

Business Feasibility Analysis of Citronella and Patchouli Essential Oil in Sawahlunto City

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Abstract—Lemongrass and patchouli oil are essential oil commodities that have the potential to be exploited. Batu Sandara Village, Barangin District, Sawahlunto City is an area that can be used as a place for investors to invest in the cultivation and refining of essential oil. The cultivation and refining business requires a large amount of capital, and in doing business there are production and price risks that will affect the feasibility of the business. The purpose of this study was to determine the business feasibility of refining citronella essential oil and patchouli non-financially and financially from normal and risk conditions. The research method used in this research includes a feasibility analysis of financial aspects and scenario analysis with a risk assessment.

Keywords—lemongrass and patchouli oil, feasibility study

I. INTRODUCTION

Essential oil is an export commodity that generates quite high foreign exchange in Indonesia. In addition, the world market demand for essential oils is also very high. The high demand for the world market cannot yet be fully met by Indonesia. The low productivity and quality of essential oils, among others, is due to the low genetic quality of plants, simple cultivation technology, and inappropriate post-harvest processes. The essential oil processing technology (refining) is basically available, but not all of these technologies have been adopted by farmers, considering that modern technological processes also require quite high investment.

Essential oils generally come from farmers who have relatively small land and are then processed using simple distillation equipment. The same thing also happened in several areas in the province of West Sumatra. This condition is the main cause of Indonesia's not optimal production of essential oil. With the establishment of West Sumatra as one of Indonesia's Essential Oil Development Centers, this must be supported by the increasing production of essential oils in both quantity and quality. As an effort in this development, it will be more efficient if small businesses that have been traditionally managed partners with large businesses in an effort to penetrate the world market (exports). Mutually needed and mutually

beneficial partnerships are the main basis for the development of this commodity.

The city of Sawahlunto, West Sumatra is one of the essential oil producing areas in Indonesia. In order to support the development of the cultivation and industry of Serai Wangi essential oil and patchouli in the City of Sawahlunto, academic references and studies are needed to see business opportunities for potential investors. In the form of preparation of a feasibility study on the Investment Potential Feasibility Study in the work program of the One Stop Investment Service, Sawahlunto City, Fiscal Year 2020.

This study aims to determine whether the essential oil business can be developed in Sawahlunto City, more precisely in Barangin District. In addition, it is also to know the future prospects of this business not only for the local community but for investors and local governments. Therefore, a research was conducted on the feasibility analysis of essential oil businesses in Sawahlunto City. With the hope that this research can be used as a recommendation to develop the essential oil business of citronella and patchouli in Sawahlunto City.

II. LITERATURE REVIEW

Essential oils are volatile oils, which consist of a mixture of volatile substances, with different compositions and boiling points. Essential oils can be obtained from citronella and patchouli plants by distillation using steam or also known as hydrodistillation [1]. According to Santoso [2], to obtain optimal essential oil products with good quality, it is necessary to select the best distillation method, namely steam distillation.

Feasibility Analysis of the Essential Oil Processing Business Sector. The feasibility of investing in essential oils can be seen from various aspects. The feasibility aspect of this essential oil investment can be seen in the feasibility classification according to the scoring analysis that has been carried out.

The weight score classification used for each eligibility level is as follows:

- 100- <180: Very Low Eligibility

- 180- <260: Low Eligibility
- 260- <340: Sufficient Eligibility
- 340- <420: High Eligibility
- 420- <500: Very High Eligibility

After the weighting of the score, an analysis of the cumulative calculations of the various aspects discussed above is carried out to determine the location of the essential oil business development plan whether it is feasible or not by adding up all the weighted scores divided by the aspects assessed.

The purpose of analysing the financial aspects of a business project feasibility study is to determine the investment plan through the calculation of expected costs and benefits, by comparing expenses and revenues, such as availability of funds, capital costs, the project's ability to pay back these funds within a predetermined time and assess whether the project will continue to develop [3]. Financial analysis consists of:

A. Net Present Value (NPV)

According to Gray et al. [4] the Net Present Value (NPV) of a project is the difference between the PV for the benefit flow and the PV for the cost flow. Meanwhile, according to [5], the criteria for net present value (NPV) are based on the concept of discounting all cash flows to present value. By discounting all cash inflows and outflows during the life of the project (investment) to their present value, then calculating the net figure, the difference will be found using the same basis, namely the current (market) price. In calculating the NPV, it is necessary to determine the relevant interest rate.

$$NPV = \sum_{t=0}^n \frac{CF_t}{(1+k)^t} \quad (1)$$

Information:

CF_t = Cash flow or cash flow at time t

K = Cost of project capital (project cost of capital)

t = period of time

n = project age

B. Average Rate of Return (ARR)

The rate of return on an investment is calculated by taking the total cash inflow over the life of the investment and dividing it by the number of years in the life of the investment.

$$ARR = \frac{\text{Annual net profit}}{\text{Initial investment value}} \quad (2)$$

C. Internal Rate Return (IRR)

According to Martono and Harjito [6], the Internal Rate Return (IRR) method is an investment appraisal method to find an interest rate that equates the present value of the present

value of proceeds and investment (initial outlays). When the IRR is reached, the NPV is equal to zero. Therefore, to calculate the IRR required NPV data from the positive pole (area) and the negative pole then interpolate (look for the difference) so that the NPV is equal to zero.

D. Discounted Payback Period

Discounted Payback Period is the number of years to recover the initial cash disbursements from the discounted (now valued) net cash flow.

The formula for calculating the Discounted Payback Period is:

$$\text{Discounted Payback Period} = \frac{I_0}{\sum \frac{A_t}{(1+r)^t}} \times 1 \text{ year} \quad (3)$$

E. Profitability Index (PI)

Also called the benefit cost ratio, it is the ratio of the present value of future net cash flows to initial expenditures.

The formula for calculating the Profitability Index (PI):

$$\text{Profitability Index} = \frac{\text{Present value of cash flows}}{\text{Initial Investment value}} \quad (4)$$

F. Break Even Point (BEP)

1) Calculating BEP is useful for:

- Find out how much money is needed to rent a place of business, buy equipment, hire employees and other things.
- Make a projection:
 - What is the sales volume that needs to be obtained in order to at least cover all costs incurred, where all costs incurred are equal to the total sales earned, so that the company does not gain or lose?
 - What is the volume of sales needed to get the profit we are targeting?

2) Type of Break Event Point (BEP)

a) *BEP Unit*: BEP which is expressed in the number of product sales at a certain value.

b) *BEP Rupiah*: BEP stated in the amount of sales or a certain sales price.

The formula for calculating BEP:

$$BEP \text{ Unit} = \frac{(\text{Fixed cost})}{(\text{Price per unit} - \text{Variable cost per unit})} \quad (5)$$

$$BEP \text{ Rupiah} = \frac{(\text{Fixed cost})}{\left(\frac{\text{Contribution margin per unit}}{\text{Price per unit}}\right)} \quad (6)$$

III. RESEARCH METHODS

The research method that researchers use is to use a quantitative descriptive approach, namely an approach that focuses on calculating the value indicated by the value in the

form of a number from a research result. This research is expected to research more deeply on the Business Feasibility Analysis of Lemongrass and Patchouli Essential Oils in Barangin District, Sawahlunto City, West Sumatra.

The type of data in this study is primary data taken directly at the research location. Researchers used 3 kinds of data collection techniques, namely observation, interview and questionnaire techniques. Observations were made to observe directly the research location by distributing questionnaires. The results of the data that have been obtained are then processed and analysed in more depth.

IV. RESULTS AND DISCUSSION

A. Scoring Analysis

TABLE I. ANALYSIS OF FEASIBILITY SCORING FOR INVESTMENT OF ESSENTIAL OIL PROCESSING BUSINESS-SERAI WANGI

No.	Eligibility Aspects	Eligibility Classification	Rating Score
1	Feasibility Analysis for Technical Aspects	High enough	330
2	Feasibility Analysis of Policy Aspects and Legality	High enough	400
3	Feasibility Analysis of Market and Marketing Aspects	High enough	349.86
4	Feasibility Analysis of Management and Organizational Aspects	Enough	325
5	Feasibility Analysis of Human Resources (HR) Aspects	Enough	325
6	Feasibility Analysis of Socio-Cultural and Environmental Aspects	High enough	350
7	Feasibility Analysis of Socio-Economic Aspects	Fairly Competitive	300
Total Score			339.98

Based on Table 1, the total scoring of all aspects assessed in the essential oil processing business sector investment is 339.98 so it can be concluded that the investment in essential oil processing is based on the feasibility analysis that has been carried out.

TABLE II. ANALYSIS OF FEASIBILITY SCORE FOR INVESTMENT IN ESSENTIAL OIL PROCESSING

No.	Eligibility Aspects	Eligibility Classification	Rating Score
1	Feasibility Analysis for Technical Aspects	High enough	254,5455
2	Feasibility Analysis of Policy Aspects and Legality	High enough	400
3	Feasibility Analysis of Market and Marketing Aspects	High enough	349.86
4	Feasibility Analysis of Management and Organizational Aspects	Enough	325
5	Feasibility Analysis of Human Resources (HR) Aspects	Enough	325
6	Feasibility Analysis of Socio-Cultural and Environmental Aspects	High enough	350
7	Feasibility Analysis of Socio-Economic Aspects	Fairly Competitive	300
Total Score			329,201

Based on Table 2, the total scoring of all aspects assessed in the essential oil processing business sector investment is 329.201, so it can be concluded that investment in essential oil processing based on the Feasibility analysis has been carried out.

B. Net Present Value (NPV)

If the value of cash inflow is greater than cash outflow then the NPV value is more than 0, the project is deemed feasible. In the processing of citronella essential oil, the NPV is obtained as much as IDR 807,052,849,-. Meanwhile, the NPV obtained for patchouli essential oil was IDR 9,229,336,352,-.

C. Average Rate of Return (ARR)

The ARR of the lemongrass essential oil project is 10.70%. Meanwhile, the ARR of the patchouli leaf essential oil project was 65.14%.

D. Internat Rate Return (IRR)

IRR in the business feasibility of citronella essential oil is 17.26%. Meanwhile, the IRR for patchouli essential oil business was 66.97%.

E. Discounted Payback Period

The time needed to return the initial investment of citronella essential oil is 5 years 11 months, while for patchouli essential oil the time needed to return the initial investment is 1 year 11 months.

F. Profitability Index (PI)

Investment appraisal using the Profitability Index (PI), if the incoming cash flow is greater than the initial investment, the project is eligible to be accepted if the Profitability Index value is more than 1. The value of the Profitability Index (PI) in the processing of seari fragrant essential oil is 1.24. While the PI for patchouli essential oil processing was 2.05.

G. Break Even Point (BEP)

The BEP needed in an essential oil processing business can be described by how many liters of essential oil must be produced in 1 year, along with BEP in liters needed in 10 years (See in Tables 3 and 4).

TABLE III. CALCULATION OF SERAI WANGI ESSENTIAL OIL BEP

Year	BEP (liter)
1	9,810.00
2	10,528.37
3	11,338.15
4	12,256.99
5	13,307.40
6	14,518.54
7	15,928.80
8	17,589.85
9	19,572.86
10	21,978.68

Source: Primary Data After Processing, 2020.

TABLE IV. CALCULATION OF PATCHOULI LEAVES ESSENTIAL OILS

Year	BEP (litter)
1	2,477.27
2	2,648.34
3	2,839.63
4	3,054.73
5	3,298.12
6	3,575.50
7	3,894.16
8	4,263.68
9	4,696.80
10	5,210.90

Source: Primary Data After Processing, 2020.

V. CONCLUSION AND SUGGESTION

A. Conclusion

The results of the feasibility analysis of citronella and patchouli essential oil business in Batu Sandaran Village, Barangin District, Sawahlunto City can be said to be feasible for all aspects including market aspects, technical aspects, management and legal aspects, social and economic aspects, and environmental aspects. In the analysis of the financial feasibility of the NPV which has a positive value, the investment in essential oil processing can be said to be feasible. calculations based on the Internal Rate of Return (IRR) for lemongrass essential oil, namely 17.26%, while for patchouli essential oil, it is obtained at 66.97% when compared to bank loan interest rates ranging from 9.95% - 11.56%. Can be said to be worthy. As for the calculation of the Payback Period, the return on investment in citronella essential oil processing will require a period of 5 years 11 months while patchouli essential oil requires a period of 1 year 11 months. Therefore, this essential oil processing has a pretty good prospect with a relatively shorter period of time.

B. Suggestion

Suggestions that can be given:

- Optimizing production by increasing the number of citronella plant populations and using the entire land according to targets and plans.
- Helping to facilitate licensing for investors / business actors who will conduct essential oil processing trades.
- Coordinating and collaborating between Sawahlunto City Governments and business fields related to essential oil processing.
- Empowering the people of Sawahlunto City, especially in Balai Batu Sandaran Village, as workers for processing essential oils.
- Choosing a location for essential oil development that is easily accessible and does not disturb community settlements around Balai Batu Sandaran Village.
- We recommend Lemongrass leaves to be used as raw material for processing essential oils.
- Do not recommend Patchouli leaves to be used as raw material for processing essential oils due to uncontrollable climatic factors.

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