

Factors Affecting the Decision of Farmers to Produce Rice Seeds in Deli Serdang Regency

Anas Maulia Abdi¹, Rahmanta², Tavi Supriana³

¹(Universitas Sumatera Utara, Indonesia)

²(Universitas Sumatera Utara, Indonesia)

³(Universitas Sumatera Utara, Indonesia)

Corresponding Author: Anas Maulia Abdi

Abstract: This study aims to analyze the factors that influence farmers' decisions to produce seeds in Deli Serdang Regency. The data used is primary data with 60 respondents. The technique of data collection is done by interview, observation and questionnaire. The results showed that the education and income variables had a positive and significant effect on farmers' decisions to produce rice seeds in Deli Serdang Regency. Membership variables in farmer groups and farming experience have no significant effect on farmers' decisions to produce rice seeds in Deli Serdang Regency.

Kata kunci: education, income, membership, experience, farmers' decisions

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I. Introduction

Current agricultural development policies, especially for food self-sufficiency, have been outlined in the Program and Activities of Food Crop Agricultural Development in 2015-2019. The strategies used in an effort to increase food production are manifested in the Seven Agricultural Revitalization Echoes, namely: 1) Land Revitalization; 2) Revitalization of seedlings and nurseries; 3) Revitalization of Infrastructure and Facilities; 4) Revitalization of Human Resources; 5) Revitalization of Farmer Financing; 6) Revitalization of Farmer Institutions; and 7) Revitalization of Downstream Technology and Industry (Ministry of Agriculture, 2015).

The achievement of sustainable rice self-sufficiency can be realized through increasing national rice production. Technically, efforts to increase rice production can be carried out through two approaches, namely by extensification (expansion of the area), and the second through intensification (increasing farming productivity). Increasing farm productivity can be done through improving the quality of intensification with improvements in the technology used, one of which is the use of quality seeds. The contribution of increased production through the use of high-yielding varieties of seeds, irrigation and improvement of cultivation techniques reached 75%. Prasetyo (2002) states that based on research data, the use of certified seeds increases production of 500 kg / ha compared to non-certified seeds.

North Sumatra is one of the national rice granary provinces with a total planting area of rice in 2016 reaching 922,668 ha. The expansion of rice planting areas in North Sumatra Province is one step to achieve national rice self-sufficiency. The expansion of this planting area must be supported by increasing the availability of certified seeds, given that the contribution of the use of certified seeds is quite large to increase production. If it is assumed that rice seed needs are 25kg / ha, then we can know the need for rice seeds for North Sumatra Province. The development of planted area and the need for rice seeds in North Sumatra Province can be seen in Table 1.

Table 1 Development of Rice Planting Area in North Sumatra Province

No.	Year	Planting Area (ha)	Seed Needs Per Hectare (Kg)	Seed Needs (Ton)
1.	2012	769.174	25	19.229,350
2.	2013	739.040	25	18.476,000
3.	2014	729.451	25	18.236,275
4.	2015	760.709	25	19.017,725
5.	2016	922.668	25	23.066,700

Source: North Sumatra Food and Horticulture Service Office, 2016

Table 1 shows that 2016 North Sumatra Province certified seed needs reached 23,066.7 tons of seed per planting season or 46,133.4 tons of seeds per year. Data obtained from the Seed Supervision and Certification Center (BPSB) of North Sumatra Province recorded that 2016 seed production reached 8,062,825

tons of certified rice seeds. If the use of certified seeds in North Sumatra Province reaches 40%, then certified seed is needed at 18,453.36 tons / year. With seed production in 2016 which only reached 8,062,825 tons, there was a shortfall of 10,390,535 tons of certified rice seeds.

The problem of rice seed availability will continue to occur along with the increase in rice planting area. The lack of availability of certified rice seeds in North Sumatra is due to a variety of factors, one of which is the lack of farmers who grow rice for seed production. Based on data from the Center for Seed Supervision and Certification (BPSB) in 2016 only recorded 100 rice seed breeders in North Sumatra Province. Meanwhile, when viewed from business prospects, rice seed production is a farm with a large opportunity to be run because there is a difference in selling prices between ordinary unhulled rice paddy and rice seeds. The price of ordinary paddy rice is Rp. 6,000 / kg while the price of rice seeds reaches Rp. 11,000 / kg.

Deli Serdang Regency is one of the districts with the largest certified production of paddy seeds in North Sumatra Province, some villages in Deli Serdang Regency have also been designated as seed independent villages. According to data from the Seed Supervision and Certification Center (BPSB) of North Sumatra in 2017 certified rice seed production in Deli Serdang Regency reached 1,913,686 tons. In addition, Deli Serdang Regency is also a district with the highest rice productivity in North Sumatra Province as shown in table 2.

Table 2 Harvest Area and Rice Production Average in 2016

No.	Regency / City	Planting Area (ha)	Production (tons)	Average Production (kw / ha)
1.	Deli Serdang	82.343,5	490.723,4	59,59
2.	Simalungun	112.658,8	669.584,9	59,43
3.	Serdang Bedagai	75.618,5	425.946,2	56,33

Source : North Sumatra Central Bureau of Statistics (BPS), 2016

Table 2 shows that Deli Serdang Regency is the district with the highest rice productivity of the five largest rice producing districts in Sumatra Province. The rice productivity of Deli Serdang Regency in 2016 reached 59.59 kw / ha with a harvest area of 82,343.5 ha and with rice production amounting to 490,723.4 tons. This shows that Deli Serdang Regency is one of the districts in North Sumatra Province that excels in rice crop commodities both for ordinary rice production / consumption rice and for seed production.

The lack of availability of certified rice seeds in North Sumatra Province due to the lack of farmers who decided to produce paddy seeds is a problem that must be solved, so research is needed to analyze the factors that influence farmers' decisions to produce rice seeds in Deli Serdang Regency. The results of the study are expected to be input for farmers and the government related to rice seed production.

II. Method

The sampling technique is done by snowball sampling. The method of snowball sampling begins with one small group or one person who is asked to designate the next respondent / sample according to the characteristics needed in the study. The method of sampling with this method is carried out in a chain that starts from a small sample and gets bigger and longer (Supriana, 2016).

The sample size in this study was 60 samples consisting of 30 samples of farmers who cultivated rice for seed production and 30 ordinary rice farmers. According to Walpole (1993) that sampling from any population (unknown population) can use a sample of 30 respondents. Determination of sample size was taken by considering the population size of each group of ordinary rice farmers and unknown rice farmers, so that the number of samples taken was balanced.

This study was conducted to examine the effect of independent variables on the dependent variable using logistic regression analysis. Logistic regression is one of the statistical models that can be used to analyze the pattern of relationships between a set of dependent variables with one dependent variable categorical or qualitative type (Rosadi, 2011). The following is the logistic regression equation in this study:

$$Y = \ln \frac{p}{1-p} = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + U_i, \text{ where:}$$

Information:

Y = Consumer decision to produce rice seeds (1 = producing rice seeds, 0 does not produce rice seeds).

P = Opportunity for consumers to decide to produce rice seeds.

1 - P = Opportunity for consumers not to decide to produce rice seeds (rice production ordinary).

X₁ = Membership in farmer groups (1 = Join in Farmer Group, 0 = Not Included in Farmers Group).

X₂ = Education (Year).

X₃ = Income (Rp. / Planting Season).

X₄ = Farming Experience (Year).

III. Research Results and Discussion

Based on data processing using the SPSS 20 program to see the effect of variable membership in farmer groups, education, income, and farming experience on farmers' decisions to produce rice seeds in Deli Serdang Regency the following results were obtained:

Table 3 Regression Results

Variable	B	SE	Wald	Sig	Exp(B)
X1	-19,561	22650,665	0,000	0,999	0,000
X2	0,415	0,198	4,400	0,036	1,515
X3	0,001	0,000	7,019	0,008	1,000
X4	0,020	0,041	0,234	0,629	0,980
Constants	-5,124	2,800	3,350	0,067	0,006

Source: Research Results

The accuracy of the model in this study can be seen using the Nagelkerke R Square value of 0.596. This value indicates that the ability of the independent variable to explain the dependent variable is 0.596 or 56.6% while the remaining 40.4% is explained by other variables outside the model. The feasibility test of the model is done using the Hosmer and Lemeshow test, the test results show the value of p-value or significance produced is 0.232. The p-value value is greater than the real level of 5%, so it can be concluded that the logit model is feasible to use because overall it is able to explain or predict the farmer's decision to produce rice seeds in Deli Serdang Regency. menjelaskan atau memprediksi keputusan petani untuk memproduksi benih padi di Kabupaten Deli Serdang.

1. Membership in Farmer Groups

The results showed that the variable membership in farmer groups did not influence the farmers' decision to produce rice seeds in Deli Serdang Regency. This is not in accordance with the theory which states that membership in farmer groups influences farmers' decisions to produce certain types of commodities. The results showed that there were differences in the activeness of farmer groups from ordinary rice farmers to rice farmers' farmer groups. The results showed that the farmer groups of rice farmers who produced very active seeds were seen from the number of activities that took place in the farmer groups, such as training and fostering of different breeders with farmer groups where ordinary rice farmers joined in tend to be passive. This is one of the causes of the variable membership in farmer groups does not affect farmers' decisions to produce paddy seeds, because even though most of the sample farmers are members of farmer groups but there are differences in the activeness of each farmer group. So that even if the farmer is registered or incorporated in a farmer group, the intensity of activities in farmer groups such as training and coaching can increase farmers' knowledge and knowledge. The farmers' insight, knowledge, and expertise gained from various activities in farmer groups can be used by farmers as a consideration in deciding which farm to run. The results of this study are in line with the research conducted by Hayati (2017). The results of the study indicate that the variable participation in farmer groups does not statistically have a significant effect on farmers' decision-making to keep chili herbal medicine.

2. Education

The results showed that the education variable had a positive and significant effect on farmers' decisions to produce rice seeds. The marginal effect value of the income variable is 0.16, which means that every increase in farmer's education level by 1 year will increase the chances of farmers to be willing to produce rice seeds by 16%. The results of the research obtained are in line with the theory presented by Muhibbin (2002) that education can improve the development of individuals in mastering knowledge, habits, attitudes and so on. The level of individual education is one aspect involved in decision making.

The results showed that farmers who decided to produce rice seeds had a higher level of education than ordinary rice farmers where the average farmer who decides to produce seeds is a high school graduate and the average rice farmer is an elementary school graduate on average. As many as 18 people from 30 rice farmers who decided to produce seeds were high school graduates and 3 of them were undergraduate (S1) graduates and as many as 18 people from 30 ordinary farmers were elementary school graduates and none of the ordinary rice farmers were graduates of Bachelor. This is in accordance with Mosher's (1987) opinion that a low level of farmer education can lead to several implications that can reduce the level of farmers' responses to businesses to develop agriculture.

3. Income

The results showed that income had a positive and significant influence on farmers' decisions to produce rice seeds in Deli Serdang Regency. The results of the research obtained are in line with the theory raised by Hanafie (2010) that Before selecting and cultivating a commodity, farmers consider the size of the

income obtained from exploiting the commodity. The higher the level of income, the faster the ability to face innovation.

The marginal effect value of the income variable is 0.005, meaning that any increase in farmer's income of 1 rupiah will increase the chances of farmers to be willing to produce seeds at 0.5%. The amount of profit obtained is a consideration of farmers in deciding to produce rice seeds in Deli Serdang Regency. The results showed that there were differences in income received by rice farmers in seed producers with ordinary rice farmers, where the income obtained by seed farmers was greater than ordinary rice farmers. Sahidu (1998) states that farming income is a source of motivation for farmers and is a strong factor that encourages the emergence of willingness, ability and the realization of farmer participation performance. The results of the research obtained are in line with the results of research conducted by Theresia (2016). The results of the study show that income has a positive and significant effect on the farmers' decision to use local shallot seeds. Similar to the research of Evayanti (2004) the results of the study showed that the decision of farmers to cultivate pineapple farming in Sungai Merdeka Village was significantly affected by income and price factors at the farm level.

4. Farming Experience

Experience variables did not affect the farmers' decision to produce paddy seeds in Deli Serdang Regency. Farming experience has no effect on farmers' decisions to produce rice seeds in Deli Serdang Regency because generally low-experience farmers have a very productive age and have a higher level of education than farmers with higher farming experience. In accordance with the opinion of Soekartawi (2010), the younger farmers usually have the enthusiasm to want to know what they do not know, so they try to more quickly adopt innovation even though they are still inexperienced in adopting innovation. For this reason, high experience in conducting rice cultivation was not a determining factor for farmers to decide to carry out rice cultivation for rice seed production.

IV. Conclusion

The results of this study indicate that education and income have a positive and significant effect on farmers' decisions to produce rice seeds in Deli Serdang Regency. Membership variables in farmer groups and farming experience have no significant effect on farmers' decisions to produce rice seeds in Deli Serdang Regency.

There are several recommendations that can be taken into consideration for the Government and subsequent Researchers. First, the Government can improve farmer education through training and fostering of farmers aimed at increasing farmers' knowledge and skills. Further researchers can add other research variables that influence farmers' decisions to produce rice seeds in Deli Serdang Regency because basically the farmers' decision to cultivate a certain type of commodity is influenced by many factors both internal factors within the farmer and external factors.

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