Factors that affect to ricefield conversion in Tasikmalaya, West Java, Indonesia

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Abstract: - Infrastructure and housing development have resulted in more agricultural land being converted. The purpose of this study is to describe the characteristics of rice farmers that are affected by land conversion and to analyze the factors that affect land. The study method is quantitative with 206 respondents from proportionate stratified random sampling. Data analysis techniques using PLS and descriptive analysis. The result shows the characteristic of the farmers: the most of farmers latest education are from elementary schools, have low income (once of harvest period is Rp. 1.607.000); majorities of farmers have narrow field (0, 23 ha): average of family members are 3; middle farming experience and sharecropper. Factors that affect to ricefield conversion consist of internal factors (age, education, income, the width of field, the member of family, sharecropper, agricultural business experience); external factors (the influence of the farmers around, heir system, investor); and policy factor (counseling and agricultural infrastructure).

Keywords: - internal factor, external factor, policy factor, land conversion.

Introduction

The increasing use of land for residences, businesses, public access, and other facilities will make the available land to be narrow. The emergence of a decrease in environmental quality will delay the balance of the ecosystem (Pewista and Rika, 2013). Continuously, people exploit the land without thinking of the available land. The available land is decreasing yet the need of food comes from the paddy field area. (Lailan, 2015). As a result, the farmer converts the function of the land.

The trend of land conversion doesn't only happen in the village area yet also happens in the urban area (Harini et al, 2012). The urban area is aimed to be the most efficient location for non-agriculture activity because of the availability of infrastructure and other supporting facilities. (Benu et al, 2013). Land conversion in the urban areas causes the urbanization process continuously increase because

of the adequate facility. The development of the city tends to a construction road and housing as well as the development of the industry. According to Irianta (2008), the impact of industrial development is the reduction of green open space because many of large trees are cut down and a lot of lands is built thus reducing water infiltration into the ground as well as industry attracts investors to invest because regions that have a lot of industries will increase its income.

Conversion of agricultural land is happened in some cities in Java which are the center of economic and industrial growth where there is high pressure on agricultural land due to the need for non-agricultural land use such as for infrastructure (Widiatmaka et al, 2016). Land conversion makes farmers lose their livelihoods, reduced food supply, and increased poverty due to many farmers who cannot work in non-agricultural fields. Farmers have no other skill instead of farming so that they cannot work in other sectors.

Tasikmalaya is one of the cities that has the highest paddy field area among other urban areas in West Java by a total land area of 5,904.40 ha in 2016, which means that the agricultural sector in Tasikmalaya is still the main business activity of the community (Central Statistics Agency, 2017). Having the highest area of paddy field does not mean that Tasikmalaya is inseparable from the phenomenon of land conversion. Tasikmalaya is one of the cities that experienced the conversion of agricultural land. The rapid region development is one of the causes of the City of Tasikmalaya experiencing land conversion due to the increasing land requirements. Tasikmalaya is a supporting area and economic center for the surrounding areas such as Tasikmalaya, Ciamis and Banjar Regencies so that the investment is considered promising which causes land conversion. Land conversion has become an unavoidable phenomenon in Tasikmalaya except for the Kawalu district and Bungursari district which have not experienced a conversion of agricultural land. The total reduction in agricultural land in Tasikmalaya is 53 ha. The reduction of paddy fields in several sub-districts is aimed at developing urban areas. More land conversion occurred in 2016 due to increased demand in non-agricultural fields.

Paddy field conversion is not only seen at the provincial and city-level but at the national level. The national level of paddy fields in 2012 to 2015 decreased by 394 ha (81,323 ha to 80,929 ha). In 2016 there was a growth of 1.16% to 81,865 ha. The level of West Java Province has decreased continuously until 2,659.9 ha. The urban and provincial levels have decreased the area of paddy field s that have been converted to non-agricultural needs. The national paddy field area tends to

decrease. The decreasing area of paddy fields is due to the higher non-agricultural needs and using paddy fields as construction development needs. This study aims to 1) describe the characteristics of rice farmers, and 2) analyze the factors that affect land conversion.

Research Methodology

The study was designed quantitatively using survey techniques. The place of study was conducted in the City of Tasikmalaya, West Java in May 2019. The research variables consisted of factors that affect land conversion. The number of respondents was 206 rice farmers. The sampling technique is conducted by proportional stratified random sampling. Data collection techniques namely primary data are obtained through interviews using a questionnaire. Secondary data were obtained from the agriculture service, agriculture instructor and the Central Statistics Agency. Characteristics of farmers using descriptive statistical analysis. Factors that affect land conversion using PLS (Partial Least Square) analysis.

Result and Discussion

Rice Farmer Characteristic

The characteristics of farmers studied were age, level of education, farm income, and land area, number of family dependents, farm experience, and land ownership status. The following explanation:

1. Age

Age is one of the factors that affect the agricultural sector. The youngest age of the farmer is 29 and the oldest one is 88 years old the average age of the farmers is 57 years old, in group 53-64 years old is a productive group.

Table 1. Composition of Farmers Age

No	Age (yo)	total (people)	Percentage (%)
1	29 – 40	18	8,74
2	41 – 52	52	25,24
3	53 – 64	75	36,41
4	65 – 76	54	26,21
5	77 – 88	7	3,40
	total	206	100,00

According to (2013), productive people are 15-64 years old. Te productive age is an ideal age for working and having a greater ability to understand innovative information and technology about agriculture. The majority of farmers who get government support are productive farmers because they have strong muscular work and sensory function very well so that it affects the performance

to absorb something new to develop more innovative farming business.

2. Education Level

Education level is the level of formal education that is taken by farmers and measured by the length of time taking formal education. Farmers only take formal education.

Table 2. Composition of Formal Education

No	Formal Education	Total (People)	Percentage (%)
1	Not pass SD	0	0,00
2	SD	182	88,35
3	SLTP	11	5,34
4	SMA	13	6,31
5	University	0	0,00
	Total	206	100,00

The level of formal education is dominated by elementary school level. Education taken by farmers is relatively low. Education brings good influence in terms of mindset and attitudes that is transmitted to other members, according to Hendrik (2014) the higher the education the higher the mindset and reasoning power. Educated farmers will increase their understanding, insight, access to

information so that they are more advanced and developed.

3. The income of Paddy Business

According to Gustiyana (2004), farm income is the difference between gross income and production costs in one planting season. The economic value that is received by farmers in farming can be used for consumption and investment.

Table 3. The income of Paddy Business

No	Income/MT (Rp)	Total (people)	Percentage (%)
1	< 2.502.000	164	79,61
2	2.503.000 – 4.961.000	30	14,56
3	4.962.000 – 7.419.000	10	4,85
4	7.420.000 – 9.877.000	1	0,49
5	> 9.878.000	1	0,49
	Total	206	100,00

Most farmers have low income in one planting season (4 months) due to experiencing crop yields and declining grain prices. Farm income between Rp. 7,420,000-Rp. 9,877,000 and >Rp. 9,878,000 where farmers work on their field and others field in large land areas. The average income of farmers in one planting season is Rp. 1,607,000 with 0.42 ha. Farm income every month Rp. 401,750 with the price Rp. 4,000 /kg. The current price of rice is Rp.

4,000 (the lowest price of rice). If the quality of the rice is good, the price of rice is Rp. 5,000. Low prices affect the income of farmers.

4. Land Area

The land is a resource which is the main production factor in supporting farming. Land area is the size of arable crop field that is cultivated by farmers to plant paddy.

Table 4. Composition of Arable Crop Field

No	Arable Crop Field (Ha)	Total (People)	Percentage (%)
1	Narrow (< 0,5)	146	70,87
2	Moderate (0,5-2)	58	28,16
3	Wide (> 2)	2	0,97
	Total	206	100,00

The majority of farmers working on <0.5-hectare farmland are included in the narrow arable crop field. Farmers have been working on paddy for a long time with a rice crop pattern. The arable crop field> 2 ha is 0.97% because farmers work on their land plus other people's land. According to Hernanto (1996) classifying the area of arable crop field into narrow arable crop field (<0.5 ha); **Table 5.** Number of dependents family

moderate arable crop field (0.5-2 ha); large arable crop field (> 2 ha). The area of farming land will determine income.

5. Number of dependents family

The number of family dependents is the number of family members who are dependent on the farmers in fulfilling their daily needs.

No	Number of dependents family (people)	total (people)	Percentage (%)
1	8 – 9	2	0,97
2	6 – 7	2	0,97
3	4 – 5	87	42,23
4	2 – 3	113	54,86
5	0 – 1	2	0,97
	total	206	100,00

The number of dependents of the family that dominates is 2-3 people. The average number of dependents of farmers' families is 3 people. The age composition of farmers is an average age of 57 years old where the age of the farmer has a dependent wife or wife with one child who is not married. More dependents will result in high total expenses. According to Martianto and Ariani (2004), family size will affect household

consumption expenditure and income. A large number of family dependents motivates farmers to be more active in doing farming business and fulfill the needs of family dependents.

6. Farming business experience

Farming business experience is the period that the farmers start the farming business from the beginning.

Tabel 6. Farming Business experience

No	Farming Business experience (th)	total (people)	Percentage (%)
1	1 – 10	71	34,47
2	11 – 20	79	38,35
3	21 – 30	44	21,36
4	31 – 40	7	3,40
5	41 – 50	5	2,42
	total	206	100,00

The average farming business experience is 17 years shows farmers have enough knowledge and experience so that paddy can grow well. According to Hendrik (2014), the experience is a knowledge of someone and it is decided from the learning result

during their life. Learning to see the experience of other farmers is important because it is a good way to make a decision.

7. Land ownership status

Land ownership Status consists of owned land, rent land, pawning land, share land (sakap) that is

Tabel 7. Composition of ownership land Status

No	Arable Crop Field Status	Total (People)	Percentage (%)
1	other	0	0,00
2	pawning	1	0,49
3	Sharing	180	87,37
4	Rent	1	0,49
5	Owned	24	11,65
	total	206	100,00

Interesting land status is sakap land. The area of sakap land (land that is cultivated not by the owner's farmers) increased from 0.01 to 2 ha. Most of the land is guntai land. According to Harsono (2007), Guntai land is a land area that is located outside the area of the landowner's residence. Jakarta, Ciamis, and Bandung. Landowners are rarely present to help on their land. The landowner entrusts the land for someone to manage (sharecropper) and only receives the harvest according to the agreement with the manager. Farming capital that is approved for sharecroppers and produces the capital needed for farming capital that is not balanced with maximum yields.

Factors that affect land conversion

According to Tri (2009) the process of conversion of agricultural land to non agricultural uses are caused by factors:

1. External factors are factors that are caused by urban, demographic and economic growth.
2. Internal factors that look more closely at the socio-economic conditions of agricultural households.
3. Policy factors are aspects of regulations that are issued by the central and regional governments with the agricultural land conversion. Its weaknesses are related to legal force, sanctions for violations, and accuracy of land that is prohibited from being converted.

Internal factors that affect land conversion are age, education, income, land area, family responsibility, farming experience, and land ownership status. External factors are the influence of surrounding farmers, the inheritance system, and the influence of

cultivated by sharecroppers of paddy farming business

investors. The land conversion policy consists of LP2B counseling and agricultural infrastructure. Looking at the factors that affect land conversion in the City of Tasikmalaya, West Java, it is conducted by analyzing the Partial Least Square (PLS) by looking at the measurement scale of each different indicator.

1) Evaluation of the Measurement Model

Measurement evaluation is used to determine the validity and reliability of indicators that measure latent variables. The validity test refers to the amount of outer loading of each indicator against latent variables. Evaluation of indicator measurement models includes item reliability, composite reliability, average variance extracted, and discriminant validity. The first three measurements are grouped in convergent validity.

- **Convergent Validity**

Convergent validity is used to measure how much the existing indicators can explain the dimensions. It means that the greater the convergent validity, the greater the dimension's ability to apply latent variables. The test of convergent validity are:

1. Reliability Item

Reliability items are usually called indicator validity. The testing of item reliability can be seen from the value of the loading factor (standardized loading). The loading factor value is the correlation between each indicator and its construct. The loading factor value> 0.7 can be said ideal means that the indicator can be said to be valid as an indicator to measure constructs. Nevertheless, a standardized loading factor> 0.5 can be accepted. A

loading factor value <0.5 was removed from the model (Ghozali, 2014). Each valid indicator explains each of the latent variables, namely internal factors, external factors, land conversion policy factors, and the level of land conversion. The loading factor shows the contribution of each indicator to the factor.

Internal loading factors, the indicators that have the greatest loading are the level of education and land ownership status worth 0.857. It shows the level of education and land ownership status has a great influence on land conversion. The higher the level of education, the opportunity for farmers to do a land conversion is smaller. The majority of farmers' final education level reaches elementary school level. According to Sasmito (2000), the high or low level of education will determine the decision of whether or not to convert the land. Low education level, farmers will easily do the conversion of land. Land ownership status factors where urgency needs are needed to be fulfilled, forcing farmers to convert some of their lands. According to Sumaryanto (2010) part of the process of releasing the status of ownership of land related to being sold. The selling of land ownership rights has more to do with economic aspects.

In terms of external factors, the indicator that has the greatest loading is the influence of surrounding farmers, which is 0.933, which means that the influence of surrounding farmers has a large influence on land conversion. This is because nearby farmers who sell paddy fields will provide opportunities for other farmers to sell or convert their land. Some farmers are influenced by other farmers who change the function of paddy fields to become a school for the advancement of their children's education. According to Pantjar and Irawan (2003), the influence of neighbors who do a land conversion is a process that is progressive in nature and spatially and can occur due to infectious symptoms (epidermis) on land conversion.

The policy factor for land conversion, the indicator that has the highest loading is LP2B counseling worth 0.931. LP2B counseling has a major impact on land conversion. According to Wijayanti (2016), the frequency of the instructor will help farmers and the government. The frequency of instructor visits to the land each month is grouped into low (0-1 times/month), moderate (2 times/month), and high (> 2 times/month). The more intense the instructor comes, the more understanding the farmer with the information given. LP2B counseling has not been fully socialized to farmers and material is given in general. The frequency of instructor visits is relatively low. the instructor will come if there are problems in the field and during the distribution of aid. The motivation of farmers to discuss with the instructor is still low so that land conversion is still happening.

2. Composite Reliability

The statistics used are Cronbach's alpha and D. Gho (PCA) where values> 0.7 indicate the constructed value has high reliability as a measurement tool. A limit value of> 0.7 means can be acceptable and> 0.8 means very satisfying (Yamin, 2011).

Table 8. Composite Reliability results

	Composite Reliability
X_1	0,918
X_2	0,851
X_3	0,857

The value of composite reliability for internal factors, external factors, land conversion policy factors and the level of land use have a composite reliability value> 0.7 so that reliability is called to be a measurement tool. The value of internal factors (X_1) is 0.918; external factors (X_2) of 0.851; and land conversion policy factor (X_3) of 0.857. Means that all factors have a reliability value.

3. Average Variance Extracted (AVE)

AVE illustrates the magnitude of the variance that items can explain compared to the variance that is caused by measurement error. AVE value> 0.5 so that the construct has good convergent validity. it means latent variables can explain an average of more than half the variance in the indicators.

Table 9. Results of AVE

	AVE
X_1	0,618
X_2	0,667
X_3	0,751

AVE values for internal factors (X1), external factors (X2), and conversion policy factors (X3) above have values> 0.5 so that the construct has a good convergent validity where latent variables can explain an average of more than half the variance from the indicators. Internal factors can explain an average of more than half the variance of 0.618 from the indicators, as well as other variables. Discriminant Validity

The examination is seen from the reflective measurement model which is assessed based on cross-loading and compares the AVE value with the square of the correlation between constructs. The size of cross-loading is to compare the correlation of indicators with their constructs and those of other blocks. Good discriminant validity can explain higher indicator variables rather than explain variants of other construct indicators.

Table 10. Discriminant Validity

	X_1	X_2	X_3	Y_2
$X_{1.1}$	0,685	0,542	0,636	0,494
$X_{1.2}$	0,857	0,460	0,753	0,627
$X_{1.3}$	0,716	0,272	0,547	0,393
$X_{1.4}$	0,813	0,310	0,626	0,491
$X_{1.5}$	0,817	0,759	0,785	0,713
$X_{1.6}$	0,739	0,379	0,606	0,555
$X_{1.7}$	0,857	0,844	0,837	0,753
$X_{2.1}$	0,709	0,933	0,731	0,754
$X_{2.2}$	0,412	0,541	0,392	0,113
$X_{2.3}$	0,612	0,916	0,582	0,598
$X_{3.1}$	0,787	0,719	0,931	0,734
$X_{3.2}$	0,793	0,495	0,797	0,557
$Y_{2.1}$	0,767	0,693	0,758	1,000

Age factors (X1.1), level of education (X1.2), farm income (X1.3), land area (X1.4), family dependents (X1.5), farming experience (X1.6), and status land ownership (X1.7) has a higher discriminant validity value on internal factors (X1) than external factors (X2), land conversion policy (X3), and land conversion rate (Y2). Indicators of the influence of farmers around (X2.1), inheritance system (X2.2), and investor influence (X2.3) are higher on external factors (X2) than internal factors (X1), land conversion policy (X3) and land conversion level (Y2), and so on. The loading factor value of each indicator has a higher correlation with the variable compared to the other variables that indicate the placement of the indicators on each variable is correct.

2) Evaluating Model Structural

There are several stages in evaluating structural models. The first is to see the significance of the influence between the constructs of the path coefficients which illustrate the strength of the relationships between constructs.

- **Path coefficient**

Seeing the significance of the impact between constructs can be seen from the path coefficient. Signs in the path coefficient must be following the hypothesized theory were to assess the significance of the path coefficient seen from the t-test (critical ratio) obtained from the bootstrapping process (resampling method).

The greatest path coefficient value on the internal factor (X1) is the land ownership status of 55.121 meaning that the land ownership status factor has the biggest and significant influence on the land conversion. According to Furi (2007), land conversion changes the status of land ownership. In line with this opinion, landowners have full authority over their land. If there is an urgent need, the landowner will sell or convert the paddy fields. The smallest path coefficient value is farm income with a value of 14.469 because some farmers have side income, namely stalls in the area of houses, construction workers, self-employed and workshop businesses so that income increases. According to Gustiyana (2004), household income is obtained from farming business plus income from non-farming activities so that farmers' income increases.

External factors (X2), the greatest value of the path coefficient is the influence of farmers around 102.294. The influence factor of the surrounding farmers has the biggest and significant influence on land conversion. Nearby farmers who convert land to non-agricultural land will influence other farmers to convert their agricultural land due to pressure. According to Siti et al (2017), the selling price of land that is offered is quite high, the easier it will be for farmers to decide to convert their land. The smallest path coefficient value on external factors is the inheritance system with a value of 6.289. According to Prilly (2018), the inheritance system does not affect because farmers have not thought in the direction of land inheritance. Farmers do not always stick to the rules of the land inheritance system because many young people move to the city so that farmers struggle in the land inheritance system and entrust their land to someone worthy.

The land conversion policy factor (X3), the largest path coefficient value is LP2B counseling with a

value of 147.155. It means that the lack of LP2B counseling has the greatest and significant impact on land conversion. LP2B counseling has not been fully socialized to farmers because according to the instructor, LP2B has not yet been fully obtained. LP2B has not socialized in detail, it has resulted in farmers having the opportunity to convert their land. According to Sugandi et al (2012), a non-economic factor that significantly affected the conversion of paddy fields was a lack of counseling intensity. The lower the intensity of counseling, the higher land conversion. The value of the path coefficient of land use level at the level of land conversion (Y2) is 0,000.

Test criteria are rejected Ho if t hitung>t table. Table t is obtained from table value $\alpha = 0,05$ and dk= n-2 = 206-2 = 204 so that t table is 1,972. Statistic t value of internal factor (X1) on the level of land conversion (Y2) for 4,038; external factor (X2) for 3,893; land conversion policy (X3) for 2,074. Comparing with t table, it shows t hitung of 3 factors > t table so that Ho is rejected. The conclusion there is the significant impacts of internal, external factors and other land conversion policies on land conversion levels. The amount of internal factor level on land conversion level is 0,184; external factor 0,215; and land conversion policy factor 0,103. A positive path coefficient indicates better internal factors, external factors, and land conversion policies, the better the land conversion level.

- **Evaluating R^2**

The following R^2 value from farmer respondent in controlling land conversion (Y1) and land conversion level (Y2):

Table 12. Result R^2

	R^2
Y1	0,526
Y2	0,407

Internal Factor (X1), external (X2) and land conversion policy (X3) can explain the respondent in controlling land conversion (Y1) is 0,526 (52,6%) while the rest is 47,4% from another construct. The

impact of controlling land conversion (Y1) to land conversion level (Y2) is40, 7%.

- **Goodness Of Fit (GoF)**

GoF is used to validate all models (Yamin, 2011). GoF index is a single measure of a combination of measurement models and structural models. The GoF value is obtained from the average communalities index multiplied by R^2 value.

Tabel 13. Average Communalities Index

	AVE	R Square
X_1	0,618	
X_2	0,667	
X_3	0,751	
Y_1	0,672	0,526
Y_2	1,000	0,407
Rata-rata	0,742	0,466
Gof	0,588	

The average communalities are 0.742. This value is then multiplied by R2 and rooted. The calculation results show a GoF value of 0.588 over 0.36 so that it is categorized as a large GoF, meaning that the model is very good (has a high ability) in explaining empirical data.

Conclusion

Based on the result are gotten

1. The majority characteristics of rice farmers in Purbaratu Subdistrict are 53-64 years old, the land area of the majority farmers are narrow category (<0,5ha) for 70,87 %, the majority of respondent education is 88,35 % have finished SD, the majority of respondent has farming business experience for 38,35 % between 11 until 20 years, the highest number of family dependent is in range 2-3 people for 54,86 %, paddy business income is less than from Rp. 2.502.000, - for 79,61%, and the ownership status is dominated by sharecropper.

2. Factors that affect to the level of farmland conversion of farmers level In Tasikmalaya consist of internal factor (age, level of education, land area, family dependent, farming business, and land ownership status) external factors (influenced of surrounding farmers, inheritance system and investor influence); and land conversion policy factor (LP2B counseling and agricultural infrastructure). The three factors have a significant impact on land conversion.

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