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FARMERS' DECISIONS IN TUMERIC SALES IN NGEPUNG, GRESIK REGENCY

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ABSTRACT

Local commodity-based farming needs to be developed by improving activities upstream to downstream of agricultural industries. Turmeric is one of the local commodities in Ngepung Village, Kedamean District, Gresik Regency. This commodity, which is widely used in food and beverage, and has health benefits, has not been cultivated intensively by some farmers in the area, mainly as a secondary commodity. The lack of access to information received caused the low willingness of the farmers to develop a turmeric business. However, some farmers have worked in small to medium-scale businesses because they can produce high production. This study analyzes the factors influencing farmers' decisions to sell turmeric. The analytical method used is binary logistic regression analysis. The results indicate that the price and production have a significant effect on farmers' decisions in selling turmeric. In contrast, the variables of distance to the market, age, education, and experience in turmeric farming have no significant effect.

Keywords*:* Influence Factor, Farmer's Decision, Sale of Turmeric.

INTRODUCTION

Turmeric is a medicinal plant needed by industries engaged in traditional medicine. Turmeric belongs to *Zingiberaceae* family and distributed throughout the tropics (Labban, 2014). Turmeric are widely cultivated in South Asia, especially in southern China, India, Taiwan, the Philippines, and Indonesia (Ahmad et al., 2010). Turmeric is one of the biopharmaceutical plants that have health benefits. Turmeric has been shown to have anti-inflammatory, antioxidant, antimutagenic, antidiabetic, antibacterial, hepatoprotective, expectorant, and anticancer pharmacological activities (Krup et al., 2013).

Research conducted by Puspitaningsi (2020) stated that the development of yellow turmeric agribusiness in Gresik Regency is progressive through the marketing expansion strategy of turmeric to new areas and market penetration. Priyono (2010) concluded that turmeric and galangal agribusiness is feasible to be developed because the B/C ratio value is 0.697 and the return on capital (ROI) is

1.7. The research of Nasution, R.K et al. (2020) concluded that the average profit obtained by the turmeric powder processing industry in Lamteuba, Seulimum District, Aceh Besar Regency was Rp. 4,952,727 per month was declared feasible because the R/C ratio obtained was Rp. 1.22

According to Hapsari et al. (2009), price information used by farmers generally comes from collecting traders. Although there is price bargaining in the buying and selling transactions, the collecting traders determine the final price. It is indicated that farmers' bargaining position is still weak compared to the level of collectors.

Wulandari et al. (2013) concluded that the factors influencing rice farmers' decisions in marketing their products are the price of grain, grain production, number of family dependents, amount of grain consumption, farmer's age, and experience of rice farming. Meanwhile, Pranoto (2016) concluded that the factors that influence the decisions of white pepper farmers on crop yields are the variable amount of production, price perception, and the number of consumption needs. Rice sales to intermediaries by farmers in Jatilawang District, Banyumas Regency, are influenced by rice production variables (Hutabarat, 2013).

Price and production problems that affect farmers' decisions in selling their products are also experienced by turmeric farmers in Ngepung Village, Kedamean District, Gresik Regency. In addition, the problem of not having access to market information causes turmeric farmers to only sell their products to middlemen and retailers. This study aimed to analyze the factors influencing farmers' decisions in selling turmeric in Ngepung Village, Kedamean District, Gresik Regency.

MATERIALS AND METHODS

The study was conducted in Ngepung Village, Kedarnean District, Gresik Regency, considering that the village has several farmers who cultivate turmeric with high productivity.

Determination of the number of samples of farmers was carried out using the Slovin equation so that 41 farmers were obtained. Sampling was carried out by a simple random sampling method. Data collection was carried out in several ways, interviews, observation, and documentation. While the analytical method used descriptive analysis, qualitative and binary logistic regression analysis using the SPSS version 22.0. The regression logistics model was as follows.

$$Y = \ln\left[\frac{\pi(x)}{1-\pi(x)}\right] = \beta 0 + \beta 1\ X1 + \beta 2\ X2 + \beta 3\ X3 + \beta 4\ X4 + \beta 5\ X5 + \beta 6\ X6 + e$$

Description:

Y = Farmer's decision in choosing to sell turmeric.
1 = Farmers sell turmeric to middlemen
0 = Farmers sell turmeric to non-middlemen
X_1 = Price (rupiah)
X_2 = Production (kilogram)
X_3 = Distance (kilometers)
X_4 = Age (years)
X_5 = Education (years)
X_6 = Farming experience (years)
0 = Constant
β_1 = Coefficient of estimation of price variable
β_2 - β_6 = Expected coefficient of independent variable
e = Error term

Steps in logistic regression analysis:

1. Assessing the Overall Model (Overall Model Fit)

The overall test of this model is used to determine whether all variables in the logistic regression simultaneously affect the dependent variable, as the F test in linear regression analysis. The joint test of the regression coefficient of the logistic model is calculated from the difference in the value of -2 Log likelihood between

models that only consists of constants and the estimated model consists of constants and independent variables (Widarjono, 2010). This test is done by comparing the difference between the values of -2 Log likelihood or chi-square count. If the calculated chi-square value is greater than the chi square table or the significant value is less than alpha, it can be said that there is a joint or simultaneous influence between the independent variables on the dependent variable.

2. Wald test

Wald's test is used to test the independent variables, which individually can have a real influence on the dependent variable. Hosmer et al. (2000) wrote the value of the Wald test systematically as follows:

$$W = \left[\frac{\beta i}{se(\beta 1)}\right]^2$$

Description :
Bi = Regression coefficient
Se(βi) = Standard error of

Widarjono (2010) said that in logistic regression, the Wald test was used to test the presence or absence of the influence of the dependent variable. Partially by comparing the Wald statistical value with the Chi-Square comparison at degrees of freedom (db) = 1 at alpha 5% (0.05). Also, compare the significance value (p-value) with an alpha of 5%, where a p-value smaller than alpha indicates that the hypothesis is accepted or there is a significant effect of the independent variable on the dependent variable individually or partially.

3. Coefficient of Determination (Nagelkerke R Square)

Nagelkerke R Square modifies the Cox and Snell R Square coefficients. This modification ensures that the value varies from 0 to 1. It is done by dividing the Cox and Snell R Square values by their maximum values (Ghozali, I. 2012). A small value means that the ability of the independent variables to explain the dependent variable is minimal. A value close to one means that the independent variables provide almost all the information needed to predict the variation of the dependent variable.

4. Coefficient Interpretation

The interpretation of the coefficients in the logistic regression model can be made by looking at the value of the odds ratio. The odds ratio can be interpreted as an opportunity which can be interpreted as the ratio of the probability of a successful event to an unsuccessful event on the dependent variable. If an independent variable has a positive coefficient sign, the odds ratio will be greater than one. On the other hand, if the sign of the coefficient is negative, the odds ratio will be less than one. The odds ratio indicates how likely a success event will occur in one group compared to another. The odds ratio is defined as:

$$\psi = \exp \beta i = \exp [g(1) - g(0)]$$

The interpretation of the odds ratio above is that the trend for Y = 1 in the X = 1 condition is times compared to X = 0. The odds ratio for the continuous variable can be interpreted as the tendency of individual odds for the Y = 1 category with an increase in X of one unit by one unit by times before the increase occurs.

RESULTS AND DISCUSSION

Factors Influencing Farmers' Decisions in Selling Turmeric

The results of the logistic regression analysis that has been carried out to determine the factors that influence farmers' decisions to sell turmeric are as follows.

1. Overall Model Fit Test

The G test was conducted to test the significance level of a model in the study. The results of the G test can be seen in the following table 1.

From table 1 it can be seen that the significance is 0.002 where the value is less than the alpha value of 0.05. It can be concluded that the independent variables

simultaneously significantly affect the dependent variable.

2. Wald test

The Wald test was conducted to see how much influence the independent variable had on the dependent variable partially. The results of the Wald test analysis can be seen in Table 2 below.

Table 2 shows the independent variables that significantly influence farmers' decisions to sell turmeric. Price affects farmers' decisions to sell turmeric because it has a significant value of 0.014 which is smaller than the alpha value of 0.05 (0.014 < 0.05). So it can be concluded that Ha is accepted. The price variable significantly affects farmers' decisions to sell turmeric. The value of the coefficient that is owned is negative, namely -0.11. This negative value means that the higher the price of turmeric, the smaller the possibility of farmers selling turmeric to middlemen. The Odds ratio value of 0.989 means that there is an addition of one rupiah to the price of turmeric, so the opportunity for farmers to sell turmeric to middlemen is getting smaller by 0.989 times. The price offered by the retailer is higher than the price offered by the middleman. Farmers sell to retailers with high prices to get a more significant profit. The difference between the middleman and retailer is that there is a price difference between the two traders, with the price at the retailer being slightly higher than the price at the middleman level.

The independent variable with a significant effect is the production result variable, with a significance value of 0.018 <0.05. Thus, Ha is accepted. The coefficient value obtained is negative, namely -0.004. This negative value means that the higher the amount of turmeric produced, the more farmers choose to sell to non-middlemen, namely retailers. The Odds ratio value of 0.996 means that if there is an addition of one kilogram of production, the opportunity for farmers to sell turmeric to middlemen is smaller by 0.996 times. Farmers who sell to retailers have a higher average yield than farmers who sell to middlemen. This is because the middlemen will determine where the turmeric must be clean of adhering soil. Middlemen avoid the obstacles that occur when chopping turmeric. Turmeric that is not clean from dirt, namely in the form of soil, will inhibit the chopping machine used. So to do turmeric chopping must be clean of dirt.

Tabel 1. Omnibus Tests of Model Coefficients

	Chi-square	df	Sig.
Step	20.892	6	.002
Block	20.892	6	.002
Model	20.892	6	.002

Table 2. Wald test.

	B	Sig.	Exp (B)
X1	-.011	.014	.989
X2	-.004	.018	.996
X3	-.092	.120	.912
X4	-.156	.195	.856
X5	-.182	.457	.833
X6	.176	.395	1.193
	51.785	.018	3.08

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Variable distance to the location of the sale obtained a significance value of 0.120. This value is greater than the significance level, 0.120 > 0.05. This shows that H0 is accepted, meaning that the distance from the sales location has no significant effect on farmers' decisions to sell turmeric. This study contrasts with research conducted by Malewa (2008) which states that in his research, distance has a significant influence on farmers' decisions to sell their agricultural products. The results show that the distance is insignificant because the distance near or far from the place of sale has almost the same opportunity in choosing a place to sell turmeric. However, farmers tend to sell their turmeric harvest to middlemen due to the availability of many markets (middlemen) in their village without looking for another institution willing to buy their turmeric.

The age of the respondent farmers in this study did not significantly influence the farmers' decisions to sell turmeric. This is because the level of significance is greater than 0.05 (0.195 > 0.05). This means that H0 is accepted. This is because the data between respondents is less varied (Apriliana et. al, 2016). The influence of age in the decision to sell turmeric indicates that the amount of opportunity to sell to middlemen and non-middlemen (retailers) is the same. It can also be interpreted that turmeric farmers, in choosing their sales locations, are not based on the age of the farmers.

Education has no significant effect on farmers' decisions to sell turmeric. This is because the significance value of 0.457 is greater than the alpha value of 0.05. The level of education of farmers who do turmeric farming does not affect the decision-making in choosing the location for selling their turmeric. The most education is at the farmer level, namely the elementary school level, where farmers have not been able to make the right decisions to choose the most potential market in order to maximize profits.

The turmeric farming experience variable does not significantly affect farmers' decisions to sell turmeric. This is because the significance value of 0.395 is greater than the alpha value of 0.05. With this, H0 is accepted. This is because there is no tendency of farming experience to any of the decisions farmers make. Farming experience owned by farmers will also support success in farming (Sumantri et al., 2004).

3. Coefficient of Determination

The coefficient of determination test is used to measure the closeness of the relationship between the independent variable and the dependent variable.

Table 3. Coefficient of Determination Test.

-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
16.586[a]	.399	.666

The Nagelkerke R Square value shown in the table is 0.666. It can be

concluded that the variability of the dependent variable can be explained by the variability of the independent variable of 66.6% and 33.4% explained by other variables outside the model.

4. Model Feasibility Test

The feasibility test of the model was carried out to determine the feasibility of the model with the formulated hypothesis. This test can be seen through the results of the analysis output with SPSS in the Hosmer and Lemeshow Test section.

Table 4. Model Feasibility Test

Chi-square	df	Sig.
3.717	8	.882

The significant value obtained was 0.882. Because the significance of 0.882 is greater than the alpha value of 0.05, H0 is accepted, and the model fits the data. The logistic regression model used is appropriate or feasible for a 95% confidence level and a significant level of 0.882.

5. Model Accuracy in Predicting

Table 5 shows the percentage of farmers' truthfulness in selling turmeric to non-middlemen is 71.4%. The decision of farmers in selling turmeric to middlemen amounted to 32 respondents. However, there was a deviation where 2 respondents chose not to sell their turmeric to middlemen. Thus, the percentage of farmers' truthfulness in selling their turmeric to middlemen is 94.1%. The comparison between farmers' decisions in selling turmeric to middlemen or selling to non-middlemen has a percentage of 90.2% with a tolerable error rate of 5%.

Table 5. Model Accuracy in Predicting.

Observed		Predicted Decision		
		Y0	Y1	%
Decision	Y0	5	2	71.4
	Y1	2	32	94.1
Overall Percentage				90.2

CONCLUSION

Factors that influence farmers' decisions to sell turmeric in Ngepung Village, Kedamean District, Gresik Regency, are prices and production results. While other factors: distance, age, education and experience in turmeric farming do not have a significant influence on the decision to sell turmeric.

Suggestion

1. Farmers are advised to continue to explore and monitor market information for turmeric commodities.
2. Farmers increase their production of turmeric, one of which is by increasing the quality of the turmeric they produce.
3. The government assists farmers in providing efficient turmeric commodity market information, for example where farmers should sell their turmeric products in order to get high yields or profits.

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