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Factors that Influence the Risk of Red Chili Production in Taraju District, Tasikmalaya Regency

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Abstract

The red chili commodity has a high farming risk. Therefore, it is necessary to carry out an analysis regarding the factors that influence the risks of chili farming. This research aims to analyze the factors that influence the productive risk of red chili farming. This research was conducted in Banyuasih Village, Taraju District, Tasikmalaya Regency, West Java. The data used are primary and secondary. The sampling technique used a proportional random sampling system with a sample size of 37 people. The analysis method used was the Just and Pope method, with a disturbance error/production risk approach regressed on the independent variables using the Ordinary Least Square/OLS method. The results showed that urea, seeds, land, labor, and manure significantly influenced the risk of red chili production. So, using production risk factors for each addition of urea fertilizer and seeds can reduce production risk, and each addition of land, labor, and manure can reduce the risk of red chili production.

Keywords: labor, risk, red chili, production.

INTRODUCTION

Indonesia is a developing country that plays an essential economic role in the agricultural sector (Fanani et al., 2019). Most of the population's livelihood is agriculture (Nurlinda et al., 2020). The agricultural sector is divided into several subsectors: food crops, horticulture, plantations, fisheries, livestock and forestry (Imelda Bou, Damianus Adar, 2021). Horticulture is one of the sectors proliferating in Indonesian agriculture (Zamili et al., 2020).

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Large red chillies are a type of horticultural plant that experiences development from year to year in line with population development, technological developments, and the ability to evolve and adapt the plant(Wijantara et al., 2022). Large red chillies are a commodity that has received the attention of the Indonesian people because they have pretty high economic value and are also used as a spice enhancer, a characteristic of Indonesian cuisine (Volantina, 2021). Chillies are also used for animal husbandry, and chilli fruit is used as a mixture (Amin & Prihantini, 2021). These various needs have caused the demand for large red chillies to increase (Wardhana et al., 2022).

Large red chillies are a commodity with quite a significant market opportunity but often experience price fluctuations due to an imbalance between supply and demand not accompanied by an increase in chilli production (Yuditya et al., 2023). In achieving a high increase in production, production factors are an inseparable unit in carrying out sizeable red chilli farming (Samsuddin & Muh. Sabir Laba, 2022). So, accuracy is needed in combining production factors (Hairiah et al., 2023). Activities involving farming which involve a production process are constantly faced with risk situations; the most critical risk faced by large red chilli farmers is production risk caused by factors in production activities such as weather uncertainty and attacks by pests and plant diseases, including price risks arising from there is uncertainty in the selling price of chillies, which will have an impact on the risk of the level of income obtained by farmers (Mala et al., 2021). Production factors often used in cultivating large chillies include seeds, manure, chemical fertilizers, and growth regulators. External factors that influence production are irrigation and HPT attacks (Pests and Plant Diseases). Production risk is influenced by several factors, some of which increase production risk and some of which reduce it (Devi et al., 2021)

The existence of risks from sizeable red chilli production prompted researchers to research and determine what risk factors influence production risks in large red chilli farming activities in the Taraju sub-district.

Objectives

The existence of risks from sizeable red chilli production prompted researchers to research and determine what risk factors influence production risks in large red chilli farming activities in the Taraju sub-district.

Research Methods

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This research was conducted in Banyuasih Village, Taraju District, Tasikmalaya Regency, West Java, in 2022 because Banyuasih Village has the highest chilli production compared to other villages in Taraju District. The research method used was the survey.

The data used are primary and secondary. Primary funding is carried out through interviews and observations of respondents. Meanwhile, secondary financing supports data from agencies, books, and journals.

The sampling technique used a proportional random sampling system. The sampling technique for this research is a proportional random sampling system. This technique obtains samples directly at the sampling unit, so each sampling unit, as a remote element of the population, has the same opportunity to become a sample or to represent the population (S.Margono, 2004).

The population in this study were all members of 6 red chilli farmer groups in Banyuasih Village, with a total of 210 red chilli farmers. Respondents were taken using the Slovin formula, with a standard error of 15 per cent, so the number of respondents was determined to be 37 people. The Slovin method is a method for calculating the minimum number of samples if a sample is not known for sure. Techniques and data analysis in determining the number of samples use the Slovin formula as follows:

$$\mathbf{n = \frac{N}{1+Ne^2}}$$

Information :

n = Sample size

N = Population size

e = Error rate

Based on the formula above and using an absolute level precision level of 85 per cent and an error rate of 15 per cent, the following research sample size is obtained:

$$n = \frac{210}{1+210\ (0{,}15)^2}$$

$$n = \frac{210}{5{,}725}$$

$$n = 36{,}68 \ = \ 37.$$

Based on the formula above, the respondents obtained were 37 people, determined by proportional random sampling from the total population in Banyuasih Village, Taraju District, presented in Table 1.

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Table 1. Number of Population and Samples obtained from Banyuasih Village, Taraju District

Names Farmer Group	Poputation (person)	Sample (Person)
Mekarsari	46	46/210 x 37 = 8
Mekarwangi	33	33/210 x 37 = 6
Mekarasih I	23	23/210 x 37 = 4
Mekarasih II	17	17/210 x 37 = 3
Bintang Tani	52	52/210 x 37 = 9
Saluyu	39	39/210 x 37 = 7
Total	210	37

Source: Taraju District Agricultural Extension Center

The Just and Pope (1974) method was used to answer this research, with a disturbance error/production risk approach regressed on the independent variables using the Ordinary Least Square/OLS method.

$$\text{Ln } |\varepsilon 1| = \ln\alpha + \beta 1 \text{ ln urea} + \beta 2 \text{ ln Benih} + \beta 3 \text{ ln Lahan} + \beta 4 \text{ ln kompos} + \beta 5 \text{ ln Phonska} + \beta 6 \text{ ln TK} + \beta 7 \text{ ln KCL} + \beta 8 \text{ ln Kandang} + \beta 9 \text{ ln Insektisida} + \beta 10 \text{ ln Dolomit} + \varepsilon 2$$

To obtain the validity of the results of the OLS model econometric testing, a test was carried out

classical assumptions and the suitability of models such as the production function.

a. F Test (Simultaneous Test)

The F test is used to jointly test whether or not there is an influence of the independent variable on the dependent variable. The criteria used are if the significance probability is <0.05, then the independent variable (X) simultaneously influences the dependent variable (Y), and if the likelihood is >0.05, then the independent variable (X) simultaneously does not influence the dependent variable (Y)

b. T Test (Partial)

The t-test is used to test whether or not there is an influence of the variables Urea fertilizer, seeds, land area, compost fertilizer, labour, phonska fertilizer, KCL fertilizer, insecticide and dolomite on production risk variables. The criteria used, a probability

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value of ≤0.05, has a significant effect. If the probability value is >0.05, then the independent variable (X) will affect the dependent variable (Y).

Discussion

Production risk assessment for red chilies is analyzed using inputs or production factors on casino productivity. Production risk analysis uses the GARCH (1,1) model to determine the production variance value, which indicates production risk. This model will produce production variance values obtained from the results of estimating the production and production variance equations.

To see the model that has been obtained, first an evaluation of the estimated model is carried out based on the output results of the Eviews 6 program that have been obtained. The results of the GARCH model estimation of the average production function equation and production variance for red chili commodities can be seen in Table 2.

Table 2. Analysis Results of Factors that Influence the Risk of Red Chili Production

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.206188	0.797821	-2.765267	0.0103
UREA	0.032513	0.016978	-1.914948	0.0666*
SEED	0.127556	0.063331	2.014102	0.0545**
LAND	0.065221	0.039159	1.665541	0.1078
COMPOST	0.020617	0.012911	-1.596833	0.1224
PHONSKA	-0.011133	0.015614	-0.713024	0.4822
LABOR	0.540829	0.180054	3.003699	0.0058*
KCL	0.024098	0.031065	0.775718	0.4449
MANURE	0.038622	0.022811	1.693143	0.1024*
INSECTICIDE	-0.059475	0.046814	-1.270436	0.2152
DOLOMIT	-0.022100	0.026073	-0.847635	0.4044
R-squared	0.470469	Mean dependent var	0.133893	
Adjusted R-squared	0.266803	S.D. dependent var	0.190796	
S.E. of regression	0.163373	Akaike info criterion	-0.543794	

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Sum squared resid	0.693955	Schwarz criterion	-0.064873	

**significant at 5 percent alpha; *significant at 10 percent alpha

Based on Table 2, it can be explained that the coefficient of determination (R2) is 47.04 percent. The coefficient of determination (R2) value means that 47.04 percent of the diversity of production variation can be explained jointly by the model, while the remaining 38.46 percent can be explained by error components or other factors outside the model. These other factors include the presence of pests and diseases and weather uncertainty.

Apart from the coefficient of determination (R2) value, a significance test of the estimated model was also carried out using the F test. Based on the results of the F test, the calculated F value was 2.31, which was greater than the F-table value, namely 2.04, where the F-table value. In addition, the P(F-statistic) value of 0.04 is smaller than α five percent. Because the F-calculated value is greater than the F-table and the P (F-statistic) value is smaller than the α value, this condition explains that all production factors used together significantly affect production risk.

The variables that influence production risk can be explained as follows:

1. Urea (X1)

The use of urea fertilizer significantly affects the variance in red chili production at the 10 percent test level. The estimated regression coefficient shows a negative value, so each urea fertilizer addition will decrease the red chili production variance. The coefficient value for urea fertilizer is 0.03. This means that every increase in the amount of urea fertilizer by 1 percent will reduce the production variance by 0.03 percent, with other production variables considered constant.

2. Seeds

The use of urea fertilizer significantly affects the variance in red chili production at the 10 percent test level. The estimated regression coefficient shows a negative value, so each additional seed will decrease the variance of red chili production. The coefficient value for urea fertilizer is 0.13. This means that every increase in the amount of urea fertilizer by 1 percent will reduce the production variance by 0.03 percent, with other production variables considered constant.

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3. Land

Land use significantly affects the variance of red chili production at the 10 percent test level. The estimated regression coefficient shows a positive value, so each increase in the land area will increase the variance of red chili production. The coefficient value for urea fertilizer is 0.06. This means that every 1 percent increase in land area will increase the production variance by 0.06 percent, with other production variables considered constant.

4. Compost

The use of compost does not significantly affect the variance in red chili production at the 5 percent test level. The estimated regression coefficient shows a negative value, so each addition of compost fertilizer will decrease the red chili production variance. The compost fertilizer coefficient value is 0.02. This means that every 1 percent addition of compost fertilizer will reduce the production variance by 0.02 percent, while other production variables are considered constant.

5. Phonska

The use of compost does not significantly affect the variance in red chili production at the 5 percent test level. The estimated regression coefficient shows a negative value, so each addition of phonska fertilizer will decrease the variance of red chili production. The Phonska coefficient value is 0.02. This means that every 1 percent addition of phonska fertilizer will reduce the production variance by 0.02 percent, while other production variables are considered constant.

6. Labor

The use of compost significantly affects the variance in red chili production at the 5 percent test level. The estimated regression coefficient shows a positive value, so each additional workforce will result in an increase in the red chili production variance. The labor coefficient value is 0.54. This means that every 1 percent increase in labor will increase the production variance by 0.54 percent, with other production variables considered constant.

7. KCL

The use of KCL fertilizer does not significantly affect the variance in red chili production at the 5 percent test level. The estimated regression coefficient shows a positive value, so each addition of KCL fertilizer will increase the variance of red chili production. The coefficient value of KCL fertilizer is 0.02. This means that every 1 percent addition of KCL fertilizer will increase the production variance by 0.02 percent, while other production variables are considered constant.

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8. Manure

The use of cages significantly affects the variance in red chili production at the 10 percent test level. The estimated regression coefficient shows a positive value, so each addition of manure will increase the variance of red chili production. The manure coefficient value is 0.03. This means that every 1 percent addition of manure will increase the production variance by 0.03 percent, while other production variables are considered constant.

9. Insecticide

The use of insecticides does not significantly affect the variance in red chili production at the 5 percent test level. The estimated regression coefficient shows a negative value, so each addition of insecticide will decrease the variance of red chili production. The insecticide coefficient value is 0.05. This means that every 1 percent addition of insecticide will reduce the production variance by 0.05 percent with other production variables considered constant.

10. Dolomites

The use of dolomite does not significantly affect the variance of red chili production at the 5 percent test level. The estimated regression coefficient shows a negative value, so each addition of dolomite will decrease the variance of red chili production. The dolomite coefficient value is 0.02. This means that every 1 percent addition of dolomite will reduce the production variance by 0.02 percent, while other production variables are considered constant.

CONCLUSION

Risks in red chili farming need to be identified to minimize the risks of red chili farming. Urea, seeds, land, labor, and manure are factors that significantly influence the risk of red chili production. Thus, the use of production risk factors for each addition of urea fertilizer and seeds can reduce production risk, and each addition of land, labor, and manure can reduce the risk of red chili production.

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