

THE EFFECT OF THE EFFECTIVENESS OF SUBSIDIZED FERTILIZER DISTRIBUTION AND AGRICULTURAL LAND AREA ON AGRICULTURAL PRODUCTION IN MEDIATION OF PREPARATION FOR APPLICATION OF TANI CARD IN SUKODADI DISTRICT, LAMONGAN REGENCY

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ABSTRACT

Problems in Indonesia are still experiencing many obstacles, one of which concerns the level of productivity that is weak and not yet optimal. Production cannot achieve maximum results if farming activities it is not carried out properly and truly under what is regulated by the government. For this reason, as a follow-up to countermeasures in addressing these problems, the government will adopt a policy of subsidized fertilizer assistance. The method used is SEM with Smart PLS version 3.3.7 with a sample of 100 farmers. The test used consisted of Outer Model, Inner Model, Mediation test, and Hypothesis test. The distribution of subsidized fertilizers, the area of agricultural land, and the variables of preparation for the application of farmer cards and agricultural production are valid and reliable. Subsidized fertilizer distribution variable, land area to production variable mediated by farmer card agricultural preparation variable is referred to as Direct-only non-mediation. The area of agricultural land on the variable of agricultural production is mediated by the preparation variable for the application of the farmer card which is referred to as Direct-only non-mediation. The subsidized fertilizer distribution variable has a positive and significant effect on the preparation variable for the application of farmer cards. The distribution variable of the effect of subsidized fertilizer is negative and not significant on agricultural production. variable land area and agricultural production variables have a negative and insignificant effect on the preparation for the application of farmer cards. The variable of the agricultural land area is positive and significant to the variable of agricultural production.

Keyword: *Fertilizer distribution, land use, agricultural production, preparation for application of farmer cards*

INTRODUCTION

Agricultural problems in Indonesia are still experiencing many obstacles, one of which is still related to the level of productivity that is weak and not yet optimal. Production cannot achieve maximum results if farming activities it is not carried out properly and correctly under what is regulated by the government. For this reason, as a follow-up to the countermeasures in addressing these problems, the government adopted a policy of subsidized fertilizer assistance. Subsidized fertilizers are goods under supervision whose procurement and

distribution receive subsidies from the Government for the needs of farmers in the agricultural sector (Regulation of the Minister of Agriculture of the Republic of Indonesia No. 01 of 2020). The distribution of subsidized fertilizers has been regulated in the Regulation of the Minister of Trade No.15/MDAG/PER/4/2013 concerning the procurement and distribution of subsidized fertilizers for the agricultural sector. Line I is the location of the fertilizer warehouse in the factory area, Line II is the location of the producer's warehouse in the provincial capital area, and Line III is the location of the warehouse for producers and/or distributors in the district or city. The

results of research by Moko, et al (2017) found problems related to the distribution of subsidized fertilizers, namely the scarcity of fertilizers, fluctuating prices, and the use of fertilizers by farmers who overdosed to ensure increased production. There is often a shortage of subsidized fertilizers due to the imbalance between the availability and demand for fertilizers at the retailer or seller level as well as low distributors. The subsidized fertilizer policy did not go well because there were still many problems in the field, so a farmer card was issued.

THEORETICAL BASIS

Effectiveness of Subsidized Fertilizer Distribution

Subsidized fertilizers are regulated in the Decree of the Minister of Industry and Trade No. 70/MPP/Kep/2/2003 dated February 11, 2003, concerning the Procurement and Distribution of Subsidized Fertilizers for the Agricultural Sector. In Article 1 of the regulation, it is explained that subsidized fertilizers for procurement and distribution receive subsidies from the government for the needs of farmers which are carried out based on government programs. The government provides subsidized fertilizers to farmers to support national food security. The provision of subsidized fertilizers must meet the six main principles that have been proclaimed or called 6T, namely the right type, the right amount, the right price, the right place, the right time, and the right quality that is expected so that the distribution of fertilizers is carried out effectively. Principle 6T is also to implement the recommendations proposed by the Corruption Eradication Commission (KPK) and the Supreme Audit Agency (BPK). Where the Ministry of Agriculture was asked to design a pattern for distributing subsidized fertilizer directly to farmers (pertanian.go.id). In this study, only 5T was used, namely the right type, the right quantity, the right price, the right place, and the right time.

Agricultural Land Area

In agriculture, the factor of land production has the most important position. This is evident from the amount of remuneration received by the land compared to other factors. The area of land planted will affect the number of plants that can be planted which in turn can affect the amount of vegetable production produced. If the farmer's land area is large enough, the economic opportunities to increase production and income will be greater (Soekartawi et al in Pradanyawati et al, 2021). The area of land for rice farmers is one of the factors that affect the increase in yields. Villagers whose main activity is farming depend on their land for a living. Thus the area of land owned is one of the indications of the amount of income received. If the area of land increases, the income of farmers will also increase and vice versa if the area of land used is small or narrow, the income earned by farmers will also decrease because less rice is planted. So, the relationship between land area and farmers' income has a positive relationship (Isfrizal & Rahman, 2018).

Agricultural Productivity

According to the National Productivity Council (in Awwaliyah, et al 2020) explains that productivity means a comparison between the results achieved (output) and the overall resources used (input). In other words, productivity has two dimensions. The first dimension is effectiveness that leads to the achievement of targets related to quality, quantity and time. The second is efficiency which relates to efforts to compare inputs with the realization of their use or how the work is carried out. Such an opinion shows that productivity includes a number of issues related to management activities and technical operations. While the concept of productivity is explained as follows:

1. Productivity is a universal concept, intended to provide more and more goods and services to more and more people using fewer resources.

2. Productivity is based on a multidisciplinary approach that effectively formulates the objectives of development plans and implements productive methods by using resources effectively and efficiently while maintaining quality.

Preparation for the Application of the Farmer's Card

According to the Technical Guidelines for the Management of Subsidized Fertilizers for the fiscal year (2021), the Farmer's Card is a card issued by the Bank to Farmers to be used in subsidized fertilizer redemption transactions through the Electronic Data Capture machine at authorized retailers. According to Campbell (in Mutiarin, et al, 2014), the effectiveness of the program can be carried out with the ability and operations in carrying out work programs that are following predetermined goals, comprehensively, effectiveness can be said to be the level of the institution's ability to carry out its main tasks or can achieve the goals that have been set previously. Sutrisno in Pertiwi, et al (2017) mentions measures of effectiveness in an organization include: Right on target, On time, Achievement of goals.

HYPOTHESES

H1: The Effectiveness of Subsidized Fertilizer Distribution has a positive and significant impact

on the Preparation for the Implementation of Farmer Cards

H0: The Effectiveness of Subsidized Fertilizer Distribution has a negative and insignificant effect on the Preparation for the Implementation of Farmer Cards

H2: The Effectiveness of Subsidized Fertilizer Distribution has a positive and significant effect on Agricultural Production.

H0: The Effectiveness of Subsidized Fertilizer Distribution has a negative and insignificant effect on Agricultural Production

H3: Agricultural Land Area has a positive and significant effect on the Preparation of Farmer Card Application

H0: The area of agricultural land has a negative and insignificant effect on the preparation for the application of the Farmer's Card

H4: The area of agricultural land has a positive and significant effect on agricultural production

H0: Agricultural land area has a negative and insignificant effect on agricultural production

H5: Agricultural Production has a positive and significant effect on the Preparation for the Implementation of Farmer Cards

H0: Agricultural Production has a negative and insignificant effect on the Preparation for the Implementation of Farmer Cards

METHOD

This research was conducted in Sukodadi District, Lamongan Regency, which consists of 20 villages used as the population and researchers took 100 farmers as research samples taken from 5 farmers in each village. This study uses quantitative research by measuring respondents' answers, filling out the questionnaire is measured using a Likert scale and the research method used is SEM with Smart PLS version 3.3.7 test tool. The test used consists of Outer Model, Inner Model, Mediation test, and Hypothesis test.

RESULTS AND DISCUSSION

1. Measurement Model (*Outer Model*)

a) *Covergent Validity*

An indicator is said to have good reliability, if the outer loading value is above 0.70 (Ghazalii,dkk, 2015).

Tabel 1 *outer loading*

	Effectiveness Of Subsidized Fertilizer Distribution (X1)	Agricultural Land Area (X2)	Agricultural Production (Z)	Preparation For Application Of Tani Card (Y)
X1,1	0,759			
X1,2	0,753			
X1,3	0,798			
X1,4	0,819			
X1,5	0,738			
X2,1		0,891		
X2,2		0,863		
X2,3		0,837		
Y1				0,743
Y2				0,881
Z1			0,731	
Z2			0,821	
Z3			0,821	

In this test, the variables of the effectiveness of subsidized fertilizer distribution, agricultural land area, agricultural production and preparation for the application of farmer cards are declared valid.

b) Reability Test

Rule of Thumb to assess construct reliability is Composite Reliability value must be greater than 0.70 and Conbarch Alpha value > 0.60 (Ghozali, 2014)

Tabel 2 Composite Realiability dan Cronbach's Alpha

	Cronbach's Alpha	Composite Reliability
Effectiveness Of Subsidized Fertilizer Distribution (X1)	0,834	0,882
Agricultural Land Area (X2)	0,833	0,898
Preparation For Application Of Tani Card (Z)	0,703	0,834
Agricultural Production (Y)	0,606	0,797

Sumber: Data Hasil SEM-PLS 3.3.7 (2022)

In the construct reliability test, the Composite Reliability value and Conbarch Alpha value of the variable Effectiveness of Subsidized Fertilizer Distribution, Agricultural Land Area, Agricultural Production and Preparation of Farmer Card Applications, the value of all variables is greater than 0.70 and greater than 0.60.

2. Struktural Model (Inner Model) R-Square

According to Ghozali, Imam (2014) if the R-Square value is 0.75 then it can be said to be strong, 0.5 is said to be moderate and 0.25 is said to be weak..

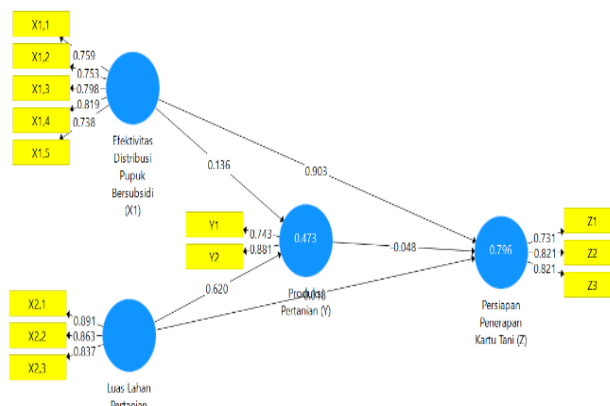
Tabel 3 R-Square

	R Square	R Square Adjusted
Preparation For Application Of Tani Card (Z)	0,796	0,789
Agricultural Production (Y)	0,473	0,462

Sumber: Data Hasil SEM-PLS 3.3.7 (2022)

From the table above, the R-Square value has a joint effect on the Variable Effectiveness of Subsidized Fertilizer Distribution (X1), Agricultural Land Area (X2) on Preparation for Farmer Card Application (Z) is 0.796 with an R-Square Adjusted value of 0.789 which is said to be

strong. The R-Square value jointly affects the Effectiveness of Subsidized Fertilizer Distribution (X1), Agricultural Land Area (X2) on Agricultural Production (Y) of 0.473 with an Adjusted R-Square value of 0.462 which is said to be weak.



Sumber: Data Hasil SEM-PLS 3.3.7 (2022)

Figure 1 Struktural Model

3. Mediation Test

The type of mediation from Baron in Bahri S, et al (2018) by identifying three consistent patterns with mediation and two consistent patterns without mediation, namely

Complementary mediation: the mediating effect (a x b) and the direct effect (c) both exist and point in the same direction.

Competitive mediation: mediating influence (a x b) and direct influence (c) both exist and point in opposite directions.

Indirect-only mediation: there is a mediating effect (a x b), but no direct effect.

Direct-only nonmediation: there is a direct effect (c), but no indirect effect

Tabel 4 Path Coefisien

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values
Effectiveness Of Subsidized Fertilizer Distribution (X1) -> Preparation For Application Of Tani Card (Z)	0,903	0,908	0,036	25,130	0,000
Effectiveness Of Subsidized Fertilizer Distribution (X1) -> Agricultural Production (Y)	0,136	0,135	0,078	1,747	0,081
Agricultural Land Area (X2) -> Preparation For Application Of Tani Card (Z)	0,018	0,004	0,081	0,224	0,823
Agricultural Land Area (X2) -> Agricultural Production (Y)	0,620	0,626	0,053	11,741	0,000
Agricultural Production (Y) -> Preparation For Application Of Tani Card (Z)	-0,048	-0,041	0,072	0,671	0,503

Sumber: Data Hasil SEM-PLS 3.3.7 (2022)

Tabel 5 *Specific Indirect Effects*

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values
Effectiveness Of Subsidized Fertilizer Distribution (X1) -> Agricultural Production (Y) -> Preparation For Application Of Tani Card (Z)	-0,007	-0,003	0,011	0,585	0,559
Agricultural Land Area (X2) -> Agricultural Production (Y) -> Preparation For Application Of Tani Card (Z)	-0,030	-0,026	0,046	0,652	0,515

Sumber: Data Hasil SEM-PLS 3.3.7 (2022)

There is a table of Path Coefficients of the effectiveness of the distribution of subsidized fertilizers on the preparation of farmer card application shows a positive relationship because P Value = 0.000 < 0.025, and on the table of Specific Indirect Effects of the effectiveness of subsidized fertilizer distribution on agricultural production variables mediated by the preparation of farmer card application variables there is a negative relationship because P Value = 0.559 which means > 0.05. So in this connection, it can be referred to as Direct-only non-mediation. Similarly, the variable land area on agricultural production in the Path Coefficient table shows a positive relationship, but when the variable area of agricultural land on agricultural production is mediated, the preparation for applying the farmer card shows a negative relationship, it can be referred to as Direct-only non-mediation.

In the Path coefficient table, the effectiveness of subsidized fertilizer distribution on agricultural production shows a negative relationship because P Value = 0.081 > 0.05, and in the Specific Indirect Effects table the variable effectiveness of subsidized fertilizer distribution on agricultural production variables is mediated by the preparation variable for the farmer card application, there is a negative relationship because P Value = 0.559 which means > 0.05. So in this connection, it can be called No-effect non-mediation. In the Path coefficient table, the relationship between agricultural land area and agricultural production in the preparation for the application of farmer cards shows negative results. and in the table of Specific Indirect Effects, the variable area of agricultural land on the

variable of agricultural production is mediated by the variable of preparation for the application of the farmer card, there is a negative relationship because P Value = 0.515, which means > 0.05. So in this connection, it can be called No-effect nonmediation.

4. Hypothesis Test

Hypothesis testing by looking at the calculated value of the Path Coefficient on the inner model test. Testing the hypothesis can be seen through the value of t-statistics and probability values. For hypothesis testing using statistical values, for alpha 5% the t-statistic value used is 1.96 (Muniarti, et al. 2013).

Tabel 6 *Path Coefisien*

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values	Sig/ Tidak
Effectiveness Of Subsidized Fertilizer Distribution (X1) -> Preparation For Application Of Tani Card (Z)	0,903	0,908	0,036	25,130	0,000	Sig
Effectiveness Of Subsidized Fertilizer Distribution (X1) -> Agricultural Production (Y)	0,136	0,136	0,078	1,747	0,081	Tidak Sig
Agricultural Land Area (X2) -> Preparation For Application Of Tani Card (Z)	0,018	0,004	0,081	0,224	0,823	Tidak Sig
Agricultural Land Area (X2) -> Agricultural Production (Y)	0,620	0,626	0,063	11,741	0,000	Sig
Agricultural Production (Y) -> Preparation For Application Of Tani Card (Z)	-0,048	-0,041	0,072	0,671	0,503	Tidak Sig

The Effect of the Effectiveness of Subsidized Fertilizer Distribution on the Preparation for the Implementation of the Farmer Card

In the variable of the effectiveness of the distribution of subsidized fertilizers on the preparation of the farmer card application, the Original Sample value (Coefficient) is 0.903 > 0.000 with T-statistics > T-table (25.130 > 1.96) and P-value 0.000 < 0.05, meaning that the variable effectiveness of subsidized fertilizer distribution has a positive influence. and significant to the preparation for the application of farmer cards. It can have a positive and significant effect because the farmer's card that is already owned by the farmer has an impact on membership in the RDKK so that farmers can receive fertilizer or the distribution of fertilizer can be accepted by farmers. This statement is supported by research conducted by Cahkim, L, et al (2019) with the results showing that the implementation

of the farmer card has a significant impact on the distribution of subsidized fertilizers.

Effect of Effective Distribution of Subsidized Fertilizer on Agricultural Production

In the variable effectiveness of the distribution of subsidized fertilizers on agricultural production, the Original Sample value (Coefficient) is $0.135 > 0.000$ with T-statistics $> T\text{-table}$ ($1.747 < 1.96$) and P-value $0.081 < 0.05$, meaning that the variable effectiveness of the distribution of subsidized fertilizers has a negative effect and does not significant effect on the preparation of agricultural production. This variable is not significant because the availability of fertilizer is not balanced with the land area and different agricultural management between villages.

The Influence of the Area of Agricultural Land on the Preparation of the Implementation of the Farmer Card

In the variable of the effectiveness of the distribution of subsidized fertilizers on the effectiveness of the application of the farmer card, the Original Sample value (Coefficient) is $0.018 > 0.000$ with T-statistics $> T\text{-table}$ ($0.224 < 1.96$) and P-value $0.823 > 0.05$, meaning that the variable effectiveness of subsidized fertilizer distribution has no effect. positive and not significant because the data collection carried out to prepare for the application of the farmer card has not been declared valid because a lot of double data is detected, the land area recorded is not in accordance with agricultural management by farmer groups due to the lack of understanding of farmer cards.

The Effect of Agricultural Land Area on Agricultural Production

In the variable of agricultural land area on agricultural production, the Original Sample value (Coefficient) is $0.620 > 0.000$ with T-statistics $> T\text{-table}$ ($11.741 > 1.96$) and P-value $0.000 < 0.05$, meaning that the variable area of agricultural land has a positive and significant influence on production.

agriculture. The area of land affects agricultural production because the wider the land owned by farmers, the more varied the production produced and the more income the farmers earn. This question is supported by research conducted by Andrias et al, 2017 with results showing that land area (X), has a positive and significant effect on production and income of rice farming because an increase in the variable area of land is followed by an increase in production and income of rice farming.

The Effect of Agricultural Production on the Preparation for the Implementation of the Farmer's Card

In the agricultural production variable on the preparation of the farmer card application, the Original Sample value (Coefficient) is $-0.048 > 0.000$ with T-statistics $> T\text{-table}$ ($0.671 < 1.96$) and P-value $0.503 > 0.05$ meaning that the agricultural production variable does not have a positive influence and does not significant on the variable of preparation for the application of farmer cards. This variable is not significant because the farmer card has not been implemented in Sukodadi District and the lack of socialization carried out.

CONCLUSION

1. Measurement Model (*Outer Model*)

In the test of the validity of the variables X1 (effectiveness of subsidized fertilizer distribution), X2 (acreage of agricultural land), variables Z (preparation for the application of farmer cards) and Y (agricultural production) are said to be valid because the results of the outer loading calculation show the value of all variables above 0.70.

In the reliability test of the Variable Effectiveness of Subsidized Fertilizer Distribution, Land Area, Farmer Card Application Preparation and Agricultural Production, it is said to be reliable because the results of the

Conbarch Alpha calculation show the value of all variables above 0.70.

2. Structural model (*Inner model*)

In the R-Squire test, the X1 variable (effectiveness of subsidized fertilizer distribution), X2 (agricultural land area) on the Z variable (preparation for the application of farmer cards) was stated to be strong because the R-Squire value was 0.796. In the R-Squire X1 test the effectiveness of the distribution of subsidized fertilizers), X2 (agricultural land area) on the Y variable (agricultural production) is declared weak because the R-Squire value is 0.473.

3. Mediation Test

Variable X1 (effectiveness of distribution of subsidized fertilizer), X2 (area of agricultural land) to variable Y (agricultural production) mediated by variable Z (preparation for application of farmer cards) is referred to as Direct-only nonmediation. X2 (acreage of agricultural land) to variable Y (agricultural production) mediated by variable Z (preparation for application of farmer cards) is referred to as Direct-only nonmediation.

4. Hypothesis Test

The variable effectiveness of the distribution of subsidized fertilizers (X1) has a positive and significant effect on the variable of preparation for the application of farmer cards (Z). The variable effectiveness of subsidized fertilizer distribution (X1) has a negative and insignificant effect on agricultural production (Y). variable land area (X2) and agricultural production variable (Y) have a negative and insignificant effect on the preparation for the application of farmer cards (Z). Agricultural land area variable (X2) has a positive and significant effect on agricultural production variable (Y).

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