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PERFORMANCE IMPROVEMENT OF GINGER FARMERS IN PEATLAND, KUBU RAYA DISTRICT

PENINGKATAN KINERJA PETANI JAHE DI LAHAN GAMBUT KABUPATEN KUBU RAYA

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ABSTRACT

The economic value of ginger agricultural commodities has many advantages as a healthy way of life for the society, and this value is reflected in the productivity of ginger farming. When used, peatlands have the potential to significantly boost ginger output, which in turn can help farmers perform more effectively. In the peatlands of Kubu Raya Regency, where ginger is grown, the purpose of this study is to investigate the technical efficacy of ginger farmers and the efforts they make to improve their crops' yields. The choice of locations for the research projects was made deliberatively with consideration given to the proximity of horticulture farmer groups. This study utilized a probability sampling approach and observed 57 representative samples of the farmers who responded to the survey. The software program known as FRONTIER 4.1 is used to aid in the stochastic frontier analysis (SFA) approach of data analysis. Based on the results of the study, the t value for the variable land area was 6.71 > 2.07 and the t value for the seed variable was 5.70 > 2.07 indicating that these two variables had a considerable influence on ginger yield. This data means that the technical efficacy of ginger farmers and the efforts they make can increase ginger yields. With this, it is important for farmers to pay attention to the performance given to ginger plants planted to obtain increased income.

Keyword: farming, farmer performance, ginger, technical efficiency

ABSTRAK

Nilai ekonomi komoditas pertanian jahe memiliki banyak keunggulan sebagai cara hidup sehat bagi masyarakat, dan nilai tersebut tercermin dari produktivitas usahatani jahe. Bila digunakan, lahan gambut berpotensi meningkatkan hasil jahe secara signifikan, yang pada gilirannya dapat membantu petani bekerja lebih efektif. Di lahan gambut Kabupaten Kubu Raya yang ditanami jahe, tujuan penelitian ini adalah untuk

mengetahui efikasi teknis petani jahe dan upaya yang mereka lakukan untuk meningkatkan hasil panennya. Pemilihan lokasi proyek penelitian dilakukan secara musyawarah dengan pertimbangan kedekatan kelompok tani hortikultura. Penelitian ini menggunakan pendekatan sampling probabilitas dan mengamati 57 sampel perwakilan petani yang menanggapi survei. Program perangkat lunak yang dikenal sebagai FRONTIER 4.1 digunakan untuk membantu pendekatan analisis data stochastic frontier (SFA). Berdasarkan hasil penelitian diperoleh nilai t untuk variabel luas lahan sebesar 6,71>2,07 dan nilai t untuk variabel benih sebesar 5,70>2,07 yang menunjukkan bahwa kedua variabel tersebut memiliki pengaruh yang cukup besar terhadap hasil jahe. Data tersebut memberikan arti bahwa efikasi teknis petani jahe dan upaya yang mereka lakukan dapat meningjatkan hasil panen jahe. Dengan ini maka para petani penting untuk memperhatikan kinerja yang diberikan pada tanaman jahe yang ditanam untuk memperoleh penghasilan yang meningkat.

Kata Kunci: usaha tani, kinerja petani, jahe, efisiensi teknis

INTRODUCTION

Awareness in today's society for a healthy life has made herbal plants a place in society (Ziraluo, 2020). One of the herbal farming that is widely used by Indonesian people is ginger (Yassir & Asnah, 2018). There are three types of ginger commonly traded in Indonesia, namely elephant ginger (Zingiber officinale var. officinale), emprit ginger (Zingiber officinale var. vubrum), red ginger (Zingiber officinale var. Amarum) (Fathiah, 2022).

Indonesia has a tropical and subtropical climate with an altitude of about 0-2,000 masl with rainfall between 2,500 – 4,000 mm/year. Good air temperature for the cultivation of ginger plants ranges from 20^0C-35^0C relatively high (Sukarman et al., 2008). Therefore, it is necessary to make efforts to consistently increase the amount of ginger harvest so that the benefits can be enjoyed in a sustainable manner. Given ginger has many benefits for the health of the human body. The process of planting ginger starts from selecting the seeds or ginger seeds. According (Nana et al., 2021) that ginger seeds by farmers are fulfilled traditionally and there is no availability of certified seeds.

One of the provinces that has carried out the productivity of elephant ginger herbal plants is the province of Kalimantan (Santi & Wahyudi, 2021), including West Kalimantan. Elephant ginger farming farmers play an important role in improving the economy of the agricultural sector, especially medicinal plant commodities (Lubis, 2022). Productivity fluctuates every year, tends to increase in 2020 even though land is reduced in 2018. Sufficient land area for this productivity can be supported by selecting the right seeds and handling intensive agriculture to take advantage (Aryanta, 2019). One of the provinces that carries out the productivity of elephant ginger herbal plants is the province of West Kalimantan. Elephant ginger farming farmers play an important role in improving the economy of the agricultural sector, especially medicinal plant

commodities. Productivity fluctuates every year, tends to increase in 2020 even though land is reduced in 2018. Land area that is sufficient for this productivity can be supported by selecting the right seeds and handling intensive agriculture.

Kubu Raya Regency is one of the largest producing areas for elephant ginger production in West Kalimantan Province. Government programs for elephant ginger commodities are able to provide hope and high economic value because they are supported by climate, soil conditions and geographical locations that are suitable for ginger cultivation (Astriani et al., 2013). This proves that the productivity of elephant ginger is more likely to be effective in utilizing land for production in Terentang District. According to (Bangun, 2021) how to measure performance, namely productivity and optimal use of inputs so that the profit obtained is good. The research was conducted in Teluk Empening Village, Terentang District because it is one of the production centers for elephant ginger commodities and around 70% of the community is engaged in elephant ginger farming (*Satu Data Kalbar, 2020*). The difficulty for farmers to get good seeds is due to the absence of ginger breeding (Lestari et al., 2022), limited capital, the use of technology that is not optimal yet effective, and the high price of production inputs so that farmers reduce their use.

The use of peatlands as a supplier of food in the future is based on several considerations, namely productivity is still low and competition for land use for non-agricultural purposes is relatively low (Masganti, 2013). This condition requires efforts to increase the food production capacity of peatlands through land use and application of technology (Tampubolon et al., 2020).

Problems in the cultivation of elephant ginger herbal plants cannot be carried out optimally due to the use of technical production factors that are not yet optimal. Efforts to empower rural communities can be supported by analyzing farmers' performance improvements in agricultural production effectively to achieve optimal efficiency levels (Nchuchuwe & Adejuwon, 2012). Therefore, it is necessary to conduct research on efficiency at the farm level to increase the production of elephant ginger farming through optimal farmer performance. This is the background for researchers to raise the topic of research regarding improving the performance of ginger farmers in Bamboo Land, Kubu Raya Regency. To determine the effectiveness or technical efficiency of farming on peatlands in improving the performance of ginger farmers which has an impact on increasing crop yields.

RESEARCH METHOD

This type of research is quantitative, where the research was conducted on 57 samples selected by purposive sampling (Mustari & Rahman, 2012). Data collection techniques were carried out using survey methods on the activities of ginger farmers. Where the research was conducted from January to November 2022 to get accurate research results.

The research location was carried out in the Peatlands of Kubu Raya Regency, precisely in Teluk Empening Village, Terentang District as a result of deliberations to consider the closeness of horticultural farmer groups. The steps in this research are as follows:

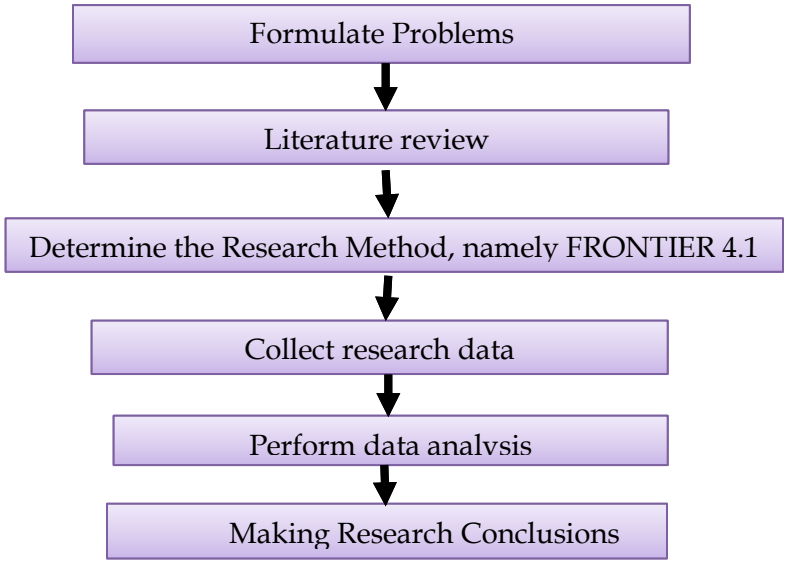

Figure 1.
Research Flow

RESULT AND DISCUSSION

This research was conducted in Peatlands located in Kubu Raya Regency, precisely in Teluk Empening Village, Terentang District. This location was chosen as a result of deliberations to bring horticultural farmers closer together. The results of research with land (X1), seed (X2), fertilizer (X3), labor (X4), experience (Z2) and education (Z3) variables show the following aspects:

1. Stochastic Frontier Production Function Analysis

Used to describe the relationship between ginger production and the use of production factors such as land area (Ha), seeds (Kg), fertilizer (Kg) and labor (HOK). In this study is greater than 0 at 0.175, not the same as zero, meaning 17.5% minimization of the use of production factor input variables such as land area, seeds, fertilizer, labor and the remaining 82.5% of production caused by maximization outside of production inputs is called inefficiency. According to (Kodde & Palm, 1986) states that the comparison of the statistical ratio value of the real level α = 5% and the number) of restriction = 6 is equal to 11.911. The LR test value is greater than the Kodde Palm value, meaning that the stochastic frontier production function can explain the technical inefficiencies of producers in the production process. Log Likelihood function (LR test) of 36.885 from the

production function means that the stochasctic frontier production function has technical inefficiencies in the 57 respondent farmers but the farmer's performance is not optimal in terms of technical efficiency.

a. The Influence of Land Area Production Factors on Ginger Production

The wider the land used, the higher the ginger production will be. The farming of elephant ginger by the respondent farmers tends to be mostly carried out on peat lands rather than clay soils because the harvest time is faster. The potential of the area as a condition for supporting the suitability of elephant ginger farming land is annual rainfall of 1,500-3,000 mm, soil pH of 5.0-7.0, 400 to 800 masl, air temperature of 25-37 degrees Celsius, soil structure is loose and contains humus (made beds with a ditch system), maximum land slope of 30%, and maximum shade for ginger 30% (Prabawa & Dewi, 2019).

This research is in line with research conducted by (Juwitaningtyas & Khairi, 2018) which states that land area has a positive effect on production levels in farming. Land that is resistant to plant pests will increase productivity and improve farming. Increasing production through increasing the area of agricultural land accompanied by the proper use of inputs will result in increasing maximum production yields.

Based on field data after examining the average land use pattern of elephant ginger intercropping with chili and vegetable commodities. If farmers want to increase elephant ginger production, then the limited land area cultivated by farmers must be increased in quality on 1 (one) type of plant for a year. The intercropping system is the density of the number of plants in one area of land which can result in elephant ginger plants being attacked by pests and diseases such as rhizome rot due to high humidity (Prabawa & Dewi, 2019) (Soverda & Alia, 2016) (Lestari et al., 2019). So that technically, this is very influential on the amount of elephant ginger production produced.

b. Effect of Seed Production Factors on Ginger Production

The average use of elephant ginger seeds is 327 Kg/Ha, spacing is 30 x 60 cm between plants with a bed length of 100 meters, the distance between the beds is 1.5 meters, and planted 5 to 7 centimeters deep. Each plot produces 200 to 400 kilograms of ginger, so if 1 hectare produces more than 12 tons of ginger per respondent farmer. This research is in line with research conducted by (Mutiarasari, 2019) which states that seed production factors have a negative effect on production results so that the use of seeds needs to be increased to achieve maximum production results.

According to (Juwitaningtyas & Khairi, 2018) states that seed production factors have a positive effect on production results because good

quality seeds are used. However, an increase in production resulting from an increase in the number of seeds will result in better production if it is supported by the use of quality seeds or seeds.

c. Effect of Fertilizer Production Factors on Ginger Production

The fertilizers applied in elephant ginger farming by the respondent farmers are urea, SP36, KCL and manure. The average use of fertilizers at the study sites was 270 Kg/Ha/year of urea, 272 Kg/Ha of KCL fertilizer, 272 Kg/Ha of SP36, and 1000 Kg/Ha of manure. According to government procedures that fertilizer should be used in ginger farming, namely urea fertilizer of 400 to 600 Kg/Ha given 1.2 and 3 months of age. SP36 fertilizer of 300 to 400 Kg/Ha and KCL of 300 to 400 Kg/Ha is given entirely at the time of planting. The use of ripe compost of 20,000 Kg/Ha is given 2 to 4 weeks before planting together with soil processing.

The results of this study are in line with (Analia et al., 2019.) If reduction or addition of chemical fertilizers is carried out, it will not affect production results. The average use of manure or organic fertilizer is 1,000 Kg/Ha. The results of this study are in line with (Chaney, 2012) that if the soil conditions in the research location indicate that the soil is sufficient for organic fertilizer, then it does not require too much organic fertilizer.

These results indicate that the use of fertilizers is not the right dose; the application of fertilizers that are applied is still simple; difficulty obtaining organic and inorganic fertilizers; the lack of information on farmers' knowledge and technology regarding the nutrient content of fertilizers (especially compound fertilizers sold in the market). Based on this, it shows that it is necessary to evaluate the use of fertilizers to be more efficient so that they are effective and help increase production in elephant ginger farming in the future.

d. Effect of Labor Production Factors on Ginger Production

The negative sign indicates that an additional 10% of the labor used with other production inputs will still reduce elephant ginger production by 1.12%. The reason farmers do pruning is so it doesn't spread to other plants and saves more costs.

The results of this study contradict research conducted by (Pasda et al., 2020) which states that labor has a positive effect on production results. The study stated that the use of labor from a sufficient number of families can increase crop production very well so as to provide maximum results. However, in reality the more the number of workers used in farming activities, the more intensive the farming will be carried out so as to increase crop production.

On the other hand, this research is in line with (Prabawa & Dewi, 2019) that if the production of elephant ginger increases, the amount of labor time in plant maintenance must also be increased so that it is not attacked by pests and plant diseases. Every farming business that is carried out definitely requires labor that can be obtained from within the family and outside the family. The results showed that the use of labor in elephant ginger farming comes from within the family and outside the family from maintenance to post-harvest. This explains that the labor force in the family is the contribution of the farming family as a whole which is never valued in money (Putra et al., 2019; Zahasfana et al., 2017).

2. Spread of Technical Efficiency

The results of the analysis in Table 1. explain that Teluk Empening Village, Terentang District is a center for elephant ginger production in Kubu Raya Regency, so elephant ginger farmers are able to produce an average efficiency of 0.902. The percentage of farmers who are technically efficient is 55 farmers or 96.49%, while 3.51% of farmers are not technically efficient. The smallest technical efficiency value for farmers is 0.646 and the largest technical efficiency value for farmers is 0.978.

Table 1. Efficiency Distribution of Elephant Ginger Farming Farmers

	Indeks Efisiensi	
Efisiensi Teknis	Jumlah	Persentase
> 0.6 ≤ 0.7	2	3.051
> 0.7 ≤ 0.8	6	10.053
> 0.8 ≤ 0.9	11	19.030
> 0.9 ≤ 1.0	38	66.067
Total	57	100.000
Average		0.902
Minimum		0.646
Maksimum		0.979

Sumber : Primary Data Processed, 2022

This research is in line with research (Prabawa & Dewi, 2019) that the research results are said to be technically efficient if the value is greater than 0.8, which is 0.910. These results indicate that overall farmers can increase their production if the use of production inputs is increased by 9.8% (1-0.902)x100%. But there are still many other factors that cannot be controlled for needing attention by elephant ginger farmers such as pests, plant diseases, climate, and drainage systems even though the gamma value based is obtained at 86.50% but there is still a chance that it is influenced by other factors of 13, 50%. Farming that is not yet technically efficient has the opportunity to be improved to obtain optimal production results.

3. Analysis of Inefficiency Factors in Elephant Ginger Farming

The estimation show that the LR test value of 13.329 is greater than the code palm value of 11.911, which means that there is inefficiency. The technical inefficiency effect model shows that the real factors that have a significant effect in explaining technical inefficiency in the production process of elephant ginger farmers at the 95% confidence level (α = 5%) are experience and education. Variables that have no significant significant effect are age and number of family members. The coefficient of determination (siqma squared) of the average function obtained is 0.435. The results of this analysis mean that age, experience, education and number of family members have an influence of 43.5% on the variation in efficiency of elephant ginger production at the study sites, while the other 56.5% is influenced by other variables outside of this study.

a. Effect of Farmer's Age on Ginger Production

Age variable (Z1) in ginger farming production with a value of 0.122. The coefficient value shows a negative value and is smaller than the t table value of 2.074 at the 95% level of confidence (α = 5%), thus the age factor has a negative but not significant effect on the effect of technical inefficiency in elephant ginger farming. The age of the farmer will affect the process of farming activities starting from the thought process to the cultivation process that is carried out (Thamrin et al., 2012).

Most of the elephant ginger farmers in Teluk Empening Village are aged 41 to 50 years with a percentage of 43.86% and aged 31 to 40 years with a percentage of 28.07%. The real observation is that elephant ginger farmers are still in their productive age and in fairly good physical condition, but if their age increases, their ability to work also decreases because old age farmers are increasingly inefficient in farming to apply new technologies and innovations.

b. Effect of Farmer's Experience on Ginger Production

Experience variable (Z2) in the production of ginger farming with a value of 0.734. The coefficient value shows a negative value and is greater than the t table value of 2.074 at the 95% confidence level (α = 5%). Farming experience has a real effect on reducing the level of inefficiency or increasing technical efficiency. The results of the study (Monica et al., 2021) are in line with this study which shows that the longer the farmer's experience will decrease the effect of inefficiency. In contrast, according to the statement (Prabawa & Dewi, 2019) that the longer the farmer's experience, the inefficiency increases and efficiency decreases.

The results of real observations at the research location were that most of the respondent farmers still used traditional cultivation patterns from

generation to generation, making it difficult to innovate to learn from previous experience in maintaining the quality of production. Farmers who are relatively old do not always have more experience than younger farmers, so that the separation of age and farmer experience variables is considered relevant.

c. Effect of Farmer's Education on Ginger Production

The education variable (Z3) is in the production of ginger farming with a value of 0.364. The coefficient value shows a positive value and is greater than the t table value of 2.074 at the 95% confidence level (α = 5%). These results indicate that the level of education is able to apply new technologies, allocate resources optimally, determine the behavior of farmers in accepting new innovations in farming. The results of the study (Prabawa & Dewi, 2019) are in line with this research that education has a real effect on increasing the level of inefficiency or reducing technical efficiency because it measures the length of formal study of general knowledge and not specifically regarding elephant ginger farming.

Most of the respondent farmers have a relatively low level of education (elementary school) regarding their understanding of the production function of farming, resulting in a lack of interest for farmers to innovate new things regarding renewable agricultural technology (Apriliya et al., 2020). Respondent farmers have an elementary education level with a percentage of 42.11% and SMP/MTS education with a percentage of 31.58%. In this case, farmers' low formal education can be offset by participating in informal education, such as training and counseling about farming (Fadhila & Wahjoedi, 2019).

Awareness of the importance of productivity plays an important role in encouraging efforts to increase agricultural production. The level of education does not only influence farmers to apply innovative information that is useful for increasing the production of sembung, but also influences the determination of the business area and the area of land used in farming (Thamrin et al., 2012).

d. The Effect of Number of Farmer Family Members on Ginger Production

The variable number of family members (Z4) in ginger farming production has a value of 0.184. The coefficient value shows a negative value and is smaller than the t table value of 2.074 at the 95% confidence level (α = 5%). The results of this analysis indicate that the increasing number of farmer family members has no effect on the effect level of inefficiency in the production of elephant ginger farming. The number of family members can affect agricultural production if used as labor in the family. However, not all

family members are used for labor, so it does not affect farm production (Yulida, 2012).

The large number of family members has an effect on increasing the amount of production, but does not affect and motivate farmers in running farming. The existence of increasingly large expenses requires farmers to be able to increase the productivity of their farming so that the family's needs can be met. The results of this finding are consistent with the statement (Rungkat et al., 2021) that the outpouring of labor used is the amount of effective labor required, so that the potential in the family does not guarantee the availability of quality labor related to farming experience in absorbing technology.

2. Efforts to Increase the Technical Efficiency of Elephant Ginger Production

Technical efficiency is carried out to analyze the use of factors of production in farming that have been used optimally or not (Swartika & Dewi, 2021). The maximum use of production factors will increase the production of the farming business that is being carried out. The higher the average value of technical efficiency indicates that the utilization of production factors is more optimal in providing an increase in elephant ginger farming.

The percentage of farmers who are technically efficient is 55 farmers or 96.49%, while 3.51% of farmers are not technically efficient. The smallest technical efficiency value for farmers is 0.646 and the largest technical efficiency value for farmers is 0.978. Elephant ginger farming is efficient and close to its frontier because various government efforts and programs are focused on this area, such as intensive counseling on elephant ginger cultivation and certification of local seeds. Based on the average efficiency value of elephant ginger farmers, it is stated that farmers have the opportunity to obtain maximum results with efficient production inputs.

This research is in line with research (Prabawa & Dewi, 2019) that the research results are said to be technically efficient if the value is greater than 0.8, which is 0.910. These results indicate that overall farmers can increase their production if the use of production inputs is increased by 9.8% (1-0.902)x100%. However, there are still many other factors that cannot be controlled for elephant ginger farmers to pay attention to, such as pests, plant diseases, climate, and drainage systems, although the gamma value is 86.50% but there is still a chance of being influenced by other factors of 13, 50%.

The results of interviews with several elephant ginger farmers in Empening Village stated that the management of elephant ginger still uses traditional equipment due to the small area of agricultural land. Farmers also rarely take part in agricultural counseling provided by the local government so that land processing is a traditional cultivation pattern that has been passed down from generation to generation. Most of the land is just managed as it has

been done before. The existence of this causes the management of elephant ginger farming is not carried out efficiently.

CONCLUSION AND SUGGESTION

Conclusion

The conclusion from the results of the research that has been done is that the variable land area (X1) in elephant ginger farming in Teluk Empening Village, Terentang District, Kubu Raya Regency has a significant positive effect on ginger production with a coefficient value of 0.671. This value indicates that a land area of 10% with fixed production inputs can increase ginger production by 6.71%, meaning that the larger the area used, the higher the ginger production. The seed variable (X2) has a significant negative effect on ginger production with a coefficient value of -0.570. This value indicates that the addition of seeds by 10% with other production inputs will still reduce ginger production by 5.70%. The coefficient value of land area and seedlings is stated to be greater than the t table value of 2.074 at a confidence level of 95% (α = 5%). Fertilizer (X3) and labor (X4) variables have no significant (significant) effect on ginger production with a coefficient of 0.655 and -0.112.

On average, 55 farmers were technically efficient elephant ginger farmers in Teluk Empening Village, Terentang District, Kubu Raya Regency, or 96.49%, while 3.51% of farmers were not technically efficient. The smallest technical efficiency value for farmers is 0.646 and the largest technical efficiency value for farmers is 0.978. overall farmers can increase their production if the use of production inputs is increased by 9.8% (1-0.902)x100%. But there are still many other factors that cannot be controlled that need to be considered by elephant ginger farmers even though the gamma value obtained is 86.50% but there is still a chance that it is influenced by other factors of 13.50%. Farming that is not yet technically efficient has the opportunity to be improved to obtain optimal production results.

The variables that significantly influence the technical efficiency of elephant ginger farming are experience (Z2) in ginger farming production with a value of 0.734 and education (Z3) in ginger farming production with a value of 0.364. The coefficient value shows a value greater than the t table value of 2.074 at the 95% confidence level (α = 5%).

Suggestion

Researchers hope that the results of this study can be used by the government in making agricultural policies so that agriculture in Indonesia will be better, including ginger productivity, considering that Indonesia is a fertile country. In addition, researchers also provide advice to farmers to continue to

improve their own abilities in agricultural management through the area of land owned so that the results can be optimal considering that experience has an influence on increasing ginger yields. In conclusion, the researcher hopes that the results of this study can also contribute ideas or references for conducting research in the future.

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