

FARMING ANALYSIS OF RED CHILI IN SOLOK REGENCY

ANALISIS USAHATANI CABAI MERAH DI KABUPATEN SOLOK

Rusda Khairat¹, ¹Rini Hakimi², Rahmat Syahni³, Ira Wahyuni Syarfi⁴, Muhammad Hendri⁵

^{1,2,3,4,5} Universitas Andalas, Padang, Indonesia

ABSTRACT

Farming analysis is important to determine the allocation of resource use on a farm. This research aims to describe the implementation of red chili cultivation techniques and analyze the income and profits of red chili farming in Lembah Gumanti District, Solok Regency. The method used in this research is the descriptive method. The number of samples is determined by quota, while the sampling method is purposive. The research results show that farmers carry out chili cultivation after shallot cultivation. Cultivation techniques begin with land processing (only repairing the beds), planting, weeding, inserting, installing stakes, fertilizing, controlling pests and diseases, harvesting, and post-harvest. Income analysis shows an average income of IDR 52,553,499.10/Land area/Planting Season or IDR 153,541,311.14/ha/Planting Season with a profit of IDR 39,570,967.01/Land area/Planting Season or IDR 89,884,691.45/ha/Planting Season. Farming efficiency through the R/C ratio obtains profitable results of IDR 2.046 from each unit of input used in red chili farming. It shows that red chili farming is worth pursuing.

Keywords: Farming, red chilies, cultivation techniques, income, profits

INTISARI

Analisis usahatani penting dilakukan untuk mengetahui alokasi penggunaan sumberdaya pada sebuah usahatani. Penelitian ini bertujuan untuk mendeskripsikan pelaksanaan teknik budidaya cabai merah dan menganalisis pendapatan serta keuntungan pada usahatani cabai merah di Kecamatan Lembah Gumanti Kabupaten Solok. Metode yang digunakan dalam penelitian ini adalah metode deskriptif. Jumlah sampel ditetapkan secara kuota, sedangkan metode pengambilan sampelnya secara purposive. Hasil penelitian menunjukkan bahwa budidaya cabai dilakukan petani setelah budidaya bawang merah. Teknik budidaya diawali dengan pengolahan lahan (hanya memperbaiki bedengan), penanaman, penyiangan, penyisipan, pemasangan ajir, pemupukan, pengendalian hama dan penyakit, panen dan pasca panen. Analisis pendapatan memperlihatkan pendapatan rata-rata sebesar Rp 52.553.499,10/LL/MT atau Rp 153.541.311,14/ha/MT dengan keuntungan sebesar Rp 39.570.967,01/LL/MT atau Rp 89.884.691,45/ha/MT. Efisiensi usahatani melalui R/C ratio mendapatkan hasil yang menguntungkan yaitu sebesar 2,046 rupiah dari setiap satuan input yang digunakan dalam usahatani cabai merah. Hal ini memperlihatkan bahwa usahatani cabai merah layak untuk diusahakan.

Kata kata Kunci: Usahatani, cabai merah, teknik budidaya, pendapatan, keuntungan

INTRODUCTION

The agricultural sector is very strategic, is the basis of the people's economy in rural areas, controls the lives of the majority of the population, absorbs more than half of the total workforce, is a source of foreign

exchange, and even becomes a safety valve in the event of an economic crisis, and very importantly is a source of food for the population. In West Sumatra, the agricultural sector is one of the mainstays of economic

¹ Correspondence author: Rini Hakimi. Email: rinihakimi@agr.unand.ac.id / rini.hakimi@gmail.com

growth, with a contribution to GRDP of 21.71% (BPS 2022).

Of the 53.67% of West Sumatra's population who work, more than half, namely 50.69%, are in rural areas and work in the agricultural sector (BPS Provinsi Sumatera Barat 2020). The agricultural sector also makes a significant contribution to the economy of Solok Regency, where in 2021, the agricultural sector in Solok Regency will make the largest contribution to Solok Regency's GRDP, namely 33.48%.

Agricultural development in Solok Regency has an important and strategic role in national and regional development. The role of the agricultural sector is not only for food security but also contributes significantly to employment opportunities, sources of income, and the regional economy. Based on inter-census agricultural survey figures (Badan Pusat Statistik 2019), the number of farmers in Solok Regency is 77,474, with the number of subsectors cultivated respectively by 38,370 farmers in rice, 3,969 farmers in secondary crops, 42,577 farmers in horticulture, and 30,193 farmers in plantations. In this regard, the largest production of horticultural crops resulted from development in the agricultural sector in Solok Regency.

Food commodities produced by the agricultural sector have a very strategic role and can influence the country's macroeconomic conditions and cause inflation. Chili is a food commodity that is often a source of rising inflation at the national and regional levels. Chili is a horticultural product that is widely consumed by the population. Based on the National Socioeconomic Survey (Badan Pusat Statistik Provinsi Sumatera Barat 2020), Indonesia's average consumption of red chilies reaches 0.15kg/capita/month. West Sumatra has the highest consumption of large red chilies in Indonesia, namely 0.59 kg/capita/month (databoks.katadata.co.id).

In 2021, West Sumatra will be Indonesia's fifth-largest red chili production center. In West Sumatra, chili production centers are Agam Regency, Solok Regency, Tanah Datar

Regency, Limapuluh Kota Regency, West Pasaman, South Solok, and Padang Pariaman. The Agam Regency, Solok Regency, and Tanah Datar Regency have the highest production contributions. In Solok Regency, the center of chili production is in Lembah Gumanti District, with the highest chili production.

The level of welfare of agricultural business actors can be seen from the income received by the agricultural business actors. Another indicator of farmers' welfare is the level of farmers' purchasing power as measured by the Farmers' Exchange Rate (NTP). According to BPS West Sumatra data (2022), the Farmer Exchange Rate in 2021, especially for the Food and Horticulture subsector in West Sumatra, is weak (< 100). The NTP for Food Crops is 96.61, and the NTP for Horticultural Crops is 99.75. Apart from that, the problem faced by chili farmers is that the price of chili fluctuates, where at the end of the year, there will be an increase in prices, and in the middle of the year, prices will decrease at the farmer level.

The importance of the role of the agricultural sector and the existence of farmers in the economy as agricultural business actors with low levels of income and purchasing power need to be paid attention. By knowing farmers' income levels, it is hoped that the government and related parties can intervene to increase farmers' income and purchasing power so that farmers' welfare increases. Therefore, it is necessary to carry out a farming analysis that can provide an overview of farmers' income and the costs incurred in red chili farming.

METHODOLOGY

Research Location

The research was conducted in Lembah Gumanti District because it is the largest chili producing area in Solok Regency. The total production of red chilies in Lembah Gumanti District in 2022 will be 19,146.70 tons or 55.89% of the total chili production in Solok Regency.

Sampling Method

The population in this study was approached by the number of farmers in Lembah Gumanti District, namely 2124 people. The number of samples in this study

was set at a quota of 100. The number of samples for each nagari was determined proportionally. Meanwhile, the samples to be interviewed were determined purposively.

Table 1. Number of Farmer Samples for Each Nagari

No	Nagari	Number of Farmers (People)	Percentage (%)	Number of samples per Nagari
1	Air Dingin	412	19,4	19
2	Alahan Panjang	436	20,5	21
3	Salimpek	346	16,3	16
4	Sungai Nanam	930	43,8	44
AMOUNT		2124	100	100

The research method used in this research is descriptive, and the data collection uses a survey method. Aspects of the data and variables used are :

1. Data aspects relate to cultivation techniques, namely land preparation and processing, seed preparation, planting, maintenance (inserting, weeding), placing stakes, fertilizing, controlling pests and diseases, harvesting, and post-harvest
2. Observed income and profit analysis variables are production amount, selling price, costs (costs paid and calculated costs), farming receipts, farming income, farming profits, and R/C ratio.

The analysis used in this research is qualitative and quantitative descriptive analysis. Qualitative descriptive analysis in describing red chili cultivation techniques. Quantitative analysis is used to analyze the income and profits of red chili farming. The quantitative analysis carried out is in the form of calculating revenue, farming costs, depreciation calculations, capital costs, income analysis, profit analysis, and R/C ratio analysis.

- a. Farming Revenue
The formula for farming revenue is as follows:
 $TR_i = Y_i \times P_{yi}$ (Agustina Shinta 1993)
 TR_i = Total revenue (IDR/kg/Planting Season)
 Y_i = Amount of red chili production (kg/Planting Season)

P_{yi} = Selling price of red chilies (IDR/kg)

- b. Farming Income
The formula for farming income is as follows:

$$Pd = TR_i - Bt$$

Pd = Farming Income (IDR/ha/Planting Season)
 TR = Total Revenue (IDR/ha/Planting Season)
 Bt = Fees paid (IDR/ha/Planting Season)

- c. Farming Profits
The formula for farming profit is as follows:

$$K = (Y_i \cdot P_{yi}) - BT$$

K = Farming Profit (IDR)
 Y_i = Amount of chili production (kg/Planting Season)
 P_{yi} = Selling price of chilies (IDR/kg)
 BT = Total cost (IDR/ha/Planting Season)

Total costs in calculating profits are the costs paid added together with the costs calculated in the production process.

- a. Depreciation costs (straight line method) (Centre 2013)

$$Annual\ depreciation\ of\ agriculture\ equipment = \frac{cost\ of\ the\ asset - salvage\ or\ scrap\ value}{estimated\ life\ of\ years}$$

- b. Capital interest is calculated based on the interest rates applicable in the research area.

$$Capital\ Interest = \frac{TC_{bm} \times i}{12} \times planting\ season$$

TC_{bm} = Total Cost without capital

interest

i = Interest rate (7%)

c. R/C analysis

The formula for R/C analysis is as follows:

$$RCR = TR/TC$$

$$RCR = \text{Nilai R/C}$$

TR = Total Revenue (IDR/ha/Planting Season)

TC = Total Cost (IDR/ha/Planting Season)

R/C > 1 means, the farming business is profitable

R/C = 1 means, the farming is break even (no profit, no loss)

R/C < 1 means, the farming losses

RESULTS AND DISCUSSION

Overview of Chili Farming in Lembah Gumanti District

Farmers in Lembah Gumanti District carry out red chili farming through crop rotation with a pattern of onions: onions: red chilies or onions; onion; onions (1-month planting age); red chilies (planted when the onions are one-month planting age). In general, farmers plant local varieties. Planting chilies is usually done after planting onions or when the onions are about to be harvested. It can save costs on using mulch and fertilizer. The labor used is usually intra-family labor (Family labor) or non-family labor.

The stages of chili cultivation carried out by farmers are:

a. Land preparation and processing

This activity begins with cleaning the land using herbicide, then tidying up the torn beds and mulch, and spreading fertilizer or lime. The manure given as basic fertilizer is chicken manure (kohe). This activity is carried out by Family labor (Farmers and their families) or non-family labor. The land planted is the land after planting the onions. This land already has raised beds, so there is no process for making beds. This land also receives fertilizer when cultivating onions, so only a small amount of fertilizer is used, namely adding manure.

b. Seed preparation

Farmers have not done sowing in the last few years because they bought seeds in polybags. Seeds are usually purchased per crate, where the number of seeds in each crate contains 1200-1500 polybags. The price per polybag is IDR100 – IDR250, depending on the size of the seeds purchased.

c. Planting

There are two ways of planting chilies in Gumanti Valley District, namely farmers who plant chilies when the onions are about to harvest (1 month old or 1.5 months old) and those who plant chilies after harvesting the onions. In method 1, planting chilies is done manually in the hole in the middle (using five holes of mulch), while the second hole from the outside is planted with onions, both on the left and right sides. Method 1 can also be done by planting chilies between the onion planting holes in the middle. Some planting activities are carried out by labor within the family. Some also use labor outside the family or a combination of both. Planting is done with a spacing of 50 x 40 cm.

d. Weeding

Weeding is usually done three times during the growing season. Where carried out by labor within the family or labor outside the family

e. Insertion

Insertion is carried out for chili plants, where the growth of the plant is seen for one week, if one dies, then the remaining seeds are inserted. This Insertion can be done up to 15 days after planting. Usually, to carry out Insertion, the remaining seeds purchased when planting are used. If more than the seeds that have been purchased previously are needed, then they are taken from the planting hole that has more than two chili stems.

f. Installation of stakes

The installation of stakes is carried out by farmers when the plants start to grow tall, usually when the plants are three months old. Ropes are also used to prevent the

- plants from falling when installing the stakes. The stake used can be made of bamboo, reed, or long wooden twigs.
- g. Fertilization
Fertilization is carried out during land preparation by applying lime and compost. Next, at 15 DAP, pearl NPK, and DGW fertilizers are given using a cast system every 15 days until the plants are four months old. Next, when the plants start to produce, they are given NPK pearl, SP, DGW, Ponska, organic (black mas), SS, and Ponska fertilizers.
- h. Pest and Disease Control
Maintenance aims to control pests and diseases. This is done by spraying insecticides, herbicides, and fungicides.
- i. Harvest
Harvesting is done manually by picking ripe chilies one by one. The first harvest is usually when the chili plant is four months old. Most farmers can harvest chilies 20-30 times or for 4-5 months. The harvesting interval ranges from 3-7 days, depending on the ripeness of the fruit and the weather.

- j. Post-harvest
Post-harvest activities are carried out by airing the harvested chilies for 30 minutes. Next, put the chilies in sacks or plastic bags. The sacks or bags used are usually provided or brought by the trader. Farmers sell their products to retailers or collectors. This is in line with the results of research on chili trading systems in Ranah Pesisir District, where farmers in this area also sell their chilies to retailers and collecting traders (Handayani, Hakimi, and Hariance 2023).

Analysis of Income and Profits from Chili Farming

1. Labor and production facilities
Red Chili farmers in Lembah Gumanti District generally plant chilies after planting onions so that the use of mulch and land processing costs are saved. The average use of labor and production factors per land area and per hectare can be seen in the table below.

Table 1. Average Use of Labor and Production Factors

No	Production Factors	Unit	Value	
			Per Land Area /Planting Season	Per Hektar/Planting Season
1	Pesticide	IDR	5,352,477.60	22,553,891.01
2	Family labor	Working People's day	59.01	331.61
3	Seeds	polybag	4,053.50	9,814.77
4	Mulch	IDR	777,083.30	2,619,658.26
5	Stakes	IDR	828,520.00	2,724,827.94
6	Non-family Labor	Working People's Day	316.91	1,195.96
7	Fertilizer	Kg	807,60	2.666,69
8	Tool Depreciation	IDR	1,306,720.17	5,597,020.18
9	Capital Interest	IDR	2,475,455.66	10,190,971.43

2. Production

Red chili production is obtained from the total harvest carried out during the productive life of the chili plant. The average production of chili plants farmers cultivate per land area is 2,601.66 kg/land area/planting season or IDR 77,428,550. The average production per hectare is 7,963.58 kg/land area/planting season or IDR 242,709,516. The selling price of chilies fluctuates greatly. The lowest selling price is IDR 10,000/kg, while the highest selling price is IDR. 40,000/kg.

3. Price

The lowest selling price is IDR 10,000/kg, while the highest selling price is IDR. 40,000/kg. The average selling price of chilies is IDR. 28,756.66/kg. In general, farmers package chilies for sale using plastic bags or sacks. The difference in prices received by farmers is influenced by the distance to the location of the farmer's land and the quality and quantity of chilies produced. Farmers usually use motorbikes or cars to transport chili production to the sales location.

4. Revenue

The average income of chili farmers is IDR 77,428,550 land area/planting season and IDR 242,709,516/ha/planting season. This revenue is influenced by production and selling prices. The production obtained by

respondent farmers is influenced by various factors such as land area and production factors in the cultivation techniques used. The sample farmer's land area ranges from 0.1 ha to 2 ha, with an average sample farmer's land area of 0.413 ha.

5. Production Costs

a. Cash Fee

Cash fee relates to the costs incurred by chili farmers in cash during chili cultivation activities until the chili produced is sold to the market or other sales locations. The costs paid for chili farming in Lembah Gumanti District are the costs of seeds, mulch, stakes, equipment spare part costs, outside family labor costs (OFL), fertilizer costs, and pesticide costs.

The highest cost in red chili farming is fertilizer costs. Farmers use much-unsubsidized fertilizer, so farmers incur high fertilizer purchasing costs. OFL costs are also high because of the high costs of harvesting activities, the frequency of which ranges from 20 to 30 times during the planting season. Pesticide costs are high because farmers spray them once every three days from the time the plants produce until the end of the harvest season. In general, farmers still use chemical pesticides.

Table 2. Average Cash fee in Red Chili Farming

No	Type of Cost	Value	
		Per Land area/Planting Season (IDR)	Per Hektar/Planting Season (IDR)
1	Seeds	524,400.00	1,922,829.55
2	Mulch	777,083.30	2,619,658.26
3	Stake	828,520.00	2,724,827.94
4	Equipment Spare parts	58,300.00	281,665.15
5	Outside Family Labor	7,638,750.00	23,679,029.57
6	Fertilizer	9,695,520.00	35,386,303.48
7	Pesticide	5,352,477.60	22,553,891.01
Amount		24,875,050.90	89,168,204.96

b. Cost calculated

Cost calculated are costs charged to farming activities, but farmers do not make cash payments for these costs. The costs calculated in chili farming are land rental, depreciation, family labor (FL), capital

interest, and land tax. The average costs calculated for red chili farming can be seen in the table 3.

When compared with the cash fee, it can be seen that the total cash fee are greater than the costs calculated.

Table 3. Average Costs Calculated in Red Chili Farming

No	Type of Cost	Value	
		Per Land area/Planting Season (IDR)	Per Hektar/Planting Season (IDR)
1	Land lease	1,781,350.00	5,624,000.00
2	Depreciation	1,306,720.17	5,597,020.18
3	Inside family Labor	7,400,531.25	42,152,959.75
4	Capital Interest	2,475,455.66	10,190,971.43
5	Land Tax	18,475.00	91,668.33
Amount		12,982,532.08	63,656,619.69

6. Income

Based on the results of calculating the cash fee and the costs calculated, the average total cost of chili farming is IDR. 37,857,582.99 per land area /Planting season or IDR 152,824,824.7 per ha/Planting Season.

The amount of income and costs incurred by farmers will influence the amount of income they receive. Revenue is revenue minus expenses paid. The average income of red chili farmers is IDR 52,553,499.10/Land Area/Planting Season and IDR 153,541,311.14/ha/Planting Season. Compared to another research in Wuluhan District, Jember Regency, the average income of red Chili farmers in Lembah Gumanti District, Solok Regency, is relatively greater than that of red chili farmers in Wuluhan District, Jember Regency. The farmers' income at Wuluhan District, Jember Regency, is only IDR33,783,000,-/ha/season (Eliyatiningsih and Mayasari 2018).

The research results in Garut Regency, found that the income of the Red Chili farmers is about IDR 49,649,350/ha/season (Saidah et al. 2020), much lower than the

income of chili farmers in Lembah Gumanti District, Solok Regency, namely IDR 153,541,311.14/ha/Planting Season. The research in Sarjo Village, Sarjo District, Nort Mamuju Regency, West Sulawesi, found that the income of the Red Chili farmers is about IDR 8,019,019/ha/season (Sartika, Muis, and Howara 2016), much lower than the income of chili farmers in Lembah Gumanti District, Solok Regency, namely IDR 153,541,311.14/ha/Planting Season. The income of red farmers' chili in Lembah Gumanti District, Solok Regency, is also higher than the income of the Red Chili farmers in Kerinci Regency, Jambi Province (Latifa and Sinta 2022).

On the other hand, if compared with the study about The Profit of Red Chili Farming in Jember by (Firdaus, Suherman, and Wahyudi 2019), the Red Chili farmers' income in Jember is relatively higher than that in Lembah Gumanti District, Solok Regency. Meanwhile, the farmers' income in the Jember Regency is about IDR 180,210,264/ha. These differences could happen because of the difference in analysis time and place, causing the difference in price.

For most farmers' red chili plants for eight months, the average monthly income of farmers with an average land area of 0.413 ha is IDR. 6,569,187.39 per land area/planting season. If this value is compared with the Provincial Minimum Wage (UMP) for West Sumatra Province in 2023, which is IDR. 2,742,476 (Gubernur Sumatera Barat 2022), so the monthly income of red chili farmers is above the UMP. However, there are red chili farmers who have less than 0.17 ha of land so they receive income below the UMP.

7. Profit

Profit is revenue minus total costs. The average profit earned by red chili farmers is IDR. 39,570,967.01/Land Area/Planting

season and IDR. 89,884,691.45/ha/Planting season. We can see that the monthly profit of farming red chili in Lembah Gumanti District, Solok Regency, is IDR 4,946,370.88/Land Area/Planting season.

8. R/C Ratio

Return per cost (R/C) ratio analysis is a comparison between revenue and costs. R/C is obtained from revenue divided by total farming costs. The table below shows that red chili farming has an $R/C > 1$. In other words, the value is greater than one, so the farming is profitable and worth running. R/C per planting season and per hectare is 2.05, meaning that every IDR 1 cost incurred by farmers will provide income of IDR. 2,046.

Table 4. Income, Profit, and R/C Analysis

No	Description	(IDR/Land area/Planting Season)
A	Revenue	77,428,550.00
B	Cash cost	24,875,050.90
C	Non cash cost	12,982,532.08
D	Total Cost (B+C)	37,857,582.99
E	Income (A- B)	52,553,499.10
F	Profit (A-D)	39,570,967.01
G	R/C	2.046

A study conducted by (Eliyatiningsih and Mayasari 2018) resulted in the R/C ratio for red chili farming in Wuluhan District, Jember Regency is 1,65, higher than 1, which means red chili farming is profitable and feasible, the same with the R/C ratio for red chili farming in Lembah Gumanti District, Solok Regency, namely 2, 05 higher than 1. The research conducted by (Saidah et al. 2020) about the Change in Production and Income of Red Chili Farmers in Garut Regency, West Java Province, have the same result as our research in Lembah Gumanti District, Solok Regency, West Sumatra Province, where the R/C ratio was higher than 1, namely 1,91 in the dry season and 1,69 in the rainy season.

CONCLUSIONS AND RECOMMENDATIONS

Conclusion

Red chili cultivation is carried out by farmers in Lembah Gumanti District after planting onions. Some cultivation techniques have become more concise. Farmers do not cultivate land by making raised beds because the beds used have been made when planting onions. Fertilizer use is also less because the previous land was onion cultivation land, which already received fertilizer.

The results of the farming analysis show that the costs paid are greater than the calculated costs. The average income earned is IDR 52,553,499.10/Land area/Planting Season or IDR 153,541,311.14/ha/Planting Season with a profit of IDR 39,570,967.01/Land area/Planting season or IDR 89,884,691.45/ha/MT. Farming efficiency through the R/C ratio obtains profitable results of 2,046 rupiahs from each unit of input used

in red chili farming. This shows that red chili farming is worth pursuing.

Recommendation

Some things that are recommended regarding this research are:

1. Red chili farmers should try to produce seeds for planting by sowing them in order to save on seed costs.
2. Farmers should think about alternative uses of natural pesticides so that the red chilies produced do not contain many chemical pesticide residues.

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