

Analysis of Watermelon (*Citrullus vulgaris* Schard.) Farming Business in Amara Jaya Farmer Group in Binawidya District, Pekanbaru City

Analisis Usaha Tani Semangka (*Citrullus vulgaris* Schard.) pada Kelompok Tani Amara Jaya di Kecamatan Binawidya, Kota Pekanbaru

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ABSTRACT

This study analyses watermelon farming in the Amara Jaya Farmer Group in Binawidya District, Pekanbaru City, focusing on farmer characteristics, conformity of cultivation techniques with Good Agricultural Practices (GAP), as well as analysis of costs, revenues, and farming efficiency. Watermelon is a horticultural commodity that has the potential to increase income, but management efficiency is very important. This analytical descriptive research used a case study approach with in-depth interviews with five farmers and secondary data. Results showed an average total production cost of IDR 244,646,434 per hectare per growing season, with an average total revenue of IDR 119,833,333.40 per hectare. The average net income was IDR 125,296,100.00 per growing season. The R/C ratio of 0.184 indicates that the watermelon farm has not broken even and is still losing money, despite the gross profit margin per kilogram.

Keywords: Watermelon, Farming Efficiency, Good Agricultural Practices (GAP), Cost, Income

ABSTRAK

Penelitian ini menganalisis usaha tani semangka pada Kelompok Tani Amara Jaya di Kecamatan Binawidya, Kota Pekanbaru, berfokus pada karakteristik petani, kesesuaian teknik budidaya dengan Good Agricultural Practices (GAP), serta analisis biaya, penerimaan, dan efisiensi usaha tani. Semangka adalah komoditas hortikultura yang berpotensi meningkatkan pendapatan, namun efisiensi pengelolaan sangat penting. Penelitian deskriptif analitis ini menggunakan pendekatan studi kasus dengan wawancara mendalam terhadap 5 petani dan data sekunder. Hasil menunjukkan rata-rata total biaya produksi Rp 244.646.434 per hektar per musim tanam, dengan rata-rata total penerimaan Rp 119.833.333,40 per hektar. Pendapatan bersih rata-rata adalah Rp 125.296.100,00 per musim tanam. Rasio R/C sebesar 0,184 mengindikasikan bahwa usaha tani semangka ini belum mencapai titik impas dan masih merugi secara keseluruhan, meskipun terdapat margin keuntungan kotor per kilogram.

Kata Kunci: Semangka, Efisiensi Usahatani, *Good Agricultural Practices* (GAP), Biaya, Pendapatan

INTRODUCTION

Watermelon is a strategic commodity for improving farmer welfare and can be a reliable fruit to meet public demand because it can be cultivated year-round due to its relatively short growing season (Haryati et al., 2022). In Pekanbaru City, watermelon farming has shown considerable growth. Harvested areas increased from 336 hectares in 2022 to 548 ha in 2023, accompanied by a rise in production from 3,867 tons to 7,019 tons, and an increase in productivity from 11.51 tons/ha to 12.83 tons/ha (BPS, 2024). However, this growth isn't uniform across all regions. Binawidya District, for instance, experienced a decrease in harvested area and productivity, contrasting with Rumbai Barat and Rumbai Timur Districts, which showed positive trends.

The decline in productivity in Binawidya District is particularly evident in the Amara Jaya Farmer Group, which comprises 21 members and manages 153 ha with watermelon as its primary commodity. This raises concerns as watermelon is the group's main livelihood source. Factors contributing to the reduced yields include pest infestations and unpredictable weather (Wahyuni et al., 2022; Hidayah et al., 2021). Additionally, fluctuations in watermelon selling prices affect farmers' income, especially when harvest times don't align with high market prices.

According to Rezani et al. (2024), decreased productivity directly impacts farmers' income, necessitating an in-depth analysis of farming activities. Such evaluations should cover aspects like production costs, revenue, profit, and economic efficiency to determine the viability and profitability of watermelon cultivation (Rahmah et al., 2023). Furthermore, applying Good Agricultural Practices (GAP) is crucial for enhancing the efficiency and sustainability of watermelon farming. Implementing GAP can help identify cultivation practices that align with good agricultural standards and support yield improvement (Agustina & Suryanawati, 2019).

Thus, evaluating watermelon farming in the Amara Jaya Farmer Group is relevant for technical and managerial improvements and vital for supporting the sustainable development of horticultural agriculture. Based on the description above, the author is interested in researching watermelon farming activities in the Amara Jaya Farmer Group, which is experiencing a decline in productivity, ranging from cultivation techniques to an analysis of production costs, profits, and the feasibility of farming activities.

MATERIALS AND METHODS

This research on watermelon farming was conducted at the Amara Jaya Farmer Group, located in Binawidya District, Pekanbaru City. This location was purposively selected as it is a significant watermelon production center in the city, despite experiencing a decline in productivity over the past year. The study spans from May 2024 to January 2025, covering all stages from proposal development to the comprehensive examination. A purposive sampling technique was employed to deeply understand and evaluate the condition of watermelon farming, selecting respondents based on specific criteria aligned with the research objectives (Widiasmoro, 2019).

The study utilizes a descriptive analytical method with a case study approach. Samples were collected using purposive sampling, focusing on watermelon farmers who are members of the Amara Jaya Farmer Group (excluding independent farmers). A total of 5 watermelon farmer respondents were selected as the sample for this study. Primary data were gathered through in-depth interviews using structured questionnaires administered to Amara Jaya Farmer Group respondents. The collected data include respondent characteristics (gender, age, education level, farming experience, and number of dependents), land size and ownership status, cultivation techniques, use of production inputs (seeds, fertilizers, pesticides), tools and machinery, labor usage, detailed production costs, total production, and the selling price of watermelon per planting season. Secondary data were obtained from the Central Statistics Agency, literature reviews (books, scientific journals, and research reports), and relevant institutions, covering general geographical and topographical conditions of the research area, as well as demographic data (population, education levels, and livelihoods) in Binawidya District.

The data were analyzed using quantitative descriptive methods to address the research objectives. The analysis included calculations for: Production Cost (Total Cost, TC): Calculated using the formula $TC = TFC + TVC$, where TFC represents total fixed costs and TVC represents total variable costs. TVC is derived from the costs of seeds, fertilizers, pesticides, labor, and other miscellaneous expenses, while TFC includes land rent and equipment depreciation.

$$TC = \{(X1.PX1) + (X2.PX2) + (X3.PX3) + (X4) + (X5.PX5)\} + D$$

Where:

TC	=	Total Cost (IDR/plot/planting)
TFC	=	Total Fixed Cost (IDR /plot/planting)
TVC	=	Total Variable Cost (IDR /plot/planting)
X1	=	Quantity of Seed Used (Watermelon/plot)
PX1	=	Price of Seed (IDR /Watermelon)
X2	=	Quantity of Fertilizer Used (IDR /plot/planting)
PX2	=	Price of Fertilizer (IDR /kg)
X3	=	Quantity of Pesticide Used (Liter/plot/planting)
PX3	=	Price of Pesticide (IDR /Liter)
X4	=	Quantity of Labor Used (HOK/plot/planting)
PX4	=	Labor Wage (IDR /HOK)
X5	=	Quantity of Miscellaneous Expenses (HOK/plot/planting)
PX5	=	Miscellaneous Expenses (IDR /HOK)
D	=	Depreciation Value (IDR /Unit/planting)

Revenue (Total Revenue, TR): Calculated as the product of the total production (Y) and the selling price (Py). $TR = P_y \times Y$. Net income (π): Calculated as the difference between Total Revenue (TR) and Total Cost (TC). $\pi = TR - TC$

This analysis aims to evaluate the feasibility and profitability of watermelon farming over one production cycle (one planting season).

RESULT AND DISCUSSION

Watermelon farming in Binawidya District, Pekanbaru City, reflects promising horticultural potential, though it still faces various technical and cost efficiency challenges. The main production factors include land, seeds, fertilizers, pesticides, labor, and agricultural tools. The land farmers use varies in size, and proper management is a key determinant of efficiency and yield. Most seeds used are high-quality, seedless varieties (Amara F1), with a total usage reaching 3,010 packets or an average of 246 packets per hectare, and seed costs amounting to IDR52,130,000/ha. The use of quality seeds is not only determined by quantity but also by their effectiveness within a good production system.

Fertilization is carried out in two stages: basal fertilization and top dressing. Farmers use ZA as a basal fertilizer, while top dressing consists of NPK, TSP, KCL, and Glomer. Among all fertilizers used, NPK is the most dominant, at 124 kg or 45.64% of the total usage (as seen in Table 1), indicating farmers' priority for complete nutrient elements to support plant growth. Balanced fertilization has been proven to support optimal plant growth and increase farming efficiency (Apriyanti & Vaulina, 2023; Adan et al., 2025).

Table 1. Distribution of basal and top-dressing fertilizer use by watermelon farmers in Binawidya District, Pekanbaru City

No	Type of Fertilizer	Quantity (kg)	Percentage (%)
1	ZA	86,00	31,63%
2	TSP	28,60	10,52%
3	KCL	33,20	12,51%
4	NPK	124,00	45,64%
5	Glomer	37,00	11,98%
Quantity		308,80	100,00

Farmers use pesticides like Abenz, Revus, and Round Up for pest and disease control, with Abenz being the most dominant at 722 liters, or 51.42% of the total pesticide used. Pests such as thrips, aphids, and diseases like anthracnose are major concerns, leading to intensive control measures. However, pesticide use needs to be controlled to prevent resistance or harmful environmental impacts (Santosh & Harshavardhan, 2024; Sari et al., 2024). Labor is divided between family and external workers. Land preparation usually involves external labor due to the need for heavy machinery like tractors, while family members carry out most maintenance and harvesting activities. The average labor allocation reaches 280 Man-Days (HOK) per planting season, with time allocated for pollination, pruning, fruit thinning, and weed control. Cooperation (gotong-royong) remains a common practice during the harvest process.

Regarding production tools, most farmers still rely on manual tools like hoes, which are widely used in almost all cultivation stages. Each farmer, on average, owns two hoes and one other auxiliary tool such as a sprayer or lawnmower. These tools are acquired independently and are used repeatedly, so their depreciation is calculated as part of the fixed costs.

Table 2. Average watermelon production costs in Binawidya District, Pekanbaru City

Description	Amount (IDR)
Variable costs	
Seed cost	1.060.000
Fertilizer cost	388.100
Pesticide cost	515.000
Labor cost	10.000.000
Total variable costs	28.996.434
Total fixed costs	215.650.000
Total costs	244.646.434
Production (units)	9000
Gross revenue	278.000.000,00
Net income	125.296.100,00
Business efficiency	0,22

Based on Table 2, which presents the average production costs of watermelon in Binawidya District, Pekanbaru City, the total variable costs, including seeds, fertilizers, pesticides, and labor, amount to Rp 28,996,434. When added to the total fixed costs of IDR 215,650,000, this results in a total production cost of Rp 244,646,434 for producing 9,000 watermelons. From this production, a gross revenue of IDR 278,000,000 was obtained, which, after deducting total costs, yielded a net income of IDR 125,296,100, with a business efficiency (R/C Ratio) of 0.22. This is significantly lower compared to the findings of [Apriyanti \(2019\)](#), where watermelon farming in Kampar Kiri Hilir district was much more efficient and profitable per unit of cost incurred, with a business efficiency of 1.05.

In terms of production, the average yield per planting season is 39,977 kg. However, fluctuations in production yield occur due to changes in land area and the management of production factors. In 2022, a land area of 250.6 ha yielded 3,091.5 tons of watermelon, whereas in 2023, the land area decreased to 203 hectares with a production of 2,360.5 tons. This highlights the importance of optimal input management to maintain productivity even on a smaller land scale. Farm income is calculated based on [Soekartawi's \(2003\)](#) formula: production yield multiplied by the selling price per kilogram. With a total production of 278,000 kg and a selling price of IDR 5,000 /kg, the total gross income for all farmers is IDR 1,390,000,000. The gross income per hectare reached IDR 115,833,333.33, and the average per respondent was recorded at IDR 119,833,333.40. This difference indicates variations in productivity among farmers, highly dependent on their ability to manage production factors.

Generally, watermelon farming in Binawidya District shows high profit potential, but cost efficiency and quality of input management are crucial determinants of success. With improved management and the adoption of appropriate technology and cultivation practices, the productivity and income of watermelon farming can be significantly enhanced. Watermelon farming in Binawidya District shows promising economic potential, indicated by a relatively high net income compared to total production costs. Net income is the difference between gross income and total production costs, calculated based on [Soekartawi's \(2003\)](#) approach. In this study, the total net income obtained from five farmers reached IDR 626,480,500, with an average of IDR 125,296,100 per planting season. This income variation is influenced by the efficiency of input use and the harvest yield obtained by each farmer, with the highest income reaching IDR 194,790,000 and the lowest IDR 73,688,500.

To assess farming efficiency, the Return Cost Ratio (R/C Ratio) was used, which is the ratio of total revenue (TR) to total production costs (TC). The results indicate an average R/C Ratio of 1.86, meaning that every IDR 1 spent generates IDR 1.86 in revenue, or a net profit of IDR 0.86. This value generally suggests that watermelon farming is efficient and profitable. However, in another scenario, an R/C Ratio of 0.184 was found with a production of 9,000 kg and revenue of IDR 45,000,000 against costs of IDR 244,646,434, indicating that the farming operation incurred a loss, as every IDR 1 in costs only generated Rp 0.18 in return. This highlights that business success is highly dependent on cost management and the level of harvest yield.

The Break-Even Point (BEP) approach further supports the feasibility analysis, which shows the minimum production quantity or sales value required to cover total costs. In this study, with fixed costs of IDR 215,650,000, variable costs of IDR 28,996,434, and a selling price of IDR 5,000/kg, the BEP in units was 121,300 kg and the BEP in value was IDR 606,500,000. With actual production of only 9,000 kg and revenue of IDR 45,000,000, the enterprise has not reached its break-even point and is therefore not yet profitable. Farmers must significantly increase their production scale or reduce costs to avoid exceeding their income to achieve profitability.

Although watermelon farming has high profit potential, the analysis results indicate that success is strongly

influenced by efficiency in input use, cost management, and achievement of production targets. Therefore, more optimal management strategies are key to ensuring the sustainability and economic viability of watermelon farming in Binawidya District.

CONCLUSION

In conclusion, watermelon farming activities undertaken by farmers in the Amara Jaya Farmer Group in Binawidya District, Pekanbaru City, have followed good cultivation stages and largely comply with GAP guidelines. Farmers in this group are generally within the productive age range, possess adequate experience, but are predominantly characterized by a basic education level. The farm business analysis reveals that total variable costs are IDR 28,996,434, while total fixed costs are IDR 215,650,000. The average selling price by farmers is Rp 5,000/kg, and the watermelon farm's production per harvest is 9,000 kg. The gross income per kg is IDR 1,778, with harvesting costs at IDR 1,781. The feasibility analysis indicates that the R/C ratio with 9,000 kg production is still far below the Break-Even Point (BEP). This means the farming operation has not reached its break-even point and is still incurring an overall loss, despite a gross profit margin per kilogram.

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