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Research Article

Financial Feasibility Analysis of Purwograpе Grape Business in Tegaldlimo District, Banyuwangi Regency

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Abstract
Tegaldlimo District in Banyuwangi Regency has the potential for grape cultivation. One of the businesses engaged in grape production in this district is Purwograpе. The increasing market demand for grapes, both domestically and internationally, presents a significant opportunity to enhance farmers' incomes. However, a comprehensive financial feasibility analysis is essential to ensure the long-term sustainability of the business. This study aims to evaluate the financial viability of the Purwograpе grape business. The research employs cash flow analysis and investment feasibility assessment. The results indicate that the Purwograpе grape business in Tegaldlimo District is financially viable. The Net Present Value (NPV) is Rp1,056,296,819, while the Internal Rate of Return (IRR) is 40%. The payback period is calculated to be 2.38 years, or approximately 2 years and 4 months. The Benefit-Cost (B/C) ratio is 5.1, which is greater than 0. Additionally, the Revenue-Cost (R/C) ratio is 2.0 (R/C > 1.3), and the Gross B/C ratio is 1.8 (Gross B/C > 1), further confirming the business's profitability.

Keywords: Grapes, Purwograpе, Financial Feasibility Analysis

1. Introduction

The current diversity of land characteristics and agro-climatic distribution has greatly influenced the development of tropical and subtropical horticulture in Indonesia. Indonesia's diverse climatic conditions provide tremendous opportunities for the cultivation of various types of ornamental plants, fruits, and vegetables. This makes the horticulture sector an important component in driving the country's economic growth. Indonesia has the potential to develop more than 323 types of horticultural commodities with its agro-climatic diversity, which includes 60 types of fruits and 80 types of vegetables, to meet the needs of domestic and international markets (Pitaloka, 2017).

Indonesian fruits are known for their wide variety and exceptional flavour compared to products from other tropical fruit-producing countries. Demand for horticultural products in local and international markets continues to increase along with rapid economic growth. One of the most in-demand horticultural commodities is grapes, which show great potential in meeting market demand. Indonesia's horticulture sector can increase its value in the international market by implementing appropriate development strategies, such as the implementation of good agricultural practices and effective supply chain control. The government also plays an important role in creating a conducive business climate through regulations and technical support for farmers. Thus, the development of horticulture in Indonesia also contributes to environmental sustainability and improved community welfare.

Indonesia has excellent prospects for grape development due to its ideal climate for grape vines. The potential for grape growth is very large to be developed in various regions (Nurani, 2017). Since 1882, grape vines have been developed in Indonesia, especially in East Java. Indonesia's subtropical

grape production has increased in the last three years. The increase in grape production occurred in 2022 from 11,905 tonnes to 13,515 tonnes. This condition is in contrast to the fact that grape needs still depend on imports in 2022 amounting to 101,899 tonnes or around 330,407,068 USD. Amran Sulaiman, Minister of Agriculture, emphasised the focus on horticulture development and market-supportive fruit production as an effort to minimise imports.

Grapes have great potential to be developed in Indonesia, especially due to its favourable climate. Since 1882, the development of grape vines in Indonesia, especially in East Java. The increase in grape production still does not meet the demand for imported grapes, which reached 101,899 tonnes in 2022. The Minister of Agriculture emphasised the focus of horticulture development to minimise dependence on imported products. Grape production in Indonesia varies between provinces, with the main centres being Bali, East Nusa Tenggara and East Java. In the period 2018-2023, grape production showed fluctuations, with an average production of around 969.83 tonnes. East Java ranked third in grape production, with Probolinggo Regency as the main centre.

Although there was an increase in production in East Java until 2021, there was a significant decline in 2022. Probolinggo Regency leads the highest production with 1,619 quintals, followed by Jember at 720 quintals and Banyuwangi at 556 quintals in 2022 (BPS Jatim, 2023). The high consumer demand and low domestic production provide a great opportunity for the development of commercial grape cultivation in Indonesia (Winarni, 2012).

Grape production in Banyuwangi, which ranks third in East Java, is influenced by districts that develop cultivation in groups, such as Tegaldlimo districts, called Purwogrape. Purwogrape sells grapes from seed to fruit. Purwogrape's sales have expanded beyond Banyuwangi, showing good prospects for grape business development in the area. However, it does not yet have consistent financial records, making it difficult to track expenses and income. Price increases and the availability of fertiliser and growing media are challenges for the business, as fertiliser is essential for vine growth. In addition, the success of grape nurseries depends on the availability of planting media and mother stems (Ifadah et al., 2023). To increase production, a financial analysis is needed to assess the feasibility of the investment. With these conditions, business actors need to conduct financial analyses to assess business feasibility and potential profits, even though they are optimistic about the promising prospects of grape commodities. The formulation of the problem raised in this study is the extent to which the financial feasibility of Purwogrape grape business in Tegaldlimo District to run. The purpose of this study was to evaluate the financial feasibility of Purwogrape grape business in Tegaldlimo districts.

2. Methods

The method adopted in this research is a quantitative approach using descriptive and analytical methods. The analytical method serves to test hypotheses and conduct more in-depth analyses based on available data and information. Meanwhile, the purpose of using descriptive methods is to present a precise and systematic description of the evidence, characteristics, and relationships between the phenomena under study (Nazir, 2014). The location chosen as the research site is Purwogrape Business located in Wringinpitu Village, Tegaldlimo District, Banyuwangi Regency using the Purposive Method. Considerations in determining the location are Banyuwangi is one of the districts that has the third largest grape production in East Java and Tegaldlimo District is one of the districts that has a grape farmer group with Purwogrape business unit. This research began in July-October 2024.

Determination of the sample is by saturated sampling technique or census. The census technique involves selecting samples from each member of the population (Sugiono, 2013). Data were collected through observation and interviews with 6 Purwogrape business owners and managers to find out

information such as business overview, land area, production costs, production amounts, and others. Secondary data were collected through documentary and literature studies to obtain information on geographical conditions, population data, and administration of the research area. The method applied in data analysis is financial feasibility assessment. The analysis was conducted by applying investment criteria to assess the financial aspects. The analysis technique was chosen to determine and assess the financial feasibility of the business.

NPV calculation is an easy investment measurement to assess the feasibility of an investment and determine whether a business is feasible or not. Other criteria include R/C, Net B/C and IRR. Return Cost Ratio (R/C) is the ratio between total revenue and total costs used. The aim is to evaluate the profitability of a business and its feasibility for expansion (Nugroho & Mas' ud, 2021). Internal Rate of Return (IRR) is an interest rate that shows the optimal rate of return on investment, which is needed to guarantee a return on the capital that has been invested (Nurmalina et al., 2018). Meanwhile, Net B/C is a ratio that compares the total positive NPV, which reflects net profit, with the total negative NPV, which represents net cost (Zulkarnain & Ranchianowarganegara, 2020).

In addition to calculating investment criteria, it is necessary to analyse the payback period. This investment criterion refers to the duration required to make a return on investment, or the period required for the company to reimburse the investment costs that have been used (Purnaya & SE, 2016). The shorter the duration required to return the capital of the venture, the better the financial condition. If the payback exceeds the useful life of the business, the business will be deemed unviable. This financial feasibility analysis will determine whether Purwogrape's wine business can be expanded or not. This information is useful for Purwograpе as a reference in expanding the grape business to a larger scale, as well as for farmers and investors who are interested in investing or developing a grape business can invest in or expand the grape business. With the investment in the development of this business, it is expected to increase the volume of grape production which in turn will contribute to an increase in profit or business income.

2.1. Cash Flow Analysis

Cash flow analysis illustrates the total costs and revenues of the Purwograpе business, which are obtained from all revenues and expenses during the business.

2.2. Outflow

Cash flow that reflects investment and operating expenditures used to fund business activities, both in the early stages of the business and during the production process. Investment costs are expenditures made at the beginning of the activity and at a certain time in order to obtain future benefits. Operational costs are expenses incurred by the business to produce products in each stage of production in one period. Operating costs are divided into variable costs and fixed costs.

$$TC = FC + VC$$

Description:
TC : Total Cost
FC : Fixed Cost
VC : Variable Cost

So, the cost of expenditure is:
Outflow = Investment Cost + Production Cost

2.3. Inflow

The cash flow that shows the income to the business during the course of the business is called the inflow. This inflow is in the form of business revenue. The formula:

$$TR = P \times Q$$

Description:
TR : Total revenue
Q : output
P : price

2.4. Net Benefit

Income or net benefit is the result of the reduction between total revenue (inflow) and all costs incurred in running a business. The formula is:

$$\text{Net benefit} = TR - TC$$

Description:
TR : Total revenue
TC : Total cost / Outflow

2.5. Financial Feasibility Analysis

The investment criteria in this business financial feasibility analysis are:

R/C Ratio (Return Cost ratio)

Return Cost Ratio or business efficiency is a comparison between income and costs. This analysis serves to assess whether a business provides profit and can be developed. This criterion provides guidelines that if the R/C value is greater than 1.3, the business is considered feasible, if the R/C value is equal to 1.3, the business is at the break-even point, and if the value is less than 1.3, the business cannot be selected (Nugroho & Mas'ud, 2021). The following is the R/C calculation formula:

$$R/C = \frac{\text{Total revenue}}{\text{Total cost}}$$

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

Net Benefit Cost Ratio (Net B/C) is a comparison between the sum of positive NPV or total net benefits and negative NPV or total net costs. The results of the Net Benefit Cost Ratio (Net B/C) calculation reflect how much benefit or profit is obtained from the costs that have been used. This criterion provides a guideline that a business will be worth developing if Net B/C>1. Meanwhile, the value of Net B/C <1, then the business is not suitable for development (Zulkarnain & Ranchianowarganegara, 2020). Here is the formula:

$$\text{Net B/C} = \frac{\sum_{t=1}^{n} \frac{B_t - C_t}{(1+i)^t} \text{ for } B_t > C_t}{\sum_{t=1}^{n} \frac{C_t - B_t}{(1+i)^t} \text{ for } C_t > B_t}$$

Description:
Bt : Benefit in year t
Ct : Cost in year t

t : Year (1,2,3, ...)
n : Length of time period (years) i : Interest rate (%)

2.7. Net Present Value (NPV)

Net Present Value (NPV) is an investment criterion used to assess the feasibility of a venture or business. A business is considered feasible if the NPV value is greater than 1, while if the NPV is less than or equal to 0, the business is considered not worth developing (Zulkarnain & Ranchianowarganegara, 2020). Here is the formula:

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

Description:
NPV : Net Present Value
Bt : Benefit in year t
Ct : Cost in year t
t : Year (1, 2, 3, ...)
n : Length of time period (years)
i : Interest rate (%)
DF : 1/〖(1+i)〗^t

2.8. Internal Rate of Return (IRR)

Internal Rate of Return (IRR) gives an idea of the optimal interest rate required to ensure a return on the capital that has been invested. It is useful to know the interest rate above which it is no longer profitable to invest. The business is considered feasible if the IRR value is higher than the interest rate, while if the IRR is lower than the interest rate, the business is considered not feasible (Nurmalia et al., 2018). The IRR equation is as follows:

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

Description:
IRR : Internal Rate of Return (%)
I1 : Interest rate when NPV is positive (%)
I2 : Interest rate when NPV is negative (%)
NPV1 : NPV value at interest rate i1 (Rp)
NPV2 : NPV value at interest rate i2 (Rp)

2.9. Payback Period (PP)

Payback Period (PP) is the time required to recover investment costs or the period required by the company to recoup the investment expenditure that has been incurred (Purnaya, 2016). The faster the company returns investment costs, the better the company's financial condition. Here is the formula:

$$\text{PP} = n + (a-b)c \times 1 \text{ year}$$

Description:
a : Total initial investment after discount factor
b : sum of nth year benefits after discount factor
c : sum of n+1 year benefits after discount factor
n : Time period before there is PP

3. Results and Discussion

Tegaldlimo district is part of Banyuwangi Regency, located at the southernmost and easternmost part of Java Island. Tegaldlimo districts is approximately 61 km south of the Banyuwangi government centre. Tegaldlimo districts covers an area of ±1,341.12 km², most of which is surrounded by Alas Purwo National Park with the largest area in Banyuwangi. Purwograpе is a business engaged in grape cultivation. Purwograpе was established in 2023 and is located at Jalan Masjid, Wringin Anom, Wringinpitu Village, Tegaldlimo District, Banyuwangi Regency, East Java Province. Purwograpе was established with the support of Field Agricultural Extension Officers and the Agricultural Extension Agency in Tegaldlimo. Purwograpе sells seeds and grapes.

The vision of Purwograpе grape business is to make grape as an educational tourism and fruit picking in Tegaldlimo District, especially Banyuwangi in general. Since its establishment, Purwograpе has had a mission to do the best possible plant care so as to produce quality grapes, maintain and improve the quality of grapes, and conduct massive product marketing. In addition, Purwograpе conducts education on the process of caring for grape plants until harvest and coaching on grape seedling buyers.

3.1. Purwograpе Business Cash Flow Analysis

a. Purwograpе Grape Business Costs

Grape costs comprise all expenses of the Purwograpе grape business to support the business for 10 years. This study includes two kinds of costs, namely investment costs and operational costs.

1. Investment cost

Investment costs are incurred at the beginning of the business (before production and revenue are made) or when the business starts, with the expectation that it will provide benefits in the future (Nurmalia et al., 2018). Details of the initial investment costs of Purwograpе grape business can be seen in Table 1.

Table 1. Initial Investment Cost of Purwograpе Grape Business (498 trees)

No.	Description	Price	Total Physical	Value	%
1	Splice / Greenhouse	Rp 127.375.000	1	Rp127.375.000	73,69
2	Agricultural Equipment:	Rp 80.000	5	Rp400.000	0,23
	a. Hoe				
	b. Plant Scissors	Rp 57.000	5	Rp285.000	0,16
	c. Trowel	Rp 25.000	3	Rp75.000	0,043
d.	Sprayer Tank	Rp 750.000	5	Rp3.750.000	2,17
3	Scales	Rp 500.000	5	Rp2.500.000	1,45
4	Lights	Rp 50.000	58	Rp2.900.000	1,68
5	Water Faucets	Rp 10.000	11	Rp110.000	0,06
6	CCTV	Rp 400.000	6	Rp2.400.000	1,39
7	Seeds	Rp 25.000	498	Rp12.450.000	7,2
8	Land Cultivation Labour	Rp 2.700.000	1	Rp2.700.000	1,56
9	Bedding Labour	Rp 1.500.000	1	Rp1.500.000	0,89
10	Green House Labour	Rp 15.600.000	1	Rp15.600.000	9,03
11	Land Processing	Rp 785.000	1	Rp785.000	0,45
Total				Rp 172.830.000	100,00

Source: Data Processed by Researchers (2024)

From the data in Table 1, it can be seen that the initial investment costs spent on Purwograpе grape business in Tegaldlimo District amounted to Rp 172,830,000. The investment costs incurred for

the Green House or vines were the highest costs used in the initial investment at 73.69% or Rp 127,375,000. This propagation is equipped with mild steel as a pole and frame, insect net surrounding the green house, UV plastic to protect the grapes from sunlight as well as rainwater, PE hose as a medium for irrigating plants, strings as a link between poles and plant propagation media, cctv as remote supervision, and lights as lighting at night. the largest equipment financing is the sprayer tank at around 2.17% of the total cost. Investment cost expenditure will be made again when the economic life of the goods has expired, namely year 5 and year 10.

Table 2. Production Costs per Year in Purwograpе Grape Business in Tegaldlimo Subdistrict

No	Description	Price	in a Year	Total
A.	Fixed Costs			
1	Land Rent	Rp 5.000.000	1	Rp5.000.000
2	Electricity	Rp396.197	12x	Rp4.754.358
3	PDAM water	Rp200.000	12x	Rp2.400.000
4	WIFI	Rp350.000	(5(pieces)x12 months)	Rp21.000.000
B.	Variable Cost			
1	Nursery Materials	Rp 12.095.000	6x	Rp72.570.000
2	Fertiliser	Rp 2.949.000	3x	Rp8.847.000
3	Pesticides	Rp 2.442.000	3x	Rp7.326.000
4	Maintenance labour			
a.	Planting (once)	Rp 500.000	1x	Rp 500.000
b.	Fertilisation	Rp 2.000.000	3x	Rp 6.000.000
c.	Pest control	Rp 5.000.000	3x	Rp 15.000.000
d.	Pruning	Rp 800.000	3x	Rp 2.400.000
5	Nursery labour			
a	Grafting wages	Rp 3.000.000	6x	Rp 18.000.000
b	Wages of media content	Rp 700.000	6x	Rp 4.200.000
6	Fruit wrapping	Rp 7.470.000	1x	Rp7.470.000
Total Cost				Rp 170.967.358

Source: Data Processed by Researchers (2024)

The amount of production costs per year without planting is Rp 170,967,358, including fixed costs of Rp 33,154,358 and variable costs of Rp 141,813,000, because planting is only done in the first year. The cost of nurseries and wages of nursery workers at the beginning of the year is only done 3x production. The cost of fertilisers, medicines, pruning and labour in the first year is only done once. So, the amount of production costs at the beginning of the year will be different in the following year.

3.2. Purwograpе Grape Business Revenue and Income

The total revenue from the grape business is the total production of grapes and seeds calculated by multiplying the price applied in Tegaldlimo District. Purwograpе grape business gets revenue from the sale of grapes and grape seeds. Meanwhile, the income of the grape business is defined as the reduction between the amount of revenue and the total costs used by the business.

The revenue of this grape business has occurred in the first year, namely the harvest of grapes that occurred once with a weight of 1.67 kg per tree and seedlings in three productions with an average sale of 655 stems. In the second year onwards, the grape business received revenue from seedling sales, namely seedling production six times in one year with an average sale of 655 once produced. The grapes were harvested three times in one year, in the second year the harvest occurred three times, but the harvest amount was still the same 1.67kg per tree. At the productive age of the tree, which is 3 years, the harvest obtained will increase by 10% per harvest each year.

Grape business revenue is obtained by multiplying the total production of grapes and the number of seeds sold by the selling price. The selling price of Purwograpе grapes is Rp 80,000/kg. While the selling price of seeds per stem is Rp 35,000. The amount of revenue from Purwograpе grape business each year is shown in Table 3.

Table 3. Income of Purwograpе Wine Business in Tegaldlimo District

Year	Total Cost (Rp)	Revenue (Rp)	Revenue (Rp)
0	Rp250.485.716	Rp -	Rp(250.485.716)
1	Rp101.200.358	Rp127.291.800	Rp26.091.442
2	Rp174.967.358	Rp337.230.000	Rp162.262.642
3	Rp174.967.358	Rp337.230.000	Rp162.262.642
4	Rp174.967.358	Rp354.703.440	Rp179.736.082
5	Rp184.343.358	Rp376.418.784	Rp192.075.426
6	Rp174.967.358	Rp400.305.662	Rp225.338.304
7	Rp174.823.358	Rp426.581.229	Rp251.757.871
8	Rp174.967.358	Rp455.484.352	Rp280.516.994
9	Rp174.823.358	Rp487.277.787	Rp312.454.429
10	Rp187.387.358	Rp522.250.565	Rp334.863.207
Total	Rp1.947.900.296	Rp3.824.773.619	Rp1.876.873.323
Mean	384.873.323	637.462.270	312.812.220

Source: Data Processed by Researchers (2024)

In Table 3, it can be seen that the total cost required in the Purwograpе wine business in 10 years is Rp 1,947,900,296, - so that the average cost used is Rp 324,650,049. From the revenue, it is known that the total amount of revenue obtained is Rp 3,824,873,323. When averaged, the revenue obtained is Rp 637,462,270, - from the Purwograpе grape business per year. Based on data on costs and revenues, Purwograpе wine business earned an income of Rp1,876,873,323,- for 10 years. It can be interpreted that Purwograpе wine business has an average income/profit of Rp312,812,220/year. This shows that the Purwograpе grape business is profitable.

3.3. Financial Feasibility Analysis

The Purwograpе grape business in Tegaldlimo Subdistrict is a business that is carried out for many years because grape vines have a productive age of decades. To run the business in the long term, it is important to know the feasibility, especially from the financial aspect. The evaluation of financial feasibility was conducted using the investment criteria analysis tool. The investment criteria used are Return Cost of Ratio (R/C Ratio), Net Present Value (NPV), Payback Period, IRR (Internal Rate Return) and Net B/C Ratio. In calculating financial feasibility, it is necessary to calculate the discount factor (DF). The calculation of financial feasibility is strongly influenced by the discount factor (DF). The DF value is obtained based on the interest rate when the research was conducted. The interest rate used is an assumption of the prevailing interest rate during the research, which is 8%.

Tabel 4. Financial Feasibility Analysis of Purwograpе Wine Business in Tegaldlimo District, Banyuwangi

Feasibility Indicator	Value	Criteria
R/C	2,0	Worth
Net B/C	5,1	Worth
NPV	Rp1.056.296.819	Worth
IRR	40%	Worth
Payback Period	2 years 4 months	Worth

Source: Data Processed by Researchers (2024)

Table 4 shows that at an interest rate of 8% per year, the Purwograpе grape business in Tegaldlimo Subdistrict is feasible for further development. The calculation of investment criteria has an R/C value of 2.0 with an interest rate of 8%. This proves that the wine business is worth running because it fulfils the investment criteria, where the R/C ratio value is more than 1.3 (R/C ratio > 1.3).

The Net B/C ratio calculation results show a value of 5.1. This indicates that the grape business is feasible because it fulfils the investment criteria, namely having a Net B/C ratio of more than one (Net B/C ratio > 1). Net B/C ratio analysis is used to evaluate the efficiency level of the Purwograpе wine business. In other words, the benefits obtained are greater than the costs incurred. Based on these results, the Net B/C value of 5.1 means that every expenditure of Rp 1,- within a period of 10 years can generate a profit of Rp 5.1,-. positive NPV calculation results at an interest rate of 8% amounting to Rp1,056,296,819,-. The NPV value obtained shows that the NPV is greater than zero (NPV> 0). This means that capital investment in Purwograpе grape business will generate a profit of Rp1,056,296,819,- per 0.22 hectares. Therefore, Purwograpе grape business in Tegaldlimo Subdistrict is said to be feasible to develop because the grape business provides a profit greater than the total costs incurred for 10 years.

According to other investment criteria, the Purwograpе wine business has an IRR value of 40%. The IRR indicator aims to measure the net profit level of a business. A business is considered viable if the IRR value exceeds the interest rate used during the study period. In this case, the Purwograpе wine business meets the feasibility criteria because its IRR value is higher than the prevailing Bank BNI interest rate of 8 per cent. The higher IRR compared to the interest rate indicates that investing in a wine business is more profitable than keeping capital in the form of bank deposits, with a profit difference of around 32 per cent.

Next, the calculation of the payback period for the Purwograpе wine business in Tegaldlimo Subdistrict shows that the payback period of the investment is 2 years and 4 months. The calculation indicates that at an interest rate of 8%, the Purwograpе grape business is feasible to continue, because the payback period does not exceed the economic life of the green-house which reaches 20 years and the economic life of the grape vines which can last decades.

4. Conclusion

From the results and discussion of research conducted on Purwograpе wine business in Tegaldlimo District, it can be concluded that:

1. Analysis of production costs, revenue, and income of Purwograpе grape business in Tegaldlimo District, Banyuwangi showed that the business was considered feasible to develop because it was profitable, and the resulting calculations: average production cost of Rp 324,650,049,-/year; business revenue of Rp 637,462,270,-/year; and average income of Rp312,812,220,-/year.
2. Financial analysis of Purwograpе grape business in Tegaldlimo Subdistrict with 8% bank interest rate, declared feasible to run. The resulting calculations: R/C value of 2.0; Net B/C of 5.1; NPV of Rp1,056,296,819, -; IRR of 40%, and payback period of 2 years 4 months.

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