

The Agricultural Labor Market: Farmer Perception and the Influence on The Efficiency of Rice Farming

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Abstract

Therefore, this research aims to analyze the factors that influence the farmer's perspective regarding the labor provider service and the effect of the service that is used by the farmers on the technical efficiency level. This research uses the methodology that involves the utilization of logit regression analysis to test the cross-sectional data that was obtained from 200 farmers in Ngawi, Lumajang, Pasuruan, Malang in Indonesia as a sample. The measurement of technical efficiency uses the Cobb-Douglas production function with the Stochastic Production Frontier approach and the Tobit Regression model to determine the effect of labor provider business on technical efficiency. This research found that factors that influence the farmer's perception of the labor provider are age, land area, the worker's wage, and the use of agricultural tools. The technical efficiency level can certainly still be improved by addressing the influencing factors, namely the use of information technology, agricultural mechanization, and the positive response towards the organizations that help in the availability of input, such as the labor provider service. The findings in this research provide an overview of how a farmer should perceive the agricultural labor provider service, especially in agriculture in the industrial or high labor wages areas.

Keywords: *Agricultural Labor, Technical Efficiency, Labor Market, Rice Farming, Farmer Perception.*

Introduction

One of the important things that became the focus of national development is employment. The focus is not only because the population doesn't get jobs or is already working, but also on how jobs give proper welfare to the workers. As an agrarian country, the agricultural sector holds an important role in national development. Not only that the sector provide welfare through food availability for the citizens, but the agricultural sector is also a sector that absorbs a great number of workers and is the mainstay in labor absorption. Based on the data published by the Ministry of Agriculture of Indonesia (Kementerian Pertanian, 2023), this sector absorbed 36.46 million workers in 2023, consisting of 23.15 million male workers and 13.31 million female workers. The amount of workers in the agricultural sector occupies 26.07% of the total workers in Indonesia. The high percentage of workers absorbed in the agricultural sector was caused by the fact that the workers in this sector are not required to have a special skill or expertise (Holle, 2023).

However, for now, the level of welfare is not yet portrayed by the absorption of the workers in the agricultural sector. Wage is one of the factors that determine the number of workers in the agricultural sector that can be absorbed (Melati & Idris, 2023). The wages that were received by workers in the agricultural sector are also considered to be smaller if compared to other sectors, such as the industrial sector, and not sufficient to fulfill the life necessities of the farmer and his/her family (Volokhova & Novikov, 2020). According to data from Indonesia's Central Bureau of Statistics (Rahman & Octaviani, 2020), the agricultural sector contributed to 50.42% of the overall poor households in Indonesia. The small income received by the agricultural workers caused them to move to work in the industrial sector, especially those who lived in an industrial area such as the Pasuruan Regency.

The farmer's family members, neighbors, hired labor, or local area labor are mostly still used to supply the agricultural labor in the villages. The supply of labor from another area is still rarely used as the farmers still feel there is sufficient labor available in the area. The supply of labor from family is prioritized as they will

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help to minimize the labor cost and is usually applied by small-scale farmers. The research that was done by Alexandra E. Hill 2021 explained that, in the United States of America, the model of agricultural labor supply is provided by family, local, and foreign labor, where 69% of the labor comes from the local area. Moreover, the majority of labor in agriculture is filled with old farmers, with the age of 40 and above, and the amount of young farmers is getting smaller. The impact of the young farmers' crisis could threaten the sustainability of the agricultural sector, especially on agricultural productivity (Susilowati, 2016). Utilizing modern agricultural technologies is one of the ways to increase productivity, welfare, and farmer empowerment, as well as to increase the quality and value of the product (Syam & Taher, 2023). So far, the management of the agricultural sector is still not at its maximum as modern agricultural tools are not much used by the farmers to manage the land, except for the tractors (Tarigan, 2019). The lack of the utilization of modern technology in agriculture causes this sector, especially rice farming, to require a lot of labor to conduct their production process. The reluctance to use tools is caused by the small area of the land and not many services that offer the rent for agricultural tools. In China, for example, the government has provided the tools servicing service. But, the farmers mostly accessed credit and insurance as it can fulfill the needs of mechanization and labor (Chen et al., 2022; Qu et al., 2022). The agricultural sector is the sector that has a small capital as the investment in it is relatively small (Adha & Andiny, 2022). Therefore, the credits and insurance are more interesting to the farmer compared to changing their agricultural tools from traditional to modern by keeping in mind that capital is the main thing in production development.

Rice farmers needed a lot of workers in the stages of planting, weed control, and harvest. The agricultural labor needs with the right time and number are very much needed by the farmers, especially during the agricultural production season which usually comes in around the same time in a small interval. The use of workers on a rotating basis was not satisfying for the farmers as there were differences in the wages and the working hours. For example, the processing process of a wetland is different from that of dry land. The differences are not only found in the technique that was used to manage it but also in the type of tools used, with dry land management being harder compared to the wetlands (Suwartapradja, 2010). Therefore, the use of labor that will help in the processing process in both lands would be different and the expenses incurred will also differ from one to another. To reduce the cost of running a farming business, some farmers in an area then implement a system to take turns processing the land together. This system is then known as *balembai ari* in the Payakumbuh area, in the West Sumatera area, for the chili farming business and *liluran/rempuhan* among the Baduy people (Ernanda et al., 2020; Suwartapradja, 2010). Another way that can be used to provide the workers that are needed by the farmer is by opening a labor provider business.

In the United Kingdom, the business of a labor provider is then called an agricultural contractor, where farmers with small or medium-sized land consider it impossible to exist without the service (Nye, 2020). These labor providers are not only providing temporary workers but also provide agricultural tools rental services for the farmers. As time passes, the farmers are more dependent on the agent of the agricultural contractor to gain access to the labor. A similar service is also available in the United States of America, where the service of a labor provider not only provides workers from the local area but also migrant workers (Hill et al., 2021). A labor provider service like this is not only available in developed countries. A labor provider service known as **Jasa Rewang-Rewang** is currently popular in the East Java Province, Indonesia. The worker provided is dedicated to fulfilling the farmer's needs of workers during the stages of planting, plant care, and harvesting. This labor provider business started to become popular among the farmers since the COVID-19 pandemic that hit Indonesia from 2020 to 2021. This service is not only for the rice farming business but also provides agricultural labor for horticulture farming. In the Pasuruan, Malang, Lumajang, and Ngawi Regency, this labor provider service is informally available but the majority of the farmers still do not know of this service. Farmers who have taken advantage of it are the rice and vegetable farmers with a land area of above 0.5 hectares. The farmers only needed to register to the service providers and the provider will distribute the labor based on the quantity and time request. However, based on the initial observation of the researcher, not all of the farmers also have access to the Jasa Rewang-Rewang due to limited information and capital. The information access of the farmers still lacking as the majority of them are not utilizing the information digitally. The major obstacle to agricultural development in the era of 4.0 is the failure of information received by the farmers (da Silveira et al., 2023). In Indonesia, the effect of

digitalization on agriculture is not yet really felt. This is influenced by the factors of age, education, and the ownership of digital information devices. Agricultural modernization influenced the use of agricultural tools but the conditions of land tenure owned by the farmer were small and the hilly topography of the land made it difficult to utilize agricultural tools. Therefore, the agricultural works are still mostly done by the human labor.

Workers are one of the production inputs in the farming process, where their role is very important as the driver of the production system. The labor availability and their utilization by the farmers determine the farming productivity. The farming process will achieve optimum technical efficiency level if the utilization of production input is done at the right time, size, and dosage. The productivity level is determined by the efficiency in allocating the input to various alternatives of the production activity. Hence, the effort to increase production by applying the principle of optimum allocation of input usage becomes the key to success in increasing production (Arru et al., 2019). The factors that influence the technical efficiency level which has been discussed a lot in the previous research are the factors of social-economic, environmental, and the technology used by the farmers. The socioeconomic factors that affect the technical efficiency level are the farmer's age, education, participation in training, income, and farming experience (Anang et al., 2016; Sapkota & Bajracharya, 2018; Tiedemann & Latacz-Lohmann, 2013). The utilization of technology, such as information technology, farming mechanization, and cultivation technology, also proves as an influencing factor in the achievement of technical efficiency (DeLay et al., 2022; Khan et al., 2021; Krasachat, 2023; Vortia et al., 2021).

The description above portrays that agricultural labor is an interesting topic to discuss considering the development of the agricultural sector and technology and the relations between the farmer characteristics from the perspective of socio-economics and technological mastery. The increase in productivity became the goal of farming and should stay balanced with efficient production input allocations. The agricultural labor provider and distributor services are available in several locations, especially the locations that have already experienced difficulty in getting workers. Therefore, to see how far the development of this labor provider service business model is, research is important to be conducted to see the perception of the farmer regarding the labor provider service and the effect of it on farming efficiency. This becomes interesting to be studied continuously, especially in developing countries, to give information on the management of an agricultural labor provider business. This research aims to know the factors that influence farmers' perceptions regarding the labor provider service and the effect of the labor provider service on the technical efficiency level of rice farming. The result of this research can be used to develop the labor provider service in the future by keeping the decreasing supply of agricultural labor in mind.

Literature Review

The Concept of Production Function

The production function shows the technical correlation between the variables of the production factor (input) and the result (output) in the production process. The production function establishes that a company couldn't achieve a greater output without using a greater input and the company couldn't be using less input without decreasing the output level. The inputs in farming are the land, seeds, fertilizer, and capital. Various studies regarding the technical efficiency of farming have discussed the production input by utilizing land, seed, labor, fertilizer, pesticides, and organic fertilizer in their model (Ahmed et al., 2018; Haile, 2018). The research used the cross-section data through interviews with the respondent farmers.

Technological innovation is something that can't be separated from the agricultural production process. The innovation is then divided into two, namely the technological and non-technological innovation, where the non-technological innovation could be a change in attitude or behavior to be more productive (Schut et al., 2016). The utilization of the right technological innovation could increase farming productivity, land, human resources, and food security (Ullah et al., 2020).

The Agricultural Production Input Market

The agricultural production input market is not the same as the market of food products or manufacture. The input market had different mechanisms that must be passed by a market. This is related to the number of suppliers and the consumers. The agricultural production input market seems as an oligopoly structure as the seller or company that works in the agricultural production input sales is not proportional to the number of consumers, that is the farmer (Sheldon, 2017). The constraint of a farmer is the unavailability of production input when it is needed. This constraint caused the supply side should be balanced by the capital availability to buy the input at a higher price or reduce the cost by reducing the input used. Generally, the constraints in the supply and demand of agricultural production input are the knowledge or information constraints, the financial, and the risk problem (Kelly et al., 2003). The constraint in supply and demand of the agricultural input becomes the government's job to issue a policy so that the farmers can still get the input suited to their needs.

The Efficiency of Farming Production

Production efficiency is a comparative measurement of obtained output and sacrificed input. The concept of efficiency was introduced by (Bozoğlu & Ceyhan, 2007) as the ability to produce certain products at a minimum cost. Technical efficiency reflects the capability of a company to produce a production or maximum output by utilizing a certain input quantity. Meanwhile, allocative efficiency shows the capability of a company to use an optimal proportion of an input with the price level of the input and a certain production technology. The productivity level also determines how the technical efficiency of a farmer. If a farmer is technically efficient, which also means that the input allocation is also efficient, then the farming productivity would be increased. The method to measure the technical efficiency relative to the production function is named the Frontier Probabilistic Production Function. When all producers face the same input price and production function and can allocate the input efficiently, then the average cost could relatively be used to measure the relative technical efficiency. All the efficiency value ranges between 0 and 1.

Method

Research Location

The data collection for this research was done through questionnaires and interviews with respondents in four locations in East Java Province, that is the Lumajang Regency, Ngawi Regency, Pasuruan Regency, and Malang Regency. The data that was obtained is then called the primary data. The secondary data is the data obtained from the data available at the local institutions, namely the agricultural office or the local government office. The location of the research is chosen purposively and tailored to the research objective. The four locations were chosen as they were the center of rice farming in East Java Province. The population of this research is the rice farmers in those locations.

Population and Sample

The population is the rice farmers in the research locations. The sample is part of the population that was chosen randomly by using the sampling techniques of multi-stage cluster sampling. The multi-stage cluster sampling in this research utilizes four steps, namely: 1) determine the Regency that will be the research location, 2) determine the district in the Regency, 3) determine the village that will be the research location, and 4) determine the sample according to the research objective profile in the chosen villages. The target number of samples for this research is 50 people in every location. So, the total number of the samples is 200 farmers which also includes the labor provider business actors. The sample determination was done by random sampling.

Data Analysis

The analysis method that is used to determine the farmer's perception regarding the existence of the agricultural labor provider service is logistic regression analysis (logit analysis), where this analysis was used to determine the effect of the independent variable on the dependent variable, which is the perception of the farmer of the labor provider service. By adding the factors that influence the perception of the farmers, the equation of the logit model obtained in this research is:

$$e^z = \frac{P_i}{1-P_i}$$

$$z = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + \beta_6X_6 + \beta_7X_7 + \beta_8X_8 + \beta_9X_9 + \varepsilon^i$$

Where:

P^i = the value of probability

β_i = coefficient of variable i

ε_i = stochastic error

Equation 1 then can be written again in the form of:

$$P_i = \frac{e^z}{1+e^z}$$

$$(1 - P_i) = \frac{1}{1+e^z}$$

Thus, the probability ratio is: $\left(\frac{P_i}{1-P_i}\right)$

The statistical test on the logit model is the Hosmer and Lemeshow test to test whether the predicted probability matches with the observation. It is expected that the test will show an insignificant difference between the predicted and the observed probability. The individual logit coefficient was tested by the Wald test. The stated hypotheses are:

$$H_0 = \beta_i = 0$$

$$H_1 = \beta_i \neq 0$$

The statistical test used is:

$$W_i = \left(\frac{\beta_i}{SE_{\beta_i}}\right)^2$$

Where:

β_i = coefficient of variable i

SE_{β_i} = standard error β_i

Factors that are thought to influence the perception of the farmers on the service of labor provider are X_1 (age), X_2 (the level of education), X_3 (the experience in farming business), X_4 (the number of the family members involved in the farming business), X_5 (the land area), X_6 (farm income), X_7 (the wage of the

workers), X_8 (the utilization of information technology), X_9 (Machinery or agricultural tools). The description of the variables used in the logit model is explained in Table 1.

Table 1. Variables That Used in the Logit Model

No	Variable	Measurements
1	The age of the farmer	Age of the farmer (years)
2	The level of education	Farmer's time in receiving education (years)
3	The experience of farming business	Farmer's farming duration (years)
4	Family members that involved in the farming business	Number of family members that involved in the farming (person)
5	Land area	Owned land area that used for farming (m ²)
6	The farm income	Farmer's income from the farming business (Rupiah)
7	The wages of the workers	The wages of agricultural labor. Female worker's wage equalized with the male workers (Rupiah)
8	Information technology	The utilization of information technology is worth 1 and 0 if not
9	Machinery or agricultural tools	The utilization of agricultural tools is worth 1 and 0 if not

The analytical method that is used to determine the technical efficiency level of rice farming is the Cobb-Douglas production function model, a production function model that is used to measure the technical efficiency, with the approach of Production Frontier. The measurement of technical efficiency of rice production is measured using the formula, that is:

$$TE = \frac{y_i}{y_i^*} = \frac{\exp(x_i\beta + v_i - u_i)}{\exp(x_i\beta + v_i)} = \exp(-u_i)$$

Where y_i is the actual production from the observation, y_i^* is the estimation of potential production from the frontier stochastic equation. The technical efficiency of a farmer ranges between 0 and 1. The technical efficiency then has the value that is opposite to the technical inefficiency effects.

Then, the result of the technical efficiency measurement through the formula is analyzed with the independent variable which is the farmer's characteristics, including the social-economy and the usage of technology. The analytical method that was used is the Tobit regression model. This research uses the Tobit regression because the value of the dependent variables, namely the technical efficiency, is limited between 0 and 1. The model to calculate the technical efficiency (TE) then was analyzed separately. In the estimating process for the parameter in the Tobit regression, the Maximum Likelihood Estimator (MLE) was used. The estimation model of factors that influence the efficiency level by the Tobit regression model is:

$$TE = \delta_0 + \delta_1 Z_1 + \delta_2 Z_2 + \delta_3 Z_3 + \delta_4 Z_4 + \delta_5 Z_5 + \delta_6 Z_6 + \delta_7 Z_7 + \delta_8 Z_8 + \varepsilon$$

Where:

TE = the value of technical efficiency

Z_1 Age = the age of the farmer (years)

Z_2 Education = the duration of farmer receiving education (years)

Z_3 Farming duration = the farming experience (years)

- Z_4 Family members = the number of family members that are involved in the farming process (person)
- Z_5 Information Technology = the utilization of information technology, valued at 1 if utilizing and 0 if not
- Z_6 Farming mechanization = the utilization of agricultural machinery/tools, valued at 1 if utilizing and 0 if not
- Z_7 Income = the farmer's monthly income (rupiah)
- Z_8 Farmer's decision = the farmer's willingness to use the labor provider service, valued at 1 if yes and 0 if not
- δ_n = coefficient of estimated variable parameters
- ε = random error term that is freely assumed and distributed and the distribution is cut normally with $N(0, \delta)$

Results

The farmer's perception regarding the labor provider service

The result of the analysis in Table 2 shows that the three factors that positively and significantly influence the agricultural labor provider service are the farmer's age, the land area, and the wage rate of the agricultural labor. From those three factors, the wage rate of the workers has the highest influence on the probability of acceptance of the agricultural labor provider service. The wage rate of workers in four research locations was different from one another. The highest average agricultural worker's wage rate is in the Pasuruan Regency with a rate of 72.500 rupiahs.

Table 2. Statistic Description of the Result of The Logistic Regression Analysis

Variable	Coefficient	Wald	Sig.	Exp β
X ₁	0,034	2,857	0,091	0,967
X ₂	0,012	0,038	0,846	0,988
X ₃	0,012	0,645	0,422	0,988
X ₄	0,067	0,930	0,335	0,936
X ₅	0,000	3,912	0,048	1,000
X ₆	0,012	0,573	0,449	1,012
X ₇	0,029	11,219	0,001	1,029
X ₈	0,286	0,492	0,483	0,751
X ₉	0,142	0,151	0,698	0,868
Constant	0,022	0,000	0,000	0,978

Source: Processed data, 2024

Table 3 also shows the capabilities of the specified logit model which has 88% correct in predicting the farmers that have a positive perception of the labor provider service. Moreover, this model also has 87.9% correct predictions for farmers that have a positive perception.

Table 3. Result of Overall Percentage and Nagelkerke R-square Estimation

Observed	Predicted		
	Labor service		% Correct
	0	1	

Labor service	0	81	11	88.0
	1	11	80	87.9
Overall Percentage				88.00
Nagelkerke R Square				0.762

Source: Data analysis, 2024

The Technical Efficiency of Farming

The distribution of technical efficiency of rice farming in the research locations and each of the farmers can be seen in Table 4 and Figure 1 respectively. Table 4 shows that, of the farmers in the research location, the highest and the lowest technical efficiency levels are 0.8805 and 0.3428. The average technical efficiency level is 0.6971 and that means that 69.71% of the potential production condition can be achieved by the respondent farmers. Hence, the farmer still can increase productivity by 30.29%. The amount of farmers that have technical efficiency above the average value is 41%, meaning that 103 farmers, or 51.5% of them, have been able to manage the input for rice farming efficiently. About 48.5% of the farmers, or 97 of them, seem to have not yet been able to maximally manage their farming and this can be seen from the technical efficiency value that is still below the average.

Table 4. The Distribution of Technical Efficiency Levels During the Rainy Season

The level of technical efficiency	Farmer (person)	Percentage (%)
0 - 0,3	0	0
0,31 - 0,5	7	3.5
0,51 - 0,7	90	45
0,71 – 0,8	82	41
0,81 - 1	21	10.5
TOTAL	200	100
Min		0.3428
Max		0.8805
Average		0.6971

Source: Primary data analysis, 2024

The gap in the technical efficiency levels also can be seen in Figure 1 in which the value of technical efficiency is seen in a fluctuating graph. The figure shows that the technical efficiency level of rice farming in the research location ranges between 0.3428 and 0.8805, which means that the farmers are still able to increase the technical efficiency level to achieve optimum production.

Figure 1. The Technical Efficiency Level of Rice Farmers

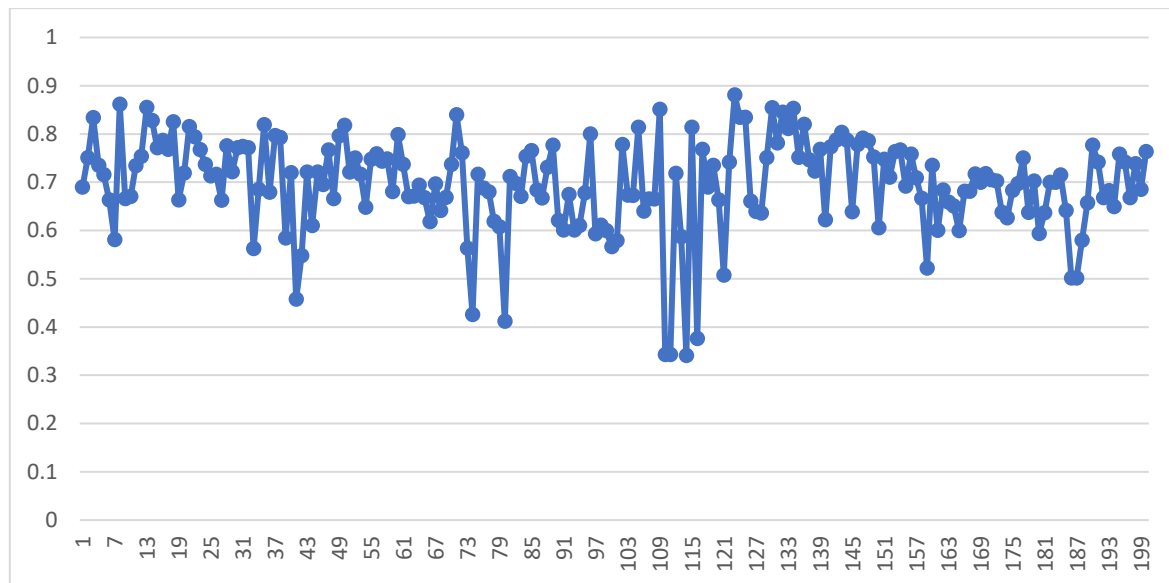


Table 5 shows the statistics of the analysis result where the parameters testing was done synchronously to determine whether the parameter used simultaneously had a significant effect on the model. The statistical test that was used are Likelihood Ratio Test. Table 3 shows that the value of the Likelihood Ratio Test was 211.36 with a probability of 0.0000. This means that, simultaneously, the independent variable (X) in the model can represent the value of Y, which is the technical efficiency level. The result of the analysis shows that factors that significantly influence the technical efficiency level are the use of information technology, agricultural machinery, income, and the farmer's decision to use the labor provider organizations.

Table 5. Results of Analysis of Factors That Influence Technical Efficiency

Independent Variable	Coefficient	Std. Err	z-statistic
Constants	0.605119	0.045269	13.36725
Age	0.000967	0.000697	1.387373
Education	-0.000948	0.002298	-0.412608
Farming duration	0.000253	0.000538	0.470612
Family members	-0.001850	0.002238	-0.826593
Information technology	*0.026562	0.014804	1.794254
Agricultural machinery	***0.057072	0.012899	4.424655
Income	***0.001493	0.000467	3.194203
Farmer's decision	***0.061398	0.012387	4.956515
Number of observation	= 200		
LR Chi ²	= 211.36		
Prob > chi ²	= 0.0000		

Note : * significant at $\alpha = 0,1$; ** significant at $\alpha = 0,05$; *** significant at $\alpha = 0,01$

Discussion

Pasuruan Regency is one of the industrial areas of the East Java Province, so the wage rate for agricultural workers follows the industrial worker's wage rate. The high wage rate of agricultural workers in Pasuruan Regency also affects the availability of labor supply in the agricultural sector. Some researchers stated that the transfer of agricultural labor to the industrial sector is influenced by the higher wage rate received by

industrial workers (Hill et al., 2021; Nye, 2020). The result of the logit regression analysis shows that the age of the farmers shows a positive and significant influence. That means the older farmers more agreed on the existence of the labor provider service. The older farmers show that they are experienced in managing their farming business and utilizing their experience to predict and handle the needs of workers. The farmers in the research location are hereditary farmers or farmers who inherited the profession from their ancestors. So, the older the age of the farmer, the more experienced they are in handling the uncertainty of the labor market. Some research explained that there are positive and significant influences between age and the attitude of the farmer in managing their farming business (Ahmad et al., 2019; Aldosari et al., 2019; Lobos et al., 2018). In the research location, the average age of the respondents is 51 years old, where at this age the farmers already experiencing a decline in productivity so they need workers to help them. The local culture shows that there is a culture of mutual cooperation (the gotong royong system) in fulfilling the needs of workers. However, the agricultural production process, such as the planting, plant caring, or harvesting, is mostly done together with other farmers at the same time in the same area so there is a probability of a lack of the labor supply. The older farmer often utilizes their family as the worker. However, that is also hard to do as a lot of their children or close relatives work in sectors other than agriculture. Only in Ngawi Regency where the labor supply is still fulfilled by the family members and neighbors. This is also shown by the number of family members involved in agriculture still quite big with an average of more than 5 people. The land area also influenced positively the existence of the labor provider service. The wider the land area owned by the farmer, the more workers are needed. So, the farmer assumes that this labor provider service helps greatly in the fulfillment of the needs of workers during the production process. Some research mentioned that the agricultural land area is directly proportional to the amount of workers needed., the wider the land then the more workers needed. (Liu et al., 2020) mentioned that the increasing land area opens more job opportunities for agricultural workers. But the supply of the workers can't fulfill it as there's a transfer of workers to the non-agricultural sectors. Migration of agricultural labor to other sectors causing the local labor supply for agriculture to lessen and the farmers are starting to complain about that. The wage rate is one of the causes of this labor migration. The result of logit regression analysis shows that the wage rate positively influences the farmer's perception of the agricultural labor provider service. This shows that the higher the wage rate in an area, the farmers agree to the service business that provides labor. A high wage rate will cause the production cost to increase. Therefore, the farmers hope that there is a labor provider service that will give lower wages and provide the labor needs that are needed.

The technical efficiency level of rice farmers in the research location is not yet optimum with the value of 0.6971, which the the farmers are still able to increase the production as much as 0.3029. This requires special attention from the government and the related parties to accompany the farmers in increasing their ability of farming management. The farmers needed to be given a technological package to increase production, the technical knowledge to optimize the use of the inputs, counseling and training, capitalization, and strengthening the farmers' organization (DeLay et al., 2022; Khan et al., 2021; Olagunju et al., 2021; Wang et al., 2020). Another important thing is to increase the capability and the productivity of the agricultural labor other than the farmer as the owner of the business. The labor that has a high capability and productivity can give a higher efficiency level continuously. The increase in the labor capability is not out of attention from the government with their policy because if this was charged to the farmer then it will add the cost as it relates to the wages of the workers Hal yang penting lainnya adalah peningkatan kemampuan dan produktivitas tenaga kerja di bidang pertanian selain petani sebagai pemilik usaha. Tenaga kerja yang memiliki kemampuan dan produktivitas tinggi mampu memberikan tingkat efisiensi yang lebih tinggi secara berkelanjutan. Peningkatan kemampuan tenaga kerja ini tidak lepas dari perhatian pemerintah dengan kebijakannya karena jika dibebankan pada petani akan menambah biaya usaha karena berhubungan dengan tingkat upah tenaga kerja (Guth & Smędzik-Ambroży, 2020). The achievement of the technical efficiency level in a farm was influenced by the social-economy and environmental factors. From the Tobit analysis, it became known that the factors that influence the level of technical efficiency in the research location are the factors of technology that were used by the farmers. This shows that the technology has an important role in increasing the technical efficiency.

These four factors are the technology that was used by the farmers. The information technology that is used by the farmers in the form of social media can help to ease communication, gaining information about

technology, climate, price, marketing, and recent issues about agriculture. The research that was done by (Zhu et al., 2021) explains that apple farmers in China utilize the internet to gain information, whereas if they don't use the internet to gain information it will reduce the technical efficiency level by 30.3%. The utilization of information technology by the farmers could increase the managerial capability in managing the farm. Hence, farming become more efficient with this capability. The utilization of agricultural machinery or agricultural mechanization could increase the efficiency level of farming. The usage of agricultural tools can save working time so that the farmer can do other work to increase the family income. Other than to save time, the utilization of agricultural tools can reduce the amount of wasted harvest, such as by using the rice threshing machine. However, the utilization of agricultural tools if not balanced by the capability of the qualified workers will cause the tools utilization to be in vain. The utilization of agricultural tools also needed to consider the characteristics of the land, especially in a narrow land. According to (SHI et al., 2021), the excessive use of agricultural tools in a small land will cause inefficiency. However, if the agricultural tools are used properly in terms of the amount and suitable for the characteristics of the land, then the technical efficiency of farming is higher (Vortia et al., 2021). Other factors that influence the technical efficiency of farming is the income. The farmers with a bigger income are allowed to choose the input that has an input with quality and dosage based on the recommendation.

Farming is a labor-intensive business that requires a lot of workers although the needs of workers are directly proportional to the area of the land. The agriculture business that depends on the season made farmers need workers at the same time and could not be delayed. The needs of workers sometimes are not proportional to the quantity of the labor supply available, especially in the industrial area such as the Pasuruan Regency. The factor of wages and the availability of job diversification made the workers migrate to other sectors, other than the agriculture sector. The result of the Tobit regression analysis shows that the farmer who utilizes the labor provider service is more efficient in farming. The farmers feel calm from the help of the labor provider service as there is a certainty of the quantity and quality of the workers. In Indonesia, the workers in the agricultural sector don't need a specific qualification. However, a person with strong power, willing to work in the fields, and knowing the cultivation technique that can be learned by the surrounding people are the minimum requirements of the workers. The important thing that was obtained by the farmers from the labor provider organization is the certainty of the workers' supply according to the time and the stages of the farming, as well as the accepted rate of wages. In Indonesia, especially in the East Java Province, the labor provider organizations are not widely available as this is an unofficial organization. It operates following the market demand, that is the farmer's demand, and is run by individuals. The individuals also worked as farmers or merchants which is known by the farmers around. The existence of this labor provider organization becomes the model of other businesses that can be run by the farmers, especially those with a big capital as they should also provide the transportation modes. The research regarding the labor-providing business is not discussed much. This research is new and discusses the quantitative perspective that provides initial data regarding the probability of the establishment of the model of the labor-providing business in the agricultural sector. Researchers estimated that with the development of agriculture and technology in the future, this business model will be established in various areas. Therefore, there is a possibility of future research that discusses this from the quantitative or qualitative perspective.

Conclusion

The agricultural labor provider service is not only available in developed countries. In Indonesia, a similar labor provider service is available although not all farmers can access it. The workers provided by the providers are dedicated to fulfilling the needs of agricultural labor during the planting, caring, and harvesting process. This research found that the farmers have a positive perception of this labor provider service. The farmers hope that the existence of this business model will help to fulfill the needs of workers. Factors that significantly influence are the farmer's age, the land area, and the rate of wage of the agricultural labor. Those three factors show a positive influence that the business model of labor provider service is expected to pay attention to these three factors.

The average technical efficiency level of rice farming in the research locations is 0.6971. This average value shows that the farmers are not yet efficient in the allocation of production input so it can be known that the production that was achieved is not yet optimal. The technical efficiency level of a farmer was influenced by the social-economy factor of the farmer and the mastery of the technology. From the factors in the Tobit model, it is discovered that the farmer's decision to use the labor provider service to fulfill their labor needs has a positive effect on technical efficiency. This gives information that the model business of the labor provider service among the farmers can still be developed and could give benefits to the farmers, naturally by still considering the land area and the rate of wages specified based on the result of the analysis of factors that influence the farmer's perception regarding the business model of labor provider service.

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