CASE STUDY OF FARMING FROM TRANSMIGRANTS AND LOCAL FARMERS IN THE DISTRICT OF SEMANGGA AND TANAH MIRING, MERAUKE REGENCY, PAPUA

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ABSTRACT
Merauke as a food barn has been carried out since the days of the Dutch administration, namely by making Merauke an Asia Pacific food warehouse. To realize this target, the Dutch government conducted a program to move the population known as colonization, namely by bringing residents from Java to be moved to Merauke. After the independence period the Indonesian colonization program was still held by the name of transmigration. These transmigrant farmers then live side by side with local residents and transmit the ability to cultivate rice to local residents in Merauke Regency who previously lived from gathering, shifting fields, sago farming, fishing, hunting and farming with the method of lagging, finally getting interested in learning to grow crops rice. The purpose of this study is to analyze (1) the factors that influence rice farming production on transmigrant
farms and local farmers in the Semangga District and Tanah Miring District of Merauke Regency, Papua-Indonesia (2) Factors that influence technical efficiency of rice farming in transmigrant farmers and local farmers in the Semangga District and Tanah Miring District of Merauke Regency, Papua-Indonesia (3) Technical efficiency of farming in transmigrant farmers and local farmers in the Semangga District and Tanah Miring District of Merauke Regency, Papua-Indonesia. This research was conducted in Merauke Regency, Papua - Indonesia, in two districts, namely Semangga District and Tanah Miring District, each district was selected by transmigrant villages and local villages which had the highest number of farmers. Semangga District was chosen by Waninggap Kai Village, Urumb, and Marga Mulya Village, while Isano Mbias Village in Tanah Miring District, Waninggap Sai Village, Kamangi Village and Sarsang Village were chosen. The study was conducted in June - August 2018. The time period of this study was to use data from one planting season in 2017. This study was a descriptive analysis. The population in this study was 7213 rice farmers. Sampling was carried out in proportional random sampling and obtained 216 respondents consisting of 185 respondents of transmigrant farmers and 31 respondents of local farmers. Data analysis uses the stochastic frontier production function. The results showed that significant gamma means that rice farming of transmigrant farmers and local farmers in Merauke Regency has not been technically efficient. 79% of technical inefficiencies in research are caused by managerial factors, which are factors that can be controlled by humans and 21% are caused by factors that cannot be controlled by humans (noise), namely pests, natural disasters, weather, and so on. The land area factor has a negative effect on rice production, while pesticides, seeds, urea fertilizer, and human labor have a positive effect on rice production. Technical efficiency factors can be improved by increasing the experience of farmers and increasing the number of family members, and transmigrant farmers more efficiently than local farmers. Transmigrant farmers who achieve technical efficiency values above 0.70 by 91% of farmers, while local farmers who achieve technical efficiency values above 0.70 by 62%. The value of transmigrant farmers 'technical efficiency is 0.85 higher than the value of local farmers' technical efficiency of 0.69. This means that transmigrant farmers are more efficient than local farmers

**Keywords:** technical efficiency, rice production, stochastic frontier.

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1. INTRODUCTION

Rice is the staple food of most Indonesian people. If the ability of the Indonesian State to produce food cannot keep up with the increasing number of food demands in Indonesia, this will make Indonesia increasingly dependent on imports, and this means that Indonesia's food security will be vulnerable because it will depend on other countries' economic policies (Djamali et al., 2018; Suryana, 2014).

Merauke has been used as a food barn since the Dutch administration. The Netherlands targets the Merauke region as a food warehouse for the Asia Pacific, which is an anticipatory measure to face the outbreak of World War II in 1942-1945. (Manikmas, 2010). To realize
this target, the Dutch government conducted a program to move the population known as colonization. This colonization program was carried out by the Dutch government in 1905 by bringing in residents from Java to be moved to Merauke. After the independence period the Indonesian colonization program was still held by the name of transmigration. These transmigrant farmers then live side by side with local residents and then transmit the ability to cultivate rice to local residents who previously lived from gathering, shifting fields, anchoring sago, fishing, hunting and planting with a simple method of wambat (making rows of beds knee-high in adults to be planted with tubers and bananas), finally began to be interested in learning to grow rice (Widyantari et al., 2018).

Rice productivity in Merauke Regency is 43.95 tons / ha, this productivity is still relatively low because it is still below the average rice productivity in Indonesia which is 53.39 tons / ha (BPS, 2016). Therefore it is necessary to increase rice productivity in Merauke Regency. One way to increase rice productivity in Merauke Regency is through technology intensification or improvement better known as technical efficiency. Therefore, it is necessary to conduct research to analyze (1) the factors that influence rice production in transmigrant farmers and local farmers in the Semangga District and Tanah Miring District of Merauke Regency, Papua-Indonesia (2) Factors that influence the technical efficiency of rice farming in transmigrant farmers and local farmers in the Semangga District and Tanah Miring District of Merauke Regency, Papua-Indonesia. (3) The level of technical efficiency of farming in transmigrant farmers and local farmers in the Semangga District and Tanah Miring District of Merauke Regency, Papua-Indonesia.

2. METHODOLOGY
This study uses a descriptive method with a quantitative approach. The study was conducted in June - August 2018. The time period used in this study was data on one planting season in 2017. The planting season data was used to analyze the technical efficiency of rice production. The research locations in two districts, namely Semangga District and Tanah Miring District, are rice centers in Merauke Regency, Papua-Indonesia Province.

Population is the whole individual or object observed or the size obtained from all individuals or related objects (Kotta et al., 2018; Lind et al., 2014; Mangkoedihardjo and April, 2012). The population in this study is 7213 rice farmers who are transmigrants and local farmers. Respondents were taken proportionally, in each village using a random sampling technique and obtained 216 respondents consisting of 185 transmigrant farmers and 31 respondent local farmers.

The data used in this study are primary data and secondary data. Primary data were obtained from questionnaires and interviews with transmigrant farmers and local farmers, while secondary data was obtained from the Central Bureau of Statistics of Merauke Regency and the Agriculture Service of Merauke Regency.

The empirical approach in this study was carried out with a frontier 41 analysis tool. The analytical tool used was the Stochastic Frontier Efficiency.

The equation model for the function of rice production in transmigration farmers and local farmers used in this study are as follows:

\[ \ln Y = \beta_0 + \beta_1 \ln X_1 + \beta_2 \ln X_2 + \beta_3 \ln X_3 + \beta_4 \ln X_4 + \beta_5 \ln X_5 + \beta_6 \ln X_6 + \beta_7 \ln X_7 + \beta_8 \ln X_8 (v_i - \mu_i) \] (1)

Where:
- \( Y \) = rice production (kg)
- \( \beta_0 \) = Constant (intercept)
\( \beta_i = \) Estimator parameter coefficient \((i = 1-8)\)  
\( X_1 = \) Number of seeds (kg)  
\( X_2 = \) Land area (ha)  
\( X_3 = \) Amount of urea fertilizer (kg)  
\( X_4 = \) Amount of fertilizer ponska (kg)  
\( X_5 = \) Amount of fertilizer sp 36 (kg)  
\( X_6 = \) Amount of pesticide (ml)  
\( X_7 = \) Total manpower (HOK)  
\( X_8 = \) Number of hours of machine work  
\( \nu = \) error term  
\( \mu = \) parameter effect of technical inefficiency, where \( \mu \) is obtained from the equation:  
\[
\mu_i = \delta_0 + \delta_1 z_1 + \delta_2 z_2 + \delta_3 z_3 + \delta_4 z_4 + \delta_5 z_5 + \delta_6 z_6 + \delta_7 z_7 + \delta_8 z_8.
\]  
Where:  
\( \mu = \) effect of technical inefficiency  
\( \delta_0 = \) Intercept  
\( \delta_1 = \) Estimator parameter coefficient  
\( z_1 = \) Farmer education (year)  
\( z_2 = \) Farming experience (year)  
\( z_3 = \) Age of farmer (year)  
\( z_4 = \) Number of family dependents (people)  
\( z_5 = \) Dummy land ownership status \((1 = \) one’s own, and 0 = someone else’s property)  
\( Z_6 = \) Dummy from farmers \((1 = \) Local, 0 = Transmigrant)  
\( Z_7 = \) Dummy membership status of farmer groups \((1 = \) member of the farmer group, and 0 = not a member of a farmer group)  
\( Z_8 = \) Dummy planting system \((1 = \) direct seed planting, 0 = transplanting moved)  

Estimating the inefficiency parameters of rice farming techniques is processed using the Frontier 41 program (Coelli, 1996).  

Mathematically, the analysis of technical efficiency can be calculated using the following formula (Coelli, 1995):  
\[
TE_i = \frac{Y_i}{\nu} = \frac{E(Y_i/U_i;X_i)}{E[\exp(-\mu_i/\nu)]} = \frac{E[\exp(-\mu_i/\nu)]}{E(\nu)} = \frac{E[\exp(-\mu_i/\nu)]}{E(\nu)}
\]  
Keterangan:  
\( TE_i = \) Farmer’s Technical Efficiency to \(-i\)  
\( Y_i = \) Actual output function without error term  
\( Y_i^* = \) Potential output function  
\( U_i = \) Random variable that describes the technical inefficiencies of the business to \(-i\), which is assumed to be free and the distribution is cut to normal \(N(\mu, \sigma^2)\)  
\[
E[\exp(-\mu_i/\nu)] = \text{expectation value (mean of } U_i \text{ with condition } \nu_i, \text{ so that } 0 \leq TE \leq 1. \text{ An effort is said to be efficient if } TE = 1, \text{ and is not efficient if } TE < 1. \text{ The efficiency value is}
\]
inversely related to the effect value of technical inefficiency and is only used for functions that have a certain number of outputs and inputs (cross section data).

3. RESULTS AND DISCUSSION

3.1. Characteristics of Respondents, Production, and Use of Inputs

Respondents in this study were transmigrant farmers both through government programs and self-help and local farmers, namely farmers who were indigenous Papuans.

Table 1 Characteristics of Rice Farmers in the Semangga Districts and Tanah Miring Districts in Merauke Regency

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Local Farmers</th>
<th>Transmigrant Farmers</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Average</td>
<td>St.Dev</td>
<td>Max</td>
</tr>
<tr>
<td>Age (year)</td>
<td>36</td>
<td>11</td>
<td>71</td>
</tr>
<tr>
<td>Educational Level of Farmers (year)</td>
<td>9</td>
<td>4</td>
<td>17</td>
</tr>
<tr>
<td>Farming Experience (year)</td>
<td>11</td>
<td>7</td>
<td>31</td>
</tr>
<tr>
<td>Number of Family Members (people)</td>
<td>6</td>
<td>2</td>
<td>10</td>
</tr>
</tbody>
</table>

Source: Primary Data Analysis 2019

Table 1 shows the average age of farmers who were respondents in this study for 48-year transmigrant farmers and 36-year-old local farmers. So the average age of transmigrant farmers is older compared to local farmers but is still included in the productive age category. According to Onibala et al (2017) The age of farmers has a relationship with the ability of farmers to work. Age of farmers has an effect on farmer productivity in farming. The average education of transmigrant farmers is 7 years (grade 1 junior high school) while local farmers are 9 (grade 3 junior high school). This means that the average education of local farmers is higher than transmigrant farmers. This is still reasonable because indeed transmigrant farmers in terms of age are older than local farmers, where the education of parents in ancient times is still low compared to now. The level of education will affect the way of thinking applied by farmers in farming and farmers will be easier to receive information on the technology of rice development.

The experience of transmigrant farmer farming is on average 24 years while local farmers are 11 years, this means the experience of transmigrant farmers is longer than local farmers. According to Cahyono (1995) The more work experience a person has, the more benefits that have an impact on the breadth of knowledge in the field of work and the more the ability of one's skills in carrying out tasks and also make work more efficient.

The average number of family members of transmigrant farmers is 4 people, while local farmers are 6 people. This means that there are more dependents on local farmers than transmigrants. These family members will then be used by farmers to carry out their farming, and if it is still lacking, the farmers will meet the needs of the workforce by increasing the number of outside workers by mutual assistance, helping each other with farmers or can also with a bulk system.
Transmigrant farmers in Merauke Regency plant rice twice a year, while local farmers only plant once a year. This is because agriculture in Merauke Regency generally only relies on rainwater.

Table 2 shows that the amount of rice production on average for one planting season in transmigrant farmers is 3,760.7 kg / ha, while the rice production of local farmers is 3,450.3 kg / ha. This means that the rice production of transmigrant farmers is more than that of local farmers. The use of rice production factors (input), namely in the form of seeds, pesticides, urea fertilizer, ponska fertilizer, sp-36 fertilizer, labor, machinery and land area used by transmigrant farmers is greater than local farmers.

<table>
<thead>
<tr>
<th>Description</th>
<th>Local Farmers</th>
<th>Transmigrant Farmers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rice Production (kg/ha)</td>
<td>3450.3</td>
<td>3760.7</td>
</tr>
<tr>
<td>Labor (ha)</td>
<td>14.9</td>
<td>17.5</td>
</tr>
<tr>
<td>Seeds (ha)</td>
<td>38.9</td>
<td>43.2</td>
</tr>
<tr>
<td>Pesticide (ml/ha)</td>
<td>630.9</td>
<td>1310.8</td>
</tr>
<tr>
<td>Urea Fertilizer (kg/ha)</td>
<td>59.5</td>
<td>106.9</td>
</tr>
<tr>
<td>SP36 Fertilizer (kg/ha)</td>
<td>18.7</td>
<td>88.9</td>
</tr>
<tr>
<td>Ponska Fertilizer (kg/ha)</td>
<td>25.0</td>
<td>106.5</td>
</tr>
<tr>
<td>Land Area (ha)</td>
<td>1.6</td>
<td>1.9</td>
</tr>
<tr>
<td>Engine hours (hours/ha)</td>
<td>11.7</td>
<td>11.6</td>
</tr>
</tbody>
</table>

Source: Primary Data Analysis 2019

3.2. Analysis of the Stochastic Frontier Production Function

Table 3 shows the estimated results of the stochastic frontier using eight explanatory variables. The sigma-square value ($\sigma^2$) is significant at an error rate of 1%, this means that the distribution of inefficiency (vi) error terms is normally distributed, or technical inefficiencies contribute to variations in production (ui) in rice farming. The technical inefficiency factors included the number of family members, education level, age, farming experience, dummy land ownership status, dummy origin of farmers, dummy membership in farmer groups, and dummy planting system.

The gamma value ($\gamma$) indicates the ratio between the deviation of technical inefficiency (ui) to the deviation that might be caused by a random variable (vi). The gamma value in this study is significant because t count is greater than the value of t table ($\alpha = 1\%$). Significant gamma means that rice farming of transmigrant farmers and local farmers in Merauke Regency is technically not efficient. The value of the gamma coefficient ($\gamma$) 0.79 means that the technical inefficiency in this study is 79% caused by managerial factors (factors that can be controlled by humans) and the rest (21%) are caused by factors that cannot be controlled by humans (noise), namely weather, natural disasters, pests and so on.
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Table 3 Results of Estimated Function of Production of Stochastic Frontier of rice in the Semangga District and Tanah Miring District in Merauke Regency

<table>
<thead>
<tr>
<th>Variable</th>
<th>A sign of hope</th>
<th>Coefficient</th>
<th>Standar Error</th>
<th>t -Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>+/-</td>
<td>7.604</td>
<td>***</td>
<td>0.211</td>
</tr>
<tr>
<td>Land Area</td>
<td>+</td>
<td>-0.000</td>
<td>***</td>
<td>0.000</td>
</tr>
<tr>
<td>Seeds</td>
<td>+</td>
<td>0.682</td>
<td>***</td>
<td>0.058</td>
</tr>
<tr>
<td>Pesticide</td>
<td>+</td>
<td>0.000</td>
<td>***</td>
<td>0.000</td>
</tr>
<tr>
<td>Urea Fertilizer</td>
<td>+</td>
<td>0.185</td>
<td>***</td>
<td>0.047</td>
</tr>
<tr>
<td>Labor</td>
<td>+</td>
<td>0.000</td>
<td>***</td>
<td>0.000</td>
</tr>
<tr>
<td>Sp 36 Fertilizer</td>
<td>+</td>
<td>0.000</td>
<td></td>
<td>0.019</td>
</tr>
<tr>
<td>Ponka Fertilizer</td>
<td>+</td>
<td>-0.000</td>
<td></td>
<td>0.000</td>
</tr>
<tr>
<td>Machine</td>
<td>+</td>
<td>0.015</td>
<td></td>
<td>0.023</td>
</tr>
<tr>
<td>Sigma-squared</td>
<td>+</td>
<td>0.079</td>
<td>***</td>
<td>0.007</td>
</tr>
<tr>
<td>Gamma</td>
<td>+</td>
<td>0.794</td>
<td>***</td>
<td>0.041</td>
</tr>
<tr>
<td>Log-likelihood</td>
<td></td>
<td></td>
<td></td>
<td>76.998</td>
</tr>
<tr>
<td>LR test of the one-sided error</td>
<td></td>
<td></td>
<td></td>
<td>158.508</td>
</tr>
</tbody>
</table>

Note:

*** : Significant at α = 1%  t-table = 2.599
**  : Significant at α = 5%  table = 1.971
*   : Significant at α = 10%  t-table = 1.652

Variable area of land has a negative effect on rice production with a coefficient of -0.000 at the level of α = 1%. This means that every 1% increase in land area will reduce rice production by 0.000% assuming other factors are constant. In other words, the more the land area of rice farmers will reduce the production of rice. This is because the more farmer's land area the more labor is used to process and care for rice plants, while the availability of labor in Merauke Regency is limited and labor costs are very expensive resulting in farmers using direct seed planting systems (tabela) so that does not require a lot of labor, and is more economical. Seeing these conditions, there are two alternatives to overcome this problem, the first alternative is to reduce the area of land so that farmers can plant and care for rice so that rice production can be maximized. The second alternative is to increase labor or mechanize (using jonder, tractor, harvester and combain harvester) so that the production of paddy rice in Merauke Regency can be increased.

Seed variables have a positive effect on rice production with a coefficient of 0.682 at the level of α = 1%. This means that every 1% addition of seeds will increase rice production by 0.682%. The average seed used by farmers is 42.6 kg / ha. Farmers use seeds in large numbers because to anticipate if there are seeds that do not grow when farmers plant rice either with the transplanting system or the tabela system. The seeds used by transmigration farmers and local farmers in Merauke Regency are mostly seeds from the previous crop so that the quality of rice seeds per farmer varies, this will affect the quality of rice produced. Therefore it is necessary to use certified superior seeds in order to increase the production and quality of rice in Merauke Regency.

Pesticide variables have a positive effect on rice production with a coefficient of 0.000 at a significance level of α = 1%. This means that every 1% addition of pesticides will increase rice production by 0.000%. Pesticides have different roles with other inputs. This pesticide
The variable urea has a positive effect on rice production with a coefficient of 0.185 at the level of α = 1%. This means that every 1% increase in urea fertilizer will increase rice production by 0.185% assuming other factors are constant.

Labor variable has a significant positive effect on rice production with a coefficient of 0.000 at the significance level α = 1%. This means that every 1% increase in labor will increase rice production by 0.000%. The use of labor as one of the factors of production in rice farming is quite varied, among others, due to differences in agro-ecosystems (Kasryno and Suryana, 1988, in Supadi 2003). These workers are employed starting from land preparation, processing, planting, fertilizing, weeding, spraying, and harvesting. The workforce used comes from inside and from outside the family. More workforce from within the family is done to save wages (Damayanti. 2013). Outside workers are used for rice planting activities for farmers who use the transplanting system, while farmers who plant with direct seed planting systems simply use labor from within the family. For land processing and harvesting, use the assistance of tracktor/jonder and Combine Harvester.

3.3. Technical Efficiency of Rice Farming

Technical efficiency is expressed as a value between 0 - 1. The level of technical efficiency of less than one indicates that farmers are generally too much in using their own production factors so they need to be reduced to improve the efficiency of rice farming (Setiawan et al., 2015).

Table 4 shows that the average technical efficiency achieved by transmigrant farmers is higher than that of local farmers. This is because transmigrant farmers have a longer farming experience of 24 years than local farmers who have had 11 years of farming experience. Besides that local farmers know and can grow rice because they learn from transmigrant farmers. According to Coelli (1998), the index value of technical efficiency of the analysis results is categorized as technically efficient if it provides an estimated value of more than 0.70 as the efficiency limit. This means that transmigrant farmers who are categorized as efficient are technically 91%, while local farmers categorized as technically efficient are 62%.

The average value of transmigrant technical efficiency of 0.85 indicates that the level of technical efficiency of transmigrant farmers in Semangga District and Tanah Miring District of Merauke Regency is higher than local farmers in Merauke Regency with a technical efficiency value of 0.805 (Widyantari et al., 2018) and farmers delta irrigation zone in Vietnam with a value of technical efficiency 0.81 (Pedrosa et al, 2018).
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Table 4 Distribution of Technical Efficiency Levels of Rice Farming in the Semangga District and Tanah Miring District in Merauke Regency

<table>
<thead>
<tr>
<th>Range Technical Efficiency</th>
<th>Local Farmers</th>
<th>Transmigrant Farmers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number of Farmers</td>
<td>Percentage</td>
</tr>
<tr>
<td>≤ 0.60</td>
<td>10</td>
<td>32%</td>
</tr>
<tr>
<td>0.61 – 0.70</td>
<td>2</td>
<td>6%</td>
</tr>
<tr>
<td>0.71 – 0.80</td>
<td>3</td>
<td>10%</td>
</tr>
<tr>
<td>0.81 – 0.90</td>
<td>7</td>
<td>23%</td>
</tr>
<tr>
<td>≥ 0.91</td>
<td>9</td>
<td>29%</td>
</tr>
<tr>
<td>Total Farmers</td>
<td>31</td>
<td>100%</td>
</tr>
<tr>
<td>Average</td>
<td>0.69</td>
<td></td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>0.28</td>
<td></td>
</tr>
<tr>
<td>Minimum</td>
<td>0.22</td>
<td></td>
</tr>
<tr>
<td>Maximum</td>
<td>0.97</td>
<td></td>
</tr>
</tbody>
</table>

Source: Results of Processing Primary Data Using Frontier 4.1 Computer Programs

Table 5 Potential Rice Production of Transmigrant Farmers and Local Farmers in the Semangga District and Tanah Miring District in Merauke Regency

<table>
<thead>
<tr>
<th>Description</th>
<th>Potential Production (kg)</th>
<th>Actual Production (kg)</th>
<th>Technical Efficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local Farmers</td>
<td>5009.20</td>
<td>3450</td>
<td>0.69</td>
</tr>
<tr>
<td>Transmigrant Farmers</td>
<td>4413.82</td>
<td>3760</td>
<td>0.85</td>
</tr>
</tbody>
</table>

Source: Primary Data Processed 2019

Table 5 is the production potential or capability that has the possibility of being able to be achieved by transmigrant farmers and local farmers in Merauke Regency so that the value of technical efficiency in rice production is equal to one (E = 1). Table 5 shows that the potential for rice production of local farmers is higher than for transmigrant farmers. This is because the actual production used in this study is the actual production for one planting season instead of one year per hectare whereas in reality transmigrant farmers produce rice twice planting in one year while local farmers only plant once a year. In the use of inputs such as pesticides, urea fertilizer, sp36 fertilizer and ponska fertilizer, local farmers are lower than transmigrant farmers (Table 2). The use of small amounts of fertilizers and pesticides makes the land of local farmers maintain their soil fertility. While excessive and continuous use of fertilizers and pesticides will result in lower productivity of agricultural land. In a study by Widyantari et al. (2018) that the production potential of local farmers in Merauke Regency was 4100.5 kg / ha, this meant lower than in this study. While the potential production of wetland rice in South Minahasa Regency, namely in Popontolen Village is 6.11 tons / ha, Pakuweru Village 573ton / ha, and Karowa Village 9.00 tons / ha Rumintjap et al. (2016). This means that the potential production of paddy rice in the Semangga District and Tanah Miring District of Merauke Regency is still low when compared to other regions.

3.4. Factors Causing Technical Efficiency of Rice Farming

The causes of technical efficiency in rice farming in this study were the number of family members, education, age, farming experience, dummy land ownership status, dummy origin
of farmers, dummy membership status in farmer groups and dummy planting systems. The results of the analysis that affect the technical efficiency of rice farming can be seen in Table 6.

**Table 6 Factors that Affect Technical Efficiency of Rice Farming**

<table>
<thead>
<tr>
<th>Variable</th>
<th>A sign of hope</th>
<th>Coefficient</th>
<th>Standard Error</th>
<th>t -Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>+/-</td>
<td>2.189</td>
<td>*** 0.142</td>
<td>15.384</td>
</tr>
<tr>
<td>Age</td>
<td>-</td>
<td>-0.000</td>
<td>0.000</td>
<td>-0.214</td>
</tr>
<tr>
<td>Farming Experience</td>
<td>-</td>
<td>-0.093</td>
<td>** 0.037</td>
<td>-2.485</td>
</tr>
<tr>
<td>Education</td>
<td>-</td>
<td>-0.000</td>
<td>0.000</td>
<td>-0.586</td>
</tr>
<tr>
<td>Number of Family Members</td>
<td>-</td>
<td>-0.034</td>
<td>** 0.014</td>
<td>-2.272</td>
</tr>
<tr>
<td>Dummy Land Ownership Status</td>
<td>-</td>
<td>0.000</td>
<td>0.000</td>
<td>1.380</td>
</tr>
<tr>
<td>Dummy Membership Status in Farmer Groups</td>
<td>-</td>
<td>-0.013</td>
<td>0.019</td>
<td>-0.679</td>
</tr>
<tr>
<td>Dummy Planting System</td>
<td>-</td>
<td>0.000</td>
<td>0.000</td>
<td>0.892</td>
</tr>
<tr>
<td>Dummy Origin of Farmers (Transmigrants/local)</td>
<td>-</td>
<td>-0.885</td>
<td>*** 0.065</td>
<td>-13.432</td>
</tr>
</tbody>
</table>

Source : Primary Data Processed 2019

Note:

*** : Significant at $\alpha = 1\%$  $t$-table = 2.599

**  : Significant at $\alpha = 5\%$  $t$-table = 1.971

*    : Significant at $\alpha = 10\%$  $t$-table = 1.652

The negative sign Table 6 shows that the variable decreases technical inefficiency or increases the efficiency of the technique, while the positive sign indicates that there is an increase in technical inefficiencies or decreases the efficiency of the technique (Nahraeni, 2012).

The efficiency factor of farming experience has a negative effect ($\alpha=1\%$), this means an increase in farmers' experience will improve technical efficiency (reduce technical inefficiencies). In other words, the longer the experience of the farmers, the more efficient the technique will be. With longer experience in farming, farmers are able to make rational decisions for their farming (Bahasoan. 2013). The efficiency factor of the number of family members has a significant negative effect ($\alpha = 1\%$), this means that an increase in the number of family members will increase technical efficiency. With the increase in family members it will increase labor in the family, so that it will increase the energy to work on the fields. However, in Merauke Regency each farmer has extensive paddy fields so that it will be more effective and efficient if the cultivation of paddy fields is carried out by mechanization. The dummy from farmers in this study consisted of transmigrant farmers from Java (Javanese) and local farmers who were farmers of the Papuan tribe. Dummy from farmers has a negative effect ($\alpha = 1\%$), this means that transmigrant farmers are more efficient than local farmers (ethnic Papuans). This is because transmigrant farmers have had a longer experience with an average experience of 24 years than local farmers who have an average experience of 11 years.
Case Study of Farming from Transmigrants and Local Farmers in the District of Semangga and Tanah Miring, Merauke Regency, Papua

The efficiency factors of age, education and membership status in farmer groups do not have a significant effect on the technical efficiency of rice production, so does the dummy status of land ownership and cropping systems have no significant effect.

4. CONCLUSION

1. Production of rice in the Semangga District and Tanah Miring District of Merauke Regency is influenced positively and negatively. Positive influence is from seeds, pesticides, urea fertilizer, and labor, while the negative influence is from the land area.

2. Factors influencing the technical efficiency of rice farming transmigrant farmers and local farmers in the Semangga District and Tanah Miring District of Merauke Regency due to farming experience, number of family members and origin of farmers.

3. Rice farming by transmigrant farmers and local farmers in Merauke Regency Papua-Indonesia Province has not been technically efficient. The technical efficiency of transmigrant farmers is greater than that of local farmers, which is 0.85 for transmigration farmers and 0.69 for local farmers. So transmigrant farmers are more efficient than local farmers.

4. Transmigrant farmers have greater technical efficiency than local farmers in other words the existence of transmigrants increases technical efficiency in Merauke Regency.

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REFERENCES


