



ANALYSIS OF THE SUPPLY OF RED CHILLI (*Capsicum Annum. L*) IN NORTH SUMATRA PROVINCE

Yayu Juita Agustina Tobing¹, Lindawati², Salmiah³

^{1,2,3}Faculty of Agriculture, Universitas Sumatera Utara

Corresponding E-mail: yayukjuitatobing@gmail.com

Abstract

YAYU JUITA AGUSTINA TOBING (207039019) with the thesis title "Analysis of Red Chili (*Capsicum Annum. L*) Supply in North Sumatra Province". This research was supervised by Dr. Lindawati SP. M.Si as Chair of the supervising Commission and Dr.Ir.Salmiah, MS as member of the supervising commission. Chili in North Sumatra plays a very important role for the government, producers and consumers. Red chilies can help increase regional income in terms of exports and imports. We know that red chilies are able to penetrate the international market both fresh and processed. Availability of planting land, price levels and production costs such as fertilizer prices change every year. This can affect the amount of chili offered in North Sumatra Province. The aim of this research is to determine the influence of independent variables on supply and analyze the short-term and long-term elasticity of red chili supply in North Sumatra Province. The data used in this research is secondary data in the form of a time series starting from 2001 to 2021 (per 6 months). The research method used is distributed lag model analysis. The results of this research are the Prob F-statistic value < significance $\alpha = 0.05$, namely 0.000011, together with the independent variables in the model, namely the price of red chilies (Pct), the price of red chilies the previous year (Pct-1), area red chili harvest (Lpt), and the price of NPK fertilizer (Hpnt) have a real influence on the dependent variable. significant $\alpha = 5\%$. Based on the probability value, the price of red chilies in the previous year was $0.0408 < \alpha = 0.05$ and the area of red chili harvested was $0.0233 < \alpha = 0.05$. This shows that the price of red chilies in the previous year and the size of the harvest area have a real influence on the supply of red chilies in North Sumatra Province. Meanwhile, the price of red chilies in year t with a probability of $0.0408 < \alpha = 0.05$ and the price of fertilizer in year t with a probability of $0.0633 > \alpha = 0.05$ do not have a significant effect because the probability value $< \alpha = 0.05$. The short term elasticity is $0.051081 < 1$, so it is stated as inelastic and the long term elasticity is $0.081358 < 1$. In the long term and short term changes in the supply of red chilies in North Sumatra province are smaller than price changes.

Keywords: *Red Chili Offer, Red Chili Price, Supply Elasticity*

1. INTRODUCTION

Horticulture is one of the sectors that is growing rapidly in Indonesian agriculture. Types of plants cultivated in horticulture include fruit, vegetables, flowers and ornamental plants. One of the products from horticulture is chilies. Chili is a vegetable product that is classified into three groups, namely large chilies, small chilies and ornamental chilies. Among the three types of chili, large chili (red chili) is the type of chili that is widely traded in society. One of the potential horticultural commodities to be developed is chilies, especially large red chilies and curly red chilies. Several important reasons for the development of red chili commodities are because they have high economic value, the value ladder phenomenon is a symptom of a shift in consumer demand from low value commodities towards high economic value commodities, as a leading national and regional commodity and occupies an important position in the daily consumption of the Indonesian population.(General & Agriculture, 2021).

ANALYSIS OF THE SUPPLY OF RED CHILLI (*Capsicum Annum. L*) IN NORTH SUMATRA PROVINCE

Yayu Juita Agustina Tobing, Lindawati, Salmiah

Many Indonesian farmers cultivate red chilies because red chilies have a fairly high selling price and demand for red chilies tends to increase every year. The amount of consumption of chilies has increased over time, making chilies reliable as a non-oil and gas export commodity. This is evident from the six major exported fresh vegetable commodities (such as shallots, tomatoes, potatoes, cabbage and carrots), chilies are one of them.(M et al., 2021). Growth in harvested area, production and productivity of red chilies in Indonesia in 2012-2021.

Table 1. Harvest Area, Production and Productivity of Red Chili in Indonesia 2012-2020

No	Year	Harvested Area (Ha)	Growth (%)	Production (Tons)	Growth (%)	Productivity (Tons/Ha)	Growth (%)
1	2012	120,275	0	954,363	0	7.93	0
2	2013	124,110	3.19	1,012,879	6.13	8.16	2.85
3	2014	128,734	3.73	1,074,611	6.09	8.35	2.28
4	2015	120,847	-6.13	1,045,182	-2.74	8.65	3.61
5	2016	123,404	2.12	1,045,587	0.04	8.47	-2.03
6	2017	142,247	15.27	1,206,266	15.37	8.48	0.09
7	2018	137,596	-3.27	1,206,737	0.04	8.77	3.42
8	2019	133,436	-3.02	1,214,419	0.64	9,10	3.77
9	2020	133,729	0.22	1,264,190	4.1	9.45	3.87
Average		129,375.3	1.35	1,113,804	3.30	8.60	1.98

Source: Indonesian Central Horticultural Statistics Agency

The area harvested for red chilies in Indonesia in 2012-2020 increased by 1.35% or 129,375.3 ha. The amount of production continues to experience increasing growth every year even though the harvested area has decreased in several years. The average growth in red chili production in Indonesia from 2012-2020 was 3.30% with the highest production in 2020 amounting to 1,264,190 tons. The average growth in red chili productivity in Indonesia from 2012-2020 was 1.98%. The growth in red chili productivity every year is very good and influences the amount of supply in the region. This is supported by the theory of factors that influence the supply of red chilies. The development of red chili imports in Indonesia in 2012-2021 can be seen in table 2 below:

Table 2. Chili Import Volume in Indonesia 2012-2020

No	Year	Chili Imports (Tons)	Growth (%)
1	2012	197,409	0
2	2013	161,933	17.97
3	2014	147,810	8.72
4	2015	187,833	27.08
5	2016	152,630	18.74
6	2017	159,131	4.26
7	2018	155,836	2.07
8	2019	154,008	1.17
9	2020	193,827	25.86
Average		167,824.11	11.76

Source: Ministry of Agriculture

Table 2 shows that the volume of chili imports in Indonesia in 2012-2020 experienced fluctuations every year, with an average growth of 11.76%. The highest chili imports were 2,821,787 tons in 2012. The lowest imports occurred in 2018 at 155,836 tons. It is very important



to pay attention to the amount of imports in an area, this is because the amount of imports is one of the references in providing red chili production in that area.

Chili in North Sumatra plays a very important role for the government, producers and consumers. Red chilies can help increase regional income in terms of exports and imports. We know that red chilies are able to penetrate the international market both fresh and processed. The benefit for producers is to increase income, while for consumers it complements cooking spices. For consumers, red chilies are not just a cooking spice, but red chilies contain vitamins. The number of red chilies offered in North Sumatra has several factors such as price. In the law of supply, we know that the quantity supplied is closely related to the price level. A high price will increase the quantity supplied.

Table 3. Average Price of Red Chilies in North Sumatra Province

No	Year	Offer (Tons)	Chili Price (Rp/Kg)	Price Growth %
1	2012	316,489.11	20,936.42	0.00
2	2013	280,187.64	26,007.50	24.22
3	2014	282,228.95	29,910.38	15.01
4	2015	355,910.74	27,922.22	-6.65
5	2016	327,646.49	29,633.78	6.13
6	2017	350,145.44	25,312.29	-14.58
7	2018	370,097.62	38,704.72	52.91
8	2019	370,437.53	41,995.00	8.50
9	2020	390,148.19	41,129.03	-2.06

Source: Ministry of Agriculture

Table 3 shows the level of red chili prices which experienced fluctuations from 2012 to 2020. The highest price over the last 9 years was in 2019 at Rp. 41,995/kg, an increase of 8.5% from the 2018 price. This can also be related to the number of offers in North Sumatra Province from 2012-2020.

Table 4. Red Chili Offers in North Sumatra 2012-2020

No	Year	Offer (Tons)	Growth (%)
1	2012	316,489.11	0
2	2013	280,187.64	11.47
3	2014	282,228.95	8.72
4	2015	355,910.74	27.08
5	2016	327,646.49	-18.74
6	2017	350,145.44	4.26
7	2018	370,097.62	2.07
8	2019	370,437.53	1.17
9	2020	390,148.19	25.86
Average		338,143.52	7.5

Source: Central Statistics Agency

Table 4 shows that the supply of red chilies in North Sumatra Province fluctuates every year. 2015 saw the highest bid of 355.910.74 tonnes with a growth rate of 27.08% from the previous year. However, it experienced a decrease of 18.74% in 2016. The lowest offer was in 2013 at 280,187.64 tons. This fluctuation can be influenced by several factors, such as the price of red chilies, fertilizer prices, harvest area area, and other factors. Table 4 explains the development of the number of offers and prices from 2012-2020. The law of supply can be seen that the quantity

ANALYSIS OF THE SUPPLY OF RED CHILLI (*Capsicum Annum. L*) IN NORTH SUMATRA PROVINCE**Yayu Juita Agustina Tobing, Lindawati, Salmiah**

supplied will increase if the total price of goods or products also increases, but in table 1.5 the quantity supplied does not correspond to the increase from 2012-2020, there are several years such as 2012-2012, where the quantity supplied has decreased even though the price Chili peppers increased that year. Non-compliance with the law of supply also occurred in several other years, such as 2014-2015, where the number of bids increased but the price of chilies increased.

Information regarding the influence of the number of offers can help estimate the number of offers for chili. Due to the government's obligation to meet the domestic demand for red chilies, knowledge of the factors that influence the supply of red chilies in North Sumatra can be used to estimate the development of the supply. Supply information needs to be known to make decisions or policies to expand harvest area, increase production in order to increase the number of offers for exports and imports. Availability of planting land, price levels and production costs such as fertilizer prices change every year. This can affect the amount of chili offered in North Sumatra Province. Therefore, research was conducted on the supply of red chilies in North Sumatra to find out the factors that influence the supply of red chilies in North Sumatra, as well as the supply elasticity conditions in both the short and long term.

2. IMPLEMENTATION METHOD**Method for Determining Research Areas**

Determining the research area was carried out purposively or deliberately, namely by taking the location by considering the reasons known for the research area. In this research, North Sumatra was chosen because red chili production in North Sumatra continues to increase along with increasing demand for red chilies.

Method of collecting data

The data collected in this research is secondary data. Secondary data was obtained from the National and North Sumatra Provincial Central Statistics Agency, and the North Sumatra Provincial Agriculture Service. As well as other agencies related to the data used in this research. The data used is a time series, where the data used is data per semester (6 months) for 21 years, namely from 2001 to 2021, so the total data is 42.

Operational Definitions and Limitations**1. Operational Definition**

To avoid misunderstandings in interpreting the results of this research, several operational definitions and limitations were created as follows:

- a. Red chili supply (Y_t) is the amount of red chili production produced from red chili farming in North Sumatra offered in the year concerned, expressed in tons.
- b. The price of red chilies (X_t) is the price of red chilies prevailing in North Sumatra in year t expressed in units of Rp/kg.
- c. The price of red chilies in the previous period (X_{t-1}) is the price of red chilies offered in North Sumatra in the previous period in units of IDR/Kg.
- d. The area of red chili harvest is the total area of red chili harvest in North Sumatra, expressed in hectares.
- e. The price of NPK fertilizer is the price of NPK fertilizer in North Sumatra in Rupiah units
- f. Elasticity of supply is the change in the amount of red chili supply in North Sumatra due to changes in the independent variables used in the research.

2. Operational Limitations

The operational limitations of this research are:

- a. The research area is an area in North Sumatra Province, Indonesia.
- b. The research time is in 2022.



3. RESULTS AND DISCUSSION

Variable Description

1. Development of Red Chili Prices in North Sumatra Province

The price of red chilies in North Sumatra province fluctuates every semester starting from 2001-2021. The development of red chili prices in North Sumatra Province can be seen in Figure 1.

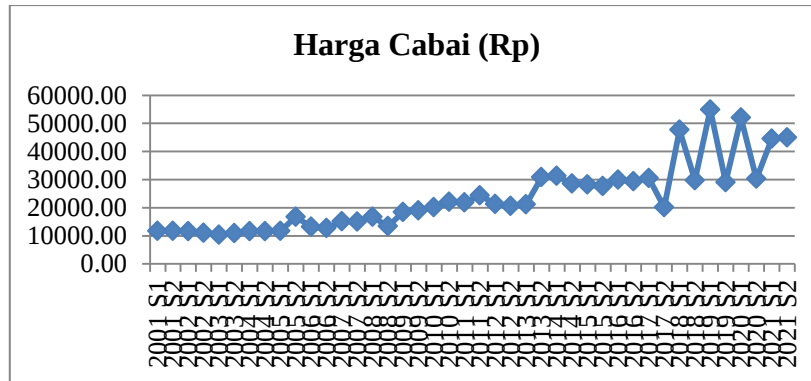


Figure 1. Development of Red Chili Prices in North Sumatra Province 2001-2021

2. Development of Red Chili Harvest Area in North Sumatra Province

The development of the area of red chili harvest in North Sumatra Province collected from the Central Statistics Agency is presented in Figure 2.

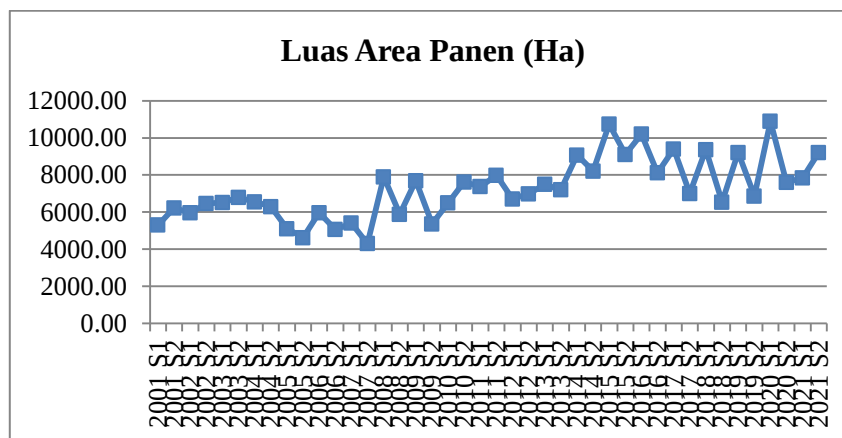


Figure 2. Development of Red Chili Harvest Area in North Sumatra Province 2001-2021

3. Development of NPK Fertilizer Prices 2001-2021 in North Sumatra Province

The development of NPK fertilizer prices in North Sumatra Province collected from the central statistical agency of North Sumatra Province is presented in Figure 3.

ANALYSIS OF THE SUPPLY OF RED CHILLI (*Capsicum Annum. L*) IN NORTH SUMATRA PROVINCE

Yayu Juita Agustina Tobing, Lindawati, Salmiah

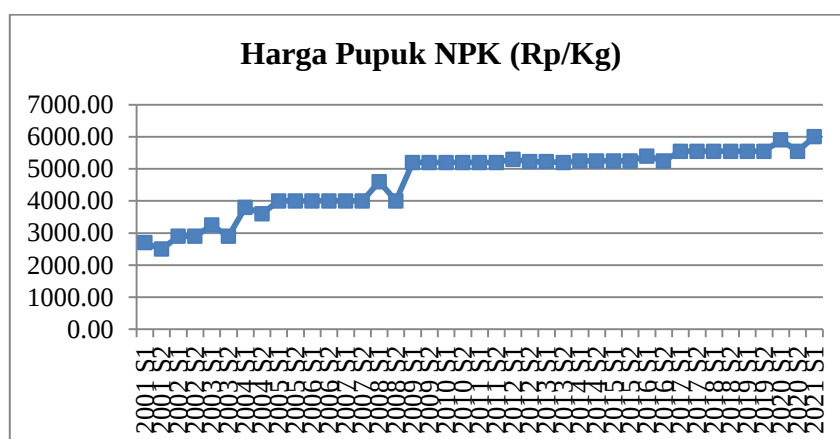


Figure 3. Development of NPK Fertilizer Prices 2001-2021 in North Sumatra Province

4. Development of Red Chili Offerings 2001-2021 in North Sumatra Province

The development of red chili offers for 2001-2021 obtained from the Central Statistics Agency of North Sumatra Province is presented in Figure 4.

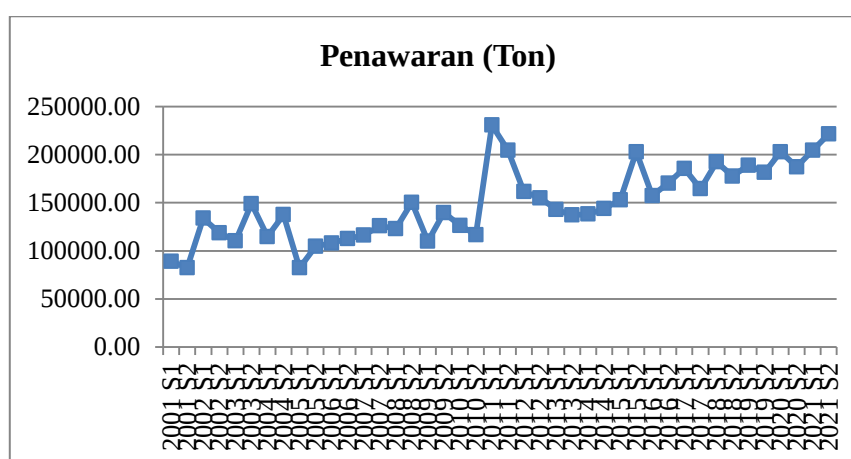


Figure 4. Development of Red Chili Offerings 2001-2021 in North Sumatra Province

Results of Analysis of the Influence of the Independent Variable on the Dependent Variable

1. Test Root Test

In this study, the data stationarity test used the ADF test (Augmented Dickey Fuller Test). Augmented Dickey Fuller Test (ADF test) on the grounds that the ADF Test has considered the possibility of autocorrelation in the error term if the series used is non-stationary. The stationary variables used are seen in Table 5.

Table 5. Unit Root Test Results at Level Level

No	Variable	t-statistics	t-statistic test critical values 5%	Prob.	Information
1	Sct (Red Chili Offer)	-2,648,194	-2,935,001	0.0919	not stationary
2	Sct (Red Chili Offer t-1)	-2761075	-2935001	0.0728	not stationary
3	Pct (Red Chili Price)	0.137631	-2,936,942	0.9648	not

stationary

4	PCt-1 (Red Chili Price t-1)	0.167303	-2,936,942	0.9670	not stationary
5	LPCT(Harvest Area)	-1,419,229	-2,936,942	0.5633	not stationary
6	Hpnt(NPK Fertilizer Price)	-2,030,138	-2,936,942	0.2733	not stationary

Source: Eviews Processed Results

Table 5 presents the results of processing the Unit Root Test at level level using the ADF value. ADF for each variable < from the t-statistic test critical values 5%, this can also be seen from the probability value for each variable > from $\alpha = 0.05$, this shows that the variables Sct, Pct, Pct-1, LPCT, and Hpnt are not stationary at level level. Based on data analysis, if the data is classified as non-stationary, it is necessary to carry out transformation through a differencing process.

2. Integration Series Test

According to Gujarati 2012, the level root test states that the variables Sct, Pct, Pct-1, Lpct, and Hpnt are not stationary, so a differencing transformation needs to be carried out so that the data becomes stationary. The form of the first degree (first difference) is denoted by I(1) then the ADF test is carried out again. The results of the integration series test are presented in Table 6.

Table 6. Unit Root Test Results at First Differentiation Level

No	Variable	t-statistics	t-statistic test critical values 5%	Prob.	Information
1	Sct (Red Chili Offer)	-9,712,318	-2,936,942	0.0000	Stationary
2	Sct (Red Chili Offer t-1)	-9,769,584	-2,936,942	0.0000	Stationary
3	Pct (Red Chili Price)	-2,277,106	-2,936,942	0.0001	Stationary
4	PCt-1 (Red Chili Price t-1)	-2,403,750	-2,936,942	0.0001	Stationary
5	LPCT(Harvest Area)	-1,754,717	-2,936,942	0.0000	Stationary
6	Hpnt(NPK Fertilizer Price)	-1,269,592	-2,936,942	0.0000	Stationary

Source: Eviews Processed Results

Table 6 presents the results of stationarity test processing of the unit root test at the first difference level showing that the ADF value for each variable is > than the t-statistic test critical values 5%, the probability of each variable is < than $\alpha = 0.05$, indicating that the variables Sct, Pct, Pct-1, Lpct, and Hpnt are stationary at the first difference level.

3. Optimal Lag Test (Lag Length)

Determining lag in this research uses the Akaike Information Criterion (AIC) indicator. The Lag Length Test results are presented in Figure 5.

ANALYSIS OF THE SUPPLY OF RED CHILLI (*Capsicum Annum. L*) IN NORTH SUMATRA PROVINCE

Yayu Juita Agustina Tobing, Lindawati, Salmiah

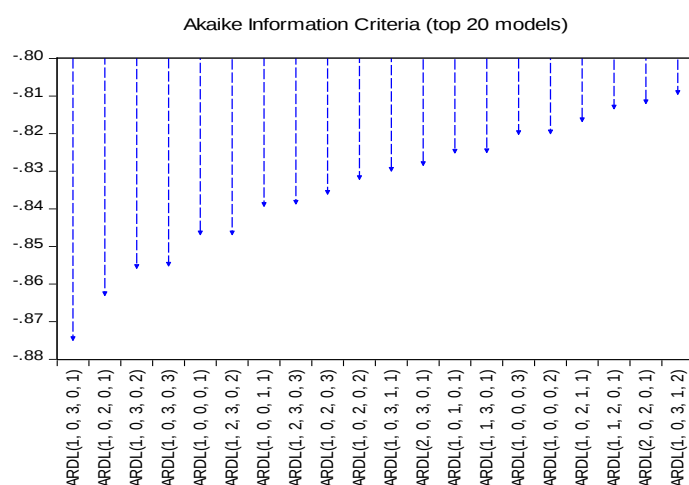


Figure 5. Optimum Lag Test Output
Table 7. Optimum Lag Model Explained

Model	LogL	AIC*	BIC	HQ	Adj. R-sq	Specifications
719	27.051083	-0.874414	-0.447860	-0.721370	0.670596	ARDL(1, 0, 3, 0, 1)
735	25.818708	-0.862498	-0.478599	-0.724758	0.660803	ARDL(1, 0, 2, 0, 1)
718	27.677314	-0.855247	-0.386037	-0.686898	0.669614	ARDL(1, 0, 3, 0, 2)
717	28.665618	-0.854647	-0.342782	-0.670994	0.674310	ARDL(1, 0, 3, 0, 3)
767	23.503554	-0.846336	-0.547748	-0.739205	0.641916	ARDL(1, 0, 0, 0, 1)
590	29.503542	-0.846336	-0.291815	-0.647378	0.676009	ARDL(1, 2, 3, 0, 2)
763	24.356088	-0.838774	-0.497530	-0.716339	0.646177	ARDL(1, 0, 0, 1, 1)
589	30.344286	-0.838169	-0.240993	-0.623907	0.677268	ARDL(1, 2, 3, 0, 3)
733	27.293252	-0.835551	-0.366342	-0.667203	0.663043	ARDL(1, 0, 2, 0, 3)
734	26.216899	-0.831636	-0.405082	-0.678592	0.656199	ARDL(1, 0, 2, 0, 2)
715	27.173455	-0.829408	-0.360198	-0.661060	0.660966	ARDL(1, 0, 3, 1, 1)

Source: Eviews Processed Results

Table 7 shows the results of lag selection on logarithmic transformation data using AIC, where the smallest AIC value is -0.874414 at lag (1,0,3,0,1). Thus, the ARDL model (1,0,3,0,1) is the best model for logarithmic transformed data.

4. Cointegration Test

The purpose of the cointegration test in this research is to determine whether the group of non-stationary variables at this level meets the requirements of the integration process. The cointegration testing criteria in this study are based on trace statistics. The results of the cointegration test are presented in Table 8.

Table 8. Cointegration Test Results

Hypothesized No. Of CE(s)	Eigrnvalue	Trace Statistics	0.05 Critical Value	Prob
None *	0.692646	107.3575	40.17493	0.0000
At most 1*	0.482130	61.34711	24.27596	0.0000
At most 2*	0.446437	35.68386	12.32090	0.0000
At most 3*	0.276454	12.62004	4.129906	0.0004

Source: Eviews Processed Results



Table 8 shows that the trace statistic value > critical value is $107.3575 > 40.17493$. Data analysis states that if the trace statistic > critical value then the test results contain a cointegration equation which means it has long-term balance.

5. Autoregressive Distributed Lag Estimation

This research uses autoregressive distributed lag model analysis, because the dependent variable in this research is influenced by the independent variable at time t , and is influenced by the independent at time $t-1$. Because the unit supply of red chilies, the price of red chilies, the size of the harvest area and the price of NPK fertilizer are different, the model needs to be transformed into a natural logarithm. This transformation into natural logarithm form is also to reduce the resulting coefficient value due to the large difference in one value between variables. Autoregressive Distributed Lag results are presented in Table 9.

Table 9. Autoregressive Distributed Lag Estimation

Variables	Coefficient	Std. Error	t-Statistics	Prob.*
Y(-1)	0.241198	0.182319	1.322947	0.1962
X1	0.093797	0.165193	0.567803	0.0145
X2	-0.107479	0.163012	-0.659331	0.0149
X2(-1)	0.196107	0.141220	1.388658	0.0155
X2(-2)	0.281415	0.153871	1.828906	0.0177
X2(-3)	-0.218003	0.158494	-1.375469	0.0195
X3	0.234234	0.168636	1.388993	0.1754
X4	-3.517436	1.379014	-2.550688	0.0163
X4(-1)	3.566698	1.344422	2.652959	0.0128
C	4.058765	9.269322	0.437871	0.6647
R-squared	0.748613			
Adjusted R-squared	0.670596			
SE of regression	0.140237			
Sum squared resid	0.570324			
Log likelihood	27.05108			
F-statistic	9.595559			
Prob(F-statistic)	0.000001			

Source: Eviews Processed Results

Table 9 shows the results of the Autoregressive Distributed Lag estimation, so the following equation is obtained:

- $\text{LnScm} = \alpha + \beta_1 \text{LnYt-1} + \beta_2 \text{LnPct} + \beta_3 \text{LnPct-1-1} + \beta_4 \text{LnPct-1-2} + \beta_5 \text{LnPct-1-3} + \beta_6 \text{LnLpct} + \beta_7 \text{LnHpnt} + \beta_8 \text{LnHpnt-1}$
- $\text{LnScmt} = + 4.0587644 + 0.241198\text{Y(-1)} + 0.093797\text{X1} - 0.107478\text{X2} + 0.1961065\text{X2(-1)} + 0.281415\text{X2(-2)} - 0.218003\text{X2(-3)} + 0.234234\text{X3} - 3.517435\text{X4} + 3.566697\text{X4(-1)}$

Discussion

1. The Influence of the Red Chili Offer in the Previous Year (ScMT-1) on the Red Chili Offer (ScMT)

Table 9 shows that the significant value of the previous year's offer of red chilies was $0.1962 > \alpha = 0.05$, so H_0 was accepted and H_1 was rejected. This shows that the previous year's red chili supply had no real effect on the red chili supply. The coefficient value of the previous year's supply of red chilies has a positive relationship with the supply of red chilies, namely 0.241198, so every

ANALYSIS OF THE SUPPLY OF RED CHILLI (*Capsicum Annum. L*) IN NORTH SUMATRA PROVINCE***Yayu Juita Agustina Tobing, Lindawati, Salmiah***

increase in the supply of red chilies in the previous year by 1,000 rupiah will increase the supply by 247,798 tons.

2. The Influence of Red Chili Prices (Pct) on the Supply of Red Chilies (ScMT)

Table 9 shows that the significant value for the price of red chilies is $0.0145 < \alpha = 0.05$, so H_0 is rejected and H_1 is accepted. This shows that the price of red chilies has a real influence on the supply of red chilies. The coefficient value of the price of red chilies has a positive relationship with the supply of red chilies, namely 0.093797, so every increase in the price of red chilies by 1,000 rupiah will increase the supply by 93,797 tons, *ceteris paribus*.

3. The Influence of the Price of Red Chilies in the Previous Year (Pct-1) on the Supply of Red Chilies

Table 9 shows that the significant value for the price of red chilies in the previous year was $0.0149 < \alpha = 0.05$, so H_0 is rejected and H_1 is accepted. This shows that the price of red chilies in the previous year had a real influence on the supply of red chilies. The coefficient value of the price of red chilies in the previous year has a negative relationship with the supply of red chilies, namely 0.10748, so every increase in the price of red chilies in the previous year by 1,000 rupiah will reduce the supply by 107.48 tons. This shows that the price of red chilies in the previous year had an influence on the supply of red chilies in North Sumatra Province. The price of red chilies was previously high, so the quantity of red chilies offered will increase along with the increase in the price of red chilies.

4. The Influence of the Price of Red Chilies in the Previous Year (Pct-1-1) on the Supply of Red Chilies

Table 9 shows that the significant value of the previous year's red chili price at lag 1 was $0.0155 < \alpha = 0.05$, so H_0 was rejected and H_1 was accepted. This shows that the price of red chilies in the previous year had a real influence on the supply of red chilies. The coefficient value of the price of red chilies in the previous year has a positive relationship with the supply of red chilies, namely 0.196107, so every increase in the price of red chilies in the previous year by 1,000 rupiah will increase the supply by 196.107 tons, *ceteris paribus* tons. This shows that the price of red chilies in the previous period at lag 1 had an influence on the supply of red chilies in North Sumatra Province. The price of red chilies was previously high, so the quantity of red chilies offered will increase along with the increase in the price of red chilies.

5. The Influence of the Price of Red Chilies in the Previous Year (Pct-1-2) on the Supply of Red Chilies

Table 9 shows that the significant value of the previous year's red chili price at lag 1 was $0.0177 < \alpha = 0.05$, so H_0 was rejected and H_1 was accepted. This shows that the price of red chilies in the previous year had a real influence on the supply of red chilies. The coefficient value of the price of red chilies in the previous year has a positive relationship with the supply of red chilies, namely 0.281415, so every increase in the price of red chilies in the previous year by 1,000 rupiah will increase the supply by 281,415 tons, *ceteris paribus*.

6. The Influence of Red Chili Prices in the Previous Year (Pct-1-3) on Red Chili Supply

Table 9 shows that the significant value of the previous year's red chili price at lag 1 was $0.0195 < \alpha = 0.05$, so H_0 was rejected and H_1 was accepted. This shows that the price of red chilies in the previous year had a real influence on the supply of red chilies. The coefficient value of the price of red chilies in the previous year has a negative relationship with the supply of red chilies, namely 0.218003, so every increase in the price of red chilies in the previous year by 1,000 rupiah will reduce the supply by 218,003 tons.



7. The Influence of Red Chili Harvest Area (LPCT) on Red Chili Supply

Table 9 shows that the significant value of the red chili harvest area is $0.1754 > \alpha = 0.05$, so H_0 is accepted and H_1 is rejected. This shows that the size of the red chili harvest area has no significant effect on the supply of red chilies. The coefficient value of the red chili harvest area has a positive relationship with the supply of red chilies, namely 0.234234, so every increase in the red chili harvest area by 1,000 rupiah will increase the supply by 234,234 tons, *ceteris paribus*.

8. The Influence of NPK Fertilizer Prices (Hpnt) on the Supply of Red Chilies (SCMT)

Table 9 shows that the significant value for the price of NPK fertilizer is $0.0163 < \alpha = 0.05$, so H_0 is rejected and H_1 is accepted. This shows that the price of NPK fertilizer has a real influence on the supply of red chilies. The coefficient value of the price of NPK fertilizer has a negative relationship with the supply of red chilies, namely 3.517436, so every increase in the price of NPK fertilizer by 1,000 rupiah will reduce the supply by 3517.4 tons.

9. The Influence of NPK Fertilizer Prices (Hpnt-1) on the Supply of Red Chilies (SCMT)

Table 9 shows the significant value of NPK fertilizer prices at lag 1 of $0.0128 < \alpha = 0.05$, so H_0 is rejected and H_1 is accepted. This shows that the price of NPK fertilizer in the lag 1 period has a real effect on the supply of red chilies. The coefficient value of the price of NPK fertilizer has a positive relationship with the supply of red chilies, namely 3.566698, so every increase in the price of NPK fertilizer by 1,000 rupiah will increase the supply by 3566.7 tonnes, *ceteris paribus*.

4. CONCLUSION

This research obtained conclusions based on the following research results:

1. Prob F-statistic value < significance $\alpha = 0.05$, namely 0.00001, together with the independent variables in the model, namely the supply of red chilies in the previous year, the price of red chilies (Pct), the price of red chilies in the previous year (Pct-1), the area of the red chili harvest (Lpt), the area of the previous year's red chili harvest and the price of NPK fertilizer (Hpnt) have a real influence on the supply variable, namely the supply of red chilies (ScMT) in North Sumatra Province with a significant $\alpha = 5\%$. The price of red chilies, the price of red chilies in the previous year, the area of the red chili harvest and the area of the red chili harvest in the previous year have a significant effect on the supply of red chilies in North Sumatra Province. Meanwhile, the price of NPK fertilizer with a probability of $0.6420 > \alpha = 0.05$ has no real effect because the probability value is $< \alpha = 0.05$.
2. Variables that have long-term balance are the supply of red chilies in the previous period (Yt-1), the price of red chilies in the current period (Pct), the price of red chilies in the previous period (Pct-1), and the price of fertilizer in the current period. Meanwhile, the short-term balance variables are the price of red chilies in the previous period (Pct-1), the price of red chilies in the previous period (Pct-1) at lag 1, the price of red chilies in the previous period (Pct-1) at lag 2 and the price of fertilizer for the current period (HPnt).

REFERENCES

- Andi, 2020. Analisis Respon Penawaran Komoditas Karet di Sulawesi Selatan. Fakultas Pertanian Universitas Muhammadiyah Makasar.
- Badan Pusat Statistik. 2020. Statistik Hortikultura. Badan Pusat Statistik Indonesia. 2020.
- Buchari, A .2018. Pertumbuhan Vegetatif Tanaman Cabai Merah (*Capsium annum* L.) Secara Hidroponik Dengan Nutrisi Pupuk Cair Dari Kotoran Kambing. Fakultas Tarbiyah Dan Keguruan Universitas Islam Negri.
- Cahyono, D. B., Ahmad, H., & Tolangara, A. R. Hama pada Cabai Merah. Vol 6 No 2. Techno: Jurnal Penelitian. 2017.

ANALYSIS OF THE SUPPLY OF RED CHILLI (*Capsicum Annum. L*) IN NORTH SUMATRA PROVINCE

Yayu Juita Agustina Tobing, Lindawati, Salmiah

- Chilin, U. M., Sulistianingsih, E., & Debatara, N. N. (2019). Model Autoregressive Distributed Lag (ADL) Pada Data Harga saham. 08(1), 83-90.
- Dewi. 2016. *Analisis Penawaran Cabai Merah (Capsicum Annum L) Di Kabupaten Karanganyar*. Fakultas Pertanian Universitas Sebelas Maret.
- Dinda, S. 2019. Faktor – Faktor Mempengaruhi Permintaan Cabai Merah (*Capsicum Annum L*) Olahan. Fakultas Pertanian Universitas Muhammadiyah Sumatera Utara.
- Firdha, R. Peramalan dinamis Produksi Padi di Jawa tengah Menggunakan Metode Koyck dan Almon. Jurnal GAUSSIAN, Vol 5 No 1. 2016.
- Hanafie, Rita. 2010. *Pengantar Ekonomi Pertanian*. C.V Andi Offset. Yogyakarta
- Hasanah, S. 2021. *Analisis Permintaan dan Penawaran Ubi Kayu di Provinsi Sumatera Utara*. Fakultas Pertanian Universitas Sumatera Utara. Medan.
- Herfianus, T. 2021. *Penawaran Cabai Rawit Di Kabupaten kubu Raya*. Fakultas Pertanian Universitas Tanjungpura Pontianak.
- Herispon. 2010. *Ekonomi Mikro*. Akademi keuangan dan perbankan riau sekolah tinggi ilmu ekonomi. Pekan baru.
- Ismanto, A. 2018. *Analisis Penawaran Cabe Rawit(Capsicum annum L)*. Fakultas Pertanian Universitas Bandowoso.
- Jannah, Z. 2019. *Penerapan Perbandingan Distributed Lag Untuk Memodelkan Nilai Ekspor Indonesia Terhadap Jepang Dengan Menggunakan Transformasi Kyock dan Almon*. Fakultas Matematika Ilmu Pengetahuan Alam Universitas Brawijaya.
- Kemendag. 2014. Profil komoditas. Kementrian Perdagangan, Kementerian Perdagangan Indonesia. Jakarta.
- Lydia, dkk. 2017. *Pengantar Ekonomi Mikro*. Scripta Cendekia. Kalimantan Selatan.
- M, S. O. V., Luthvina,dkk. Pengolahan Cabai Merah (*Capsicum annum l .*) Menjadi Sari Cabai Original Untuk Menciptakan Peluang Usaha Bagi Masyarakat. Vol 6, No 1. Jurnal Hasil Pengabdian Kemasyarakatan. 2021.
- Mira. 2020. *Analisis Penawaran Cabe Rawit di Kabupaten Boyolali*. Fakultas Pertanian Sebelas Maret.
- Miyarnis. 2021. *Penawaran Jagung di Provinsi Sumatera Utara*. Fakultas Pertanian Universitas Sumatera Utara. Medan.
- Muhammad. 2016. *Budidaya Cabai Panen Setiap Hari*. Penebar Swadaya. Jakarta.
- Nuralya, A. R (2020). *Analisis Respons Penawaran Komoditi Karet Alam Di Sulawesi Selatan*. Program studi Agribisnis Fakultas Pertanian. Universitas Muhammadiyah Makasar.
- Pratiwi, Dona Arum. 2018. *Analisi Penawaran Ubi Kayu di Kabupaten Wonogiri*. Fakultas Pertanian Universitas Sebelas Maret
- Purba, M.P.K. 2019. *Analisi Permintaan dan penawaran beras di Provinsi Sumatera Utara*. Fakultas Pertanian Universitas Sumatera Utara. Medan.
- Purwadi, D.W.A. *Analisis Penawaran Cabai Merah (Capsicum Annum L) di Kabupaten Karanganyar*. Jurnal AGRISTA, Vol 4 No 3. 2016.
- Pusat data dan sistem informasi pertanian. 2020. Outlook Cabai Merah. Kementerian Pertanian. Jakarta.
- Puslitbanghorti. 2016. *Budidaya Cabai Merah*. Pusat Penelitian dan Pengembangan Hortikultura. Jakarta.
- Rozi, P. 2019. *Analisis Pendapatan Usahatani cabai Keriting (Capsicum annum L) Di Musim Hujan dan Musim Kemarau*. Fakultas Sains dan Teknologi Universitas Islam Negeri Syarif Hidayatullah.
- Rukmana. 2017. *Untung Selangit Dari Agribisnis Cabai*. Lily Publisher. Yogyakarta.
- Serly, N.S. 2020. *Elastisitas Penawran*. Fakultas Ekonomi Universitas Muhammadiyah Sidoarjo.
- Soekartawi, 1993. *Prinsip Dasar Ekonomi Pertanian : Teori dan Aplikasi*. Jakarta : PT Raja Grafindo Persada.



- Soleh, A. 2019. Analisis Ekspor dan Produksi Karet di Indonesia. Fakultas Ekonomi Universitas Dehasen Bengkulu.
- Srirapi, H. *Distributed Lag* Model Pengaruh Jumlah Uang Beredar Terhadap Nilai Tukar Rupiah Menggunakan Metode Koyck dan Almon. Jurnal Jambura JPS, Vol 3 No 1. 2022.
- Sugiyanto, dkk. (2020) *Pengantar Ilmu Ekonomi Mikro dan Makro*. Yayasan Pendidikan dan Sosial Indonesia Maju (YPSIM), Banten.
- Sujiono, Rinda Nur Rohmah. 2021. Analisis Permintaan Dan Penawaran Komoditas Jagung Di Kabupaten Tulungagung. Fakultas Pertanian Universitas Jember.
- Sukirno, Sadono. 2015. Makroekonomi Teori Pengantar. Jakarta: PT RajaGrafindo Persada
- Sumarni, N., & Muharam, A. 2005. Budidaya Tanaman Cabai Merah. In Budidaya Tanaman Cabai Merah. Balai Penelitian Tanaman Sayuran. Bandung
- Suyono. 2015. *Analisis Regresi Untuk Penelitian*. Depublish. Jakarta.
- Syahidin. 2021. Analisis Faktor-Faktor Yang Mempengaruhi Penawaran Cabai Merah Di Kecamatan Rusip Antara Kabupaten Aceh Tengah. *Gajah Putih Journal of Economics Review*. Vol 3 No 2 Oktober 2021 pp 51-64.
- Vica. 2016. Analisis Penawaran Cabai Besar di Kabupaten Purworejo. Fakultas Pertanian Universitas Muhammadiyah Purworejo.
- Yopi, N.F.. *Penawaran Dalam Ekonomi Mikro*. Fakultas Edunomic. Vol. 3 No. 1. 2015.
- Zamili, N., Harahap, G., & Siregar, R. S. Faktor-Faktor Yang Mempengaruhi Permintaan dan Penawaran Cabe Merah. Jurnal Ilmiah Pertanian (JIPERTA), Vol 2 No 1. 2020.