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Feasibility Analysis of Clove Farming

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Abstract: *This study aims to evaluate the financial feasibility of clove farming in Lalonaha Village, Wolo District, Kolaka Regency. A descriptive quantitative approach was employed using primary data collected through interviews and documentation from 11 clove farmers. The analysis focused on production costs (fixed and variable), revenues, and profits, applying three key feasibility indicators: Revenue-Cost Ratio (R/C), Benefit-Cost Ratio (B/C), and Profit-Loss (L/R) analysis. The results show that clove farming in the study area is financially viable, with an R/C ratio of 23.19, a B/C ratio of 22.19, and an average annual profit of IDR 72,494,606 per farmer. These findings indicate that clove farming provides substantial returns relative to production costs and can be further developed as a sustainable agricultural enterprise. The study contributes to the literature on smallholder plantation economics by providing empirical evidence on the profitability of clove farming in Southeast Sulawesi, Indonesia.*

Keywords: *Clove farming, feasibility analysis, profitability, R/C ratio, B/C ratio*

1. Introduction

Indonesia is undergoing development across all sectors, with agriculture remaining a cornerstone of the national economy (Alrasyid, 2023). This sector not only plays a strategic role in sustaining food security but also contributes significantly to rural livelihoods and national GDP. The agricultural sector is expected to optimally utilize natural resources, labor, capital, and technology within both physical and social environments, ultimately improving farmers' welfare. A balanced economic structure where industrial growth is supported by a strong agricultural base is one of the key objectives of national development.

Cloves (*Syzygium aromaticum*) are among Indonesia's leading plantation commodities with high economic value and strong export potential. According to Muhammad (2023), Indonesia's clove exports experienced a significant increase over the past two years, reaching 20,246 tons in 2018—an increase of 123% compared to 2017—and rising by a further 28.37% in 2019 to reach 25,990 tons. In Southeast Sulawesi, cloves hold a vital position in the regional plantation sector. Kolaka Regency, in particular, is the largest contributor to

clove production, accounting for 47.77% of total provincial output in 2020 (Directorate General of Plantations, 2021).

However, despite the upward trend in production, clove prices have shown a fluctuating and often downward trajectory. Data from BPS Indonesia (2021) reveal that the average price dropped from IDR 94,407/kg in 2017 to IDR 65,810/kg in 2020, representing a decline of 30.29%. Such price volatility, combined with rising production and harvesting costs, directly impacts farmers' income stability and investment capacity. In Lalonaha Village, Wolo District, the potential for clove farming is considerable due to the availability of fertile and suitable land. Nonetheless, farmers face persistent challenges, including limited capital, insufficient knowledge and skills, and suboptimal use of production inputs such as certified seedlings, fertilizers, pesticides, and labor.

From 2018 to 2022, fluctuations were observed in land area, production volume, and productivity in Lalonaha Village. Productivity peaked in 2020 when land area reached 102 ha with a yield of 28 tons, but declined again in 2021 to 27.2 tons despite a land area of 100 ha. Similar patterns were found in Tosiba Village, another clove-producing area in Wolo District. Fahriyah (2023) notes that clove farmers face three critical problems: (1) volatile market prices that can change rapidly in short periods, (2) high costs of harvesting and post-harvest processing, and (3) weather conditions that can significantly reduce yields.

These issues underscore the need for careful planning and informed decision-making to ensure the sustainability and profitability of clove farming. According to Dilapanga et al. (2020), feasibility analysis provides a systematic framework for determining whether a farming enterprise can operate efficiently and generate acceptable returns. Commonly used financial criteria include the Revenue-Cost Ratio (R/C), Benefit-Cost Ratio (B/C), Net Present Value (NPV), Internal Rate of Return (IRR), and Payback Period (PP). For smallholder farmers, R/C and B/C ratios are especially valuable as they directly indicate whether the benefits outweigh the costs.

Given these conditions, this study aims to analyze the financial feasibility of clove farming in Lalonaha Village, Wolo District, Kolaka Regency. The findings are expected to assist farmers, policymakers, and stakeholders in formulating strategies to enhance productivity, profitability, and long-term sustainability in the clove farming sector.

2. Methodology

This study employed a descriptive quantitative approach (Harun Alrasyid, 2024) to evaluate the financial feasibility of clove farming in Lalonaha Village, Wolo District, Kolaka Regency. The research focused on a single variable farm business feasibility—measured through cost and revenue analysis, as well as profitability indicators. The study population consisted of all clove farmers in

Lalonaha Village, totaling 11 individuals, and due to the relatively small population size, a census method was applied, whereby the entire population was used as the research sample.

Primary data were collected through direct interviews with farmers using a structured questionnaire, alongside on-site observations to obtain detailed information on farm management practices, input use, and production levels. Secondary data were obtained from relevant government offices, including the village administration, the Wolo District Agricultural Office, and statistical reports from the Central Statistics Agency (BPS). Additional data were sourced from literature, previous research, and official publications related to clove production and marketing.

The variables measured in this study included fixed costs (such as land tax, depreciation of equipment, and permanent labor costs) and variable costs (including seeds, fertilizers, pesticides, and hired labor), total production volume, selling price, total revenue, and net profit. The financial feasibility of clove farming was analyzed using three main indicators: the Revenue-Cost Ratio (R/C), which compares total revenue to total costs; the Benefit-Cost Ratio (B/C), which compares net benefits to total costs; and the Profit-Loss (L/R) calculation, which measures the difference between total revenue and total costs. An R/C or B/C value greater than one indicates that the farming operation is financially viable, while a value equal to one suggests a break-even point, and a value below one indicates unprofitability.

Data analysis was carried out using quantitative descriptive methods, whereby the collected data were tabulated, calculated, and interpreted to describe the current economic conditions of clove farming in the study area. This methodological approach allowed for a straightforward yet comprehensive assessment of the profitability and sustainability of smallholder clove farming systems in Lalonaha Village.

3. Results and Discussion

The results of the financial feasibility analysis of clove farming in Lalonaha Village, Wolo District, Kolaka Regency, are presented below in thematic points.

Production Costs and Revenue Structure

The financial analysis revealed that the average annual total production cost per farmer was **IDR 3,125,000**, consisting of fixed costs (land tax, equipment depreciation, and permanent labor) and variable costs (seeds, fertilizers, pesticides, and seasonal labor for harvesting).

a. **Fixed costs** represented a relatively small proportion of total expenses, indicating that the majority of costs are flexible and related to seasonal farming activities.
b. **Variable costs** were dominated by labor for harvesting, as clove harvesting is labor-intensive. This aligns with findings from Halil &

Rahmawati (2020), who reported that in labor-intensive crops, harvesting costs often account for the largest share of variable expenses.

The average annual revenue per farmer reached **IDR 75,619,606**, derived from the total production volume multiplied by the average selling price at the time of harvest. This resulted in an **average net profit** of **IDR 72,494,606** per year, indicating high profitability. The large gap between total revenue and total cost demonstrates the strong return potential of clove farming in the region.

Revenue-Cost (R/C) Ratio Analysis

The R/C ratio was calculated at **23.19**, meaning that for every IDR 1 spent, farmers earned IDR 23.19 in gross revenue.

a. This value is far above the profitability threshold (>1), confirming that clove farming is economically viable.
b. The high ratio reflects both the relatively low production costs and favorable selling prices during the research period.
c. Similar high R/C ratios were also observed by Juslan (2022) in lime farming, where efficient cost management and optimal yield led to strong financial performance.

Benefit-Cost (B/C) Ratio Analysis

The B/C ratio stood at **22.19**, meaning that each IDR 1 of cost generated IDR 22.19 in net benefit.

a. This value strengthens the conclusion that clove farming is highly profitable under current market conditions.
b. A B/C ratio greater than one also indicates that farmers have the capacity to reinvest profits into farm improvements, such as better planting materials or pest control measures.

Profitability and Market Price Influence

The profitability of clove farming in Lalonaha is strongly influenced by market price fluctuations. As noted by Fahriyah (2023), clove prices can change rapidly within short periods due to changes in market demand, export volumes, and seasonal harvest patterns.

a. In years when prices drop significantly, the profitability margins can shrink, potentially falling below sustainable levels.
b. Farmers who time their sales to periods of high market prices—rather than selling immediately after harvest—tend to secure higher profits.

Comparative Analysis with Other Studies

a. The results are consistent with Dilapanga et al. (2020), who found that clove farming can deliver high returns when cost efficiency is maintained.
b. However, the current study's R/C and B/C ratios are notably higher than those reported in previous research, suggesting that local conditions

in Lalonaha—such as soil fertility, favorable climate, and proximity to markets—may provide additional advantages.

c. This aligns with Muhammad (2023), who emphasized that location-specific factors play a crucial role in determining farming profitability.

Challenges to Long-Term Sustainability

While the current profitability levels are high, several challenges could threaten long-term sustainability:

a. **Price Volatility** – Rapid changes in clove prices can cause uncertainty in income.
b. **Labor Shortages** – Harvest periods often face limited labor availability, increasing labor costs.
c. **Pest and Disease Risks** – Without adequate pest control, production levels could decline.
d. **Capital Constraints** – Many farmers lack access to affordable credit to invest in productivity-enhancing inputs.

Implications for Farmers and Policy Makers

a. **For Farmers:** Adoption of better financial planning and post-harvest handling techniques could stabilize income and maintain product quality.
b. **For Policy Makers:** Support through agricultural extension services, provision of subsidized inputs, and facilitation of farmer cooperatives could enhance collective bargaining power and market access.
c. **For Investors:** The high profitability indicators suggest potential for investment partnerships, particularly in post-harvest processing and marketing infrastructure.

Comparative Feasibility with Previous Studies

The findings of this study indicate that the financial feasibility of clove farming in Lalonaha Village shows a much higher level of profitability compared to similar studies conducted in other regions and on different commodities. The **R/C ratio of 23.19** and **B/C ratio of 22.19** obtained in this research reflect exceptionally high returns on investment. These figures are significantly higher than those reported by **Dilapanga et al. (2020)** for clove farming in North Sulawesi, which recorded an R/C ratio of only 4.12 and a B/C ratio of 3.12. This stark difference suggests that location-specific advantages, cost efficiency, and market access strategies play a substantial role in the superior performance of clove farming in Lalonaha.

When compared to the findings of **Juslan (2022)** on lime farming, which achieved an R/C ratio of 5.18 and a B/C ratio of 4.15, clove farming in Lalonaha still demonstrates far greater profitability. While lime is also considered a profitable perennial crop, its market price, yield per hectare, and higher input requirements contribute to lower profitability compared to clove.

Similarly, **Halil & Rahmawati (2020)** reported an R/C ratio of 2.45 and a B/C ratio of 1.45 for vannamei shrimp seed farming, indicating lower returns and higher vulnerability to input cost fluctuations. Even in staple crops such as paddy rice, **Wahyuningsih (2020)** found an R/C ratio of 1.85 and a B/C ratio below 1, implying that farmers often face difficulties in covering their total production costs.

These comparisons highlight the **competitive advantage** of clove farming in Lalonaha, especially in terms of relatively low production costs and favorable selling prices during the study period. However, as **Fahriyah (2023)** points out, such favorable conditions are not entirely stable due to the high volatility of clove prices, which can change significantly within a short time. Therefore, although the results indicate very high feasibility, market risks remain a critical factor for long-term planning.

In other words, the superior profitability of clove farming in Lalonaha during this research period can be considered **situational**, highly dependent on stable market conditions and controlled input costs. If any of these factors were to shift significantly—such as an increase in fertilizer prices or a drop in clove market prices—the feasibility indicators could decline to levels similar to or even below those reported in previous studies.

4. Conclusion

This study assessed the financial feasibility of clove farming in Lalonaha Village, Wolo District, Kolaka Regency, using a descriptive quantitative approach. The findings show that clove farming in the study area is highly profitable, with an average R/C ratio of 23.19, a B/C ratio of 22.19, and an average net profit of IDR 72,494,606 per farmer per year. These values are well above the profitability threshold, indicating that clove farming is economically viable and capable of generating substantial returns relative to production costs.

However, the sustainability of this profitability is challenged by fluctuating market prices, rising input costs, and seasonal labor shortages. Addressing these challenges will require improved access to agricultural inputs, better farm management practices, and effective marketing strategies to stabilize prices and maintain profit margins. The study recommends that policymakers and local stakeholders support farmers through agricultural extension services, access to affordable credit, and the development of farmer cooperatives to strengthen bargaining power in the market.

Future research could expand the scope by including other clove-producing regions in Southeast Sulawesi and conducting a sensitivity analysis to examine how changes in input costs and market prices impact profitability. Such insights would be valuable for designing policies aimed at ensuring the long-term sustainability of the clove farming sector.

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