AGROLAND: The Agricultural Sciences Journal
Vol. 11, No. 2 December (2024), 101 - 114
P-ISSN : 2407- 7585 & E-ISSN : 2407- 7593, Published by Tadulako University

Original Research **Open Access**

FACTORS AFFECTING COCOA PRODUCTION IN BOBO VILLAGE, PALOLO DISTRICT, SIGI REGENCY

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Submit: 26 September 2024, Revised: 15 October 2024, Accepted: December 2024
DOI : https://doi.org/10.22487/agroland.v11i2.2340

ABSTRACT

The plantation commodity that is currently being intensively cultivated again by the people of Central Sulawesi is cocoa plants because the price continues to soar and its trade cannot be separated from government policies such as subsidies and Government Assistance Programs.. The purpose of this study was to determine the influence of production factors, the number of productive plants, labor, use of NPK fertilizer, labor input, age of plants, farming experience and government assistance on cocoa production in Bobo Village, and to determine the extent of the success rate of increasing cocoa production through government assistance programs in Bobo Village.. Respondents in this study amounted to 60 cocoa farmers who received assistance and those who did not receive assistance, where in determining the respondents was done by census method and Simple Random Sampling Method and to achieve the objectives of this study the analysis method used was Cobb-Douglass function analysis. The results of this study show that based on the t-test and F-test There is a significant relationship between all independent variables and cocoa production, and there is a difference in cocoa production between farmers receiving assistance and farmers who do not receive government assistance.

Keywords: Cocoa Production, Government Assistance.

INTRODUCTION

Cocoa is one of the leading strategic plantation commodities that plays an important role in the Indonesian economy, namely as a foreign exchange earner, a source of income for farmers, job creation, encouraging domestic agribusiness and agro-industry, environmental conservation and regional development. In 2020, the export value of cocoa and its derivative products reached US$ 1,244.2 million with an export volume of 377,868 tons. This position places cocoa as the third largest plantation foreign exchange earner after palm oil and rubber commodities. On the other hand, the cocoa business involves more than

1.63 million rural farmer families and for large plantations involves around 11 thousand workers (Directorate General of Plantations, Ministry of Agriculture, 2022).

Agricultural development aims to increase production results and quality, increase farmers' income and standard of living, expand employment and business opportunities and support economic development and exports. In line with these objectives, one of the agricultural development policies is to develop the plantation subsector which is directed at the development of people's plantations. The plantation subsector is a business field that absorbs a lot of labour, provides raw materials for processing industry materials and plays a role in environmental preservation, therefore efforts to develop this subsector need to be continuously improved (Soekartawi, 2006).

Efforts to increase production are faced with quite a tough challenge for farmers, namely the high cost of production facilities such as seed and labour costs. The high cost of production inputs means that farmers must run their farms well and not waste a lot of time, labour and costs. This is closely related to improving welfare for farmers through increased income. Increasing income can be attempted by increasing production results with appropriate actions in allocating production inputs to make a profit (Masna, et al., 2018). Given that cocoa is an export-oriented Indonesian plantation commodity, its trade cannot be separated from government policies such as subsidies and the Government Assistance Program. These policies are closely related to the output and input of cocoa commodity business. One of the government policies for cocoa commodities is the Added Value and Industrial Competitiveness Program by the Director General of Plantations, Ministry of Agriculture, which targets plantation farmers who need assistance.

The implementation of the policy and the form of government presence in providing solutions in Indonesian cocoa, then cocoa plant development activities are allocated such as Intensification, Rejuvenation and Expansion of cocoa plant areas, with the aim of increasing production and productivity targeting communities receiving government assistance, while the indicator of the success of this activity is the distribution of government assistance to the community. (Directorate General of Plantations, Ministry of Agriculture, 2022.)

The area of plantation land in Central Sulawesi will play a significant role for cocoa farmers and the economy of a region. (Yantu et al., 2009) stated that the plantation sub-sector is the main supporting sub-sector for the agricultural sector in the economy of Central Sulawesi. Cocoa is indeed a superior plantation commodity, cocoa commodities in Indonesia are one of the plantation commodities that provide business and employment opportunities, as a source of life for millions of people who are actively involved in production activities, processing results, marketing, storage to export. The development of cocoa area and production in Central Sulawesi is shown in Table 1.

Table 1 shows that Sigi Regency is ranked fifth in Central Sulawesi Province in terms of land area, production and productivity, but in terms of quality it is in the best category, both at the provincial and national levels.

Sigi Regency is one of the regencies in Central Sulawesi Province that has the potential to produce cocoa, this can be seen in Table 2 of the cocoa potential whose area fluctuated from 2017-2022, reaching an area of 27,887 ha in 2022, spread across 15 sub-districts throughout Sigi Regency. (Regional Plantation Service of Central Sulawesi Province 2022).

Bobo Village is one of the villages in Palolo District that has quite good potential in cocoa cultivation. This condition can be seen in table 2 which shows that Bobo Village has a land area of 251 ha with a production of 199 tons. This shows that the land area with current cocoa production in Bobo Village is still relatively low when compared to several villages in Palolo District.

Table 1. Area, Production, Productivity and Number of Cocoa Farmers in Central Sulawesi Province in 2022.

No	District/City	Acreage (Ha)	Production (Ton)	Produktivity (Kg/Ha)	Total Farmers (KK)
1	Palu City	215,80	52,30	407	169
2	Donggala	31.365	18.287,62	730	23.931
3	Sigi	27.887	19.498,65	968	11.486
4	Parimo	67.440	28.713,23	694	37.667
5	Poso	38.553	24.498,20	835	37.056
6	Morowali	14.233	1.727,75	969	10.678
7	Banggai	45.953	15.338,48	628	19.513
8	Bangkep	6.287	270.00	93	4.167
9	Banggai Laut	757	85,85	157	688
10	Morowali Utara	14.264	4.645,30	607	7.022
11	Tolitoli	21.154	7.095,28	613	15.021
12	Buol	7.431	2.173,20	552	5.949
13	Touna	11.984	3.603.60	616	6.396
	Amount	284.125	195.845.613	994	181.697

Table 2: Area, Production, Productivity and Number of Cocoa Farmers by Sub-District in Sigi Regency, 2022.

No	Regency	Area (Ha)	Production (Ton)	Produktivity (Kg/Ha)	Total Farmers (KK)
1	Dolo	326,0	153.755	625	132
2	Dolo Selatan	1.583,0	1.348.205	1.097,9	648
3	Dolo Barat	437,0	404.050	1.384	182
4	Kinovaro	71,0	1.981.531	31.960	16
5	Marawola	58,0	75.268	1.505	12
6	Marawola Barat	671.367,0	71.290	774,9	50
7	Biromaru	779.311,0	57.183	205,7	208
8	Gumbasa	1.559.825,0	837.697	1.150,7	606
9	Tanambulava	1.421.324,0	699.204	681	613
10	Palolo	4.051.166,0	8.874.348	982,4	4.504
11	Nokilalaki	13.350,0	15.472	18	651
12	Kulawi	4.600.430,0	2.321.310	721,4	1.822
13	Kulawi Selatan	12.887,0	854.406	1.346	698
14	Lindu	112.816,0	630.806	789	384
15	Pipikoro	656.135,0	1.174.125	744	960
16	Sigi	27.887,0	19.498.650	968,2	11,486

Source : Plantation Agency of Central Sulawesi Province, Indonesia (Data 2022).

The results of the survey conducted other factors that caused the decline in cocoa production in this village are likely influenced by the condition of the community, especially plantation farmers who have not been able to independently manage production factors such as the availability of superior seeds, fertilizers, pesticides and other supporting factors to increase cocoa production. This encourages the local government to pay special attention to increasing cocoa production in this village related to government policies in the form of the

Government Assistance Program for plantation farmers. This policy is closely related to the output and input of cocoa commodity business.

One of the government policies for cocoa commodities is the Added Value and Industrial Competitiveness Program by the Director General of Plantations, Ministry of Agriculture, which targets cocoa farmers who need direct assistance through community assistance programs.

Results of monitoring in the field, cocoa farmers in Bobo Village still maintains the cultivation of cocoa plants, in addition to trying to provide superior seeds, fertilizers, and pesticides and other supporting facilities, farmers in this village have also mostly received subsidies in the form of assistance from the government as a form of government attention in efforts to increase production and productivity of cocoa commodities, but for production and productivity results have not shown an increase in accordance with the targets or expectations of farmers or the government as the party that has provided assistance. Based on these problems, the researcher intends to conduct a study entitled Factors Affecting Cocoa Production in Bobo Village, Palolo District, Sigi Regency.The main problem in this study is to determine how much influence the factors have: number of productive plants, NPK fertilizer, labor, age of plants, farming experience, and assistance government towards increasing cocoa production.

Table 3. Area, Production and Productivity of Cocoa Plants by Village in Palolo District, 2022.

No	Village	Area (Ha)	Production (Ton)	Produktivity (Kg/Ha)
1	Ampera	372	245	0,75
2	Bahagia	323	284	0,88
3	Bakubakula	1.106	762	0,69
4	Berdikari	917	647	0,71
5	Bobo	251	199	0,79
6	Bunga	446	348	0,78
7	Kapiroe	270	216	0,8
8	Karunia	310	275	0,89
9	Lemban Tongoa	685	496	0,72
10	Makmur	780	685	0,88
11	Petimbe	249	210	0,84
12	Rahmat	1.209	1.058	0,88
13	Ranteleda	60	21	0,35
14	Rejeki	705	640	0,91
15	Sarumana	15	5	0,33
16	Sejahtera	366	312	0,85
17	Sigimpu	278	178	0,64
18	Sintuwu	790	655	0,83
19	Tanah Harapan	16	6	0,38
20	Tongoa	820	710	0,87
21	Uenuni	685	493	0,72
22	Uerani	250	80	0,33
	Amount	10.858	8.527	-
	Average	494	388	0,79

Increased production and productivity of farming is influenced by several production factors including land area, number of productive plants, fertilizer, pesticides, labor, age of plants and farming experience. The objectives of this study are:

1. To determine the influence of production factors on the number of productive plants, labor, use of NPK fertilizer, labor input, plant age, farming experience and government assistance on cocoa production in Bobo Village.
2. To determine the extent of success in increasing cocoa production through government assistance programs in Bobo Village.

RESEARCH METHODS

Research Type

The type of research used is Quantitative. Quantitative is information data in the form of numerical symbols or numbers. Based on these numerical symbols, quantitative calculations can be carried out to produce a conclusion that applies generally within a parameter. Data values can change or be varied (Sugiyono, 2002).

Sampling Method

In this research activity, the determination of respondents will use a random sampling method (Simple Random Sampling Method). The population in this study is 150 people. The determination of sample size uses the Slovin formula (Riduwan, 2005) Determining the number of samples in this study used the Slovin formula with the consideration that farmers can provide information, so that the data obtained is accurate and representative in accordance with the expected objectives of the Slovin formula as follows:

$$n = \frac{N}{1 + Ne2}$$

Information:
n = Sample size
N = Population size
E = Margin of error 10%

Based on the formula, it is drawn the sample size was 60 respondent farmers who were cocoa farmers receiving assistance and those who did not receive government assistance.

Data Analysis Methods

Cobb-Douglas production function analysis is a technique for determining the factors that influence cocoa farming production or in other words, it is an analysis tool that explains the relationship between production factors (X) and production (Y). The Cobb-Douglas function is a function or equation that involves two or more variables, where one variable is called the dependent variable (Y) and the other explanatory variable is called the independent variable (X) (Soekartawi, 2006).

Coefficient of Determination (R^2)

The coefficient of determination is basically used to measure how much the model's ability to explain the variation of independent variables, so, the coefficient of determination actually measures the percentage of the influence of all independent variables in the regression model on the dependent variable. The value of the coefficient of determination is in the form of a percentage of the variation in the value of the dependent variable that can be explained by the regression model. So to find out the accuracy of the model, the coefficient of determination (R^2) is used, then the following formula is used:

$$R2 = \frac{\text{Jumlah Kuadrat Regresi}}{\text{Jumlah Kuadrat Total}}$$

F Test (Simultaneous Test)

The F test is used to see whether all independent variables entered the equation or model simultaneously affect the existing dependent variable. A tool to find out whether the regression model can be used to predict the dependent variable or not. Significant means that the relationship that occurs can apply to the population (can be generalized).

The f test is carried out to determine whether all the independent variables used together have a real effect. For non-free variables, the formula used is:

$$F = \frac{KTR}{KTS}$$

Information:

F = Fisher's Test
KTR = Regression Mean Square
KTS = Middle Square Remainder

$$H_0: b1 = b2 = b3 = b4 = 0$$

t-test (Partial Test)

The t-test is carried out to determine whether each independent variable has a real effect on the dependent variable, so the formula used is:

$$t\ hit = \frac{b_i}{Se\ b_i}$$

Information:

t = Student Test (t-test)
b_i = Regression Coefficient Value of Variable to-i
Seeb_i = Standard Error of the i-th Variable

Hypothesis Form:

H_0: bi = 0 means that the observed factors have no effect on production.

H_1: bi ≠ 0 means that the observed factors have a real influence on production.

Information:

If t count > t table, then H0 is rejected, meaning that individually the independent variables have a real effect on the dependent variable.

If t count ≤ t table, then H0 is accepted, meaning that individually the independent variable has no significant effect on the dependent variable.

If H_0 is rejected, it means that the independent variable (Xi) has a significant effect on the dependent variable (Y). Conversely, if H0 is accepted, it means that the independent variable (Xi) does not have a significant effect on the dependent variable (Y). In addition, it can be seen from the probability value. If the probability value is smaller than α, then the independent variable has a significant effect on the dependent variable.

RESULTS AND DISCUSSION

Factors Affecting Cocoa Production in Bobo Village, Palolo District, Sigi Regency Land area

Land in agriculture can be interpreted as a place to produce production. The area of land greatly determines the size of agricultural production and influences farmers' decisions in combining agricultural efforts and the use of cropping patterns. The wider the land owned by farmers, the more effective and profitable the decisions taken regarding the use of cropping patterns will be compared to farmers who have relatively narrow land areas, in addition, the production that will be achieved will be greater if the level of soil fertility is sufficient to support the type of plant being cultivated.

Table 8 shows that the percentage of agricultural land area owned by cocoa farmers in Bobo Village, Palolo District varies. For land area of 0.25 - 1 Ha as much as 75% and for land area of 1.1 - 3 Ha as much as 25%. This indicates that the wider the land owned, the greater the opportunity for farmers to develop cocoa commodities. The results of this study are supported by previous research by Marding (2019) which states that the area of cultivated land will affect the level of production and income of farmers from the farming business they manage.

Number of Productive Plants

Production in farming is an important thing to pay attention to. This will describe the process or operational activities in a farming business whether it is optimal or not. The number of productive plants is the number of trees that produce in a certain area of planting. Generally, for cocoa plants to grow optimally, they are planted with a planting distance of 3 x 3 m so that in 1 Ha there are 1000 trees.

The results of crop production are very much determined by the number of productive plants, the more productive

plants there are, the more production will be produced. The number of productive trees of farmer respondents in Bobo Village, Palolo District can be seen in the Table 9.

Farming Experience

Farming experience plays an important role in managing a farm. The more experience, the greater the level of success in managing a farm. Farmers who have a lot of farming experience will be very selective in choosing an action to be taken, because farmers often use the experience they have gone through as a benchmark.

Farming experience is a learning process for farmers that can influence farmer behaviour in managing their farming to obtain maximum cocoa production. The classification of cocoa farmer respondents based on farming experience in Bobo Village, Palolo District can be seen in Table 10.

Table 10 shows that cocoa farmers in Bobo Village, Palolo District, Sigi Regency have quite long farming experience in the range of 21-30 years, as many as 28 people or around 46.67%, respondents who have 10-20 years of farming experience are 23 people with a percentage of 38.33%, and respondents who have 31-45 years of experience are 9 people with a percentage of 15%, so that in general farmers have good experience in running their businesses. This is in line with the opinion of Soekartawi (1995) who stated that farmers tend to have a brave attitude in taking risks with increasing farming experience.

Table 8. Classification of Respondents Based on Land Area in Bobo Village, District Palolo, Sigi Regency.

No	Land Area (Ha)	Number (of Souls)	Percentage (%)
1.	0.25 – 1	45	75.00
2.	1.1 – 3	15	25.00
	Amount	**60**	**100**

Source: Primary Data After Processing 2024.

Table 9. Number of Productive Cocoa Plants in Bobo Village, Palolo District.

No	Number of Productive Plants (Trees)	Number (of Souls)	Percentage (%)
1.	100 – 700	37	61.67
2.	701 – 1,500	17	28.33
3.	1501 – 2500	6	10.00
	Amount	**60**	**100**

Source: Primary Data After Processing 2024.

Table 10. Classification of Respondents Based on Farming Experience in Bobo Village, Palolo District, Sigi Regency.

No	Farming Experience (Years)	Number (of Souls)	Percentage (%)
1.	10 – 20	23	38.33
2.	21 – 30	28	46.67
3.	31 – 45	9	15.00
	Amount	**60**	**100**

Source: Primary Data After Processing 2024

Results of Estimation of Factors Affecting Cocoa Production.
Normality Test

One-Sample Kolmogorov-Smirnov Test

		Unstandardized Residual
N		60
Normal Parameters[a,b]	Mean	,0000000
	Std. Deviation	,30305918
Most Extreme Differences	Absolute	,077
	Positive	,070
	Negative	-,077
Test Statistic		,077
Asymp. Sig. (2-tailed)		,200[c,d]

a. Test distribution is Normal.
b. Calculated from data.
c. Lilliefors Significance Correction.
d. This is a lower bound of the true significance.

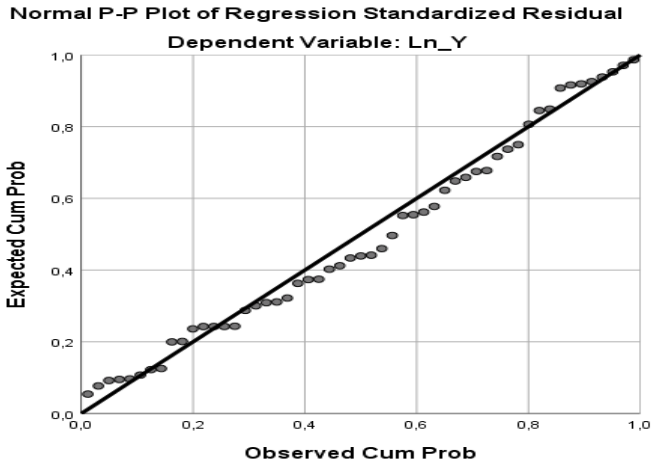

Figure 2. Normality Test of Probability Plot Graph.

Based on the normality test table, there are normality test results with the Kolmogorov-Smirnov test which show that the Asymp.Sig. (2-tailed) value is 0.200 and the results show that sig 0.200 > 0.05, this shows that the variable data is normally distributed.

Data with scale type generally follows the assumption of normal or near normal distribution, to detect whether data is normal can be done by looking at the distribution of data (points) on the diagonal axis of the graph. The statistical analysis used is statistical analysis in the form of data normality test on the Normal Probability Plot graph. The following is a picture of data normality test on the Normal Probability Plot graph.

Figure 2 explains that in the normal plot graph, the points are spread around the diagonal line, and their distribution follows the direction of the diagonal line. According to Sugiyono (2017), if the data is spread around the diagonal line and follows the direction of the diagonal line, it can be concluded that the regression model meets the assumption of normality.

F Test (Simultaneous Test)

According to Ghozali (2016) the F test basically shows whether all independent or free variables entered the model have a joint influence on the dependent or bound variable. Meanwhile, the calculated F value can be determined using the following formula :

ANOVA[a]						
	Model	Sum of Squares	df	Mean Square	F	Sig
1	Regression	29,507	6	4,918	41,943	,000[b]
	Residual	6,214	53	,117		
	Total	35,722	59			

a. Dependent Variable : Cocoa production

b. Predictors : (Constant), Dummy, Labor force, Business experience, Plant age, Produtive plant count, Application of NPK Fertilizer.

Source : Primary Data After Processing 2024

Table 13. T-Test Results (Partial Test)

Coefficients						
		Unstandradized Coefficients		Standardized Coefficients		
	Model	B	Std Error	Beta	t	Sig
1	(Constant)	3,620	,927		3,905	,000
	X1 (Number of Productive Plants)	,478	,139	,488	3,433	,001
	X2 (Application of NPK Fertilizer)	,269	,124	,320	2,172	,034
	X3 (Plant Age)	,606	,238	,188	2,551	,014
	X4 (Labor Outflow)	,244	,105	,254	2,326	,024
	X5 (Farming Experience)	,388	,150	,152	2,586	,013
	Dummy	,413	,113	,232	3,666	,001
a.	Dependent Variable	Cocoa production				

Based on the test results, the calculated F value is 41.943 and the F table is 2.167, in other words, the calculated F> F table (41.943> 2.167), with a probability/significance value of 0.000 because the probability value is more (0.000 <0.05). So H1 is accepted and H0 is rejected, meaning that together the variables Number of productive plants (X1), fertilizer application (X2), plant age (X3), labor input (X4), farming experience (X5), and government assistance (D) show that the six independent variables simultaneously or together have a positive or significant effect on the dependent variable, namely cocoa production (Y) in Bobo Village, Palolo District, Sigi Regency.

t-test (Partial Test)

The t-statistic test basically shows how far the influence of one explanatory or independent variable individually in explaining the variation of the dependent variable. Ghozali (2016) explains in an example that shows that variables whose significance level exceeds 0.05 are not significant and do not affect the dependent variable, while variables that have a significance level below 0.05 are significant and affect the dependent variable. The results of the partial regression test (t-test) in the table.

Based on the results of the Cobb-Douglass multiple regression equation in the table above, a regression equation for the data to the natural logarithm (ln) can be made as follows:

$InY = 0.3620 + 0.478\ X_1 + 0.269$

From the Cobb-Douglass multiple regression equation it can be explained as follows:

Number of Productive Plants (X_1)

The results of the analysis show that the number of productive plants has a significant effect on cocoa production in Bobo Village. This is indicated by a significant value of 0.001 which is smaller than 0.05 (0.001 <0.05) because the significant value is below 5%, thus H0 is rejected and H1 is accepted. The regression coefficient value of B1 is 0.478, meaning that every 1% increase in the number of productive plants will increase cocoa production by 0.478%, assuming ceteris paribus (other factors are considered constant). The results of this study are supported by Sulasti, et al. (2019) regarding the factors that influence cocoa production that the variable number of productive plants has a significant effect on cocoa production per year. The existence of old and damaged cocoa trees must be replaced with new plants so that these new plants are productive at the age of 5-15 years. The results of observations in the field found that there were several cocoa plants that were no longer productive, even damaged and old, so that farmers got minimal production results with poor quality.

Application of NPK Fertilizer (X_2)

The next variable is NPK fertilizer, the results of the analysis show that NPK fertilizer (X_2) has a significant effect on cocoa production in Bobo Village. This is indicated by a significant value of 0.001 which is smaller than 0.05 (0.001 <0.05) because the significant value is below 5%, thus H0 is rejected and H1 is accepted. The regression coefficient value of B1 is 0.269, meaning that every 1% addition of fertilizer will increase cocoa production by 0.269% assuming ceteris paribus (other factors are considered constant). This is because every addition of NPK fertilizer to agricultural land means that it will increase the nutrients Nitrogen, Phosphorus and Potassium which are very much needed by cocoa plants. Nitrogen nutrients are very much needed by cocoa plants to accelerate plant growth and increase the size of cocoa beans so that it will tend to increase cocoa production, Potassium nutrients are very much needed by cocoa plants for resistance to pests and diseases and to accelerate the formation of starch so that it will tend to increase cocoa production, assuming that the use of previous fertilizers has not been efficient. The addition of NPK fertilizer will increase cocoa production so that it will have implications for farmers' income. This study is in line with the research of Saputro, et al. (2020) where NPK fertilizer has a significant effect on cocoa production in Nglanggeran Village, Gunung Kidul Regency.

Plant Age (X_3)

The third variable is plant age (X_3) which has a significant effect on cocoa production in Bobo Village. This is indicated by a significant value of 0.001 which is smaller than 0.05 (0.001 <0.05) because the significant value is below 5%, thus H0 is rejected and H1 is accepted. The regression coefficient value of B1 is 0.606, meaning that every 1% increase in plant age will increase cocoa production by 0.606% assuming ceteris paribus (other factors are considered constant). Cocoa plants can produce from the age of 5 years and can actively produce up to 30 years or more, plant age is closely related to the ability of the plant to produce well, the older the age of the plant, the lower the ability of the plant to produce good quality cocoa fruit. This study is in line with the opinion of Renaldi (2018) who also stated that every 1% increase in plant age will decrease production. Plant age will decrease production because the plant is old, and to increase production, rejuvenation or rehabilitation of the plant is needed. The results of a survey in Bobo Village showed that cocoa farmer respondents had an average plant age of 20-25 years, which means that the plants

are in their productive age so that they are expected to be able to produce maximum cocoa production.

Labor Outflow (X_4)

The fourth variable is the influx of labor (X_4) which has a significant effect on cocoa production in Bobo Village. This is indicated by a significant value of 0.001 which is smaller than 0.05 (0.001 <0.05) because the significant value is below 5%, thus H0 is rejected and H1 is accepted. The regression coefficient value of B_1 is 0.244, meaning that every 1% increase in labor influx will increase cocoa production by 0.244% assuming ceteris paribus (other factors are considered constant). The results of field research on the effect of labor influx are seen in cocoa production in the Bobo Village area. The labor used in managing their cocoa farming business comes entirely from family labor, namely the farmers themselves, as leaders or decision makers are usually held by the farmers themselves. Soekartawi (2006) stated that every agricultural business that will be carried out requires labor. Usually, small-scale agricultural businesses will use family labor and do not require skilled labor. Every additional workforce will cause implementation in cocoa farming such as fertilization, weeding, pest and disease control, timely harvest and post-harvest handling, which will tend to increase cocoa production. The results of this study are also in line with research conducted by Alfayanti, et al. (2013) stating that the use of labor has a significant effect on cocoa production at a 99% confidence level, with a calculated T value (9.910) > T table (2.638).

Farming Experience (X_5)

The fifth variable is farming experience (X_5) which has a significant effect on cocoa production in Bobo Village. This is indicated by a significant value of 0.001 which is smaller than 0.05 (0.001 <0.05) because the significant value is below 5%, thus H0 is rejected and H1 is accepted. The regression coefficient value of B1 is 0.388, meaning that for every 1% increase in farming experience, cocoa production will increase by 0.388% assuming ceteris paribus (other factors are considered constant). Marding (2019) in his research stated that farming experience plays an important role in managing a farming business. The more experience, the greater the level of success in managing a farming business. Farmers who have a lot of experience will be very selective in choosing the farming actions they take because farmers often use past experiences as a benchmark. The results of field research show that on average, cocoa farmer respondents in Bobo Village have more than 20 years of farming experience with a percentage of 46.67% of the total respondents, which can be said that they have quite a long experience in farming, so they are considered capable of producing good cocoa production.

Government Assistance (D)

The dummy variable on government assistance (D) shows that with government assistance in the form of production facilities, cocoa production for farmers receiving assistance is 0.413 kg greater than farmers who do not receive assistance. So, it can be said that the government assistance variable (D) has a significant effect on cocoa production/year (Y). Bobo Village has good potential in cocoa production. This is supported by the government assistance program for cocoa farmer groups which is given regularly every year. The results of the analysis show that government assistance has a significant effect on cocoa production in Bobo Village. The results of this study are in line with previous research by Ramadhan, et al. (2017) which stated that there was a comparison of the average income of nutmeg farmers before and after government assistance, simultaneously and partially government assistance had a very significant effect on farmer income. The same thing was also stated in the research of Siwu, et al. (2018), the results of the study showed that there was a significant difference in income based on the t-test between before

and after receiving the assistance program, where the income of farmers after receiving assistance was greater than before receiving assistance.

However, the problems regarding the receipt of this assistance also vary depending on the needs of the farmer group. Some things found in the field are the types of assistance that are not used properly by farmers receiving assistance. For example, fertilizer assistance provided to be applied to cocoa land was sold by unscrupulous farmers, as well as assistance for seeds and other agricultural inputs included in the assistance program are often not used properly, the seeds provided are not planted and equipment and machinery assistance is not used properly. The cause is the mismatch between the needs of farmers and the assistance program provided by the government, so a deeper analysis is needed by the relevant agencies regarding the needs of farmers in the field so that the government assistance program is right on target and efficient, so that the objectives of this government assistance program are truly achieved so that it can increase cocoa production, especially in Bobo Village.

Determinant Coefficient Test (R^2)

The coefficient of determination (R^2) essentially measures how far the model's ability to explain the variation of the dependent variable. A value close to one means that the independent variables provide almost all the variables needed to predict the variation of the dependent variable (Ghozali, 2016). The coefficient value can be seen in Table 14.

Table 14 shows the results of the Cobb-Douglass multiple linear analysis of the use of production factors, the coefficient of determination (R^2 square) value is 0.909, which means that the independent variables (number of productive plants) (X_1), provision of NPK fertilizer (X_2), age of plants (X_3), labor input (X_4), farming experience (X_5), and government assistance (D) simultaneously influence 90% of the dependent variable of cocoa production (Y) and the remaining 10% is influenced by other factors outside the analysis model.

CONCLUSION AND SUGGESTIONS

Conclusion

The results of the Cobb-Douglass analysis showed that the factors influencing cocoa production were the number of productive plants, provision of NPK fertilizer, age of plants, labor input, farming experience had a significant effect on cocoa production in Bobo Village, and there was a difference in the amount of production between farmers who received government assistance and farmers who did not receive government assistance.

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin - Watson
1	,909[a]	,826	,806	,34242	1,492

a. Predictors : (Constant), Dummy, Labor force, Business experience, Plant age, Produtive plant count, Application of NPK Fertilizer.
b. Dependent Variable : Cocoa production

1. Simultaneously, the independent variable X has a positive effect on the dependent variable Y. In addition, the value of the coefficient of determination (R^2 square) of 0.909 explains that the contribution of the variables of productive plants, NPK fertilizer application, plant age, labor input, farming experience and government

assistance to cocoa production is 90%, while the remaining 10% is influenced by other factors outside the analysis model.

Suggestion

Based on the description of the conclusions obtained from this research, several suggestions can be put forward as follows:

1. Efforts to increase cocoa production, especially for farmers in Bobo Village, Palolo District, Sigi Regency, can be carried out more intensively by utilizing existing production factors, especially government assistance provided so that the expected production results are achieved.
2. To the relevant agencies to further strengthen CPCL in farmer groups, extension workers in the field to be able to coordinate well with the agencies so that the government assistance program provided is right on target and can truly increase cocoa production sustainably.

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