

Factors Affecting the Price of Curly Chili at the Producer Level in West Bandung Regency

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Abstract: Fluctuations in chili prices often occur due to the uneven availability of chili supply throughout the year, so the price of chili will jump up when the supply is low. The decline in the amount of cayenne pepper crop production in West Bandung Regency is an indicator that there is a decrease on the supply side. This study aims to analyze the effect of total harvested area, production costs, and yields/production of curly red chili on the price of curly red chili at the farm level. This research uses quantitative research methods. Data analysis using multiple linear regression. The types of data in this study are secondary data and primary data. The method of determining the sample in this study is a survey method with random sampling techniques selected randomly. The total respondents were 68 farmers, so the number of samples in this study was 35 farmers and consumers. The results showed that simultaneously, there was no significant and simultaneous influence between area, production costs, and yields/production on the price of curly red chili peppers in Parongpong District. While partially independent, the independent variables (area, production costs, and yields/production) have a real effect on the price of curly red chili peppers in Parompong District.

Keywords: Cost; Curly Chilli; Harvest; Land Area; Price

Introduction

Horticulture is the science that studies the cultivation of garden plants (Puryati et al., 2019; Rantung & Memah, 2017). Horticulture is one of the agricultural subsectors that plays an important role in the Indonesian economy. The development of agricultural subsectors, especially horticulture, is part of an integrated effort to build competitiveness and increase the role of national agriculture (Kementan RI, 2020). In geographically, Indonesia is very supportive of the development of various types of tropical fruit crops and various types of vegetables (Frasipa, 2021). One of the horticultural products that is an important and high-value commodity in Indonesia is chili (Dwikurnia & Arianti, 2016; Tubagus et al., 2016). Based on Presidential Regulation No. 71 in the Minister of Trade Regulation No. 22 of 2021 concerning (Frasipa, 2021) Determination and Storage of Basic Needs Goods and Important Goods

with a High Scale of Fulfillment of Needs, it is stated that red chili and cayenne pepper are included in the category of basic needs goods other than rice, soybeans, shallots, sugar, cooking oil, and meat (Permendag 2021). Chili peppers, which are included in the group of vegetable plants, are consumed by most Indonesians from all corners of the country, from Sabang to Merauke.

In 2022, West Bandung Regency had a chili harvest area of 201 ha and production of 38,430 kw (Badan Pusat Statistik, 2022). Based on BPS data, the production of curly red chilies by sub-district in West Bandung Regency in 2019-2021 has fluctuated on average. For example, in the Cihampelas area in 2019, 2020, and 2021, it was 50 tons, 220 tons, and 715 tons, respectively. In the Rongga area, it was 3,100 tons, 1,800 tons, and 2,295 tons, respectively. In the Batujajar area, it was 1,575 tons, 2,000 tons, and 575 tons, respectively. The imbalance between the amount of chili available and the amount needed by consumers is often a source of problems in the chili

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market. This imbalance causes the price level to be uncertain (fluctuating), as in the data processed by researchers. In December 2022, the average price was the lowest, in July 2022, the average price was the highest. And the rest of the months fluctuated. Unstable or fluctuating curly red chili prices can trigger economic inflation, such as when entering the main harvest period or a small harvest (Hidayati et al., 2022).

The results of the study Fajri et al. (2017) show that simultaneously and partially, the variables of rainfall, population, and number of restaurants have a positive or significant effect on the price of red chili in Banda Aceh City. The price of red chilies as projected by the ARIMA model indicates that prices for red chilies would likely drop in the future, according to research by Windhy and Jamil (2021). Based on research Sijabat et al. (2020), the price of substitute cayenne pepper, red chili production, complementary shallot price, and population in Medan City simultaneously have a significant effect on the current price of red chili. Research Pradana (2020) Red chili production significantly affects the price of red chili both at the producer/farmer and consumer levels in Aceh Jaya Regency. According to research Simatupang (2020), the increase in tomato prices contributes significantly to the welfare of farmers. Based on the result of research Surbakti (2021), In the short term, wholesale pricing, consumer prices, cayenne pepper prices, and fuel prices all have an impact on the establishment of producer-level red chili prices in North Sumatra Province. Long-term factors that affect it include the cost of cayenne pepper and the producer price from the previous month. According to research Suwandari and Suciati (2018), red chili production and costs vary every three months. Research Naully (2017), it is suggested that the government needs to develop off-season chili planting, regulate chili planting and develop partnerships between farmers and industry. Based on the results of research Erviana et al. (2020), the curly red chili market in West Java Province is efficient in terms of price efficiency. Research Dara & Sinta (2022) suggests that the cost of production is IDR 8,580.56 per kg, which is lower than the 2017 farmer selling price of IDR 20,400 per kg.

Fluctuations in chili prices often occur due to the uneven availability of chili supply throughout the year, so the price of chili will jump up when the supply is low. The decline in the amount of cayenne pepper crop production in West Bandung Regency is an indicator that there is a decrease on the supply side. This requires a more in-depth study of what factors affect the supply side of curly red chili in West Bandung Regency, especially in Parongpong District. Chili is an important commodity for the economy. The increase in chili prices can trigger quite high inflation, so it becomes a commodity strategy that needs to be controlled.

Therefore, knowledge of what factors affect chili prices is very necessary as a material for future commodity strategies. Based on this, this study aims to analyze the effect of total harvested area, production costs, and yields/production of curly red chili on the price of curly red chili at the farm level.

Method

This study uses quantitative research methods. Quantitative research method is a research method in which there are many numbers which will later be processed for statistical testing (Creswell, 2019). Data analysis uses multiple linear regression to analyze the relationship between the independent variables, namely the amount of production, production costs, harvest area, and farmer selling prices, and the dependent variable, namely the price of curly red chili at the producer level. The types of data in this study are secondary data and primary data. Primary data is data obtained directly from observations using questionnaires distributed to respondents and conducting interviews with related parties (Rea & Parker, 2014). Meanwhile, we obtained secondary data from publications or archives of the Agriculture Office, the Industry and Trade Office, and the West Bandung Regency Statistics Agency, as well as publications relevant to this research.

A survey method with randomly selected random sampling techniques is used to determine the sample in this study. The respondent criteria set in this study are cayenne pepper farmers and consumers. The number of samples determined in this study was 35 farmers and consumers. The researcher chose the recommended number of 35 people by considering their available resources. In addition, this number has met the requirements of normal spread in statistics, which is at least 30 of the total respondents, 68 farmers.

Research Framework

One horticultural commodity that is very sensitive to price changes due to production fluctuations is chili. When prices fall, farmers tend to switch to other commodities because chili is considered less profitable (Kusumah, 2018; Sumantri et al., 2016). However, in West Bandung Regency, which is the center of chili production in West Java, the price of curly red chili continues to fluctuate and has not been able to stabilize the market price, especially in Parongpong District. This is mainly due to the significant influence of marketing institutions, which act as distributors and play an important role in determining the price of chili from farmers to consumers. This study aims to analyze the factors that influence the price of curly red chili in West Bandung Regency, specifically focusing on the supply

factors of farmers in Parongpong Sub-district. This study uses multiple linear regression analysis to analyze the relationship between various independent variables (production quantity, production cost, harvest area, and farmer selling price) and the dependent variable, the price of curly red chili, at the producer level. The results of this analysis can provide an overview of the factors that influence the price of chili in the region.

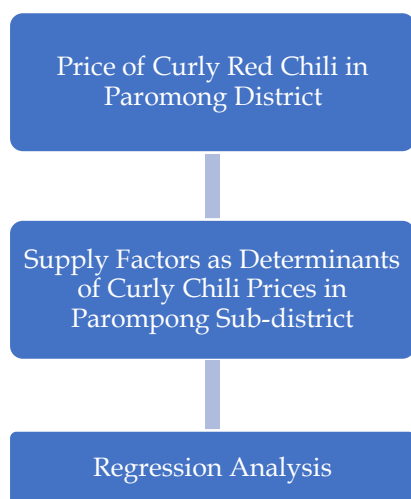


Figure 2. Research Framework

Hypothesis

1. Total Harvested Area of curly red chili affects the price of curly red chili at the farm level.
2. Chili production costs affect the price of curly red chili at the farm level.
3. The yield / production of curly red chili has an effect on the price of curly red chili at the farmer level.

Result and Discussion

Respondent Characteristics

Farmer characteristics are characteristics or traits possessed by farmers consisting of age, education, number of family dependents, and income (Subagio & Manoppo, 2016). The respondents in this study were farmers from Parongpong sub-district, West Bandung district. The results of distributing questionnaires to 55 respondents explain the data on the distribution of respondent characteristics presented in Table 2.

According to Rismayadi (2015), Novianti et al. (2017) and Darmayanti et al (2021), the age factor of workers is very influential in carrying out their work activities; as an example of this, we can find out in the type of pioneer group. The pioneer group is between 25 and 40 years old. This pioneer group is characterised by being forward-thinking, smart, and having broad knowledge. The average business is advanced, high-income, rich, and has high productivity.

Their specialty is being inquisitive and actively seeking out as much knowledge as possible. But they are less concerned about the people around them, not actively spreading their knowledge and experience (Suarni & Audri, 2021). Meanwhile, the old age group between the ages of 45 years and 60 years and over usually tends to be static. This group is usually included in the final acceptance group and has the characteristics of being less capable and less active in nature towards new things (Budiman et al., 2016).

Table 2. Characteristics of Farmers

Indicator	Totaln(People)	Percentagen(%)
Age (years old)		
<40	4	9
41 - 55	47	82
>56	4	9
Gender		
Male	52	94
Female	3	6
Education		
Elementary school	15	27
Junior High School	10	18
Senior High School	30	55
Income		
<50.000.000	17	30
50.000.000 - 100.000.000	14	25
>100.000.000	22	45
Number of Dependents		
1	20	33.3
2	20	33.3
3	20	33.3

According to Mulyadi, labour is the population of working age (aged 15–64 years) or the total population in a country that can produce goods and services if there is demand for their labour and if they are willing to participate in these activities (Arida et al., 2015). Another opinion states that productive labour are company residents who have worked for a minimum of 17 years and not more than 40 years (Firmansyah, 2015). Based on some of the above opinions, it can be concluded that the age of productive workers is between 15 and 40 years because this age group is characterised by forward-thinking, broad knowledge, and a high inquisitive nature, while ages above 40 and 60 years and over are said to be old age or no longer productive because these ages tend to be static.

The characteristics of respondents based on age are divided into 3 categories: less than or equal to 40 years, 41–55 years, and more than 55 years. Respondents aged less than 40 years and more than 55 years each amounted to 4 farmers. Most respondents were aged 41–55 years. From these data, it can be concluded that the majority of respondents are of productive working age, with the majority of male respondents.

In terms of education, it can be seen in Table 4 that the last education of the most respondents is high school or equivalent (55%) and junior high school or equivalent, as the last education of the least respondents is only 18%. However, when viewed in terms of education and income, there is no specific correlation that shows that the higher the last education of the respondent, the higher the income.

From the data obtained through the questionnaires distributed, it was found that there were no farmers who had more than 3 family dependents. Respondents only have 1, 2 to 3 dependents with a percentage of 33.3% each, with no majority of the highest percentage in this case.

Validity Test and Reliability Test

During the early stages of this study, we first tested the questionnaires distributed to respondents using validity and reliability tests. The validity test shows the extent to which a measuring device can measure what it wants to measure (Janti, 2014). Questionnaires are considered valid if their question points are interconnected with the desired concepts. Meanwhile, the reliability test measures the extent to which a measurement can be trusted when the measurement results are repeated and produce relatively the same results (Amanda et al., 2019).

55 respondents who work as curly red chili farmers participated in the questionnaire test conducted in this study. The validity test is carried out by calculating the correlation value (r) between the score of each question and the total score using the Pearson Product Moment method, which is processed using SPSS software version 2.5 for Windows. The confidence level used is 95 percent, namely α of 0.05 (r-table = 0.294). Variable validity is known by comparing the r table value with the calculated r value. If the r count is greater than the r table, then the variables in the study are declared valid. Thus, the validity test results of the 4 attribute variables used in this study are valid (r count = 0.500 - 0.597), which can be seen in Appendix 1.

The validity test is followed by reliability testing with Cronbach's Alpha technique using SPSS software version 2.5 for Windows. The reliability test results are declared red if the value of all attribute variables in the questionnaire has a value greater than the Cronbach's Alpha value. All attribute variables in this study are labelled with a value of 0.837, which can be seen in Table 3.

Table 3. Results of the reliability test of 8 research attribute variables

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0,837	0.842	4

F-test

The F statistical test basically shows whether all independent variables included in the model have a joint or simultaneous influence on the dependent variable (Sanderson & Windmeijer, 2016). By comparing $F_{hitung} > F_{tabel}$, there is an influence between the independent and dependent variables and vice versa. As for significance, if $F < 5\%$ then there is an influence between the independent and dependent variables and vice versa (Sarwono in Polii, 2015).

Table 4. Statistical Test of F

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	9750	3	3250	1.535	.217 ^b
Residual	107995	51	2118		
Total	117745	54			

Based on Table 4, it can be seen that the significance value is 0.217. This value is greater than the significance level of 0.05 so it can be concluded that H0 is accepted and H1 is rejected. This means that there is no significant and simultaneous influence between X1, X2, X3, on the price of curly red chili in Parongpong District. This is in accordance with the opinion of Ghozali (2018) which states that if the significance value is more than 0.05, then H0 is accepted (H1 is rejected) which states that the independent variables simultaneously have no effect on the dependent variable.

T-test

Testing the partial effect of X1, X2, and X3 on Y based on the following criteria:

1. If the sig value > 0.05, then H1 is rejected (H0 is accepted)
2. If the sig value ≤ 0.05, then H1 is accepted (H0 is rejected)

Table 5. T Test Table

Variabel	Std. Error	Thitung	Ttabel
Hasil Panen (X1)	0.300	2.006*	2.004
Biaya Produksi (X2)	0.326	2.139*	2.004
Luas Panen (X3)	0.365	2.020*	2.004
R-Squared	0.083		
Adjusted R- Squared	0.029		
Fhitung	2.17		
Ftabel	1.535		

When the t-count value of an independent variable exceeds the t-table, it is considered influential (Bairizki, 2017). The t-test results in Table 25 show the t-count value of variables X1 (2.006), variable X2 (2.139), and X3 (2.020), which is greater than the t-table (2.004) for each variable, so each independent variable (X1, X2, and X3) has a real effect on the price of curly red chilli peppers in Parompong District.

Regression Analysis

We analyzed the research data using multiple linear regression analysis with SPSS software version 2.1. Table 6 displays the results of the multiple linear regression analysis, which include a t-test and an f-test.

Table 6. Results of multiple linear regression analysis

Variabel	B
Hasil Panen (X1)	0.072
Biaya Produksi (X2)	0.228
Luas Panen (X3)	0.027

Notes: 5% real difference level; * significantly different (influential)

Multiple linear regression analysis was conducted on variable X1 (Harvest Yield), variable X2 (Production Cost), and variable X3 (Harvest Area) on variable Y (Price of Curly Chili). Based on the results of the regression analysis in Table 25, the regression equation model that can be written from these results is as follows:

$$Y = a + b1X1 + b2X2 + b3X3 + e \quad (1)$$

$$Y = 1,54 + 0,72 X1 + 0,228 X2 + 0,27 X3 \quad (1)$$

The coefficient value on each variable is positive, which states that the regression equation shows that the value of Y (curly red chili price) will change by 0.72 for every one unit of X1 (yield) if other variables are constant. Likewise, for every unit of X2 (production cost), the value of Y will change by 0.72 if other variables are constant, and for every unit of X3 (harvest area), the value of Y will change by 0.27 if other variables are constant. The value of Y will be equal to its constant if X1, X2, and X3 are zero.

Coefficient of Determination (R2)

Table 7. Coefficient of Determination (R2)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.288 ^a	.083	.029	1.45518

The suitability of the regression model can be seen from the coefficient of determination, R2. In Table 7, the results of the R2 determination coefficient test show an

R square value of 0.083, which means that 8.3% of the variation or change in the supply of curly red chili can be explained by all the independent variables that are thought to have an effect. Other factors outside of the study explain the remaining 91.7%. This value illustrates that all the independent variables used can explain the factors that affect the demand for curly red chili. This is in accordance with the opinion of Ghozali (2018), which states that a value close to 1 indicates that the independent variables provide almost all the information needed to predict variations in the dependent variable.

This study aims to analyze the effect of harvest area, production costs, and production yield of curly red chili on the price of curly red chili at the farm level. This study used rigorous methods to ensure the validity and reliability of the research instruments. Validity was established through the Pearson Product Moment method, which showed that the questions used in the questionnaire accurately measured the attributes in question. Furthermore, reliability was confirmed using Cronbach's Alpha, which showed a high level of consistency among the measured attributes. These measures enhance the credibility and trustworthiness of the findings of this study.

Based on the results of the simultaneous test or test, it shows that there is no significant effect together between Harvest Yield (X1), Production Cost (X2), and Harvest Area (X3) on the price of curly red chili in Parompong District. This suggests that when viewed together, these variables may not have a large impact on the price of chili peppers. This finding challenges conventional assumptions about the interaction between agricultural factors and market prices.

In contrast to the results of the partial test or t-test, which shows that each independent variable, namely Yield (X1), Production Cost (X2), and Harvest Area (X3) individually has a significant effect on the price of chili. This indicates that although these factors do not jointly influence chili prices, farmers and other stakeholders can still take these variables into account separately in making decisions related to farm management and pricing.

This finding supports Pradana (2020) research, where the results of his research show that red chili production significantly affects the price of red chili. This research is also in line with Erviana et al. (2020) where the results of the analysis of factors affecting producer price formation show that the producer price of the previous period and the amount of curly red chili supply affect price formation. In the Rachmawati (2017) study, simultaneously all independent variables (harvested area, production volume, consumption expenditure volume and population) had an effect on the price of red chili in North Sumatra, but partially only

the production volume and consumption expenditure variables had a significant effect on the price of red chili in North Sumatra. In the Ramadani (2023) study, simultaneously the variables of demand, supply and price of red chili in the previous month have a significant effect on the price of red chili. While partially the demand and price of red chili in the previous month have a significant positive effect on the price of red chili, but the supply of red chili does not have a significant effect on the price of red chili in Jambi Province. In Surbekti and Supriana (2022) study, the factors influencing the formation of producer prices showed that price formation was influenced by producer prices in the previous period and the amount of supply of large red chilies. In the Sativa et al., (2017) study, simultaneously the variables of demand, supply and price of red chili in the previous month have a significant effect on the price of red chili. While partially the demand and price of red chili in the previous month have a significant positive effect on the price of red chili, but the supply of red chili does not have a significant effect on the price of red chili in Jambi Province.

Multiple linear regression analysis provides a comprehensive picture of the relationship between the independent variables and the price of curly red chili peppers. The positive coefficients associated with each independent variable indicate that an increase in yield, production cost, and harvested area is associated with an increase in chili price, assuming all other things being equal. However, the coefficient of determination (R^2) shows that only 8.3% of the variation in chili prices can be explained by the independent variables included in the model. This indicates that other factors outside the scope of this study may have a more significant role in determining the price of curly red chili.

Besides the significant benefits for farmers, stakeholders and researchers, this study also has limitations that need to be considered. One of the main limitations lies in the scope of the variables investigated. It is possible that there are other factors not included in the analysis model that could affect the price of curly red chili, such as complex market factors, consumer consumption patterns, or climate variability that could affect crop yields. In addition, this study was only conducted in Parongpong Sub-district, so the results may not be generalizable to other areas. Therefore, further research with the development of a more inclusive model and the use of a more representative sample may provide a more comprehensive understanding of the factors that influence the price of curly red chili.

Conclusion

Based on the results of the study, it can be concluded that simultaneously there is no significant and simultaneous influence between area, production costs, and yields/production on the price of curly red chilli peppers in Parongpong District. But partially, the independent variables (area, production costs, and yields/production) have a significant effect on the price of curly red chilli peppers in Parompong District.

All the independent variables that are thought to have an effect can study, simultaneously the variables of demand, supply and price of red chili in the previous month have a significant effect on the price of red chili. While partially the demand and price of red chili in the previous month have a significant positive effect on the price of red chili, but the supply of red chili does not have a significant effect on the price of red chili in Jambi Province. Other factors outside of the study explain the remaining 91.7%. This value illustrates that all the independent variables used can explain the factors that affect the demand for curly red chilli.

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Author Contributions

Carrying out research and writing papers was carried out by 3 authors, namely authors 1 and 2 preparing proposals and instruments, author 3 as an enumerator took data in the field. The data results were analyzed for validity and reliability by author 2, followed by multiple regression analysis and description of the results. The results of the analysis are described in the writing of reports and papers carried out by the three authors together.

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This research was carried out independently, without receiving financial assistance from anywhere, the aim was to analyze the factors that influence the price of curly chilies through interviews and filling out questionnaires by curly chili farmers.

Conflicts of Interest

There is no conflict of interest in this research.

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