue

Revenue is the difference between the company's total revenue and expenditure. To analyze revenue, two main information is needed, namely the state of expenditure and revenue within a certain period, the income formula is as follows:

$$TR = Q. P$$

Note :
TR : Total Revenue (IDR)
Q : Total Production (IDR)
P : Product Price (IDR)

a. Financial Aspects

1. Revenue Cost Ratio (R / C)

R / C is the ratio between revenue and total cost. There are three criteria inthe calculation, namely if R / C> 1 means that the farm is profitable, if R / C =1 means that the farmis breaking even and R / C <1 means that the farm is losing [7]. The calculation formula is as follows

$$\frac{R}{C} = \frac{\text{Total Product Sales Receipts}}{\text{Total Cost}}$$

2. Benefit Cost Ratio (BCR)

Analysis *benefit cost ratio*(BCR) is used to determine the amount of profit / loss as well as the feasibility of a project. Effort is said to be feasible if BCR> 1. The calculation formula is as follows:

$$Net\frac{B}{C} = \begin{cases} \sum_{t=0}^{n} \frac{\square|\square\square}{(\square^{\square})} \text{ for } Bt - Ct > 0 \\ \sum_{t=0}^{n} \frac{\square\square\square\square|}{(\square^{\square})} \text{ for } Bt - Ct < 0 \end{cases}$$

Note :
Bt: Total revenue in year t (IDR)
Ct: Total costs in year t (IDR)
n: Project life (years)
t: Year 1,2,3....., n
i: Discount rate (%)

$$Gr\square ss\ B/C = \frac{\sum_{i=1}^{n} B(1+r)^{-n}}{\sum_{i=1}^{n} C_i(1+r)^{-n}}$$

Note :
I : Interest rate
n : The economic life of the project
Bt : *Benefit* (revenue) net year t
Ct : *Cost* (cost) in year t

3. Net Present Value (NPV)

Net Present Value used to calculate value now from the return of an investment whether it means whether the investment provides a return or even vice versa [8]. The calculation formula is as follows:

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

Note:
Bt : Total revenue in year t (IDR)
Ct : Total costs in year t (IDR)
N : Project life (years)
T : Year 1, 2.3, ..., n
I : *Discount rate* (%)

4. Internal Rate Return (IRR)

IRR is used to calculate the interest rate (discount rate) which makes the present value of all estimated cash inflows equal to the present value of the expected cash flows.. The calculation formula is as follows:

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

Note:
i` :*discount rate* which results in a positive NPV
i` :*discount rate* which results in a negative NPV
NPV` : NPV is positive
NPV : NPV is negative

5. Break Even Point Analysis (BEP)

Break Even Point (BEP) is the break-even point of a situation that describes the business profits obtained with the issued capital, in other words a situation where the business condition does not experience a gain or loss [9]. The BEP value can be calculated by the formula:

$$\text{BEP (ducks)} = \frac{\text{Total Fixed Cost}}{\text{Selling Price/item} - \text{Variabel Cost/item}}$$

6. Payback Period (PP)

Payback Period represents the time it takes for the initial investment to return. The payback period is also an indicator of business success. Payback period is a period required to cover investment expenditures using cash flow [10]. The calculation formula is as follows:

$$\text{PP} = \frac{\text{I}}{\text{Ab}}$$

Note:
PP: Time needed to return the capital (years)
I : Total investment capital (IDR)
Ab: Average net benefit per year period (IDR)

3. Results and Discussion

3.1. Financial Analysis of Laying Ducks in Community Farms

3.1.1 Economic Aspects

Table 1. Economic Analysis of Laying Ducks Farming

Type of Fee	Scale enterprises		
	150-340 ducks	**350-500 ducks**	**550 - 800 ducks**
Fixed Costs (IDR / Period)	2,060,000	5,111,333	5,668,667
Variable Cost (IDR / Period)	201,742,833	314,664,000	512,699,467
Total Production Cost (IDR / Period)	203,802,833	319,775,333	518,368,133
Receipt of Duck Eggs (IDR / Period)	229,341,667	419,652,667	704,450,000
Receipt of Rejected ducksIDR / period)	7,253,333	12,513,333	21,350,000
Total Revenue (IDR / Period)	236,595,000	432,166,000	725,800,000
Income (IDR / Period)	32,792,167	112,390,667	207,431,867

Production cost

Production cost of laying ducks in Air Batu District in "Table 1" shows that the highest average production cost is found at the highest business scale (550 - 800 head) of Rp. 518,368,133. Production costs tend to increase as the number of livestock increases. Thedifference in the amount of the total cost of production at each business scale is caused by the difference in the number of livestock raised by each farmer.

Revenue

Revenue is the multiplication of production obtained by the selling price and revenue is

also determined by the size of the production and the price of the production. In “Table 1”, the income obtained by laying duck farmers in Air Batuper District varies in period. In “Table 1”, it shows that the highest income is on the business scale of 550 - 800 heads of Rp. 725,800,000.

Income

The income of farmers increases with the increase in the number of livestock being kept. The more ducks that are kept, the higher the income that will be obtained. The income earned by breeders in the business of laying ducks in Air Batu District is different for each business scale. “Table 1” shows that the highest income is Rp. 207,431,867 per period.

3.1.2 *Financial Aspects*

Table 2. Financial Analysis of Laying Ducks

No.	Criteria	Scale enterprises		
		150-340 ducks	**350-500 ducks**	**550-800 ducks**
1	R / C	1.3	1.30	1.33
2	BEP			
	Production Volume (kg)	133,797	193,173	185,688
	Production Price (IDR)	1,391	1,256	1,337
3	BCR			
	Net B / C	11.20	14.99	24.55
	Gross B / C	1.19	1.40	1.35
4	NPV	51,306,828	176,832,918	322,271,435
5	IRR	26%	27%	27%
6	PP (month)	4 months	3 months	2 months

Revenue Cost Ratio (R / C)

Revenue cost ratio (R / C) is the ratio between the total revenue and the total productioncost which is used to determine the efficiency of the laying duck business. Business feasibilityis known by comparing the value of the R / C ratio with a constant value of one. The revenue cost ratio R / C based on “Table 2” shows that the business of laying ducks on the small, medium and largest scale is quite efficient because each farmer shows more than one R / C, namely on a business scale of 150 - 340 ducks of 1.13 on a business scale of 350 - 500 ducks of 1.30 while on the largest scale of business of 550 - 800 ducks of 1.33 means that the business oflaying ducks is profitable. This is in accordance with the opinion [7] if R / C> 1 means that the farming is profitable, if R / C = 1 means that the farm is breaking even and R / C < 1 means thatthe farm is losing.

Break Even point (BEP)

Break event point is the break-even point of a situation that describes the business profits obtained with the capital issued, in other words a situation where the business condition does not experience a gain or loss [9]

BEP Production volume

Break Even Point (BEP) production is an illustration of the maximum production a farmer must produce so that the livestock business does not suffer losses. BEP for production is obtained by comparing the total cost of production with the selling price of eggs per egg. In "Table 2", it shows that the BEP of production volume in the laying duck business in Air Batu District on a scale of 150 - 340 ducks is 133,797 duck eggs, on a scale of 350 - 500 ducks of 193,173 duck eggs, while on the largest scale of 550 - 800 duck eggs, 285,688 duck eggs.The yield from the BEP was smaller than the number of eggs produced. This shows that the breeders do not experience losses from the duck farming business if they only sell eggs as many as the number of eggs produced during one period.

Benefit Cost ratio (BCR)Net B / C Ratio

Based on "Table 2" Small, medium and large businesses have a Net B / C value of 11.20, 14.99, and 24.55. This value means that every Rp. 1.00 investment issued by the farmer can increase the profit (net benefit) of Rp. 11.20, Rp.14.99 and Rp.24.55. The Net Benefit Cost Ratio value describes the level of comparison of the benefits to the costs incurred from a project. If the Net Benefit Cost Ratio is greater than 1, the project is deemed feasible to continuebecause it is profitable [11].

Gross B / C Ratio

Gross B / C Ratio analysis is used to determine the profit of a business which is calculated by comparing the total benefit value or revenue and the total cost value that has been present value. Based on "Table 2", Small, medium and large businesses has a Gross B / C value of 1.19, 1.40 and 1.35. If, the gross B / C is> 1, the business is declared feasible [12].

Net Present Value (NPV)

Net Present Value (NPV) is the present value of the income streams generated by investment. NPV is the result of deduction from discounted cost [13]. Based on "Table 2", the NPV on the lowest scale to the highest scale is Rp. 51,306,828, Rp. 176,832,918, Rp. 322,271,435, respectively. This shows that the NPV of the cash flow is positive or greater than zero, so the livestock business in Air Batu District is feasible to run. Because if the calculation with the NPV analysis produces a negative value or less than 0, this indicates that the livestock business has suffered a loss. If the NPV value is

≥ 0 then it is feasible to be cultivated, if the NPV value <0 then it is not worth cultivating.

Internal Rate Return (IRR)

Internal Rate of Return (IRR) is an interest rate which shows the net present value (NPV) equal to the total investment in the business [13]. The internal rate of return (IRR) is the maximum interest rate a project can pay for the resources used. In "Table 2", the IRR calculation uses the bank interest rate of 16.75% and 21%. Getting results on the lowestlivestock business scale is 26% while the middle and highest business scale is 27%, this shows that the laying duck business on the people's farms in Air Batu District can return loan capitalup to a maximum interest rate of 27%, it can be said an IRR that is greater than the interest rate used indicates that the laying duck business in Air Batu District is feasible to run.

Payback Period (PP)

Based on "Table 2", it can be seen that the payback period for laying ducks on a business scale of 150 - 340 ducks, 350 - 500 ducks and 500 - 800 ducks in Air Batu District is 4 months, 3 months. 2 months, respectively. which means it is the investment return period when business activities are running. The time of return on investment is judged by the time the cage reaches the age of 5 years. So it can be said that the payback period value in this livestock business is feasible to run because the payback period value is smaller than the project life.

4. CONCLUSION

The results of the study based on financial analysis showed that the average income per period per business scale was Rp. 32.792.167, - Rp. 112.390.667, - and Rp. 207.431.867. Financial analysis of laying duck business on smallholder farms, obtained R / C value> 1, the value of BEP production is smaller than the amount of egg production, BEP price is smallerthan the selling price of eggs per egg, the value of Net B / C and Gross B / C> 1, the NPV value> 0 or positive, the IRR value with an interest rate of 16.75%, respectively, is 26%, 27% and 27% greater than the interest rate and PP, respectively 4,3,2 months before the project age(5 years).

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