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ANALYSIS OF ECONOMIC EFFICIENCY FOR USE OF PRODUCTION AND INCOME FACTORS IN LOCAL CORN FARMING IN WEWIKU DISTRICT OF MALAKA REGENCY, EAST NUSA TENGGARA, INDONESIA

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ABSTRACT
Corn (Zea Mays L.) is the second food commodity after rice as a source of calories or rice food, besides that also as animal feed. This study aims to (i) Analyze the influence of production factors (land area, seeds, labor, and pesticides) on corn production in Wewiku District, Malaka Regency; (ii) Analyzing the level of economic efficiency using the factors of production of corn farming in Wewiku District, Malaka Regency; (iii) Analyzing income earned by farmers from Corn farming in Wewiku District, Malaka Regency. The study was conducted in Alkani Village and Seserai Village Kecmatan wewiku Malaka Regency with a survey method and the number of respondents was 90 farmers. The results showed that the analysis with the production function of the Cobb-Douglas model of variable land area, seeds, labor, fertilizers and pesticides together pushed significantly towards local maize production. The influence of each factor of production shows that local maize production has a significant effect on land area and pesticide variables, while seeds, labor and fertilizers are not real to local maize production. Economically the use of variable land area and pesticides on local corn ushatani is not yet efficient, and the use of variable seeds, labor and fertilizers is inefficient. The income of local corn farming in Wewiku District in the planting period from November 2018 to February 2019 is Rp 2,698,355 / 0,155 ha / MT.

KEY WORDS
Efficiency, income, corn, farming.

Indonesia is an agricultural country; most of Indonesia's population is domiciled in rural areas and has a livelihood in the agricultural sector. Until now, the agricultural sector is a major sector in people's lives in Indonesia. The agricultural sector still plays an important and strategic role in national ownership. Based on data from the Indonesian Central Statistics Agency (2018), in 2016 maize production in Indonesia amounted to 20,700 tons, while in 2017 corn production was 25,700 tons, and an increase of 5,000 tons. The corn production centers in Indonesia are East Java, Central Java, Lampung, South Sulawesi, North Sumatra, West Java, West Nusa Tenggara, Gorontalo and East Nusa Tenggara BPS (2017).

Corn (Zea Mays L) is the second food commodity after rice as a source of calories or food substitute for rice, besides that also as animal feed. For residents of East Nusa Tenggara (NTT) Corn is a superior agricultural commodity in the region because it is used as a staple food for the majority of the population so that maize is cultivated from the lowlands to the mountains to meet the regional demand for maize, which increases annual crop productivity. There are several important factors so that corn productivity in East Nusa Tenggara (NTT) can continue to increase, namely (1) planting area, (2) modern farming patterns, (3) fertilizer use, and (4) use of superior seeds.

The province of East Nusa Tenggara (NTT) is the number nine center for corn production in Indonesia after East Java, Central Java, Lampung, South Sulawesi, North Sumatra, West Java, West Nusa Tenggara and Gorontalo (BPS, Indonesia 2017). Corn production in East Nusa Tenggara (NTT) has fluctuated over the past five years. According to the East Nusa Tenggara Statistics Agency 2013-2017 (BPS, NTT 2013-2017) the highest corn productivity in 2013 was 2.62 tons / ha with a harvest area of 270,344 ha and production of 707,638 tons. In 2014 corn productivity was 2.52 tons / ha with a harvest area of 257,025 ha and production of 647,108 tons. In 2015 corn productivity was 2.51 ha / ton with harvest area of 273,194 ha and production of 685,081 tons. In 2016 maize productivity was 2.59 tons / ha with harvested area of 265.318 ha and production of 688.452 tons, and in 2017 corn productivity was 2.591 ha / ton with harvest area of 311,322 ha and production of 806,846 tons. The average productivity of corn at the level of farmers in East Nusa Tenggara (NTT) is still very low, between 2.62-2.59 tons / ha (BPS NTT). The low productivity of corn occurs because generally farmers still plant local varieties that have not been replaced with superior varieties for a long time and are attributed by several factors between other farmers who have not been efficient in allocating production inputs used in farming as well as easy farming and technology development. So it produces less than optimal production and this will be profitable for farmers. Soekartawi (2016), said that the choice of the combination of the use of seeds, fertilizers, labor, optimal medicines will get maximum results. According to Saptana's research (2011), the level of allocation of the use of production factors by farmers to the amount of production produced, the level of production, and can provide an overview of the level of efficiency obtained by farmers.

Productivity of crop yields is consumed by drought stress. The same thing happened to corn plants. Drought that occurs in each phase of growth will decrease. The initial growth phase and flowering phase are the most sensitive phases of drought stress. When drought occurs in the initial growth phase can cause plant growth to be blocked (dead). Whereas when drought occurs in the flowering phase, it causes the female flower to reverse faster than the male flower, thus minimizing the chances of successful pollination and causing an increase in seed production.

Malaka Regency is one of the corn producing districts in East Nusa Tenggara (NTT) Province. The sub-districts in the Malacca District are all corn plants. Corn grown by farmers uses local varieties of Lamuru with two types, namely white corn and yellow corn. Wewiku Subdistrict is one of the Districts in Malaka District which has the potential to develop corn, which can be seen from extensive land, production and productivity. Corn production in Wewiku District has increased over the past five years. According to the Malaka Regency Central Bureau of Statistics in 2013-2017 (BPS, Malaka Regency 2013-2017) the highest productivity was achieved in 2015, which was 3.29 with a land area of 1,521 ha and 5,019 tons, while the lowest productivity in 2016 was 2.89 with a harvest area of 1,057 ha and production of 3,065 tons. The low productivity of maize is predicted by heterogeneous heterogeneous heterogeneity promoted using the farmers' own crop hereditary on a limited scale (inbreeding).

The research objectives are (1) Analyzing the influence of production factors (land area, seeds, labor, and pesticides) on corn production in Wewiku District, Malacca District. (2) Analyzing the level of economic efficiency using the factors of maize farming production in Wewiku District, Malaka Regency and (3) Analyzing the income earned by farmers from Corn farming in Wewiku District, Malaka Regency.

METHODS OF RESEARCH

Research has been carried out in Alkani and Seserai Villages, Wewiku Sub-District, Malaka Regency, East Nusa Tenggara (NTT) for two months, namely February and March 2019, with survey methods. Determination of samples is done by Simple Random Sampling obtained by 90 local corn farmers. This study uses secondary data and primary data. Secondary data was obtained from other existing sources and from the Indonesian Ministry of Agriculture, Malacca District Agriculture, Plantation and Forestry Agency, and Central Statistics Agency. Primary data was obtained from the respondents' farmers using a questionnaire. Data collected using: farmer identity, capital use, corn farming planting season period November 2018 - February 2019 (use of seeds, fertilizer, pesticides, labor, and other uses of corn farming), production and post-harvest processing, management and marketing.

The data analysis used in this study is quantitative analysis based on primary and secondary data from the results of the study. Quantitative analysis is carried out using analysis of production and efficiency of the use of economic factors, and analysis of farm income. Analysis was carried out with Microsoft Excel and SPSS 16 Statistical Products and Services Solutions.

The first objective: Analyzing Production Factors that Affect the Production of Corn Farming.

The analytical method used to study the effect of factor-use on corn production is the production function of the Cobb-Douglas model.

$$Y = Ax1b1, X2b2, X3b3, X4b4, X5b5e^{u}$$

To output the parameters, the equation must be transformed in the form of a natural double logarithm (1n) into a multiple linear form, as follows:

$$Ln\ Y = 1n\ a + b1\ 1n\ X1 + b21nX2 + b31nX3^{b} + b41nX4 + b5\ 1nX5 + u$$

Where: Y variable is local corn production (kg), X1 land area (ha), X2 seed (kg), X3 labor (HOK), X4 manure (kg) and X5 = pesticide (lt), u = estimation deviation, a = constant, b1,2, ...5 = regression coefficient. The independent variable influences the production results in the above model using the F test and t test (Ghozali, 2011).

Second Objective: Analyzing the Economic Efficiency Level of Using Production Factors in Corn Farming. According to Asmara (2017), the concept of technical efficiency is related to the production theory that discusses the maximum product that can be obtained from each use of certain combinations. Technical efficiency can produce maximum for each input use, but if it is not fulfilled it results in ineffectiveness use of these input combinations. According to Dewi et al. (2018), the production factor does not achieve technical efficiency with the value of production elasticity depending on the number one.

Technical efficiency requires or requires a production process that can use fewer inputs to produce the same amount of output (Millier & Meiners in Suprapti et al., 2014). Technical efficiency reflects the ability of farmers to obtain maximum results from a certain number of inputs. A farmer provides technically efficient from farmers if it can produce greater output at the level of use of smaller inputs at the same technological level, also provided more efficiently than other farmers, if it produces the same output.

If the production function used is the Cobb-Douglas production function model, then:

$$Y = AX^{b}$$

$$Log\ Y = Log\ A + b\ Log\ X$$

$$E^{p} = \frac{\delta Y}{\delta X}\frac{x}{Y} = b$$

In the Cobb-Douglas model production function, b is called a regression coefficient which simultaneously reflects production elasticity. The value of elasticity is the presentation of changes in output as a result of the presentation of changes in inputs. Technical efficiency can be seen through its elasticity value. Technical efficiency will increase farmer efficiency which results in an elasticity value between zero and one.

Price efficiency (allocative) is the ability of farmers to maximize profits by equating the Marginal Product Value of NPM for each production input with the desired production factor price. Related to price efficiency, it is used as a benchmark to regulate the use of production factors in such a way that the value of the marginal product for input X is equal to the price of the production factor (input).

Thus, the marginal product value (NPM) of production factor X, can be written:

$$NPMx = \frac{b.Y.py}{x}$$

Where: b = production elasticity; Y = production; Py= production price; X= number of factors of production.

The price-efficient requirement to get the maximum profit requires NPMx to be equal to the price of the production factor X, which can be written as follows:

$$NPMx = Px$$

$$\frac{NPMx}{Px} = 1$$

Where: NPM = Marginal Production Value; Px = Price of production factors X.

However, in agreement with NPMx and Px, it was obtained three times:

- $\frac{NPMx}{Px} = 1$; the use of production factors X efficiency;
- $\frac{NPMx}{Px} > 1$; That is, the use of production factors X is not efficient, to achieve efficiency, the use of input X needs to be add on;
- $\frac{NPMx}{Px} < 1$; That means the use of production factors X is not efficient, so to achieve efficiency, the use of input X needs help.

The efficiency of the price reaches when the calculation of the NPMxi and Px ratios for each production factor is equal to one, so that the optimal value of each production factor can be calculated to achieve efficiency. It is estimated that it can be done in the following ways:

Optimal compilation production NPMxi/Pxi = 1

Atau NPMxi = Pxi

$$PMXi = \frac{bi.\dot{Y}}{Xi}$$

$$NPMXi = Pxi = Pmxi.Py$$

$$Pxi = \frac{bi.\dot{Y}}{Xi}Py$$

$$Xi = \frac{bi.\dot{Y}py}{pXi}$$

Susantun (2000), economic efficiency obtained from previous efficiency, efficiency and efficiency supported by, follows:

1. Requirements required (requirements required) indicate the physical relationship between input and output, namely the production process at the time of production elasticity between 0 and 1. This result is technical production efficiency.

2. Adequacy requirements (sufficient conditions) relating to approval, namely the maximum requirements that can be determined by the value of marginal products equal to marginal, or the maximum profit requirements obtained from assessing the marginal value of products with marginal factor cost or NPMx / px = 1

Third Objective: Analyzing Revenue in Corn Farming. Analysis Revenue is the balance between costs incurred as a production process.

With income formula:

$$Pd = TR – TC$$

Where: Pd = Income; TR = Total receipt; TC = Total cost.

RESULTS AND DISCUSSION

Based on the results of research on the number of respondent farmers in Alkani and Seserai Villages, Wewiku Subdistrict, Malaka District who cultivate the most local maize in the age range of 47-56 years or (35.5%) and the lowest age range is 67-76 or (3.33 %). This shows that the majority of respondents were at the productive level, namely the age of being able to cultivate local corn to increase the production and income of farmers. According to Soekartawi (2016), that the level of craft use at the level can improve work ability, because the more increasing the age level, the increasing level of productivity in work. Whereas according to Yuliana et al. (2017), the farmer level influences the policy of farmers making decisions in farming activities and influencing the physical abilities of farmers in carrying out farming engagements, which ultimately affects farm production.

Based on the results of research in Alkani and Seserai Villages, Wewiku Subdistrict, Malaka District varied from farmers did not graduate TS (not school), elementary, junior high and high school. The highest level of education possessed by farmers is SD as many as 47 farmers or (52.2%) then SMP as many as 21 farmers or (23.3%), SD as many as 12 farmers or (13.3%), and those of value is a high school of 10 farmers or (11.1%). It can be concluded that the level of education that is still low is therefore still to be improved. The state of education is very low at the level of application of technology and insights that increase the production and income of farmers. According to Nurhaphsa (2013), education is an insignificant one that can change attitudes or mindsets. Education will make it easier for someone who instills information and new technological innovations will improve quality in making decisions in an effort, which in turn will affect farmers. While according to Dlamini et al (2016), discussing formal education does not refer to corn production.

Based on the results of the research in Alkani and Seserai Villages, Wewiku Subdistrict, Malaka Regency with 14-25 years experience of 45 people or (50%) with the least experience of 36-45 years, namely 1 person or (1.1%). Experience shows that the respondent farmers in applying agricultural technology about local corn farming. According to Widiyanti (2016), farming experience can be negatively correlated with farmers 'motivation in applying technology and innovation to improve the experience of corn farmer farmers will be able to increase farmers' motivation to promote technology and innovation. The results of the Syaifullah et al (2014) study show the fact that the low yields of corn farmers cannot increase corn because the dominant dive farmers apply their own experience to do their business by encouraging the development of new technologies that have been tested to improve production.

Factors of production Evaluate the physical relationship between input and output through the equation Y = f (x). To find out how the factors of production to local maize production were analyzed by a non-linear Cobb-Douglass model, which in operation was changed in multiple linear forms. Before being analyzed by multiple linear models, it was tested beforehand whether the data of production factors and local maize farm production results used had a linear or not relationship, so that there was no deviation in the regression model. After the linearity test, continued with the classic assumption test, the normality test, multicollinetic, and heteroscedicity tests were completed.

The model of the contribution of production functions to local corn ushatani is seen in table 1:

Table 1 – Regression coefficients affect production factors for local maize production

Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	564.137	100.948		5.588	.000
land area	5.442	1.571	.508	3.464	.001
Seed	-1.285	4.247	-.056	-.303	.763
labor	2.205	1.900	.108	1.160	.249
Fertilizer	.767	.586	.212	1.310	.194
Pesticide	129.204	34.771	.615	3.716	.000

Source: Analysis of Primary Data (Processed), 2019.

Based on Table 1, a regression equation for production factors can be made for the following local maize production:

$$Y = 564.137\ X_1^{0,508} X_2^{-0,056} X_3^{0,108} X_4^{0,212} X_5^{0,615}\ e^u$$

Where: Y = Local corn production; X1 = total land area; X2 = number of seeds; X3 = number of workers; X4= amount of fertilizer, and X5 = amount of pesticides.

The results of the Normality test in Alkani Village and Seserai Village, Wewiku Subdistrict, Malaka Regency, can be seen as a significance value of 0.933> than 0.05. This indicates that the data is normally distributed.

The t test is used to study the effect of using partial production factors on corn production. The t test is carried out with a confidence level of 95% or a significant value of 0.05. The test results of the influence of variables on land area, seeds, labor, fertilizers and pesticides can be seen in Table 2.

Table 2 – Results of Test Analysis t

Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
1 (Constant)	564.137	100.948		5.588	.000
land area	5..442	1.571	.508	3.464	.001
Seed	-1.285	4.247	-.056	-.303	.763
labor	2.205	1.900	.108	1.160	.249
Fertilizer	.767	.586	.212	1.310	.194
Pesticide	129.204	34.771	.615	3.716	.000

Source: Primary Data Analysis, 2019.

Based on Table 2, it can be seen that Alkani Village and Seserai Village, Wewiku Subdistrict, Malacca District, the production factors used in corn farming, namely land area and pesticide are production factors which are partially in accordance with corn yield. While the factors of seed production, labor and fertilizers are not real to the yield of corn.

The results of the t test for land area variables obtained t count value of 3.464 with a confidence level of 95%, and a significant value of 0.001. From the results obtained t count is greater than t table and a significant value is greater than 0.05, then it can be given the individual land area yields a real yield on corn yield Tomy (2013), and Yuniarsih et al. (2015), which states that land area has a positive relationship and real participation in corn production.

The results of the t test for seed variables obtained t count of -0.303 with a confidence level of 95%, and a significant value of 0.763. From the results obtained t count smaller than t table and a significance value greater than 0.05, it is acceptable that individual seeds are not significantly related to corn production.

The results of the t test for the labor variable obtained by t count of 1.160 with a confidence level of 95%, and a significant value of 0.249. Obtained t count smaller than t table and a significant value greater than 0.05, then individual labor can be given not significantly related to corn production. Yuliana et al. (2017), states that labor does not approve real to corn production.

The results of the t test for the fertilizer variable obtained t count of 1.310 with a confidence level of 95%, and a significant value of 0.194. It can be obtained t count smaller than t table and significance value greater than 0.05, then individual fertilizers can be given not significantly related to corn production. This condition is related to the research of Yuliana et al. (2017), implying that manure is not real to corn production.

The results of the t test for pesticide variables obtained t count value of 3.716 with a confidence level of 95%, and a significant value of 0,000. Obtained from a calculation greater than t table and a significant value greater than 0.05, it can be explained that individual pesticides significantly influence the yield of corn.

The effect of the use of factors of production of land area, seeds, labor, fertilizers and pesticides together on local maize production can be known by carrying ou the f test (f-test).

Table 3 – Test Results

ANOVA[b]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	462483.112	5	92496.622	8.274	.000[a]
	Residual	939072.444	84	11179.434		
	Total	1401555.556	89			

Source: Primary Data Analysis, 2019.

Based on Table 3, it can be seen in Alkani Village and Seserai Village, Wewiku Subdistrict, Malaka Regency, the value of f count is 8.27 greater than f table 2.32. This shows that the production factor consists of extensive land, seeds, labor, fertilizers and pesticides together with the real local maize production. This condition is contrary to Susilawati et al. (2015), stated that large areas, seeds, labor, fertilizers and pesticides jointly supported the production of corn.

Adjusted (R^2) test is used to show the ability of the model to explain the relationship between production factors used for local corn farming and local corn production. In the regression analysis the number of independent variables included in the model has more than two independent variables, so the coefficient of determination used is adjusted by R^2 or the coefficient of determination adjusted to Priyatno (2009). From the analysis results, R^2 adjustment is 0.290 or 2.9%, which means that the variation of local corn production of 2.9% is needed by variable land area, seeds, labor, fertilizers and pesticides, which can be accessed by other factors such as soil fertility, weather and other factors not estimated in this study.

Based on the analysis results obtained D-W of 1.823. Because the value of D-W obtained is located between 1.77 <DW> 2.23, meaning that it can be obtained if there is no autocorrelation.

Table 4 – Multicollinearity Test Results

Coefficients[a]

Independent variable tolerance VIF information
Land area (x1). .416 2.407 There is no multicollinearity
Seed (x2) .234 4.274 There is no multicollinearity
Labor (X3) .924 1.083 There is no multicollinearity
Fertilizer (X4) .304 3.289 There is no multicollinearity
Pesticides (x5) .291 3.438 There is no multicollinearity

Source: Analysis of Primary Data (Processed), 2019.

Based on Table 3, it can be seen that in Alkani Village and Seserai Village, wewiku District, Malaka, tolerance and VIF values for each independent variable. For the land area variable, it is known that the tolerance value is 0.416 and the VIF value is 2.407. Then it can be concluded that in the independent variable of land area (X1) there is no multicollinearity. For the seed variable, it is known that the tolerance value is 0.234 and the VIF value is 4.274. Then it can be concluded that in the independent variable of seed (X2) there is no multicollinearity. For labor variables, it is known that the tolerance value is 0.924 and the VIF value is 1.083. Then it can be concluded that the independent variable of labor (X3) does not occur multicollinearity. For fertilizer variables, it is known that the tolerance value is 0.304 and the VIF value is 3.289. So it can be concluded that the independent variable of fertilizer

(X4) does not occur multicollinearity. And for the pesticide variable, it is known that the tolerance value is 0.291 and the VIF value is 3.438. Then it can be concluded that independent pesticides (X5) do not occur multicollinearity.

Variable of error regression model is not constant or variable between one error with another error is different (Riadi 2015). This test aims to analyze whether the variance of error is constant (homoskedastic) or changing (heteroscedastic). Can be seen from the pattern of distribution of errors, if it is in a certain pattern, heteroscedasticity occurs, if there is no pattern (random), and then there will be no heteroscedasticity of Rosadi (2011).

Based on the scatterplot diagram it can be seen that the patterns in the diagram spread and not and do not form a particular pattern, meaning that it can be concluded that heteroskedastistas do not occur.

Economic efficiency analysis of the use of production factors can be done using regression coefficient values of each input production variable, average use of production inputs, average input production prices and average corn production and corn prices in Alkani Village and Seserai Subdistrict Village My district of Malacca. The average use of production inputs can be used to estimate the cost of values, as shown in Table 5.

Table 5 – Calculation of economic efficiency using the factors of production of corn farming in Wewiku District, Malaka Regency

Production factor	NPM	BKM	Economic Efficiency
Land	1.779.660	11.511	154,605
Seed	-139.571	8.122	-17,184
Labor	214.826	28.611	7,508
Manure	15.472	500	30,944
Pesticide	194.689	83.233	2,339

Source: Primary Data Analysis, 2019.

Based on Table 5, it shows that in the villages of Alkani and Seserai Village, Wewiku District, Malaka Regency, it is known that the marginal product value of production factors with the price of production factors is 154,605 land area, -17,184 seed, 7,508 labor force, 30,944 manure and 2,339 pesticides. NPM / BKM > 1, meaning that the use of factors of production x has not yet reached economic efficiency.

The average total production obtained by local corn respondent farmers is 746 kg with a selling price of 3,656 per kg, so that the total revenue is 2.916.690 per 0.155 ha/MT. The income of local corn farming in Alkani Village and Seserai Village, Wewiku District, Malacca Regency in the planting period from November 2018 to February 2019 is Rp 2.698.355 / 0,155 ha / MT.

CONCLUSION

Factors of production of variable land area, seeds, labor, fertilizers and pesticides jointly have a significant effect on local maize production. The influence of each factor of production shows that local maize production has a significant effect on land area variables and pesticides, while seeds, labor and fertilizers have no significant effect on local maize production. The economical use of seed, labor and fertilizer factors does not reach efficiency. While the use of economic factors in the production of land area and pesticides has not yet reached efficiency. Local maize farming income in Wewiku District, Malaka regency in the planting period from November 2018 to February 2019 is Rp 2.916.690 / 0,155 ha / MT.

REFERENCES

1. Asmara. 2017. Production Efficiency Front Stochastic Approach and Data Envelopment Analysis (DEA). Department of Agricultural Economics, Faculty of Agriculture, Universitas Brawijaya. Poor.

2. Central Bureau of Statistics. 2018. Data on Harvest Area, Production and Productivity in 2016-2017.
3. Central Nusa Tenggara (NTT) Provincial Statistics Agency. 2018. Data on Harvest Area, Corn Production and Productivity 2013-2017.
4. Dewi, A. R. Y. T, S. I. Santoso, and E. Prasetyo. 2018. Analysis of technical and economic efficiency in the use of production factors in hybrid corn farming in Sidomulyo 01 farmer group in Sukolilo District, Pati Regency. Journal of Agricultural Sciences. 2 (1): 1-10.
5. Dlamini, N. S. dan Salomon, W. K. 2016. Effect of ingredients ratio on physicochemical and sensory properties of shorgum, maize and soya protein concentrate blend extrudates. International Journal of food Science and Nutrition Enginnering. 6 (5): 112-120.
6. Miller, R. L., and R. E Meiners. 2000. Micro Intermediate Economic Theory. PT Raja Grafindo Persada. Jakarta
7. Nurhapsa. 2013. Analysis of Technical Efficiency and Risk Behavior of Farmers and Their Effects There Is Application of Superior Varieties in Potato Farming in Enrekang Regency, South Sulawesi Province. Doctoral Dissertation. Postgraduate School, Bogor Agricultural Institute, Bogor (in Indonesia).
8. Riadi, E. 2015. Parameter and Non-Parameter Statistical Methods for Research in Social and Educational Sciences. Mandiri Library. Tangerang
9. Rosadi, D. 2011. Economical Analysis and Applied Time Guide. CV. Andi Offset. Yogyakarta.
10. Saptana. 2011. Production Efficiency and Farmer Behavior Against the Risk of Red Chili Productivity in Central Java Province. Dissertation. Postgraduate of Bogor Agricultural University. Bogor.
11. Soekartawi. 2016. Analysis of Farming. UI Press. Jakarta.
12. Susantun, I. 2010. Cobb-Douglas profit function in estimating relative economic efficiency. Journal of development economics vol 5 no 2.
13. Shaifullah, L. Arsyad. A, and Miftah H. 2014. Comparative study of farming analysis and margins of organic and non-organic carrot farming systems (case study of BP3K working area in Cisarua Sub-district, Bogor Regency, West Java Province). Journal of Agriculture. 5 (2): 78-88.
14. Susilawati, Y. Sugeng and S. Adi, 2015. Analysis of allocative efficiency of production factors for hybrid maize farming in the Agribusiness business area combined (strong) Rasau Jaya Komplek Kabupaten Kubu Raya. Economy of Agriculture social journal. 4 (2): 1-15.
15. Tomy, J. 2013. Analysis of production and income of corn farming in Palolo District, Sigi Regency. Agroland Journal. 20 (2): 146-154.
16. Widiyanti. 2016. Farming Performance and Motivation of Farmers in the Application of Hybrid Corn Seed Innovations on Dry Land in East Lombok Regency. Thesis. Economic and Business Research, Practice Theory. Graha Ilmu. Yogyakarta.
17. Yuniarsih, E. T., Maintang, and M. Taufik. 2015. Analysis of the efficiency of production factors for corn ushatani in Sidrap Regency, South Sulawesi Province. Proceedings of the Cereals National Seminar.
18. Yuliana L, Yuyetta A, N, E, 2017. Analysis of factors that influence company leverage (empirical studies on invoice manu companies listed on the Indonesia Stock Exchange 2013-2015). Journal, Of Accounting, 6 (3) 1-13.