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ANALYSIS OF PRODUCTION EFFICIENCY IN HYBRID CORN SEED FARMING IN RANDUBLATUNG DISTRICT BLORA REGENCY

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ABSTRACT

Efficiency is important to know to see the success of a farming business. Farming activities in producing a product cannot be separated from the use of production factors. Using production factors appropriately and efficiently will provide benefits for farmers, namely maximum productivity. This research aims to analyze the factors that influence hybrid corn seed production, as well as analyzing technical, allocative and economic efficiency. The research location is Randublatung District, Blora Regency, Central Java. The research method used was a case study of seed breeder farmers in Randublatung District using saturated sampling with a total sample of 53 farmers. The analytical method used is quantitative descriptive analysis which includes influence analysis, technical, allocative and economic efficiency analysis using Stochastic Frontier. The results of the research show that there is a simultaneous influence between land variables, seeds, urea fertilizer, phonska fertilizer, pesticides and labor on hybrid corn production results. The variables of land area, seeds and urea fertilizer partially have a significant effect on production results, while the variables of phonska fertilizer, pesticides and labor partially have no effect on production results. The technical efficiency results of hybrid corn farming in Randublatung District are quite technically efficient with an average technical efficiency value of 0.878. The results of the analysis of allocative and economic efficiency show that it is not yet efficient with average values of 0.337 and 0.293 respectively. Opportunities to increase the efficiency of hybrid corn seed farming in Randublatung District include farmers better allocating inputs according to their needs so that input costs are not large, providing more intensive counseling and assistance to farmers regarding hybrid corn seed cultivation techniques, especially in the use of inputs so that they are more proportional in accordance with recommendations from relevant agencies.

Keywords: *economics, efficiency, farming, hybrid corn, technic*

BACKGROUND

Efficiency is very important in farming activities in order to produce maximum production. Efficiency describes a situation when a certain amount of output can be produced from combining a smaller number of inputs and with the combination of these inputs it can minimize production costs without reducing the output produced (Fadwiwati et al., 2014). Maximum output will be obtained if a person or business can apply the concept of production efficiency well. The concept of production efficiency consists of 3, namely technical, allocative and economic efficiency (Doll and Orazem, 1984). Technical efficiency includes the relationship between input and output, while economic production efficiency is related to selling prices and prices of production factors. Technical efficiency is defined as the ratio of input actually used to available output, allocative efficiency shows the

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relationship between costs and output, while economic efficiency can be achieved if both technical and allocative efficiency are achieved (Sutanto and Imaningati, 2014). Production efficiency analysis can be used to assess the feasibility level of a farming business by looking at the profits from the inputs used (Leovita et al., 2015).

The condition of corn farming efficiency in several regions in Indonesia, based on previous research, mostly shows that farming has not yet reached efficiency. The research results of Firdaus and Fauziyah (2020) state that the majority of hybrid corn farmers on Madura Island are technically efficient, but have not yet achieved allocative and economic efficiency with values of 0.720, 0.312 and 0.208 respectively. The results of the efficiency analysis by Dewi et al. (2018) shows that the use of production factors does not achieve technical and economic efficiency because the production elasticity value is below 1. Farming has not reached efficiency due to the use of production factors that are inappropriate or not in accordance with the recommended use, as a result the resulting production is less than optimal. The use of superior seeds is an important component in increasing corn production. The government is making efforts to increase corn production through implementing a national hybrid corn development program, through this activity the national corn production is targeted to increase by 5% per year (Kementerian Pertanian, 2016). The advantages of hybrid corn varieties include higher production yields, faster harvest times and more resistance to pest and disease attacks (Purwanto et al., 2015).

The development of hybrid corn carried out in Randublatung District was formed in the food crop seed producer farmer development program (P3BTP). The hybrid corn seed breeding business in Randublatung District began in 2019 in partnership with a seed company, namely PT. Tunas Widji Inti Nayottama. In the P3BTP program, farmers act as members and managers who must be active in planning and implementing hybrid corn seed cultivation from upstream to downstream, extension workers are tasked with accompanying hybrid corn seed farming activities, PT. Tunas Widji Inti Nayottama is the party that provides the seeds, the party that buys the produce, and participates in assisting hybrid corn seed cultivation activities. As time goes by, there are several problems in developing this program, namely limited access to financing for hybrid corn seed cultivation activities, and it is not easy to consolidate farmers because farmers are used to working alone with their own management. This causes the input allocation for hybrid corn seed cultivation activities to be inappropriate, so that the results achieved are less than optimal. Maximum production is obtained if farmers are able to choose production factors correctly, and can combine them optimally and efficiently (Panjaitan et al., 2014). Efficiency in allocating production factors is important to pay attention to, therefore it is necessary to research whether hybrid corn seed farming in Randublatung District is efficient or not.

The novelty in this research is that there has been no specific research that discusses technical, allocative and economic efficiency in hybrid corn seed farming. Other information from this research is the efficiency analysis method using frontier analysis software. The benefits of research are providing information in managing hybrid corn seed farming efficiently and as a consideration for farmers in increasing productivity, recommendations for the government and related agencies to determine further policies that can be taken to develop hybrid corn farming and as a reference source for further research. The aims of this research are:
1. Analyzing the factors that influence hybrid corn seed production in Randublatung District.
2. Analyzing the technical, allocative and economic efficiency of the use of production factors in hybrid corn seed farming in Randublatung District.

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RESEARCH METHODS

Research Location

The research location is in Randublatung District, Blora Regency, Central Java. Randublatung District was chosen as the research location because this district is one of the largest corn producers in Blora Regency based on data from BPS Blora Regency (2019). Randublatung District in 2018 was able to produce corn production of 42,277 tons with a harvest area of 8,355 ha and productivity of 50.23 kw /ha (BPS Blora, 2019). This location was also chosen because there are farmers who breed hybrid corn seeds who are members of the development activities for food crop seed producers (P3BTP).

Sample

The sampling method used in this research is the saturated sampling method. According to Mokodongan et al. (2016) the saturated sampling method is a sample determination method where all members of the population are used as samples. This saturated sampling method is often known as the census method. The number of samples taken in this research were 53 seed breeder farmers from 4 hybrid corn farmer groups in Randublatung District who participated in the government program, namely Pengembangan Petani Produsen Benih Tanaman Pangan (P3BTP). The 4 farmer groups are Tani Maju Farmer Group, Loh Jinawe Farmer Group, Sumber Makmur Farmer Group, Tani Makmur Farmer Group.

Type of Data and Data Collection Methods

The data used in the research consists of primary and secondary data. Primary data was collected by interviewing respondents regarding the amount of production, land area, amount of seed used, amount of urea fertilizer used, amount of pesticide used and amount of labor used, price per unit of input and product price. Apart from interviews, researchers also conducted direct observations. in the field. Secondary data can be obtained from related agencies such as BPS, as well as from other literature related to this research. Secondary data includes data on farmer groups, land use and corn production at sub-district level.

Data Analysis

The data analysis used in this research is quantitative descriptive analysis. According to Sugiyono (2019) descriptive analysis is data analysis carried out by describing or describing the data that has been collected as it is without making generalized conclusions. Emzir (2009) states that the quantitative approach is an approach that principally uses postpositivist in developing science (such as relating cause and effect, reduction to variables, hypotheses and specific questions with measurement, observation and theory testing), using research strategies such as surveys and experiments that require statistical data. Quantitative analysis in this research was used to analyze the influence of production factors on the level of hybrid corn seed production, apart from that, technical, allocative and economic efficiency analyzes were also carried out.

The analytical method used to analyze the influence of production factors (land area, seeds, urea fertilizer, phonska fertilizer, pesticides and labor) on the production of hybrid corn seed farming in Randublatung District, Blora Regency is Stochastic Frontier production function analysis using the Frontier 4.1 program. These independent variables were chosen with the consideration that the

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production factors commonly used by respondent farmers in hybrid corn seed cultivation activities include land area, seeds, urea fertilizer, phonska fertilizer, pesticides and labor. The production function of hybrid corn seed farming is assumed to have the Cobb Douglas form which is transformed into a natural logarithm. According to Schmidt and Lovell (1979) Mathematically, the Stochastic Frontier production function model used in the research is as follows:

$$Ln\ Y = \beta_0 + \beta_1 \ln X_1 + \beta_2 \ln X_2 + \beta_3 \ln X_3 + \beta_4 \ln X_4 + \beta_5 \ln X_5 + \beta_6 \ln X_6 + (V_i - Ui)$$

Information:

Y : Hybrid corn seed production (kg)
β_0 : Intercept
β_i : Regression coefficient which is the elasticity of production (i = 1,2,3,4,5)
X_1 : Land area (ha)
X_2 : Seeds (kg)
X_3 : Amount of urea fertilizer (kg)
X_4 : Amount of phonska fertilizer (kg)
X_5 : Amount of pesticide (liter)
X_6 : Number of workers (HKP)
u : Error term
Vi-Ui : Vi is noise effect, ui is the effect of the technical inefficiency of the model

Parameter testing of the Cobb-Douglas stochastic frontier production function is carried out through two stages. The first stage, estimating the parameters of the βi production function is carried out by the ordinary least square (OLS) method. The second stage estimates all parameters β0, βi, variance using the maximum likelihood (MLE) method. Frontier 4.1 software processing also produces estimates of variance. The variance value can be used to find the gamma value of γ. The γ value is the contribution of technical efficiency in the total residual effect. The presence or absence of technical inefficiencies and economic inefficiencies in hybrid corn farming can be known through gamma estimation values. The gamma value (γ) = 0, then there is no technical and economic inefficiency in hybrid corn farming or it can be said to have achieved technical and economic efficiency. If the value $\gamma > 0$ then there is technical and economic inefficiencies or farming has not achieved technical and economic efficiency. The results of technical efficiency calculations need to be tested to ensure that a farm is technically efficient. The test technique uses the likelihood ratio test (LR test) method. The LR formula is as follows:

$$LR = -2\ (Ln\ (Lr) - Ln\ (Lu))$$

Information:

LR : Likelihood Ratio
Lr : LR value in the OLS approach
Lu : LR value in the MLE approach

The LR value that has been obtained is then compared with the critical value $\chi 2$ (Code & Palm, 1986). The LR test value > $\chi 2$ indicates that the stochastic frontier model is good. The analytical method used to analyze the efficiency of the use of production factors is as follows:

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1. Technical Efficiency Analysis. Technical efficiency requires a production process that uses the smallest input to produce a certain amount of output. The value of technical efficiency in hybrid corn hatchery farming in Randublatung District, Blora Regency was obtained from the results of data processing using Frontier Version 4.1.c software. Measuring the technical efficiency of farming achieved by farmers can be measured using the following formula (Coelli, 1996).

$$ET_i = \frac{Yi}{Yii} = \exp(-\mu_i)$$

   Information:
   ET_i : Level of technical efficiency achieved by farmer i
   Yi : Actual production amount of farmer i
   Yii : Potential production amount of farmer i
   μ_i : One-side error term ($Ui \geq 0$) or random variable

   The technical efficiency value can be determined from data processing with the help of Frontier version 4.1.c software. Range the technical efficiency (ET) value is between 0 and equal to 1 ($0<ET\leq1$). Farming becomes more efficient if the ET value approaches 1 and becomes less efficient if the value approaches 0. The farmer's technical efficiency value is categorized as quite efficient if the ET value is ≥ 0.7 (Darmawan, 2016).
2. Allocative Efficiency Analysis. Allocative efficiency is the ability of a company or farm to use inputs in optimal proportions at certain prices and production technology. Allocative efficiency and economic efficiency are analyzed using an input side approach. Before measuring allocative and economic efficiency, the dual cost function is first derived from the homogeneous Cobb-Douglas production function (Debertin, 1986). According to Darmawan (2016), the way to derive the dual cost function is to minimize the input cost function with the constraint of the stochastic frontier production function, so that the dual cost function is obtained as follows:

$$C = f(Y, P_1, P_2, P_3, P_4, P_5, P_6)$$

   Information:
   C : Production costs
   Y : Production output
   $P_{(1-6)}$: Price of each input

   Economic efficiency is a combination of technical efficiency and allocative efficiency, so that allocative efficiency (EA) can be obtained using the following equation (Fitri et al., 2017). The EA value ranges from $0<EA<1$.

$$EA = \frac{EE}{ET}$$

3. Economic Efficiency Analysis. Economic efficiency will be achieved if technical efficiency and allocative efficiency have been achieved. Economic efficiency is defined as the ratio between

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observed total production costs and actual total production costs. The formula is as follows (Jondrow, 1982). Economic Efficiency Value 0<EE<1.

$$EE = \frac{E\,(C_i \mid U_i = 0, Y_i, P_i)}{E(C_i \mid U_i\,, Y_i, P_i)} = E\,[\exp(U_i\,)/\varepsilon_i\,]$$

Hypothesis Testing

The t test was carried out to determine the magnitude of the influence of one independent variable individually in explaining the dependent variable. The hypothesis used is:

1. H_0 : bi = 0, means that the independent variable (X_i) has no significant effect on the dependent variable (Y)
2. H_0 : bi ≠ 0, means that the independent variable (X_i) has a significant effect on the dependent variable (Y)

Decision making criteria according to Ghozali (2016).

1. H0 is accepted if t count < t table
2. H0 is rejected if t count > t table

RESULT AND DISCUSSION

Stochastic Frontier Production Function Analysis

The model used to estimate the production function of hybrid corn farming at the research location is the Cobb-Douglas stochastic frontier production function. The results of the estimation of the frontier production function are presented in Table 1.

Table 1. Estimation Results of the Frontier Production Function

Variable	Coefficient	t-Ratio
Constant	4.444	8.032**
X1 (land area)	0.266	2.194*
X2 (seed)	0.309	2.869**
X3 (urea fertilizer)	0.504	6.997**
X4 (Phonska Fertilizer)	0.076	1.194ns
X5 (pesticide)	0.149	1.921ns
X6 (labor)	-0.101	-0.867ns
Gamma(γ)	0.956	
OLS log-likelihood	26.746	
MLE log-likelihood	29.402	
LR test of the one-sided error	5.313	
X2 Value (Palm Code)	5.138	

Information:
** : Significance at α 1% (t table = 2.68)
* : Significance at α 5% (t table = 2.01)
Ns : Non significant

The stochastic frontier production function model for hybrid corn farming in Randublatung District can be written using the following equation:

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$$\text{Ln } Y = 4.444 + 0.266 \ln X_1 + 0.309 \ln X_2 + 0.504 \ln X_3 + 0.076 \ln X_4 + 0.149 \ln X_5 - 0.101 \ln X_6 + (V_i - U_i).$$

The estimation of the stochastic frontier production function in hybrid corn seed farming showed a generalized-likelihood ratio value of 5.313 greater than the X^2 value (Kodde and Palm, 1986) of 5.138. This shows that the stochastic frontier model is good. The estimation results of the frontier production function model show that this model has a γ value of 0.956. This figure shows that if the value of $\gamma > 0$, the model has technical inefficiency. This value means that 95.6% of the variation in sample farmers' results is caused by differences in technical efficiency and the remaining 4.4% is caused by external influences such as climate, pest attacks and errors in modeling. The results of estimating the stochastic frontier production function can show a partial relationship between production factors (land area, seeds, urea fertilizer, phonska fertilizer, pesticides and labor) to the amount of hybrid corn production. The partial relationship can be known by doing a t-test. The influence of each factor of production is described below.

Land Area

Based on the results of the t test that was carried out, it was found that the calculated t value was 2.194 > t table 2.01 at α 5%. These results show that land area has a significant effect on the amount of production with a positive frontier production elasticity (0.266), meaning that if land area is increased by 1%, production will increase by 0.266% assuming other inputs remain constant. These results are supported by research by Hasan and Fauziyah (2020) which states that the land area variable has a positive effect on increasing hybrid corn production. The average land area used by respondent farmers for hybrid corn farming activities is 0.68 ha. Dewi and Yuliarmi (2017) stated that the larger the area of land used in farming, the greater the agricultural results that will be obtained. Changes in land ownership and control will affect farmers' income. Increasing the area of land will increase farmers' income, but the wider the farming area, the greater the use of other production factors. Farmers still have to pay attention to the allocation of other production costs so that increasing land area does not have a negative impact on farmer income. This is in accordance with the opinion of Lanamana et al. (2022) which states that the larger the land area, the greater the farming income, but the greater the use of land, the greater the impact on the use of production factors. In the opinion of Alitawan and Sutrisna (2017), the narrower the farming land, the more inefficient the farming business will be, conversely, the wider the farming land, the more efficient the farming will be.

Seed

Based on the results of the t test that was carried out, it was found that the calculated t value was 2.869 > t table 2.01 at α 1%. These results show that seeds have a significant effect on the amount of hybrid corn production with a positive frontier production elasticity (0.309), meaning that if seeds are added by 1%, production results will increase by 0.309 % assuming other inputs remain constant. These results are supported by research by Purwanto et al. (2015) that seeds have a positive effect on increasing corn production. The average hybrid corn seed used by farmers is 25.6 kg /ha. The average use of seed from respondent farmers is in accordance with the provisions for the cultivation of hybrid corn hatcheries of PT. Tunas Widji Inti Nayottama is a seed requirement of 1 ha as much as 25 kg consisting of 20 kg of female seeds and 5 kg of male seeds. The use of quality hybrid corn seeds, namely the JH-37 variety at the research site, has an influence on the amount of production. This is

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in line with the opinion of Azhar et al. (2016), namely the use of quality seeds is the first step in achieving agricultural success, quality seeds are seeds that have a germination of more than 95%.

Urea Fertilizer

Based on the results of the t test that was carried out, it was found that the calculated t value was 6.997 > t table 2.68 at α 1%. These results show that urea fertilizer has a significant effect on the amount of hybrid corn seed production with a positive frontier production elasticity (0.504), meaning that if urea fertilizer is added by 1%, production will increase by 0.504 % assuming other inputs remain constant. In line with Sutrantiyas et al. (2022) that applying fertilizer to plants can affect production results both in terms of quality and quantity. The average use of urea fertilizer by respondent farmers is 366.9 kg/ha, while the recommended dosage from partner companies for urea fertilizer is 400 kg/ha, given at 3 times, namely when the hybrid corn aged is 10-14 days after planting (DAP) as much as 100 kg/ha, aged 25-30 DAP as much as 200 kg/ha and aged 55 DAP as much as 100 kg/ha. This shows that there is still an opportunity to increase production by increasing the application of urea fertilizer.

Phonska Fertilizer

Based on the results of the t test that was carried out, it was found that the calculated t value was 1.194 < t table 2.01 at α 5%. These results show that Phonska fertilizer has no effect on the amount of hybrid corn seed production, meaning that if Phonska fertilizer is added by 1% it does not increase the amount of production. Phonska fertilizer did not have a significant effect on increasing hybrid corn production due to the application of Phonska fertilizer which was too late from the specified fertilization time and the dose was not correct. The average use of NPK Phonska fertilizer by respondent farmers was 324.7 kg /ha, this amount exceeds the recommended dose for using Phonska fertilizer. Providing Phonska fertilizer to hybrid corn plants must be in accordance with recommendations so that the nutrients needed are sufficient for the plant so that it can increase production yields. In the opinion of Saprianto et al. (2021) plants will grow well if the necessary nutrients are available in sufficient quantities, applying 300 kg of Phonska fertilizer will get the best yield components.

Pesticide

Based on the results of the t test that was carried out, it was found that the calculated t value was 1.921 < t table 2.01 at α 5%. These results indicate that pesticides have no effect on the amount of hybrid corn production. Pesticides did not have an effect on production because at the research location the timing of pesticide spraying was late and the amount of pesticide used was incorrect. The average pesticide use of respondent farmers is 0.9 liters /ha, this amount is still relatively low, so production results cannot be increased because pests and diseases in hybrid corn have not been completely eradicated. The recommendation for pesticide use on corn fields by Badan Penelitian dan Pengembangan Pertanian (2008) is around 1-2 liters/ha. Pesticides should be given according to recommendations so that they do not have a bad impact. According to Munarso et al. (2016) that insufficient use of pesticides will cause pests to remain attached to plants and excessive use of pesticides will cause residues that can harm plants as well as human health.

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Labor

Based on the results of the t test that was carried out, it was found that the calculated t value was -0.867 < t table 2.01 at α 5%. These results indicate that labor has no effect on the amount of hybrid corn production. This is not in accordance with the opinion expressed by Khakim et al. (2013) that labor is an important factor in influencing agricultural production results. The labor regression coefficient value is -0.101, indicating that if additional labor is added by 1% it will not increase production, but will reduce production by 0.101%. The reason labor has a negative regression coefficient is because the labor variable has reached its maximum point on hybrid corn production in Randublatung District. The results of this research support the theory that the production function is subject to the law of The Law of Diminishing Returns. Jannata and Ma'rif (2017) explain that Diminishing Return is the law of decreasing increase which is stated if the use of one input is added while other inputs are fixed, then the additional output produced from each additional input that initially increases but if the input is added again it will decrease.

The average number of workers used by respondents is 77.5HKP/ha. The number of workers is almost equivalent to research by Wahyuningsih et al. (2018), namely the average labor used in hybrid corn farming is 72.93 HKP /ha. Most of the workforce at the research location has switched to using machine technology such as tractors to cultivate land so that it does not require much human labor, so additional labor will only increase production costs. This is in accordance with the opinion of Habib (2013) that attention must be paid to the use of labor so as not to cause an increase in costs which results in a decrease in income. The higher the labor force used in farming, the more the labor force will be less active in working. The quality of labor in farming activities also needs to be considered because the better the quality of labor, the production of hybrid corn will also increase. Based on the results of interviews with workers at the research location, the average level of education is still low and their experience in the hybrid corn seeding business is still limited, this is why the workforce does not have a significant effect on production results.

Technical Efficiency Analysis

The distribution of technical efficiency of hybrid corn farming in Randublatung District is presented in Table 2.

Table 2. Technical Efficiency Values of Hybrid Corn Seed Farming

Efficiency Category	Number of Farmers	Percentage (%)
≤ 0.50	0	0.00
0.51 – 0.60	1	1.89
0.61 – 0.70	4	7.55
0.71 – 0.80	3	5.66
0.81 – 0.90	18	33.96
0.91 – 1.00	27	50.94
Average	0.878	
Maximum	0.974	
Minimum	0.597	

The technical efficiency distribution table for hybrid corn shows that the average value of technical efficiency at the research location is 0.878, the maximum value of technical efficiency is 0.974 and the minimum value of technical efficiency is 0.597. This average value shows that the

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majority of respondent farmers in the research area are quite technically efficient. This categorization is adjusted to Darmawan's opinion (2016) which states that if the ET value is ≥ 0.7 then the farmer's technical efficiency is categorized as quite efficient.

Farmers who achieve average efficiency and want to achieve maximum efficiency have the opportunity to increase production amount by 9.9 % (1-(0.878/0.974)) × 100. In the same calculation, if the most inefficient farmer wants to achieve maximum farmer efficiency, then the opportunity to increase production is 38.71 % (1-(0.597/0.974)) × 100. The level of technical efficiency achieved by respondent farmers varies because between respondents there are differences in input allocation, knowledge, experience and hybrid corn seed cultivation techniques. This is in accordance with the opinion of Rivanda et al. (2015) which states that differences in the level of efficiency of each farmer are caused by various technologies, farming experience, education, land ownership status and counseling. The level of efficiency of the respondent farmers has not been able to reach number 1 or perfect efficiency in farming because the respondents are still unfamiliar with carrying out hybrid corn seed cultivation activities, so the input allocation is still not optimal. In the opinion of Mutiarasari et al. (2019) opportunities to increase technical efficiency are by increasing skills and abilities in adopting the most efficient cultivation technology innovations, as well as improving farming management.

Allocative Efficiency Analysis

Allocative efficiency shows the relationship between input prices and output. Allocative efficiency relates to the ability of a farm to use optimal inputs at a certain price. The result of the allocative efficiency value is obtained from the division of economic efficiency with technical efficiency. The allocative efficient value of hybrid corn farming is presented in Table 3.

Table 3. Allocative Efficiency Value

Allocative Efficiency	Value
Average	0.337
Maximum	0.481
Minimum	0.300

The average value of allocative efficiency of hybrid corn seed farming at the study site was 0.337, the maximum value of allocative efficiency was 0.481, the minimum value of allocative efficiency was 0.300. The average value of allocative efficiency of most farmers has not achieved allocative efficiency. Farmers who achieve the average efficient value if they want to achieve the same allocative efficiency level as farmers with the maximum efficient value, they can save costs of 29.9 % (1-0.337/0.481) × 100. The allocative efficiency value at the research location is still low, this shows that the costs incurred by large farmers in the sense of allocating inputs in hybrid corn hatchery farming by farmers are not proportional and not in accordance with needs. The price of production factors at the study site is relatively expensive, especially the price of fertilizers, pesticides and labor, causing the allocation of input costs to be higher not proportional to the income obtained by farmers. The cost of input expenditure can be reduced by using production factors in accordance with the predetermined dosage. This is in accordance with the opinion of Sutrantiyas et al. (2022) that the use of production factors must still pay attention to the recommended dosage, so that production becomes more optimal and the costs incurred do not exceed the increase in results obtained.

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Economic Efficiency Analysis

Economic efficiency is the ratio of total minimum costs to total actual costs. The purpose of carrying out an efficiency analysis is to avoid waste in farming activities which can result in losses or reduce farming results. The economic efficiency value of hybrid corn farming is presented in Table 4.

Table 4. Economic Efficiency Value of Hybrid Corn Seed Farming

Economic Efficiency	Value
Average	0.293
Maximum	0.302
Minimum	0.283

The average value of economic efficiency of hybrid corn farming at the research location is 0.293, the maximum value of economic efficiency is 0.302, the minimum value of economic efficiency is 0.283. The average value of economic efficiency for most farmers has not yet reached economic efficiency. This is because respondent farmers tend to use production inputs without considering the input price. To increase economic efficiency, input use should be adjusted to the recommended dosage. Economic efficiency can also be increased by improving farmers' skills in managing their farming business. In line with the opinion of Situmorang et al. (2020) which states that efficiency can be increased by providing outreach in the form of training and mentoring farmers to use production inputs according to recommendations and transferring agricultural technology innovations to support farmers who are efficient in the production process.

CONCLUSION AND SUGGESTION

Based on the research that has been carried out, it is concluded that there is a simultaneous influence between the independent variables (land area, seeds, urea fertilizer, phonska fertilizer, pesticides and labor) on the dependent variable (amount of production). The variables of land area, seeds and urea fertilizer partially have a significant effect on the amount of production, while the variables of phonska fertilizer, pesticides and labor partially have no effect on the amount of production. The results of the technical efficiency analysis of hybrid corn farming in Randublatung District are quite technically efficient with an average technical efficiency value of 0.878. The maximum farmer technical efficiency value is 0.974 and the minimum farmer technical efficiency value is 0.597. The farmer's opportunity level to increase technical efficiency according to the maximum farmer is 9.9%. The results of the analysis of allocative and economic efficiency show that it is not yet efficient with average values of 0.337 and 0.293 respectively.

Based on the research that has been done, there is still an opportunity to improve the technical efficiency of hybrid corn hatchery farming in Randublatung District, namely by increasing counseling and more intensive assistance to farmers regarding hybrid corn hatchery cultivation techniques, especially in the use of production factors to be more proportional in accordance with the recommendations of related agencies. Economic efficiency can be improved if farmers allocate inputs as needed so that input costs are not large. The local government pays more attention to hybrid corn farmers in terms of ease of access and the ability of farmers to buy inputs so that cultivation activities can be better.

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