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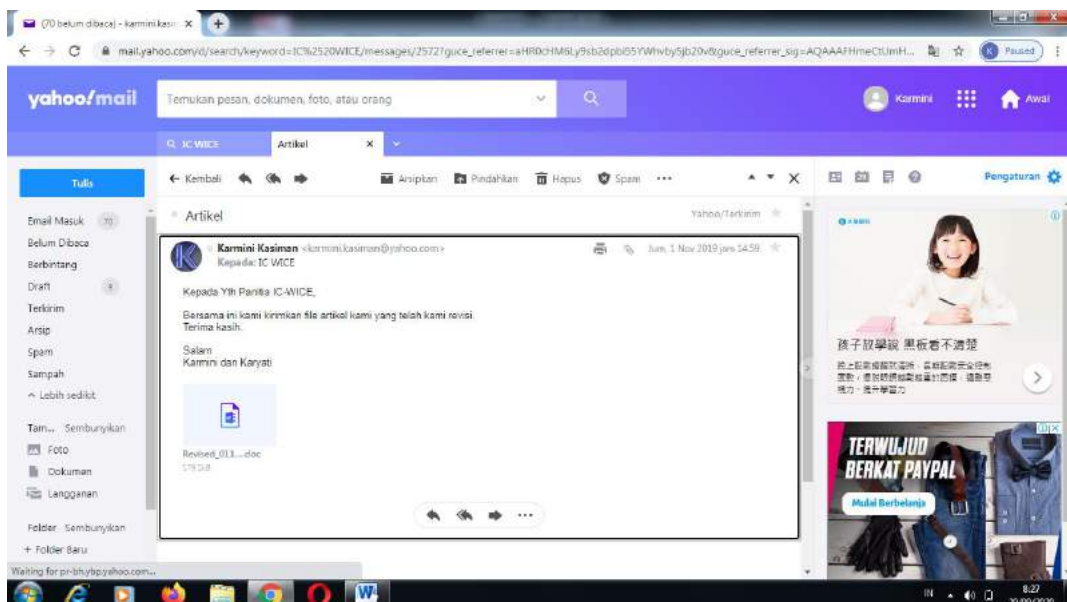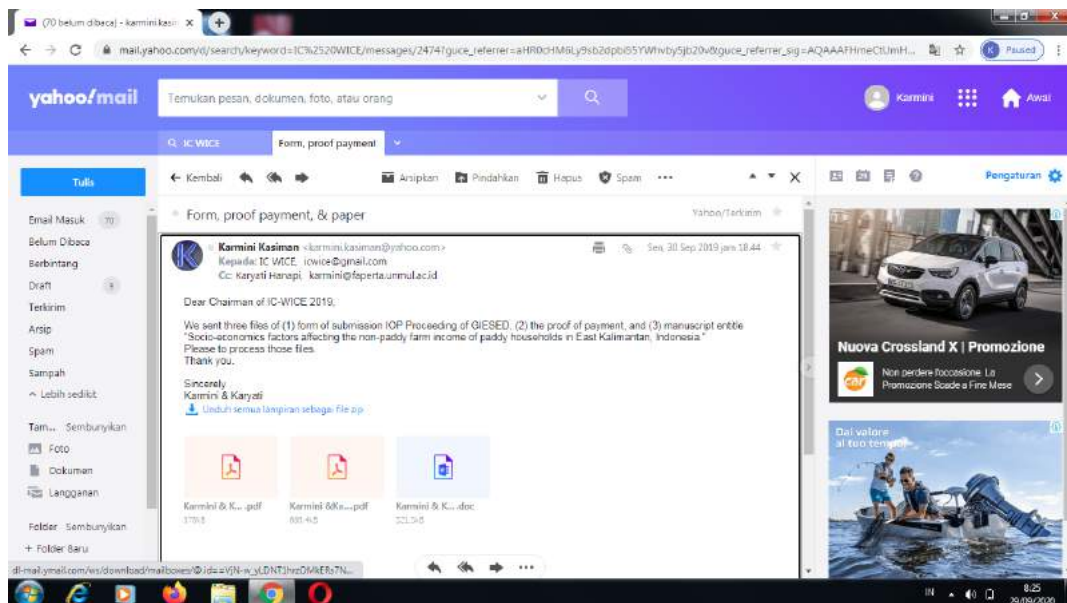
Socio-economics factors affecting the non-paddy farm income of paddy households in East Kalimantan, Indonesia

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Abstract. Numerous studies in the past have discovered a number of socio-economic factors affecting individual income, household income, or non farm income. However, there is still limited information concerning the comprehensive analysis of factors which influence non-paddy farm income in East Kalimantan, Indonesia. The objective of this study was to determine the effect of eight socio-economic factors to the non-paddy farm income of paddy households. This study was carried out in East Kalimantan Province, Indonesia. The study areas were located in the Kutai Kartanegara Regency (Tenggarong Seberang, Loa Janan, and Muara Muntai), Penajam Paser Utara Regency (Babulu, Penajam, and Waru), and Bontang City (South Bontang and North Bontang). This study collected the data by conducting in-depth interviews with respondents. This study used the regression equation to analyze the data statistically. Eight variables are an average age of laborers, average experience in non-paddy farm jobs, average working-days in non-paddy farm jobs, land ownership, number of family dependents, number of non-paddy farm jobs, number of non-paddy farm laborers, and paddy farm income become a set of factors affecting non-paddy farm income.

1. Introduction

The total number of households in East Kalimantan in 2013 was 820,888; of which 180,614 (22.00%) were farmers and 83,564 (10.18%) were farmers of food crops [1]. Paddy farming is a major farming activity because as many as 84.08% of food crops farmers were paddy farmers (70,262 households)[2]. Meanwhile, there are members of the paddy household in East Kalimantan who cultivate annual and perennial crops besides paddy. Members of a household are also involving in other economic activities besides farming. All economic activities except the production of primary agricultural commodities are called the non farm economy [3]. The result of the previous study showed as many as 88.42% paddy households have members of the household who involve in non-paddy farm activities in East Kalimantan [4]. Members of the paddy household get non-paddy farm income from their involvement in non-paddy farming activities and it contributes to household income.

Despite the various non-farm activities, the level of labor income from paddy farmers households is still low. The agricultural household has income from business in the agriculture sector (46.69%) and other sectors (53.31%). The contribution of paddy farm income to a household income of paddy farmers (49.29%) is smaller than that of non-paddy farm income (50.71%) [4]. The nonfarm sector is hoped for reducing the income gap among rural households. It is needed for the study to find ways to increase the non-paddy farm income.

There was limited information on the comprehensive analysis of factors affecting non-paddy farm income of paddy households in East Kalimantan, Indonesia. Previous studies in some localities have discovered socio-economics factors that are related to the off farm income [5–7] including education [8]. Those previous researches examined the different combination of socio-economic factors. It did not found yet the previous research which studied a set of socio-economic factors that consisted of eight socio-economic factors were the average age of laborers, the average experience in non-paddy farm jobs, the average working-days in non-paddy farm jobs, the land ownership, the number of

family dependents, the number of non-paddy farm jobs, the number of non-paddy farm laborers, and the paddy farm income. Those factors have chosen because they have a relation to the off-farm income such as the age of laborers [6,9], weekly work hours [6], landholding [7,9], number of dependents [5,9], and farm income [10]. Meanwhile, the other three factors were selected because this study assumed the average experience in non-paddy farm jobs, the number of non-paddy farm jobs, and the number of non-paddy farm laborers have the potential to affect non-paddy farm income.

Therefore, the objective of this study was to determine the effect of eight socio-economic factors to non-paddy farm income of paddy households in East Kalimantan, Indonesia. This study was designed to provide significant contribution particularly in terms of theoretical development to overcome the main issues concerning the increase of non-paddy farm income of paddy households in East Kalimantan, Indonesia. The result of this study could be deduced useful relevant information as foundation and guideline in agricultural development planning especially on what policies and decisions should be implemented to increase non-paddy farm income and also the household income of paddy farmers.

2. Methods

This study was conducted from November 2016 to April 2017. The location of this study was the Province of East Kalimantan, Republic of Indonesia. The study areas were located in Regency of Kutai Kartanegara (Tenggarong Seberang, Loa Janan, and Muara Muntai), Regency of Penajam Paser Utara (Babulu, Penajam, and Waru), and City of Bontang (South Bontang and North Bontang) as illustrated in Figure 1.

This study collected the data through in-depth interviews by using a questionnaire. The number of respondents was 252 paddy households. The purposive sampling was applied to select the households of paddy farmers that could be respondents.

The factors affecting non-paddy farm income of paddy households in East Kalimantan, Indonesia, were determined based on the result of multiple log-linear regression equation below:

$$\ln Y_i = \beta_0 + \beta_1 \ln X_{1i} + \beta_2 \ln X_{2i} + \beta_3 \ln X_{3i} + \beta_4 \ln X_{4i} + \beta_5 \ln X_{5i} + \beta_6 \ln X_{6i} + \beta_7 \ln X_{7i} + \beta_8 \ln X_{8i} + \varepsilon_i$$

where:

Y_i = non-paddy farm income (IDR year^{-1});
X_{1i} = average age of laborers (year);
X_{2i} = average experience in non-paddy farm jobs (year);
X_{3i} = average working-days in non-paddy farm jobs (day year^{-1});
X_{4i} = land ownership (hectare or ha);
X_{5i} = number of family dependents (person);
X_{6i} = number of non-paddy farm jobs (number);
X_{7i} = number of non-paddy farm laborers (person);
X_{8i} = paddy farm income (IDR ha^{-1}cropping season (cs)$^{-1}$);
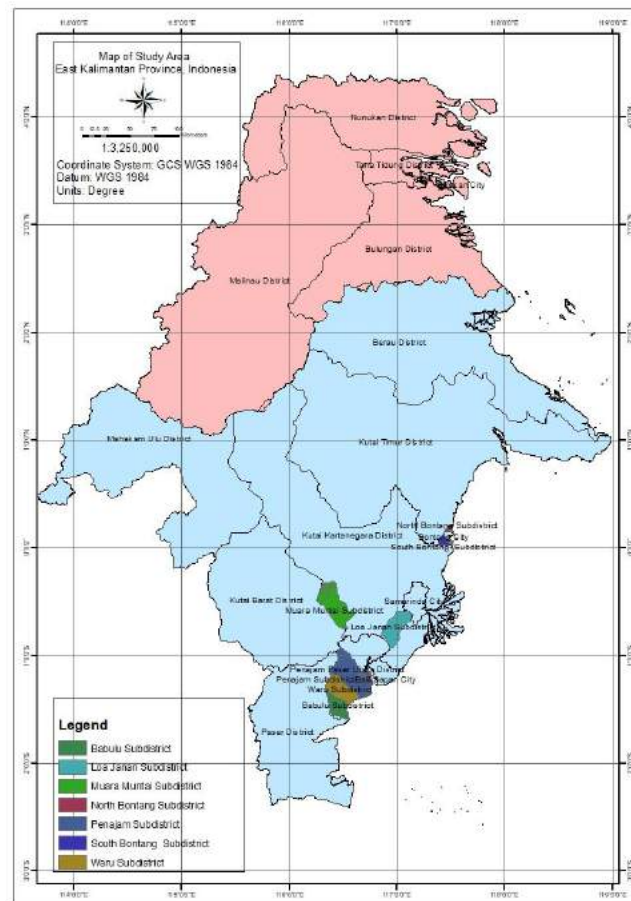ln = natural log;
ε_i = error term.

The hypothesis of the simultaneous influence of eight socio-economic factors on non-paddy farm income of paddy households was tested by using the F test. Furthermore, the partial influence of each factor on the non-paddy farm income of paddy households in East Kalimantan would be determined from the results of the t-tests. This study also calculated the multiple coefficients of determination and the Durbin-Watson d statistics.

3. Results and Discussion

Non-paddy farm income is income from non-paddy farming jobs such as annual crops farmer, perennial crop farmer, employee, seller, fisherman, breeder of livestock, carpenter, and laborer. The findings of this study revealed that the average non-paddy farm income of paddy households in East Kalimantan was IDR. 20,920,464.31 year^{-1} (Table 1). The result of F test (Table 2) indicated that the formulated hypothesis in this study is accepted. This implied that the simultaneous usage of all

independent variables, either increasing or decreasing, would influence the increase or the decrease of non-paddy farm income levels. Furthermore, the t values of the three variables were statistically significant at the 1% level. On the other hand, the other variables did not notably affect the non-paddy farm income of paddy households at both 1% and 5% levels.

Figure 1. Study areas in East Kalimantan Province, Indonesia.

The R^2 value was 0.4431, which meant that 44.31% of the variation or fluctuation in the non-paddy farm income of paddy households is influenced by the fluctuation of eight independent variables. This R^2 value in this study was higher than the prior study [7] who found the R^2 value of 0.29 for the effect of characteristics of farm household to non farm income. This study found an insignificant d statistic with the d value of 1.73. This meant that there was no presence of autocorrelation. The interpretation of this result is that the influence of an increase of one independent variable on its non-paddy farm income is not expected to affect the independent variables of another respondent.

3.1. The average age of laborers

The average age of laborers in non-paddy farm jobs is calculated to be about 40.17 years old with 9.15 years old as its standard deviation. The age at which the laborers engages in non-paddy farm varies from 20.4 years old to 67.5 years old. The t value of the average age of laborers was 0.49 and the p value was 0.63. However, this number was not significant at the level of 1% and 5%. Therefore, this result shows that the average age does not have a significant effect on non-paddy farm income in

East Kalimantan, Indonesia, *ceteris paribus* (holding other factors constant or all else being equal). This is contrary to the findings of a previous study [6], in which there is a significant effect of business owner age on the business gross revenue. The finding of that previous study [6] is supported by another study [9].

Table 1. Descriptive statistics of factors affecting non-paddy farm income of paddy households in East Kalimantan, Indonesia.

Variable	Minimum	Maximum	Average	Standard deviation
Non-paddy farm income (IDR year^{-1})	1,500,000.00	86,700,000.00	20,920,464.31	15,174,179.81
Average age of laborers (year)	20.40	67.50	40.17	9.15
Average experience in non-paddy farm jobs (year)	1.00	40.00	10.22	7.88
Average working-days in non-paddy farm jobs (day year^{-1})	101.00	227.00	177.47	22.71
Land ownership (ha)	0.25	5.00	1.22	0.79
Number of family dependents (person)	1.00	5.00	1.88	0.84
Number of non-paddy farm jobs (number)	1.00	4.00	2.11	0.52
Number of non-paddy farm laborers (person)	1.00	6.00	2.46	0.89
Paddy farm income (IDR ha^{-1} cs^{-1})	341,500.00	10,123,333.00	4,668,720.82	2,221,847.19

Table 2. The results of regression on factors affecting non-paddy farm income of paddy households in East Kalimantan, Indonesia.

Variable	Coefficient estimate	Standard error	t value	p value
Intercept	19.89	1.70	11.74	0.00
ln Average age of laborers (year)	0.08	0.16	0.49^{ns}	0.63
ln Average experience in non-paddy farm jobs (year)	-0.05	0.04	-1.34^{ns}	0.18
ln Average working-days in non-paddy farm jobs (day year^{-1})	-0.70	0.26	-2.70**	0.01
ln Land ownership (ha)	0.08	0.06	1.25^{ns}	0.21
ln Number of family dependents (person)	-0.05	0.08	-0.59^{ns}	0.55
ln Number of non-paddy farm jobs (number)	1.56	0.14	11.28**	0.00
ln Number of non-paddy farm laborers (person)	0.40	0.11	3.76**	0.00
ln Paddy farm income (IDR ha^{-1} cs^{-1})	-0.08	0.06	-1.33^{ns}	0.18

n = 252; F value = 24.17**; * significant at 5%, p value < 0.05; **significant at level 1%, p value < 0.01; ^{ns} non significant; $R^2 = 0.4431$, d value = 1.73.

The coefficient of an average age of laborers was 0.08, which meant that if it goes up by 1%, the average income of non-paddy farms will increase by 0.08% with all else being equal. The standard error was 0.16 for the coefficient of the average age of laborers. This result indicates that it has positive effects on non-paddy farm income of paddy households in East Kalimantan, Indonesia, *ceteris paribus*. This result is in line with the finding from the prior study [6]. The younger and elder laborers in non-paddy farm jobs have the opportunity to earn the same income level. Both shared common desires to obtain a higher income, which became a driving force for good work. Other than that, the age of a laborer is not a main consideration in salary/wages in most of the non-paddy farm jobs in the

study areas. They receive wages, salaries or profits based on their working-days, productivity, education, and skills.

3.2. Average experience in non-paddy farm jobs

The members of households have an average experience of 10.22 years in the non-paddy farm jobs. Average experience in non-paddy farm jobs does not significantly affect non-paddy farm income of paddy households in East Kalimantan, Indonesia, *ceteris paribus*. This finding is similar to the prior study [11], which discovered that experience is not very influential to the paddy farming adoption process. The result of this study showed if the average work experience in non-paddy farm jobs has a negative effect on non-paddy farm income in East Kalimantan, Indonesia, *ceteris paribus*. This is similar to the result of another study [11] stating that farming experience has significant negative effects on the integrated pest management adoption.

Furthermore, an increase in work experience has a negative impact on labor income in some of the non-paddy farm jobs, although the effect is not significant. The result of this study showed if the average experience in non-paddy farm jobs goes up by 1%, the average amount of non-paddy farm income will go down by 0.05%, holding other factors constant. Experience of labor is not the main factor which determines how much income of laborer, however, the productivity of some labors has a dominant influence in determining the labor wage. On the other hand, the income of employees in government and non-government institutions varies according to the level of education. Their wage is between IDR 500,000.00 month^{-1} and IDR 3,000,000.00 month^{-1} or 21.06% and 70.13% of total household income. They receive monthly wages in the average of IDR 2,366,489.36 month^{-1} [4]. The employees who own a high level of experience and low level of education most probably would obtain fewer wages compared to those who have a low level of experience but a high level of education. A total of 47 persons in this study area (13.99%) works as employees in government institutions or non-government institutions or companies as teachers, administrators, drivers, security officers, etc [4].

3.3. Average working-days in non-paddy farm jobs

The average working-days in non-paddy farm jobs are 177.47 days year^{-1}. The finding of this study revealed that the average working-days in non-paddy farm jobs very significantly affects on non-paddy farm income of paddy households in East Kalimantan, Indonesia, *ceteris paribus*. This result resembles other researchers who found that weekly hours affect the gross business revenue. The average working-days in non-paddy farm jobs has a negative effect on the non-paddy farm income of paddy households in East Kalimantan, Indonesia, *ceteris paribus*. This result is contrary to a previous study [6] which identified the positive impact. The increase of work hours could degrade the quality of output which subsequently, impacts on the price of output and the opportunity to raise the income. The attempt to increase non-paddy farm income could be achieved if the workers work in such effective and efficient ways.

3.4. Land ownership

Paddy households in the study areas own land on average of 1.22 ha whereas the land ownership of paddy households in the range of 0.25 ha to 5.00 ha. In this study, land ownerships does not significantly affect non-paddy farm income in East Kalimantan, Indonesia, *ceteris paribus*. This result is in line with the findings from previous studies [7,10,12,13]. It contrasts with another study [14]. Land ownership is not considered as a dominant factor that causes the members of the household to be engaged in non-paddy farm jobs. Moreover, non-paddy farm jobs could be done in-small areas and not in their own land. Land ownership positively affects non-paddy farm income of paddy households in East Kalimantan, Indonesia, *ceteris paribus*. The result is similar to the findings of some studies [7,12,14], whereas it is in contrast to the finding from another study [13]. The result meant the wider land, the bigger opportunity to own non paddy farm income.

3.5. Number of family dependents

A number of family dependents in paddy households is calculated at a minimum of 1 person and a maximum of 5 persons in East Kalimantan. The average number of family dependents is 2 persons. The t value of a number of family dependents was –0.59, and the p-value was 0.55, which was not significant at the 1% and 5% levels. Therefore, a number of family dependents do not significantly affect non-paddy farm income in East Kalimantan, Indonesia, *ceteris paribus*. This is similar to the findings from past studies [7,12]. However, this contradicts the findings by the previous study which mentioned that having more people living in a household indicates a greater burden on the work active individuals, expecting to increase the likelihood of participation in off-farm work.

The coefficient of a number of family dependents was -0.05, which measured the elasticity of non-paddy farm income with respect to the number of family dependents. Specifically, this number suggests that *ceteris paribus*, if the number of family dependents increases by 1%, on average, the non-paddy farm income of paddy households decreases by 0.05%. The standard error was 0.08 for the coefficient of a number of family dependents. This meant that a number of family dependents negatively affects non-paddy farm income in East Kalimantan, Indonesia, *ceteris paribus*. The increasing number of family dependents leads to more time to take care of family and hence, less time to work.

3.6. Number of non-paddy farm jobs

The paddy households in the study areas have two non-paddy farm jobs on average. The result of this study revealed that the number of non-paddy farm jobs has a very significant effect on non-paddy farm income of paddy households in East Kalimantan, Indonesia, *ceteris paribus*. This is similar to the findings of another study [10] which mentioned that job opportunity would affect different proportions of farm income. This implies that the more non-paddy farm jobs done by paddy households, the higher their income will be. Furthermore, the number of non-paddy farm jobs positively affects non-paddy farm income in East Kalimantan, Indonesia, *ceteris paribus*. Paddy households could possibly increase their income if they have other sources of income besides paddy farming. Consequently, various non-paddy farm jobs provide greater opportunities to increase income.

3.7. Number of non-paddy farm laborers

The result of this study revealed that a number of non-paddy farm laborers in the study areas vary from 1 to 6 persons with an average of 2 persons. Moreover, the number of non-paddy laborers has a very significant effect on the non-paddy farm income of paddy households in East Kalimantan, Indonesia, *ceteris paribus*. The finding of this study is in line with a previous study [6] which also found that the size of business (number of employees) has a positive and significant effect on gross business revenue. Furthermore, the number of non-paddy laborers positively affects the non-paddy farm income in East Kalimantan, Indonesia, *ceteris paribus*. This confirms the finding of a previous study [6] that showed the number of employees has a positive effect on gross business revenue. Non-paddy farm laborers contribute to household income through their wages, salary, and profit from their business.

3.8. Paddy farm income

The average of paddy farm income in East Kalimantan was IDR 13,487,069.21 year^{-1} [4]. The result of a previous study [15] indicated that labor cost, land cultivation cost, paddy farm size, and raw materials cost, individually, affect paddy farm income in East Kalimantan Province, Indonesia in a significant way. However, the result of this study showed that paddy farm income does not significantly affect non-paddy farm income of paddy households in East Kalimantan, Indonesia, *ceteris paribus*. This finding is in contrast to other studies [10,12]. This study found that paddy farm income negatively affects non-paddy farm income in East Kalimantan, Indonesia, *ceteris paribus*.

The source of household income of farmers in the Parigi Moutong Regency is from farming (rice and other plants and vegetables) and outside farming (from carpenter or building, opening a stall,

providing labor in the market or from motorcycle taxis). In addition, this study found farmers in East Kalimantan Province generate their paddy farm income mainly from their activities by the utilization of wetland fields, labor, and capital in paddy farming. On the other hand, the annual and perennial crops farming are mostly performed in dryland fields with different raw materials such as seeds, fertilizers, pesticides, and other agrochemical inputs. Some members of paddy households have different occupations such as employees, traders, and others who do not need land, but only labor and capital.

4. Conclusions and Recommendations

Eight socio-economics variables, namely 1) average age of laborers, 2) average experience in non-paddy farm jobs, 3) average working-days in non-paddy farm jobs, 4) land ownership, 5) number of family dependents, 6) number of non-paddy farm jobs, 7) number of non-paddy farm laborers, and 8) paddy farm income, are found to be a set of factors affecting non-paddy farm income of paddy households. Moreover, average working-days in non-paddy farm jobs, number of non-paddy farm jobs, and number of non-paddy farm laborers, partially, very significantly affect on non-paddy farm income of paddy households in East Kalimantan, Indonesia. The other five factors, partially, do not significantly affect on non-paddy farm income of paddy households. In addition, the average age of laborers, land ownership, number of non-paddy farm jobs, and number of non-paddy farm laborers, partially, positively affect on non-paddy farm income of paddy households whereas the other four factors, partially, negatively affect that in East Kalimantan, Indonesia.

Based on the results of this study, the effort to increase non-paddy farm income of paddy households in East Kalimantan, Indonesia, could be done more efficiently and effectively if considers the average working-day of laborers in non-paddy farm jobs, the number of non-paddy farm jobs, and the number of non-paddy farm laborers. The prior study [16] has made integrated planning to increase the total household income of paddy farmers in East Kalimantan, Indonesia. A program to increase non-paddy farm income of paddy households in East Kalimantan is the creating the paddy and non-paddy farm jobs with the activities such as the developing crops diversification and home industries that utilizes local resources, the setting up business, the developing public-private partnership, the developing regular maintenance of infrastructure such as economic, physical, capacity building, and services. The other program is the increasing family laborers through the activities such as the involving paddy household members in many activities to increase their skills, experience, and education, the employing household members in paddy farming and non-paddy farming, and the increasing business size.

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Abstract. Numerous studies in the past have discovered a number of socio-economic factors affecting individual income, household income, or non farm income. However, there is still limited information concerning the comprehensive analysis of factors which influence non-paddy farm income in East Kalimantan, Indonesia. The objective of this study was to determine the effect of eight socio-economic factors to the non-paddy farm income of paddy households. This study was carried out in East Kalimantan Province, Indonesia. The study areas were located in the Kutai Kartanegara Regency (Tenggarong Seberang, Loa Janan, and Muara Muntai), Penajam Paser Utara Regency (Babulu, Penajam, and Waru), and Bontang City (South Bontang and North Bontang). This study collected the data by conducting in-depth interviews with respondents. This study used the regression equation to analyze the data statistically. Eight variables are an average age of laborers, average experience in non-paddy farm jobs, average working-days in non-paddy farm jobs, land ownership, number of family dependents, number of non-paddy farm jobs, number of non-paddy farm laborers, and paddy farm income become a set of factors affecting non-paddy farm income.

1. Introduction

The total number of households in East Kalimantan in 2013 was 820,888; of which 180,614 (22.00%) were farmers and 83,564 (10.18%) were farmers of food crops [1]. Paddy farming is a major farming activity because as many as 84.08% of food crops farmers were paddy farmers (70,262 households)[2]. Meanwhile, there are members of the paddy household in East Kalimantan who cultivate annual and perennial crops besides paddy. Members of a household are also involving in other economic activities besides farming. All economic activities except the production of primary agricultural commodities are called the non farm economy [3]. The result of the previous study showed as many as 88.42% paddy households have members of the household who involve in non-paddy farm activities in East Kalimantan [4]. Members of the paddy household get non-paddy farm income from their involvement in non-paddy farming activities and it contributes to household income.

Despite the various non-farm activities, the level of labor income from paddy farmers households is still low. The agricultural household has income from business in the agriculture sector (46.69%) and other sectors (53.31%). The contribution of paddy farm income to a household income of paddy farmers (49.29%) is smaller than that of non-paddy farm income (50.71%) [4]. The nonfarm sector is hoped for reducing the income gap among rural households. It is needed for the study to find ways to increase the non-paddy farm income.

There was limited information on the comprehensive analysis of factors affecting non-paddy farm income of paddy households in East Kalimantan, Indonesia. Previous studies in some localities have discovered socio-economics factors that are related to the off farm income [5–7] including education [8]. Those previous researches examined the different combination of socio-economic factors. It did not found yet the previous research which studied a set of socio-economic factors that consisted of eight socio-economic factors were the average age of laborers, the average experience in non-paddy farm jobs, the average working-days in non-paddy farm jobs, the land ownership, the number of family dependents, the number of non-paddy farm jobs, the number of non-paddy farm laborers, and the paddy farm income. Those factors have chosen because they have a relation to the off-farm income such as the age of laborers [6,9], weekly work hours [6], landholding [7,9], number of dependents [5,9], and farm income [10]. Meanwhile, the other three factors were selected because this study assumed the average experience in non-paddy farm jobs, the number of non-paddy farm jobs, and the number of non-paddy farm laborers have the potential to affect non-paddy farm income.

Therefore, the objective of this study was to determine the effect of eight socio-economic factors to non-paddy farm income of paddy households in East Kalimantan, Indonesia. This study was designed to provide significant contribution particularly in terms of theoretical development to overcome the main issues concerning the increase of non-paddy farm income of paddy households in East Kalimantan, Indonesia. The result of this study could be deduced useful relevant information as foundation and guideline in agricultural development planning especially on what policies and decisions should be implemented to increase non-paddy farm income and also the household income of paddy farmers.

2. Methods

This study was conducted from November 2016 to April 2017. The location of this study was the Province of East Kalimantan, Republic of Indonesia. The study areas were located in Regency of Kutai Kartanegara (Tenggarong Seberang, Loa Janan, and Muara Muntai), Regency of Penajam Paser Utara (Babulu, Penajam, and Waru), and City of Bontang (South Bontang and North Bontang) as illustrated in Figure 1.

This study collected the data through in-depth interviews by using a questionnaire. The number of respondents was 252 paddy households. The purposive sampling was applied to select the households of paddy farmers that could be respondents.

The factors affecting non-paddy farm income of paddy households in East Kalimantan, Indonesia, were determined based on the result of multiple log-linear regression equation below:

$$\ln Y_i = \beta_0 + \beta_1 \ln X_{1i} + \beta_2 \ln X_{2i} + \beta_3 \ln X_{3i} + \beta_4 \ln X_{4i} + \beta_5 \ln X_{5i} + \beta_6 \ln X_{6i} + \beta_7 \ln X_{7i} + \beta_8 \ln X_{8i} + \varepsilon_i$$

where:

Y_i = non-paddy farm income (IDR year^{-1});
X_{1i} = average age of laborers (year);
X_{2i} = average experience in non-paddy farm jobs (year);
X_{3i} = average working-days in non-paddy farm jobs (day year^{-1});
X_{4i} = land ownership (hectare or ha);
X_{5i} = number of family dependents (person);
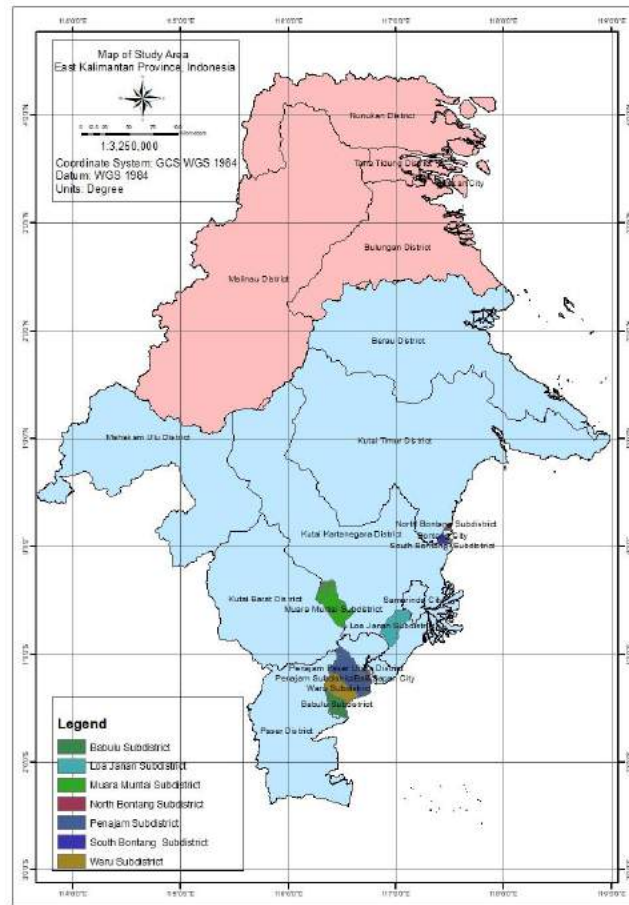X_{6i} = number of non-paddy farm jobs (number);
X_{7i} = number of non-paddy farm laborers (person);
X_{8i} = paddy farm income (IDR ha^{-1}cropping season (cs)$^{-1}$);
ln = natural log;
ε_i = error term.

The hypothesis of the simultaneous influence of eight socio-economic factors on non-paddy farm income of paddy households was tested by using the F test. Furthermore, the partial influence of each factor on the non-paddy farm income of paddy households in East Kalimantan would be determined from the results of the t-tests. This study also calculated the multiple coefficients of determination and the Durbin-Watson d statistics.

Figure 1. Study areas in East Kalimantan Province, Indonesia.

3. Results and Discussion

Non-paddy farm income is income from non-paddy farming jobs such as annual crops farmer, perennial crop farmer, employee, seller, fisherman, breeder of livestock, carpenter, and laborer. The findings of this study revealed that the average non-paddy farm income of paddy households in East Kalimantan was IDR. 20,920,464.31 year^{-1} (Table 1). The result of F test (Table 2) indicated that the formulated hypothesis in this study is accepted. This implied that the simultaneous usage of all independent variables, either increasing or decreasing, would influence the increase or the decrease of non-paddy farm income levels. Furthermore, the t values of the three variables were statistically significant at the 1% level. On the other hand, the other variables did not notably affect the non-paddy farm income of paddy households at both 1% and 5% levels.

The R^2 value was 0.4431, which meant that 44.31% of the variation or fluctuation in the non-paddy farm income of paddy households is influenced by the fluctuation of eight independent variables. This R^2 value in this study was higher than the prior study [7] who found the R^2 value of 0.29 for the effect of characteristics of farm household to non farm income. This study found an insignificant d statistic with the d value of 1.73. This meant that there was no presence of autocorrelation. The interpretation of this result is that the influence of an increase of one independent variable on its non-paddy farm income is not expected to affect the independent variables of another respondent.

Table 1. Descriptive statistics of factors affecting non-paddy farm income of paddy households in East Kalimantan, Indonesia.

Variable	Minimum	Maximum	Average	Standard deviation
Non-paddy farm income (IDR year^{-1})	1,500,000.00	86,700,000.00	20,920,464.31	15,174,179.81
Average age of laborers (year)	20.40	67.50	40.17	9.15
Average experience in non-paddy farm jobs (year)	1.00	40.00	10.22	7.88
Average working-days in non-paddy farm jobs (day year^{-1})	101.00	227.00	177.47	22.71
Land ownership (ha)	0.25	5.00	1.22	0.79
Number of family dependents (person)	1.00	5.00	1.88	0.84
Number of non-paddy farm jobs (number)	1.00	4.00	2.11	0.52
Number of non-paddy farm laborers (person)	1.00	6.00	2.46	0.89
Paddy farm income (IDR ha^{-1} cs^{-1})	341,500.00	10,123,333.00	4,668,720.82	2,221,847.19

Table 2. The results of regression on factors affecting non-paddy farm income of paddy households in East Kalimantan, Indonesia.

Variable	Coefficient estimate	Standard error	t value	p value
Intercept	19.89	1.70	11.74	0.00
ln Average age of laborers (year)	0.08	0.16	0.49^{ns}	0.63
ln Average experience in non-paddy farm jobs (year)	-0.05	0.04	-1.34^{ns}	0.18
ln Average working-days in non-paddy farm jobs (day year^{-1})	-0.70	0.26	-2.70**	0.01
ln Land ownership (ha)	0.08	0.06	1.25^{ns}	0.21
ln Number of family dependents (person)	-0.05	0.08	-0.59^{ns}	0.55
ln Number of non-paddy farm jobs (number)	1.56	0.14	11.28**	0.00
ln Number of non-paddy farm laborers (person)	0.40	0.11	3.76**	0.00
ln Paddy farm income (IDR ha^{-1} cs^{-1})	-0.08	0.06	-1.33^{ns}	0.18

n = 252; F value = 24.17**; * significant at 5%, p value < 0.05; **significant at level 1%, p value < 0.01; ^{ns} non significant; R^2 = 0.4431, d value = 1.73.

3.1. The average age of laborers

The average age of laborers in non-paddy farm jobs is calculated to be about 40.17 years old with 9.15 years old as its standard deviation. The age at which the laborers engages in non-paddy farm varies from 20.4 years old to 67.5 years old. The t value of the average age of laborers was 0.49 and the p value was 0.63. However, this number was not significant at the level of 1% and 5%. Therefore, this result shows that the average age does not have a significant effect on non-paddy farm income in East Kalimantan, Indonesia, *ceteris paribus* (holding other factors constant or all else being equal). This is contrary to the findings of a previous study [6], in which there is a significant effect of business owner age on the business gross revenue. The finding of that previous study [6] is supported by another study [9].

The coefficient of an average age of laborers was 0.08, which meant that if it goes up by 1%, the average income of non-paddy farms will increase by 0.08% with all else being equal. The standard

error was 0.16 for the coefficient of the average age of laborers. This result indicates that it has positive effects on non-paddy farm income of paddy households in East Kalimantan, Indonesia, *ceteris paribus*. This result is in line with the finding from the prior study [6]. The younger and elder laborers in non-paddy farm jobs have the opportunity to earn the same income level. Both shared common desires to obtain a higher income, which became a driving force for good work. Other than that, the age of a laborer is not a main consideration in salary/wages in most of the non-paddy farm jobs in the study areas. They receive wages, salaries or profits based on their working-days, productivity, education, and skills.

3.2. Average experience in non-paddy farm jobs

The members of households have an average experience of 10.22 years in the non-paddy farm jobs. Average experience in non-paddy farm jobs does not significantly affect non-paddy farm income of paddy households in East Kalimantan, Indonesia, *ceteris paribus*. This finding is similar to the prior study [11], which discovered that experience is not very influential to the paddy farming adoption process. The result of this study showed if the average work experience in non-paddy farm jobs has a negative effect on non-paddy farm income in East Kalimantan, Indonesia, *ceteris paribus*. This is similar to the result of another study [11] stating that farming experience has significant negative effects on the integrated pest management adoption.

Furthermore, an increase in work experience has a negative impact on labor income in some of the non-paddy farm jobs, although the effect is not significant. The result of this study showed if the average experience in non-paddy farm jobs goes up by 1%, the average amount of non-paddy farm income will go down by 0.05%, holding other factors constant. Experience of labor is not the main factor which determines how much income of laborer, however, the productivity of some labors has a dominant influence in determining the labor wage. On the other hand, the income of employees in government and non-government institutions varies according to the level of education. Their wage is between IDR 500,000.00 month^{-1} and IDR 3,000,000.00 month^{-1} or 21.06% and 70.13% of total household income. They receive monthly wages in the average of IDR 2,366,489.36 month^{-1} [4]. The employees who own a high level of experience and low level of education most probably would obtain fewer wages compared to those who have a low level of experience but a high level of education. A total of 47 persons in this study area (13.99%) works as employees in government institutions or non-government institutions or companies as teachers, administrators, drivers, security officers, etc [4].

3.3. Average working-days in non-paddy farm jobs

The average working-days in non-paddy farm jobs are 177.47 days year^{-1}. The finding of this study revealed that the average working-days in non-paddy farm jobs very significantly affects on non-paddy farm income of paddy households in East Kalimantan, Indonesia, *ceteris paribus*. This result resembles other researchers who found that weekly hours affect the gross business revenue. The average working-days in non-paddy farm jobs has a negative effect on the non-paddy farm income of paddy households in East Kalimantan, Indonesia, *ceteris paribus*. This result is contrary to a previous study [6] which identified the positive impact. The increase of work hours could degrade the quality of output which subsequently, impacts on the price of output and the opportunity to raise the income. The attempt to increase non-paddy farm income could be achieved if the workers work in such effective and efficient ways.

3.4. Land ownership

Paddy households in the study areas own land on average of 1.22 ha whereas the land ownership of paddy households in the range of 0.25 ha to 5.00 ha. In this study, land ownerships does not significantly affect non-paddy farm income in East Kalimantan, Indonesia, *ceteris paribus*. This result is in line with the findings from previous studies [7,10,12,13]. It contrasts with another study [14]. Land ownership is not considered as a dominant factor that causes the members of the household to be engaged in non-paddy farm jobs. Moreover, non-paddy farm jobs could be done in-small areas and not

in their own land. Land ownership positively affects non-paddy farm income of paddy households in East Kalimantan, Indonesia, *ceteris paribus*. The result is similar to the findings of some studies [7,12,14], whereas it is in contrast to the finding from another study [13]. The result meant the wider land, the bigger opportunity to own non paddy farm income.

3.5. Number of family dependents
A number of family dependents in paddy households is calculated at a minimum of 1 person and a maximum of 5 persons in East Kalimantan. The average number of family dependents is 2 persons. The t value of a number of family dependents was –0.59, and the p-value was 0.55, which was not significant at the 1% and 5% levels. Therefore, a number of family dependents do not significantly affect non-paddy farm income in East Kalimantan, Indonesia, *ceteris paribus*. This is similar to the findings from past studies [7,12]. However, this contradicts the findings by the previous study which mentioned that having more people living in a household indicates a greater burden on the work active individuals, expecting to increase the likelihood of participation in off-farm work.

The coefficient of a number of family dependents was -0.05, which measured the elasticity of non-paddy farm income with respect to the number of family dependents. Specifically, this number suggests that *ceteris paribus*, if the number of family dependents increases by 1%, on average, the non-paddy farm income of paddy households decreases by 0.05%. The standard error was 0.08 for the coefficient of a number of family dependents. This meant that a number of family dependents negatively affects non-paddy farm income in East Kalimantan, Indonesia, *ceteris paribus*. The increasing number of family dependents leads to more time to take care of family and hence, less time to work.

3.6. Number of non-paddy farm jobs
The paddy households in the study areas have two non-paddy farm jobs on average. The result of this study revealed that the number of non-paddy farm jobs has a very significant effect on non-paddy farm income of paddy households in East Kalimantan, Indonesia, *ceteris paribus*. This is similar to the findings of another study [10] which mentioned that job opportunity would affect different proportions of farm income. This implies that the more non-paddy farm jobs done by paddy households, the higher their income will be. Furthermore, the number of non-paddy farm jobs positively affects non-paddy farm income in East Kalimantan, Indonesia, *ceteris paribus*. Paddy households could possibly increase their income if they have other sources of income besides paddy farming. Consequently, various non-paddy farm jobs provide greater opportunities to increase income.

3.7. Number of non-paddy farm laborers
The result of this study revealed that a number of non-paddy farm laborers in the study areas vary from 1 to 6 persons with an average of 2 persons. Moreover, the number of non-paddy laborers has a very significant effect on the non-paddy farm income of paddy households in East Kalimantan, Indonesia, *ceteris paribus*. The finding of this study is in line with a previous study [6] which also found that the size of business (number of employees) has a positive and significant effect on gross business revenue. Furthermore, the number of non-paddy laborers positively affects the non-paddy farm income in East Kalimantan, Indonesia, *ceteris paribus*. This confirms the finding of a previous study [6] that showed the number of employees has a positive effect on gross business revenue. Non-paddy farm laborers contribute to household income through their wages, salary, and profit from their business.

3.8. Paddy farm income
The average of paddy farm income in East Kalimantan was IDR 13,487,069.21 year^{-1} [4]. The result of a previous study [15] indicated that labor cost, land cultivation cost, paddy farm size, and raw materials cost, individually, affect paddy farm income in East Kalimantan Province, Indonesia in a significant way. However, the result of this study showed that paddy farm income does not

significantly affect non-paddy farm income of paddy households in East Kalimantan, Indonesia, *ceteris paribus*. This finding is in contrast to other studies [10,12]. This study found that paddy farm income negatively affects non-paddy farm income in East Kalimantan, Indonesia, *ceteris paribus*.

The source of household income of farmers in the Parigi Moutong Regency is from farming (rice and other plants and vegetables) and outside farming (from carpenter or building, opening a stall, providing labor in the market or from motorcycle taxis). In addition, this study found farmers in East Kalimantan Province generate their paddy farm income mainly from their activities by the utilization of wetland fields, labor, and capital in paddy farming. On the other hand, the annual and perennial crops farming are mostly performed in dryland fields with different raw materials such as seeds, fertilizers, pesticides, and other agrochemical inputs. Some members of paddy households have different occupations such as employees, traders, and others who do not need land, but only labor and capital.

4. Conclusion and recommendation

Eight socio-economics variables, namely 1) average age of laborers, 2) average experience in non-paddy farm jobs, 3) average working-days in non-paddy farm jobs, 4) land ownership, 5) number of family dependents, 6) number of non-paddy farm jobs, 7) number of non-paddy farm laborers, and 8) paddy farm income, are found to be a set of factors affecting non-paddy farm income of paddy households. Moreover, average working-days in non-paddy farm jobs, number of non-paddy farm jobs, and number of non-paddy farm laborers, partially, very significantly affect on non-paddy farm income of paddy households in East Kalimantan, Indonesia. The other five factors, partially, do not significantly affect on non-paddy farm income of paddy households. In addition, the average age of laborers, land ownership, number of non-paddy farm jobs, and number of non-paddy farm laborers, partially, positively affect on non-paddy farm income of paddy households whereas the other four factors, partially, negatively affect that in East Kalimantan, Indonesia.

Based on the results of this study, the effort to increase non-paddy farm income of paddy households in East Kalimantan, Indonesia, could be done more efficiently and effectively if considers the average working-day of laborers in non-paddy farm jobs, the number of non-paddy farm jobs, and the number of non-paddy farm laborers. The prior study [16] has made integrated planning to increase the total household income of paddy farmers in East Kalimantan, Indonesia. A program to increase non-paddy farm income of paddy households in East Kalimantan is the creating the paddy and non-paddy farm jobs with the activities such as the developing crops diversification and home industries that utilizes local resources, the setting up business, the developing public-private partnership, the developing regular maintenance of infrastructure such as economic, physical, capacity building, and services. The other program is the increasing family laborers through the activities such as the involving paddy household members in many activities to increase their skills, experience, and education, the employing household members in paddy farming and non-paddy farming, and the increasing business size.

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