Received: July 16, 2024
Revised: August 12, 2024
Accepted: August 15, 2024

*Corresponding author: Ryan Suwandih, Department of Economics and Development Studies, Faculty of Economics and Business, Universitas Tadulako, Central of Sulawesi, Indonesia.

E-mail: andyryannnn@gmail.com

DESCRIPTIVE OF QUANTITATIVE DATA | SUPPLEMENTARY

Income Analysis of Tomato Farming in Wuasa Village, North Lore Sub-District, Poso District

Ryan Suwandih[1] , Failur Rahman[2]

[1,2] Department of Economics and Development Study, Faculty of Economic and Business, Universitas Tadulako, Central of Sulawesi, Indonesia. Email: andyryannnn@gmail.com[1], myfaiels@gmail.com

Abstract: Tomato *(lycopersicum esculetum)*, is a horticultural commodity from the group of annual tomato fruit types that can be planted in lowlands or highlands. This fruit is a source of vitamins A and C. The purpose of this study was to analyze the income of tomato farming businesses in Wuasa Village, North Lore District, Poso Regency. The method used is data collection techniques by means of observation and interviews with tomato farmers. The data source for this study is primary data. Based on the results of research in Wuasa Village, North Lore District, Poso Regency from farming respondents, the following conclusions were obtained: The income or profit of tomato farmer 1, Mr. Mujito, was Rp16,125,000. While tomato farmer 2, Mr. Rizal, got income and profit of Rp59,500,000. And tomato farmer 3 got income and profit of Rp38,000,000.

Keywords: Lycopersicum Esculetum, Income, Farming Business.

1. INTRODUCTION

The agricultural sector plays a crucial role in Indonesia, as it has the capacity to create job opportunities, provide food, and contribute to foreign exchange earnings. Given Indonesia's status as an agrarian country, where the majority of the population is engaged in farming, the agricultural sector has significant potential and prospects for growth. Therefore, it is imperative for both the government and society to actively promote agricultural activities to enhance the nation's economy, living standards, and overall well-being of the Indonesian people (Bongkang et al., 2019). The agricultural sector supports Indonesia's national economy through its subsectors, including food crops, plantations, and horticulture. Therefore, it is essential to support the development of the agricultural sector to seize greater opportunities. With its tropical climate, Indonesia has the potential to capitalize on opportunities in the field of horticulture, especially with the vast lands available in North Sumatra. Horticulture holds a crucial position as a valuable commercial product, given its high economic value and strategic role in meeting societal needs (Sitanggang, 2020).

Tomatoes (Lycopersicum esculentum), a horticultural commodity, can thrive in both lowland and highland areas. They are rich in vitamins A and C (Patricia, 2019). Tomatoes are an agricultural crop with high economic value and numerous uses across various industries, such as the production of jams, chili sauce, tomato sauce, tomato paste, beverages, herbal medicines, and cosmetics (Luntungan, 2020). Tomato prices in the market tend to increase when production is low and decrease when production is abundant. Tomatoes have a promising development potential due to their widespread use in society. Given the extensive utilization of tomatoes, this commodity holds high economic value and potential for further development (Nuryahati, 2018). Horticultural crops play a vital role in both societal life and the national economy. In the context of daily life, horticultural crops serve as a source

of nutrition, while economically, they contribute significantly to the country's resources (Patricia, 2019). Since horticultural commodities, such as tomatoes, are part of daily consumption, it is crucial to further develop this sector, considering its significant economic value.

Central Sulawesi, particularly in Wuasa Village, Lore Utara District, is one of the primary tomato-producing areas, where the majority of the village's residents work as tomato farmers. Fluctuations in tomato prices can affect farmers' incomes due to the significant production costs involved. These price variations impact farming activities, especially in terms of production factors, which in turn affect farmers' incomes. Effective management of resources such as land, capital, and labor is essential to avoid overuse, which can harm farmers and reduce production levels (Sridianto, 2019). There are approximately 178 tomato farmers in Wuasa Village, Lore Utara District, Poso Regency. Field findings indicate that Wuasa Village, Lore Utara District, Poso Regency, is a village where many farmers engage in tomato farming as their livelihood, with varying land sizes. The majority of tomato farmers in this village own their land. Owning land allows farmers to employ labor in managing tomato crops. In January 2023, tomato prices surged to IDR 20,000 per kg, but at the beginning of February, prices dropped to IDR 7,500 to IDR 5,000 per kg. These fluctuations in tomato prices lead to instability in the income of tomato farmers. Based on the explanation above, the purpose of this study is to analyze the income of tomato farming businesses in Wuasa Village, Lore Utara District, Poso Regency.

2. LITERATURE REVIEW

2.1 Farm Income

Farm income refers to the monetary or economic value obtained from agricultural activities or farming enterprises. This income includes all the revenues generated by farmers from their agricultural production. Farm income can come from various sources, including the sale of agricultural products, agricultural services, and other income streams related to farming activities (Barkah and Masdari, 2022). The level of farm income is heavily dependent on factors such as productivity, market prices, weather conditions, and other influences affecting the agricultural sector. Effective monitoring and management of these aspects are crucial for increasing farm income.

2.2 Costs of Tomato Farming

Tomatoes are a high-value agricultural commodity, but their cultivation also comes with a relatively high risk of failure. One of the primary challenges in tomato cultivation today is the decline in quality. Optimal tomato production quality largely depends on proper soil and seed management, as tomatoes require special care and attention. Tomatoes are not only used for household needs but also have applications in the culinary, food, and pharmaceutical industries (Cahyono B., 2017). In the production process, tomato farmers must incur necessary expenses to ensure smooth operations. Costs represent the sacrifices made, measured in specific units, to achieve certain objectives. These costs include the sacrifice of both physical and non-physical economic resources, measured in monetary terms, whether already incurred or anticipated. Production costs refer to the expenses incurred in transforming raw materials into finished products ready for sale. These are measurable expenditures made in the present to achieve future goals and can be seen as current sacrifices for future gains (Wameto, 2023). The Exponential Production Function (Cobb-Douglas) is a specific type of production function typically used to describe the relationship between inputs and outputs. The Cobb-Douglas production function involves two or more variables, with the dependent variable denoted as Y and the independent variables as X. The relationship between Y and X can be analyzed through regression, where variations in Y are influenced by variations in X. Therefore, the principles

of the regression line also apply to the Cobb-Douglas function. This exponential production function can vary depending on the characteristics of the available data, but it is generally expressed in Equation form (1) as follows: Y = axb. Mathematically, the Cobb-Douglas function can be written in equation (2) as: Y = aX1^b1 X2^b2 ... Xi^bi ... Xn^bn e^n. When the Cobb-Douglas function is expressed in terms of the relationship between Y and X, it can be represented by equation (3) Y = f(X1, X2, ...Xi,...Xn), where: Y = dependent variable, X = independent variable, a and b = parameters to be estimated, u = disturbance term, and e = the natural logarithm number, with e = 2.718.

Listiani, Setiyadi, and Santoso (2019) conducted a study titled "Analysis of Income from Rice Farming in Mlonggo District, Jepara Regency." The study aimed to identify and analyze the income from rice farming and the production factors affecting it in Mlonggo District, Jepara Regency. The research used a survey method with interviews conducted using a questionnaire. A total of 100 farmers were selected using the Slovin method from 8 villages in Mlonggo District. The sample was determined using Accidental Sampling, where the researchers directly approached farmers in the fields. The study results showed an average rice production of 1,947 kg per half hectare per planting season. The average production cost incurred by farmers was Rp7,529,623 per half hectare, with an average income of Rp16,454,048 per half hectare, resulting in an average net income of Rp8,924,425 per half hectare per planting season. The average monthly income was Rp1,487,404, which is lower than the regional minimum wage (UMR) of Jepara Regency, set at Rp1,600,000. Factors affecting rice farmers' income included pesticide costs (X1) and land costs (X5), while fertilizer costs (X2), seed costs, and labor costs (X4) did not significantly impact income in Mlonggo District, Jepara Regency.

Mooduto, Boekoesoe, and Bakari (2020) in their study "Income Analysis of Clove Farming in Iloheluma Village, Mongondow Selatan District," aimed to identify the costs involved in clove cultivation and calculate the revenue and income generated from clove farming in the village. The research employed a survey method, collecting empirical data through questionnaires, interviews, and field observations. The sampling technique used was simple random sampling, where samples were randomly selected from the population without considering population strata. The study used primary and secondary data, and analysis was conducted using a descriptive approach. The findings showed that the costs of clove farming in Iloheluma Village included fixed costs such as land taxes and equipment depreciation, with an average fixed cost per farmer of Rp67,905. Variable costs included expenses for medications and non-family labor wages, with an average total variable cost per farmer of Rp26,671,670. Additionally, the average income from clove farming in Iloheluma Village was Rp44,782,206.

Fadhilah and Rochdiani (2021) conducted a study titled “Income Analysis of Mangosteen Farming in Simpang Sugiran Village, Guguak District, Lima Puluh Kota Regency.” The study found that mangosteen cultivation faced challenges such as inefficiencies in production factor use and export barriers due to the COVID-19 pandemic, which led to decreased income for mangosteen farmers. The study aimed to evaluate the income from mangosteen farming in the village. The research used a survey method with a quantitative approach. The analysis showed that the average income from mangosteen farming in Simpang Sugiran Village reached Rp1,508,207 per tree. Furthermore, the R/C ratio analysis showed a value of 5.92, indicating significant profitability in mangosteen farming in the village.

3. RESEARCH DESIGN AND METHOD

This study aims to gather comprehensive and in-depth information on the income analysis of tomato farming in Wuasa Village, Lore Utara District, Poso Regency. To achieve this, a descriptive qualitative approach is employed, which seeks to understand the phenomena experienced by the research subjects. The research was conducted throughout February 2024, covering the entire process

from data collection to the preparation of the research report. The location of the study is Wuasa Village, Lore Utara District, Poso Regency. The data analysis in this study uses income and revenue analysis methods.

1. **Income Calculation (Suratiyah, 2015):** Income (π) is determined as the difference between total revenue (TR) and total cost (TC). The formula is:

$$\pi = TR - TC$$

Where:
π: Profit
TR: Total Revenue
TC: Total Cost

2. **Total Cost Calculation (Suratiyah, 2015):** The total cost (TC) is calculated by summing fixed costs (TFC) and variable costs (TVC) using the formula:

$$TC = TFC + TVC$$

Where:
TC: Total Cost
TFC: Total Fixed Cost
TVC: Total Variable Cost

3. **Total Revenue Calculation (Suratiyah, 2015):** Total revenue (TR) is calculated by multiplying the quantity of production (Q) by the selling price (P). The formula is:

$$TR = P \times QTR = P \times Q$$

Where:
TR: Total Revenue
Q: Quantity of Production
P: Price of Production

4. RESULT AND DISCUSSION

This research uses the method of interview results with several respondents. The results that researchers get from the interviews, namely:

a) Respondent 1 Identity

Name	: Rizal
Age	: 38 Years
Education Level	: High School
Family Dependents	: Family and Children
Land Status	: Owned

Mujito shared, "My name is Mujito, I am 60 years old, and my highest level of education is junior high school. I live alone and rent the land for my tomato farming, which is my only source of income. The land I cultivate is about one-third of a hectare. In each harvest, I use 3,000 plants and 150 kg of NPK fertilizer. Thankfully, there are no taxes imposed on farming here. My workforce consists of 5 to 10 people, whom I pay between Rp80,000 and Rp100,000 per day. There are no additional costs for each production cycle, and the tools I use include stakes and

seeds. The variable costs are Rp750,000 for 3,000 seeds and Rp17,500 per kg for NPK fertilizer. Besides these variable costs, I also incur expenses for labor. On average, I harvest 4.5 tons of tomatoes per season. The price of tomatoes per kilogram ranges from Rp5,000 to Rp8,000, and I sell the produce to wholesalers. I have been farming tomatoes for two years."

b) Respondent 2 Identity

Name	: Rizal
Age	: 38 Years
Education Level	: High School
Family Dependents	: Family and Children
Land Status	: Owned

Rizal stated, "I am 38 years old and completed my education at the high school level. I support my wife and children, and the land I farm is my own. My income comes from farming tomatoes and vegetables. I have one hectare of land and use 10,000 plants per harvest. I use 300 kg of NPK fertilizer, and there are no taxes on farming here. I employ between 5 to 10 workers, paying them Rp100,000 per day. My variable costs include 10,000 seeds costing Rp2,500,000 and NPK fertilizer at Rp15,000 per kg, along with additional labor costs. On average, I produce 15 tons of tomatoes per harvest, which I sell to traders in Dongi-dongi for around Rp5,000 per kg. I have been farming for nine years."

c) Respondent 3 Identity
Name: Lince
Age: 53 Years
Education Level: Junior High School
Family Dependents: Family and Children
Land Status: Owned

Lince explained, "I am 53 years old and my highest education level is junior high school. I support my children, and I own the land where I farm and also sell cakes. I have half a hectare of land, where I plant 6,000 tomato plants per harvest. I use 200 kg of NPK fertilizer and there are no taxes on farming here. I employ between 5 to 10 workers, paying them Rp100,000 per day. My variable costs include 6,000 seeds costing Rp1,500,000 and NPK fertilizer at Rp16,000 per kg, along with additional labor costs. On average, I harvest 10 tons of tomatoes per season, which I sell to traders in Palolo District for Rp6,000 per kg. I have been in this business for seven years."

4.1 Input Usage and Financial Analysis of Tomato Farming

R/C Ratio for Tomato Farming (Mujito)

Table 1. Average Production Costs for Tomato Farming (Mujito)

No.	Cost Type		Cost/Farming (Rp)
1.	Fixed Costs:		
	Sticks	(3000 units)	1.500.000
	Land Rent		4.000.000
2.	Variable Costs:		
	Seeds	(3000 units)	750.000
	NPK Fertilizer (150 kg)		2.625.000
	Labor		2.000.000
	Total		**10.875.000**

Source: Primary Data Processed, 2024

Table 2. Average Revenue and Income for Tomato Farming (Mujito)

No.	Description	Amount/Farming
	Reception	
1.	Average Production (A)	4.500 kg
2.	Average Price (B)	Rp 6.000
3.	Revenue (AxB)	Rp 27.000,000
	Income	
1	Average Revenue	Rp27.000.000
2	Average Total Cost	Rp10.875.000
3	Average Income	Rp16.125.000

Source: Primary Data Processed, 2024

Based on Table 2, the average production obtained by the respondent is 4,500 kg, with an average selling price of Rp6,000 per kg, resulting in total revenue of Rp27,000,000. The average income, calculated by subtracting the average total costs from the average revenue, is Rp16,125,000. According to Soekartawi (2016), the R/C ratio in farming is used to determine whether the farming activity is profitable. The R/C ratio is the ratio of total revenue to total costs. The formula is:

= Rp27.000.000 : Rp10.875.000

= 2,48

R/C Ratio for Tomato Farming (Rizal)

Table 3. Average Production Costs for Tomato Farming (Rizal)

No.	Cost Type	Cost/Farming (Rp)
1.	Fixed Costs:	
	Sticks (10,000 units)	4.500.000
	Land Rent	-
2.	Variable Costs:	
	Seeds (10,000 units)	2.500.000
	NPK Fertilizer (300 kg)	4.500.000
	Labor	4.000.000
	Total	**15.500.000**

Source: Primary Data Processed, 2024

Table 4. Average Revenue and Income for Tomato Farming (Rizal)

No.	Description	Amount/Farming
	Reception	
1.	Average Production (A)	15.000 kg
2.	Average Price (B)	Rp 5.000
3.	Revenue (AxB)	Rp 75.000.000
	Income	
1.	Average Revenue	Rp 75.000.000
2.	Average Total Cost	Rp 15.500.000
3.	Average Income	Rp 59.500.000

Source: Primary Data Processed, 2024

Based on Table 4, the average production obtained by the respondent is 15,000 kg, with an average selling price of Rp5,000 per kg, resulting in total revenue of Rp75,000,000. The average income, calculated by subtracting the average total costs from the average revenue, is Rp59,500,000. The R/C ratio for tomato farming, according to Soekartawi (2016), is calculated as:

= Rp75.000.000 : Rp15.500.000
= 4,83

R/C Ratio for Tomato Farming (Lince)

Table 5. Average Production Costs for Tomato Farming (Lince)

No.	Cost Type	Cost/Farming (Rp)
1.	Fixed Costs:	
	Sticks (6,000 units)	3.000.000
	Land Rent	-
2.	Variable Costs:	
	Seeds (6,000 units)	1.500.000
	NPK Fertilizer (300 kg)	4.500.000
	Labor	3.000.000
	Total	**12.000.000**

Source: Primary Data Processed, 2024

Table 6. Average Revenue and Income for Tomato Farming (Lince)

No.	Description	Amount/Farming
	Reception	
1.	Average Production (A)	10.000 kg
2.	Average Price (B)	Rp 5.000
3.	Revenue (AxB)	Rp 50.000.000
	Income	
1.	Average Revenue	Rp 50.000.000
2.	Average Total Cost	Rp 12.000.000
3.	Average Income	Rp 38.000.000

Source: Primary Data Processed, 2024

Based on Table 6, the average production obtained by the respondent is 10,000 kg, with an average selling price of Rp5,000 per kg, resulting in total revenue of Rp50,000,000. The average income, calculated by subtracting the average total costs from the average revenue, is Rp38,000,000. The R/C ratio for tomato farming, according to Soekartawi (2016), is calculated as:

= Rp50.000.000 : Rp12.000.000
= 4,16

5. CONCLUSIONS

Based on the results of research in Wuasa Village, North Lore Subdistrict, Poso Regency, from respondents of tomato farming, the following conclusions were obtained: The results of income or profit from tomato farmers 1 get Rp16,125,000. From the receipt of Rp 27,000,000 tomato sales during the season, as much as 4500 kg of tomatoes valued at Rp 6,000, the total cost of Rp 10,875,000 was obtained from fixed costs plus non-fixed costs. The formula TR-TC or 27,000,000 - Rp10,875,000 is used to get revenue or profit. Then, the results of Rp16,125,000 from this income can be used to fulfill daily life. On the other hand, in the case of tomato farmer 2, the results of income or profit are significantly higher at Rp59,500,000. This substantial increase is evident from the receipt of Rp. 75,000,000 tomato sales during the season of 15,000 kg of tomatoes valued at Rp. 5,000, the total cost of Rp. 15,500,000 is obtained from fixed costs plus non-fixed costs. To get revenue or profit, the formula TR-TC or 75,000,000—Rp15,500,000 is used. The results are a noteworthy Rp59,500,000, which can significantly improve the daily life of the farmer. Based on the income or profit of tomato farmers, 3 amounting to Rp. 38,000,000 from the receipt of Rp.

50,000,000 of tomato sales during the season of 10,000 kg of tomatoes valued at Rp. 5,000, the total cost of Rp. 12,000,000 is obtained from fixed costs plus non-fixed costs. The formula TR-TC or 50,000,000 - Rp12,000,000 is used to get revenue or profit. Then, the Rp38,000,000 from this income can be used to fulfill daily life. This conclusion shows that tomato farming in Wuasa Village contributes significantly to these farmers' income and economic life where the average R/C balance value of farmer 1, Mr. Mujito, is 2.48, Mr. Rizal is 4.83, and farmer 3, Mrs. Lince, is 4.16.

REFERENCES

Adli, R. R., Saputra, M., & Supardi, J. (2023). Analisis Tingkat Kebisingan di Area Pabrik Sawit PT Beurata Subur Persada. Jurnal Mahasiswa Mesin UTU (JMMUTU), 2(1), 13–17.

Ariyahman Wameto, Yuriko Boekoesoe, Yuliana Bakari.(2023). "Analisis Pendapatan Usahatani Tomat Di Desa Dungaliyo Kecamatan Dungaliyo Kabupaten Gorontalo". Agrinesia Vol. 7 No. 3

Barkah, Shandy, dan Masdari. (2020). Pengaruh Luas Lahan Dan Modal Terhadap Pendapatan Petani Padi Di Kampung Buyung-Buyung Kecamatan Tabalar. Echo- Build Journal 4(2):55–63.

Cahyono B. 2017. Tomat (Usaha Tani dan Penanganan Pascapanen). Yogyakarta: Kanisius Fadhilah dan Rochdiani (2021). “Analisis Pendapatan Usahatani Manggis di Desa Simpang

Frans Nico Sitanggang, Juliana Br Simbolon, Fandri Siburian. (2020) "Analisis Pendapatan Usaha Tani Dan Tataniaga Tanaman Tomat (Solanum Lycopecuml.) Di Desa Semangat Kecamatan Merdeka Kabupaten Karo". Regionomic. Vol.2. No. 01

Listiani, Setiyadi dan Santoso (2019). “Analisis Pendapatan Usahatani Padi di Kecamatan Mlonggo Kabupaten Jepara”

Luntungan, A.Y. (2020) Analisis Tingkat Pendapatan Usahatani Tomat Apel Di Kecamatan Tompaso Kabupaten Minahasa. Jurnal Pembangunan Ekonomi dan Keuangan Daerah (PEKD). 17(1)

Mooduto, Boekoesoe dan Bakari (2020). ”Analisis Pendapatan Usahatani Cengkeh di Desa Iloheluma Mongondow Selatan”

Nurhayati, S. (2018). Produksi Tomat (Lycopersicum esculentum Mill.) F1 yang Dihasilkan dari Induksi Medan Magnet dan Terinfeksi oleh Fusarium oxysporum f. sp. lycopersici. Skripsi. Fakultas Matematika dan Ilmu Pengetahuan Alam, Universitas Lampung.

Patricia (2019). Analisis Pendapatan dari Usahatani Tomat Apel di Desa Kunyangan, Kecamatan Tombatu. Skripsi, Fakultas Pertanian, Universitas Sam Ratulangi Manado.

Putri Rhizka Amalia Bongkang Putri Rhizka Amalia Bongkang, Paulus A. (2019). Pangemanan,dan Ellen G. Tangkere. "Analisis Pendapatan Usahatani Tomat Di Desa Taraitak Satu Kecamatan Langowan Utara". Agrirud. Vol 1 . No. 3

Soekartawi. 2016. Analisis usahatani. Universitas Indonesia (UI-Press).

Sridianto, A. (2019). Analisis Pendapatan Petani Tomat di Desa Kanreapia, Kecamatan Tombolo Pao, Kabupaten Gowa. Fakultas Ekonomi dan Bisnis Islam, UIN Alauddin.

Sugiran Kecamatan Guguak Kabupaten Lima Puluh Kota”

Suratiyah, K.2015. Ilmu Usahatani. Penebar Swadaya. Jakarta

Wang, X. dan Fu, Y. (2013). “Some Characterizations of the Cobb-Douglas and CES Production Functions in Microeconomics”. Abtract and Applied Analysis,pp1-6.