Effectiveness of Pajale Special Efforts Program on Productivity And Revenue of Corn Farming In Bunga Mayang District, Oku Timur Regency

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Abstract: *This study aims to analyze the effectiveness, income level and strategy for the development of the Program Upsus Pajale on corn farming production in Kecamatan Buay Madang Timur. This research will be conducted in March to April 2018 using production data for January 2017 and December 2017. The data source consists of primary data and secondary data. The sampling method used is a non-balanced layered random sampling method. To answer the research objectives, the Cobb-Douglass type function production equation, income calculation and SWOT analysis are used. The results of data processing show that the results of statistical analysis of production factors that support the Pajale Upsus Program, there are five of the 7 production factors that have been effective have positive effects, namely seeds, urea fertilizer, npk fertilizer, herbicides, functionides and insecticides. While the production factors that have not been effective have a negative effect, namely labor, Npk fertilizer and counseling. From the results of the t test, it can be concluded that the income between corn farmer participants in the Pajale Upsus Program and corn farming of farmers who are not participants of the Upsus Pajale Program is significantly different.*

Keywords: *effectiveness, corn farming, Program Upsus Pajale*

I. Introduction

Food self-sufficiency is one of the main targets of agricultural development in the future. This food self-sufficiency program has a very important meaning and role for the life of a nation because by achieving food self-sufficiency automatically the steps to achieve food security will be fulfilled. For this reason, the policy of self-sufficiency in the form of investment in the agricultural sector needs to be studied in depth and comprehensively in order to have a positive impact on food security, especially economic activities, employment, income distribution and poverty, even environmental conservation (Ministry of Agriculture, 2015). According to Wibawa (2013), the agricultural system remains the backbone of agriculture in maintaining the livelihoods that receive farmers.

In 2015, the Ministry of Agriculture issued a policy regarding special efforts (upsus) for three food crop commodities, namely rice, corn and soybeans, in order to achieve food self-sufficiency. This program is carried out through the development of irrigation networks, optimization of land, Movement of Integrated Crop Management Implementation (GP-PTT), provision of agricultural facilities and infrastructure (seeds, fertilizers, pesticides and agricultural machinery) and escorting / assistance (Busyra, 2016). Factors of production are very important in the farming. High productivity can only be achieved by using appropriate methods of cultivation and technology (Firdaus, 2010). Effective allocation of production factors will result in the efficient use of production factors. If farmers allocate factors of production effectively and efficiently, surely farmers are able to allocate farming costs appropriately in order to get maximum profit (Soekartawi, 2002).

The government through the Ministry of Agriculture embodies food self-sufficiency efforts through increasing production and productivity in three food commodities namely Rice, Corn and Soybean, better known as Rice, Corn and Soybean Special Efforts program (Upsus Pajale). This government policy is called Upsus Pajale because Upsus is a joint effort that is specifically carried out to achieve the targets set through a variety of integrated problem solving and participatory collaboration between farmers, extension workers, babinsa, students and other parties who support the achievement of targets to increase production and the special productivity of three food commodities, namely rice, corn and soybeans, the Upsus Pajale program is present as an effort to self-sufficiency in food to achieve food security (Ministry of Agriculture, 2016).

The effectiveness of a program can be seen how the results obtained after the program took place.Substantive problems faced in accelerating the achievement of Food Self-Sufficiency (Ministry of Agriculture, 2015).The Agricultural Research Agency (Balitbangtan) was ask to apply the superior technology it already had to support the success of the Upsus program, especially in terms of providing superior seeds and pajale cultivation techniques and human resources for production assistance. Assistance / escort Upsus is an

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important factor in achieving production targets, namely by mobilizing available resources at the Ministry of Agriculture. Trust factors are very important in community life as well as extension agents and main actors.

Bunga Mayang district is one of the sub-districts participating in the Upsus Pajale Program in OKU Timur Regency, which focuses on special efforts to increase corn and soybean production, with three main activities in 2015 consisting of fulfilling seeds and seeds, fertilizing and irrigation systems. Bunga Mayang district has a high harvest and production area, besides that the Madang Buay Timur district has good land potential in the effort to develop corn and soybean commodities in the Pajale Upsus Program. The fulfillment of the Pajale Upsus Program is expect to meet the needs of increasing food crops, especially corn.

II. Material and Methods

Time and place

This research was conducted in the Bunga Mayang district with the consideration that the Bunga Mayang district is increasing food crop production, especially corn. Data collection will be conducted from March to April 2018 using production data for January 2017 and December 2017.

Research methods

The method used in this study is a survey method that relates to situations that require certain data collection techniques such as interviews, questionnaires or observations in the hope of getting a real picture in the field.

Sample Withdrawal Method

The sampling method used in this study is a disproportional stratified random sampling method. Of the two types of population at the study site, farmers who received assistance from the Pajale Upsus and farmers who did not receive the Pajale Upsus assistance, 50 respondents were taken from each sample. According to Sugiyono (2011) that the determination of the number of samples from a particular population depends on the level of error consisting of 1%, 5%, and 10%, whereas in this study sample was taken confidence of the population 95% or 5% error rate.

Table No 1. Number of Farmer Households (FH) and Number of samples taken in Bunga Mayang District

Group	Number of FH	Number of Samples	%
Farmers Participants Upsus Pajale Program	200	50	25
Farmers Non-Participants Upsus Pajale Program	150	50	33.33
Total	450	100	

Source:Processed from 2017 Statistics and BP3K Bunga Mayang District

Method of collecting data

The data used in this study are primary data and secondary data. Primary data were obtained from direct observation and interviews of sample farmers who participated in the Pajale Upsus Program and sample farmers who did not attend the Upsus Program. While secondary data is obtained from the relevant agencies and other sources that support this research.

Data Processing Method

To answer the first research objective, the Cobb-Douglas function equation is used. The method used is the Ordinary Least Square (OLS) Regression method using SPSS 21. The Ordinary Least Square (OLS) Regression method serves to test the influence model and the relationship of independent variables with more than two variables on the dependent variable. Multiple regression analysis is a statistical technique used to analyze the effect between a dependent variable and several independent variables (Gujarati, 2003).

One of the benefits of using this function is that researchers can simultaneously measure the level of effectiveness at different levels or traits. Non-linear regression forms in the form of mathematical equations in this method are:

$$P = f(Tk, Bnh, Urea, Npk, Her, Ins, Fungi, Py)$$

Econometric equation model for research:

$$P = \alpha_0 + \alpha_1 Tk + \alpha_2 Bnh + \alpha_3 Urea + \alpha_4 Npk + \alpha_5 Her + \alpha_6 Ins + \alpha_7 Fungi + \alpha_8 Py + e$$

Information:

P	= Production (Kg/Ha/Musim Tanaman)
$\alpha 0$	= Intersept
$\alpha 1...\alpha 7$	= Variable Parameters
Tk	= Labor (HOK)
Bnh	= Seeds (Kg)
Urea	= Amount of Urea Fertilizer (Kg)

Npk	= Number of Npk Fertilizers (Kg)
Her	= Amount of Herbicide (Lt)
Ins	= Amount of Insecticide (Lt)
Fungi	= Amount of Fungicide (Lt)
Py	= counseling (Dummy)
1	= Following the Upsus Program counseling
2	= Not following counseling for the Upsus Program
e	= error term

In this study the type of dummy variable used is the intercept dummy, by using a dummy variable, the equation becomes:

$$Ln\ Y = Lnb_0 + b_1 Ln\ Tk + b_2\ Ln\ Bnh + b_3 Ln\ Urea + b_4\ Ln\ Npk + b_5\ Ln\ Her + b_6 Ln\ Ins + b_7 Ln\ Fungi + b_8\ D + b_9 Ln$$

$$Tk\ D + b_{10} Ln\ Bnh\ D + b_{11}\ Ln\ Urea\ D + b_{12} Ln Npk\ D + b_{13} Ln\ Her\ D + b_{14} Ln\ Ins\ D + b_{15} Ln\ Fungi\ D + \varepsilon$$

III.   Result

The results of the estimation of the regression analysis of the relationship between the production of corn farming as a dependent variable with factors of production are labor, seeds, urea fertilizer, NPK fertilizer, herbicides, insecticides, fungicides, and counseling which are explained by dummy variables as independent variables. The regression results obtained as follows:

Ln Y = 6,177 + 0,263 LnTk + 0,086 LnBnh + 0,091 LnUrea + 0,085 LnNpk +0,117 LnHer + 0,209 LnIns – 0,072 LnFungi – 1,812 LnD1 - 0,196 LnTkD + 0,497 LnBnhD + 0,178 LnUrea D + 0,005 LnNpk D + 0,363 LnHerD - 0,413 LnIns D + 0,150 LnFungi D

TableNo 2. Results of Regression Analysis of Factors Affecting Corn Farm Production.

No	Variabel	Bi	Se	t-hit	Sig.t
1	Konstanta	6,177	0,510	12,107	0,000
2	LnTk	0,263	0,080	3,296	0,001**
3	LnBnh	0,086	0,094	0,910	0,365
4	LnUrea	0,091	0,056	1,645	0,104
5	LnNpk	0,085	0,063	1,354	0,179
6	LnHer	0,117	0,091	1,287	0,202
7	LnIns	0,209	0,111	1,878	0,064**
8	LnFungi	-0,072	0,061	-1,177	0,243
9	D	-1,812	0,768	-2,358	0,021**
10	LnTkD	-0,196	0,150	-1,309	0,194
11	LnBnhD	0,497	0,145	3,425	0,001**
12	LnUreaD	0,178	0,098	1,824	0,072**
13	LnNpkD	0,005	0,094	0,053	0,958
14	LnHerD	0,363	0,175	2,077	0,041**
15	LnInsD	-0,431	0,161	-2,681	0,009**
16	LnFungiD	0,150	0,072	2,093	0,039**
	R^2= 0,781		Fhit = 20,357		

R^2= 0,781   Fhit = 20,357

Information:

Information: ** real at 10% level,

Standard α = 10 percent: F-table = 2,26   : t-table = 1,66

Standard α = 5 percent: F- table = 1,79   : t table = 1,98

Based on the data in Table No 2, The magnitude of the coefficient of determination of the value of R2 in the regression model. The value of R2 in the regression model obtained was 0.781. 78.1% of the variation in corn farming production can be influenced by variable labor, seeds, urea fertilizer, NPK fertilizer, herbicides, insecticides, fungicides, and counseling. While the other 21.9% are being discussed by the model.

The F test was carried out to see the effect of the independent variables (together) on the dependent variable, statistically. In the first and second equations used a 90 percent confidence level (α = 10%), with df = 30 (100 - (k - 1) = 100 - 8 = 92), then an F table of 2.53 is obtained from the regression results of the equation, it is known that the F-statistic value in the equation is 20.357 and the F-statistic probability value for the equation is 0.000000. Then it can be concluded that F arithmetic> F table then it can be concluded in the equation the explanatory variables simultaneously and together influence the variables explained significantly (H0 is rejected and H1 is accepted).

IV. Discussion

Corn Farming Participants in Upsus Pajale Program (D = 1)

By entering a dummy variable value of one in the previous production function equation, then:

Ln Y   =   4,365+ 0,067 LnTk + 0,583 LnBnh + 0,296 LnUrea + 0,09LnNpk + 0,48 LnHer + 0,222 LnIns - 0,078
LnFungi

Y   = Estimates of the value of agricultural production in corn that gets Upsus program Pajale (kg).

Bo = 4.365 is a constant that indicates a natural effect.

to Y or value of production if all production variables equal to zero (X = 0).

Effects of Use Workers in Participants Upsus Pajale Program

Regression coefficient value of the labor variable is 0.067, positive variable value states that if the labor variable experiences an increase of 1 percent, it will increase the amount of corn farming production by 0.047 percent, assuming that the other variables are considered zero or constant. The labor factor in this study did not significantly influence the production of corn farming. These results explain that the increase in labor used in a corn farming production process does not directly increase corn production.

T test results for labor variables indicate that the variable has a t test value of 1.296. The t-table value in this equation is 1.66. Where the value of t-count is greater than the value of t-table and the significance value of t is greater than the real level (0.1), then this means that labor has a significant effect on corn production.

Effect of Use Seed in Participants Upsus Pajale Program

Regression coefficient value of the seed variable is 0.583, positive variable value states that if the seed variable has an increase of 1 percent, it will increase the amount of corn farming production by 0.583 percent, assuming that the other variables are considered zero or constant. The seed use factor in this study did not significantly influence the production of corn farming.

T test results for seed variables indicate that the variable has a t test value of 0.910. The t-table value in this equation is 1.66. Where the value of t-count is smaller than the value of t-table and the significance value of t is greater than the real level (0.1), then this means that the seeds do not have a significant effect on corn production.

Effect of Use Urea Fertilizer in Participants Upsus Pajale Program

Regression coefficient value of urea fertilizer variable is 0.296, positive variable value states that if the urea fertilizer variable increases by 1 percent it will increase the amount of corn farming production by 0.296 percent with the assumption that the other variables are considered zero or constant. These results explain that increasing the amount of urea fertilizer used in a corn farming production process can directly increase corn production.

T test results for the urea fertilizer variable showed that the variable had a t test value of 1.645. The t-table value in this equation is 1.66. Where the value of t-count is smaller than the value of t-table and the significance value of t is greater than the real level (0.1), then this means that urea fertilizer has no significant effect on corn production.

Effect of Use NPK Fertilizer in Participants Upsus Pajale Program

Regression coefficient value of the Npk fertilizer variable is 0.09,positive variable value states that if the Npk fertilizer variable increases by 1 percent it will reduce the amount of corn farming production by 0.09 percent with the assumption that the other variables are considered zero or constant. These results explain that increasing the amount of Npk fertilizer used in a production process of corn farming can directly reduce corn production.

T test results for the Npk fertilizer variable indicate that the variable has a t test value of 1.354. The t-table value in this equation is 1.66. Where the value of t-count is smaller than the value of t-table and the significance value of t is greater than the real level (0.1), then this means that Npk fertilizer has no significant effect on corn production. The use of NPK fertilizer in the Upsus Program is considered ineffective. This is due to the delay in coming in supply of fertilizer in large quantities. Only some Upsus participants received fertilizer on time.

Effect of Use Herbicide in Participants Upsus Pajale Program

Regression coefficient value of the herbicide variable is 0.48, positive variable value states that if the herbicide variable had an increase of 1 percent it would increase the amount of corn farming production by 0.482 percent assuming that the other variables were considered zero or constant. These results explain that increasing the amount of herbicide used in a corn farming production process directly increases corn production.

T test results for herbicide variables indicate that the variable has a t test value of 1.286. The t-table value in this equation is 1.66. Where the value of t-count is smaller than the value of t-table and the significance value of t is greater than the real level (0.1), then this means that the herbicide has no significant effect on corn production. The use of herbicides in corn farming has not been effective. The use of herbicides at the beginning of corn cultivation can only maximize the production of corn farming because the distribution of nutrients is only focused on corn plants without disturbing plants.

Effect of Use Insecticide in Participants Upsus Pajale Program
Regression coefficient value of the insecticide variable is 0.222, negative variable value approves the variable increase in insecticide increase by 1 percent then it will reduce the amount of corn farming production by 0.222 percent by increasing the related variable so that it is free or constant. These results explain the increase in the number of insecticides used in a corn farming production process directly decreasing corn production.

T test results for fertilizer variables indicate that the variable has a t test value of 1.8878. The t-table value in this equation is 1.66. Where the t-value is greater than the t-table value and the significance value of t is greater than the real level (0.1), then this means that the insecticide has a significant effect on corn production.

Effect of Use Fungicide in Participants Upsus Pajale Program
Regression coefficient value of the fungicide variable is 0,078,positive variable values state that if the fungicide variable has increased by 1 percent it will reduce the amount of corn farming production by 0.078 percent with the assumption that the other variables are considered zero or constant. These results explain that increasing the amount of fungicide used in a corn farming production process directly increases corn production.

T test results for the fungicide variables indicate that the variable had a t test value of 1.177. The t-table value in this equation is 1.66. Where the value of t-count is smaller than the value of t-table and the significance value of t is greater than the real level (0.1), then this means that the fungicide has a significant effect on corn production.

Corn Farming Non-Participants in Upsus Pajale Program (D = 0)
By entering a dummy variable value of zero in the production function equation, the production function equation for corn farming that does not get the Upsus Pajale program is:

$Ln\ Y = 6,169 - 0,263\ LnTk + 0,086\ LnBnh + 0,091\ LnUrea + 0,085\ LnNpk + 0,117LnHer + 0,209\ LnIns - 0,072\ LnFungi$

Y   = estimated production value in corn farming that does not get Upsus Pajale program
bo   = 6.169 is a constant that reflects the natural influence on Y or value of production if all production variables
  equal to zero (X = 0)

Effects of Use Workers in Non-Participants Upsus Pajale Program
Regression coefficient value of the labor variable is -0,263,negative variable value states that if the labor variable has an increase of 1 percent, it will reduce the amount of corn farming production by 0.271 percent with the assumption that the other variables are considered zero or constant.

T test results for labor variables indicate that the variable has a t test value of 1.309. The t-table value in this equation is 1.66. Where the t-value is greater than the t-table value and the significance value of t is greater than the real level (0.1), then this means that labor does not have a significant effect on corn production.

Effects of Use Seed in Non-Participants Upsus Pajale Program
Regression coefficient value of the seed variable is 0.086, positive variable value states that if the seed variable has increased by 1 percent, it will increase the amount of corn farming production by 0.086 percent, assuming that the other variables are considered zero or constant. These results explain that increasing the amount of seed used in a corn farming production process directly increases corn production.

T test results for seed variables indicate that the variable has a t test value of 3.425. The t-table value in this equation is 1.66. Where the t-value is greater than the t-table value and the significance value of t is greater than the real level (0.1), then this means that the seed has a significant effect on corn production.

Effects of Use Urea Fertilizer in Non-Participants Upsus Pajale Program
Regression coefficient value of urea fertilizer variable is 0.091, positive variable value states that if the urea fertilizer variable increases by 1 percent it will increase the amount of corn farming production by 0.091 percent assuming that the other variables are considered zero or constant. These results explain that increasing

the amount of urea fertilizer used in a corn farming production process can directly increase corn production.

T test results for the urea fertilizer variable showed that the variable had a t test value of 1,824. The t-table value in this equation is 1.66. Where the value of t-count is greater than the value of t-table and the significance value of t is smaller than the real level (0.1), then this means that urea fertilizer has a significant effect on corn production.

Effects of Use NPK Fertilizer in Non-Participants Upsus Pajale Program

Regression coefficient value of the Npk fertilizer variable is 0.085, negative variable value states that if the Npk fertilizer variable has increased by 1 percent it will increase the amount of corn farming production by 0.085 percent assuming that the other variables are considered zero or constant. These results explain that increasing the amount of Npk fertilizer used in a production process of corn farming can directly increase corn production.

T test results for the Npk fertilizer variable indicate that the variable has a t test value of 1.053. The t-table value in this equation is 1.66. Where the value of t-count is smaller than the value of t-table and the significance value of t is greater than the real level (0.1), then this means that Npk fertilizer does not have a significant effect on corn production.

Effects of Use Herbicide in Non-Participants Upsus Pajale Program

Regression coefficient value of the herbicide variable is 0.117, positive variable value states that if the urea fertilizer variable increased by 1 percent it would increase the amount of corn farming production by 0.117 percent assuming that the other variables were considered zero or constant. These results explain that increasing the amount of herbicide used in a corn farming production process directly increases corn production.

T test results for herbicide variables indicate that the variable has a t test value of 2.077. The t-table value in this equation is 1.66. Where the value of t-count is greater than the value of t-table and the significance value of t is smaller than the real level (0.1), then this means that the herbicide has a significant effect on corn production.

Effects of Use Insecticide in Non-Participants Upsus Pajale Program

Regression coefficient value of insecticide variable is 0.209, negative variable value states that if the insecticide variable has an increase of 1 percent, it will reduce the amount of corn farming production by 0.209 percent with the assumption that the other variables are considered zero or constant.

T test results for fertilizer variables indicate that the variable has a t test value of 2.681. The t-table value in this equation is 1.66. Where the value of t-count is greater than the value of t-table and the significance value of t is smaller than the real level (0.1), then this means that the insecticide has a significant effect on corn production.

### Effects of Use Fungicide in Non-Participants Upsus Pajale Program

Regression coefficient value of fungicide variable is 0.072. Positive variable value states that if the fungicide variable has increased by 1 percent, it will reduce the amount of corn farming production by 0.072 percent with the assumption that the other variables are considered zero or constant. These results explain that increasing the amount of fungicide used in a corn farming production process directly increases corn production.

T test results for fertilizer variables indicate that the variable has a t test value of 2.093. The t-table value in this equation is 1.66. Where the t-value is greater than the t-table value and the significance value of t is smaller than the real level (0.1), then this means that the fungicide has a significant effect on corn production.

Interception Difference

The interception difference between the production equation of corn farming that gets the Upsus Pajale program and corn farming that does not get the Upsus Pajale program is 4,365 - 6,169 or equal to -1,804. This value of 1.804 means that the natural condition Y or the value of production if all production variables are equal to zero ($Xi = 0$). When described as follows:

Picture No 1. The difference in the value of intercepts in corn farming
that participantsand non participantsUpsus Pajale Program
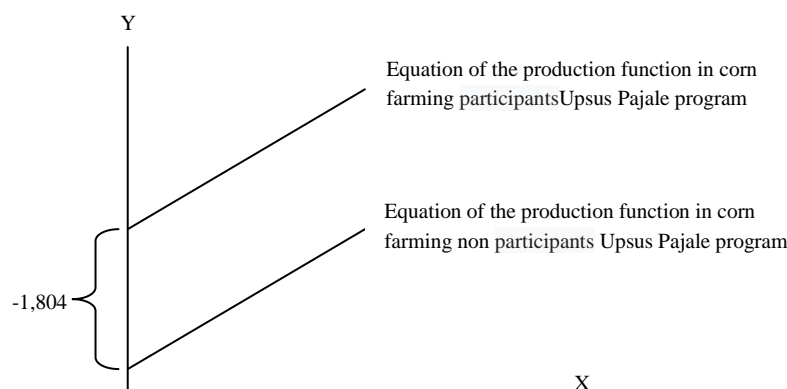
The minus value in the above intercept calculation is due to differences in productivity in corn farming between Upsus Program participants and non Upsus Program Participants. The productivity value of non-Upsus Pajale Program participants is greater than the productivity of Upsus Program participants. The productivity of Upsus Program participants is 5.9 tons / ha while the productivity of non-Upsus Program participants is 6.3 tons / ha. Based on data from the Ministry of Agriculture, Indonesian corn production (forecast figure I) in 2018 weighing 30.56 million tons with a harvested area of 5.73 million hectares (ha). Thus, national corn productivity last year weighed 5.24 tons / ha. Both Upsus Program participants and non participantsUpsus Program actually met national corn productivity and the average target of corn production targets in Bunga Mayang District per hectare was 7.2 tons / ha

V. Conclusions

The results of statistical analysis of production factors that support the Upsus Pajale Program which have been effective have a positive effect are labor, insecticide and fungicide. While the production factors that support non-participants of the Upsus Pajale Program that have been effective have a positive effect, namely seeds, urea fertilizer, herbicides, insecticides and fungicides. The interception difference between the production equation of corn farming that gets the Upsus Pajale program and corn farming that does not get the Upsus Pajale program is 4,365 - 6,169 or equal to -1,804.

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