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Impact of Increasing Fertilizer Prices on Productivity and Its Influence on Tobacco Farmers' Income in Palongan Village

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Abstract

New problems have emerged in the agricultural sector related to fertilizer. Fertilizer prices have now increased to twice the previous price. Apart from that, the limited supply of non-subsidized fertilizer is a concern for farmers to continue their farming. Many farmers' land in Palongan Village is starting to be abandoned. The increase in fertilizer prices causes fertilizer to be given at the wrong time, due to the limited capital that farmers have. The impact of this problem is a decrease in tobacco productivity. This can also affect farmer income. The aim of this research is to examine further the impact of increasing fertilizer prices on tobacco productivity and its effect on farmers' income in Palongan Village. Apart from that, to analysis whether there is a difference in the productivity of tobacco farmers before the increase in fertilizer prices and after the increase in fertilizer prices. The method used in this research is the test method paired sample t-test and path analysis. The hypothesis test used is the t-test. Test results paired sample t-test stated that there was a difference in tobacco productivity before and after the increase in fertilizer prices. Test results path analysis stated that the increase in fertilizer prices directly affected tobacco productivity. Meanwhile, indirectly the increase in fertilizer prices through tobacco productivity does not have a significant effect on the income of tobacco farmers.

Keywords: fertilizer prices; tobacco productivity; income

Introduction

According to BPS data (2019), agriculture is a crucial sector in Indonesia which contributes to state income by ranking 3rd out of 17 sectors. This will continue to develop with the aim of increasing state income.

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Tobacco commodity is a plantation commodity that has high value and competitiveness. Apart from that, tobacco is also a commodity that provides benefits both economically and socially. It can be proven from the contribution of tobacco to the economy through the amount of excise tax as state income. Apart from that, a lot of workers have been absorbed, both in planting and processing tobacco and in the cigarette production stages, which aims to reduce unemployment.

Tobacco commodities are considered to have a positive impact on several aspects of the economy, one of which is the fiscal aspect. This aspect explains that all transactions resulting from industrial tobacco products have an impact on state income generated through excise. In 2016, tobacco's contribution to the country from excise was recorded at IDR 138.69 trillion. From the contribution of tobacco commodities in 2016, it was recorded that revenues from excise taxes paid amounted to approximately IDR 138.69 trillion. This value is equivalent to 96.65% of the total state excise tax (Ministry of Industry, 2017).

Basically historical, Indonesia is one of the world's largest tobacco producing countries with an average annual production of 164,851 tons. From the tobacco harvest in Indonesia, it was recorded that it was able to contribute 2.67% of tobacco to the global supply. Another fact about tobacco is that it is a strategic commodity which is one of the largest investors in state finances. This is because the profits from tobacco farming are very promising and in the future it can support the agricultural sector, trade sector, financial sector and industrial sector.

Currently, there are many rumors circulating that the problems experienced by farmers are mostly from fertilizer. Even in recent years, the government has also taken part in overcoming problems in the agricultural sector. One of them is creating a fertilizer subsidy policy that can support the agricultural sector. As we know, fertilizer can be said to be a basic need for farmers. Around 20% of the success of increasing agricultural yields comes from fertilizer. So, the government tries to always pay attention to the procurement process. Even though fertilizer prices continue to fluctuate, the value of subsidies also continues to increase. The aim of government policy which tends to continue to increase fertilizer subsidies is to improve the performance of the agricultural sector. The basis of this policy is because fertilizer is the main factor in increasing productivity. With the subsidy program, fertilizer prices will certainly be much cheaper and will be able to encourage an increase in farming income.

Every policy issued by the government does not always work well. Recently, the agricultural sector received negative news again, namely regarding the price of non-subsidized fertilizer, which experienced a very significant price increase. It was recorded that the increase in fertilizer prices this time was almost double the previous price, plus the limited supply of non-subsidized fertilizers meant that farmers' land in Palongan Village was neglected. Due to this problem, many farmers complained and some farmers even decided to temporarily stop managing their farming businesses. This is the result of an increase in fertilizer prices where farmers have to pay more to continue their tobacco farming business.

An increase in fertilizer prices can cause fertilizer to be given at the wrong time, due to the limited capital that farmers have. The impact of this problem is a decrease in tobacco productivity. This phenomenon has an impact on farmers' income which will also decrease.

Viewed from the perspective of the agricultural sector, the main goal of farming is to obtain production/harvest results that will continue to increase. High production yields will be directly proportional to the amount of income received by farmers, which will have an impact on increasing the welfare of farming families. Theoretically, farming income is the result of total farming costs reduced by the farmer's total income (Septiadi, Suparyana, & FR, 2020).

From the results of observations, in Palongan Village the majority of farmers reduced the amount of tobacco planted. This is because the costs required for tobacco farming are predicted to double compared to previous years. Plus the increase in fertilizer prices is making farmers worried. The increase in farming costs will certainly affect the income of farmers in Palongan Village. In a situation like this, the government's role is really needed to support the welfare of farmers. From this background, the researcher wants to study in more depth the "Impact of the Increase in Fertilizer Prices on the Productivity and Income of Tobacco Farmers in Palongan Village".

Literature review

Non Subsidized Fertilizer

Non-subsidized fertilizer is widely used in agricultural activities, one of which is for vegetable farming in the form of chilies, onions, beans and other types of vegetables (Lasindrang & DH, 2018). Fertilizer is one of the factors that determines the success of farming. The use of fertilizer is a very important input in increasing productivity, quality and competitiveness of agricultural products for food crops, horticulture, smallholder plantations, animal husbandry and fisheries. Fertilizers used by farmers include inorganic fertilizers, organic fertilizers, a combination of inorganic and organic fertilizers (Maman et.al 2021). Recently, a problem that often occurs is the increase in fertilizer prices and fertilizer scarcity among farmers, which is one of the problems that occurs very frequently both at the regional and national levels.

Productivity

In the agricultural sector, productivity is the ability of a production factor (such as land area) to obtain production results per unit area of land. Production and productivity are determined by many factors, such as soil fertility, the variety of seeds planted, the use of adequate fertilizer (both type and dose), the availability of sufficient water, appropriate farming techniques, the use of adequate agricultural equipment, and availability of labor. The increase in productivity is due to several things, such as strategies in an effort to increase production, one example is the shift from the use of traditional tools to modern tools in the form of agricultural machines (Nasoi, et.al., 2019).

Farmers' Income

Basically, farmer income is the result of reducing the total income of farmers from the total costs incurred by farmers. So the variables that form income such as total production value

and selling price, as well as variables that form farming costs such as use of land area, seeds, use of fertilizers and medicines certainly have an influence on the amount of income earned by farmers. High production will be directly proportional to the high income generated by farmers, thus having an impact on increasing the welfare of farming families (Septiadi, D., et.al. 2022). One important factor in efforts to identify factors that influence tobacco farmers' income is to analyze the characteristics of tobacco farming activities as well as socio-economic factors that influence tobacco farmers' income (Santoso, 2018).

Research Methods

This type of research, explanatory research with a quantitative approach using instruments that produce data in the form of numbers. The location of this research is Palongan Village, Bluto District, Sumenep Regency. The data in this research was obtained from tobacco farmers in Palongan Village. This research uses primary and secondary data sources. Primary data sources are data sources that are directly provided by respondents. This data is data obtained from the results of questionnaires and information based on interviews with respondents. The questionnaires will be distributed directly to respondents, namely people who work as tobacco farmers in Palongan Village. Meanwhile, secondary data sources are data sources obtained through media or stakeholder. In this research, it was obtained from several books and other references that were considered relevant to this research.

The population of this research is tobacco farmers in Palongan Village with a total of 38 people (according to farmer group data). Meanwhile, the sample in this research is the entire population. Using sampling techniques non-probability sampling, saturated sampling type. Saturated sampling technique is a sample determination technique if the entire population is used as a sample. A saturated sample is also defined as a sample that is at its maximum, adding any amount will not change the representativeness. So the sample for this research was 38 tobacco farmers in Palongan Village.

The data collection technique used in this research is using instruments such as questionnaires, observation and direct interviews. Questionnaires are used to obtain data in the form of numbers. Observations are carried out to find out actual events in the field to strengthen the data received. Meanwhile, the interview was to find out in detail about the validity of the data from respondents in this research.

There are 3 variables, namely independent variables, intervening variables and dependent variables. The independent variable in this research is the increase in fertilizer prices (X). The intervening (mediation) variable in this research is farmer income (Z). Meanwhile, the dependent variable in this research is tobacco productivity (Y).

In this research, researchers used descriptive statistical analysis which aims to determine variations in answers to the questionnaires submitted to respondents. Then the data results are presented in the form of numbers or percentages. Furthermore, to obtain results that are in accordance with the objectives of this research, inferential statistical analysis is also used which aims to test the data parameters obtained from respondents by carrying out analysis using SPSS

25. This makes it easier to process data in statistical form in order to draw conclusions from the results. research conducted. The method used is the paired sample t-test and Path Analysis. Paired Sample t-test The aim is to find out whether there is a difference in the average between two related samples. The basis for decision making based on the probability used is H_0 accepted if the significance value is > 0.05 while H_0 rejected if the significance value is < 0.05. The hypothesis used is as follows:

1. H_0 rejected and H_1 accepted if the significance value is <0.05 which indicates there is a significant difference between tobacco productivity before the increase in fertilizer prices and after the increase in fertilizer prices.

2. H_0 accepted and H_1 rejected if the significance value is > 0.05, which indicates there is no significant difference between tobacco productivity before the increase in fertilizer prices and after the increase in fertilizer prices.

The second method of analysis is using Path analysis. This analysis is an extension of regression analysis. This analysis is used to examine the direct and indirect influence of the dependent variable on the independent variable by referring to the magnitude of the coefficient value. It can be concluded that the purpose of Path Analysis is to analyze the pattern of relationships between variables (Sugiyono, 2014). The hypothesis used is as follows:

1. H_1 : the increase in fertilizer prices has a direct effect on tobacco productivity

2. H_2 : the increase in fertilizer prices has a direct effect on farmers' income

3. H_3 : tobacco productivity has a direct effect on farmer income

4. H_4 : the increase in fertilizer prices through productivity has a direct effect on farmers' income.

Hypothesis testing in this research uses the t-test (partial test) by comparing the t table and calculated t values. The basis for decision making is if the calculated t value > t table means H_0 rejected and H_1 accepted. Meanwhile, if the calculated t value < t table means H_0 accepted and H_1 rejected.

Results

Descriptive Analysis

The results of descriptive analysis with 38 farmers in Palongan Village show that the respondents have a land area of 0.15 Ha - 0.2 Ha with ownership status, namely their own land. The respondents who were the objects of this research were predominantly male with a percentage of 90%. The educational background of some of the respondents in this study was on average elementary school (SD) with a percentage of 60% of the total respondents. From the respondents' information, their experience in farming is more than 15 years.

Paired Sample t-test

To determine the differences in tobacco productivity in Palongan Village, before the increase in fertilizer prices and after the increase in fertilizer prices, a test was carried out paired sample t-tes. The significance level used in this test is α = 5% or α = 0.05. The test results are presented in table 1 as follows:

Tabel 1. Paired Sample T-Test results

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	Productivity Before Increase in Fertilizer Prices - Productivity After Increase in Fertilizer Prices	1.86316	.93936	.15238	1.55440	2.17192	12.227	37	.000

Source: Primary data processed in 2023

From these results it can be concluded that there is a significant difference between tobacco productivity before the increase in fertilizer prices and after the increase in fertilizer prices in Palongan Village with reference to the Sig value. (2-tailed) of 0.000 < 0.05. This state H_0 rejected and H_1 accepted.

Path Analysis

Tabel 2. Path Analysis model 1 results

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	11.832	4.442		2.663	.011
	Increase in Fertilizer Prices	.627	.175	.512	3.577	.001

a. Dependent Variable: Tobacco Productivity

Source: Primary data processed in 2023

Direct Effect of Increased Fertilizer Prices on Tobacco Productivity

The table above shows the results analysis path to determine the effect of increasing fertilizer prices (X) on tobacco productivity (Y). The table above shows a beta coefficient value

of 0.512 and a significance value of 0.001 < 0.05 with the conclusion that there is a significant influence of increasing fertilizer prices on tobacco productivity. This state that **H_1 is accepted**.

Tabel 3. Path Analysis model 1 results

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	2.029	3.683		.551	.585
	Increase in Fertilizer Prices	.706	.155	.586	4.563	.000
	Tobacco Productivity	.262	.126	.267	2.077	.045

a. Dependent Variable: Farmer Income

Source: Primary data processed in 2023

Direct Effect of Increased Fertilizer Prices on Farmers' Income

The table above shows the results analysis path to determine the effect of increasing fertilizer prices (X) on farmer income (Z). The table above shows a beta coefficient value of 0.586 and a significance value of 0.000 <0.05 with the conclusion that there is a significant effect of increasing fertilizer on farmer income. This state that **H_2 is accepted**.

Direct Influence of Tobacco Productivity on Farmers' Income

Next, to find out the effect of tobacco productivity (Y) on farmer income (Z). The table above shows a beta coefficient value of 0.267 and a significance value of 0.045 <0.05 with the conclusion that there is a significant influence of tobacco productivity on farmer income. This state that **H_3 is accepted**.

Indirect Effect of Increased Fertilizer Prices Through Tobacco Productivity on Farmers' Income

Indirect influence of the variable increase in fertilizer prices (X) through tobacco productivity (Y) on income (Z). It is known that the direct effect of increasing fertilizer on tobacco productivity is 0.586. Meanwhile, the indirect effect of the increase in fertilizer prices through tobacco productivity on farmer income can be seen from the multiplication of the beta value (increase in fertilizer prices on tobacco productivity) and the beta value (tobacco productivity on farmer income), namely 0.586 x 0.267 = 0.156. Based on these results, it is known that the value of the direct influence is 0.586 and the indirect influence is 0.156, which means that the indirect influence <direct influence. It can be concluded that indirectly increasing prices through tobacco productivity does not have a significant effect on tobacco farmers' income. This state that **H_4 is rejected**.

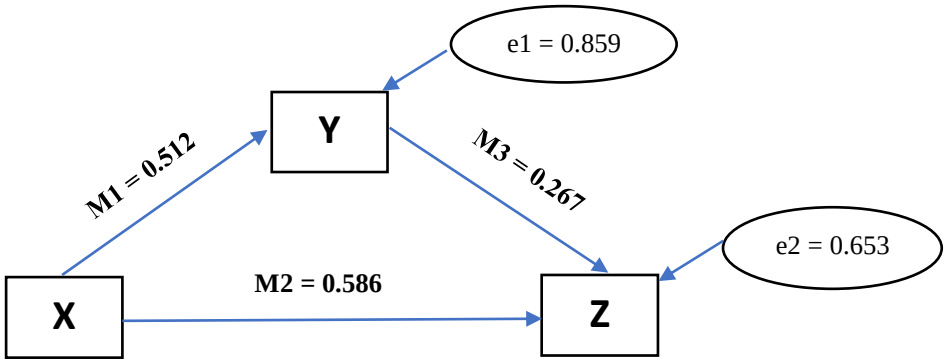

Figure 1. Equation model Path Analysis
Source: Primary data processed in 2023

Information:

X = Increase in Fertilizer Prices
Y = Tobacco Productivity
Z = Tobacco Farmer Income
M1 = Coefficient of influence of increasing fertilizer prices on tobacco productivity
M2 = Coefficient of influence of increasing fertilizer prices on farmer income
M3 = Coefficient of influence of tobacco productivity on farmer income
e = standart Eror

From the picture above, Path Analysis can be formulated as follows:
Y = 0,512X
Z = 0.586X + 0.267Y

Uji t

Based on data that has been processed via SPSS 25, the following t test results are presented in the table below:

Tabel 4. T test results

Variabel	t_{hitung}	Sig.	t_{tabel}
X → Y	3.577	.001	1.688
X → Z	4.563	.000	1.688
Y → Z	2.077	.045	1.688

Source: Primary data processed in 2023

From the t test values in the table above it is known that:

1. The increase in fertilizer prices (X) on tobacco productivity (Y) has a calculated t value of 3,577 > t table of 1,688. With the conclusion that the increase in fertilizer prices has a significant influence on tobacco productivity.

2. The increase in fertilizer prices (X) on farmer income (Z) has a calculated t value of 4,563 > t table of 1,688. With the conclusion that the increase in fertilizer prices has a significant influence on farmers' income.
3. Tobacco productivity (Y) on farmer income (Z) has a calculated t value of 2,077 > t table of 1,688. With the conclusion that tobacco productivity has a significant influence on farmer income

Coefficient of determination (R^2)

The following are the results of the coefficient of determination test via SPSS 25 which are presented in the following table:

Tabel 5. Coefficient of determination Test Results

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
Model 1	.512[a]	.262	.242	1.93234
Model 2	.758[a]	.574	.550	1.46448

Source: Primary data processed in 2023

Based on the data in the table above, it is known that the first model has a coefficient of determination value of 0.262. It can be concluded that the variable increase in fertilizer prices contributes to the tobacco productivity variable by 26.2%. Meanwhile, the second model has a coefficient of determination value of 0.574. The conclusion is that the variable increase in fertilizer prices through the tobacco productivity variable contributes to the farmer income variable by 57.4%.

Discussion

Differences in Tobacco Productivity Before and After the Increase in Fertilizer Prices

Results of the Paired Sample t-test, it is known that the significance value is 0.000 <0.05. It can be concluded that there is a difference between tobacco productivity before the increase in fertilizer prices and after the increase in fertilizer prices in Palongan Village. This is in line with research (Suwandi,et.al. 2023) which states that there is a real difference between corn productivity before and corn productivity after the increase in non-subsidized fertilizer prices in Tigabinanga District.

Direct Effect of Increased Fertilizer Prices on Tobacco Productivity

Based on field research and results Path Analysis, explained that the increase in fertilizer prices had a significant effect on tobacco productivity. This can be seen through a significance value of 0.001 < 0.05 with the conclusion that the policy of increasing fertilizer prices has a big impact on tobacco productivity.

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Most respondents in this study revealed that the increase in fertilizer prices made it difficult for farmers to get good quality fertilizer. Of course, this can affect tobacco productivity and impact crop yields. This argument is strengthened by research (Kautsar, et.al 2020) which states that it is feared that there is a scarcity of subsidized fertilizer in Montasik District that will affect rice productivity due to its limited availability.

Indirect Effect of Increased Fertilizer Prices through Tobacco Productivity on Farmers' Income

Judging from research in the field and results of path analysis, It's known that the value of the direct influence is 0.586 and the indirect influence is 0.156, which means that the indirect influence is smaller than the direct influence. It can be concluded that indirectly the increase in fertilizer prices through tobacco productivity does not have a significant effect on the income of tobacco farmers. The results of this analysis show that the farmer income variable cannot be a mediator between the increase in fertilizer prices and tobacco productivity.

Conclusion

1. There is a difference between tobacco productivity before and after the increase in fertilizer prices. This explains that the increase in fertilizer prices has a big impact on tobacco productivity in Palongan Village
2. The increase in fertilizer prices directly affects tobacco productivity. The increase in fertilizer prices makes it difficult for farmers to get good quality fertilizer. Of course, this can affect tobacco productivity and impact crop yields.
3. The increase in fertilizer prices through tobacco productivity does not have a significant effect on farmer income. With the decision that the farmer's income variable cannot be a mediator between the increase in fertilizer prices and tobacco productivity.

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