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ANALYSIS OF TOMATO FARMING INCOME IN KARO REGENCY, NORTH SUMATRA

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Abstract

This study aims to analyze the production costs, revenues, and income of tomato farming in Karo Regency, North Sumatra. This study used a survey method with a quantitative descriptive approach. The sample was determined using a saturated sampling method, with all 20 tomato farmers as respondents. The data used consisted of primary data obtained through interviews using questionnaires and secondary data from relevant agencies. Data analysis was conducted using cost, revenue, and farm income analysis. The results showed that the average total production cost of tomato farming was IDR 2,680,655 per planting season, consisting of fixed costs of IDR 733,605 and variable costs of IDR 1,947,050. The average income received by farmers was IDR 21,401,100, while the average revenue was IDR 18,720,445 per planting season. The R/C ratio of 8.01 indicates that tomato farming in Karo Regency is very feasible and profitable to develop. Thus, tomato farming in Karo Regency has good prospects for increasing farmer income. However, farmers still face challenges such as price fluctuations and high production costs, necessitating increased efficiency in the use of production factors and policy support from the local government to improve farmer welfare.

Keywords *: tomato farming, production costs, income, Karo Regency*

INTRODUCTION

Indonesia is an agricultural country with enormous potential for natural resources, particularly in the agricultural sector. This sector plays a strategic role in national economic development as it provides food, absorbs labor, and provides income for the majority of rural communities. Furthermore, the agricultural sector contributes to increasing foreign exchange through the export of agricultural commodities (Mardikanto, 2007). Indonesia's agroclimatic conditions, supported by adequate rainfall, relatively stable temperatures, and sufficient sunlight throughout the year, provide this sector with significant potential for sustainable development. In an effort to increase farmer productivity and welfare, agricultural development is carried out through various strategies, such as intensification, extensification, diversification, and agricultural land rehabilitation. These strategies aim to increase production output in terms of both quantity and quality, thereby meeting domestic demand and increasing the competitiveness of agricultural products in the global market (Soekartawi, 2006). However, the success of agricultural development is inseparable from the ability of farmers to manage their farms efficiently and profitably.

One agricultural subsector with bright prospects for development is horticulture, particularly vegetables. Horticultural commodities have high economic value and relatively stable market demand. One vegetable commodity with significant potential is the tomato. Tomatoes are a horticultural crop widely demanded by the public, both for household consumption and as a raw material for the food industry. Furthermore, tomatoes have a high nutritional content, so demand tends to increase in line with increasing public awareness of the importance of healthy eating (Cahyono, 2008). Tomato plants have a wide range of adaptability, allowing them to be cultivated in a variety of agro-ecological conditions, both in the highlands and lowlands. This presents an opportunity for farmers in various regions to develop tomato farming as a source of income (Purwati & Khairunisa, 2007). However, tomato cultivation also carries a high level of risk, particularly related to pest and disease attacks, as well as frequent price fluctuations in the market (Hidayati & Dermawan, 2012). Karo Regency, North Sumatra, is one of the regions with significant potential for developing horticultural commodities, including tomatoes. This highland region, with relatively cool

temperatures and fertile soil, is highly conducive to tomato growth. Furthermore, the majority of Karo Regency residents depend on agriculture for their livelihoods, making tomato farming a viable option for increasing farmer incomes and the regional economy. However, in practice, tomato farming in Karo Regency still faces various challenges. One major issue is the suboptimal use of production factors such as seeds, fertilizers, labor, and pesticides. Farmers often use pesticides in doses that do not comply with recommended dosages, which not only increases production costs but can also negatively impact the environment and health (Hidayati & Dermawan, 2012). Furthermore, limited access to modern agricultural technology and market information also hinders increased productivity and farm efficiency. On the other hand, tomatoes are a perishable commodity, requiring proper post-harvest handling. Limited storage and distribution facilities often force farmers to sell their crops at relatively low prices. High market price fluctuations also significantly impact farmers' income levels. When prices fall while production costs remain high, farmers' profits are suboptimal (Arief, 2009).

Farm income is a key indicator in assessing the success of an agricultural enterprise. Income is derived from the difference between total revenue and total costs incurred during the production process (Soekartawi, 2006). Therefore, analyzing tomato farm income is crucial to determine the level of profitability and the efficiency of farmers' use of production factors. This analysis can also provide an overview of business feasibility and serve as a basis for farmers' decision-making in managing their farms more effectively. Based on this description, research on the analysis of tomato farming income in Karo Regency, North Sumatra, is relevant. This research is expected to provide comprehensive information on the cost structure, revenue, and income levels of tomato farmers. Furthermore, the results are expected to serve as a consideration for the local government and relevant parties in formulating policies that support the development of the horticultural sector, particularly tomatoes in Karo Regency. In line with this, this study aims to analyze the production costs and income of tomato farming in Karo Regency, North Sumatra.

RESEARCH METHODS

Location and Time of Research

This research was conducted in Karo Regency, North Sumatra Province , a horticultural center, particularly for tomatoes. The location was selected purposively, considering the region's significant potential for tomato farming. The research was planned to last one growing season, encompassing data collection, processing, and report preparation.

Data Types and Sources

The data used in this study consists of primary data and secondary data .

1. Primary data was obtained directly from respondents through interviews using a structured questionnaire. This data included information on production costs, production volume, selling prices, and farmer characteristics.
2. Secondary data was obtained from relevant agencies such as the Central Statistics Agency (BPS), the Department of Agriculture, and other sources relevant to this research. Secondary data was used to support the analysis and discussion.

Population and Sample

The population in this study was all tomato farmers in the research location in Karo Regency. The sampling method used was census sampling , where all members of the population were used as samples. The number of respondents in this study was 20 tomato farmers , who were considered representative of the tomato farming conditions in the research area.

Data collection technique

Data collection techniques in this study were carried out through:

1. Observation , namely direct observation of tomato farming activities in the field.
2. Interviews , namely collecting data through direct questions and answers with farmers using questionnaires.
3. Documentation , namely collecting data from documents or reports related to the research.

Data Analysis Techniques

The data analysis used in this study includes cost analysis, revenue analysis, and tomato farming income analysis. The results are presented in tabular form and explained descriptively.

Cost Analysis

Cost analysis is used to calculate the total production costs incurred by farmers in a single growing season. Total costs are the sum of fixed and variable costs, which is formulated as follows:

TC = TFC + TVC

Information:

- TC = Total Cost (Rp)
- TFC = Total Fixed Cost (Rp)
- TVC = Total Variable Cost (Rp)

Acceptance Analysis

Farm business income is calculated based on the result of multiplying the production quantity by the selling price of the product, using the formula:

TR = P × Q

Information:

- TR = Total Revenue (Rp)
- P = Selling price (Rp)
- Q = Quantity of production

Revenue Analysis

Farm income is calculated as the difference between total revenue and total production costs, which is formulated as follows:

$$I = TR - TC$$

Information:

- I = Income (Rp)
- TR = Total Revenue (Rp)
- TC = Total Cost (Rp)

RESULTS AND DISCUSSION

Results

Analysis of Tomato Farming Income in Karo Regency, North Sumatra

1. Analysis of Tomato Farming Costs

Production costs in tomato farming consist of fixed costs and variable costs calculated over one planting season (±5 months).

Fixed Costs

Fixed costs are costs that are not affected by production volume. Fixed cost components in tomato farming include equipment depreciation and other costs.

Table 1. Depreciation Value of Tomato Farming Tools and Materials in Karo Regency

Types of Tools	Average Cost (Rp)	Percentage (%)
Hoe	5,510	83.42
Bucket	1,095	16.58
Amount	**6,605**	**100.00**

Source: Processed data, 202

Based on the table above, the largest depreciation cost comes from the use of hoes, while the smallest contribution comes from buckets.

Table 2. Types of Fixed Costs of Tomato Farming in Karo Regency

Fixed Costs	Average (Rp)	Percentage (%)
Equipment Depreciation	6,605	0.90
Other Fees	727,000	99.10
Amount	**733,605**	**100.00**

Source: Processed data, 2022

The table shows that most of the fixed costs come from other cost components.

Variable Costs

Variable costs are costs that change according to the level of production.

Table 3. Variable Costs of Tomato Farming in Karo Regency

Cost Description	Average (Rp)	Percentage (%)
Seed	591,500	30.38
Fertilizer	165,300	8.49
Pesticide	40,250	2.07
Mulch	1,075,000	55.21
Transportation	75,000	3.85
Amount	**1,947,050**	**100.00**

Source: Processed data, 2022

From the table above, it can be seen that the largest cost is in the use of mulch, which shows the high need for land processing.

Total Cost

Total costs are the sum of fixed costs and variable costs.

Table 4. Total Cost of Tomato Farming in Karo Regency

Description	Average (Rp)	Percentage (%)
Fixed Costs	733,605	27.37
Variable Costs	1,947,050	72.63
Amount	**2,680,655**	**100.00**

Source: Processed data, 2022

Variable costs dominate the production cost structure, which shows that the use of production inputs greatly determines farming costs.

2. Analysis of Tomato Farming Income

Farm income is obtained from the difference between revenue and total production costs.

Table 5. Tomato Farming Income in Karo Regency

No	Description	Total (Rp)	Average (Rp)
1	Reception	428,022,000	21,401,100
2	Total cost	53,613,100	2,680,655
3	Income	374,408,900	18,720,445
	R/C Ratio		**8.01**

Source: Processed data, 2022

Based on the table above, the average income for tomato farmers is Rp 18,720,445 per planting season. The R/C ratio of 8.01 indicates that tomato farming is highly feasible and profitable.

Discussion

The analysis shows that tomato farming in Karo Regency provides quite high profits for farmers. This high income is influenced by farmers' ability to efficiently manage production factors and favorable agro-climatic conditions. A cost structure dominated by variable costs demonstrates the importance of managing production inputs, particularly the use of mulch and seeds. Efficient use of these inputs can significantly increase farmer profits. Furthermore, the high R/C ratio indicates that tomato farming has good prospects for development as a leading horticultural commodity in Karo Regency. However, farmers still face challenges such as price fluctuations and high production costs, necessitating policy support from the local government to improve farmer welfare.

CONCLUSION

Based on the results of research on the Analysis of Tomato Farming Income in Karo Regency, North Sumatra, the following conclusions can be drawn:

1. The cost structure of tomato farming consists of fixed and variable costs. The average total production cost incurred by farmers is Rp 2,680,655 per growing season, with variable costs predominating over fixed costs. This indicates that the use of production inputs such as seeds, fertilizer, and mulch significantly impacts farming costs.
2. The average income earned by tomato farmers is IDR 21,401,100 per planting season, which comes from the sale of tomato production.
3. The average net income obtained by farmers is IDR 18,720,445 per planting season, which shows that tomato farming in Karo Regency provides quite high profits for farmers.
4. The R/C ratio was 8.01, meaning that every Rp 1 spent generated Rp 8.01 in revenue. This indicates that tomato farming in the research area is highly feasible and profitable to develop.

SUGGESTION

Based on the results of the research that has been conducted, the following suggestions can be given:

1. For Farmers: Farmers are expected to increase the efficiency of their use of production factors, particularly in the use of seeds, fertilizers, and mulch, to reduce production costs without reducing yields. Furthermore, farmers need to ensure pesticide use is consistent with recommended dosages to maintain crop quality and environmental health.
2. For Regional Governments: Regional governments are expected to provide support in the form of outreach, training, and production facility assistance to tomato farmers. Furthermore, policies are needed to maintain stable tomato prices in the market to protect farmers' incomes from adverse price fluctuations.
3. For Further Researchers: Further research is recommended to further examine the factors that influence tomato farming production and income using more complex analysis methods, such as regression, so that it can provide more comprehensive results.

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