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The Decreasing Interest of Farmers in Soybean Farming in Puger Sub-District Jember Regency

The Decreasing Interest of Farmers in Soybean Farming in Puger Sub-District Jember Regency

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Abstract. Puger Subdistrict is a soybean producer in Jember Regency, where the amount of production in the last three years has decreased drastically. In 2017 the soybean production in Puger sub-district reached 53 tons, in 2018 it fell to 508 quintals, and in 2019 it fell to 39 quintals. The decline in soybean production will threaten food security. It is also known that based on statistical data, Puger has decreased the area of soybean harvested, from 201 to 14 hectares ectara during the 2018-2019 period. The objectives of this study are to 1) identify the factors that influence the decrease in farmers 'interest in doing soybean farming in Puger, and 2) provide alternative strategies that can be used to increase farmers' interest in soybean farming in Puger. The research methods are descriptive, Multiple Linier Regression, and Force Field Analysis (FFA) with incidental sampling (45 people and 3 expert respondents). This research used primary and secondary data. The results showed that 1) The factor that had a significant effect on reducing farmers' interest in soybean farming was the price of soybeans (Rp/kilo), while the price of corn (Rp/kilo) and the weather factor did not have a significant effect, 2) the alternative strategies are: increasing the selling price of soybeans at the farmer level, training from extension agents to farmers to increase the ability of farmers in doing soybean farming, especially related to technical matters, and strengthening central government policies stabilization of local soybean prices as an incentive to foster farmers' interest in planting soybeans which will have an impact on increasing the amount of local soybean production that can meet market needs and reduce the number of soybean imports.

1. Introduction

Soybean production in Jember Regency when viewed from the data for the last 3 years has decreased. Production data in 2017 was 19,164 tons, while in the following year it continued to decline to 13,886 quintals in 2018 and 12,521 quintals in 2019 (1). Puger sub-district is one of the soybean-producing sub-districts, it's just that the amount of production in the last three years has decreased very drastically. In 2017 the soybean production in Puger sub-district reached 53 tons, in 2018 it fell to 508 quintals, and in 2019 it fell to 39 quintals. The decline in soybean production will threaten food security. It is also known that based on BPS data from Puger Subdistrict, there was a decrease in soybean harvested area, from 201 Ha to 14 Ha during the 2018-2019 period [1].

This symptom of a decline in soybean production in the Jember Regency in general and Puger, in particular, is an indication that farmers are starting to experience a decline in interest in not doing soybean farming. Many factors are suspected to be the trigger for the decline in farmers' interest in soybean farming, it's like the soybean price factor. This condition is an interesting phenomenon to be studied further and find a solution in the form of an appropriate alternative strategy to overcome the decline in production.

The objectives to be achieved from this research are: 1) Identifying the factors that influence the decrease in farmers' interest in doing soybean farming in Puger, and 2) Providing alternative strategies to increasing farmers' interest in soybean farming in Puger.

2. Material and Methods

2.1. Method of Study

Study used descriptive and analytic method.This methodexamine status of respondent, object, set of condition, system of thinking, condition or occurance in once time, testing hypothesis and interpreting analysis result deeply.

2.2. Field of Study

Field of study was determined by purposive methodin Puger sub-district because in Puger there is a decrease in the amount of soybean production and planting area from year to year.

2.3. Methodof Sampling

Method of sampling by incidental sampling. The number of samples taken for Questionnaire I was 45 respondents, while for Questionnaire II with an expert sample of 3 people (2 respondents from the expert soybean farmer and 1 respondent from the Department of Agriculture, Food Crops and Horticulture, Jember Regency).

2.4. Methodof Data Analysis

Analysis of the data to answer the first objective with Multiple Linear Regression Analysis. The data to be tested can be called good data if it meets the BLUE (Best Linear Unbiased Estimator). The BLUE test including 1) Normality, 2) Autocorrelation, 3) Multicollinearity, and 4) Heteroscedasticity [2]. This research didn't use an autocorrelation test because the data used in the study is cross-section data, while the error rate used is 5%. The equation model:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + e$$

Explanation:

Y	= The interest of farmers
$\beta_0 .. \beta_x$	= constanta
X_1	= price of soybean (Rp/kilo)
X_2	= price of corn (Rp/kilo)
X_3	= weather (Likert scale method)
e	= natural logarithm = 2,7183

To test how far the Y is caused by variations in the X variables the Coefficient of Determination or adjusted R Square (R2) is used. If the adjusted R Square value is greater, it indicates that there is a very strong relationship between the X and the Y variable. Then test the hypothesis that has been proposed using statistical tests:

a) The ANOVA test criteria:
   a. Sig F > Sig α (0,05) means that the independent variables jointly affect the dependent variable.
   b. Sig F ≤ Sig α (0,05) means that the independent variables together do not affect the dependent variable.

b) Partially test criteria:
   a. If Sig ≤ α (0,05) means that the Xi variable has a significant effect on the Y variable.
   b. If Sig > α (0,05) means that the Xi variable has no significant effect on the Y variable.

The analytical method to answer the second objective is used Force Field Analysis (FFA). The stages in conducting the FFA analysis are as follows [3]:

1. Identify problems based on strategic issues.
2. Analyze the problem by identifying various driving and restraining forces.
3. Provide a priority scale assessment of each driving and resistor factor.

The assessment of each identified factor will determine the success factor of the goal. There are several aspects that need to be considered in assessing each factor, namely (3):

1. The urgency of the factor to the goal, consisting of the value of urgency (NU) and the weight of the factor (BF).
2. Factor support for goals, consisting of Support Value (ND) and Support Weight Value (NBD).
3. The relations between factors to the goal, consisting of the Correlation Value (NK), the Average Correlation Value (NRK), and the Weighted Linkage Value (NBK).

The NU, ND, and NK assessments use 1-5 scale:a) 5: very high value of urgency; b) 4: a high value of urgency; c) 3: quite high of urgency; d)2: less value of urgency, and e)1: very less value of urgency.

The driving factors came from strengths and opportunities, while the resistor factors from weaknesses and threats. In general, the assessment can be carried out using qualitative values that are quantified using 1-5 scale. Determining the Urgency Value (NU) aspect of each driving and resistor factor by using a comparison technique. To determine the value of the aspect of urgency (NU) on the resistor factors, it is the same as in determining the NU on the driving factors. Furthermore, the NU and BF of each driving and resistor factors are entered into their respective columns (Table 1).

Table 1. Evaluation of Driving and Resistor Factors

No.	Driving &Resistor Factors	NU	BF (%)	ND	NBD	NK						NRK	NBK	TNB	FKK
						D1	D2	D…	H1	H2	H…				
	D1														
	D2														
	D…														
	H1														
	H2														
	H…														

Source: *Sianipar dan Entang, 2003. [3]*

The NBD value is ND x BF
The NRK value is from TNK/(N-1), where TNK is the sum of the correlation values of one factor and N is the number of driving and resistor factors assessed.
The NBK value is obtained from NRK x BF
TNB value is NBD + NBK

To assess the driving and resistor factors, the Key Success Factors (FKK) are used. The determination is as follows (3):
1. Select each resistor factor and driving factor based on the largest TNB or Total Factor Weight Value.
2. If TNB is the same, then the largest BF is chosen.
3. If BF is the same, then the largest NBD is selected.
4. If the NBD is the same, then the largest NBK is selected.
5. If the NBK is the same, then choose based on experience and rational considerations.

3. Result And Discussion

3.1 The Decreasing of Farmers Interest in Soybean Farming Factors

a. Normality Test

The Skewness Ratio shows a negative result of -1.867, while the Kurtosis Ratio shows the result of 0,525. The value of the Skewness and the Kurtosis ratio is between -2 to +2, so the data used has been shown to be normally distributed.

b. Multicollinearity Test

The results of the analysis show that the VIF value for each independent variablesare less than 10 (in the value of 1.005 - 1.043). Thus, it can be concluded that all independent variables did not experience multicollinearity disorders.

c. Heteroscedasticity Test

The results of the analysis (Glejser test) in the Significance column (Sig.) of all independent variables, the significance value is above 0.05 (Sig > 0.05). This shows that all independent variables are homoscedasticity.The result of Multiple Linear Regression shows as follows:

Table 2. The results of multiple regression analysis (α = 5%)

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	T	Sig.
1	(Constant)	2.580	.896		2.878	.006
	X1	9.024	.000	.160	.021	.013
	X2	-4.624	.000	-.110	-.703	.486
	X3	-.048	.152	-.048	-.312	.757
Sig ANOVA: 0,046						
R Square: 0,723						
Adj R Square: 0,698						

The Adj R Square is 0.698 or 69.8% the decrease in interest in farmers in conducting farming soybean is influenced by all the third independent variables, while 30.2% influenced factor, availability of production facilities, and other factors. Meanwhile, if viewed from the ANOVA significance is 0.046 it shows that simultaneously, the three independent variables had a significant effect. The equation for the multiple linear regression function from this research is:

$$Y = 2{,}580 + 9{,}024X_1 - 4{,}624X_2 - 0{,}048X_3 + e$$
$$\textit{(0,013)} \quad \textit{(0,486)} \quad \textit{(0,757)}$$

a. The value of the constant on the model is 2,580, if there is no effect of all the independent variables then the interest of farmers in soybean farming is only 2,580 units.

b. The X_1coefficient is 9,024, means that every time there is a decrease in the price of soybeans of Rp. 1000/kilo means that it can reduce farmer's interest in soybean farming by 9024 units with other factors which have influence are considered. This condition has a significant effect as seen from the significance value of 0.013. It cannot be denied that the selling price has become an attraction for farmers. If the selling price of soybeans is getting better, this will be a separate stimulus for farmers to continue to do soybean farming.

c. The X_2 coefficient is 4,624 (negative). which means that every time there is an increase in the price of corn by Rp 1000/kiloi.e. it will decrease the interest of farmer for planting soybeans by 4624 units, although this condition does not indicate this significance value of 0,40, which is a significant value of influence. This fact shows that farmers have an interest to switch the corn farming if the price of corn is higher than the price of soybean.

d. The X_3 coefficient is 0.048 (negative), means that every time there is a change in the weather, the weather is not erratic, so it will be able to reduce the interest of farmers in doing soybean farming. If we look at the statistical results, it shows that this does not have a significant effect (0.757 > 0.05). From the results of observations, even though there is news regarding the weather conditions, it is still raining continuously during the planting until the harvest periodof soybeans. In fact, when the soybean harvest season arrives, the rain falls almost every day and destroys the harvest yields.

3.2. Alternative Strategies in Efforts to Increase Farmers Interest in Soybean Farming

The identification of the driving and resistor factors that has been carried out by the FFA analysis shows the following results.

Table 3. Identification of the drivers and resistors of the strategy in increasing farmers' interest in soybean farming in puger

No	Driving Factors	TNB	FKK	No	Resistor Factors	TNB	FFK
	Strengths				*Weaknesses*		
D1	Low soybean price	2,58	*	H1	Farming costs are relatively cheaper than other farming in the 3rd season (corn)	1,33	
D2	No subsidies	0,19		H2	Availability of production inputs can be obtained anywhere	1,45	*
Total *Strengths*		2,77		Total *Weaknesses*		2,78	
	Opportunities				*Threats*		
D3	Crop failure due to pest and disease attacks	0,93		H3	Many seeds of superior varieties	0,44	
D4	Weather does not support (Continuous rain)	1,98	*	H4	Market needs	3,03	*
D5	The selling price of subsidized commodity (corn) is higher than soybean	1,50		H5	There is an extension of the soybean farming	0,56	
Total *Opportunities*		4,41		Total *Threats*		4,03	
Total Driving Factors		7,18		Total Resistor Factors		6,81	

Note: *) The main factors.

The alternative strategies to increase farmers' interest in doing soybean farming in Puger are:

1. Increasing the selling price of soybeans at the farmer level is the main key in returning farmers' interest to plant soybeans.
2. Coaching of extension workers to farmers to improve the ability of farmers in soybean farming, especially related to technical matters. This is mainly related to the handling of soybean farming when the weather is uncertain
3. Strengthening of central government policies through stabilizing local soybean prices as a stimulus to foster interest in farmers planting soybeans which will have an impact on increasing the amount of local soybean production that is able to meet market needs and reduce the amount of soybean imports.

4. Conclusion

1. Factors that significantly influence farmers' interest in soybean farming are the price of soybeans, while the price of corn and weather factors do not have a significant effect.
2. Alternative strategies to increase farmers' interest in doing soybean farming in Puger are:
   a. Increasing the selling price of soybeans at the farmer level is the main key in returning farmers' interest in growing soybeans.
   b. Coaching of extension workers to farmers to improve the ability of farmers in soybean farming, especially related to technical matters. This is mainly related to the handling of soybean farming when the weather is uncertain

c. Strengthening of central government policies through stabilizing local soybean prices as a stimulus to foster interest in farmers planting soybeans which will have an impact on increasing the amount of local soybean production that is able to meet market needs and reduce the amount of soybean imports.

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