



**CARROT FARMING (*DAUCUS CAROTA L.*) AT PT FUJITAKE SHOUTEN CO., LTD.,
NAGASAKI PREFECTURE, JAPAN**

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ABSTRACT

This study analyzes the production system and economic feasibility of carrot farming (*Daucus carota L.*) at PT Fujitake Shouten Co., Ltd., Nagasaki Prefecture, Japan. A descriptive quantitative approach was applied using observation, interviews, and documentation. The production system includes land preparation, planting, maintenance, harvesting, and post-harvest handling across two production cycles per year. The results show that annual production ranges from 300,000 to 400,000 kg. The total production cost is IDR 400,000,000 per year, while total revenue reaches IDR 500,000,000. The net income obtained is IDR 100,000,000 per year. The R/C ratio of 1.25 indicates that the farming system is economically feasible, as revenue exceeds total costs. The B/C ratio of 0.25 reflects moderate efficiency influenced by multi-activity farm operations and post-harvest processes such as sorting and packaging. Overall, the study concludes that efficient input management and a well-structured production system are essential to maintain farm sustainability and economic performance.

Keyword: Carrot farming, feasibility, Income, Production.

INTRODUCTION

Carrots (*Daucus carota L.*) are one of the horticultural commodities that have important economic value in the modern agricultural system. In Japan, the agricultural sector is thriving with a high-tech approaches, production efficiency, and strict quality standards. This condition requires an organized cultivation system to be able to maintain production stability while meeting quality-oriented market demand. Several previous studies have shown that the performance of agricultural businesses is influenced by the management of production factors, cost efficiency, and income structure in farming activities. These studies are generally mostly conducted on the scale of smallholders in developing countries, especially Indonesia, with a focus on analyzing the costs, revenues, and profits of horticultural farming. The results of the study confirm that the efficiency of the use of production inputs is the main factor in determining the level of business profitability. However, studies on horticultural cultivation systems on a corporate scale in developed countries such as Japan are still relatively limited. In addition, research that integrates production process analysis with economic feasibility evaluation in horticultural agribusiness companies has not been carried out specifically. This

shows that there is a research gap in understanding the modern company-based agricultural system that has a more complex production structure. The novelty of this research lies in the analysis of the carrot cultivation system at PT Fujitake Shouten Co., Ltd. in Nagasaki Prefecture, Japan, which not only describes the production process, but also evaluates the economic feasibility of the business through the R/C Ratio and B/C Ratio approaches in the context of a modern company-based agricultural system. Based on this description, this study aims to analyze the production system of carrot farming and evaluate the economic feasibility of the business in PT Fujitake Shouten Co., Ltd., Nagasaki Prefecture, Japan.

MATERIALS AND METHODS

Research location

This research was conducted at PT Fujitake Shouten Co., Ltd., Isahaya-shi, Prefecture Nagasaki, Japan.

Research methods

This study used descriptive quantitative approach with a case study design. This method was applied to describe the actual condition of carrot farming production and to analyze its economic feasibility based on numerical data obtained from the field.

Data collection

Data used in this study consisted of primary and secondary data. Primary data were obtained through direct observation and interviews with company management. Secondary data were collected from company records related to production activities, production costs, and business outcomes of carrot farming.

Data analysis

Data analysis was conducted to determine production costs, revenue, income, and business feasibility of carrot farming. The analytical tools used in this study are as follows:

Total Cost (TC) is the total cost consisting of fixed and variable cost:

$$TC = FC + VC \text{ (Soekartawi, 2006).}$$

Total Revenue (TR) is calculated by multiplying production output with selling price:

$$TR = Y \times P_y \text{ (Suratiah, 2015).}$$

Income (π) is obtained from the difference between total revenue and total cost:

$$\pi = TR - TC \text{ (Soekartawi, 2006).}$$

R/C Ratio is used to measure business feasibility:

$$R/C = TR \div TC \text{ (Soekartawi, 2006).}$$

B/C Ratio is used to measure profit efficiency:

$$B/C = \pi \div TC \text{ (Suratiah, 2015).}$$

RESULTS AND DISCUSSION

Production system

Carrot cultivation at PT Fujitake Shouten Co., Ltd. is organized through a well-structured production cycle that includes land preparation, planting, crop maintenance, harvesting, and post-harvest handling. The production activities are scheduled in two planting periods each year to adjust with seasonal conditions in Nagasaki, Japan. This system is implemented to maintain production continuity and ensure consistent product quality.

Similar production structures have been reported in modern horticultural systems where organized farm management contributes to operational stability and quality control (Hartati, irda Fidrianny, 2023; Kawasaki *et al.*, 2023).

Production performance

The farming operation produces approximately 300,000–400,000 kg of carrots annually. This output reflects relatively stable production performance supported by efficient land utilization and input allocation.

Previous studies indicate that production levels in vegetable farming are strongly influenced by the effectiveness of resource management, particularly land, labor, and capital utilization (Di *et al.*, 2020; Simatupang *et al.*, 2024). The stability observed in this study suggests that operational efficiency is adequately maintained.

Distribution and pricing system

Carrots are distributed in standardized 10 kg packaging units and sold at varying prices depending on quality grading, ranging from IDR 103,000 to IDR 206,000 per pack. The pricing system follows product classification standards that ensure consistency in market valuation. Quality-based pricing mechanisms in agricultural commodities have been shown to significantly influence market acceptance and consumer preference (Idris *et al.*, 2025).

Cost composition

Annual production costs reach approximately IDR 400,000,000, covering two production cycles. These costs include labor, agricultural inputs, operational activities, and supporting production services. In agribusiness systems, cost structure is generally divided into fixed and variable components that determine overall farm efficiency and financial sustainability (Rahim, Supardi, & Hastuti, 2012).

Income overview

The total revenue generated from carrot farming is estimated at IDR 500,000,000 per year, resulting in a net income of around IDR 100,000,000. This indicates that the farming activity remains financially viable despite moderate profit margins. Fluctuations in agricultural income are commonly associated with production conditions, market dynamics, and post-harvest handling efficiency (Moteagaonkar *et al.*, 2024).

CONCLUSION

Carrot farming at PT Fujitake Shouten Co., Ltd. demonstrates a structured and efficient production system supported by seasonal cultivation management and organized operational practices. The production system is able to maintain stable output levels ranging from 300,000 to 400,000 kg per year, indicating consistent farm performance under controlled agricultural conditions in Nagasaki, Japan.

From an economic perspective, the total production cost reaches IDR 400,000,000 per year with total revenue of IDR 500,000,000, resulting in a net income of IDR 100,000,000 annually. The R/C ratio of 1.25 indicates that the farming activity is economically feasible and generates revenue higher than production costs.

However, the B/C ratio reflects moderate efficiency due to the diversified operational structure of the company, where resources are allocated across multiple agricultural activities. Overall, carrot farming in the study area remains profitable and sustainable under the current production and management system.

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TABLES

Tabel 1. Land Area Distribution

Location	Area (ha)
Kantaku	4.00
Shimabara	4.00
limorichou	2.60
Others	3.00
Total	10.60

Explanation: The table show that kantaku and shimabara are the main production areas.

Tabel 2. Variable Cost

Component	Value (IDR/year)
Total Cost	400,000,000/year
Variable Cost	Included In total cost
Fixed Cost	Not separately reported
Total Cost	400,000,000 IDR

Explanation: Production cost at PT Fujitake Shouten Co., Ltd. is presented in aggregate form based on company data. The cost consists of all operational expenses during carrot cultivation, including labor, inputs, and field activities. Detailed separation between fixed cost and variable cost is not provided by the company.

The total production cost is IDR 200,000,000 per planting season and IDR 400,000,000 per year (two seasons).

Tabel 3. Profitability Analysis Of Carrot Farming

Indicator	Value
Total Production Cost (TC)	400,000,000 IDR/year
Total Revenue (TR)	500,000,000 IDR/year
Net Income (π)	100,000,000 IDR/year
R/C Ratio	1.25
B/C Ratio	0.25

Explanation: The profitability analysis shows that carrot farming at PT Fujitake Shouten Co., Ltd. generates a total revenue of IDR 500,000,000 per year with a total production cost of IDR 400,000,000.



This results in a net income of IDR 100,000,000 annually. The R/C ratio of 1.25 indicates that the farming activity is economically feasible, as revenue is higher than production costs. Meanwhile, the B/C ratio of 0.25 reflects moderate profit efficiency due to the diversified agricultural operations within the company.