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The influence of the farmer socio-economic factor on the decision wet paddy areas into those of palm plantation in Pulau Rimau District of Banyuasin

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Abstract

This research was aimed at identifying the influence of the farmer" socio-economic characteristics on the change of wet paddy areas into those of palm plantation in Pulau Rimau, analyzing that of total production, total farmhands, sales and production cost on their incomes, and, comparing the incomes of the farmer who work on wet paddy areas and those on palm plantation. In other word, this research attempted to find out the potential of functional change from the wet paddy areas into those of palm plantations. The research results show that the farmers age, education field size, experiences, income and cultural backgrounds influence their decision to change the wet paddy fields into palm plantation. Their average income riil that is, Rp. 3.323.655,00, with a B/C value of 1.02, this means thet for every 1 Rupiah cost, they obtained Rp. 1.02, this indicated that in 2013 they did not receive proper income from their paddy fields. As for the pal planters five years, the average income was Rp 3.776.028,18, with a B/C value of 1.4, for every 1 Rupiah cost, they obtained Rp 1,4. Therefore, palm planting was more profitable, and the pal planters over 25 years, the average income was Rp 18.622.874, with a B/C value of 5,5.

Keywords: Socio-Economic; Land Conversion; Rice Farming; Farming of Oil Palm

1. Introduction

1.1. Background of the Study

As an agricultural country, the agricultural in Indonesia plays an important role and ensure the people's survival as well as Nation and State's welfare. The role of the agricultural is not only for the health with suffice foods and nutritional needs for people, but also it is very important for the economic aspects of industry, environment, social politics and safety (Rahmanto, 2008).

Rice field has very important meaning to maintain food security. However, as time goes by, population increase and economic demands, the existence of food plots is starting to be disturbed. One of the most serious problems at the moment relate with food plot is widespread of food land conversion to the other uses.

From all of the food land spread throughout Indonesia, the widest is rice field 57%, garden 19% and the rest is housing area, public facilities, farm, etc. The largest province that exploit tidal land to be rice field is South Sumatera, almost 200,000 ha, followed by Central Kalimantan for more than 150,000, ha, South Kalimantan 100,000, ha and the other Province is average 100 ha (Agriculture Department of South Sumatra Province, 2007). Swamp land in South Sumatera is 1.602.490 ha, 60% is tidal land and the remaining is lebak swamp 40%.

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The increasing of economic development especially in South Sumatera, so agricultural sector cannot be avoided from competition of the use land resources with various economic sector per year less than 30,000, until 50,000, ha rice field has switched functions to non-agriculture (Suganda, 2007).

Banyuasin Regency has 80% flat area of tidal swamp land and lebak swamp, whereas 20% choppy until wavy of dry land with the height 0-40 meter on sea surface. Tidal swamp land lies along the East coast until inland comprise Muara Padang subdistrict, Makrti Jaya, Muara Telang, Banyuasin II, Pulau Rimau, Air Saleh, Muara Sugihan, in part of Talang Kelapa Subdistrict, Betung and Tungkang Ilir.

Rice field has very important meaning to maintain food security. However, as time goes by, population increase and economic demands, the existence of food plots is starting to be disturbed. One of the most serious problems at the moment relate with food plot is widespread of food land conversion to the other uses.

A farmer usually changes his land function from old commodity into new commodity because affected by many economic and social factors. One of the comodity that change to the new plant is paddy which is converted into oil palm, data from Food Crops and Horticulture Department South Sumatera shows the increasing of switched agricultural land. As a result, decreasing of rice field, from 752,000, ha in 2003 become 702,000, ha in 2006. The switch of land is hard to prevent during paddy plant does not provide adequate profits for farmers so farmers prefer more profitable crops and little risk of crop failure. Oil palm farm, rubber plant, and coconut is the most selected plants in tidal land as a substitute paddy.

The conversion of rice fields to oil palm plantation according to Kurdianto (2011) caused by various things, higher income from oil palm farming with lower risk, and limited water availability. One of the impacts of rice field conversion is the disruption of food security. The problems caused are permanent or it will be felt in the long term although land conversion is no longer (Irawan, 2005).

Related to statement above, uncontrolled land conversion, so the author interest to research about what economic social factors that drives farmer's decision to do conversion of rice land into oil palm with a case study in Banyuasin Regency.

1.2. The Formulation of the Problem

Based on the background above, so the formulation of the problem are:

- How do socio-economic characteristics influence farmer's decisions to convert tidal rice fields into oil palm plantation?
- What factors that influence income of rice and oil palm on tidal land in Pulau Rimau District?
- Is there any difference between the income earned by farmers in tidal rice field and the income of oil palm farmers?
- How does the potential for conversion of tidal rice plantations into oil palm plantations affect food security?

1.3. The Objectives of the Study

The Objectives of the study are:

- To identify the influence of socio-economic characteristics to convert tidal rice fields into oil palm plantation
- To analyze the factors that influence the income of rice and oil palm farmers on tidal land in Pulau Rimau
- To compare the income earned by tidal rice farmers and the income of oil palm farmers
- To determine the conversion of tidal rice land to oil palm on food security

1.4. The Use of the Study

The use of the study is: It is hoped that it can be used as literature for the students, readers and the future researchers and become a consideration for policy makers in dealing with the problem of conversion food crops in tidal areas to oil palm plantations.

2. Material and Methods

2.1. Theoretical Framework

2.1.1. Approach Model

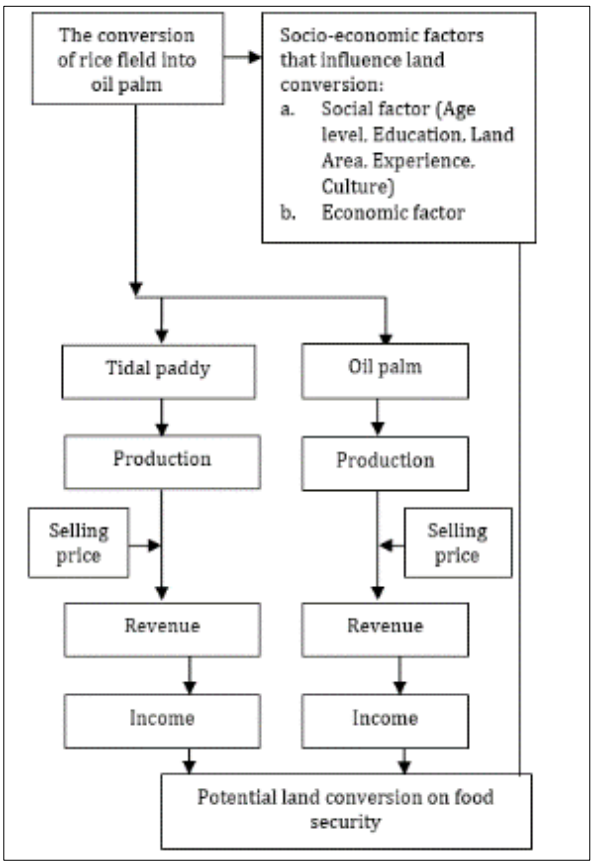

Figure 1 Diagrammatic Approach Model The Influence of The Farmer Socio-Economic Factor on The Decision Wet Paddy Areas Into Those of Palm Plantation In Pulau Rimau District of Banyuasin

2.2. Hypothesis

Based on the description and background, the problem and theoretical framework, then the hypothesis obtained as follows:

- It is suspected that socio-economic factors that influence farmers' decision to convert land into oil palm plantations
- It is suspected that production, number of workers, price and capital have a significant effect on income of rice and oil palm farmers on tidal land in Pulau Rimau District
- It is suspected that the income received by oil palm farmers is more than the income received by tidal rice fields

2.3. Operational Limitations

The definition and limitation are used in this research are:

- The farming that was researched were tidal rice farming and oil palm farming.
- Sample farmer (respondent) in this research are farmers who have converted tidal rice land into oil palm in Pulau Rimau District.
- The production factors (cost) taken into account in this research are: land, labor and capital.
- The price is the production selling price at the time of research.
- Production costs are the fixed costs and variable costs incurred in the oil palm farming.
- Total costs are all operational costs incurred by farmers within 1 planting season.

- Total of oil palm production is the number of fresh fruit bunches produced each year.
- Land area is land used for tidal rice and oil palm crops (Ha)
- Capital is the costs required by farmers for all tidal rice and oil palm farming activities (Rupiah/Ha/year)
- Labor is the number of workers who work in rice and oil palm farming each year (HOK/Ha/year)
- Income is received by farmers from the sale of rice or palm oil production after deducting the costs incurred to produce the rice (Rp/year)
- Selling price is the price received by farmers for each kg of rice production (GKP) or palm oil production (FFB) (Rp/kg)
- Land conversion is a change in land use from rice farming to oil palm farming which is measured in area units (Ha)
- Social factors are social conditions that influence farmers to convert land, in this case social factors can be seen in education and interest
- Economic factors are economic conditions that influence farmers to convert land, in this case economic factors are seen from income and ability to save (Rp/year)
- Farmers are the entire farming community who convert their rice land, either partially or completely, into oil palm farming.
- The harvest age for oil palm is the age of the plant calculated from the fifth year.
- The converted land area is the area of oil palm land originating from the conversion of rice land (ha).
- Revenue is the amount of production multiplied by the selling price per unit of production at the time this research took place (Rp/year).

3. Results

3.1. Place and Time of Research

The location of research is in Banyuasin Regency with consideration that in this Regency almost 80% of farmers have converted their land to oil palm and their oil palm plants are already producing. The conversion of tidal land from rice to oil palm is in Pulau Rimau District, Banyuasin Regency with the case that the oil palm in the District already produces. The location was carried out purposively.

3.2. Research Methods

The research method used in this research is a survey method, namely research carried out by taking sample farmers from a population and is a systematic effort to reveal a social phenomenon (Usman, 2004). Most of the agricultural land in Banyuasin Regency is tidal land spread across several sub-district locations, because it has extensive tidal land and most of the farmers in the area have converted land from rice to oil palm. Oil palm plants have an average age of 5 years (2nd year harvest).

Tidal land oil palm farmers who are used as example must follow this criteria:

- Farmer owners and cultivators who have converted land
- Farmers have oil palm plants that are already producing

Meanwhile, tidal rice plants that will be used as example must follow this criteria:

- A farmer is an owner and a cultivator
- A farmer has rice plants as a source of income

3.3. Sampling Method

The choice of research location was carried out purposively with the case on the location there were farmers who had converted land into oil palm plantations and farmers who were still continuing to grow rice. Next, sample farmers were selected using a balanced stratified random sampling method. Where the sample farmer layer is the village that has converted the most land from rice to oil palm.

Table 1 Sampling framework in Pulau Rimau District, Banyuasin Regency

Village	Oil Palm farmers	Rice Field farmers	The Number of example farmer		
			%	KP	Rice
Sumber Mukti	190	98	10	19	9
Wonodadi	118	80	10	11	9
Songo Makmur	110	100	10	11	10
Sumber Agung	156	80	10	15	8
The number	574	358		56	36

Source: Primary Data

3.4. Data Collection Methods

The data collected consists of primary data and secondary data. Primary data was collected by conducting observations and direct interviews using a prepared list of questions. The sampling units are farmer households that have not yet changed their function to households with farmer households that have converted their land to oil palm. Secondary data was obtained from institutions and agencies related to this research, including data on the general condition of the area and the general condition of plantations.

3.5. Data Processing and Analysis Methods

Data processing and analysis techniques are carried out to obtain information regarding the condition of farmers' living standards before and after conversion, as well as to determine the factors that influence the level of land conversion. Qualitative data techniques and analysis are carried out through three stages of analysis, namely data reduction, data presentation, and drawing conclusions.

Primary data collected using questionnaire is in principle processed following procedures to test the hypothesis that have been formulated. The information recorded in the questionnaire is first processed tabulate by transferring information from the questionnaire to a table, which is done manually, followed by using the Excel computer program by presenting the results obtained in the form of a systematic description. According to Arif (1999), the logit model is used to overcome the problem of qualitative variables, the factors that influence the level of land conversion and the impacts are formulated as follows:

$$K = \beta_0 + \beta_1 PP + \beta_2 MP + \beta_3 PPT + \beta_4 JP + \beta_5 LL + \beta_6 B + U(!)$$

Because of K (farmer's decision) varies between 1 and 0, so we can estimate the logit model equation using the following formula:

$$K = Log\left[\frac{Pi}{1-Pi}\right] = Log\beta_0 + \beta_1 LogUP + \beta_2 LogPP + \beta_3 LogLL + \beta\_4\ Log\ PP + \beta\_5\ PPT + \beta\_6\ BP + \mathrm{U}$$

Which:

Pi = farmers' decision to convert the tidal land from paddy to oil palm (1: farmers' decision switch function land, 0: farmers' decision doesn't switch function land
β_o = Intersep
$\beta_{1\text{-}6}$ = Estimator Parameter
UP = Farmers' Age
PP = Farmers' Education (skor) SD: 0, dan tamat SLTP keatas : 1)
LL = Land Area (skor)
PP = Farmers' Experience
PPT = Farmers' Income per year (economic factor)
BP = culture's factor (skor) melakukan fragmentasi lahan : 0, tidak melakukan fragmentasi lahan : 1

To test the factors of hypothesis affect farmer tidal rice land and oil palm income use Cobb-Douglas production:

$$Y = \beta_0 X_1^{\beta 1} X_2^{\beta 2} X_3^{\beta 3} \delta^u$$

The multiple linear regression equation model of the factors that influence farmer income is

$$\ln Y = \ln \beta_0 + \beta_1 \ln X_1 + \beta_2 ln X_2 + \beta_3 ln X_3 + \beta_4 ln X_4 + U_3$$

Which:

Y_3 = total amount of rice plantation income/tidal oil palm plantation (Rp)
X_{31} = Production Amount (Ton)
X_{32} = Selling Price (Rp/Kg)
X_{33} = Capital (Rp)
B_1-β_2 = Regression coefficient
U_3 = confounding variables (error term)

Hypothesis testing use Pearson correlation coefficient, the Least Square method which is formulated as follows:

$$r = \frac{n \sum XY - \sum X . \sum Y}{\sqrt{(n \sum X^2 - (\sum X)^2 (n \sum Y^2 - (\sum Y)^2)}}$$

Before doing an analysis, in accordance with the requirements of the Ordinary Least Square (OLS) method, normality and classical assumptions will first be tested.

- Data normality testing:

Data normality testing is carried out to test whether in the regression method the independent and dependent variables have a normal distribution or not in a good regression model. Data must be distributed normally/near normal (Santoso, 2000), to detect whether a regression model is normal/not, the Pearson correlation test is carried out, to detect whether a regression model is normal/not then the Kolmogorov-Smirnov UI is carried out with the following conditions:

- If the asyimp sig (2.tailed) value is above the significance level of 0.01 then the regression model is suitable to be used
- If the asyimp sig (2.tailed) value is below the significance level of 0.05 then the regression model is not suitable for use.

- Testing classical assumptions

This test aims to ensure that a regression model can produce estimates that are unbiased (valid). A regression model is said to be good if it is free from classical assumptions. This classical assumption test consists of heteroscedasticity and multicollinearity

- Heteroscedasticity

Occurs if the variance of each confounding error is not constant, the impact that will arise is that the assumption that occurs remains unbiased but is no longer efficient. Heteroscedasticity occurs if there is a certain pattern in the scatter plot such as the points forming a continuous pattern (wavy, merging and narrowing.

- Multicollinearity

Arises as a result of a causal relationship between two/more independent variables or the fact that two/more explanatory variables are jointly influenced by a third variable that is outside, to detect multicollinearity (Nugroho, 2000) states that the value of the variance inflation factor (VIF) no more than 10 then the model is free from multicollinearity. VIF is an estimate of how much multicollinearity increases the variance in an estimated coefficient of an explanatory variable. A high VIF indicates that multicollinearity does not introduce a small variance in the coefficient estimates resulting in the t value.

3.5.1. Hypothesis test

To test the hypothesis, multiple regression analysis is used which consists of:
a. t test (partially)

To test the influence of each independent variable on the dependent variable, use the t test at a confidence level of 95% and an analysis error rate of α of 5% with the results:

- If t count ≤ t table: Ho is accepted
- If t count > t table: Ho is rejected

b. F test (simultaneously)

This test is carried out to find out whether all independent variables simultaneously influence the dependent variable. This test was carried out with the f test at a confidence level of 95% and an analysis error rate (α) of 5% with the condition of degree of freedom (d,f)=n-k; degree of freedom (d,f) = k-1

- If F count ≤ F table: Ho is accepted
- If F count > F table: Ho is rejected

To calculate the difference in income from other farming businesses due to the conversion of rice land to oil palm, a calculation using the following formula is used (Shim and Siegel, 1992); (Husin and Lifianthi, 1995); and (Sjarkowi and Sufri, 2004)

- Pd = Pn – BT
- Pn = Y x Hy
- BT = Bt + Bv

Present value (Variable costs) = Price of variable inputs in the year of purchase x (1+i)t, Present value (Fixed costs) = Price of fixed inputs in the year of purchase x (1+i)t

Information:

- Pd = Pendapatan (Income)
- Pn = Penerimaan (Revenue)
- BT = Biaya Total (Total Costs)
- Y = Jumlah Produksi (Production Amount)
- Hy = Harga Jual (Selling Price)
- Bt = Biaya Tetap (Permanent Costs)
- Bv = Biaya variable (Variable Costs)
- i = inflasi (Inflation)
- t = tahun (year)

According to Sjarkowi and Sufri (2004), to calculate the depreciation value of fixed costs (agricultural equipment, warehouses, vehicles) the depreciation value formula is used. The depreciation value is obtained from the nominal depreciation value and the real depreciation value. The nominal depreciation value is obtained using the following formula:

$$NPA_n = \frac{HB_A - Nilai\ Sisa}{Umur\ Ekonomis}$$

$$NPG_n = \frac{HB_G - Nilai\ Sisa}{Umur\ Ekonomis}$$

$$NPK_n = \frac{HB_k - Nilai\ Sisa}{Umur\ Ekonomis}$$

After getting the nominal depreciation value, then multiply it by the compounding factor to get the real depreciation value:

$$NPA_r = \frac{HB_A - Nilai\ Sisa}{Umur\ Ekonomi} \quad (1+i)^t$$

$$NPA_r = \frac{HB_G - Nilai\ Sisa}{Umur\ Ekonomi} \quad (1+i)^t$$

$$NPA_r = \frac{HB_k - Nilai\ Sisa}{Umur\ Ekonomi} \quad (1+i)^t$$

Explanation :

NPA_n = Nilai penyusutan alat nominal (Nominal depreciation value)
NPA_r = Nilai penyusutan alat riil (Real equipment depreciation value)
NPG_n = Nilai penyusutan gudang nominal (Nominal warehouse depreciation value)
NPG_r = Nilai penyusutan gudang rill (Real warehouse depreciation value)
NPK_n = Nilai penyusutan kendaraan nominal (Nominal vehicle depreciation value)
HB_A = Harga beli alat/ Equipment purchase price (Rp)
HB_G = Harga beli gudang/ Warehouse purchase price (Rp)
HB_k = Harga beli kendaraan/Vehicle purchase price (Rp)
T = Deviation between a year to buy equipment with a year calculation of analytical data)
I = Average annual inflation rate (from 10 years final)

4. Discussion

4.1. Farmer Characteristics

The characteristics of respondent farmers (rice and oil palm that were analyzed were age, education, number of dependents, farming experience, area of land cultivated, production, reception and income. For rice farmers, 36 sample farmers were taken, while for oil palm farmers, 56 sample farmers were taken, the average age of rice farmers is 42 years, while the average age of oil palm farmers is 46 years with a range of 25 - 60 years, so physically they have enough potential to support farming activities. From this data, it can be seen that the age of rice and oil palm farmers is not evenly distributed. This happens because young people are willing to accept input, absorb technological developments more easily and are willing to speculate in business, while older farmers are lazy to try new things for fear of not succeeding and just wasting money and energy.

The education of rice farmers ranges from not completing elementary school to high school, while for farmers who have converted land to oil palm, it ranges from not completing elementary school to high school. From the data obtained in the field, it can be seen that it is much easier for those with higher education to make reforms and changes to the conditions around them to support their standard of living. It can be concluded that the higher the education, the more developed their way of thinking is to alleviate poverty in their lives.

The average number of dependents borne by rice farmers and farmers who have converted their land is around 2 - 6 dependents. This shows that the number of dependents of the sample farmers is relatively small. The area of land planted is around 1 – 2 ha because in Pulau Rimau District area the planting season is only once a year so if they plant less than 1 hectare of rice they will experience losses disproportionate to the production costs they incur, which is different from oil palm plantations they only plant 1 hectare and are able to return their capital in the fifth year with production and maintenance costs which are not as complicated as rice plants. Apart from that, oil palm plants are much easier to maintain than rice plants.

Annual rice production ranges from 2100 - 5000 tons while for FFB it is 6,940 - 15,440 tons per year and income can be seen in the next table that the income of rice farmers is greater than oil palm plants, but the risk of failure is high. Apart from that, rice is an annual crop while oil palm can see annual plants from the calculation of the b/c ratio which will be explained in the next sub-chapter.

The experience of rice farmers ranges from 8 years to 45 years, while farmers who have converted land to oil palm range from 8 years to 50 years. From the data obtained in the field, it can be seen that it is much easier for those with high experience to make decisions about converting land into oil palm plantations if rice farming is deemed less profitable. If we look at it from a cultural perspective, the average rice farmer who uses an inheritance system which divides land from generation to generation is around 16 heads of family, while oil palm farmers have around 35 heads of family.

If we look at the average, it is known that the age of oil palm farmers is still in their productive age, with an average education of junior high school level (9 years) and the average number of dependents per farmer is 4 people. The area of tidal oil palm land cultivated is an average of 2 ha with the production of oil palm FFB at the age of 5 being 10274.55357 kg per ha per year. The average net income of farmers from oil palm farming which has been reduced by

total costs is IDR 3,776,028.18 per ha per year, the average education is at junior high school level (9 years) and the average number of dependents per farmer is 4 people. The area of tidal land cultivated for planting rice is an average of 1 ha with a production of 3,423 kg per year. The average income of farmers from tidal rice farming is IDR 3,323,655 per year. For more details, see below.

Table 2 Farmers' Characteristics in Banyuasin Regency

No	Statement	Average
1	Tidal rice farmers (36)	
	Year (year)	42.722
	Education (year)	12
	The amount of people (people)	3.75
	Land area (ha)	1.5
	Experience (year)	22.333
	Culture	0.444
	Rice Production per year	3.423
	Rice Production per ha	2.372
	(Income per year) (Rp)	3.323.655
2	Oil palm farmers who have converted land (56)	
	Year (year)	46.304
	Education (year)	12
	The amount people (people)	3.82
	Land Area (ha)	1.7
	Experience (year)	24.910
	Culture	0.538
	Production (5 years old) (kg TBS/2 ha/th)	10.274,55357
	Production (5 years old) (kg TBS/ha/th)	6.091,1
	Income per year (Rp/ha/th)	3.776.028,18
	Production (3-25 years old) (kg TBS/ha/th)	22.000,
	Production cost (Rp/ha/th)	3.335.854,94
	Price (Rp/ha/th)	998,124
	Revenue (Rp/ha/th)	21.958.728
	Income (Rp/ha/th)	18.622.874
	B/C ratio	5,5

Source: Primary Data

If we look at the potential production results produced by oil palm farmers aged 3 to 25 years based on the land class of the palm oil processing factory, in 2010 calculated according to land class, the average FFB production for land class S1 reached 24 tons per hectare, land class S2 reached 22 tons per hectare per year, land class S3 reaches 20 tons per hectare per year and land class S4 reaches 18 tons per hectare per year.

In general, oil palm grows on average 20 – 25 years. The first 3 years are called young oil palms, because at that age the oil palm trees have not yet produced fruit. Oil palm trees will begin to bear fruit at the age of 4 - 6 years, and at the age

of seven years is called the mature period at which time the plant begins to produce fresh fruit bunches. At the age of 11 - 20 years, oil palm trees will experience a decline in production, and usually at the age of 20 - 25 years the oil palm plants will die (Fauzi et al, 2002).

Based on attachments 30 and 31 and shown in table 8, there is a high increase in the income of S2 class oil palm plantation farmers at the age of 5 years with oil palm plantations over the age of 25 years, namely: the level of oil palm income for the age of 5 years reaches an average of Rp. 3,776,028.18 and for a life of 25 years it reaches IDR 18,622,874 per hectare per year, while the income from rice farming is only IDR 3,323,655 per year each year.
Thus, it appears that the conversion of rice fields to coconut plantations is caused by various things, especially the higher and more secure income from oil palm farming, so that oil palm plantations have become the crop that many farmers choose to plant on tidal land as a substitute for rice

4.2. An Analysis of Socio-Economic Factors that Influnce the Conversion of Tidal Rice Land into Oil Palm Plantations

To determine the factors that influence the conversion of rice land to oil palm was obtained from 92 respondents and 36 respondents who continued to grow rice, respondents' answers to the factors that influenced the conversion of rice land to oil palm is socio-economic factors.

The estimated results of regression analysis on farmers' decisions to switch functions through logistic regression are:

K = -2.169 - 4.396UP + 1.394PP - 3.760LL + 5.263PP + 8.965PPT + 1.569BP

The results of the regression analysis of the factors that influence farmers' decisions to switch land use from rice to oil palm are as follows:

Table 3 Results of regression analysis of conversion of rice land to oil palm on tidal land in Pulau Rimau District

No	Variabel	Parameter Dugaan	Thit	Sig	Ket
1	Age	-4.396	1.193	.004	A
2	Education	1.394	.003	.778	-
3	Land Area	-3.760	6.682	.013	A
4	Experience	5.263	2.781	.004	A
5	Income	8.965	.000	.000	A
6	Culture	-1.569	1.582	.248	D
7	Constant	-2.169	2.579	.085	

Source: Primary Data

Explanation :
A=Signifikan pada α = 0.05
B=Signifikan pada α = 0,10
C=Signifikan pada α = 0,20
D=Signifikan pada α = 0,30

Based on the determination coefficient (adjust R2) is 0.631, it means that age, education, land area, experience, income and culture are able to explain the variation in the area of rice land converted to oil palm in Rimau Island District by 63%. Meanwhile, the remaining 37% is explained by other variables not included in the model. The Chi-Square statistical value is 91.801 with 6 degrees of freedom and a -p value = 0.000 or smaller than 1% alpha. This means that together these factors have a real influence on farmers' decisions to convert land.

Based on the regression equation, it was found that information on age, education, land area, experience, income and culture had a unidirectional (positive) influence on farmers' decisions in converting land.

The regression coefficient value for age is -4.369, which after carrying out the t test has a significant effect on farmers' decisions to convert their land. This means that the higher the education level of one percent, the chance of farmers'

decision to utilize their land increases by -4.3%. The results of research in the field show that the average age of oil palm farmers is much more evenly distributed and younger. This happens, usually the younger ones are willing to accept input, the younger ones absorb technological developments and are willing to speculate in business, while the older farmers are lazy about trying new things because they are afraid that it doesn't work and is a waste of money and energy.

The regression coefficient value for education is 1.394, which after carrying out the t test has a significant effect on farmers' decisions to convert their land. This means that farmers who have high or low age do not influence farmers to change land functions. The results of research in the field show that the level of education does not influence their way of thinking in finding the best solution to improve their standard of living by utilizing the land they own. This is different from what Sasmito (2000) stated, namely that the level of education of farmers influences decisions regarding land conversion. If the farmer's education is low, it is possible that the farmer will be easily influenced by other people. This influence can come from nearby neighbors or from the village officials concerned. On the other hand, if the farmer's education is high, he can think more rationally in making decisions about converting the land he owns.

The regression coefficient value for farmers' land area is -3.760, which after carrying out the t test has no real effect on farmers' decisions to convert their land. This means that farmers who have large or narrow land areas do not influence farmers to change land functions. In the Pulau Rimau District area, the rice planting season is only once a year, so if they plant less than 1 hectare of rice, they will experience losses that are disproportionate to the production costs they incur. In contrast to oil palm plantations, they only plant 1 hectare and are able to return their capital in the fifth year with production and maintenance costs that are not as complicated as rice plants. Apart from that, oil palm plants are much easier to maintain than rice plants.

The regression coefficient value for farmers' experience is 5.263, which after carrying out the t test has a significant effect on farmers' decisions to convert their land. Every time there is an increase in farming experience for one year, there is an increase in farmers' decisions to convert their land to 3.04, meaning that farmers really understand the ins and outs of farming so they can manage it effectively and efficiently. The experience of rice farming certainly also influences the farmer's decision to choose a better farming alternative, if rice farming is considered less profitable.

The income regression coefficient value is 8.965, which after carrying out the t test has a real effect on farmers' decisions to convert their land. With a one percent increase in income, the chances of farmers deciding to convert their land will increase by 8.965 percent. Based on conditions in the field, the total income received by farmers is getting higher, making farmers take the decision to change land use from food crops to more profitable plantation crops.

The cultural regression coefficient value is 1.560, which after carrying out the t test has a significant effect on farmers' decisions to convert their land. Based on conditions in the field, the culture accepted by farmers is getting higher, making farmers take the decision to change land use from food crops to plantation crops which are more profitable. This is because farmers see other farmers getting high yields and land control is narrow due to the inheritance system that has been passed down from generation to generation. The inheritance system which divides agricultural land equally among descendants causes land fragmentation which ultimately encourages land conversion for economic reasons. Even though rice is still planted, the results obtained cannot support their economy and cannot even meet the food needs of the farming families themselves. The rice fields were converted into land for cultivating oil palm plants so that they are easier to maintain and can be used as a side business. If rice fields are converted into non-agricultural land or converted to oil palm plantations, there will be a decrease or reduction in the area of rice fields, in other words, there will be a narrowing of rice fields. Even though there are government efforts to create new rice fields, these efforts are not commensurate with the very rapid population growth where the need for rice is very high because the consumption pattern of the majority of the Indonesian population is the main food. If this happens continuously, it cannot be denied that we will lack agricultural land.

4.3. The Factors that Influence Income of Tidal Land Rice Farmers

Income is the income obtained by farmers from tidal land rice production after deducting the costs incurred to obtain tidal land rice production. Before the regression analysis is carried out, a linearity test is first carried out, namely a data normality test. The aim is to find out whether in a regression model the independent variable and dependent variable have a normal distribution or not. The data used for normality testing here is data that has been transformed into logarithmic data. After the data was transformed into logarithmic data, normality was tested using the Kolmogorov-Smirnov Test with the SPSS program Ver 16. Test results using SPSS processing can be seen in Table 4.

Table 4 Results of Normality Testing of Rice Farmers' Income

	Kolmogorov-Smirnov[a]		
	Statistic	**Df**	**Sig.**
Labor	.183	36	0.004
Production	.143	36	0.059
Capital	.168	36	0.012
Income	.152	36	0.034

Source: Primary Data

From the table above, it can be seen that the Asymp Sig (2 tailed) value is greater than the 0.01 significance level for the four research variables, namely labor of .004, capital variable of .059 and expected return, income variable of .012, and production variable of .012. 034, then based on these results it can be concluded that the data is normally distributed and meets the assumptions of normality so that the regression model is suitable for use.

The coefficient of determination (adjusted R2) of .860 means that the variables production, selling price, labor, amount of capital explain the variation in tidal land rice farming income in Pulau Rimau District by 86% while the remaining 14% is explained by other variables that are not included in the model such as production costs, the level of technology used.

Table 5 Influence of Rice Farmer Income Factors

No	**Variabel**	**Parameter dugaan**	**Thit**	**Sig**	**Ket**
1	Labor	0.661	2.762	0.010	B
2	Production	0.421	2.803	0.009	B
3	Capital	0.421	3.512	0.001	A
4	Price	0.228	.517	609	-

Source: Primary Data

Explanation :
A=Signifikan pada α = 0.01
B=Signifikan pada α = 0,05
C=Signifikan pada α = 0.10
D=Signifikan pada α =0.20

Based on a partial test with a T table value of 2.738, it can be seen that the variables that have a significant effect on the income of rice farmers in Pulau Rimau District are labor, production and amount of capital at 95% confidence level, while partial selling price does not have a significant effect on income tidal land rice farmers.

From the test results, it can be explained that the smaller the rice production, the less income will be generated, and the more rice production, the income will increase as well. If there is less labor, the income of oil palm farmers will increase, as well as the more labor, the income of oil palm farmers will decrease. If the more labor is used in processing oil palm plantations, the more costs will be incurred to pay for daily labor.

The amount of capital influences the amount of income of tidal rice farmers because most farmers in Pulau Rimau District manage their land by maximizing the use of capital, from the results of this test, it can be explained that the smaller the capital, the less income received and conversely, the greater the capital, the greater the income received. It can be seen from the f-statistic value, which is 47.499, which is significant at the 95% confidence level, this means that production, selling prices, labor and capital will influence variations in the income of tidal rice farmers in Pulau Rimau District.

4.4. Factors that Influence Income of oil palm farmers on tidal land

Determination coefficient (adjusted R2) of .670 means that variables production, selling price, labor, amount of capital, explain the variation in income of oil palm farmers in Pulau Rimau District by 67%, while the remaining 43% is explained by other variables not included in model. Partial correlation values can be seen in the table below.

Table 6 Value of the Influence of Palm Oil Farmers' Income

No	Variabel	Parameter dugaan	Thit	Sig	Ket
1	Labor	0.052	0.388	0.699	-
2	Production	0.221	2.761	0.044	A
3	Selling price	1.269	3.699	0.001	A
4	Capital	0.475	3.492	0.001	A

Source: Primary Data

Based on a partial test with a t table value of 2.674, it can be seen that the variables that have a significant effect on the income of oil palm farmers in Pulau Rimau District are production, selling price and capital at a 95% confidence level, while partial labor does not have a significant effect on income of oil palm farmers in Pulau Rimau District. From the results of this test, it can be explained that the smaller the palm oil production, the less income will be generated, and the more palm oil production, the income will increase as well. The lower the selling price of palm oil is, the income of oil palm farmers in Pulau Rimau District will decrease. Likewise, the higher the selling price of oil palm farmers, the farmer's income will increase. The amount of capital influences the amount of income of tidal rice farmers because most farmers in Pulau Rimau District manage their land by maximizing the use of capital income received.

Meanwhile, labor does not affect the income of oil palm farmers because the majority in Pulau Rimau District manage their land by maximizing the use of their own labor and minimizing the use of labor. Judging from the F-statistic value in the table above, it is 10,402 which is significant at the 95% confidence level, meaning that together production, selling price, labor and capital will influence variations in the income of oil palm farmers in Pulau Rimau District.

4.5. Farming Analysis

4.5.1. Tidal Land Rice

The real income of rice farming is influenced by the size of the production produced and the costs incurred for production and maintenance. The ability of farmers to optimize the use of production factors will provide maximum output and income that farmers can achieve. The real income of tidal rice farming in Pulau Rimau District can be seen in Table 7

Table 7 Average Costs, Revenues and Real Income of Rice Farming per hectare in Pulau Rimau District

No	Statement	Riil (Rp/ha/th)
1	Revenues	6.557.089
2	Average Costs	3.233.429
3	Real Income	3.323.655
4	B/C	1,02

Source: Primary Data

Pendapatan Riil : $(1 + i)^t = (1,07)^1$

Based on table 7, it can be seen that the average real income for rice farming is IDR 3,323,655. From this table, we get a B/C value of 1.02, which means that every 1 rupiah spent by farmers will result in farmers generating real income of IDR 1.02. This shows that rice farming during 2013 provided adequate income, so that tidal land rice farming in Pulau Rimau District reached the break-even point and is still profitable.

Efforts to increase farmers' income from rice farming activities often face obstacles in providing capital for procuring fertilizer production facilities and selling the results. Farmers often access capital through rice milling entrepreneurs,

production input traders, or wealthy farmers who own capital. The farmer's ties to the capital provider continue until the sale of the harvest, where the debt is paid with rice yields or what is called the yarnen system. If taken into account, fertilizer prices are higher and rice prices are lower than local market prices. The yarnen system results in high capital costs paid by farmers. The existence of professionally managed cooperatives in rice production centers can be an effort to help farmers in providing non-current capital.

From the results in the field, the price of fertilizer as a burden for yarnen system farmers is more expensive at 150 thousand (urea), 160 (tsp) and if purchased in cash it is 110 thousand (urea), 120 (TSP) rupiah per planting season. By having to pay for the results in the form of grain, there is a price difference of 300 rupiah per kilogram. Fertilizer requirements per hectare are taken at the time of land processing and paid after harvest or the yarnen system within one planting season. The capital costs that farmers must pay are 50 percent per planting season. All debts are paid by farmers in the form of grain at the time of rice harvest.

4.5.2. Tidal Land Oil Palm

Palm oil farming income is influenced by the size of the production produced and the costs incurred for production and maintenance. The ability of farmers to optimize the use of production factors will provide maximum output and income that farmers can achieve. Income from tidal rice farming in Pulau Rimau District can be seen in Table 8.

Table 8 Average Total Costs, Revenues and Real Income of Palm Oil Farming per hectare in Pulau Rimau District.

No	Statement	Riil (Rp/ha/th)
1	Revenues	6.091.144,56
2	Average Costs	2.649.927
3	Real Income	3.941.217,29
4	B/C	1,2

Source: Primary Data

Pendapatan Riil : $(1 + i)^t = (1,07)^1$

Based on table 8, it can be seen that the average real income from oil palm farming is IDR 3,941,217.29. From this table, we get a B/C value of 1.2, which means that every 1 Rupiah spent by farmers will result in the farmer generating a real income of IDR 1.2, thus making oil palm farming on tidal land in Pulau Rimau District profitable.

Oil palm production is obtained after the plant is approximately 4 years old. The age of the sample farmer's oil palm is 5 years. For tidal land areas, the production age of oil palm plants can only reach a maximum age of 21 years, in contrast to oil palm plants on dry land. This occurs because the soil is inundated by tidal water so that the grip of the plant roots on the ground is not as strong as that of plants on dry land. Production can be done twice a month. Farmers' palm oil production is fresh fruit bunches (FFB) which are sold to collecting agents.

4.6. Potential for converting tidal rice land into oil palm plantations for food security

According to Lifianthi (2013), there are differences in the profits of oil palm plantation agribusiness in three different plant age groups, namely: the level of profit from oil palm for the 4 - 9 year age group reaches IDR 16,037,436.56, for the 10 - 20 year age group it reaches IDR 18,786,207.35 and for the age group over 20 years it reached 16,326,057.22, thus the influence of land conversion is caused by several things, one of the one is high palm oil income.

The consequences or impacts of land conversion are decreased rice production, negative land conversion or disproportionately available land, both existing and new, on the population and decreased land productivity, where former land that has been planted with oil palm takes a very long time to be able to grow into productive land. Theoretically, increasing population will have a direct impact on increasing national demand for food. The government has implemented various methods, including intensification and extensification of agricultural land in the food sector. However, unfortunately, the policy is still not implemented well. Due to the rapid rate of conversion of productive agricultural land, food independence, especially rice, soybeans and corn, is also threatened. Data shows that agricultural land conversion in Banyuasin district reached 1,170,022 hectares, consisting of 204,125 hectares of tidal rice fields or 17 percent and 965,897 hectares of land or around 83 percent. Banyuasin Regency uses tidal land, Muara Telang District, Banyuasin II, Pulau Rimau is a rice producing center. The level of potential agricultural products such as productivity, income and selling value of agricultural food crop commodities is still low compared to the potential for

plantation products which are superior in terms of income and selling price. Therefore, the Government must immediately implement a moratorium on agricultural land to reduce the rate of conversion of productive rice fields into plantations. If not, Indonesia will be threatened with food shortages.

Changes in agricultural land use are a threat to food security. Changes in food security have very serious implications for food production, the physical environment, and the welfare of agricultural communities whose livelihoods depend on their land. Changes in agricultural land use in Banyuasin Regency are increasingly serious, both carried out by farmers and plantation companies. As a result of changes in agricultural land use, changes in the area of rice fields during the period 2007 - 2010 experienced a significant decline. The area of rice fields in 2007 was 225,337 hectares and in 2010 it was 172,263 hectares. This is inversely proportional to the condition of the plantation area which continues to increase in 2007, the plantation area was 120,424 hectares and in 2010 it was 194,145 hectares or an increase of 73,721 hectares.

The area of tidal land in Pulau Rimau District has decreased, the area of rice field harvest in 2008 was 16,701 hectares and in 2012 it was 14,540 hectares. Meanwhile, oil palm plantations in Pulau Rimau District in 2008 covered an area of 1,540 hectares, increasing in 2012 to 5,281 hectares (Central Statistical Agency, 2013).

Knowledge of Land Conversion Regulations. One of the drivers of land conversion is the community's low understanding of the regulations issued by the government regarding the allocation and management of rice fields. Discussion and handling of the problem of conversion of agricultural land which can reduce the amount of agricultural land, especially rice fields, has been going on since the 90s. However, to date, controlling the conversion of agricultural land has not been successful. In general, the existing regulations/legislation regarding the protection of agricultural land are only advisory in nature without accompanying sanctions and supervision from the government. To improve the performance of existing regulations in reducing the rate of conversion of paddy fields, the government then issued new regulations through Law 41 of 2009, where every perpetrator, whether farmers, officials or business entities who carry out land conversion, will be subject to criminal penalties and fines accordingly with applicable provisions.

Law Number 41 of 2009 and the Banyuasin Regency RTRW draft are used as references for controlling the use of agricultural land, but in both regulations there are no technical guidelines that are implementable in controlling the use of agricultural land for food crops in Banyuasin Regency, so there is a need for derivative regulations from Law Number 41 of 2009 and RTRW design as a land control instrument.

The government has made several efforts in the food crop agriculture sector, such as rolling assistance, subsidies for seeds and fertilizers as well as assistance with infrastructure, although in some places there are still inappropriate recommendations and not appropriate for use. One thing that must be done in the future is that farmers can be involved in the policy making process, especially regarding plans for developing facilities and infrastructure and providing any assistance so that this assistance is effective because it is in accordance with what is needed. Apart from the above, the Regional Government must also strive for policies and programs that do not just replicate national programs, but should also pay attention to conditions of need and matters of a local nature.

The increasingly widespread phenomenon of conversion of food agricultural land into oil palm plantations and the increasing number of residential rice fields in almost all districts is a serious threat to the decline and even disappearance of food crop farming areas. The increasing growth rate of the oil palm plantation sector is one factor that influences the decline in the area of food crop farming. Based on field findings from Setara Foundation and the results of discussions with several farmer groups in many places, it shows that there has been a process of buying and selling land (residential rice fields and food potential land) from the community to oil palm plantation companies and that several rice fields that are still being cultivated are at risk of experiencing drought due to the construction of oil palm plantations by companies around the community's rice fields. This indicates that permits for oil palm plantations have been issued in agricultural areas that should be protected. This means that as a starting point for achieving self-sufficiency, the government must carry out an inventory of agricultural land so that it is widely known and the location of active agricultural land, residential rice fields and potential land. And of course, no less important is the need for preventative measures to prevent the conversion of agricultural land, either independently or by companies through the process of buying and selling land. Likewise, the 2010-2030 RTRW must accommodate agricultural food land as explicitly as the forestry sector. One policy that can be taken as a reference is the publication of PP No. 1 concerning the determination and conversion of sustainable agricultural land (Zulhakim, 2011).

Narrow land tenure is due to the inheritance system that has been passed down from generation to generation. The inheritance system which divides agricultural land equally among descendants causes land fragmentation which ultimately encourages land conversion for economic reasons. Even though rice is still planted, the results obtained

cannot support their economy and cannot even meet the food needs of the farming families themselves. The rice fields were converted into land for cultivating oil palm plants so that they are easier to maintain and can be used as a side business. If rice fields are converted into non-agricultural land or converted to oil palm plantations, there will be a decrease or reduction in the area of rice fields, in other words, there will be a narrowing of rice fields. Even though there are government efforts to create new rice fields, these efforts are not commensurate with the very rapid growth in population where the need for rice is very high because the consumption pattern of the majority of the Indonesian population is the main food.

5. Conclusions

Based on the research results, the following conclusions were obtained:

- Age level, education, land area, experience, income and culture which influence farmers' decisions to convert tidal rice fields into oil palm plantations.
- Variables that have a significant effect on rice farmers' income are labor, production amount and capital, while for oil palm plants they are production amount, capital and selling price.
- Real income from rice farming is significantly different from real income from oil palm farming, where real income from oil palm farming is greater than real income from rice farming with a B/C ratio for rice farming of 1.02, and oil palm farming of 5.5.
- Since 2005 to 2010, there has been potential for land conversion, but there has been no implementation of technical guidance and public awareness in controlling the use of agricultural land for food crops, especially in Pulau Rimau District.

Suggestions

Based on the conclusions obtained, the suggestions that can be recommended are as follows:

1. The government needs to overcome the problem of converting food crops into plantations
2. Rice farmers should strengthen their bargaining position in marketing their produce by reactivating village unit cooperatives or conducting group sales.
3. Further research needs to be carried out regarding trading systems because many farmers have difficulty marketing their agricultural products in Pulau Rimau District.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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