

Diversification of Farmer Income in West Java

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Abstract

Agricultural land has decreased the impact on farmers in meeting their needs. The transition to agriculture complicates industry in its effort to meet the needs of farmers. Another issue, climate change will disrupt plant crops that will result in inefficient farming. Farming inefficiencies are a reason for farmers to diversify. This study was based on a micro data survey data of agricultural enterprise household income in the Regencies / Cities of West Java on a household level. Limits of household income diversification of farming is when the household has to venture outside the agricultural sector or one of the cores and the sources of income comes from salaries / wages of laborers / employees outside the agricultural sector. The results showed that with the increasing age of the household head the diversity decreases, the higher the education of the head of household the more it encourages the diversification of income, the more the additional land area increases diversification, the easier access to credit for adding revenue diversification, increasing the income of farmers that tend not to diversify, the more houses and stairs in school which support farmers to diversify, the more productive the household income lowers with diversification.

JEL Classification: D31, O12, O13

Keywords: Climate Change, Diversify, Diversity of Income, Farming, Inefficiency

1. INTRODUCTION

Along with the time agricultural land area experienced a decrease more and more. The decrease impacts the farmers that have a hard effort in fulfilling their life needs. The transition of the farming sector to the industry sector closes the farming sector scope especially land problems so the farming sector does not run optimally. The farmer population becomes more burdened to obtain income. The Strategic Plan of the Ministry of Agriculture 2015-2019 has many serious concerns in the farming sector one of which is the land area that continuously experience decrease as a cause of productive land conversion to non agriculture use. Other than land problems, another farming problem in West Java is climate change that is not stable so it will disturb the crop farming agriculture which causes farming to be not efficient

The inefficiency of the agriculture causes farmers to search for income outside the primary business of farming for fulfilling routine needs neither everyday needs nor monthly. The businesses that they implement outside their primary business is usually named diversification. One of the reasons to implement diversification is that the needs increase continuously yet the income from the primary agriculture sector does not increase, so in the long term will cause poverty. Observed from the

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poverty rate (West Java Agricultural Census 2013), the agriculture sector is a sector that has the highest rate of poverty. Because of that income diversification of the agriculture business becomes the best alternative for fulfilling life needs. Based on figure 1, the highest level of poverty is able to be seen in the agriculture sector. A high percentage compared with other sectors indicates that less land, low income, the output price received by farmers are not compatible with the spending creates poverty levels to occur in the agriculture sector. This occurrence becomes a reason that many farmers implement diversification of their business which is for increasing income as a form for covering needs which increase continuously.

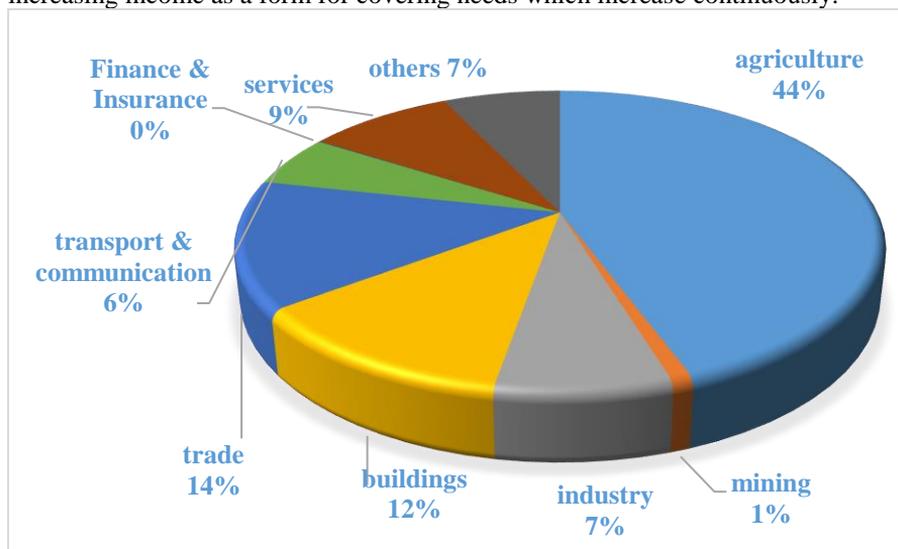


Figure 1 Poverty Based on Primary Income Sources (West Java Agricultural Census 2013)

The labor condition of agriculture in West Java (figure 2) experienced development that is fluctuated even occurring negative growth. The development of this agriculture sector is very alarming if observed from the long term point of view. The larger the population the higher the chance for agricultural land to switch functions to become housing complexes or places to live. A low productive age that works in the agriculture sector causes labor growth that fluctuates. The condition from the picture is able to become a reason why farmers implement land diversification.

Income diversification is often connected with risk treatment as a cause of income uncertainty. Because of that a business diversity needs to be implemented and there needs to be asset use to increase income or added value income for farmers. Generally farmers use agriculture diversification as a cause of agricultural land that decreases more and more.

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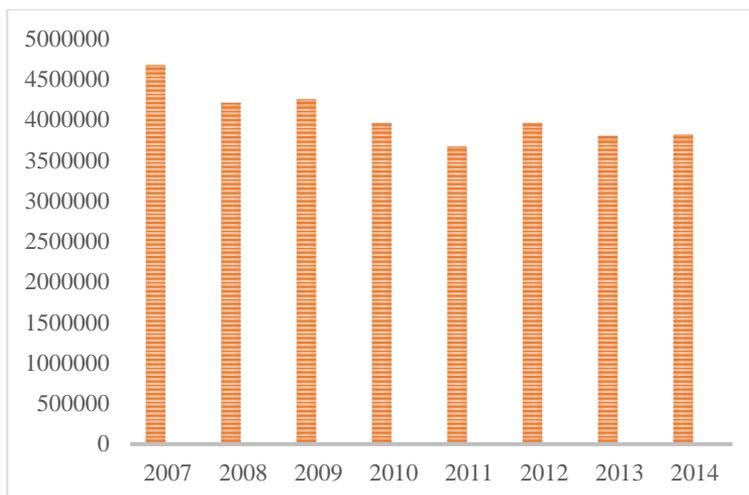


Figure 2 Agricultural Labor Force Aged 15 and Above in West Java Years 2007-2014

The low rate of agricultural land made the farmers add production cost so there needs to be credit access that supports the farmers to implement agriculture business diversifications. The social and cultural factor becomes important as the cause of diversification of farming. The obstacles faced are often as a cause of differences in skill and expertise that farmers have in implementing diversification so it will cause an inequality of income from the farmers.

Based on the background that is already explained this research has a purpose for analyzing the age factor and education of the heads of households, number of household members that still go to school and the number of household members of the productive age that influences agricultural business household income in West Java. Analyzing the land area that they have and credit access influences income diversification of business households and the amount of income per capita influences household income diversification of agricultural household business in West Java.

2. RESEARCH METHOD

The method used in this research is the descriptive analysis method, the research location is implemented in Regencies/Cities in West Java. The data used is secondary data in the form of micro data of agricultural business household income survey implemented by the Central Body of Statistics in the year 2013, this data is the form of cross section data in the household level.

Other data that are used are the Regional Gross Domestic Product, agricultural labor data and other supporting data. The limit of agricultural business household income diversification is if the household already has a business outside of the primary agricultural sector and one of the sources of income comes from the employee/labor salary/wage outside the farming sector.

$$Y_i = \beta_0 + \beta_1 Ar_i + \beta_2 Educ_i + \beta_3 Oa_i + \beta_4 Al_i + \beta_5 Ai_i + \beta_6 S_i + \beta_7 PA_i + e_i \quad (1)$$

Remarks :

Y_i : Dummy diversification respondent opinion i

- Ar_i : I respondent household head age (years)
 $Educ_i$: I respondent household head length of school (years)
 Oa_i : Land area owned by respondent i (m^2)
 Al_i : Dummy credit access respondent i
 Ai_i : Per capita agricultural income respondent i (thousands of rupiah)
 S_i : Total household members that still go to school respondent i (persons)
 PA_i : Total household members of the productive age, 15-64 years respondent i (persons)
 β_0 : Intercept
 $\beta_1-\beta_7$: Coefficient variable clarification
 e_i : Error term

The method that is used is the Binary Response (Logit) with a cross section data from 24.432 respondents that are agricultural business households in Regencies/Cities in West Java.

3. RESULTS AND DISCUSSION

Before implementing an analysis there are some implementations that are implemented a statistical test such as the determination coefficient and Z test. The determination coefficient value is as large as 0.1675 which means that the ability of the independent variable to influence the dependent variable is as large as 0.1675%.

So in this model, the dependent variable only explains as large as 0.1675% and 99.832% is explained outside the model.

The z test is implemented for observing the influence of each independent variable to the dependent variable in the logit regression model. This Z test result shows that all independent variables are significant, so individually these variables influence the dependent variable.

Data that is used is micro data which the samples are large enough, so whatever the value of the determination coefficient the result is able to be ignored (Woolridge, 2003). The regression count is able to be seen in the following table:

Table 1 The Regression Results

| Variable | Coefficient | Error Standard | Z Statistic | Prob | Marginal effect |
|----------|-------------|----------------|-------------|----------|-----------------|
| C | 0,9102 | 0,0989 | 9,20 | 0,000*** | |
| Ar | -0,0172 | 0,0013 | -13,55 | 0,000*** | -0,0029 |
| Educ | 0,0545 | 0,0051 | 10,67 | 0,000*** | 0,0094 |
| Oa | 1,22e-05 | 4,8e-06 | 2,53 | 0,011** | 2,10e-06 |
| Al | 0,6537 | 0,0755 | 8,66 | 0,000*** | 0,0130 |
| Ai | -6,7E-04 | 1,74e-05 | -38,59 | 0,000*** | -1,16e-4 |
| S | -0,1432 | 0,0196 | -7,28 | 0,000*** | -0,0248 |
| Pa | 0,6286 | 0,0159 | 39,31 | 0,000*** | 0,0109 |

Mc Fadden R Squared : 0,1675

Prob(LR Statistic) : 0,0000

Remarks : *** Significant at 99 %, ** significant at 95 %

Based on counting results with using the Logit regression which is observed from the marginal effect. The **household head age variable** has a value of 0.0029, every increase of 1 household head age, it will decrease the diversification change income as large as 0.0029%. As seen from this counting result, the more age increases the less chance for income diversification to be implemented.

The activities of younger households are larger compared with older households, as a cause of some factors such as health, motivation, and age. Younger age households do not depend too much on only agricultural land but older age households depend on agricultural land and the less motivation for implementing diversification (Demissie and Legesse, 2013) The more they age, the less the household head will implement business diversification. Business diversification needs a healthy condition and it is seen that younger aged household heads are more productive in implementing business diversification (Hardono and Saliem, 2004).

The variable value of **household head length of school** as large as 0.0094 (marginal effect) which means an increase of one year length of school of the household head will increase the diversification chance as large as 0.0094%. The role of education has a positive and significant influence to diversification. The education level is a proxy of human resource quality. The education increase will provide a better thinking of creativity so it has a chance for implementing business diversification (Hardono and Saliem, 2004).

The length of school of the household head is a determination of human resource quality increase in implementing work and reaching a higher chance of business. The higher the education level of the household head, the larger the chance of the household for implementing the income diversification.

Another variable which is **land area** which is as large as 2.0e06% in the marginal effect count, which means every increase of 1m², it will increase the business diversification as large as 2.0e06%. the influence of land area is not very large in implementing business diversification. According to Demissie and Legesse (2013), the low influence of land area to diversification is as a cause of the low condition of the land so farmers will implement diversification in non-farming businesses.

For **credit access** based on the marginal effect count which is as large as 0.0130. The credit access value explains that household agricultural business as large as 0.0130% have credit access compared with

Households that do not have credit access to implement income diversification. According to Reardon (1997) and Ellis (2000), a low level of credit access will hamper income diversification.

Several research mentioned that credit access has a positive and significant influence to income diversification (Oluwatayo, 2009). The research implemented by Demurger et al. (2009) explained credit access in North China has a positive influence to farmer household income diversification. The minimal amount of business land forces the farmers for implementing diversification by needing capital in implementing it.

Then the **farmer income** value based on the marginal effect count as large as -1.14e-4, so every increase of 1000 farmer income per capita will decrease the diversification chance of income as large as -1.16e-4%. In the presence of a tendency of farmer income increase, the farmers are not motivated for implementing diversification. According to Pieniadz et al (2009), if farmer income

has already fulfilled incentives that are desired, the passion for implementing income diversification will decrease. Based on this research, farming households in West Java when the incentives that are desired are reached, the chance to implement diversification decreases.

The **number of schooling households** variable seen from the marginal effect is able to be explained as an increase of 1 household member person that is still in school, there will be a decrease of income diversification as large as 0.0248%. The addition of a household member does not necessarily increase income diversification because the costs of the needs of one household member are still subsidized by the government. Generally members of agricultural business households in West Java are in the primary and junior high school level so the costs spent are not too large.

Then the **productive age household** that is seen from the marginal effect is able to be defined that every increase of 1 productive age household member will increase the chance of income diversification as large as 0.0190%. The members that are productive will influence significantly and positively to income diversification.

The presence of a number of household members that are active in the household increases the capacity and ability of the household to participate in several economic activities. This makes it possible for producing a better income than households with a limited number of active household members (Demissie and Legesse, 2013). Household members in the productive age (15-64 years) are considered as household members that are active and expected to be able to increase the income of the household. The more the members of the household are in the productive age, the larger the chance of the household for implementing income diversification.

4. SUMMARY

Based on the background which is already explained, this research has a purpose for analyzing the age and education factors of household heads, number of household members that are still schooling, and number of household members in the productive age that influences income diversification of agricultural business households in West Java. Analyzing the land area that is owned and credit access influences the diversification of agricultural household income and the amount of agricultural income per capita influences the diversification of agricultural business household income in West Java.

This research summarizes some results that are analyzed among others: **First** the age of the household head variable has a negative influence to income diversification. The more age adds the less the implementation of income diversification. Younger aged households are more motivated for implementing income diversification compared with older aged households. The old variable of school as an education proxy of household heads has a positive influence to income diversification. The higher the education the more creativity is implemented for business and motivated for implementing income diversification when the land area is less. **Second** the land area variable has a positive influence to income diversification with a coefficient value that is very small. So the addition of land area in West Java has little influence to income diversification. Credit access has a positive influence to income diversification. The low amount of land area makes

credit access important for implementing income diversification. Farmer income influences negatively to income diversification. Farmer income increase tend to not implement diversification. **Third** the schooling household variable has a negative influence to income diversification. The more households that go to school, it is expected for supporting agricultural business that becomes the livelihood without implementing income diversification, when the household is productive, the farmers will not implement diversification yet become more focused on tackling the agriculture business that is routinely done.

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