

PRODUCTION AND INCOME IMPROVEMENT OF PADDY FARMING ON FOOD SELF SUFFICIENCY PROGRAM IN PONOROGO, EAST-JAVA, INDONESIA

Dwinda Rahmadya^{*1}, Syafrial², Suhartini²

¹Master's Degree, Post Graduate Program Faculty of Agricultural Economics, University of Brawijaya, Indonesia

²Departement of Socioeconomics Faculty of Agricultural Economics, University of Brawijaya, Indonesia

*corresponding author: dwindarahmadya@gmail.com

Abstract: This study aims (1) to determine the production, production costs and income of farmers who join and not join the Food Self Sufficiency Program; (2) to analyze the factors that influence the production of rice farmers for those two groups observed in the Food Self Sufficiency Program; (3) to analyze the allocative efficiency of the production of rice farmers who participate and do not participate in the Food Self Sufficiency Program in Ngunut Village, Ponorogo Regency. The methods used to determine the factors that influence rice farming in Ngunut Village, Babadan Subdistrict are income analysis, multiple linear regression, and allocative efficiency analysis using SPSS application. The results showed that rice farmers who participated in the program produced on average of 3 tons of rice while the farmers who did not participate in the program on average is 1.5 tons. Farmers who participated in the Mandiri Pangan Village Program spent production costs of Rp. 5,933,141, while for the income obtained was Rp. 8,850,772. Farmers who did not participate in the Mandiri Food Food Program spent production costs of Rp 5,623,610 while for the income obtained was Rp 1,496,703. Production factors for rice farming were in Ngunut Village, Babadan Subdistrict, namely seeds, petrochemical fertilizer, orgamas fertilizer, and Bio Prisma fertilizer.

Keywords: *Production of Paddy, Farming, Program Desa Mandiri Pangan*

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INTRODUCTION

Ngunut Village is a village in the Babadan District, Ponorogo Regency. Ngunut Village is a village that is quite far from the center of Ponorogo Regency. The people of Ngunut Village, previously may be said to be people with middle to lower economic levels. However, in fact the agricultural sector in Ngunut Village can be developed to see that there are still many vacant land that can be used as agricultural land and most of the people in Ngunut Village have their livelihood as rice farmers. It is undeniable that people who work as farmers and live in the countryside are far from being successful and prosperous. For Indonesian countries that have

a large enough land with a geographical location and favorable climate, the agricultural sector can be said to be a very strategic sector. Building Indonesia's national economy can be done by building the agricultural sector in rural areas well. The impression of being a farmer is backwardness, and has a simple living condition away from the word luxury. Farmer family welfare is the goal of agricultural development and national development. In addition, life as a farmer is increasingly uncertain because of disasters such as floods or droughts that can cause the destruction of agricultural land. In addition to natural factors,

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there are other factors that can cause agriculture in Indonesia to weaken, namely transformation.

So far, the role of the agricultural sector is only seen as a mere support. So far economic development is synonymous with rapid structural transformation of economic development. So the role of the agricultural sector is only seen as a source of cheap labor and food for the development of the industrial sector which has been crowned as a highly dynamic leading sector in the overall economic development strategy. Economic transformation in developing countries, especially since the industrial revolution era which was mostly carried out in developed countries, ultimately led to a shift in the economic structure that initially many backbone developing countries from the agricultural sector tended to be "forced" to participate in industrialization. As happened in Indonesia which initially becomes an agrarian country that was quite rich in agricultural products, then continued to shift to rely on the economy to the industrial and trade sectors. This is what causes the conversion of agricultural land to non-agriculture, the agricultural land automatically becomes less and less. As a result of less agricultural land, the results of food production will also be reduced. On a large scale, national food stability will also be difficult to achieve. Considering that the population continues to increase so that food needs also increase, but agricultural land is actually decreasing. This transformation can also have an impact on rising food prices. When food production decreases, of course, foodstuffs on the market will be increasingly difficult to find. This can be used by traders to make big profits. Then the price of the food becomes expensive. If agricultural land continues to change its function, farm workers who do not have agricultural land are threatened with loss of livelihood. This is what causes farmers to be less prosperous.

The reason for this is that there is not enough success in the transformation process from the people who have so far acted as peasant communities to become industrial communities. During this time farmers also still use traditional model methods, farmers are not sufficiently adaptive to climatic conditions and other external disturbances. Researchers and research are one of the main factors for agricultural progress. Agricultural progress in question is expected to

provide changes in farmer behavior, increase production, farm efficiency, and effectiveness.

The problems and challenges in alleviating poverty in general are the increasingly limited natural resources and the function of agricultural land, the limited business infrastructure in the field of agriculture, the increasingly intense market competition with imported products, and the large proportion of the poor. For this reason, the government has a role in providing poor village infrastructure and development to be prosperous. Farmer are actors managers of food corp cultivation that are not can access physical processes occur on land as a result of behavior it self (Bennet, 1992). The Government established a Food Independent Village Program to alleviate poverty and increase farmer's household income by involving participation with the community. After agriculture becomes more advance, the form of cash, the more farmer take into account the costs and results (Mosher, 1997).

With the Village Law program that regulates village management, village authority, the administration of the Village Government, village and village communities' rights and obligations, village finances, village assets, village development, and guidance and supervision are expected to revive cooperative relations with the industrial sector to improve the welfare of farmers. Farmers need to be directed to develop adequate stock management to control prices to become more stable. For example, for horticultural farmers with seasonal characteristics, farmers need to measure the condition of market demand to determine the equilibrium point with the supply that will be provided, so that the price of the product does not exist, there is the lowest point during the harvest. The strategy is to divert part of the primary production to be managed into secondary production through the processing industry. The classic production function shows 3 different production areas. The area is differentiated based on production elasticity (Doll and Orazem, 1984)

In an effort to achieve the first goal of the Millennium Development Goals (MDGS), which is to reduce the number of poverty and hunger in the world by half in 2015, the government has and still continues the development program contained in the triple track strategy, including revitalization of agriculture, forestry, marine, and the rural economy

to reduce poverty. In the field of agriculture, the government created a Food Independent Village Program.

The Government, through the Food Security Agency of the Ministry of Agriculture, since 2006 has inaugurated a Food Independent Village Action Program which is expected to encourage the ability of rural communities to reduce poverty, to realize food security and to meet the nutrition of their family members. Independent Food Village activities are carried out in selected villages that have poor households and are at risk of food and nutrition vulnerability, on the basis of their selection, namely FIA 2005/FSVA 2009 and the village is food insecure, with a number RTM (Rumah Tangga Miskin) more than 30% of the number of family cards in the village. Components of Food Independent Village activities (Demanpan) among others: 1) community empowerment, institutional strengthening, development of food security systems and village infrastructure support. As for those involved in food independent villages, namely the Village Food Team (TPD), extension workers, district working groups, facilitators or facilitators, village heads, Village Development Institutions (LPD), you development, village officials and community leaders.

Ngunut Village, Babadan District, Ponorogo Regency, East Java Province is the village designated as Desa Mandiri Pangan. Where there not all villages appointed to run the program. The village of Ngunut in Babadan Subdistrict, Ponorogo Regency, has run the program as Desa Mandiri Pangan since year 2012. Final destination Desa Mandiri Pangan Program in Desa Ngunut is able to improve living standards by increasing the income of its people. The level of income is an indicator of the level of success of a country's economic development. Efforts to increase farmer community income can be done by eradicating poverty for example by providing programs to foster farmer groups that are expected to contribute to the development of agricultural enterprises so that efforts to increase farmers' income can be realized optimally. With doing research on "effort to production and income improvement of paddy farming in Desa Mandiri Pangan Program" this is expected to be obtained input for efforts to increase the production and income of farmers through Desa Mandiri Pangan Program.

RESEARCH METHODS

Determination of the place of this research was carried out intentionally in Ngunut Village, Babadan Subdistrict Ponorogo Regency East Java Province. The selection of this research location is because Ngunut Village, Babadan Subdistrict, Ponorogo Regency, East Java Province is a village that has implemented the Food Independent Village Program since 2012. In addition, the research location was chosen because of its proximity to the residence of the researcher. The research will be held in April 2018.

Determination of respondents was carried out purposively in the Ngunut Village, Babadan District, Ponorogo Regency, East Java Province. Purposive sampling is a method of determining respondents with certain considerations. Respondents used were farmers who participated in the Mandiri Mandiri Food Program, and those who did not attend the program in Ngunut Village, Babadan District, Ponorogo Regency, East Java Province. Respondents used in this study were 160 respondents. 80 respondents were farmers who participated in the program and as a comparison the study also used 80 respondents who did not participate in the program. As a complement to the completeness of the research data also used a sample of community leaders. The community leaders who were made as respondents were the Head of the RT, the Chairperson of the RW, the Village Secretary and the Village Head. The community leaders who were made as respondents were considered important because they were community leaders in the village and knew the condition of the village.

Data collection methods used in this study are literature studies or literature studies, interviews, documentation, and observations. Literature study or literature study, aims to obtain secondary data obtained through books, internet, journals, other articles to support the research data needed to strengthen the theory.

The interview was conducted by submitting a questionnaire in the form of a questionnaire submitted to farmers who participated in the Mandiri Food Village Program and who did not participate in the program. While the community figures who were made as respondents were the Head of the RT, Chairperson of the RW, Village Secretary, Village Head and residents in the

Ngunut Village, Babadan District, Ponorogo Regency, East Java Province.

Documentation is carried out by recording, studying and photographing data related to the research location, namely the income of farmers every day. While observations, carried out by observing directly how the program of Food Independent Village program took place, agricultural activities carried out every day in Ngunut Village, Babadan District, Ponorogo Regency, East Java Province.

Data analysis aims to simplify data that has been collected in a form that is easier to understand and interpret that has been collected and then tabulated and then analyzed to make an overview of increased production and income. Data analysis methods used in this research are as follows:

Data analysis methods used in this research are as follows: Descriptive analysis method is a problem solving process that is examined by describing the state of the subject and the object of research based on the facts that appear or as they are at the research location. In this study descriptive analysis was used to describe age, education, number of family members and experience of rice farming.

Cost Analysis

Total cost is the total cost incurred to produce production which is the sum of total fixed costs and total variable costs. The total cost formula is:

$$TC = TFC + TVC$$

Where:

TC = Total Cost (Rp/Ha)

TFC = Total Fixed Cost (Rp/Ha)

TVC = Total variable Cost (Rp/Ha)

Income Analysis

Farm income is the difference between revenue and all costs. Income analysis in this study is used to calculate how much income is derived from rice farming. The level of income of rice farmers in Ngunut Village, Babadan Subdistrict, Ponorogo Regency is calculated by the following formula:

First, calculate the acceptance of farmers by formula

$$TR = Y \cdot P_y$$

Where :

TR = Total Revenue (Rp/Ha)

Y = Production (Rp/Ha)

P_y = Selling price of rice (Rp)

After knowing the farmer's acceptance then this study calculates the income of farmers with the following formula:

$$\pi = TR - TC$$

Where:

π = Income

TR = Total Revenue (Rp/Ha)

TC = Total Cost

Multiple Linear Regression Analysis Method

This method is used to determine prediction provisions and to complete the analysis of the extent to which the independent variables influence the dependent variable. A tool to process this research is using SPSS version 18.0. Regression in this study uses quantitative variables and qualitative variables (Dummy variables). Basically the dependent variable cannot only be influenced by quantitative independent variables, but can also be influenced by qualitative variables. In the qualitative variable regression the attributes must be quantified.

In this study, quantifying the attributes of qualitative variables is in a dummy, namely: value 1 is a respondent who follows the Food Independent Village Program and 0 is a respondent who does not join the Food Self-Sufficient Village Program. Regression equation to find factors that influence production in this study is:

$$Y = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + b_8X_8 + b_9X_9 + b_{10}X_{10} + b_{11}X_{11} + b_{12}X_{12} + b_{13}X_{13} + b_{14}D$$

Where:

Y = Production (Ton)

X_1 = Land area (Ha)

X_2 = Feed (Kg)

X_3 = Labor (HOK)

X_4 = Fertilizer Petroganik (Kg)

X_5 = Fertilizer Orgamas (Kg)

X_6 = Fertilizer Urea (Kg)

X_7 = Fertilizer TSP (Kg)

X_8 = Fertilizer PONKA (Kg)

X_9 = Fertilizer ZA (Kg)

X_{10} = Fertilizer Cair Bio Prisma (L)

X_{11} = Pesticide Glydo (L)

X_{12} = Pesticide Leili (L)

X_{13} = Pesticide Folicur (L)

D = Dummy Variable Farmer

D = 1, if farmers follow the Food Independent Village Program

D = 0, if farmers do not follow the Food Independent Village Program

b_0 = Intersept

b = regression coefficient of $X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8, X_9, X_{10}, X_{11}, X_{12}, X_{13}, D$

1. Model Accuracy Test (R^2)

Model Accuracy Test (R^2) done by looking at the coefficient of determination (R^2), where (R^2) is the amount used to indicate how well the overall regression model is in applying changes in the value of the dependent variable. If (R^2) the size of 1 or close to 1, then the regression results will be good. This means that independent variables can describe changes in the dependent variable well. So the opposite, if (R^2) a regression smaller or farther away from 1 means that the regression is not good (the level of trust). This means that the independent variable cannot explain the change in the dependent variable.

2. The significance test of the estimator used is Test F

Analysis of Variance (ANOVA) or F Test has the purpose to find out the multiple linear regression that is done. This test is used to see the effect of independent variables together or simultaneously on the dependent variable. In this study decision-making uses probability levels, namely:

Probability value (F-sig) (0.05), then the independent variables together or simultaneously have no effect on the dependent variable.

The probability value (F-sig) $< (0.05)$, means that the independent variables together (Simultaneous) affect the dependent variable.

3. T test

The T test is used to test how much influence each of the independent variables has on the dependent variable. The relationships that occur can apply to population use, the level of significance varies from 0.01 (1%); 0.05 (5%); and 0.10 (10%). The T test hypothesis is as follows:

H0: Independent variables partially have no effect on the dependent variable

H1: Independent variables partially affect the dependent variable.

In this study decision-making uses probability levels, namely:

Probability (t-sig) $< (0.05)$ then accept H1

Probability (t-sig) (0.05) then accept H0

RESULTS AND DISCUSSION

Production Costs, Farmers' Income and Revenue

Rice farmers who follow the Mandiri Village Program and who do not attend the Mandiri Food Village Program in Ngunut Village, Babadan Subdistrict are as follows:

Table 1. Average Production Costs, Farmers Revenue and Revenues

Follow the Program		
TC	TR	π
5.933.141	14.783.913	8.850.772
Not Following the Program		
TC	TR	π
5.623.610	7.120.313	1.496.703

Source: Primary Data, 2018 (Processed)

See the results of the research on Desa Mandiri Pangan Program in Desa Ngunut, Kecamatan Babadan, Kabupaten Ponorogo that is, farmers who take part in the program spend less. This is because farmers who participate in the program get the price of subsidized seeds, are not allowed to use chemical pesticides in any form so that the costs of farming are not as much as farmers who do not participate in the program. For chemical fertilizers it is still permitted to use but within reasonable limits. The rice yield of farmers who participated in the program was also more and healthier for the price of wet grain in Ngunut Village, which was Rp. 4,900 / kg. So that it can be concluded that farmers who follow the Food Independent Village Program are more profitable than farmers who do not participate in the program.

Factors Affecting Rice Production

The coefficient of determination is used to see how far the dependent variable can be explained by the independent variable. The higher the coefficient of determination (R^2) or the approximate 1 model that is obtained more accurately, namely the independent variable affects the dependent variable. On the contrary, the lower the coefficient of determination (R^2) or away from number 1 means that the overall independent variable does not affect the dependent variable. Based on the results of data processing in this study, shows the coefficient of determination of 0.984. This shows 98.4% together the independent variables can explain the dependent variable.

The output of research data shows the value (F-sig) $<(0.05)$. In the research results, the F-sig value amounted to, 000a, this means that together the independent variables affect the dependent variable. In this study independent variables support each other and have their respective roles in influencing production.

T test in this study is used to see how much influence each individual variable individually affects the dependent variable. Looking at the results of the primary data processing output in the research in Ngunut Village, the farmers who followed Desa Mandiri Pangan Program produce more rice than farmers who do not join the program. This can be seen from the probability value (t-sig in the program of (0,000) $<(0.05)$) then accept H1. Means partially by following Desa Mandiri Pangan Program affect can affect rice production. Besides participating in the program, the land variable is also 0.001; seed of 0,000; petroganic fertilizer by 0.024, orgasm fertilizer by 0.019, and BIO fertilizer by 0.003. The t-sig value of this variable is smaller than 0.05, this means that the variables of field, seed, petrochemical fertilizer, orgasm fertilizer, and ZA fertilizer partially affect rice production.

Table 2. Results of Multiple Linear Regression Analysis

Variable	Coef.	S.E	T-Sig
Constant	0,242	0,14	0,093
Land area X_1	1,813	0,55	0,001*
Seed X_2	0,038	0,008	0,000*
Labor X_3	0,000	0,000	0,188
Petroganik X_4	0,001	0,000	0,024*
Orgamas X_5	0,001	0,000	0,019*
Urea X_6	0,000	0,001	0,686
PONKA X_7	0,001	0,001	0,376
ZA X_8	0,001	0,001	0,441
BIO X_9	0,003	0,001	0,003*
Glydo X_{10}	0,014	0,011	0,218
Leili X_{11}	0,000	0,000	0,402
Folicur X_{12}	-2,562	0,000	0,869
Program X_{13}	1,512	0,000	0,967
$R^2 = 0,984$			
F-Sig = 0,000 ^a			
* signifikan = 0,05			

Source: Primary Data, 2018 (Processed)

In Desa Ngunut, Kecamatan Babadan, Kabupaten Ponorogo rice farmers who follow Desa

Mandiri Pangan Program not allowed at all to use pesticides. This is because chemicals can add residues that can interfere with human health. At first it was hard to build the image of farmers not to spray plants with pesticides. But with the hard work of the government assisted by village officials and also Field Extension Officers can build the image of farmers that without spraying pesticides can still produce more, healthier and more profitable rice. For use of fertilizer in Desa Mandiri Pangan recommended using organic fertilizer. For example in this study rice farmers at the study site used petroganic fertilizer and orgasm fertilizer. Both of these fertilizers are fertilizers made from organic materials and the price has been subsidized by the government so as not to burden the farmers. In this study, the use of chemical fertilizers such as urea did not significantly affect production. This is because the land used to support the life of rice plants is already saturated with chemicals.

Allocative Production Efficiency Analysis

Efficiency analysis is used to determine the level of efficiency of the use of a factor of production by calculating the value that shows a comparison between the NPM (Marginal Product Value) and the input price (Px) or can be written in the formula NPM_x / P_x . For the results of the analysis can be seen in Table 3.

In the results of research data processing in Ngunut Village, Babadan Subdistrict, Ponorogo Regency, the use of land inputs, seeds, labor, Orgamas Fertilizer, TSP Fertilizer, PONKA Fertilizer, ZA Fertilizer, Bio Prisma Fertilizer, glydo pesticides, Pesticide Folicur inefficient so that it needs to be reduced its use. While the use of Leili Petroganic and Pesticide Fertilizers is not efficient so it needs to be added.

Table 3. Allocative Analysis of Production Efficiency

No.	Variable	NPMXi/Pxi	Efficiency
1.	Land area	0,002566	No
2.	Seed	0,0135088	No
3.	Labor	0,0001657	No
4.	Petroganik	1,404E-05	Not yet
5.	Orgamas	0,0002832	No
6.	TSP	0,0001481	No
7.	PONKA	-2,848E-05	No
8.	ZA	0,0005215	No

9.	B.Prisma	0,0066439	No
10.	Glydo	-1,365E-05	No
11.	Leili	9,788E-05	Not yet
12.	Folicur	-0,0003107	No

Source: Primary Data, 2018 (analyzed)

CONCLUSION

In this study conclusions can be drawn, as follows:

1. Rice farmers who follow Desa Mandiri Pangan Program producing rice on average 3 tons while farmers who do not follow Desa Mandiri Pangan Program 1,5 tons. Farmers who follow Desa Mandiri Pangan Program issued production costs amounting to Rp. 5,933,141 while for the income earned amounted to Rp 8.850.772. Farmers who do not follow Desa Mandiri Pangan Program issued production costs amounting to Rp. 5,623,610 while for income obtained amounted to Rp. 1,496,703.
2. Factors that influence rice production are seeds, petroleum fertilizer, orgamas fertilizer, and Bio Prisma fertilizer. The multiple linear regression model that has been tested with SPSS is declared valid from the probability value (t-sig is 0.000 <0.05).
3. The use of land inputs, seeds, labor, fertilizer orgamas, TSP fertilizer, ZA fertilizer, PONKA fertilizer has not been efficient so it still needs to be reduced.

REFERENCES

- Abd Rahim dan Riah Retno Dwi Hastuti. 2007. *Ekonomika Pertanian, Pengantar Teori dan Kasus*. Penebar Swadaya.
- Adi, Fahrudin. 2012. *Pengantar Kesejahteraan Sosial*. Bandung: PT Refika Aditama.
- Adi, Isbandi Rukminto. 2003. *Pemberdayaan, Pengembangan Masyarakat dan Intervensi Komunitas*. Jakarta: Fakultas Ekonomi Universitas Indonesia.
- Badan Ketahanan Pangan. 2012. *Petunjuk Pelaksanaan Program Aksi Desa Mandiri Pangan*. Provinsi Jawa Timur.
- Bennet, J.W. 1992. *Alternative to Pesticides in Central America: Applied Studies of Local Knowledge. Culture and Agriculture*.
- Boediono. 1993. *Ekonomi Makro. Seri Sinopsis Pengantar Ilmu Ekonomi No.2*. Yogyakarta: BPFE.
- Chambers, R, A Pacey. 1980 *Farmer Firs: Farmer Innovation and Agricultural Research*. London: Technologi Publication.
- Daniel, Moehar. 2002. *Pengantar Ekonomi Pertanian*. Jakarta: Bumi Aksara.
- Doll, John P and Frank Orazem. 1984 *Production Economics Theory With Application* second edition. Inc. Canada
- Mahyu. Danil 2013. *Pengaruh Pendapatan terhadap Tingkat Konsumsi pada Pegawai Negeri Sipil di Kantor bupati kabupaten Bireuen*, Jurnal Ekonomika. Aceh: Universitas Almuslim Bireuen .
- Mosher, AT. 1997 *Agriculture Building*. Terjemahan Yasaguno. Jakarta
- Prawirokusumo, Suharto. 1990. *Ilmu Usaha Petani*. Yogyakarta: BPEF
- Rokhana. Asri Ninik 2005. *Hubungan Antar Pendapatan dengan Status Gizi*. Semarang: Universitas Negeri Semarang.
- Rosyidi, Suherman. 2006. *Pengantar Teori Ekonomi: Pendekatan Kepada Teori Ekonomi Mikro dan Makro (Edisi Revisi)*. Jakarta: PT Raja Grafindo Persada.
- Scoones, I. And J. Thompson. 2009. *Farmer First Revisited: Innovation for Agricultural Research and Development*. Rugby: Partical Action Publishings, Ltd.
- Soekartawi. 2002. *Analisis Usahatani*. Jakarta: Universitas Indonesia.
- Sukirno. 1985. *Ekonomi Pembangunan*. Jakarta: LP FEUI.
- Surono. 2004. *Pertanian Organik Indonesia*. Jurnal Berita Bumi: Edisi Juli 2004.