

Factors Affecting Farmers to Do Diversification Rice-Based Farming on Tidal Lowland in Banyuasin Regency, South Sumatra Province, Indonesia

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Abstract: *The development of tidal swamp areas for the transmigration program which was originally thought to solve a number of potential problems, it turned out that with a variety of local wisdom of its inhabitants in developing agriculture, it had made this part of the center a new economic growth center and as a food production center especially for Indonesia. Farmers who have been doing farming with a monoculture system then developed into polyculture farming between food crops and plantations. The high cost of living causes farmers to seek even higher income. This research was conducted using a survey method with primary data collection at tidal locations namely Tungkal Ilir District, Saleh Mulya District, and Telang Sari District. Primary data collection in three villages, and 30 villages randomly selected in each village because the average population of each village in Banyuasin Regency is around 300 households, meaning that each village on average is taken 10% of the total population. Thus the number of respondents was chosen around 90 respondents in three villages, and the sampling technique used cluster random sampling. High farmer needs to meet primary, secondary and tertiary needs require farmers to diversify rice-based farming. Factors influencing farmers to diversify farming based on rice are Capital (X1), Land area (X3), Dummy Rice - Palm Oil (D1), Dummy Rice - Rubber (D2) and Dummy Rice - Coconut (D4). Farmers diversify their farming also because the income received by farmers is low so the majority of farmers in Banyuasin Regency diversify rice-based farming.*

Keywords: *Diversification, Tidal Lowland, Rice-Based Farming.*

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I. Introduction

The area of tidal lowland throughout Indonesia is around 33.33 million ha, and until now the tidal lowland area utilized for agricultural cultivation has only reached about 2.27 million ha. That is, tidal lowland utilized for agricultural activities is only 23.8 percent of the total swamp area suitable for agricultural activities. The remaining 76.2 percent or around 7.26 million ha has not been utilized. Tidal soils in Indonesia can generally be divided into lowland and swamps. Tidal lowland has the largest area, reaching 20.1 million ha. The land consists of potential land typology (2.1 million ha), acid sulphate (6.7 million ha), peat (10.9 million ha), and saline (0.4 million ha). While the swamp land area in Indonesia is around 13.3 million ha, the details of which are 4.2 million ha in the form of shallow swamp, 6.1 million ha in the middle, and 3.0 million ha in the depth. Not all types of tidal lowland are suitable for agricultural cultivation. Various factors limit the use of tidal lowland for agriculture, as Wildayana (2017) argues that inundation, inadequate rooting systems, and low availability of nutrients are part of the limiting factor for swamp land use. For tidal land which is still covered by primary forest, secondary forest, and peat forest, it does not need to be converted, because in the swamp ecosystem it stores high biodiversity.

In the tidal areas the population has been dominated by ex-transmigrants (local migration programs from Java Island outside Java) and developing rice-based agricultural businesses. The tidal area has been utilized for the transmigration program since 1969, the first time in the Upang Delta of South Sumatra (Zahri et al, 2018). The development of tidal areas for the transmigration program which was originally thought to solve a number of potential problems, it turned out that with the various local wisdom of the population in developing agriculture, it has made this area a center of new economic growth and as a center for food production especially rice for Indonesia.

The development of agriculture in tidal areas is caused by the dynamics of agricultural business actors who were originally based on rice farming, then developed diversification of farmer household businesses. Growing business diversification includes increasing branches of agricultural business carried out by farmer households with business branches in agriculture and outside agriculture. The main determinant of the cause of

the development of business diversification is the improvement of household income so that farmers have the capital to develop other businesses. In addition, it is caused by the technical and economic efficiency of agricultural business besides rice which is better than rice farming. Research from Nickerson et al (2001) identified the motivation for developing agricultural / livestock diversification, namely 61% of respondents who diversified because of economic reasons, 23% who diversified due to external operations reasons, and 16% who diversified for social, economic reasons and external factors. While Barbieri and Mahoney (2008) says that the addition of revenue, sustainability of farming and animal husbandry, and improved quality of life is the most important goal of diversifying in Texas. Analysis of factors carried out in the ranking of importance of diversification objectives produces six dimensions, namely reducing uncertainty and risk; market growth and service, improvement in financial conditions, aspirations and pursuit of individuals; increased revenue; and family connections. In addition, this study also examined the relationship between various characteristics of entrepreneurs and agriculture and the dimensions of achieving goals. The age of the operator, the number of generations of agriculture in the family, household income, the number of agricultural workers, and the distance to urban areas affect the type of goals to be achieved through diversification.

According to Estudillo (2001), that after the green revolution non-agricultural jobs can provide distribution for the income of farm households in addition to doing rice farming. The decisive factor in increasing income in the non-agricultural sector is influenced by the education of the rural population. The higher a person's education, the higher the position and income obtained by someone. Work in the non-agricultural sector proved to significantly increase the income of farmer households. However, after the green revolution the rural population and farmers should get a fair update in terms of technology.

The development of business diversification raises a number of questions, such as how the performance of business diversification in the tidal swamp area has developed, which involves the development of business patterns, use of inputs and technology in production, labor use and changes in farmer household income. The extent to which technical efficiency and efficiency of the agricultural economy has changed with the development of business diversification. Agricultural technical efficiency described by more capital intensive businesses reduces labor use, "convenience" and decreases the risk of failure. Rice farming business is felt to be more labor intensive or more labor use, lack of "comfort" effort and high risk of failure compared to other crops. How much diversification of business has an effect on increasing farmer household income. In order to answer a number of these questions, this research was carried out.

II. Material And Methods

Time and place

The study was conducted in Banyuasin District, South Sumatra Province, Indonesia. Banyuasin Regency has an area of 11,832.69 Km² and is divided into 19 sub-districts. Banyuasin Regency has 80% topography of flat areas in the form of tidal swamp land and swamp land, while the other 20% is wavy to wavy in the form of dry land with a spread of 0-40 meters above sea level. Banyuasin Regency was chosen because 80% of its land is tidal land. Banyuasin Regency is divided into 19 sub-districts (Banyuasin Regency, 2015). There are three sub-districts that have tidal land which are mostly carried out for rice farming activities, namely Tungkal Ilir District, Saleh Mulya District, and Telang Sari District. To get to the location you can use water and land transportation which is about 60 km from Palembang City with a travel time of around 2 to 4 hours.

Research methods

This research was conducted using a survey method with primary data collection at tidal locations namely Tungkal Ilir District, Saleh Mulya District, and Telang Sari District. The use of this method is intended to make a thorough observation to obtain data or facts that exist and look for information - information in fact from the area studied or by way of going directly to the field, visiting, and interviewing farmers at the research site.

Sample Withdrawal Method

The sampling method is done using Cluster Random Sampling. The sampling method was carried out by collecting primary data in three villages, and in each village 30 farmers randomly selected because the average population of each village in Banyuasin District was around 300 households, meaning that each village had an average of 10% of the total population. 30 respondents were taken in Tungkal Ilir village, 30 respondents were taken from Saleh Mulya village and 30 respondents were taken in Telang Sari village. Thus the number of respondents was chosen, namely as many as 90 respondents in three villages.

Method of collecting data

The sampling method is done using Cluster Random Sampling. The sampling method was carried out by collecting primary data in one Banyuasin district and then taking randomly as many as three sub-districts.

Table no 1 : Sample table

No	Cropping Pattern	Total Sample n = 90	Districts
1	Diversification of Rice – Palm Oil	21	Tungkal Ilir
2	Diversification of Rice – Rubber	22	Saleh Mukti
3	Diversification of Rice – Coconut	25	Telang Sari
4	Rice (Monoculture)	22	Tungkal Ilir, Saleh Mukti, Telang Sari

Data Processing Method

Farmers who diversify their farming are influenced by the low income received by farmers, then fulfilling household needs, outpouring labor, and investing in venture capital. With the economic conditions faced by farmers today is fairly low by only cultivating rice farming so that the income received is less and when viewed from the time used by farmers in conducting rice farming activities do not fully work for 8 hours in other words a lot of time is not used by farmers effectively or wasted. If farmers do polyculture farming, it is likely that farmers will get additional income. According to Block et al. (2001) that richer farmers tend to have a more diversified income stream, those who are initially more diversified then experience a relatively greater increase in household income income.

In this study, it was assumed that the application of farming diversification was identical to the income from other farming. Independent variables (independent variables), namely capital, labor allocation, land and dummy diversification of rice-oil palm, rice-rubber and rice-coconut. Then for the dependent variable (dependent variable) is income. If Y is income then it can be formulated using the regression equation as follows:

$$Y = f(\text{CAPITAL, LABOR ALLOCATION, LAND AREA, DIVERSIFICATION OF RICE-PALM OIL, OF RICE-PALM OIL, DIVERSIFICATION OF RICE-COCONUT})$$

$$Y = \alpha + \beta_1 \text{CPT} + \beta_2 \text{ACT} + \beta_3 \text{LA} + \beta_4 \text{D}_1 + \beta_5 \text{D}_2 + \beta_6 \text{D}_3 + e$$

Keterangan :

- Y = Total Of Farming Income
- α = Constants
- $\beta_1 \dots \beta_6$ = Estimated Parameter
- CPT = Capital (Rp)
- ACT = Labor Allocation (Hok)
- LA = Land Area (Ha)
- D_1 = Dummy Diversification Of Rice-Palm Oil (1 = Palm Oil, 0 = Otherwise)
- D_2 = Dummy Diversification Of Rice-Palm Oil (1 = Rubber, 0 = Otherwise)
- D_3 = Dummy Diversification Of Rice-Coconut (1 = Coconut, 0 = Otherwise)
- e = Error

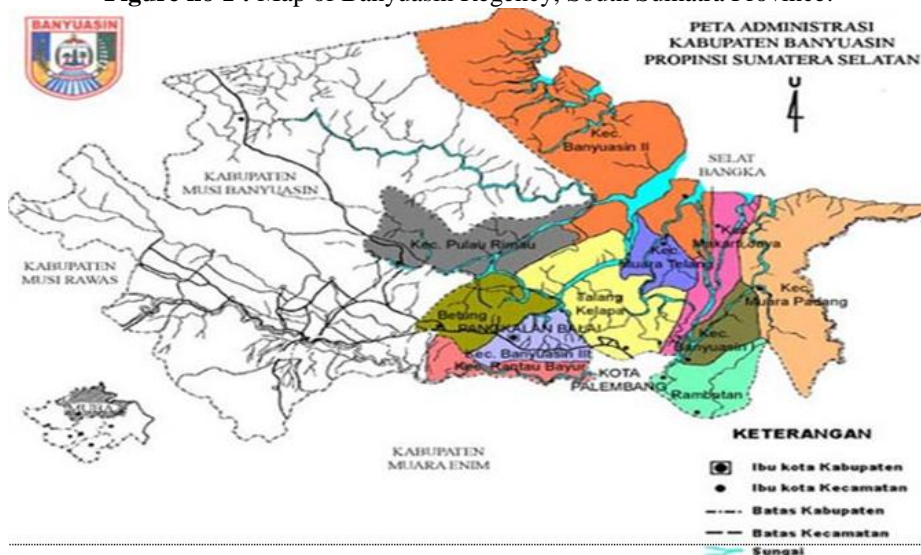
CPT variable is the amount of money spent by farmers to carry out farming activities. ACT variable is Manpower Allocation which is the time used by farmers to carry out rice-based farming activities measured in HOK per year. LA variable is the area of land used by farmers for farming, land area included in the variable to see whether the farmer's land area is reduced or increased when farmers diversify rice-based farming. The DIVERSIFICATION variable is a puppet variable to differentiate farmers who diversify based farming. Dummy 1 is diversification of rice-palm oil farming that does and does not do where $\text{D}_1 = 1 = \text{palm oil}$, $0 = \text{otherwise}$. then Rubber is included in $\text{D}_2 = 1 = \text{rubber}$, $0 = \text{otherwise}$, and diversification of Rice-Coconut farming is included in $\text{D}_3 = 1 = \text{coconut}$, $0 = \text{otherwise}$. The variable e is the term residue which is expected to be zero and the " β " parameter estimate obtained through Ordinary Least Squares (OLS).

To build an econometric multiple regression model with Ordinary Least Square, then the use of basic assumptions from the regression model is very important. The power guess model can be applied only if there are no violations of assumptions in the preparation of the model. The basic regression assumption is known as the classical assumption. A regression is built on the assumption that the data used spreads normally, there are no multicollinearity disorders, and heteroscedasticity. Especially for autocorrelation tests are not done because the data used is old data (cross-section). Therefore the classic assumptions used in this study are normality, multicollinearity, and heteroscedasticity.

III. Result

Banyuasin Regency is one of the districts in South Sumatra Province. The name of this district is derived from the name of the Banyuasin River, which crosses this district and the Musi Banyuasin Regency. The words of Banyuasin itself are derived from the Javanese term banyu (water) and salty, referring to the quality of the river's water which still tastes, especially towards the beach. The geographical location of Banyuasin Regency is located between 1.30 ° - 4.0 ° South Latitude and 104 ° 00' - 105 ° 35' East Longitude which stretches from the middle part of South Sumatra Province to the East with a total area of 11,832, 99 Km2 or 1,183,299 Ha.

Figure no 1 : Map of Banyuasin Regency, South Sumatra Province.



The geographical location of the Banyuasin Regency places Banyuasin Regency in a potential and strategic position in terms of trade and industry, as well as the growth of new growth sectors. This condition and the position of Banyuasin Regency with the Capital of Pangkalan Hall are located in the East Cross Line. In addition, Banyuasin Regency is the organizer of the growth of the city of Palembang, especially for the industrial sector. On the other hand, if it is associated with the plans of the Industrial Estate and Tanjung Api-api port, Banyuasin Regency has a very big role for the surrounding regencies as the center of downstream industry, distribution services for natural, agricultural, forestry, fisheries and marine and mining products so that they regenerate Sriwijaya Bandar belongs to Banyuasin Regency.

Factors Affecting Farmers Diversifying Rice-Based Farming

Factors that influence farmers to diversify farming are small income received by farmers from their jobs, increasing needs such as education for children, for household needs, for recreation, eating drinking and other household needs. Then the existence of land, time, labor and capital owned by farmers is a factor for farmers to diversify farming.

To find out the factors that influence farmers to diversify rice-based farming carried out multiple linear regression analysis with enter method whose variables consist of income values as non-independent variables and the independent variables consist of 6 variables of capital value, labor allocation, land, palm oil farming , rubber farming, and coconut farming. The regression model used is a multiple linear regression model according to the data pattern where the linear conditions can be seen from the partial plot of each factor that influences the income of farmers to diversify rice-based farming can be seen in Table 1 below:

Table no 2 : The results of multiple linear regression analysis.

Variabel	Regression Coefficient	Expected Sign	t-hit	Sig.
(Constant)	5466955,57	+	0,983	0,328
Capital (X1)	0,994	+	2,850	0,006*
Labor Allocation (X2)	-20387,526	+	-0,471	0,639
Land Area (X3)	5899621,88	+	2,527	0,013**
Dummy Diversification Of Rice-Palm Oil (D1)	42461202,1	+	5,444	0,000*
Dummy Diversification Of Rice-Rubber (D2)	9801415,12	+	1,716	0,090***
Dummy Diversification Of Rice-Coconut	19188743,9	+	3,067	0,003*

(D3)				
R ² = 0,739				
F Statistic = 39,106/sig 0,000				

Information :

- * = Signifikansi 1% (0,01)
- ** = Signifikansi 5% (0,05)
- *** = Signifikansi 10% (0,10)

The results of multiple linear regression analysis in Table no 2. assisted by the SPSS 23 program above explain that there are 6 variables that influence income. One variable that is not significant between 6 variables and 5 significant variables. Variables that have a significant effect are smaller than 0.01, namely the Capital variable (X1) of 0.006, Dummy Diversification Rice-Palm Oil (D1) of 0,000 and Dummy Diversification Of Rice-Coconut (D3) which is 0.003. Then the variable that has a significant effect is smaller than 0.05, which is the Land Area variable (X3) of 0.013. Then the variable that has a significant effect of 0.10 is the Dummy Diversification Rice-Rubber variable (D2) as wide as 0.090. Whereas for the Labor Allocation (X2) variable there is no significant effect on income which is equal to 0.639. This is due to the existence of covert unemployment, meaning that there is too much labor for one unit of work even though by reducing the workforce to a certain amount it still does not reduce the amount of production.

IV. Discussion

Classical Assumption Test

The classic assumption test results in multiple linear regression models aims to see whether there are equations that are used well or not so that the results of the classic assumption test are obtained from multicollinearity test, heterocedasticity test, and normality test that there is no correlation variable, heterocedasticity does not occur. but is homocedasticity and data spreads normally.

Based on multiple linear regression analysis, the estimation equation can be formulated as follows.

Estimator Equation Formula:

$$Y = \alpha + \beta_1 \text{CPT} + \beta_2 \text{ACT} + \beta_3 \text{LA} + \beta_4 \text{D}_1 + \beta_5 \text{D}_2 + \beta_6 \text{D}_3 + e$$

Estimated Equation Of Regression :

$$Y = 5,466,955 + 0,994 \text{X1} - 20,387 \text{X2} + 5,899,621 \text{X3} + 42,461,202 \text{D1} + 9,801,415 \text{D2} + 19,188,743 \text{D3} + e$$

Dimana :

- Y = Income (Y)
- CPT = Capital (X1)
- ACT = Labor Allocation (X2)
- LA = Lan Area (X3)
- D₁ = Dummy Diversification Of Rice-Palm Oil (X4)
- D₂ = Dummy Diversification Of Rice-Rubber (X5)
- D₃ = Dummy Diversification Of Rice-Coconut (X6)
- e = Error

The regression equation above can be explained as follows:

The constant is 5,466,955: if CPT (X1), ACT (X2), LA (X3), Dummy Diversification Of Rice-Palm Oil (D1), Dummy Diversification Of Rice-Rubber (D2), Dummy Diversification Of Rice-Coconut (D3) the value is 0, then income (Y) value is Rp. 5,466,955.

The regression output results obtained by the estimation equation which shows a positive effect on income, namely capital variables, land area, diversification of rice-palm oil, dummy diversification of rice-rubber and dummy diversification of rice-coconut while variables that negatively affect income that are not as expected, namely variables labor allocation. This is because if too much labor is used by farmers to diversify rice-based farming activities will affect income. The labor used in the ushatani activities of palm oil, rubber and coconut requires not much labor. The majority of the workforce is the most widely used, which comes from palm oil farming. While rubber farming is only 1 to 3 people who work. And for coconut farming, the workforce is from animals, namely monkeys. The more labor used by farmers, the higher the wages that farmers must pay. This causes the labor allocation variable to have a negative effect on income.

R² Test

R² test aims to predict how much the influence of the independent variable (X) on the dependent variable (Y) provided that if the F test results are significant then the coefficient of determination (R Square) can be used to predict the contribution of the effect of variable X to variable Y. The results of the analysis of the coefficient of determination (R²) indicate that the independent variables, namely capital, labor allocation, land area, dummy diversification of rice-palm oil, dummy diversification of rice-rubber, and dummy diversification of rice-coconut can explain the dependent variable, namely income is 73.9 percent. While the remaining 26.2 percent is influenced by other variables not included in the model or not discussed in this study.

F Test

The F test is used to determine the effect of independent variables on the dependent variable together. The F test is done by comparing F count with F Table. If F count > from F table, (H₀ is rejected H_a is accepted) then the model is significant or can be seen in processed with SPSS. The results of data analysis using SPSS then obtained an F test of 39.106 with a significance level of 0.000, which means the error rate of the tests carried out was 0 percent. This explains that 6 independent variables, namely capital, labor allocation, land area, oil palm dummy, rubber dummy, and coconut dummy jointly affect the dependent variable, income.

t Test

Capital (X1)

Capital variables have a real effect on income. The results of the analysis show that the capital variable has a positive coefficient of 0.994 with a significance value of 0.006. This shows that every additional one unit of capital will increase revenue by Rp. 994. Capital affects income because capital is the initial cost needed by farmers to diversify farming, so it is clear that capital is needed by farmers. The capital comes from farmers' savings. Capital is needed mainly to buy seeds, buy fertilizer, buy agricultural tools such as hoes, sprayers and so on. In line with the research conducted by Busyro (2016), that Capital has a positive and significant effect on income. According to Busyro in his research said that in conducting business activities of course it needs costs or expenses (capital) both for production costs, for purchasing raw materials and so on in conducting business operations to expect income as remuneration. If the provision of capital is sufficient in accordance with the amount needed, the production process will run smoothly and this will greatly affect increasing income or income for business development.

Labor Allocation (X2)

The labor allocation variable has an effect on income. The results of the analysis show that the labor allocation variable has a negative coefficient value of -20,387 with a significance value of 0.639. This shows that every addition of one unit of labor allocation will reduce income by Rp. 20,387. This is because farming diversification, namely oil palm, rubber and rice farming has almost the same HOK compared to HOK rice farming. HOK farming diversification is lower than farming because in these activities farmers need at least 5-7 laborers in 2 times per month for oil palm harvesting activities, then 1 to 2 rubber farms needed by farmers for tapping activities 3 to 4 times in a week. While for coconut farming, most farmers use beruk or monkeys to pick coconuts. So that if the farmer adds labor beyond the required capacity, the farmer will pay for the labor wage. In line with the research conducted by Trisnawati et al (2013), that the allocation of labor has no significant effect on income, then the use of labor that exceeds or does not match the one used should be reduced in order to reduce costs incurred. Therefore the allocation of labor values is negative to income.

According to Soekartawi (1986), labor will increase its working time allocation, if the increase will increase its income, generally the use of working hours is considered to be able to meet the needs, regardless of work habits, namely eight working hours in one working day. Weaknesses in this measure, among others, workers who have different skills, strengths and work experience are considered the same even though the work in farming is relatively diverse. Then when viewed from the results of regression studies that are not positive and insignificant, of course the labor allocation is inversely proportional to the opinion of Soekartawati. However, if viewed from the results of the field that the fixed income increases with the diversification of rice-based farming, this is certainly different from the non-diversification of rice-based farming, where the income of rice farmers is less than the development of rice-based farming diversification.

Land Area (X3)

Variable area of land has a positive effect on income, from the results of regression analysis, the results of the coefficient value are 5.899.621 with a significance level of 0.013. These results indicate that every addition of one hectare of land will increase income by Rp. 5,899,621. Production results are influenced by the area of land owned by farmers. According to Soekartawi (2002) that the area of agricultural land will affect the scale of business and scale of business will ultimately affect the efficiency or failure of an agriculture. The area

of land can affect the amount of production of farmers, the wider the area the greater the production results obtained by farmers. However, if the farmer cannot utilize the land area, the wider the land does not guarantee the income of farmers increases due to the land which will be difficult to supervise the use of factors of production, in addition to large land also requires considerable labor and capital.

Diversification Of Rice - Palm Oil (D1)

The variable dummy diversification of rice-palm oil has a positive effect on income, from the results of the regression analysis the results of the coefficient value are 42,461,202 with a significance level of 0,000. This shows that every farmer who diversifies rice-palm oil based farming will raise an income of Rp. 42,461,202. Rice-palm oil based farming is very influential on income because palm oil production benefits farmers because palm oil is the most productive plant producing oil per hectare from all other oil-producing plants. Farmers who diversify rice- palm oil based farming will receive higher yields than farmers who only do rice farming. From the results of this study it is proven that the income of farmers who diversified oil palm farming increased. In line with the research conducted by Zhao and Barry (2013) that diversification greatly affects income, especially for poor people.

Diversification Of Rice - Rubber (D2)

The diversified rice-rubber dummy variable has a positive effect on income, from the results of the regression analysis the results of the coefficient value are 9,801,415 with a significance level of 0,090. This shows that every farmer who diversifies rice-rubber-based farming will increase income by Rp. 9,801,415. Farmers who do not diversify rice-based farming will have lower incomes with farmers who diversify rice-based farming. Although currently the price of rubber is relatively low, but with diversification it does not rule out the possibility that the income from rubber products will increase and this can still cover the shortage of income to meet the needs of farmers' households.

Diversification Of Rice - Coconut (D3)

Variable diversification of rice-coconut has a positive effect on income, from the results of regression analysis the results of the coefficient value are 19,188,743 with a significance level of 0,000. This shows that every farmer who diversifies coconut farming will raise an income of Rp. 19,188,743. Rice-coconut based farming contributes to income that is quite high because since ancient times coconut was one of the farms that was able to prosper farmers. Coconut is a plant that can be used from stems, leaves, fruit, even pulp from coconut shells can also be used. In line with the research conducted by Kawau et al (2015) that the amount of income of coconut farmers processed with horizontal diversification is greater than the income of coconut farmers who are processed monoculturally. The horizontal diversification cropping pattern that provides the largest income for farmers is the Coconut-Rice Field. From the results of previous studies that have been carried out, diversification of coconut farming has been shown to increase farmers' income. And this is in accordance with the current research.

V. Conclusion

The study found that to meet the needs of high farmers such as primary, secondary and tertiary needs requires farmers to diversify rice-based farming. Not entirely farmers depend on one farm. Farmers will diversify their farming because of supporting factors. Factors influencing farmers to diversify farming based on rice are Capital (X1), Land area (X3), Dummy Rice - Palm Oil (D1), Dummy Rice - Rubber (D2) and Dummy Rice - Coconut (D4). Farmers diversify their farming also because the income received by farmers is low so the majority of farmers diversify rice-based farming. The development of farming diversification can add to the contribution of farmers' income.

References

- [1]. Becker, G.S. *The Economic Approach to Human Behavior*. The University of Chicago Press. Chicago (1965).
- [2]. Block, S., & Webb, P. The dynamics of livelihood diversification in post-famine Ethiopia. *Food Policy*, 26(4), 333–350. doi:10.1016/S0306-9192(01)00015-X.
- [3]. Carla Barbieri and Edward Mahoney. Why is diversification an attractive farm adjustment strategy? Insights from Texas farmers and ranchers. *Journal of Rural Studies* 25 (2009) 58–66.
- [4]. Debertin, D. L. *Agriculture Production Economics*. Mac Millan Publishing Company. New York (1989).
- [5]. Delke Susanti Kawau, Caroline B.D Pakasi, Mex L. Sondakh, Leonardus R.Rengkung. *Kajian Pendapatan Usahatani Kelapa Dengan Diversifikasi Horizontal Pada Gapoktan Petani Jaya Di Desa Poigar 1 Keca-Matan Sinonsayang Kabupaten Minahasa Selatan*. Ase – Volume 11 Nomor 3, September 2015: 41 – 52.
- [6]. Elisa Wildayana. Challenging Constraints Of Livelihoods For Farmers In The South Sumatra Peatlands, Indonesia. *Bulgarian Journal of Agricultural Science*, 23 (No 6) 2017, 894–905.
- [7]. Fabio Boncinellia, Fabio Bartolinib, Leonardo Casini. Analyzing the economies of crop diversification in rural Vietnam using an input distance function. *Land Use Policy* 71 (2018) 204–212. <https://doi.org/10.1016/j.agsy.2017.01.024>.

- [8]. Fageria and Baligar. N.K. Fageria, V.C. Baligar Lowland rice response to nitrogen fertilization *Commun. Soil Sci. Plant Anal.*, 32 (2001), pp. 1405-1429 CrossRefView Record in Scopus.
- [9]. Ismail, I.G., T. Alihamsyah, I P.G. Widjaja-Adhi, Suwarno, T. Herawati, R. Thahir, dan D.E. Sianturi. Sewindu penelitian pertanian di lahan rawa: Kontribusi dan prospek pengembangan. Dalam M. Syam, Soetjipto, dan Z. Hararap (Ed.). *Proyek Penelitian Pertanian Lahan Pasang Surut dan Rawa - Swamps II*. Badan Penelitian dan Pengembangan Pertanian, Jakarta (1993).
- [10]. Imron Zahri, Dessy Adriani, Elisa Wildayana, Sabaruddin, M. Umar Harun. Comparing Rice Farming Appearance Of Different Agroecosystem In South Sumatra, Indonesia. *Bulgarian Journal of Agricultural Science*, 24 (No 2) 2018, 189–198.
- [11]. Jonna P. Estudillo, Agnes R. Quisumbing, Keiji Otsuka. Income distribution in rice-growing villages during the post-Green Revolution periods: the Philippine case, 1985 and 1998. *Agricultural Economics* 25 (2001) 71–84.
- [12]. Loison, S.A. Rural livelihood diversification in sub-saharan Africa: a literature review. *J. Dev. Stud.* 51 (9), 1125–1138. <https://doi.org/10.1080/00220388.2015.1046445>.
- [13]. Nicholson, W. *Mikroekonomi Intermediate dan Aplikasinya*. Penerbit Erlangga. Jakarta.
- [14]. Norma Polovitz Nickerson, Rita J. Black, And Stephen F. Mccool. 2001. Agritourism: Motivations Behind Farm/Ranch Business Diversification. *Journal Of Travel Research* 2001; 40; 19.
- [15]. Rahman A, Zahri Imron, Husin Laila, Adriani Dessy. Determinant Of Business Diversification Of Household's Oil Palm Plasma Smallholders In Bahar Region, Jambi Province, Indonesia. *Russian Journal Of Agricultural And Socio-Economic Sciences* 4(64). Doi <https://doi.org/10.18551/Rjoas.2017-04.24>.
- [16]. Pierre Dupraz, Laure Latruffe. Trends in family labour, hired labour and contract work on French field crop farms: The role of the Common Agricultural Policy. *Journal of Food Policy* 51 (2015) 104–118.
- [17]. Sarah M. Martin And Kai Lorenzen. Livelihood Diversification In Rural Laos. *Jurnal Of World Development* (2016).
- [18]. Soekartawi. *Agribisnis Teori dan Aplikasinya*. Raja Grafindo Persada, Jakarta. 1993.
- [19]. ----- Prinsip Ekonomi Pertanian. PT. Raja Grafindo: Jakarta (2002).
- [20]. ----- Analisis Usahatani, UI Press, Jakarta. 1995.
- [21]. ----- Pembangunan Pertanian. Jakarta : PT Raja Grafindo Persada.1995.
- [22]. Zhao J, Barry P. 2013. Implications of different income diversification indexes: the case of rural China. *Econ Bus Letters*. 2(1):3-20.

Evi Herleni." Factors Affecting Farmers to Do Diversification Rice-Based Farming on Tidal Lowland in Banyuasin Regency, South Sumatra Province, Indonesia. "IOSR Journal of Agriculture and Veterinary Science (IOSR-JAVS) 11.12 (2018): PP- 39-46.