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PENGUKURAN EFISIENSI EKONOMI USAHATANI PADI LADANG PADA STATUS PENGUASAAN LAHAN YANG BERBEDA DI DESA MAUSAMBI KECAMATAN MAUROLE KABUPATEN ENDE

Measurement Of Economic Efficiency Of Upland Rice Farming In Different Land Ownership Status In Mausambi Village, Maurole Sub-District, Ende Regency

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ABSTRACT

This research is to: (1) analyze the level of economic efficiency of upland rice farming in different land ownership status and (2) analyze the factors that influence the economic efficiency of upland rice farming in different land ownership status. The data analysis method used was the production function approach and stochastic frontier cost function. The analysis results show that seed and fertilizer price variables have a significant impact on the 99% significance level and are positive. Labor wage has no significant impact on production costs and is negative. Production variable has a significant impact on the 99% significance level. Landowner and farmhand dummy variables have a 99% significant level and are positive. It can be interpreted that the production costs in both the landowner and farmhand land ownership status are higher than in the pawn taker land ownership status. The average level of economic efficiency of the landowner is higher than the farmhand and pawn taker ownership status. Factors that influence the economic efficiency of upland rice farming include: age, duration of farming, frequency of obtaining information, membership of farmer groups, other sources of income, landowner dummy and farmhand dummy.

Keywords: *Ende, Economic Efficiency, Upland Rice Farming***.**

ABSTRAK

Penelitian yang dilakukan ini bertujuan untuk: (1) menganalisis tingkat efisiensi ekonomi usahatani padi ladang pada status penguasaan lahan yang berbeda dan (2) menganalisis faktor-faktor yang berpengaruh terhadap efisiensi ekonomi usahatani padi ladang pada status penguasaan lahan yang berbeda. Metode analisis data menggunakan pendekatan fungsi produksi dan fungsi biaya frontier stokastik, Hasil analisis menunjukkan bahwa, variabel harga benih, dan harga pupuk berpengaruh nyata pada taraf signifikansi 99 %, dan bertanda positif. Upah tenaga kerja tidak berpengaruh nyata pada biaya produksi dan bernilai negatif. Variabel produksi berpengaruh nyata pada taraf signifikansi 99 %. Variabel dummy pemilik dan dummy penyakap berpengaruh nyata pada taraf signifikan 99 %, dan bertanda positif. Ini dapat diartikan bahwa, biaya produksi pada status penguasaan lahan pemilik dan penyakap lebih tinggi dari status penguasaan lahan penggadai. Rata-rata tingkat efisiensi ekonomis pada status penguasaan lahan pemilik lebih tinggi dari pada status penguasaan penyakap dan penggadai. Faktor-faktor yang berpengaruh terhadap efisiensi ekonomis usahatani padi ladang meliputi: umur, lama berusahatani, frekuensi mendapatkan informasi, keanggotaan kelompok tani, sumber pendapatan lain, dummy pemilik dan dummy penyakap.

Kata Kunci: *Ende, Efisiensi Ekonomi, Padi Ladang.*

INTRODUCTION

Study on different land ownership status (farmhand, landowner and pawn taker) is an interesting issue for agricultural economists since this phenomenon influences farming efficiency. Efficiency is one of the determinants in increasing farmers' productivity and income. An efficient production will reduce production costs, thus income will increase. Research conducted by Wahyuninsi, Suwarto and Agustono (2012) and Muslich (1994) show that different land ownership status influences farm efficiency. Landowners carry out farming activities in a more efficient way than farmhands.

An interesting phenomenon that became the focal point of this study was the existence of farming with profit sharing and land pawning systems in upland rice farming. This commodity has a strategic and economic value to be developed specifically in dryland farming areas. In connection with agricultural land pawning in village community, there are two parties who make land pawning contract. The first party is the landowner, this party is called the pawn giver. The second party is the party who gives money to the pawn giver, which is called the pawn taker.

Theories underlying this research were Marshall's theory (1959) and the traditional profit sharing theory of Cheung (1969). Marshall in his study explained that profit sharing system led to inefficiencies in the utilization of labor

production factors, while Cheung stated that land ownership status had no impact on the inefficiency of production factors utilization assuming that landowners determine not only the percentage of profit sharing and the number of land which profit is shared, but also the number of labor that must be provided by the farmhand.

Ende Regency has a vast dryland potential that has not been utilized optimally until now. The drylands is 86% of the land used for the agricultural sector. From the existing dryland, only 55% is utilized. It is also found that 80% of the Ende Regency community consumes rice as a staple food, for this reason the need for rice is continuously increasing. This increase in demand for rice is not offset by increase in productivity, so that the gap between demand and production is growing. In 2013, new productivity reached 20.00 kw/hectare, while the average production of upland rice per hectare in NTB Province in 2013 had reached 40.65 kw/hectare. In 2014, it reached 34.22 kw/hectare. The average national upland rice productivity was 33.62 kw/hectare (Lanamana, 2016). This is assumed to be related to the efficiency of agricultural input allocation.

Research on economic efficiency of upland rice farming has been carried out considerably, but research on economic efficiency of different land tenure status is lacking in number. This research is to: (1) analyze the level of economic efficiency of upland rice farming in different land ownership status and (2) analyze the factors that influence the economic efficiency of upland rice farming in different land ownership status.

RESEARCH METHODS

This research was conducted in Mausambi Village, Maurole Sub-District, Ende Regency, NTT Province. Consideration in choosing the village was the number of farming activities with profit sharing and land pawning systems which is quite large in the research location. The population of upland rice farmers in Mausambi Village was 214 farmers. There were 36 farmhands, 32 pawn takers and 146 landowners. The sampling method was cluster sampling, a technique for selecting sample from groups, small units or clusters. The sample size was calculated using the Parrel formula (Parel, et al., 1973).

$$n = \frac{NZ^2\sigma^2}{Nd^2+Z^2\sigma^2}$$

where n is Sample size; N is Population size; D is Tolerable minimum deviation is 0.05; Z is Confidence level 95%, i.e., 1.96 according to the Z distribution table; and σ^2 is Population variance of upland rice farming area.

If the maximum expected deviation was 5% of the population variance, estimated from the upland rice farming area sample variance, then the sample size for each land ownership status is as follows:

Table 1. Population Size and Sample Size per Land Ownership Status

No	Land Ownership Status	Population Size*)	Sample Variance	Sample Size
1	Landowner	146	0.16092	92
2	Farmhand	36	0.45069	34
3	Pawn taker	32	0.04207	21
	Total	214		147

**) Source: Mausambi Village Office, Mauroleh Sub-District, Ende Regency, 2015.*

In this study, the production function used was the Cobb-Douglass stochastic frontier production function. The measurement of technical efficiency from farm production for farmer i was estimated by the following formula (Coelli, Rao, Battese, 2005).

$$TE_i = \frac{Y_i}{Yi*} = \frac{\exp(x_i\beta + V_i - u_i)}{\exp(x_i\beta + V_i)} = exp(-\mu_i)$$

Y_i is the actual production of the observation, and Y_i* is the estimation of frontier production obtained from the stochastic frontier production function. Allocative and economic efficiency was analyzed using an approach based on input. Before measuring the allocative and economic efficiency, the dual cost function was derived from the stochastic frontier production function. Allocative and economic efficiency was analyzed using the stochastic frontier cost function approach. Some researchers use the stochastic frontier cost function approach to measure allocative and economic efficiency, including Ogundari and Ojo (2006), Kahinde and Awoyemi (2009), Revoredo et al (2009). The model can estimate the level of economic efficiency of the whole farming. Analysis was carried out using the Frontier software Version 4.1.

Cost inefficiency (CE_i) is defined as the ratio between the actual total cost (C) and the estimated minimum total cost (C*), so that the CE_i value ranges from one to infinity. Thus, the inverse of CE_i is the level of cost efficiency.

$$CE_i = \frac{C}{C*} = \frac{\mathrm{E}(C \mid u_i, Y_i, P_i)}{\mathrm{E}(C_i \mid u_i = 0, Y_i, P_i)} = exp(-u_i)$$

According to Ghosh, C & Raychaudhuri, A (2010), cost efficiency is also defined as allocative efficiency (EA), so allocative efficiency is formulated as follows: $AE_i = 1/CE_i$. The allocative efficiency (EA) value ranges from 0 to 1.

Economic efficiency (EE) per individual farm was obtained from technical and allocative efficiency: $EE_i = ET_i \, . \, EA_i$.

The stochastic cost frontier parameters and the impact of cost inefficiency testing were carried out in two stages. The first stage was estimating parameters using the Ordinary Least Squares (OLS) method. The second stage was estimating all parameters using the maximum likelihood (MLE) method. The factors that influence the allocative and economic efficiency level were estimated simultaneously with the frontier production function and the OLS method, using multiple linear regression models.

RESULTS AND DISCUSSION

Technical Efficiency of Upland Rice Farming

The results show that the average technical efficiency of upland rice farming of the landowner land ownership status is 89 percent. It means that farmers in the landowner land ownership status have an average opportunity of 11% to increase their upland rice production. If upland rice farming per individual farmer is professionally managed and uses the best cultivation technology, production can be increased by 322 kg. (The actual production average is 2613, production potential per hectare = (100:89) x 2613 = 2935). The average level of technical efficiency of the farmhand land ownership status is 84 percent. It means that farmhands have an average opportunity of 16% to increase their upland rice production. The actual production average is 1310, production potential per hectare = (100:84) x 1310 = 1559. If upland rice farming per individual farmer is well managed and uses the best cultivation technology, it is possible to increase production by 249 kg. In the pawn taker land ownership status, the average level of technical efficiency of upland rice farming is 87 percent. The average opportunity to increase upland rice production is 13%. The actual production averages is 1321, production potential per hectare = (100:87) x 1321 = 1518. If upland rice farming per individual farmer is well managed and uses the best cultivation technology, it is possible to increase production by 197 kg.

Impact of Land Ownership Status on Allocative Efficiency

Stochastic Frontier Cost Function

Results of cost function estimation using the MLE method is presented in Table 2. Gamma coefficient value (γ) in the results of cost function estimation using the MLE method is 0.4558. Gamma value is interpreted as a variation of a random error that is predominantly caused by a cost efficiency of 45.58%, or the difference between actual costs and the possibility of minimum costs (frontier costs) due to differences in cost efficiency. The likelihood Ratio Test (LR test) value = 1.1402 < X^2 = 189.80. This shows that the upland rice farming carried out by the farmers is not yet fully efficient.

Seed price variable has a significant impact on the 99% significance level and is positive. It means that the seed (*cateris paribus*) price addition of 1% will increase production costs by 0.1713. Fertilizer price has a significant impact on the 99% significance level and is positive. This can be interpreted that the fertilizer (*cateris paribus*) price addition of 1% will increase costs by 0.5371. Labor wage has no significant impact on production costs and is negative. Production variable has a significant impact on the 99% significance level. If there is a production addition, it will have a significant impact on increasing production costs. If the production increase by 1%, production costs will increase by 0.4931. Landowner and farmhand dummy variables have a 99% significant level and are positive. It can be interpreted that the production costs in both the landowner and farmhand land ownership status are higher than in the pawn taker land ownership status.

Table 2. Results of Cost Function Estimation in the Landowner, Farmhand and Pawn Taker Land Ownership Status using the MLE Method.

Variable	Coefficient	Standard Error	t-ratio
Intercept	-12.5954	17.9029	-0.7035
$P_{X1}(seed\ price)$	0.1713$^{***)}$	0.2123	8.0675
$P_{X2}(fertilizer\ price)$	0.5371$^{***)}$	0.149	3.6044
$P_{X3}(labor\ wage)$	1.8075	1.672	1.0809
Y (production)	0.4931$^{***)}$	0.0406	12.131
$D_1(land\ owner)$	0.2495$^{***)}$	0.049	5.0912
$D_2(Farm\ hand)$	0.3730$^{***)}$	0.1168	3.1911
Sigma Square	0.0153		4.3121
Gamma	0.4558		2.1524
Log Likelihood Function	12.3464		
LR test = 1,1402			
$\chi^2 = 189{,}80$			

Description:

1. *Dependent variables in production costs (kg)*
2. *Ttable a 0.01 = (0.01, df 99) = 2.35*
   Ttable a 0.05 = (0.05, df 95) = 1.66
   Ttable a 0.10 = (0.10, df 90) = 1.32.
3. ****) real at a 1%*
   ***) real at a 5%*
   **) real at a 10%*

Distribution of Allocative Efficiency Level.

Allocative and economic efficiency is obtained through analysis from the production input that uses the prevailing input price at the farmer level. The production function used as the basis of analysis is the stochastic frontier production function. Based on the results of dual costs reduction, the value of allocative and economic efficiency can be calculated. Distribution of allocative efficiency level is presented in Table 3. Distribution of allocative efficiency level shows that 98.92% of upland rice farmers in the landowner land ownership status operate at allocative efficiency level above 0.80, the remainder is at allocative efficiency level between 0.70 - 0.79. Meanwhile, 100% of farmers in the farmhand and pawn taker land ownership status operate above 0.80. Farming efficiency research conducted by Bravo, Ureta and Pinheiro (1993), in 14 developing countries found an average allocative efficiency of 68%, ranging between 43 and 89 percent.

The average allocative efficiency for landowner land ownership status is 0.9377, this value is higher than other land ownership status. The value of 0.9377 means that the average minimum costs level achieved by landowner farmers is around 93.77% of the frontier costs. If a farmer in the landowner land ownership status can achieve the most efficient level of cost efficiency, then the additional profit for the farmer is 4% (1-(0.93/0.96)). For the most inefficient farmer, the possibility of increasing profit is 21% (1-(0.76/0.96)).

Table 3. Distribution of Allocative Efficiency Level of Upland Rice Farming in the Landowner, Farmhand and Pawn Taker Land Ownership Status.

Range of Efficiency Level	Landowner		Farmhand		Pawn Taker	
	Frequency	Relative Frequency (%)	Frequency	Relative Frequency (%)	Frequency	Relative Frequency (%)
0.30 - 0.39	0	0	0	0	0	0
0.40 - 0.49	0	0	0	0	0	0
0.50 - 0.59	0	0	0	0	0	0
0.60 - 0.69	0	0	0	0	0	0
0.70 - 0.79	1	1.08	0	0	0	0
0.80 - 0.89	1	1.08	5	14.7	1	4.76
0.90 - 0.99	90	97.84	29	85.3	20	95.24
Total	92	100	34	100	21	100
Average	0.9377		0.9284		0.9366	
Minimum	0.7617		0.8741		0.8273	
Maximum	0.9606		0.9832		0.9518	

Std. Deviation	0.022	0.0302	0.0265

The average allocative efficiency value for farmhand land ownership status is 0.9284. It means that the average minimum costs level achieved by farmers is around 92.84% of the frontier costs. If a farmer can achieve the most efficient level of cost efficiency, then the additional benefit for the farmer is 7% (1-(0.92/0.98)). For the most inefficient farmer, the possibility of increasing profits is 12% (1-(0.87/0.98)). The value of allocative efficiency of the three land ownership status can be included in the high category, which can be interpreted that the allocation of input for upland rice farming in the research location is quite efficient at a certain input price level.

The average value of allocative efficiency in the pawn taker land ownership status is 0.9366. The average allocative efficiency of 0.9366 means that the average minimum costs level achieved by farmers is around 93.66% of the frontier costs. If an upland rice farmer in the pawn taker land ownership status can achieve the most efficient level of cost efficiency, then the farmer can get an additional profit of 3% (1-(93/0.95)). This calculation can be used for the least efficient farmers and the possibility of adding profit is 14% (1-(0.82/0.95)).

The results showed that, landowner and pawn taker were more optimal in the use of agricultural inputs and were more efficient in obtaining prices for agricultural inputs when compared to Farmhand. This is because Landowner and Pawn taker farmers have better knowledge in the use of agricultural inputs, and have access to fertilizers and pesticides at lower prices. This fact is consistent with Adrianto (2016) study, which explains that the low allocative efficiency is due to some high production input prices at the study site.

The differences in land tenure status (landowners, farmhand and pawn taker) has an impact on the efficiency of farming. Lubis (2014) in his research explained that land ownership has a negative sign which can be interpreted that, farmers who have land of their own will be able to reduce allocative inefficiency. Efforts to increase allocative efficiency can be done by adding less inputs or reducing excessive inputs so that minimum costs are achieved.

The fact also shows that, as much as 35% farmhand are not members of farmer groups, in contrast to the landowner who are mostly members of farmer groups, this helps in accelerating the transfer of knowledge and technology, and has an impact on farm efficiency. On the other hand, the low allocative efficiency of the farmhand is due to the fact that land rent is paid by yield sharing. Jamal and Dewi (2009) show that the smaller the proportion of arable land leased against the total arable land, the lower the inefficiency.

Factors that Influence Allocative Efficiency Level.

The data in Table 4 gives an overview of the analysis results of factors that influence the allocative efficiency of upland rice farming in the landowner,

farmhand and pawn taker land ownership status. From the analysis results, the F-statistic value obtained is 4.435. The value of $F_{count} > F_{table}$ (4.435 > 2.770), it can be interpreted that all variables included in the model jointly influence the allocative efficiency level.

Table 4. Factors that Influence Allocative Efficiency of Upland Rice Farming in the Landowner, Farmhand and Pawn Taker Land Ownership Status.

Variable	Coefficient	Default Error	t-ratio
Constants (Z_0)	1.081***)	0.050	21.810
Age (Z_1)	-0.003***)	0.001	-4.593
Duration of farming (Z_2)	-0.004**)	0.002	-2.233
Frequency of obtaining information (Z_3)	-0.003	0.004	-0.878
Membership of farmer group dummy (Z_4)	0.028**)	0.016	1.736
Other sources of income dummy (Z_5)	-0.025***)	0.008	-2.984
D1 Landowner	0.033***)	0.011	2.883
D2 Farmhand	0.002	0.017	0.125
R^2 = 0.183			
F-Statistic = 4.435			

Description:

1. Dependent variables of allocative inefficiency
2. F_{table} (α = 0.01, df1 = 7, df2 = 139) = 2.770
3. Ttable α 0.01 = (0.01, df 99) = 2.35
   Ttable α 0.05 = (0.05, df 95) = 1.66
   Ttable α 0.10 = (0.10, df 90) = 1.32
4. ***) real at α 1%
   **) real at α 5%
   *) real at α 10%

The analysis results of factors that influence allocative efficiency indicate that the regression coefficient of age variable in the three land ownership status is negative and significant. It means that the older the farmer is, the lower the allocative efficiency will be. Older farmers are more likely to be conservative and less willing to accept changes. It is related to the working ability, striving ability in business, desire to bear risks and implement new innovations. The same results were found in research conducted by M. Jahangir Alam in Bangladesh and Sutiarso (2009).

Regression coefficient of the duration of farming variable in the three land ownership status statistically has an impact on allocative efficiency and is negative. It means that the longer a farmer's farming duration, the more inefficient the utilization of production input. It is related to the notion that the longer the farming activities carried out by a farmer in upland rice farming, the more the farmer will grow and tend to maintain a particular habit. Moreover, a farmer who carries out farming activities for a longer period of time tends to be less responsive to new things. The results of this study are in line with the research conducted by Siregar (1987) in the thesis by Haryani (2009).

Regression coefficient of the frequency of obtaining information variable for all three land ownership status statistically has no impact. This is assumed to be caused by the high level of allocative efficiency achieved. Viewed from the relationship between the alleged factor and efficiency, the two variables are not in accordance with the initial expectation, meaning that the phenomenon in the upland is not in accordance with expectations based on hypotheses and theories and literature studies.

Membership of farmer group variable significantly influences allocative efficiency and is positive, meaning that if the number of farmer group membership increases, allocative efficiency also increases (*cateris paribus*). This shows that farmer membership in farmer groups will increase the efficiency of input utilization. The results showed that members of farmer groups always shared experiences in the use of agricultural inputs and price information from several inputs of agricultural production. Farmer groups have made an agreement to buy agricultural production inputs collectively, the prices obtained are relatively cheaper. Farmer groups are actually the right place for farmers to be able to improve their bargaining position in getting quality production inputs at affordable prices. This can be done by collaborating with input production sellers around the location and increasing the bargaining position of farmers in determining the proper harvest price. This finding is in line with the results of research conducted by Mussa et al.(2012), but not with that of Lubis (2014), which provides an explanation that farmer group variable has a positive and real effect on allocative inefficiency. The study conducted by Tanjung (2003), gave a different finding from this study, which explained that participation in farmer groups increased farmer inefficiency. Being a member of a farmer group forces the farmer to be more proactive in group activities thereby hampering the freedom and activities of the farmers in the farming that is being carried out. Farmers who are members of farmer groups have a division that tends to be stiff so that it is not easy for farmer members to reallocate the use of inputs so that it can reduce allocative efficiency.

Landowner dummy variable has a positive and significant parameter on allocative efficiency. It means that the allocative efficiency of farmers who are in the landowner land ownership status increases compared to the profit sharing and pawn taker land ownership status. On the contrary, the farmhand dummy variable statistically has no significant impact on allocative efficiency and is positive.

Distribution of Economic Efficiency Level

Distribution of economic efficiency level in the three land ownership status is presented in Table 5. The average economic efficiency of farmers in the landowner land ownership status is 0.8351. It is 0.7882 in the farmhand land ownership status and 0.8215 in the pawn taker land ownership status. If the

average landowner farmer is able to achieve the highest level of economic efficiency, then the farmer can save costs by 10.95% (1-(0.8351/0.9378)) and the least efficient farmer will be able to save costs by 43.32% (1-(0.5315/0.9378)).

Table 5. Distribution of Economic Efficiency Level in the Landowner, Farmhand and Pawn Taker Land Ownership Status.

Range of Efficiency Level	Landowner		Farmhand		Pawn Taker	
	Frequency	Relative Frequency (%)	Frequency	Relative Frequency (%)	Frequency	Relative Frequency (%)
0.30 - 0.39	0	0	0	0	0	0
0.40 - 0.49	0	0	0	0	0	0
0.50 - 0.59	1	1.08	4	11.76	0	0
0.60 - 0.69	2	2.17	5	14.72	0	0
0.70 - 0.79	13	14.13	4	11.76	6	28.57
0.80 - 0.89	75	81.52	17	50	13	61.9
0.90 - 0.99	1	1.08	4	11.76	2	9.53
Total	92	100	34	100	21	100
Average	0.8351		0.7882		0.8215	
Minimum	0.5315		0.5483		0.749	
Maximum	0.9378		0.9512		0.9115	
Std. Deviation	0.0561		0.1248		0.0472	

Farmhands can save costs by 17.13% (1-(0.7882/0.9512)), and the least efficient farmers will be able to save costs by 42.35% (1- (0.5483/0.9512)). Meanwhile, for pawn takers can save costs by 9.87% (1- (0.8215/0.9115)) and the most inefficient farmers will be able to save costs by 17.82% (1- (0.7490/0.9115)). 82.6% of farmers in the landowner land ownership status operates at the economic efficiency level above 0.80. Next, 61.76% of farmers in the farmhand land ownership status operates above 0.80 and the remaining 38.24% operates below 0.80. Meanwhile, 71.43% of farmers in the pawn taker land ownership status operates above 0.80 and 28.57% operates below 0.80.

Economically, farmhand paddy field farming is less efficient, one of them is because the farm requires a lot of labor, seeds and fertilizer so that a lot of use and high prices result in high expenditure. The low economic efficiency (EE) of farmhand is more due to inefficient allocation problems than technical inefficiencies, input price information that is not transparent, information on

output prices is difficult to predict. The solution is the need to support input and output prices, so farmers can make savings and achieve maximum profits.

The farmhand must be given attention because most of them still have narrow land, this problem causes the allocation of inputs and the cost of farming in paddy fields becomes inefficient. This is in line with research by Bravo-Ureta and Pinheiro (1997) which states that the greater the area of farmers' land, the significantly reduced economic inefficiency. According to Nahraeni (2012) farming in developing countries focuses more on technical efficiency, with the main concern of achieving maximum production yet to see how allocative efficiency and economic efficiency.

Factors that Influence Economic Efficiency of Upland Rice Farming.

Table 6 presents the results of analysis of factors that influence economic efficiency level. The data in Table 6 shows that the F-statistic value (52.433) is significant at α 1%. Value of $F_{count} > F_{table}$ (52.433 > 2.770). Regression coefficient of age variable has a negative impact on economic efficiency, meaning that farmers' efficiency level decreases as they grow older. This is related to striving ability in business, desire to bear risks and implement new methods, technologies and innovations. The duration of farming variable has a significant impact and is negative. This can be interpreted that the longer the farmer runs farming activities, the economic efficiency decreases. This is related to the notion that the longer farmers work, the more they grow older. Hence, they tend to maintain their habits and are less responsive to new things.

Frequency of obtaining information variable all three land ownership status statistically do not significantly influence economic efficiency, and are negative. Other sources of income variable has a significant impact and is positive. If other sources of income increases, then economic efficiency will increase. The condition in the upland indicate that the increasing other sources of income are being allocated by respondents' for upland rice farming activities. Membership of farmer group variable does not statistically influence economic efficiency. This is due to the fact that there are quite a number of upland rice farmers of the three land ownership status who are not yet members of the farmer group, the number reaches 35%. The findings from the membership of farmer group variable in this study are different from the research conducted by Idiong (2007) and Javed et al. (2008), which explains that farmers' membership in farmer group and their active participation in counseling activities can increase their opportunities in accessing information and application of technology, so as to improve farming efficiency. Landowner dummy variable statistically does not influence economic efficiency and is positive. While farmhand dummy variable has a negative impact on economic efficiency. This means that the upland rice farmers in the profit sharing land ownership status

has a lower economic efficiency when compared to those in the landowner and pawn taker land ownership status.

Table 6. Factors that Influence Economic Efficiency of Upland Rice Farming in the Landowner, Farmhand and Pawn Taker Land Ownership Status.

Variable	Coefficient	Default Error	t-ratio
Constants (Z_0)	1.461***)	0.079	18.416
Age (Z_1)	-0.012***)	0.001	-14.972
Duration of farming (Z_2)	-0.014***)	0.004	-4.081
Frequency of obtaining information (Z_3)	-0.003	0.006	-0.533
Membership of farmer group dummy (Z_4)	-0.029	0.025	-1.172
Other sources of income dummy (Z_5)	0.035*)	0.021	1.616
D1 Landowner	0.015	0.017	0.881
D2 Farmhand	-0.145***)	0.027	-5.476
R^2 = 0.725			
F-Statistic = 52.433			

Description:

1. *Dependent variables of economic inefficiency*
2. F_{table} *(a = 0.01, df1 = 7, df2 = 139) = 2.770*
3. *Ttable a 0.01 = (0.01, df 99) = 2.35*
   Ttable a 0.05 = (0.05, df 95) = 1.66
   Ttable a 0.10 = (0.10, df 90) = 1.32
4. ***) *real at a 1%*
   **) *real at a 5%*
   *) *real at a 10%*

CONCLUSION AND SUGGESTIONS

Conclusion

The average of economic efficiency level of upland rice farming in the landowner land ownership status is higher than that of in the profit sharing and pawn taker land ownership status. Regression coefficient of age variable has a negative impact on economic efficiency, duration of farming variable has a significant impact and is negative, and frequency of obtaining information variable for the three land ownership status statistically does not significantly influence economic efficiency and is negative. Other sources of income variable has a significant impact and is positive. Membership of farmer group variable does not statistically influence economic efficiency. Landowner dummy variable

statistically does not influence economic efficiency and is positive. While farmhand dummy variable has a negative impact on economic efficiency.

Suggestions

To improve the efficiency of upland rice farming in all three land ownership status, it is necessary to carry out an intensification accompanied by guidance by utilizing appropriate technology involving the government, universities and the private sector.

The existence of cooperatives in the village needs to be optimized as a provider of agricultural production and savings and loan facilities for the village community. Farmers as members of cooperatives are given payment waivers, so that farmers can repay it after the harvest. This facility is to overcome the financial problems of farmers in research location and the problems of obtaining agricultural production facilities. Farmer groups need to be optimized, as a place where farmers can learn about upland rice farming well with PPL officers and fellow farmers, as well as a forum where farmers get information about prices and availability of agricultural production facilities.

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