AGRISOCIONOMICS
Jurnal Sosial Ekonomi dan Kebijakan Pertanian

ISSN 2580-0566; E-ISSN 2621-9778
http://ejournal2.undip.ac.id/index.php/agrisocionomics
Vol 7 (2): 349-362, June 2023

TECHNICAL EFFICIENCY OF CIHERANG RICE FARMING IN EAST LENTENG VILLAGE, LENTENG DISTRICT, SUMENEP REGENCY

Silviana Dewi and Resti Prastika Destiarni*
Department of Agribusiness, Faculty of Agriculture, University of Trunojoyo Madura, Madura, East Java, Indonesia

*Correspondence Email: resti.destiarni@trunojoyo.ac.id

Submitted 01 January 2023; Approved 28 February 2023

ABSTRACT

The food crop subsector has a very important role because the increasing population in Indonesia can affect food fulfillment and food security. One of the most dominant staple foods is rice, so rice farming is still the mainstay of farmers to fulfill the needs of households and communities. East Lenteng Village is one of the villages that plant ciherang rice 2 times a year. However, the productivity of ciherang rice in East Lenteng village did not reach 8.5 tons / ha. The purpose of this study is to analyze the factors that affect the production yield of ciherang rice farmers and analyze the level of efficiency of ciherang rice farming in East Lenteng Village. The analysis method of this study is the Cobb Douglas Production Function through Frontier Stochastic approach. The data used are primary data obtained from direct interviews with farmers using structured questionnaires. The results showed that there are 3 factors that affect the yield of ciherang rice production, they were planting area, number of seeds, and the amount of organic fertilizer and 88.4% of farmers in East Lenteng Village have achieved technical efficiency. Farmers can increase their productivity by using quality rice seeds. In addition, farmers can use fertilizers according to recommendations such as the use of organic fertilizer as much as 2 tons / ha, NPK Phonska fertilizer 150 kg / ha, Urea 200 kg / ha and ZA fertilizer 150 kg / ha.

Keywords: *cobb – douglas, production factors, rice production, stochastic frontier, technical efficiency*

BACKGROUND

Indonesia is known as an agricultural country with vast agricultural land and abundant natural resources. The area of agricultural land in Indonesia reaches 99.65 million ha, which is wider than the area of swamp land, which is only 34.12 million ha (Ritung et al., 2015). The agricultural sector plays an important role in the national economy as a whole because the agricultural sector remains the mainstay of job creation in a very large number compared to other sectors in the Indonesian economy (Waskito et al., 2021). This can be seen from the total population of 88.43% who work in agriculture, or in domestic products originating from agriculture (BPS, 2021a). In addition, the agricultural sector also has a very important role in national food security, especially the food crops sub-sector (Nafisah, 2020). This sub-sector is very important because the increasing population in

ISSN 2580-0566; E-ISSN 2621-9778
http://ejournal2.undip.ac.id/index.php/agrisocionomics
Vol 7 (2): 349-362, June 2023

Indonesia can affect food fulfillment and food security (Abdullah et al., 2021). One of the most dominant staple foods is rice, so that rice farming, which is a commodity that produces rice, is still the mainstay of farmers to meet household and community needs (Fitri et al., 2017).

Based on data from BPS (2022), the average level of rice consumption in Indonesia per capita in a week reaches 1,451 kg. Along with the increase in population, the need for food in Indonesia, namely rice, will also increase. However, domestic rice production in 2021 was 31.36 million tons, down 140.73 thousand tons or 0.45% compared to rice production in 2020 of 31.50 million tons (BPS, 2021b). One of the areas that contributes greatly to the availability of rice in Indonesia is the province of East Java, but in 2021 rice production in East Java will decrease by 97.92 thousand tons (BPS, 2021b). The decline in rice production was caused by a decrease in harvested area. The reduced harvested area is due to the conversion of agricultural land (rice) to non-agricultural land and the conversion of commodities (Dahiri et al., 2022). The decline in rice production was also experienced by several districts that contributed to the availability of rice in East Java, one of which was Sumenep Regency with a total production of 1,999,582.7 tons. In 2017 Lenteng District was one of the 6th largest contributors to rice production out of 24 Districts in Sumenep Regency. However, in 2021 the rice production ranking in Lenteng District will drop by 2 ranks, namely 8th out of 24 Districts in Sumenep Regency. Rice production in Lenteng District shows a fluctuating trend during the 2017-2021 planting season or can be seen in figure 1.

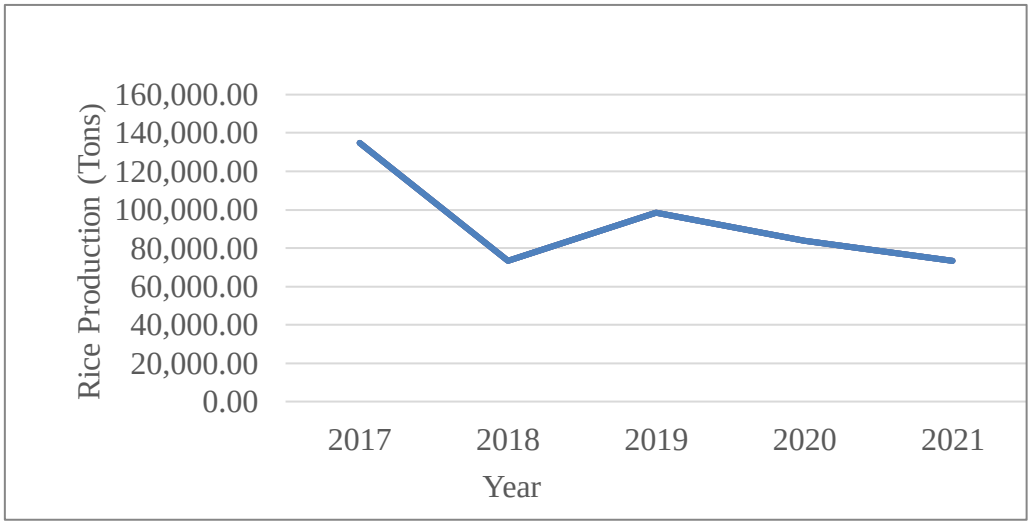

Figure 1. Graph of Rice Production (Tons) in Lenteng District from 2017-2021
Source: Office of Communication and Information of Sumenep Regency, Processed, 2022

In Figure 1, it is known that rice production data in Lenteng District in 2018 has decreased by 61,473 tons or 46% compared to rice production in 2017. In 2019 rice production has increased by 25,018 tons or 34% compared to 2018. In 2020 rice production decreased by 14,645 tons or 15% compared to 2019 production. In 2021 rice production decreased by 10,373 tons or 12% compared to 2019 (Dinas Komunikasi dan Informatika Kabupaten Sumenep, 2022). The decline in rice production in Lenteng District was caused by various factors such as the quality of the seeds used from the first

ISSN 2580-0566; E-ISSN 2621-9778
http://ejournal2.undip.ac.id/index.php/agrisocionomics
Vol 7 (2): 349-362, June 2023

harvest where there are farmers in Lenteng Timur Village using rice seeds more than once planting even though to get high productivity each planting season must use new seeds, spacing where farmers' spacing is not in accordance with the principle of spacing of 25 cm x 25 cm, fertilization where farmers use fertilizer has not reached the recommended amount in rice cultivation, as well as pest and disease attacks.

One of the villages in Lenteng District which has the potential to maximize rice production is Lenteng Timur Village. This is because in general the livelihoods of the people in Lenteng Timur Village are farmers with a total of 1,909 people. The number of lowland rice farmers in Lenteng Timur Village reached 569 people with a total land area of 61.93 ha. The planting area of paddy rice in Lenteng Timur Village has increased every year because rice planting in Lenteng Timur Village is carried out 2 times in 1 year. The types of rice varieties planted by farmers in East Lenteng Village are generally the Ciherang variety.

The Ciherang variety is the result of a cross between the IR 64 variety and other varieties. Some of the IR 64 characteristics possessed by Ciherang include high yield and quality of rice. Since its launch in 2000, Ciherang has earned a reputation for excellence such as the fluffier taste and texture of rice. In addition, the productivity of the Ciherang variety has a yield potential of up to 8.5 tonnes/ha (Surisman et al., 2021). However, the productivity of rice in Lenteng Timur Village is still below 8.5 tons/ha and rice production does not show a significant increase or can be seen in table 1 where the decrease was caused by decreasing of seed quality, the using of fertilizers that had not reached the optimal amount, and the spacing which affected the planting area of Ciherang rice in East Lenteng.

Table 1. Data on Planted Area, Productivity, Rice Production in East Lenteng Village for 2017-2021

Year	Rice PlantingArea (Ha)	Productivity (Ton/Ha)	Production (Ton)
2017	91	5.8	527.8
2018	98	5.8	568.4
2019	101	5.9	595.9
2020	112	5.9	660.8
2021	117	6.1	713.7

Source: Agricultural Extension Centre of Lenteng District (Processed), 2022

Based on table 1, it is known that the data for paddy planting area in 2018 increased by 8% compared to 2017, but productivity remained 5.8 tonnes/ha with the difference in production increasing by 8% compared to 2017. In 2020 the planted area increased 11% compared to 2019, but productivity remained 5.9 tons/ha with a total production difference that increased by 11% compared to 2019. In 2021 the planted area increased 4% compared to 2020, but productivity only increased 2 tons/ha with a production difference of 8% compared to 2019 and 2020. The inability of farmers to produce maximum output by using certain inputs will lead to production inefficiencies (Wilujeng & Fauziyah, 2021). The use of production factors can affect increased production in farming, if farmers do not use production factors efficiently, it will cause low production and high costs (Ihsan et al.,

ISSN 2580-0566; E-ISSN 2621-9778
http://ejournal2.undip.ac.id/index.php/agrisocionomics
Vol 7 (2): 349-362, June 2023

2021). Therefore, this research needs to be conducted to analyze the factors that influence the production of ciherang rice farmers in East Lenteng Village and analyze the efficiency level of ciherang rice farming in East Lenteng Village. Lenteng Timur Village is a village in Sumenep Regency where all of the farmers grow Ciherang rice without mixing it with other types of rice. Farmers in Lenteng Timur Village will plant other types of rice only when they receive assistance from the government and when the assistance runs out, farmers will return to planting Ciherang rice.

RESEARCH METHODS

This research was conducted from October to November 2022 in Lenteng Timur Village, Lenteng District, Sumenep Regency, East Java. The location selection was carried out purposively (purposive sampling) by considering areas with Ciherang rice productivity below 8.5 tons/ha, whereas Ciherang rice productivity could reach 8.5 tons/ha. Based on Rahmadi, (2011) purposive sampling is a sampling technique with criteria or consideration of characteristics that are in accordance with the research subjects to be studied, especially people who are considered experts related to research. The criteria for farmers in this study were Ciherang rice farmers in East Lenteng Village who planted rice 2 times in a year. For the past 3 years, rice farmers in Lenteng Timur village have not received seed assistance from the government, so farmers have only planted ciherang rice. The population used in this study were farmers who did Ciherang rice farming in East Lenteng Village.

Based on Fitri et al., (2017), the sample is part of the population selected as the object of observation. The method used to determine the sample is the Slovin formula, namely:

$$n = \frac{N}{1+N\,(e^2)}$$

$$n = \frac{569}{1+569\,(0{,}15^2)}$$

$$n = \frac{569}{1+(569x0{,}0225)}$$

$$n = \frac{569}{1+12{,}8}$$

$$n = \frac{569}{13{,}8}$$

$$n = 41{,}2 \sim 42$$

Information:
n : Sample
N : Population
e : Error correction (15%)

This study uses Slovin's theory with a significance level of 15% because the value of significance decreases with sample size and on consideration of labor and time in searching for respondents according to the criteria (Kim, 2015). Based on the results of the calculation of the number of samples obtained were 42 farmers from 569 ciherang rice farmers in East Lenteng Village.

ISSN 2580-0566; E-ISSN 2621-9778
http://ejournal2.undip.ac.id/index.php/agrisocionomics
Vol 7 (2): 349-362, June 2023

The data used in this research is quantitative data derived from primary data. Primary data was obtained from direct interviews with farmers using a structured questionnaire. The questionnaire includes data on the identity of farmers and the use of production factors.

This study uses the Cobb-Douglas (Frontier Stochastic) production function data analysis method. Analysis of the Cobb-Douglas function is used to determine the effect between the independent variable (X) and the dependent variable (Y) with the Maximum Likelihood Estimated (MLE) parameter (Adhiana & Riani, 2019). The independent variables or inputs used in this study included 8 variables, namely planting area, number of seeds, amount of NPK Phonska fertilizer, amount of Urea fertilizer, amount of ZA fertilizer, amount of organic fertilizer, amount of labor, and amount of pesticides. While the dependent variable or output is the result of rice production (Wilujeng & Fauziyah, 2021; Zulkarnain et al., 2022), vi is a random variable related to external factors and ui is a random variable which is assumed to affect the level of technical inefficiency. Systematically the frontier stochastic production function equation is as follows:

$$LnY=\beta0+\beta1LnX1+\beta2LnX2+\beta3LnX3+\beta4LnX4+\beta5LnX5+\beta6LnX6+\beta7LnX7+\beta8LnX8+vi-ui$$

Information:

Y	: Rice production (kg)
X1	: Rice planting area (ha)
X2	: Seeds (kg)
X3	: NPK Phonska fertilizer (kg)
X4	: Urea fertilizer (kg)
X5	: ZA fertilizer (kg)
X6	: Organic fertilizer (kg)
X7	: Labor (HOK)
X8	: Pesticide (Litre)
β0	: Intersep
β1, β2,…….β8	: Estimated parameter
vi-ui	: Error term

The model feasibility test was carried out using the t-test compared to the t-count value. Decision making criteria at a significance level of 5%. The hypothesis used is that if the t-count <t-table, then the independent variables do not significantly influence rice production. Meanwhile, if the t-count > t-table, then the independent variable has a significant effect on rice production.

Furthermore, a second test can be carried out regarding the generalized likelihood-ratio test (LR test) to test whether there is an effect of inefficiency in the field (Ulpah et al., 2018). The model suitability test was carried out using the LR value compared to the palm code table. The hypothesis used is that if the LR value is greater than the Palm code, then there is a technical efficiency problem in the field. Meanwhile, if the LR value is smaller than the Palm code, technical efficiency problems

ISSN 2580-0566; E-ISSN 2621-9778
http://ejournal2.undip.ac.id/index.php/agrisocionomics
Vol 7 (2): 349-362, June 2023

will not occur in the field (Wilujeng & Fauziyah, 2021). Mathematically, technical efficiency can be calculated by the following formula:

$$TE = Yi/Yii$$

Based on Nikmah et al. (2014), TE is the technical efficiency level of the i-th farmer, Yi is the i-th production yield, Yii is the estimated production potential. The TE value is $0 \leq TEi \leq 1$. Farming activities can be said to be full efficient if the level of technical efficiency is equal to 1 (ET=1). If the value of technical efficiency > 0.8, then farming can be said to be efficient.

RESULT AND DISCUSSION

The characteristics of the respondents can represent the ability of farmers in Lenteng Village to increase the efficiency of Ciherang rice cultivation in the region. based on the respondent's data it can be seen the conditions in the field related to Ciherang rice cultivation so that factors that influence the efficiency and achievement of tennis efficiency can be analyzed. There were 42 rice farmers in Lenteng Timur Village who were respondents aged 30-64 years, 36 people (88%) and aged > 64 years, 5 people (12%). In Indonesia, the productive age limit is 15-64 years (Heriani & Nurdin, 2022). This shows that the production of Ciherang rice in East Lenteng Village can still be increased well, considering the number of respondents who are classified as of productive working age. Respondents of ciherang rice farmers in Lenteng Timur Village who had elementary school education totaled 18 people (43%), junior high school students totaled 7 people (17%), high school students totaled 15 people (36%), S1 students totaled 2 people (5%). This shows that the average education of farmers in East Lenteng Village is still relatively low. Education influences the mindset of farmers. The higher the level of farmer education, the more dynamic, innovative and willing to take risks compared to farmers with low education (Anum et al., 2020). Land is a supporting factor for farming, the wider the land cultivated, the expected increase in production is obtained (Noer et al., 2018). Farmers' land tenure ranged from 0.2–0.9 hectares with an average land tenure of 0.79 hectares. This shows that the ownership of land area is still relatively narrow.

Factors Affecting Ciherang Rice Farming in Lenteng Timur Village, Lenteng District, Sumenep Regency

The calculation results by estimating the stochastic frontier production function with the Final Maximum Likelihood Estimated (MLE) approach are used to determine the factors that influence ciherang rice production and the level of technical efficiency in East Lenteng Village. Based on the results obtained in Table 2, it can be seen that the Generalized Likelihood Ratio (LR) value of 7.149 is greater than the palm code value of 2.91, meaning that there are technical efficiency problems in the field. In addition, the value of γ (gamma) was 0.942 > 0, meaning that 94.2% of the error term was due to technical inefficiency while 5.74% was caused by noise such as the quality of the seeds used from the first harvest, spacing, fertilization, pest and disease attacks that were not the result of inefficiency. This value indicates an error or error caused by production factors and there is a

ISSN 2580-0566; E-ISSN 2621-9778
http://ejournal2.undip.ac.id/index.php/agrisocionomics
Vol 7 (2): 349-362, June 2023

difference between production in the field and maximum production. Thus, it can be explained that the frontier stochastic production function in this study is able to explain the level of technical efficiency of ciherang rice farming in East Lenteng Village.

Table 2. Results of the Estimation of the Frontier Stochastic Production Function of Ciherang Rice Farming in East Lenteng Village, Lenteng District, Sumenep Regency

Variable	Maximum Likelihood Estimated		
	Coefficient	**Standard-error**	**t-ratio**
Konstanta	8.513	1.097	7.775
Rice plating area (ha)	1.350	0.222	6.077*
Seeds (kg)	0.322	0.138	2.334*
NPK Phonska fertilizer (kg)	5.942	0.147	0.403
Urea fertilizer (kg)	8.460	0.209	0.403
ZA fertilizer (kg)	8.787	0.102	0.859
Organic fertilizer (kg)	0.136	4.667	2.931*
Labor (HOK)	0.146	0.191	0.767
Pesticide (Litre)	0.114	6.003	1.908
δ (Sigma-Squared)	0.127	0.270	0.471
γ (Gamma)	0.942	0.134	7.033
Ratio Generalized Likelihood (LR)		7.149	

Source: Primary Data, 2022

Note: *) Significant influence on the level 95% (α=0,05) t table (2.032)

Based on the estimation results of the Cobb-douglas frontier stochastic production function in Table 2, there are 3 variables that have a significant effect on the amount of ciherang rice production in East Lenteng Village, namely planting area (X1), number of seeds (X2) and amount of organic fertilizer (X6). While the variables that have no significant effect are as many as 5 variables including the amount of Phonska NPK fertilizer (X3), the amount of urea fertilizer (X4), the amount of ZA fertilizer (X5), the amount of labor (X7) and the amounts of pesticides (X8), along with an explanation from each variable:

1. Rice planting area (X1)
   Planting area has a significant effect on ciherang rice production in East Lenteng Village. This can be shown from the calculated t value of 6.077 > t table value of 2.032. The coefficient value of 1,350 reports that if the area of weapons is increased by 1%, this will increase ciherang rice production in East Lenteng Village by 1,350%. This research is not aligned with research Wilujeng & Fauziyah (2021), which shows that the planting area has no effect on rice production in Lamongan because the addition of planting area is not really necessary given the structure of the land which is not very fertile and does not contribute to the addition of rice production in Lamongan. In contrast to the land in East Lenteng Village which has more fertile land so that the addition of planting area will affect rice production.
2. Seeds (X2)

ISSN 2580-0566; E-ISSN 2621-9778
http://ejournal2.undip.ac.id/index.php/agrisocionomics
Vol 7 (2): 349-362, June 2023

The number of seeds significantly affects the production of ciherang rice in East Lenteng Village. This can be shown from the calculated t value of 2,334 > the t table value of 2,032. The coefficient value of 0.322 illustrates that if the number of seeds is increased by 1% it can increase the production of ciherang rice in East Lenteng Village by 0.322%. It can be proven that the rice farmer who has the highest efficiency value has a planting area of 0.9 ha and the amount of seed that should be used is 27 kg, but the farmer uses 35 kg of seed so that the farmer has the highest efficiency because it increases the amount of seed used. Each 1 ha of planting area requires 30 kg of seeds to be planted (Saragih & Panjaitan, 2020). This research is in line with research of Kartiasih & Setiawan (2019) that the use of seeds has a significant effect on rice production in the Bangka Belitung Islands. This is evidenced by the value of the number of seeds in Bangka Belitung of 0.1484, which means that the number of seeds used by farmers in Bangka Belitung is still possible to add and increase production.

3. NPK Phonska fertilizer (X3)
   The amount of NPK fertilizer had no significant effect on ciherang rice production in East Lenteng Village. This can be shown from the calculated t value of 0.403 < t table value of 2.032 with a coefficient value of 5.942. Ciherang rice farmers in Lenteng Timur Village use an average of 167 kg/ha of NPK fertilizer, even though the recommended use of NPK fertilizer is 150 kg/ha. Therefore, it is necessary to reduce the amount of NPK fertilizer used in order to affect rice production. In addition, the cause of the decrease in ciherang rice production was due to the use of too much or too little NPK fertilizer. This research is aligned with research of Isnaini et al., (2019) which shows the use of NPK fertilizer of 370.93 kg/ha did not significantly affect rice production in the Ten Tons Syngenta Pasuruan Area. This is because the use of NPK fertilizer in the Ten Tons Syngenta Pasuruan area and in East Lenteng Village does not use fertilizer according to the recommended use of NPK fertilizer of 150 kg/ha.
4. Urea fertilizer (X4)
   The amount of Urea fertilizer had no significant effect on ciherang rice production in East Lenteng Village. This can be shown from the calculated t value of 0.403 < t table value of 2.032 with a coefficient value of 8.460. Ciherang rice farmers in East Lenteng Village use an average of 167 kg/ha of urea, whereas the recommended use of Urea is 200 kg/ha. Therefore, it is necessary to increase the amount of use of urea fertilizer so that it can affect rice production. In addition, the cause of the decrease in ciherang rice production was due to the use of too much or too little Urea fertilizer. This research is aligned with research of Rachmawati et al. (2022) which showed that the use of urea fertilizer had no significant effect on rice production in Burneh District. This is because in Burneh District and in Lenteng Timur Village they did not use Urea fertilizer according to the recommendation of 200 kg/ha.
5. ZA fertilizer (X5)
   The amount of ZA fertilizer had no significant effect on ciherang rice production in East Lenteng Village. This can be shown from the calculated t value of 0.859 < t table value of 2.032 with a coefficient value of 8.787. Ciherang rice farmers in East Lenteng Village use an average of 149 kg/ha of ZA fertilizer, even though the recommended use of ZA fertilizer is 150 kg/ha. Therefore,

ISSN 2580-0566; E-ISSN 2621-9778
http://ejournal2.undip.ac.id/index.php/agrisocionomics
Vol 7 (2): 349-362, June 2023

it is necessary to increase the amount of ZA fertilizer used in order to affect rice production. In addition, the cause of the decrease in ciherang rice production was due to the addition of too much or too little ZA fertilizer. This research is aligned with research of Wilujeng & Fauziyah (2021) which shows the use of ZA fertilizer has no significant effect on rice production in Lamongan Regency. This is because in Lamongan Regency and in East Lentemg Village they did not use ZA fertilizer according to the recommendation of 150 kg/ha.

6. Organic fertilizer (X6)

   The variable amount of organic fertilizer has a significant effect on ciherang rice production in East Lenteng Village. This can be shown from the calculated t value of 2,931 > the t table value of 2,032. The coefficient value of 0.136 illustrates that if the amount of organic fertilizer is increased by 1% then this can increase ciherang rice production in East Lenteng Village by 0.316%. The average farmer in Lenteng Timur Village uses an organic fertilizer amount of 157 kg/ha, even though the recommendation is to use organic fertilizer of 2 tons/ha (Suharyanto et al., 2015). This can be proven by the use of different amounts of organic fertilizers which will give different results, because each plant will make optimal use of environmental conditions according to the level of soil fertility. This research is aligned with research of Suharyanto et al. (2013) which shows the use of organic fertilizers significantly affects rice production in the Province of Bali. This is because each farmer's land in Bali Province and in East Lenteng Village has a different level of soil fertility.

7. Labor (X7)

   The number of labors has no significant effect on ciherang rice production in East Lenteng Village. This can be shown from the calculated t value of 0.767 < t table value of 2.032 with a coefficient value of 0.146. Farmers in Lenteng Timur Village use a larger number of labors not because there is more intensity in each farming activity. In addition, the difference in the use of the number of labors mostly only lies in planting and harvesting activities. Therefore, the use of the number of labors does not significantly affect the yield of rice production. This research is aligned with research of Novia & Satriani (2020) which shows the number of workers has no significant effect on rice production in Banyumas Regency. This is because the difference in the number of workers in Banyumas Regency lies in the harvesting and post-harvest processes and in East Lenteng Village most of it lies in the planting and harvesting process.

8. Pesticide (X8)

   The variable amounts of pesticides has no significant effect on rice production in East Lenteng Village. This can be shown from the calculated t value of 1.908 < t table value of 2.032 with a coefficient value of 0.114. Farmers in Lenteng Timur Village use chemical pesticides. Therefore, the pesticides used have no effect on rice production because chemical pesticides used in a sustainable manner tend to kill pests and their predators. In addition, pest control with chemical pesticides has a slower reaction compared to the growth of pests that occur. This research is aligned with research of Ulpah et al. (2018) which shows the use of pesticides has no significant effect on rice production in Gunung Toar District. This is because the pesticides used in Gunung Toar District and in East Lenteng Village are chemical pesticides.

ISSN 2580-0566; E-ISSN 2621-9778
http://ejournal2.undip.ac.id/index.php/agrisocionomics
Vol 7 (2): 349-362, June 2023

Technical Efficiency Level of Ciherang Rice Farming in East Lenteng Village, Lenteng District, Sumenep Regency

The level of technical efficiency in East Lenteng Village is calculated using the stochastic frontier production function with the distribution of the results of the technical efficiency analysis shown in Table 3. The achievement of the technical efficiency score is said to be inefficient if the value index is less than 0.8 and is said to be efficient when the index reaches more than 0.8 (Hidayah et al., 2013). The average value of the technical efficiency level of Ciherang rice farming in East Lenteng Village in Table 3 reaches 0.884, which means that the average value of rice production is said to be efficient because the technical efficiency capability reaches 88.4% with the highest efficiency value of 0.967 and the lowest value of 0.626.

Table 3. Results of Distribution of Technical Efficiency Analysis of Ciherang Rice Production in East Lenteng Village, Lenteng District, Sumenep Regency

Efficiency Level	Number of Farmers	Percentage (%)
> 0.8	36	86
< 0.8	6	14
Total	42	100

Source: Primary Data, 2022

Based on the results of the distribution of efficiency values shown in Table 3, it is known that 36 Ciherang rice farmers are technically efficient, which means that as many as 86% of farmers have allocated the use of inputs properly so as to obtain maximum yields. Meanwhile, 6 farmers in Lenteng Timur Village were not technically efficient, which means that 14% of farmers could not allocate their inputs properly so that the production results obtained were not optimal. The lowest efficiency value owned by farmers is 0.626, meaning that farmers have a 37.4% chance of getting even higher yields. While the highest efficiency value obtained by ciherang rice farmers in East Lenteng Village was 0.967, which means that farmers can still increase production by 3.3%. The average value of technical efficiency obtained by farmers in East Lenteng Village is 0.884, which means that on average farmers in East Lenteng Village are able to allocate inputs properly so as to produce maximum output.

In Table 3 it is known that there are 36 farmers who are technically efficient and have the highest efficiency value of 0.967. Farmers who have the highest efficiency because they add to the use of seeds, for every 1 ha of planting area, they need 30 kg/ha of seeds (Saragih & Panjaitan, 2020). Farmers with an efficiency value of 0.967 have a planting area of 0.9 with the use of seeds that should be 27 kg, but use as much as 35 kg of seeds. While there are 6 farmers who are inefficient and have the lowest efficiency value of 0.626. The farmer with the lowest efficiency value has a planting area of 0.25 and uses 10 kg of seed, even though farmers should use 7.5 kg of seed. Even though farmers have increased the number of seeds, farmers have not been efficient. This can also be caused by the use of organic fertilizers. The recommendation for using organic fertilizer should be 2 tons/ha (Suharyanto et al., 2015). Farmers with a planting area of 0.25 should use 500 kg of fertilizer, but

ISSN 2580-0566; E-ISSN 2621-9778
http://ejournal2.undip.ac.id/index.php/agrisocionomics
Vol 7 (2): 349-362, June 2023

farmers only use 150 kg of fertilizer. In addition, different amounts of organic fertilizer will give different results, because each plant will make optimal use of environmental conditions according to the level of soil fertility (Kriswanto et al., 2016).

The results of ciherang rice production in East Lenteng Village have different efficiency levels. This is due to the influence of the use of different production inputs. Ciherang rice farmers in Lenteng Timur Village can improve technical efficiency by increasing production inputs such as planting area, number of seeds, and amount of organic fertilizer. The planting area in Lenteng Timur Village can be increased by planting rice 3 times a year. In addition, the use of the number of seeds can be increased and adjusted to the planting area because it is known that farmers who have the highest efficiency value are farmers who use more seeds. This is supported by research of Arnama, (2020) who compared rice production per hectare between varieties and the number of seedling clumps and obtained the results of the ciherang variety with a production of 8.14 tons/ha using 6 clump sticks. This is because the tillers are formed from the number of seeds used, so as to increase production. Increasing rice production can also be done by using quality seeds and not from the first harvest. The use of organic fertilizer as much as 154.878 kg can affect rice production, even though the recommended use of organic fertilizer is 2 tons/ha. This is because organic fertilizers play a role in improving the chemical, physical and biological properties of the soil (Suharyanto et al., 2013).

CONCLUSION AND SUGGESTION

Based on the results of the study, it shows that the planting area, the number of seeds, and the amount of organic fertilizer have a significant effect on ciherang rice production in East Lenteng Village. The average value of the technical efficiency level of rice production in East Lenteng Village is 0.884 or 88.4%. The level of technical efficiency of ciherang rice farming business run by farmers varies, namely the number of ciherang rice farmers who are categorized as technically efficient as much as 86% while the remaining 14% of ciherang rice farmers in East Lenteng Village are not technically efficient. The results of the research conducted there are several suggestions including (1) the use of NPK Phonska fertilizer urea fertilizer, ZA fertilizer in East Lenteng Village is more considered by continuing to use the recommended dose and (2) the use of planting distances of 25 cm x 25 cm so that the ciherang rice production results obtained are maximum. In addition, it is hoped that there will be further research on the allocative efficiency and economic efficiency of rice farming in East Lenteng Village.

REFERENCES

Abdullah, F., Imran, S., & Rauf, A. (2021). Analisis Ketersediaan Beras di Kabupaten Gorontalo Selang Tahun 2021-2030. Agrinesia: Jurnal Ilmiah Agribisnis, 6(3), 188–197. https://ejurnal.ung.ac.id/index.php/AGR/article/view/16138/5081

Adhiana, & Riani. (2019). Analisis efisiensi ekonomi usahatani : Pendekatan Stochastic Production Frontier. In CV. Sefa Bumi Persada. https://repository.unimal.ac.id/4688/1/BUKU ANALISIS EFISIENSI EKONOMI USAHATANI.pdf

ISSN 2580-0566; E-ISSN 2621-9778
http://ejournal2.undip.ac.id/index.php/agrisocionomics
Vol 7 (2): 349-362, June 2023

Anum, H., Kardi, C., & Sukanteri, N. P. (2020). Efisiensi Penggunaan Faktor Produksi Pada Usahatani Padi Ciherang Di Kelurahan Sempidi Kecamatan Mengwi Kabupaten Badung. Agrimeta: Jurnal Pertanian Berbasis Keseimbangan Ekosistem, 10(19), 7–12. https://e-journal.unmas.ac.id/index.php/agrimeta/article/view/785

Arnama, I. N. (2020). Pertumbuhan Dan Produksi Varietas Padi Sawah (Oryza sativa L .) Dengan Variasi Jumlah Bibit Per Rumpun. Jurnal Pertanian Berkelanjutan, 8(2), 166–175. http://journal.uncp.ac.id/index.php/perbal/article/view/1546

BPS. (2021a). Persentase Tenaga Kerja Informal Sektor Pertanian. https://www.bps.go.id/indicator/6/1171/1/persentase-tenaga-kerja-informal-sektor-pertanian.html

BPS. (2021b). Produksi Padi Tahun 2021 Naik 1,14 Persen (Angka Sementara). Badan Pusat Statistik. Berita Resmi Statistik, 2021(77), 1–14. https://www.bps.go.id/pressrelease/2021/10/15/1850/produksi-padi-tahun-2021-naik-1-14-persen--angka-sementara-.html#:~:text=Produksi padi pada 2021 diperkirakan,54%2C65 juta ton GKG.

BPS. (2022). Rata-rata Konsumsi Perkapita Seminggu di Daerah Perkotaan dan Pedesaan Menurut Komoditi Makanan dan Golongan Pengeluaran per Kapita Seminggu (Satuan Komoditas). In Badan Pusat Statistik. https://www2.bps.go.id/indicator/5/2090/2/rata-rata-konsumsi-perkapita-seminggu-di-daerah-perkotaan-dan-pedesaan-menurut-komoditi-makanan-dan-golongan-pengeluaran-per-kapita-seminggu.html

Dahiri, Octavia, E., Rahayuningsih, & Ramiayu, D. D. (2022). Budget Issue Brief Industri & Pembagunan. 02(5), 1–7. http://u.lipi.go.id/1615187832

Dinas Komunikasi dan Informatika Kabupaten Sumenep. (2022). Laporan Akhir Buku Data Statistik Sektoral Kabupaten Sumenep. https://www.sumenepkab.go.id/uploads/document/books/statistik-sektoral-2022.pdf

Fitri, N. M. R., Darmawan, D. putra, & Suamba, I. K. (2017). Efisiensi Penggunaan Faktor Produksi pada Usahatani Padi Sawah di Subak Sembung Desa Peguyangan Kecamatan Denpasar Utara (Penerapan Analisis Stokastik Frontier). Jurnal Agribisnis Dan Agrowisata (Journal of Agribusiness and Agritourism), 6(3), 441–449. https://doi.org/10.24843/jaa.2017.v06.i03.p13

Heriani, & Nurdin, M. F. (2022). Analisis Produksi Usahatani Padi Sawah di Desa Kasimbar Utara Kecamatan Kasimbar Kabupaten Parigi Moutong. E-J. Agrotekbis, 10(1), 57–63. http://103.245.72.23/index.php/agrotekbis/article/view/1181

Hidayah, I., Pengkajian, B., Pertanian, T., & Tiga, R. (2013). Analisis Efisiensi Teknis Usahatani Padi Sawah di Kabupaten Seram Bagian Barat. Jurnal Pengkajian Dan Pengembangan Teknologi Pertanian, 16(2), 122–131. https://ejurnal.litbang.pertanian.go.id/index.php/jpengkajian/article/view/4772/4039

Ihsan, S. H., Rasyid, Mohtar, & Wahyuningsih, D. (2021). Analisis Efisiensi Teknis Usahatani Padi di Kabupaten/Kota Jawa Timur Tahun 2020. OECONOMICUS Journal of Economics, 6(1), 1–10. https://doi.org/10.15642/oje.2021.6.1.1-10

Isnaini, M., Khairiyah, N., & Rianti, T. S. M. (2019). Faktor-Faktor Yang Mempengaruhi Produksi Padi Di Kawasan Ten Tons Syngenta Pasuruan, Jawa Timur. SEAGRI: Jurnal Sosial Ekonomi Pertanian Dan Agribisnis, 7(1), 1–13. https://jurnal.uns.ac.id/sepa/article/view/48828/30099

Kartiasih, F., & Setiawan, A. (2019). Efisiensi Teknis Usaha Tani Padi di Provinsi Kepulauan Bangka Belitung. Analisis Kebijakan Pertanian, 17(2), 139. https://doi.org/10.21082/akp.v17n2.2019.139-148

Kim, J. (2015). Munich Personal RePEc Archive How to Choose the Level of Significance : A

ISSN 2580-0566; E-ISSN 2621-9778
http://ejournal2.undip.ac.id/index.php/agrisocionomics
Vol 7 (2): 349-362, June 2023

Pedagogical Note How to Choose the Level of Significance : A Pedagogical Note. How to Choose the Level of Significance: A Pedagogical Note Jae, 66373. https://mpra.ub.uni-muenchen.de/66373/

Kriswanto, H., Safriyanti, E., & Bahri, S. (2016). Pemberian pupuk organik dan pupuk NPK pada tanaman jagung manis (Zea mays saccharata, Sturt). Klorofil : Jurnal Ilmu-Ilmu Agroteknologi, 11(1), 1. https://jurnal.um-palembang.ac.id/klorofil/article/view/209

Nafisah, D. (2020). Efisiensi Teknis Dan Perilaku Risiko Petani Padi Berdasarkan Penggunaan Input (Studi Kasus Di Desa Langkap Kecamatan Burneh). SEPA: Jurnal Sosial Ekonomi Pertanian Dan Agribisnis, 17(1), 55–64. https://doi.org/10.20961/sepa.v17i1.42228

Nikmah, A., Fauziyah, E., & Rum, M. (2014). Efisiensi Produksi Petani Jagung Madura dalam Mempertahankan Keberadaan Jagung Lokal. Agriekonomika: Jurnal Sosial Ekonomi Dan Kebijakan Pertanian, 3(1), 11–20. https://ejurnal.litbang.pertanian.go.id/index.php/jpengkajian/article/view/4772/4039

Noer, S. R., Zakaria, W. A., & Murniati, K. (2018). Analisis Efisiensi Produksi Usahatani Padi Ladang Di Kecamatan Sidomulyo Kabupaten Lampung Selatan. Jurnal Ilmu-Ilmu Agribisnis, 6(1), 17–24. https://doi.org/10.23960/jiia.v6i1.17-24

Novia, R. A., & Satriani, R. (2020). Analisis Efisinesi Teknis Usahatani Padi Sawah Tadah Hujan di Kabupaten Banyumas. Mediagroediagro, 16(1), 48–59. https://publikasiilmiah.unwahas.ac.id/index.php/Mediagro/article/view/3389/3147

Rachmawati, A. R., Agustina, N. W. D., Rahman, S. N., Oktaviana, T., & Maulidya, W. E. W. (2022). Pendekatan Stochastic Frontier Pada Efisiensi Teknis dan Ekonomi Usahatani Padi (Oryza Sativa L) di Kecamatan Burneh, Kabupaten Bangkalan. 7(1), 88–99. https://scholar.archive.org/work/5eg4hlovfraarj3xhkrhrs7dgq/access/wayback/http://jurnal.unpad.ac.id/agricore/article/download/40316/pdf

Rahmadi. (2011). Pengantar Metodologi Penelitian. In Syahrani (Ed.), Antasari Press. https://idr.uin-antasari.ac.id/10670/

Ritung, S., Suryani, E., Subardja, D., Sukarman, Nugroho, K., Suparto, Hikmatullah, Mulyani, A., Tafakresnanto, C., Sulaeman, Y., Subandiono, R. E., Wahyunto, Ponidi, Prasodjo, N., Suryana, U., Hidayat, H., Priyono, A., & Supriatna, W. (2015). Sumberdaya Lahan Pertanian Indonesia: Luas Penyebaran dan Potensi Ketersediaan. https://www.researchgate.net/profile/Sukarman-Kartawisastra/publication/323457112_SUMBERDAYA_LAHAN_PERTANIAN_INDONESIA_Luas_Penyebaran_dan_Potensi_Ketersediaan/links/5a970219aca27214056b33c7/SUMBERDAYA-LAHAN-PERTANIAN-INDONESIA-Luas-Penyebaran-dan-Potensi

Saragih, F. H., & Panjaitan, F. A. B. (2020). Faktor-Faktor Yang Mempengaruhi Pendapatan Usaha Tani Padi Ciherang Di Desa Tebing Tinggi Kabupaten Serdang Bedagai. Agrica : Jurnal Agribisnis Sumatera Utara, 13(1), 55–65. https://doi.org/10.31289/agrica.v13i1.3555

Suharyanto, Mulyo, J. H., Darwanto, D. H., & Widodo, S. (2013). Analisis Efisiensi Teknis Pengelolaan Tanaman Terpadu (PTT) Padi Sawah Di Provinsi Bali. SEPA: Jurnal Sosial Ekonomi Pertanian Dan Agribisnis, 9(2), 219–230. https://jurnal.uns.ac.id/sepa/article/view/48828/30099

Suharyanto, Mulyo, J. H., Darwanto, D. H., & Widodo, S. (2015). Analisis Produksi dan Efisiensi Pengelolaan Tanaman Terpadu Padi Sawah di Provinsi Bali. Jurnal Penelitian Pertanian Tanaman Pangan, 34(2), 131. https://doi.org/10.21082/jpptp.v34n2.2015.p131-143

Surisman, H., Haerunnisa, & Aminah, S. (2021). Analisis Usahatani Varietas Unggul Padi Sawah (Varietas Ciherang, Inpari 13, dan Mekongga) di Kelurahan Talotenreng Kecamatan Sabbangparu Kabupaten Wajo. Jurnal Ilmiah Agrotani, 3(2), 265–273.

ISSN 2580-0566; E-ISSN 2621-9778
http://ejournal2.undip.ac.id/index.php/agrisocionomics
Vol 7 (2): 349-362, June 2023

https://doi.org/10.54339/agrotani.v3i2.249

Ulpah, A., Tinaprilla, N., & Baga, L. M. (2018). Analisis Efisiensi Teknis Usahatani Penangkaran Benih Padi Pola Kemitraan di Kabupaten Subang : Pendekatan Stochastic Frontier Analysis. Jurnal Pengkajian Dan Pengembangan Teknologi Pertanian, 21(3), 259–275. https://core.ac.uk/download/pdf/326453498.pdf

Waskito, R. H., Diartho, H. C., & Yunitasari, D. (2021). Analisis Produksi Padi Di Desa Selodakan Kecamatan Tanggul Kabupaten Jember. Jurnal Ekonomi Ekuilibrium (JEK), 5(1), 1–12. https://jurnal.unej.ac.id/index.php/JEK/article/view/18806/10345

Wilujeng, E. D., & Fauziyah, E. (2021). Efisiensi Teknis Dan Faktor Yang Mempengaruhi Produksi Padi Di Kabupaten Lamongan. Agriscience: Agricultucal Science and Technology, 1(3), 712–727. https://doi.org/10.21107/agriscience.v1i3.11179

Zulkarnain, Z., Said, D. U., & Amitasari, D. (2022). Analisis Efisiensi Teknis, Alokatif dan Ekonomi pada Usahatani Padi Sawah. Studi Ekonomi Dan Kebijakan Publik, 1(1), 1–12. http://penerbitgoodwood.com/index.php/sekp/article/view/728