

## Virgin Coconut Oil (VCO) Business Analysis in Terms of Economic Income

Gina El Safira, Yuni Sari, Dadang Waluyo

<sup>1,2,3</sup>Universitas Muhammadiyah Makassar, Makassar, Indonesia

\*Corresponding Author: [elsafira44@gmail.com](mailto:elsafira44@gmail.com)



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### ABSTRACT

High fluctuations in coconut prices have resulted in coconut farmers in North Minahasa Regency experiencing uncertainty about their economic conditions, so derivative products from coconuts, such as Virgin Coconut Oil (VCO), which can be processed, are needed. This study aims to calculate the feasibility of making Virgin Coconut Oil (VCO), which is processed traditionally, and analyze sensitive indicators from each aspect studied. Traditionally processed Virgin Coconut Oil (VCO) quality highly depends on raw materials and processing. The business feasibility analysis parameters used are marketing, technological, management, legal, and economic. The method used is the Multidimensional Scaling (MDS) Method. The analysis showed that the financial aspect obtained Net Present Value NVP value = IDR 482,378,746, IRR = 93.88%, Gross B/C Ratio = 2.193, PR = 3.64, PBP = 1 year eight days. The feasibility index assessment of five aspects obtained values: marketing aspects 83.50%, technology aspects 52.28%, management aspects 60.91%, legal aspects 65.39%, and economics 74.83%. The average value of the feasibility index shows that the traditional VCO manufacturing business in North Minahasa Regency can be declared feasible.

**Keywords:** Virgin Coconut Oil, Multidimensional Scaling, Business Feasibility, Economic Income

### INTRODUCTION

Indonesia is a country with a vast agricultural area. Agricultural land is one of the sectors that improve the country's economy. The subsector of agriculture with great potential is plantations. Crop commodities from plantation subsectors developed in Indonesia, one of which is the area of coconut plantations in North Sulawesi, is also the second largest in Indonesia. North Sulawesi Province managed to supply 242.5 thousand tons of coconuts last year.

The development of coconut farming in North Minahasa Regency, which amounted to 37.1 thousand tons, is beneficial for the community as a source of income. To increase the revenue of coconut farming, management is needed that can be an added value for the product. However, coconut management in North Minahasa Regency is still not optimal. People, in general, still sell coconuts without being processed (granular coconut). This causes the selling price of coconuts to be low. The selling price of granulated coconut in Maluku ranges from IDR 800 to 1,300 /kg. More precise and profitable coconut management is needed to increase the selling price of coconuts. One alternative to diversify coconut products that can be processed traditionally is virgin coconut oil (VCO).

The development of Virgin Coconut Oil (VCO) is no longer only used as cooking oil. Still, it has been widely developed as a product of high quality, such as in the pharmaceutical, infant formula, and cosmetic industries (Liu, 2023) (Spennemann, 2020). Virgin Coconut Oil (VCO) is also gaining popularity worldwide because of its pure manufacturing without containing chemicals and subsequent use, which is an added value (Ajien, 2023). VCO can be a functional food because it contains nutrients that are good for health and reduce the risk of chronic diseases (Bot, 2023) (George, 2023).

In the last ten years, VCO exports have experienced very rapid growth. In Indonesia, VCO is quite in demand because of its properties. One of the countries that is the largest exporter of VCO in Indonesia is the Philippines. In the Philippines, VCO obtained from farmers is sold through drug stores before finally reaching consumers. The demand for VCO in India for domestic consumption and export also continues to increase due to increasing knowledge about the proven health benefits of VCO products (Beegum, 2022)(Romão, 2022).

Virgin Coconut Oil (VCO) has emerged as a promising diversified coconut product with growing world market demand (Doe, 2023). The advantage of VCO is that it can be produced at home, at the micro-scale level by villages, and at the macro-scale level by companies (Ragab, 2023). Seeing the increasing demand for VCO worldwide, and its manufacture does not require complicated and sophisticated equipment, VCO processing can be developed, especially in North Minahasa Regency (Obianefo, 2023)(Thangaraja, 2019) because North Minahasa Regency is an area with high coconut production, so the need for raw materials will be easily obtained. In addition, the selling price of VCO is quite good in the market, both domestically and abroad. The cost of marketed Virgin Coconut Oil (VCO) can reach IDR 55,000 / bottle size 250 ml. Based on the explanation above, further research related to the feasibility study of the Virgin Coconut Oil (VCO) manufacturing business with a traditional production process in North Minahasa Regency is needed.

## **METHODS**

### ***Identify the Problem***

As a result of observations and interviews, the problem in the field is that coconut farmers in North Minahasa Regency sell coconuts in circles and copra, so the selling value of coconuts is still low. This will affect farmers' income because most farmers depend only on selling coconuts (Marongiu, 2022)(Narmadha, 2022). Therefore, it takes processing coconut into products with high selling value and can be processed by the farmers themselves (AlNouss, 2020; Maia, 2020; Sudha, 2021; Sudhalakshmi, 2021; Udayakumar, 2021; Vijayakumar, 2020). Processed coconut products that have the potential to be developed by coconut farmers in North Minahasa Regency are Virgin Coconut Oil (VCO) because this product has a high selling value and can be processed traditionally.

### ***Problem Formulation***

Problem formulation is carried out to determine the scope of the problem to be studied. The formulation of this problem can facilitate researchers in solving problems because the issues learned focus on the real problem (Rahim, 2023). The problems in this study focused on the feasibility of making Virgin Coconut Oil (VCO) with traditional production processes to increase the income of coconut farmers in North Minahasa Regency.

### ***Data Processing***

This research examines the business feasibility study with consideration of several aspects. Data processing in this study can be seen in Table 1 (Thamban, 2019).

Table 1 Step Data Processing

| <b>Purpose</b>                               | <b>Variable</b>  | <b>Method</b> | <b>Output</b>           |
|--|--|---------------|-------------------------|
| Determining feasibility indicators           | Aspects of the Feasibility Study   | Interview     | Feasibility indicators  |
| Analyze market and marketing aspects.        | The potential of the product to be marketed, the strength of competitors, and estimated sales. | MDS method    | Eligibility index value |
| Analyze technical and technological aspects. | Site selection, machinery and equipment, and layout arrangement.                               | MDS method    | Eligibility index value |
| Analyze legal and legality aspects.          | The legality of the existence of a business, both in   | MDS method    | Eligibility index value |

|                                      |   |            |                         |
|--------------------------------------|---|------------|-------------------------|
|                                      | terms of licensing and legal entities.  |            |                         |
| Analyze management and H.R. aspects. | Managing development, operation, and division of organizational tasks and responsibilities. | MDS method | Eligibility index value |

**RESULTS**

The flow of the VCO production process in the Integrated Nyiur Community can be seen in Figure 1.

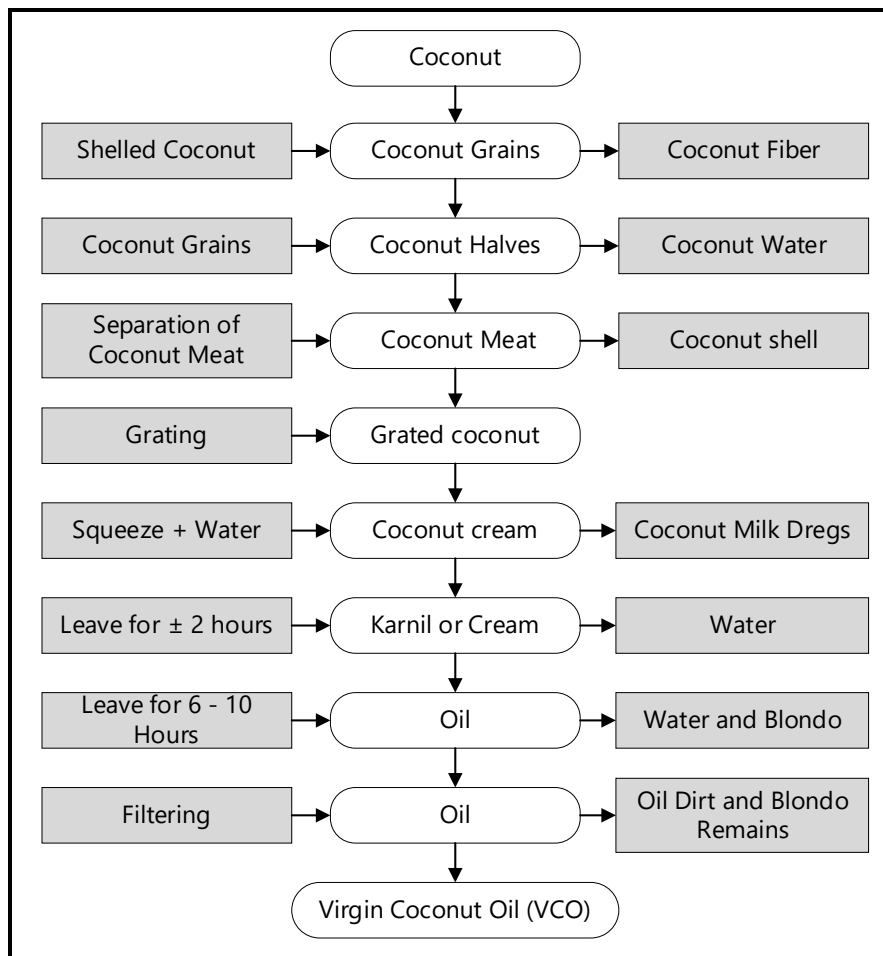


Figure 1 VCO production process flow

**Cash Flow**

The flow of income and expenditure from the first year to the fourth year can be seen in Table 2.

Table 2 Cash Flow

| Year to | Cash In         | Cash Out       | Net Benefit     |
|---------|-----------------|----------------|-----------------|
| 1       | IDR 199,420,000 | IDR 59,151,350 | IDR 140,268,650 |
| 2       | IDR 267,540,000 | IDR 69,251,450 | IDR 198,288,550 |
| 3       | IDR 335,530,000 | IDR 79,332,275 | IDR 256,197,725 |
| 4       | IDR 403,650,000 | IDR 89,432,375 | IDR 314,217,625 |

Table 2 shows that income is greater than operational costs incurred. Furthermore, the net cash received the year increased. MARR is an interest rate used as a benchmark to evaluate and compare various assessment criteria. The value of MARR is obtained from the sum of interest rates (i), other costs used to obtain investment ( $\alpha$ ), and investment risk factors (Cc).  $MARR = i + \alpha + Cc$   
 $= 12\% + 0 + 0 = 12\%$

**Net Present Value (NPV)**

Net present value is used to calculate net cash at present. To calculate NPV in a business, data on estimated investment costs, operational costs, and planned benefits are needed. The calculation of NPV values can be seen in Table 2.

Table 3 Net Present Value Calculation

| Year To    | Investment (IDR) | Cost Operational (IDR) | Total Cost (IDR) | Benefits (IDR) | Net Benefit (IDR) | D.F. 12 % | Present Value (IDR) |
|------------|------------------|------------------------|------------------|----------------|-------------------|-----------|---------------------|
| 0          | 182,983,000      | -                      | 182,983,000      | -              | -182,983,000      | 1.000     | -182,983,000        |
| 1          | -                | 59,151,350             | 59,151,350       | 199,420,000    | 140,268,650       | 0.893     | 125,239,866         |
| 2          | -                | 69,251,450             | 69,251,450       | 267,540,000    | 198,288,550       | 0.797     | 158,074,418         |
| 3          | -                | 79,332,275             | 79,332,275       | 335,530,000    | 256,197,725       | 0.712     | 182,356,480         |
| 4          | -                | 89,432,375             | 89,432,375       | 403,650,000    | 314,217,625       | 0.636     | 199,690,981         |
| <b>NPV</b> |                  |                        |                  |                |                   |           | <b>482,378,746</b>  |

The calculation result of Table 2 is the NPV value of IDR 482,378,746. The proposed business of making virgin coconut oil is feasible because the NPV value is more significant than zero, also called positive NPV.

**Internal Rate of Return (IRR)**

If the NPV1 value shows a positive number, then the second discount factor must be more significant than MARR, and vice versa. If NPV1 shows a negative number, then the second discount factor must be smaller than MARR.

Table 4 Internal Rate of Return Calculation

| Year To -  | Net Benefit (IDR) | D.F. 12% | Present Value (IDR) | D.F. 94% | Present Value (IDR) |
|------------|-------------------|----------|---------------------|----------|---------------------|
| 0          | -182,983,000      | 1.000    | -182,983,000        | 1.000    | -182,983,000        |
| 1          | 140,268,650       | 0.893    | 125,239,866         | 0.515    | 72,303,428          |
| 2          | 198,288,550       | 0.797    | 158,074,418         | 0.266    | 52,685,873          |
| 3          | 256,197,725       | 0.712    | 182,356,480         | 0.137    | 35,088,926          |
| 4          | 314,217,625       | 0.636    | 199,690,981         | 0.071    | 22,183,171          |
| <b>NPV</b> |                   |          | <b>482,378,746</b>  |          | <b>-721,603</b>     |

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

$$IRR = 0.12 + \frac{482,378,746}{482,378,746 - (-721,603)} \times (0.94 - 0.12) = 0.9388 = 93.88\%$$

**Break Even Point (BEP)**

The break-even point (BEP) is the point of return where total revenue equal total cost. Judging from the period of implementation of a business, the occurrence of the principal return point depends on the length

of the revenue flow of a business. It can cover all operational costs and other costs. The preparation of the break-even point (BEP) calculation can be seen in Table 5.

Table 5 Break-Even Point Calculation

| Year         | Investment (IDR) | Operational (IDR) | Total Cost (IDR) | Benefits (IDR) | D.F. 12 % | B (IDR)            | C (IDR)     |
|--------------|------------------|-------------------|------------------|----------------|-----------|--------------------|-------------|
| 0            | 182,983,000      | -                 | 182,983,000      | -              | 1.000     | -                  | 182,983,000 |
| 1            | -                | 59,151,350        | 59,151,350       | 199,420,000    | 0.893     | 178,053,571        | 52,813,705  |
| 2            | -                | 69,251,450        | 69,251,450       | 267,540,000    | 0.797     | 213,281,250        | 55,206,832  |
| 3            | -                | 79,332,275        | 79,332,275       | 335,530,000    | 0.712     | 238,823,627        | 56,467,146  |
| 4            | -                | 89,432,375        | 89,432,375       | 403,650,000    | 0.636     | 256,526,872        | 56,835,891  |
| <b>Total</b> |                  |                   |                  |                |           | <b>404,306,575</b> |             |

$$BEP = T_{p-1} + \frac{\sum_{i=1}^n T.C._i - \sum_{i=1}^n B_{icp-1}}{B_p}$$

$$BEP = 1 + \frac{404,306,575 - 178,053,571}{213,281,250} = 2 \text{ Years } 15 \text{ Days}$$

Based on the calculation above, a break-even point (BEP) for two years and 15 days is obtained. This time shows that the new investment income revenue stream can cover all operating and other expenses within two years and 15 days.

### Eligibility Index Assessment

Feasibility index assessment is carried out by rapfish analysis, Which is carried out to see the feasibility index in the form of a diagram that illustrates the feasibility status. Pictures of rapfish research are shown in Figures 2 through 6.

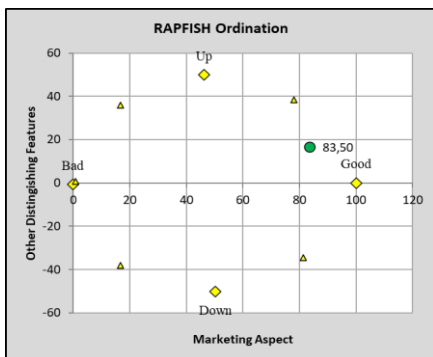


Figure 2 Marketing Aspect Index

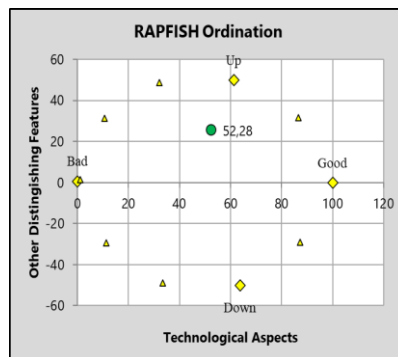


Figure 3 Technology Aspect Index

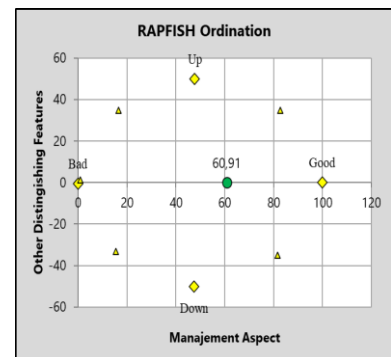


Figure 4 Management Aspect Index

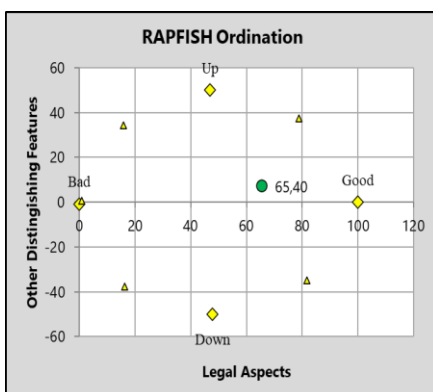


Figure 5 Legal Aspect Index

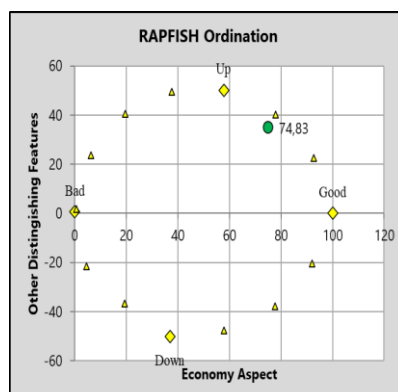


Figure 6 Economic Aspect Index

The percentage of VCO manufacturing business feasibility status from five aspects. The qualification status with the highest value is from the market and marketing aspect, with a discount of 83.50%. At the same time, the feasibility status with the lowest value is in technical and technological factors, with a value of 52.28%. The five feasibility aspects show that making a VCO business can be feasible. Furthermore, determining the feasibility status of the VCO-making business is based on the average feasibility index of the five aspects assessed. The average value of the traditional VCO manufacturing business feasibility index from the five aspects considered is 67.38%. The average value of the feasibility index shows that the conventional VCO manufacturing business in North Minahasa Regency can be declared feasible.

## DISCUSSION

Percentage of feasibility status of VCO manufacturing business from five aspects. The eligibility status with the highest value is from the marketing aspect, with a discount of 83.50%. Meanwhile, the feasibility status with the lowest score is in the technological part, with a score of 52.28%. These five feasibility aspects show that each element of the feasibility of the VCO manufacturing business can be said to be feasible. Furthermore, determining the feasibility status of the VCO manufacturing business is based on the average feasibility index of the five aspects assessed. The average value of the feasibility index for traditional VCO manufacturing businesses from the five aspects considered is 67.38%. The average value of the feasibility index shows that the conventional VCO manufacturing business in North Minahasa Regency can be declared feasible. The same research, namely research (Dewi & Saputra, 2023) with the results of the organoleptic feasibility test, meets the validation criteria with results obtained of 60%, so it can be concluded that the hair mask is suitable for public use. Research (Oktaviany et al., 2016) on VCO results analysis was conducted based on technical, management, and financial aspects. It was found that this business requires capital of IDR 2,564,312,903, with an NPV value of IDR 14,719,243,689, a MARR value of 14.8%, and an IRR value amounting to 119%, socio-cultural and environmental aspects, work culture and business transactions of local coconut farmers, as well as analysis of waste and pollution from the VCO production process. Based on the results of all aspects, it can be concluded that this business development is feasible.

## CONCLUSION

The revenue of the traditional Virgin Coconut Oil (VCO) manufacturing business in Minahasa Utara Regency is estimated to increase, obtained by the amount of net income or cash received in the first year IDR140,268,650, the second year IDR 198,288,550, the third year IDR 256,197,725 and the fourth year IDR 314,217,625. Investment criteria obtained NVP = IDR 482,378,746 (greater than zero), IRR = 93.88% (greater than MARR), Gross B/C Ratio = 2.193 (greater than one), PR = 3.64 (greater than one), PBP = 1 year eight days (faster than payback time). Furthermore, the feasibility index assessment of five aspects obtained scores: marketing aspects 83.50%, technological aspects 52.28%, management aspects 60.91%, legal aspects 65.39%, and economics 74.83%.

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