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RESEARCH ARTICLE

FINANCIAL ANALYSIS AND FARMING FEASIBILITY OF SALAK PONDOH IN TIGA JUHAR VILLAGE, STM HULU SUBDISTRICT, DELI SERDANG DISTRICT

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Abstract

The purpose of this research is to determine the Income and profits of Salak Pondoh farming and the feasibility in Tiga Juhar Village, STM Hulu District, and Deli Serdang Regency. This research conducted in Tiga Juhar Village, STM Hulu Subdistrict, which was deliberately chosen as the location of the study because it was the center of the production of Salak Pondoh in Deli Serdang. The number of respondents was 60 farmers who were taken randomly by a simple random sampling system. The research method used in this research is a survey method; the data collection was carried out in April 2018. The Sampling of this research was to answer the quantitatively by using financial analysis Net B / C NPV, IRR, PBP, and sensitivity analysis using a 9% discount factor. The Results showed that Salak Pondoh farming in Tiga Juhar Village, STM Hulu subdistrict was financially feasible and profitable to continue. This refers to the value of the Net B / C = 3.5, value of NPV = 116,953,200. The value of IRR = 20.6% and PBP = 4 years 8 months. Salak Pondoh farming is sensitive to decreasing production and decreasing production prices, but not sensitive to rising fertilizer prices.

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Introduction: -

Salak has become one of the mainstay commodities in Deli Serdang. Tiga Juhar is a village in Senembah Tanjung Muda Hulu (STM Hulu) sub-district, Deli Serdang district, which known as a Salak producer in North Sumatera (North Sumatera). Salak produced from the village, then known as Salak Ponti (Salak Pondoh Tiga Juhar). Salak Pondoh found in many fruit markets in Medan and surrounding areas.

According to information from the board Cooperative of Ponti Salak located in the village of Tiga Juhar, on harvest time, Salak delivered to Medan as many as ± 10 tons every day. Because of the enormous potential possessed by salak farming in this area, then Regent of Deli Serdang set and launched as a center of salak production farming. The declaration of this was on November 30, 2016, marked with the inscription by the Regent of Deli Serdang. Before running a business either salak farming or other horticultural commodities, farmers should have to pay attention to several aspects of the market which are marketing, technical and technological issues, management, human resources aspects, social aspects and also financial aspect.

Therefore, analyzing the economic feasibility of farming Salak Pondoh needs to be done to avoid the loss of farmers. Based on the above description of the background, the research problem formulated as follows: The

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revenue and profit farming of Salak Pondoh and the feasibility of farming in Tiga Juhar Village Salak Pondoh Juhar, STM Hulu subdistrict, Deli Serdang district.

There are several earlier studies regarding financial analysis, sensitivity analysis, and strategy development related to commodities as research objects. Some past research results related to this research are as follows: Handayani, Thomson, and Salmiah (2018) NPV of Salak farming with a term of ten years farming in the discount factor of 4.25 % to Rp. 761 221 931. That is a discount factor of 4.25 %; Salak Farming at the end of the ten-year term gain of Rp 761 221 931. Furthermore, to a factor of 5%, it will benefit next year is Rp 717 812 690. Based on the criteria of net B / C Salak Pondoh farming viable, because the value of the net B / C obtained at 9.39. The net value of B / C of 9.39, meaning every Rp. 1.00 expenses incurred will get an additional benefit of Rp. 9.39. Salak Farming has an IRR of 15.48%. The meaning of IRR is more significant than a specified discount factor of 4.5% so that Salak Farming feasible to be developed, and the value of IRR obtained at 15.48% indicates that Salak Farming possible to be developed and benefit.

Nooriman (2006) conducted a financial feasibility study Waringin kurung farming in Serang District in Banten Province. The results showed that the results of a financial analysis of farming worthy of being pursued. NPV, IRR and Net B / C value, respectively 43,818,375, 15.72%, and 1.7566.

Widarti and Rahayu (2016) have also been researching the feasibility analysis of farming at Kaliurang village, Srumbung, Magelang regency. Produce the NPV at a discount factor of 14% amount to 19.852.280, IRR = 24.89%, Net B / C = 1,79 and Payback Period for 4 years and 5 months.

The Research purposes were to determine the costs, benefits and to know the feasibility of Salak Pondoh farming in Tiga Juhar village, STM Hulu Subdistrict of Deli Serdang.

Research Methods: -

Sampling methods:

The total population of Salak farmers in Tiga Juhar are 280 people. The method of determining the sample size for this study is to establish specific criteria which are;

- a) Have a minimum land area of 0.2 hectares.
- b) The area has been farming for at least five years.

From 280 farmers found 112 farmers who meet the criteria. Furthermore, by using a random sampling of 112 farmers selected some of them to be sampled by the Slovin formula:

$n = N / (1 + Ne^2)$ with an error rate of 10% obtained:

$n = 112 / (1 + 112 \cdot 0,01)$

$n = 53.3$ rounded up to 60 samples

Assumption:

The assumptions used in this study are;

- a. Input and output prices are the prices at the time of the survey.
- b. The production of Salak sold out.
- c. The interest rate used is the KUR BRI 9% (BRI Bank).

Data collection technique:

This study was conducted using a survey method, and the research took a sample of a population. Data collected in the study consisted of primary data and secondary data. Primary data were collected by interviewing directly to Salak farmers by using a list of questions (questionnaire), which prepared beforehand. Secondary data obtained from the published literature and other agencies involved in this study (Zulfikardy, 2014).

Data analysis methods:

Data analysis methods used in the study are a quantitative analysis that is used to answer all the goals in this study. The data processing method and computerized tabulation method (Microsoft Excel).

Data Analysis Techniques:

A data analysis technique used to test the feasibility of salak farming of the financial aspects of using a measuring instrument or investment following criteria, namely NPV, Net B / C, IRR, and PP (Kadariah, 2001).

Net Present Value (NPV):

The difference between the current value and the present value expenditure reception at a certain discount rate. The formula used is:

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

- bt = Benefit in t
 Ct = Cost in year t
 n = Economic life of the plant (10 years)
 i = Discount rate of 9%
 t = Year 1, 2, onward.

Here are financial feasibility assessment criteria based on NPV (Net Present Value).

- 1) NPV > 0, meaning that the project is financially feasible because the benefits outweigh the costs incurred.
 - 2) NPV < 0, meaning that the project is not financially feasible for smaller benefits than costs. (Sinaga, 2008).
- b). Net Benefit-Cost Ratio (Net B / C) Is a comparison of the present value of net positive benefits to the present value of net benefits, which negatively expressed by the following formula:

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

- bt = Benefits in year t
 Ct = Costs incurred in year t
 n = Economic life of the plant
 i = Discount rate 9 (percent)
 t = Year to 1, 2 ff.

The project is said to be feasible if the values obtained Net B / C is higher than 1 (one) and not worth it if the earned amount of Net B / C is smaller than 1 (one). If Net B / C is equal to one, the decision submitted to the management (Sinaga, 2008).

- c). Internal Rate of Return (IRR).

The discount rate (discount rate) at the time of the NPV equal to zero expressed as a percentage, which is represented by the formula;

$$IRR = i1 + \frac{NPV1}{NPV1 - NPV2} (i2 - i1)$$

- NPV1 = Present value is positive
 NPV2 = Present value is negative
 i1 = compound factor, if NPV > 0
 i2 = Compound factor, if NPV < 0

If a project IRR greater than or equal to the prevailing interest rate, the project is feasible, but if the IRR of a smaller project than the prevailing interest rate, the project is not feasible. (Sinaga, 2008).

- d). Payback Period (PBP)

Payback Period (PP) an assessment of the investment project based on the settlement of investment costs based on the net benefits of a project. Mathematically Payback Period can be formulated as follows:

$$PBP = T_{p-1} + \frac{\sum_{i=1}^n I_i - \sum_{i=1}^n B_{iCP-1}}{B_p}$$

- PBP = Pay Back Period
 Tp-1 = The year before there PBP
 ii = The investment amount has been discounted
 Bicp-1 = Number of benefits discounted before PBP
 bp = Number of interests to the PBP.

The assessment criteria Payback Period:

- 1) If the payback period is shorter than the economic life of salak farming crops, then declared eligible.
- 2) If the payback period is more extended than the economic growth of salak plant, then farming declared unfit. (Sinaga, 2008).

Sensitivity Analysis:

The sensitivity analysis is an activity to analyze back in an attempt to see if that would happen to the business if the business did not go as plan. In agriculture, some things are sensitive to changes. Changes that occur include increased investment, changes in the cost of production, and commodity price changes.

Result and Discussion:-

Receipts and Revenue Farming:

Reception Salak Pondoh farming calculated by multiplying the number of productions at a price per kilogram. While income calculated by subtracting the number of admissions for a total cost during the production process. Salak Pondoh begins the production at the end of the third year so that revenue and income are calculated starting from the 3rd year of farming business. Showed in the table 1 below,

Table 1:- Revenues and Earnings .

Year	Production (kg)	Price (Rp /kg)	Reception	Cost	Income
0	0	0	0	43.957.500	-43.957.500
1	0	0	0	1.266.493	-1.266.493
2	0	0	0	1.548.493	-1.548.493
3	470	5000	2.350.000	5.162.653	-2.812.653
4	2.820	6500	18.330.000	6.878.193	11.451.807
5	8.460	7000	59.220.000	7.959.193	51.260.807
6	8.460	7000	59.220.000	8.636.106	50.583.894
7	8.460	7000	59.220.000	9.372.974	49.847.026
8	8.460	7000	59.220.000	10.175.291	49.044.709
9	8.460	7000	59.220.000	11.049.066	48.170.934
10	8.460	7000	59.220.000	12.000.874	47.219.126
Total	54.050		376.000.000	118.006.835	257.993.165

Questionnaire Data

In Table 1. Given the acceptance number of Salak Pondoh farming in the area of 0.47 ha area for ten years amounting to Rp. 376.000.000. The total cost of Rp.118.006.835 Thus obtained revenue of Rp.257.993.165.

Feasibility of Salak Pondoh farming:

Salak Pondoh is an annual plant that has industrial age and a long harvest period. By knowing the revenue and income from farming is certainly not sufficient to determine whether the business is worth it or not to be pursued. Therefore, revenue analysis is required to assess the feasibility of farming Salak Pondoh. Here some of the approaches used in the study of the financial viability of farming Salak Pondoh are; NPV, Net B / C, IRR, and Payback Period.

Net Present Value (NPV)

To determine the NPV of Salak Pondoh farming expand the area of 0.47 ha showed in Table 2 below.

Table. 2:- Net Present Value (NPV) of Salak Pondoh.

Year	Total cost	Benefit	Benefit-Cost	Df 9%	Df 10%	NPV 9%	NVP 10%
0	43.957.500	0	-43.957.500	1		-43.957.500	-43.957.500
1	1.266.493	0	-1.266.493	0.917	0.909	-1.161.374	-1.151.242
2	1.548.493	0	-1.548.493	0.842	0.826	-1.303.831	-1.279.055
3	5.162.653	2.350.000	-2.812.653	0.772	0.751	-2.171.368	-2.112.302
4	6.878.193	18.330.000	11.451.807	0.708	0.683	8.107.879	7.821.584
5	7.959.193	59.220.000	51.260.807	0.650	0.621	33.319.525	31.832.961
6	8.636.106	59.220.000	50.583.894	0.596	0.565	30.148.001	28.579.900

7	9.372.974	59.220.000	49.847.026	0.547	0.513	27.266.323	25.571.524
8	10.175.291	59.220.000	49.044.709	0.502	0.467	24.620.444	22.903.879
9	11.049.066	59.220.000	48.170.934	0.460	0.424	22.158.630	20.424.476
10	12.000.874	59.220.000	47.219.126	0.422	0.386	19.926.471	18.226.583
Total	118.006.835	376.000.000	260.343.165			116.953.200	106.860.808

Questionnaire Data

NPV calculation with an interest rate of 9% NPV Rp.116 953, 200, shows that farming Salak Pondoh advantageous because of NPV value greater than 0 (zero).

Net Benefit-Cost Ratio.

Net B / C obtained by finding the ratio of the present value of which is positive with several present values is negative. Shown in the table 3 below,

Table 3:- Net Benefit Cost Ratio (Net B/C) of Salak Pondoh.

Commentary	Score
NPV (+)	165 547 273
NPV (-)	48,594,073
Net B / C	3.5
Status	Worthy

Questionnaire Data

Based on Table 3, Net B / C made at 3.5, which indicates that farming Salak Pondoh indeed very worthy of being pursued.

Internal Rate of Return (IRR):

IRR describes the rate of return results that linked to bank interest rates, showed in the table 4 below,

Table 4:- Internal Rate of Return (IRR) of Salak Pondoh.

Commentary	Score
NPV 1	116 953 200
NPV 2	106 860 808
i1	9%
i2	10%
IRR	20.6%
Status	Worthy

Questionnaire Data

From Table 4, it showed that the IRR of farming Salak Pondoh amounted to 20.6%. With the value of IRR is that the farm Salak Pondoh declared eligible for higher than the benchmark interest rate stipulated 9%.

Payback Period (PBP)

The Payback Period is used to determine how long it takes or how long the project could recoup the investment. Shown in the table 5 below,

Table 5:- Payback Period (PBP).

Year	Investment	Benefit	Df 9%	PV I	PV B
0	43.957.500	0	1	43.957.500	0
1	-	0	0.917		0
2	-	0	0.842		0
3	-	2.350.000	0.772		1.764.850
4	-	18.330.000	0.708		12.519.390
5	-	59.220.000	0.650		36.775.620
6	-	59.220.000	0.596		33.459.300
7	-	59.220.000	0.547		30.379.860
8	-	59.220.000	0.502		27.655.740
9	-	59.220.000	0.460		25.109.280

10	-	59.220.000	0.422		22.858.920
Total	43.957.500	376.000.000		43.957.500	190.522.960

Questionnaire Data

Table 5. The payback period calculated as follows;

$$\text{PBP} = 4 + (43.957.500 - 14.791.840) / 36.775.620$$

$$\text{PBP} = 4 + 0.7$$

$$\text{PBP} = 4.7$$

$$\text{PBP} = 4 \text{ Years } 8 \text{ Months (viable)}$$

Analysis sensitivity:

The sensitivity analysis aims to see what happens with the results analysis, investment in case of changes in the calculation of costs and revenues. In the sensitivity analysis, there is a miraculous aspect analyzed with the loss, falling prices, and rising costs. Shown in the table 6 below,

Table 6:- NPV of 40% fertilizer increase.

Year	Total cost	Benefit	Benefit-Cost	Df 9%	Df 10%	NPV 9%	NVP 10%
0	43.957.500	0	-43.957.500	1	1	-43.957.500	-43.957.500
1	1.405.613	0	-1.405.613	0.917	0.909	-1.288.947	-1.277.702
2	2.035.413	0	-2.035.413	0.842	0.826	-1.713.818	-1.681.251
3	8.926.273	2.303.000	-5.636.273	0.772	0.751	-4.351.203	-4.232.841
4	10.641.813	13.818.000	9.098.187	0.708	0.683	6.441.516	6.214.062
5	11.722.813	41.454.000	47.497.187	0.650	0.621	30.873.172	29.495.753
6	12.644.362	41.454.000	46.575.638	0.596	0.565	27.759.080	26.315.235
7	13.641.766	41.454.000	45.578.234	0.547	0.513	24.931.294	23.381.634
8	14.721.554	41.454.000	44.498.446	0.502	0.467	22.338.220	20.780.774
9	15.890.835	41.454.000	43.329.165	0.460	0.424	19.931.416	18.371.566
10	17.157.360	41.454.000	42.062.640	0.422	0.386	17.750.434	16.236.179
Total	152.745.302	264.845.000	225.604.698			98.713.665	89.645.909

Questionnaire Data

Table 6 showed the condition of the rising price of fertilizer by 40%; 9 % NPV value is Rp. 99,713,665, Value Net B / C, IRR, and PBP showed that the result of the calculation is as follows:

$$1. \text{Net B / C} = 150\,025\,132 / 51,311,468$$

$$\text{Net B / C} = 2.9$$

$$2. \text{IRR} = 9 + 98.713.665 / (98.713.665 - 89.645.909) (10 - 9)$$

$$\text{IRR} = 9 + (10.9 \times 1)$$

$$\text{IRR} = 9 + 10.9$$

$$\text{IRR} = 19.9\%$$

$$3. \text{PBP} = 4 + (43.957.500 - 16.515.800) / 38.439.000$$

$$\text{PBP} = 4 + 0.7$$

$$\text{PBP} = 4.7$$

$$\text{PBP} = 4 \text{ Years, } 8 \text{ Months}$$

Based on the calculations, it showed that the farming Salak Pondoh still viable on the situation of fertilizer price increases by 40%. Despite a decline, but not very significant when compared to normal conditions. In other words, Salak farming is not sensitive to the effect of fertilizer price increase of 40%. Shown in the table 7 below,

Table 7:- NPV of 30% production decrease.

Year	Total cost	Benefit	Benefit-Cost	Df 9%	Df 10%	NPV 9%	NVP 10%
0	43.957.500	0	-43.957.500	1	1	-43.957.500	-43.957.500
1	1.266.493	0	-1.266.493	0.917	0.909	-1.161.374	-1.151.242
2	1.548.493	0	-1.548.493	0.842	0.826	-1.303.831	-1.279.055
3	5.162.653	2.350.000	-2.859.653	0.772	0.751	-2.207.652	-2.147.599
4	6.878.193	18.330.000	6.939.807	0.708	0.683	4.913.383	4.739.888
5	7.959.193	59.220.000	33.494.807	0.650	0.621	21.771.625	20.800.275
6	8.636.106	59.220.000	32.817.895	0.596	0.565	19.559.465	18.542.110
7	9.372.974	59.220.000	32.081.026	0.547	0.513	17.548.321	16.457.566

8	10.175.291	59.220.000	31.278.709	0.502	0.467	15.701.912	14.607.157
9	11.049.066	59.220.000	30.404.934	0.460	0.424	13.986.270	12.891.692
10	12.000.874	59.220.000	29.453.126	0.422	0.386	12.429.219	11.368.907
Total	118.006.835	376.000.000	146.838.165			57.279.838	50.872.199

Questionnaire Data

From Table 7. Known about the conditions of production fell by 30%, 9% NPV value is Rp. 57,279,838, Value Net B / C, IRR, and PBP can be seen from the calculation as follows:

- Net B / C = 105 910 195 / 48,630,357
Net B / C = 2.2
- IRR=9+57.279.838/ (57.279.838-50.872.199) (10-9)
IRR = 9 + (8.9 x 1)
IRR = 9 + 8.9
IRR = 17.9%
- PBP=5+(43.957.500-38.506.160)/24.706.584
PBP = 5 + 0.3
PBP = 5.3
PBP = 5 Years 4 Months

In terms of feasibility indicates that farming is still viable in the conditions of production fell by 30%. The occurrence of a significant reduction, when compared to normal conditions, shows that farming Salak Pondoh sensitive to the decline in output of 30%. Showed in the table 8 below,

Table 8:- NPV of 30% sales price down.

Year	Total cost	Benefit	Benefit-Cost	Df 9%	Df 10%	NPV 9%	NVP 10%
0	43.957.500	0	-43.957.500	1	1	-43.957.500	-43.957.500
1	1.266.493	0	-1.266.493	0.917	0.909	-1.161.374	-1.151.242
2	1.548.493	0	-1.548.493	0.842	0.826	-1.303.831	-1.279.055
3	5.162.653	1.645.000	-3.517.653	0.772	0.751	-2.715.628	-2.641.757
4	6.878.193	12.831.000	5.952.807	0.708	0.683	4.214.587	4.065.767
5	7.959.193	41.454.000	33.494.807	0.650	0.621	21.771.625	20.800.275
6	8.636.106	41.454.000	32.817.895	0.596	0.565	19.559.465	18.542.110
7	9.372.974	41.454.000	32.081.027	0.547	0.513	17.548.321	16.457.566
8	10.175.291	41.454.000	31.278.709	0.502	0.467	15.701.912	14.607.157
9	11.049.066	41.454.000	30.404.934	0.460	0.424	13.986.270	12.891.692
10	12.000.874	41.454.000	29.453.126	0.422	0.386	12.429.219	11.368.907
Total	118.006.835	263.200.000	145.193.165			56.073.066	49.703.920

Questionnaire Data

From Table 8. The note of the condition of selling price fell by 30%, 9% NPV value is Rp. 56,073,006, Value Net B / C, IRR, and PBP can be seen in the results of the calculation as follows:

- Net B / C = 105 211 399 / 49,138,333
Net B / C = 2, 1
- IRR=9+56.073.066/ (56.073.066-49.703.920) (10-9)
IRR = 9 + (8.8 x 1)
IRR = 9 + 8.8
IRR = 17.8%
- PBP=5+(43.957.500-37.249.388)/24.706.584
PBP = 5 + 0.2
PBP = 5.2
PBP = 5 Years, 2 Months

In terms of feasibility indicates that farming is still viable on the condition, the price fell 30%. The occurrence of a significant reduction, when compared to normal conditions, Salak Pondoh farming sensitive to the decline in production of a 30% price.

Conclusions:-

From the results of research and discussion, we got some findings and suggestions in farming of Salak Pondoh namely:

1. Salak Pondoh Farming in the total area of 0.47 ha cultivated submarine ten years will provide income to farmers amounting to Rp. 260 343 163.
2. Salak Pondoh farming in the village of Tiga Juhar District of Deli Serdang Hulu STM is viable in terms of the following criteria:
3. NPV with 9% interest rate values obtained Rp.118.677.160 indicates that Salak Pondoh farming sustainable.
4. Net B / C ratio of 3.5 indicates that the farming Salak Pondoh eligible to run because of greater than 1 (one).
5. IRR obtained by 20.7% is higher than the benchmark bank interest rate of 9% so that farming Salak Pondoh eligible to run.
6. PBP obtained by four years and eight months shows that farming is rated feasible for the capital payback period is shorter than the economic life of the plant that is ten years old.
7. Salak Pondoh Farming sensitive to the decline in production and a decrease in selling price but not sensitive to the rise in fertilizer prices.

Suggestion:-

The researchers suggest several things:

1. The farmers should start getting used to making records and proceeds from the use of inputs so that farmers know the income derived from farming operations.
2. The role of agricultural extension is necessary and enhanced monitor and give guidance to the farmers so that Salak Pondoh farming grew and local government programs make the region as a production center of Salak Pondoh could be thriving.

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