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Financial Feasibility of Layers Farming Business

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Abstract

Egg prices exhibit high volatility over short time intervals, which is not surprising given their affordability and popularity as a primary protein source. However, this fluctuation in prices poses significant challenges for businesses, particularly in managing cash flow. Hence, it becomes crucial to evaluate the feasibility and sensitivity of the Layers farming business at PT JIF. The objective of this research is to provide a comprehensive analysis of the characteristics, financial aspects, cost flow, and overall feasibility of PT JIF's Layers farming operations. To achieve this, the study employs several data analysis methods, including the Net Present Value (NPV), Internal Rate of Return (IRR), Net B/C ratio, and Payback Period techniques. These methods are used to assess the economic viability of PT JIF's Layers farming business. The results demonstrate that PT JIF's layer farming business is indeed feasible, meeting the established investment feasibility criteria. Specifically, the NPV is greater than zero, the IRR exceeds the discount rate, the Net B/C ratio is higher than one, and the payback period is within three years, which is shorter than the commercial life of PT JIF's Layers farming business. For aspiring farmers venturing into the layer farming industry, it is advised to exercise patience, resilience, and consistency, considering the return-on-investment period of approximately three years. Moreover, future researchers are encouraged to conduct sensitivity analyses to explore the potential effects of uncertainties on PT JIF's Layers farming business in the long term. By incorporating such sensitivity analyses, a more comprehensive understanding of the business's potential performance under varying circumstances can be obtained. This, in turn, would aid in making informed decisions and implementing effective strategies for sustained success in the Layers farming sector.

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INTRODUCTION

Eggs are the primary protein source widely consumed by Indonesians (Alhuur et al., 2020; Wulandari & Arief, 2022). According to available data, broiler eggs account for 65% of the national egg demand, with the remaining portion sourced from free-range chicken, duck, and quail eggs (Badan Pusat Statistik, 2022b, 2022a, 2022c). In 2016, the production of broiler eggs reached 1.48 million tons, while the national consumption stood at 1.40 million tons, resulting in a surplus of 86 thousand tons (Badan Pusat Statistik, 2017). Projections for this year indicate an estimated total egg production of 1.58 million tons, with consumption expected to be around 1.52 million tons, resulting in a projected surplus of 55 thousand tons. Over the period from 1987 to 2017, broiler egg consumption witnessed an average annual increase of 3.57 percent (Badan Pusat Statistik, 2022d). Notably, broiler egg consumption rose from 2.55 kg per capita per year in 1987 to 6.53 kg per capita per year.

Between 2013 and 2017, the Layers population in Indonesia witnessed an average annual increase of 3.28 percent, and this growth is projected to rise further by an average of 5.54 percent over the next five years (Badan Pusat Statistik, 2019). Projections for the next five years indicate that egg production from Layerss will experience an average annual increase of 4.87 percent, while consumption is expected to rise by 4.18 percent per year (Badan Pusat Statistik, 2022b). Cargill Indonesia estimates that national egg demand will reach 2.5 million tons in 2025, with a projected annual per capita consumption rate of 9 kilograms. This represents a 4.7% increase compared to the consumption level of 1.78 million tons in 2017. Despite the increasing production, Indonesia continues to import eggs from other countries, possibly due to challenges in stabilizing prices.

Considering both domestic and international market conditions, as well as supply and demand dynamics, the Layers business in Indonesia holds a positive outlook. However, it is noteworthy that Indonesia's Layers production has not yet reached its optimal capacity (Abidin, 2003; Rahmawati et al., 2016). To fully tap into its potential, the development of breeding farms requires meticulous management to align with modern farming practices. Presently, regional consumption needs for purebred poultry remain below the established standard of 6.5 kg per capita per year, standing at 4.04 kg per capita per year (Kurniawan et al., 2011). This indicates an opportunity for further growth and improvement in meeting the market demands for Layers products.

PT. JIF is a company located in Jatinom, Kanigoro, Blitar, Indonesia, specializing in the distribution and storage of egg products sourced from Layerss. The company currently manages Layerss during their laying stage, supplies Pellets, offers necessary facilities and infrastructure for Layerss, and also sells feed specifically formulated for Layerss. Capitalizing on the positive business prospects in the industry, PT. JIF has ambitious plans to expand its operations. The expansion strategy involves establishing 2 layer units and 6 Layers farms in key locations such as Kediri, Blitar, Nganjuk,

Lamongan, Bojonegoro, and Tuban. Additionally, PT. JIF plans to construct 2 Pellet farm units with a capacity of 45,000 hens each, along with 2 feedmill units, each with a capacity of 80 tons per day. It is important to highlight that undertaking a comprehensive business feasibility study will play a pivotal role in determining the viability and success of the proposed business development plan.

The study of business feasibility entails assessing the viability and potential operational success of a business venture, thus determining its value. Such assessments enable organizations to comprehensively evaluate the business's current condition and the potential advantages of its operations (Colpo et al., 2022). Moreover, the study of business feasibility delves into the feasibility and viability of implementing and developing the proposed business concept. Notably, Layers farming represents one of the focal points of business feasibility studies. Prior research on the business feasibility of Layers farms, using indicators such as NPV, IRR, and Payback Period, have consistently affirmed their feasibility and economic profitability (Ceunfin et al., 2020; Chopra et al., 2023; Hadidi & Omer, 2017; Nurjannah et al., 2022; Waleleng et al., 2022).

This research contributes novelty to the study of business feasibility by conducting an in-depth analysis of business characteristics and assessing financial aspects and cost flows specifically within Layers farms. By incorporating additional business feasibility criteria, this study endeavors to provide a more comprehensive and objective evaluation of a business's financial feasibility, which is commonly limited to NPV, IRR, and Payback Period analyses. The specific objectives of this study are threefold: 1) to describe the characteristics of Layers farming business at PT. JIF; 2) to delineate the financial aspects and cost flow of Layers farming business at PT. JIF; and 3) to conduct a thorough feasibility analysis of the Layers farming business at PT. JIF.

RESEARCH METHOD

This study is focused on PT. JIF, situated in Jatinom, Kanigoro, Blitar, Indonesia, which operates a Layers farming business and is involved in egg distribution as well. A significant issue faced by PT. JIF is the challenge of consistently meeting the demand for eggs, leading to occasional shortages or oversupply. Given the diverse nature of PT. JIF's business activities, it presents an intriguing opportunity to examine its business, financial, and financial feasibility aspects. For this study, the researchers utilized secondary data from the previous year's business cashflow of PT. JIF, provided by key informants who possess this data. Descriptive analysis was conducted to address objectives 1 and 2, focusing on outlining the characteristics of the Layers farming business at PT. JIF. Objective 3 involves business feasibility analysis employing the Net Present Value (NPV), Internal Rate of Return (IRR), Net B/C ratio, and Payback Period (PP) methods.

The Net Present Value (NPV) is a financial feasibility calculation that projects the prospective profit a company can attain from its ongoing business operations, taking into account the concept of time value of money (Goyal et al., 2022; Juwitaningtyas et al., 2015; Nurahmi et al., 2021).

$$NPV = \sum_{t=0}^{N} \frac{Bt - Ct}{(1+t)^{i}}$$

Description:
Bt = gross benefits of the project in the t-th month
Ct = gross project cost in the t-th month
i = interest rate
n = economic life of the project (12 months)
t = t-th month (t= 1, 2, 3, ... ,12)

The feasibility criteria based on Net Present Value (NPV) are as follows for the Layers farming business operated by PT. JIF:
a. NPV > 0, indicating that the business is profitable and feasible to continue operating.
b. NPV < 0, indicating that the business is not profitable and not feasible to sustain.
c. NPV = 0, indicating that the business is in a break-even position.

The Internal Rate of Return (IRR) represents the rate of return on the net investment in a given project. This metric serves as an indicator of the maximum interest rate that the project can accommodate to compensate for the utilized resources (Juwitaningtyas et al., 2015; Nurahmi et al., 2021; Singh et al., 2021). The calculation of the IRR value is expressed as follows:

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

Description:
NPV1 = Positive Net Present Value
NPV2 = Negative Net Present Value
i1 = Discount rate that generates NPV1
i2 = Discount rate that generates NPV2

The assessment criteria for the Internal Rate of Return (IRR) are as follows for the Layers farming business operated by PT. JIF:
a. If the IRR is greater than the prevailing interest rate, the business is considered feasible.
b. If the IRR is smaller than the prevailing interest rate, the business is deemed not feasible.
c. If the IRR is equal to the prevailing interest rate, the business is in a break-even position.

Net B/C (Benefit-Cost) is a financial feasibility calculation that quantifies the level of benefits or returns derived from a business in relation to the investments or costs incurred (Juwitaningtyas et al., 2015; Nurahmi et al., 2021). The Net B/C calculation is expressed as follows:

$$Net\frac{B}{C}Ratio = \frac{\sum_{t=0}^{n}\frac{Bt - Ct}{(1+i)^i}}{\sum_{t=0}^{n}\frac{Bt - Ct}{(1+i)^i}}\ untuk\frac{(Bt - Ct) > 0}{(Bt - Ct) < 0}$$

Description:
Bt = Benefit or net income in the t-th month (t = 1, 2, 3, ... ,12)

Ct = Cost or expense in the t-th month
i = Interest rate
t = month (economic time)

The assessment criteria employed in this analysis are as follows for the Layers farming business operated by PT JIF:
a. If the Net B/C > 1, it indicates that the business is considered feasible.
b. If the Net B/C < 1, it indicates that the business is not feasible.
c. If the Net B/C = 1, it indicates that the business is in a break-even position.

As per Bakhtiar et al. (2018); Nurahmi et al. (2021), the payback period represents a financial feasibility calculation that elucidates the rate of return on the investment made. The payback period calculation is as follows:

$$Payback\ Period = \frac{I}{Ab}$$

Description:
I = the amount of investment invested
Ab = net benefits that can be obtained every month

RESULT AND DISCUSSION

Characteristics of PT. JIF's Layers Farming Business

PT. JIF is a poultry farming company that focuses on both Layerss and broilers. It offers a diverse range of poultry-related products and partnerships, encompassing animal feed, high-quality seeds, vaccines, medications, livestock sector support tools, and various collaboration opportunities.

PT. JIF has planned to establish two layer units, with each unit comprising three farms and one feedmill unit. Additionally, PT JIF intends to establish a Pelleting Unit to serve as a Pellet supplier, consisting of two farms. Each farm will supply one layer farm unit. Each Pelleting farm will encompass three pelleting cages, with a capacity of approximately 45,000 heads each (Table 2). Consequently, the combined capacity of layer unit 1 and layer unit 2 will amount to 1,008,000 (Table 1).

1. Layer Unit

Table 1. Total of Layer Unit in 2021

Business Capacity	*Layer* Unit 1			*Layer* Unit 2		
	Farm 1	Farm 2	Farm 3	Farm 1	Farm 2	Farm 3
Number of cages (unit)	5	6	6	6	6	6
Area per unit (m2)	840	840	840	840	840	840
Land width per unit (m)	150	150	150	150	150	150
Land length per unit (m)	107	121	121	121	121	121
Population per cage (headcount)	28,800	28,800	28,800	28,800	28,800	28,800
Total Population (headcount)	144.,00	172,800	172,800	172,800	172,800	172,800

Total (headcount)	**1,008,000**

Source: Primary Data Processed, 2023

Unit 1 had a total population of 489,600, while unit 2 housed 518,400, resulting in a combined planned population of 1,008,000 layers (Table 1).

2. Pelleting Unit

Table 2. Total of Pelleting Unit in 2021

Business Capacity	**Farm 1**	**Farm 2**
Number of cages (unit)	3	3
Area per unit (m2)	1.260	1.260
Land width per unit (m)	150	150
Land length per unit (m)	102	102
Population per cage (headcount)	45,000	45,000
Total Population (headcount)	135,000	135,000

Source: Primary Data Processed, 2023

The pelletting unit as a supply of pellets consists of 2 farms in Blitar. Each farm supplies 1 unit of the layers farm. Each pelleting farm consists of 3 pelleting cages with a capacity of 45,000 headcount each. So the planned pelleting population is 270,000 headcount (Table 2).

3. Feedmill Unit

The feedmill is used to support the production of the layer unit and farm starter. The capacity of each feedmill is 80 tons per day. Each feedmill unit will supply the feed needs of each layer unit (3 farms) and 1 starter farm.

Table 3. Inflow in 2021

Description	**Details Per Headcount**	**Layer Unit 1**	**Layer Unit 2**
Capacity (Headcount)	1	489,600	518,400
Total of Farm		3	3
Total of cage		17	18
Income			
a. Egg (Whole)	472,933	231,547,922,000	245,168,388,000
b. Egg (Cracked, White, Dirty)	1,413	691,906,540	732,606,925
c. Layers (Culling)	28,844	14,121,861,051	14,952,558,760
Total Revenue	503,190	246,361,689,592	260,853,553,685

Source: Primary Data Processed, 2023

1. Sales Revenue of Eggs (Whole) and Eggs (Cracked, White, Dirty)

PT. JIF generates a portion of its farm income through the sale of both whole and deformed eggs. The primary product of the farm consists of eggs produced by laying hens aged 14-88 weeks during a 75-week period. The per-head production value for whole eggs during this period was IDR 472,933, while the production value for dirty, white eggs was IDR 1,413 (Table 3).

2. Sales Revenue of Culling Layers

At the end of the period, the source of revenue is obtained from the culling layers. At PT. JIF, the poultry age is only 52 weeks. Culling layers is in high demand

as a source of meat, and the price of culling layers is IDR 28,844 each. Given that the consumption of culling layers is quite high on any given day, the sales value is also comparable. The total sales of layer units 1 and 2 generated revenue of IDR 507,215,243,277 per production period (Table 3).

Financial Aspects and Outflows of PT. JIF's Layer Farming Business

Outflows represent the total costs accrued in establishing and operating a business from its inception until its conclusion. The outflows incurred by PT. JIF are categorized into two groups: investment costs and operational costs within the farming business.

1. Investment costs

Investment costs encompass expenses accrued during the initial phase of business establishment or pioneering, extending to reinvestment, particularly for replacing layers approaching or reaching their economic age limit. At PT. JIF, investments are allocated towards constructing layer unit cages, feedmill units, and pelleting units, with the aim of generating profits over the next 20 years.

a. Layer Unit Cages

Cages represent one of the most valuable and pivotal investment components in this farming business. To enhance egg production, PT. JIF plans to construct two units of cages, each consisting of three to six individual cages. Across various locations such as Kediri, Blitar, Nganjuk, Lamongan, Bojonegoro, and Tuban, a total of 35 cages will be established. The overall capacity of layers is 1,008,000. Here are the specific details of the layer capacity per cage.

Table 4. Outflow in 2021

Cage	Layer Unit 1			Layer Unit 2		
	Farm 1	**Farm 2**	**Farm 3**	**Farm 4**	**Farm 5**	**Farm 6**
Number of cages	5	6	6	6	6	6
Population per cage	28,800	28,800	28,800	28,800	28,800	28,800
Total population	144,000	172,800	172,800	172,800	172,800	172,800
Area per unit	840	840	840	840	840	840
Land width	150	150	150	150	150	150
Ground length	107	121	121	121	121	121
Location	Kediri	Blitar	Nganjuk	Lamongan	Bojonegoro	Tuban
Investment Cost	86,157,396,000			89,996,052,000		
Total Investment	**176,153,448,000**					

Source: Primary Data Processed, 2023

The expense incurred for constructing cages for layer units 1 and 2 amounts to IDR 176,153,448,000 (Table 4). Considering the robustness and durability of these cages, their estimated economic lifespan is 20 years. In the event that the business is not sustained, the cages can be sold at the conclusion of their economic life.

b. *Feedmill*

Feedmill serves as a crucial production support for PT JIF. Two Feedmill units, each with an 80-ton capacity per day, are required. Each Feedmill unit will cater to the feed requirements of a layer unit (comprising 3 farms) and a starter farm. The

investment cost for each Feedmill unit is IDR 14,110,000,000, thus resulting in a total cost of IDR 28,220,000,000 for the Feedmill facilities to be established by PT. JIF (Table 5). The cost breakdown is as follows:

Table 5. Feedmill Construction Cost in 2021

No	Description	Unit	Volume	Price	Farm 1	Farm 2
1	Feedmill capacity: 80 tons per/day	unit	1	2,500,000,000	2,500,000,000	2,500,000,000
2	Feed building 23x90x2	m2	4,140	2,000,000	8,280,000,000	8,280,000,000
3	PLN 320 KW		1	400,000,000	400,000,000	400,000,000
4	Generator 400 kva	unit	1	500,000,000	600,000,000	600,000,000
5	Vehicle	Unit	3	350,000,000	1,050,000,000	1,050,000,000
6	Weighbridge	Unit	1	250,000,000	250,000,000	250,000,000
7	Licensing / IMB		1	150,000,000	150,000,000	150,000,000
8	Public Facilities	m2	400	2,000,000	800,000,000	800,000,000
9	Electrical and panelization	unit	1	80,000,000	80,000,000	80,000,000
Total Feedmill					14,110,000,000	14,110,000,000
Total					**28.220.000.000**	

Source: Primary Data Processed, 2023

c. Pelleting Unit

The Pelleting unit, functioning as a pellet supplier, is comprised of two farms located in Blitar. Each Pelleting farm consists of three cages, with a capacity of 45,000 headcount each, resulting in the ability to supply 135,000 headcount to one layer farm unit. The total cost for constructing each Pelleting farm is IDR 20,205,158,000, thus making the overall cost of establishing the Pelleting unit by PT JIF to be IDR 40,410,316,000 (Table 6).

Table 6. Pelleting Unit Construction Cost in 2021

No	Description	Farm 1	Farm 2
1	Land Preparation	3,342,650,000	3,342,650,000
2	Licensing	219,908,000	219,908,000
3	Building	4,637,600,000	4,637,600,000
4	Battery and Accessories	12,005,000,000	12,005,000,000
Total Pelleting Unit		20,205,158,000	20,205,158,000
Total		**40,410,316,000**	

Source: Primary Data Processed, 2023

2. Operational Cost

Operational costs encompass all production-related expenses accrued over an 18-month period. In the company's cash flow calculation, variable costs are assumed to have a constant value, thereby becoming fixed. Examples of operational costs include expenditures on feed, medicines, vaccines, disinfectants, vitamins, electricity, pellets, cage maintenance, and labor salaries. The average amount of costs incurred per farm was IDR 53,805,493,566 (Table 7). Unit layer 1 necessitates operating costs of IDR 152,448,898,437, while unit layer 2 requires operating costs of IDR 161,416,480,698. Consequently, the combined total operating costs for unit layer 1 and unit layer 2 amount to IDR 313,416,072,988.

Table 7. Operational Cost in 2021

Description	Unit (Per Headcount Per Period)	Unit (Per Farm Per Period)
Capacity	1	172,800
expenditures / Cost		
- Feed	282,150	48,755,520,000
- Medicine	2,005	346,436,746
- Vaccine	1,970	340,424,128
- Disinfectants	69	11,890,758
- Vitamin	327	56,587,936
- Cage Maintenance	1,183	204,478,916
- Labor salary	14,954	2,583,976,204
- Electricity	7,651	1,322,058,661
- Others	1,066	184,120,217
Total Expenditures	311,374	53,805,493,566

Source: Primary Data Processed, 2023

The instrument utilized to assess business development over a specific period involves profit and loss analysis, comprising components such as revenue, operating costs, and depreciation (Shodiq, 2021). The net income is derived from the difference between total revenue and variable and operating costs. An additional factor affecting income is depreciation, which represents the annual depreciation of investment assets. For this study, the depreciation calculation employs the straight-line method, wherein the residual value is deducted from the purchase price and divided by the economic life of the asset. The residual value constitutes an income component that can be evaluated at the end of the period when an asset has reached its economic lifespan but retains economic value if sold. The assumed residual value for investments in cages, feedmill, and pelleting is 30%. The annual depreciation of PT. JIF's farming business for each year, from the first to the twentieth year, is as follows:

Table 8. Depreciation Cost in 2021

No	Depreciation Cost	Layer Unit 1	Layer Unit 2
1	Layer Unit Cage	2,824,526,632	2,950,370,571
2	Pelleting Unit	308,332,430	308,332,430

3	Feedmill Unit	462,572,833	462,572,833
	Total	3,595,431,895	3,721,275,835

Source: Primary Data Processed, 2023

The income tax, as indicated in the profit and loss analysis, plays a vital role in the cashflow calculation. The cumulative net profit of layer units 1 and 2 for their 20-year economic lifespan amounts to IDR 63,973,444,353, with an annual net income of PT JIF reaching IDR 131,838,510,572.

Table 9. Profit and Loss in 2021

Description	Layer Unit 1	Layer Unit 2
Profit/Loss	93,912,791,155	99,437,072,988
Profit Per Headcount	191,815	191,815
Profit Per Cage	5,524,281,833	5,524,281,833
Profit Per Farm	33,145,690,996	33,145,690,996
R/C Ratio Per Period	1,62	1,62

Source: Primary Data Processed, 2023

Feasibility Analysis of PT. JIF's Layers Farming Business

The financial viability of PT. JIF is ascertained through the examination of investment feasibility criteria. The capital for the farming business solely relies on own funds, thereby rendering the determination of Discount Factor (DF) based on the Bank Indonesia deposit rate (BI Rate) of 4.25 percent. The outcomes of the investment feasibility test are presented in Table 10.

Table 10. Feasibility Study in 2021

Feasibility Criteria	Assessment Result (Per Period)	Assessment Result (Per Period)
NPV	IDR 1,053,025,170,573	IDR 629,164,469,667
NET B/C	1,46	1,39
IRR	79%	53%
PP	3	3

Source: Primary Data Processed, 2023

1. Net Present Value (NPV)

The NPV analysis serves as a means to forecast the potential profit that a company can attain from its operations (Abdallah et al., 2018; Abdelhady, 2021). For PT. JIF's Layers farming business, the NPV value amounts to IDR 629,164,469,667 (Table 10), signifying its feasibility and financial profitability as the NPV is greater than zero (NPV > 0). This finding aligns with Nuralamika et al. (2021), who also reported that a matoa juice business was deemed feasible with NPV values greater than zero and positive. Similarly, Suryadi et al. (2022) concluded that a business is considered feasible and profitable if its NPV value is greater than zero and has a positive sign (Asciuto et al., 2019).

2. Internal Rate of Return (IRR)

The IRR analysis aims to showcase the rate of return on invested capital in a business venture (Bimantio & Wardoyo, 2020). Employing an interest rate of 12%, if the resulting IRR equals the interest rate, the business is deemed suboptimal in generating net profit. However, the Layers farming business operated by PT. JIF exhibits an IRR value of 53% (Table 10), indicating its feasibility and financial profitability as the IRR surpasses the applicable interest rate. This finding aligns with Diatin et al. (2021); Youssefi et al. (2022), who assert that a business is considered viable and profitable if its IRR value exceeds the opportunity cost of capital.

3. Net Benefit Cost Ratio (Net B/C)

The Net B/C ratio illustrates the level of influence (benefits or advantages) a business acquires from the investments (costs) it has incurred. Business ventures are considered feasible and profitable if the Net B/C > 1 (Kusmaryatun et al., 2020). At PT. JIF, the Net B/C value stands at 1.39 (Table 10), indicating that each IDR 1 of costs incurred is projected to generate benefits or advantages of 1.39. As the Net B/C value exceeds 1, the layer business operated by PT. JIF is deemed feasible and profitable. This finding aligns with Bakhtiar et al. (2018); Nurahmi et al. (2021), who similarly report that a business is declared profitable and feasible when the Net B/C ratio value is greater than 1.

4. Payback Period (PP)

The Payback Period analysis describes the rate of return on investment in a business (Aruta et al., 2022). When the payback period is shorter than the project duration, the business or project is deemed feasible to operate (Cardoso et al., 2020; Mahdiyar et al., 2021). For PT. JIF's Layers farming business, the Payback Period is 3 years (Table 10), indicating that the capital or investment deployed in PT. JIF will be recouped within 3 years of business operation. Given that the layers farming business run by PT. JIF has been in operation for approximately 20 years, the business is considered profitable and feasible, as the Payback Period is smaller than the age of the business.

Based on various investment feasibility analyses conducted, it can be inferred that the layers farming business operated by PT. JIF is deemed feasible and profitable. This determination stems from the fulfillment of specific investment feasibility criteria, namely NPV greater than zero, IRR greater than the discount rate, Net B/C greater than one, and payback period (PP) smaller than the economic life of the business. These criteria affirm that the investment undertaken at PT. JIF can be considered viable and robust. This observation aligns with Meyer et al. (2021), who found that the investment in biogas reactors at the household and community level in Eastern Cape, South Africa, was financially and economically feasible due to its NPV value exceeding zero and the investment return rate being shorter than the business life.

CONCLUSION

The feasibility of PT. JIF's layers farming business is substantiated through a comprehensive examination of both non-financial and financial aspects. The analysis of non-financial aspects, encompassing market aspects, technical considerations,

and development prospects, supports the viability of running the layers farming venture. Moreover, the financial evaluation of the business aligns with investment feasibility criteria, satisfying conditions such as NPV greater than zero, IRR greater than the discount rate, Net B/C greater than one, and payback period (PP) shorter than the economic life of the enterprise.

RECOMMENDATION

The financial aspect analysis of PT. JIF's layers farming indicates its feasibility for operation, suggesting significant potential for expanding the business beyond the currently fostered 6 areas. Subsequent research should consider incorporating sensitivity analysis to assess the impact of uncertainties in the future. For aspiring farmers, patience is vital, considering the extended investment return period of approximately 3 years. Consistency is also crucial in managing the layer farming business, especially in terms of providing adequate capital and optimal care to ensure favorable outcomes.

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REFERENCES

Abdallah, M., Shanableh, A., Shabib, A., & Adghim, M. (2018). Financial feasibility of waste to energy strategies in the United Arab Emirates. *Waste Management*, *82*, 207–219. https://doi.org/10.1016/j.wasman.2018.10.029

Abdelhady, S. (2021). Performance and cost evaluation of solar dish power plant: sensitivity analysis of levelized cost of electricity (LCOE) and net present value (NPV). *Renewable Energy*, *168*, 332–342. https://doi.org/10.1016/j.renene.2020.12.074

Abidin, Z. (2003). *Meningkatkan Produktivitas Ayam Ras Petelur*. Agromedia Pustaka.

Alhuur, K. R. G., Pratama, A., & Yuniarti, E. (2020). Kualitas dan Cara Penyimpanan Telur Yang Baik dalam Upaya Menjaga Asupan Gizi Optimal di Masa Pandemi COVID-19. *Farmers: Journal of Community Services*, *1*(1), 24–28. https://doi.org/10.24198/fjcs.v1i1.28647

Aruta, G., Ascione, F., Bianco, N., & Mauro, G. M. (2022). Optimization of a diabatic compressed air energy storage coupled with photovoltaics for buildings: CO2-eq emissions vs payback time. *Energy Reports*, *8*, 12686–12698. https://doi.org/https://doi.org/10.1016/j.egyr.2022.09.112

Asciuto, A., Schimmenti, E., Cottone, C., & Borsellino, V. (2019). A financial feasibility study of an aquaponic system in a Mediterranean urban context. *Urban Forestry & Urban Greening*, *38*, 397–402. https://doi.org/10.1016/j.ufug.2019.02.001

Badan Pusat Statistik. (2017). Produksi Telur Ayam Petelur menurut Provinsi (Ton), 2014-2016. In *Badan pusat statstik* (p. 2012). Badan Pusat Statistik. https://www.bps.go.id/indicator/24/491/1/produksi-telur-ayam-petelur-

menurut-provinsi.html

Badan Pusat Statistik. (2019). *Populasi Ayam Ras Petelur menurut Provinsi (Ekor), 2017-2019* (pp. 1–2). Badan Pusat Statistik. https://www.bps.go.id/indicator/24/477/2/populasi-ayam-ras-petelur-menurut-provinsi.html

Badan Pusat Statistik. (2022a). *Produksi Telur Ayam Buras menurut Provinsi (Ton), 2020-2022*. Badan Pusat Statistik. https://www.bps.go.id/indicator/24/490/1/produksi-telur-ayam-buras-menurut-provinsi.html

Badan Pusat Statistik. (2022b). *Produksi Telur Ayam Petelur menurut Provinsi (Ton), 2020-2022*. Badan Pusat Statistik. https://www.bps.go.id/indicator/24/491/1/produksi-telur-ayam-petelur-menurut-provinsi.html

Badan Pusat Statistik. (2022c). *Produksi Telur Itik/Itik Manila menurut Provinsi (Ton), 2020-2022*. Badan Pusat Statistik. https://www.bps.go.id/indicator/24/492/1/produksi-telur-itik-itik-manila-menurut-provinsi.html

Badan Pusat Statistik. (2022d). *Rata-rata Pengeluaran Perkapita Seminggu Menurut Kelompok Telur dan Susu Per Kabupaten/kota (Rupiah/Kapita/Minggu), 2022*. Badan Pusat Statistik. https://www.bps.go.id/indicator/5/2115/1/rata-rata-pengeluaran-perkapita-seminggu-menurut-kelompok-telur-dan-susu-per-kabupaten-kota.html

Bakhtiar, A., Ibrahim, J. T., & Relawati, R. (2018). Analisis Kelayakan Finansial Agroindustri Tahu "RDS" (Studi Kasus di Agroindustri Pengolahan Tahu "RDS" Kecamatan Singosari Kabupaten Malang). *Jurnal Agribest*, *02*(02), 174–178. https://doi.org/10.32528/agribest.v2i2.1628

Bimantio, M. P., & Wardoyo, A. D. H. (2020). Sensitivity and Feasibility Analysis of Citronella Oil Business. *SOCA: Jurnal Sosial, Ekonomi Pertanian*, *14*(2), 313. https://doi.org/10.24843/soca.2020.v14.i02.p11

Cardoso, R. N. C., Cavalcante Blanco, C. J., & Duarte, J. M. (2020). Technical and financial feasibility of rainwater harvesting systems in public buildings in Amazon, Brazil. *Journal of Cleaner Production*, *260*, 121054. https://doi.org/https://doi.org/10.1016/j.jclepro.2020.121054

Ceunfin, S., Prihatminingtyas, B., & Asnah. (2020). Kelayakan Usaha Pada Agribisnis Ayam Petelur Studi Kasus Pada CV. Gali Putra Junrejo Malang. *Berkala Ilmiah AGRIDEVINA*, *9*(1), 39–52. https://doi.org/10.33005/adv.v9i1.2207

Chopra, K., Tyagi, V. V, Popli, S., & Pandey, A. K. (2023). Technical & financial feasibility assessment of heat pipe evacuated tube collector for water heating using Monte Carlo technique for buildings. *Energy*, *267*, 126338. https://doi.org/https://doi.org/10.1016/j.energy.2022.126338

Colpo, I., Rabenschlag, D. R., De Lima, M. S., Martins, M. E. S., & Sellitto, M. A. (2022). Economic and Financial Feasibility of a Biorefinery for Conversion of Brewers' Spent Grain into a Special Flour. *Journal of Open Innovation: Technology, Market, and Complexity*, *8*(2), 79. https://doi.org/10.3390/joitmc8020079

Diatin, I., Shafruddin, D., Hude, N., Sholihah, M., & Mutsmir, I. (2021). Production

Performance and Financial Feasibility Analysis of Farming Catfish (Clarias Gariepinus) Utilizing Water Exchange System, Aquaponic, and Biofloc Technology. *Journal of the Saudi Society of Agricultural Sciences*, *20*(5), 344–351. https://doi.org/10.1016/j.jssas.2021.04.001

Goyal, N., Aggarwal, A., & Kumar, A. (2022). Financial feasibility of concentrated solar power with and without sensible heat storage in hot and dry Indian climate. *Journal of Energy Storage*, *52*, 105002. https://doi.org/https://doi.org/10.1016/j.est.2022.105002

Hadidi, L. A., & Omer, M. M. (2017). A financial feasibility model of gasification and anaerobic digestion waste-to-energy (WTE) plants in Saudi Arabia. *Waste Management*, *59*, 90–101. https://doi.org/10.1016/j.wasman.2016.09.030

Juwitaningtyas, T., Ushada, M., & Purwadi, D. (2015). Financial Feasibility Analysis for Moss Greening Material Panel in Yogyakarta. *Agriculture and Agricultural Science Procedia*, *3*, 159–162. https://doi.org/10.1016/j.aaspro.2015.01.031

Kurniawan, H., Guntoro, B., & Wihandoyo. (2011). Strategi Pengembangan Ayam Ras Petelur di Kota Samarinda Kalimantan Timur. *Buletin Peternakan*, *35*(1), 57–63. https://doi.org/10.21059/buletinpeternak.v35i1.591

Kusmaryatun, S., Pudjiastuti, A. Q., & Prihatminingtyas, B. (2020). The Feasibility of Mango Farming Agribusiness in Oro Oro Ombo Wetan Village, Pasuruan Regency. *SOCA: Jurnal Sosial, Ekonomi Pertanian*, *14*(3), 463. https://doi.org/10.24843/soca.2020.v14.i03.p08

Mahdiyar, A., Tabatabaee, S., Yahya, K., & Mohandes, S. R. (2021). A probabilistic financial feasibility study on green roof installation from the private and social perspectives. *Urban Forestry & Urban Greening*, *58*, 126893. https://doi.org/https://doi.org/10.1016/j.ufug.2020.126893

Meyer, E. L., Overen, O. K., Obileke, K. C., Botha, J. J., Anderson, J. J., Koatla, T. A. B., Thubela, T., Khamkham, T. I., & Ngqeleni, V. D. (2021). Financial and economic feasibility of bio-digesters for rural residential demand-side management and sustainable development. *Energy Reports*, *7*, 1728–1741. https://doi.org/10.1016/j.egyr.2021.03.013

Nurahmi, S., Relawati, R., & Baroh, I. (2021). Analisis Kelayakan Finansial dan Sensitivitas UKM Kue Kering "Loyang Ncim" di Kecamatan Pakis, Kabupaten Malang. *Jurnal Agribest*, *5*(2), 124–130. https://doi.org/10.32528/agribest.v5i2.5827

Nuralamika, F. D., Relawati, R., & Baroh, I. (2021). Analisis Kelayakan Finansial Usaha Sari Buah Matoa di Kecamatan Sukorejo Kabupaten Pasuruan. *Jurnal Pertanian CEMARA (Cendekiawan Madura)*, *18*(1), 1–8. https://doi.org/10.24929/fp.v18i1.1361

Nurjannah, Hasyim, S. H., & Hasani, A. N. (2022). Analisis Kelayakan Usaha Peternak Ayam Petelur. *Jurnal EcoGen*, *5*(4), 528–543. https://doi.org/10.24036/jmpe.v5i4.14066

Rahmawati, I. R., Muksin, & Rizal. (2016). Peran dan Kinerja Penyuluh Pertanian dalam Memberdayakan Peternak Ayam Petelur di Kabupaten Jember, Provinsi Jawa Timur. *Jurnal Penyuluhan*, *12*(2), 183–189. https://doi.org/10.25015/penyuluhan.v12i2.12252

Shodiq, W. M. (2021). Perbandingan Perusahaan Perkebunan Sawit Berdasarkan Kinerja Keuangan Periode 2015-2019. *Jurnal Sosial Ekonomi Pertanian*, *17*(1),

1–18. https://doi.org/10.20956/jsep.v16i3.11930

Singh, S., Anand, A., Shukla, A., & Sharma, A. (2021). Environmental, technical and financial feasibility study of domestic solar water heating system in India. *Sustainable Energy Technologies and Assessments*, *43*(January 2020), 100965. https://doi.org/10.1016/j.seta.2020.100965

Suryadi, S., Riani, R., Jamilah, J., & Kembaren, E. T. (2022). Financial Feasibility of Citronella in The Reforestation Area. *SOCA: Jurnal Sosial, Ekonomi Pertanian*, *16*(2), 224. https://doi.org/10.24843/soca.2022.v16.i02.p09

Waleleng, P. O. ., Santa, N. M., & Tuwaidan, J. A. M. (2022). Analisis kelayakan usaha peternakan ayam ras petelur UD.Tetey Permai Di Desa Tetey Kecamatan Dimembe Kabupaten Minahasa Utara (Studi Kasus). *Zootec*, *42*(2), 339. https://doi.org/10.35792/zot.42.2.2022.42661

Wulandari, Z., & Arief, I. I. (2022). Review : Tepung Telur Ayam : Nilai Gizi , Sifat Fungsional dan Manfaat. *Jurnal Ilmu Produksi Dan Teknologi Hasil Peternakan*, *10*(2), 62–68.

Youssefi, I., Celik, T., & Azimli, A. (2022). Financial feasibility analysis for different retrofit strategies on an institutional building. *Sustainable Energy Technologies and Assessments*, *52*, 102342. https://doi.org/10.1016/j.seta.2022.102342