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DEVELOPMENT OF AGRICULTURE AND ITS IMPACT ON THE WELFARE OF FARMERS IN THE AREA OF BOSOWASIPILU SOUTH SULAWESI

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ABSTRACT

This study aims to examine agricultural sector budget policies, fertilizer subsidies and irrigation infrastructure that affect farmers' income through the variable productivity of agricultural land in the food crops sub-sector in the 8 districts of Bosowasipilu which were food buffer advocates in South Sulawesi during the 2014-2018 period. Qualitative and quantitative analysis is carried out to illustrate the relationship between land productivity and farmers' income. The Cobb-Gouglas production function is applied by multiple regression models using path analysis for policies that affect the production and productivity of the agricultural sub-sector of rice. The results show that only irrigation infrastructure policies that have a significant effect on land productivity directly, however, do not have a direct effect on farmer's income but through land productivity as an interpening variable, it has a significant effect on farmer's income.

I. Introduction

The goal of welfare as the final goal to be achieved from development. However, from the data of the number of poor people in the Bosowasipilu region whose majority population is as a food-producing farmer with a fairly good economic growth rate, but the poverty rate is still quite high. The percentage of poor population in rice-producing districts in the Bosowasipilu Region is still high. This illustrates that agricultural development is still far from the target. Agricultural development as part of economic development is a process to increase agricultural production while increasing farm income and productivity. Agricultural development is basically an effort to improve the quality of life of farmers achieved through investment strategies in developing technology, facilities and infrastructure accompanied by structuring and developing rural institutions.But the government policies in the agricultural sector tend to focus more on increasing agricultural production and less attention to the quality of life of farmers, partiality for farmers is so lacking that agricultural value added is not enjoyed by farmers, this means that agricultural development policies are not successful. There must be a political will from the government to improve the lives of farmers. This is also due to farmers being trapped in issues of basic problems such as high costs of production, dependence on seeds and pesticides, scarcity of fertilizers, lack of business capital, limited information, price issues and lack of land tenure. So that the development of the agricultural sector is not able to prosper farmers.

During this time the agricultural sector often gets a small budget allocation from the total APBN whereas on the other hand this sector has a high employment absorption in (Suwarto, 2008). In South Sulawesi, the agricultural sector of rice is the most widely produced and absorbs the most labor because it is the staple food of the people whose needs continue to increase along with the increase in population. This increase in population also causes the need for agricultural land to increase but the land for non-agriculture also continues to increase from time to time. This condition causes the transfer of land functions from agricultural land to

non-agricultural land, so that rice fields as agricultural land become limited. For this reason, the government needs to continue to develop various policies to increase production through increasing the productivity of agricultural land.

Government policies such as the agriculture sector budget to finance intensification programs for increased production coupled with the use of appropriate fertilizers and irrigation infrastructure management will be able to make plants fertile so as to increase yields. Increased production means that the land becomes more productive which directly affects the income of farmers and with regard to the income of farmers affected by the price of this rice commodity. The price of rice consists of harvested dry rice and milled dry rice both of these prices are regulated by the government according to crop quality standards. The adoption of a rice price policy that directly limits the price of rice so that it is not too low so that it harms farmers but is also not expensive and burdensome to consumers. Almost all matters relating to agricultural development policies are regulated by the government. Government intervention in this case has an important role as a form of government consistency in terms of agricultural development aimed at improving the welfare of farmers.

Furthermore, agricultural development policies are variable factors of production. And it is expected that these policy variables coordinate and complement each other so that it directly affects the income variables of farmers and indirectly influences farmers' income through productivity variables. This analysis regarding whether or not the policies can be seen from the presence or absence of the influence of the relationship between the variables of the various agricultural development phenomena that have been described above, the authors are interested in examining how the influence of agricultural development intervention policies using exogenous variables of the agricultural sector budget sourced from APBD funds, fertilizer subsidies sourced from APBN funds and irrigated land infrastructure in food buffer districts through variables between land productivity and the impact on farmers' income as endogenous variables as seen from the amount of production and price.

II. Theoretical Review

A.T Mosher in (Mubyarto, 1989) defines agriculture as a place on the surface of the earth where agricultural business is carried out by a farmer by using natural resources for agricultural production such as plants, soil, water and sunlight. And agricultural development is basically an effort to improve the quality of life of farmers achieved through investment strategies and policies for developing professionalism and productivity of agricultural labor, developing economic facilities and infrastructure, developing science and technology accompanied by structuring and developing rural institutions, hereinafter referred to as agricultural modernization. using technology. And agricultural technology includes methods for farming such as farmers' sowing, planting and harvesting crop techniques. This includes seeds, fertilizers, pesticides, medicines and feed they use, tools, tools and resources. This business combination is used by farmers by making the best use of their energy and land. For agricultural development to work, this technology must continue to change to become more modern. When they stop changing, agriculture becomes stagnant, production stops increasing and may decrease due to decreasing soil fertility or increased damage due to pests and diseases.

There are 6 activities in agricultural development planning as a condition of agricultural modernization: 1. Research; to find and develop new and better farm technology, 2. Increasing production by using production facilities and agricultural tools with the latest technology, 3. Creating rural area organizations that provide information institutions between farming businesses and surrounding communities can be established, 4 . Creating incentive incentives for farmers to increase production, 5. Improving agricultural land, and 6. Agricultural extension for farmer training.With modernization of agriculture agricultural development will affect the welfare of the countryside. According AT Mosher (1966) explained about investment as a strategy of agricultural development with the aim of increasing the production and productivity of agricultural products, namely by building irrigation channels, creating markets to sell yields at good prices, using technology with the latest revolution. And the government as the executor of agricultural development has been running it.

In line with this the government also issued a policy as an incentive to increase production for farmers. For example the minimum rice price policy, fertilizer price subsidies, intensive agricultural extension activities, both on new techniques in agriculture and on other skills also greatly help create a climate that intensifies agricultural development efforts so that it will affect production and productivity increases. According (Suwarto, 2008) about the basic concepts of the production function. This concept is a systematic way that shows the relationship between various amounts of resources or inputs that can be used to produce products. The same relationships in other agricultural disciplines are known as response curves, yield curves, or input / output relationships. Whatever the name, a production function shows the amount of output produced through the use of variable inputs in different amounts.

Productivity measurement using the Cobb-Douglas approach is done by measuring productivity in all systems, it must first be clearly defined what outputs are expected from the system and what resources (inputs) will be used in the process of the system to produce outputs. Where productivity is the key to determine the optimal combination, or proportion of input (variable proportion) that must be used to produce a product that refers to the law of variable proportion. In measuring land productivity, the output produced is the amount of rice production and agricultural land area output which explains the ability of land to produce. So that said production is a component of land productivity. Land productivity is formulated as follows:

$$\boldsymbol{Land\ Productivity} = \frac{\boldsymbol{Amount\ of\ paddy\ Production\ (ton)}}{\boldsymbol{Land\ Area\ (Ha)}}$$

Mathematically the production function is defined as follows:

Q = f (X1, X2, ..., Xn). Q is the quantity of a particular product, while X1, X2, ..., Xn describe the quantity of the number of n inputs used in the production process. The equation above states that output is a function of the level of input usage. The concept of Cobb Douglas function is an equation that involves two or more variables, one independent variable and the other is called an independent variable, applied by increasing production by increasing the amount of production, there are 2 general ways that can be done namely by extensification by extending paddy fields and intensification ways that is intensifying existing land with the help of technology such as the use of appropriate fertilizers and the use of effective and efficient irrigation water to increase productivity.

The product of production (output) is denoted as y and the factor of production (input) is x, so there is a relationship between input and output which in the mathematical formula is y = f (x1, x2, xi .... xn), where x1, x2 , xi and xn can be in the form of agricultural land, labor and capital (Soekartawi, 1995)

To determine the factors that influence income in rice farming, the income function model is derived from the Cobb-Douglss function. Where, X1 is the budget, X2 is fertilizer subsidies and X3 is irrigated land is a variable that affects farmers' income (Y). As explained in previous studies that an increase in land area, urea prices and varieties of varieties are in line with an increase in income. While fertilizer prices and labor prices have the potential to reduce the income of rice farmers (Muzdalifah et al, 2012).

The basic concept used to analyze land productivity is from the Cobb Douglas production function. And the production function in its development, can explain the function of land productivity includes 3 independent variables in this study which can be formulated as follows:

$$\boldsymbol{Y = \alpha X_1^{b1} X_2^{b2}, \ldots X_i^{bi}, \ldots X_n^{bn}} \quad \text{.....(1)}$$

Y = dependent variable (land productivity),

X = independent variable (budget, fertilizer and irrigation subsidies),

a and b = estimated coefficients.

To simplify the calculation process, equation (1) is changed to a linear form by logifying the equation in the form of double natural logarithms (ln) to be as follows:

Y = ln a + b_1 ln X_1 + b_2 ln X_2 + ... + b_n ln X_n .... (2)

The function in this case is used to measure the effect of 3 variables changes in budget inputs, fertilizer subsidies and irrigation on land productivity output. Productivity provides the basis for efficient use of agricultural sector resources in rice production systems.

Theory Of Relationships Between Variables

Economic thought which has been put forward by Francois Quesnay (1694-1774) and Baron Jaques Turgot (1721-1781) which can be considered as a process of transition towards the thinking of economists in classical schools. The physiocrats returned to the traditional teaching that all wealth comes from land, only land can produce results through what is planted into it. So, the only surplus comes from land in the form of agricultural land. The figure of the French physiocrat Francois Quesnay considers land as the only source of income and wealth. Only the agricultural sector can be considered productive because only this sector produces the remaining net products in terms of the difference (surplus) between production and consumption.

All agricultural development activities are as a government investment strategy. Where investments are made every year will form the accumulation of capital stock which includes the development of public infrastructure assets, land improvement including irrigation, fertilizer subsidies and tools that contribute to increasing output and income in the agricultural sector (BPS, 2007)

Linked to farmers' income is the result of deduction from revenue with total costs. Farmers' income is determined by the high and low yields of agricultural production itself. Farmer income will be high if agricultural production is also high, because farmers' production and income have a linear relationship. Farmer net income theory in the form of production multiplied by price reduced by production and marketing costs (Mubyarto, 1997)

When there are many farmers' income, the farmers are automatically said to be prosperous, because they are able to meet the needs of their families and farming businesses to return to production. In line with Pigou (1960), welfare economic theory is part of social welfare which can be directly or indirectly related to the measurement of money.

Through the policy and allocation of the state budget, the government can directly play an active role in achieving various goals and targets of development programs in all areas of life, supporting economic stability, and supporting a more equitable distribution of income. According to Rostow and Musgrave spending of the budget as government investment for development is needed to finance development. The central government budget has two important roles in the achievement of national goals, especially related to improving people's welfare. First, the magnitude and composition of central government spending has a significant impact on aggregate demand which is a determinant of national output. Second, related to the availability of funds to carry out the three economic functions of the government, namely the function of allocation, distribution and stabilization. Therefore, the quality of policies and the allocation of the central government budget occupies a very strategic position in supporting the achievement of national goals. (Bachtiar, Sofilda and Kusumastuti, 2015).

The instrument used by the government to influence agricultural development. one of them is government expenditure which means the government is spending an investment budget to finance agricultural development. In the development model of the development of government spending developed by Rostow and Musgrave (Mangkoesoebroto, 1999) it is explained that in the initial stages of economic development the percentage of government investment to total investment is very large. This is because at this stage the government must provide infrastructure.

Subsidies assistance to finance infrastructure. In accordance with the understanding in economics that infrastructure is a form of public capital (public capital) formed from investments made by the government (Mankiw, 2003). The infrastructure in this study is in the form of government subsidized fertilizer assistance to help meet the fertilizer needs of rice farmers. With the development of technology found the advantage of using fertilizers that can make land more productive.

According to Pindyk (2005) explaining welfare theory is associated with this research, that welfare is a surplus enjoyed by farmers as consumers when there is a difference between the budget owned to buy goods and services with the price of goods and services real market created. Meanwhile the welfare of farmers as producers occurs when there is more difference between sales and costs to produce goods and services or cost of goods manufactured or cost of goods sold. In this case, farmers are said to be prosperous, which is related to income as fertilizer, which will get a surplus because the price of fertilizer is lower because it gets subsidies in the fertilizer market, and on the farmer side, as a producer, it will be surplus because there is a difference in the cost of rice production with the cost of farming.

The results of the study of Carl O. Sauer and N. I. Vavilov (1969), the emergence of new varieties and better farming techniques are the main sources of productivity growth in farming. The results of a case study in Kenya in (Wangusi and Muturi, 2015) show that there is a positive and significant relationship between agricultural productivity, and public spending on the agricultural sector. Based on the findings of this study, it recommends that the government should invest in directing and expanding appropriate agricultural public spending which can have a significant increase in effect on agricultural productivity.

III. Research Methods

This study aims to look at the effect of the relationship of independent variables on the dependent variable through intermediate variables. The dependent variable in this study is farmer's income, the independent variable in this study is the agricultural sector budget, fertilizer subsidies and irrigation land infrastructure while the intermediate variable is land productivity where the analytical method used to test the truth of the hypothesis is proposed, the method used is the Analysis model Path (Path Analysis).

Path analysis method or path analysis which is an extension of multiple linear regression, or path analysis is the use of regression analysis to estimate the relationship of the independent variable to the dependent variable through intermediate variables. In this study, this path analysis is used to test whether there is an influence of the agricultural sector budget, fertilizer subsidies, and land infrastructure on land productivity, hereinafter referred to as model I. Then to determine the effect of the agricultural sector budget, fertilizer subsidies, land infrastructure, and land productivity on income farmers, hereinafter referred to as model II.

a. Model Equation I

To analyze the direct influence of the relationship between the agricultural sector budget, fertilizer subsidies and irrigation infrastructure on land productivity, an analysis model is made as follows:

$$Y_{1it} = f\ (X_{1i}t,\ X_{2it},\ X_{3it}.)$$

$$Y_{1it} = \alpha_0 + \alpha_1 X_{1it} + \alpha_2 X_{2it} + \alpha_3 X_{3it} + \mu_{0it}$$

b. Equation Model II

To analyze the direct and indirect effects of the agricultural sector budget, fertilizer subsidies, irrigation infrastructure and land productivity on farmer's income, an analysis model is made as follows:

$$Y_{2it} = f\ (Y_{1it}.;\ X_{1it},\ X_{2it},\ X_{3it}.)$$

$$Y_{2it} = \beta_0 + \beta_1 Y_{1it} + \beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 X_{3it} + \mu_{1it}$$

IV. Results and Discussion

Data analysis method in this research is panel data regression analysis using SPSS IDM 34. The hypothesis test used for each variable with multicollinearity test, heteroscedasticity test, F-test, determination coefficient, T-test and Sobet test. which explained that for each hypothesis test is as follows:

Variable of Model I	Coefisien	t-cont	Probability	Standar of Error	Description
X1 > Y1	-,098	-,684	0,497	0,000	Not Significan
X2 > Y1	,228	1,250	,218	0,000	Not Significan
X3 > Y1	,484	2,607	,012	,047	Significan

Source: spss (Data Processed)

Variable of Model II	Coefisien	t-cont	Probability	Standar of Error	Descpription
X1 > Y2	0,081	0,769	0,446	0,000	Not Significan
X2 > Y2	0,122	0,839	0,377	0,000	Not Significan
X3 > Y2	-0,05	-0,341	0,735	1042,07	Not Significan
Y1 > Y2	0,745	6,718	0,000	3094,083	Significan

Source: spss (Data Processed)

Classic Assumption Test Results

a. Normality Test

Residual normality test results using the Kolmogorov-Smirnov normality test as a residual normality test in the regression model I showed an Asymp Sig of 0.948 (p> 0.05) and the residual in the regression model 2 of 0.573 (p> 0.05) so that it can be concluded that the residual the regression model 1 and model II are normally distributed.

b. Multicollinearity Test

The results of the multicollinearity test of model I obtained the results that the independent variables showed Tolerance values> 0.1 and VIF <10 so it was concluded that multicollinearity did not occur in the regression model I. The results of the multicollinearity model II regression results showed that the independent variables showed Tolerance values> 0.1 and VIF <10 so that it was concluded that multicollinearity did not occur in regression model II.

c. Heteroscedasticity Test

Detection of heteroscedasticity can be done by looking at the scatterplot graph produced by the regression model I scatterplot regression graph shows that the points spread randomly above or below the number 0 on the Y axis, based on this it was

concluded that there was no heteroscedasticity in the regression model I. The model II scatterplot regression graph shows that the points spread randomly above or below the number 0 on the Y axis, based on this it was concluded that there was no heteroscedasticity in the model II regression.

d. F test

The results of the F test in the regression in model I showed a significance value of 0.083 (p> 0.05), so it was stated that the regression model I was not suitable for use while for the results of the model II F test showed a significance value of 0,000 (p <0.05) , so it is stated that regression model 2 is fit to be used (fit).

e. Coefficient of Determination

The coefficient of determination shows how far the ability of the regression model in explaining the variance of the dependent variable. The results of the coefficient of determination of model I are shown by the adjusted R Square value of 0.080 so that it can be seen that the regression ability of model I in explaining the variance of the dependent variable is 0.080 × 100% = 8%. The remaining 100% -8% = 92% is explained by other variables not examined in the study. And for the coefficient of determination of model II is shown by the value of Adjusted R Square of 0.502 so that it can be seen the regression ability of model II in explaining the variance of the dependent variable of 0.502 × 100% = 50.2%. The remaining 100% -50.2% = 49.8% is explained by other variables not examined in the study.

f. T-test

The result on H test

t-test	P-Value	Description
Model I		
$X_1 > Y_1$	0,497	Not Significan
$X_2 > Y_1$	0,218	Not Significan
$X_3 > Y_1$	0,012	Significan
Model II		
$X_1 > Y_2$	0,446	Not Significan
$X_2 > Y_2$	0,377	Not Significan
$X_3 > Y_2$	0,735	Not Significan
$Y_1 > Y_2$	0,000	Significan

g. Mediation Test

Mediation test results are as follows:

- The influence of the agricultural sector budget on farmer's income through land productivity obtained t value of -0,000 so that t count <t table (-0,000 <1.96), it was concluded that the agricultural sector budget does not affect farmers' income through land productivity (land productivity does not can mediate).

- The effect of fertilizer subsidies on farmers 'income through land productivity is obtained t count value of -0,000 so that t count <t table (-0,000 <1.96), it is concluded that fertilizer subsidies have no effect on farmers' income through land productivity (land productivity cannot mediate).

- The effect of irrigation land infrastructure on farmer's income through land productivity is obtained t count value of -0,000 so that t count <t table (-0,000 <1.96), it is concluded that irrigation land infrastructure has no effect on farmer income through land productivity (land productivity does not can mediate).

Conclusion

Based on the results of research and analysis that has been done, it can be concluded as follows:

a) The agricultural sector budget does not significantly affect farmers' income either directly or indirectly through land productivity.
b) Fertilizer subsidies do not significantly influence farmers' income either directly or indirectly through land productivity.
c) Irrigation land infrastructure has a significant effect on land productivity but does not significantly influence farmer's income.
d) The policy in terms of expenditure in the form of a budget (the agricultural sector budget and fertilizer subsidies) does not affect land productivity and farmers' income either directly or directly, but irrigation land infrastructure affects land productivity. So as to increase farmers' income, it can be done by increasing land productivity.
e) Land productivity becomes a mediator that influences farmers' income. Then farmers' income will increase if land productivity increases.

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