Jurnal Ilmiah Mahasiswa Agribisnis
Journal homepage: http://ojs.unimal.ac.id/index.php/jima

FACTORS AFFECTING RICE RICE PRODUCTIVITY IN GAMPONG KUTA MEULIGOE, SAWANG DISTRICT, ACEH UTARA REGENCY

Irwanda[1], Mawardati[2], Rita Ariani[3]
[1,2,3]Student of Agribusiness Study Program, Universitas Malikussaleh, North Aceh, Indonesia
Email: mawardati@unimal.ac.id

Abstract

The research was conducted in Kuta Meuligoe village, Sawang subdistrict, North Aceh regency from September to October 2018. This study aims to determine the factors that affect the productivity of paddy rice fields. The analysis method used Cobb-Douglas production function analysis. The result describes the relationships between variables through hypothesis testing research on factors that affect the productivity of rice. In this study used primary data (data obtained from respondents) and secondary data (data acquired from the library, journal and related institutions). equation of linear regression used is multiplied by test hypothesis. Test are F Test and T as well as testing the assumptions of normality. Classical multicollinearity and heteroscedasticity. Variables that have significant effect are urea fertilizer and fertilizer shortages,

Keywords: **Productivity, Rice, Farming**.

1. INTRODUCTION

Indonesia is one of the largest rice consuming countries in the world. The increasing population means the need for food will also increase (Srirande 2012). With the increase in population from year to year, various efforts have been made by the government to increase food productivity, especially rice in terms of meeting the needs of the population. This increase in production is the target and goal of agricultural activities (Pongoh 2014).

One of the efforts to increase production for rice plants is the provision of balanced fertilizers. That way, it will provide additional nutrients for plants so that they can reproduce optimally. Fertilizers have always been at the forefront of efforts to increase world food production and perhaps more than any other type of input, are largely responsible for the success that has been achieved. Only fertile land is productive land. When plant nutrients are low, soil productivity and crop yields are low. So by supplying plant nutrients that are essential for high crop production, fertilizers have become vital for crop production (Melda, 2008).

In addition to the use of balanced fertilizers, superior seeds are also very decisive to support production. The use of superior seeds has several advantages such as resistance to plant pests and diseases, has a relatively fast harvest age and higher productivity. Farmers in general still use seeds from previous harvests, this will make production yields very difficult to increase. Superior or labeled seeds consist of white labels (for captive breeding), blue labels and purple labels. In the use of this seed, farmers need to pay attention to the label.

Sawang sub-district is one of the sub-districts in North Aceh Regency which is a rice production center area which is supported by a good irrigation network. In this area, many farmers have used superior seeds, but the availability of fertilizer when needed is often not available. As a result, rice growth is hampered which results in decreased productivity. This study aims to determine what factors affect rice productivity in Sawang District, North Aceh Regency.

2. RESEARCH METHODS

This research was conducted in Gampong Kuta Meuligoe, Sawang District, with the target of rice farmers receiving subsidized fertilizers based on the RDKK (Definitive Plan for Farmers Group Needs). The selection of the research location was carried out purposively with the consideration that the village has the largest area of irrigated rice fields among other villages in Sawang District and the majority of the population works as lowland rice farmers.

This study uses two types, namely primary data and secondary data. Primary data is data obtained from interviews with respondents (rice farmers) who use subsidized fertilizers in Gampong Kuta Meuligoe, Sawang District, North Aceh Regency. Secondary data is data obtained from local government agencies and literature studies related to research.

Data analysis using Cobb-Douglas production function. According to Soekartawi (2003) the Cobb-Douglas function in general can be written as follows:

$$\mathbf{Ln\ Y = Ln\beta 0 + 1LnX1 + 2LnX2 + 3X3 + 4X4\ e}$$

Information :

Y	= Total Paddy Rice Productivity (Ton/Ha)
0	= Constant
1, 2,....., 3	= Regression coefficient
X1	= Urea Fertilizer (Kg)
X2	= Organic Fertilizer (Kg)
X3	= Seed Type
1	= Superior
0	= Not Superior
X4	= Scarcity of Fertilizer
1	= Rare
0	= Not Rare
e	= Error term

3. RESULTS AND DISCUSSION

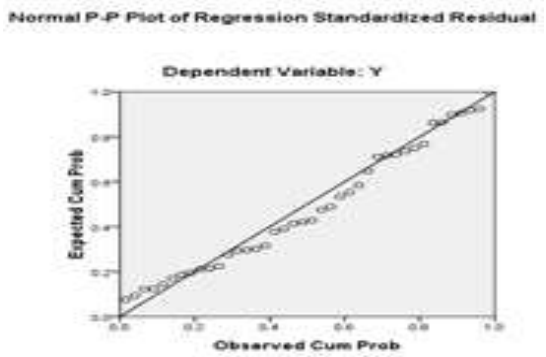

Image 1 Normality Test Results

Table 1 Multicollinearity Test Results

Variable	Tolerance	VIF
(1)	(2)	(3)
Urea Fertilizer	.356	2.808
Organic fertilizer	.388	2,577

Jurnal Ilmiah Mahasiswa Agribisnis
Journal homepage: http://ojs.unimal.ac.id/index.php/jima

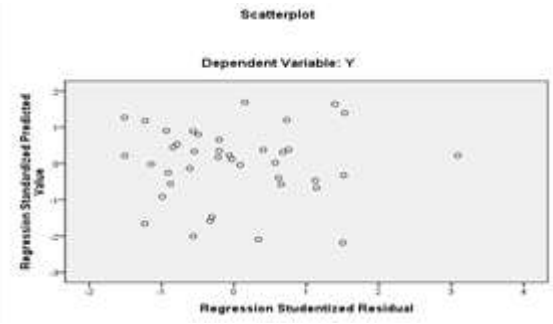

Figure 2 Heteroscedasticity Test Results

Table 2 Multiple Linear Regression Results

Model	Unstandardized Coefficient		Standardized Coefficient	T	Sig.
	B	**Std. Error**	**Beta**		
(Constant)	-3,569	.983		-3,630	.001
Urea Fertilizer	1.427	.284	.929	5.018	.000***
Organic fertilizer	-.244	.277	-157	-.883	.383
Seed	.247	.209	.133	1.183	.245
Scarcity of Fertilizer	-.463	.249	-.220	-1.862	.071*
R = 0.757a			Fcount = 11.739		
Adjusted R2= 0.524			Fsig = 0.000		

Information:
*** = Real at = 0.01
** = Real at = 0.05
* = Real at = 0.10

Table 3 Types of Variables and Value of Rice Paddy Productivity Elasticity

Variable Type	Elasticity Value
(1)	(2)
Urea Fertilizer	1.427
Organic fertilizer	-.244
Seed	.247
Scarcity of Fertilizer	-.463
Total elasticity value (RTS)	**967**

Source: Data Analysis Results, 2018

Based on Figure 1 the results of graphic analysis (normal PP plot) show that the data is normally distributed because the residual data is around the regression line, the data can also explain that the dependent variable (dependent) and independent variable (independent) have a normal distribution in the regression model.

If the VIF value is greater than 10, there is a very high multicollinearity in the data (Gujarati, 2003). In Table 1 it is clear that the variables of urea fertilizer, organic fertilizer, seeds and scarcity of fertilizer are free from multicollinearity because the VIF value for all variables is less than 10. From the results above it can also be explained that all independent variables have a perfect relationship (near perfect) on regression model.

Detection of the presence or absence of heteroscedasticity can be done by looking at the presence or absence of the pattern on the scatterplot graph between SRESID and ZPRED where the Y axis is the predicted Y, and the X axis is the residual (Y predicted - Y actually) that has been studentized. The results of the analysis show that the data on the factors that affect productivity in Sawang District do not experience heteroscedasticity because the plot does not show a systematic pattern or the residual data is randomly distributed.

Based on the results of the analysis of the multiple linear regression model in Table 5 above, it can be arranged into the multiple linear regression equation as follows:

Y = -Ln 3,569+ Ln 1.427 X1 - Ln 0.244 X2 + 0.247 X3 - 0.463 X4

Based on Table 3, it can be seen that the overall value is less than 1 (value bi = 967), this means that simultaneously the use of productivity factors for urea, organic fertilizers, seeds and the scarcity of fertilizers used results in productivity at the stage of increasing yields. which is decreasing (decreasing return to scale). Meanwhile, partially, almost all variables have a positive effect on productivity, organic fertilizer variables and fertilizer scarcity variables have a negative effect on productivity. so that the productivity of lowland rice in the research area can be increased by increasing the use of productivity factors.

3.1 Correlation (R)

From the results of the correlation analysis, it was found that the R value was 0.757, which means that the variables of urea fertilizer, organic fertilizer, seeds, and fertilizer scarcity had a strong enough relationship with lowland rice productivity. The positive correlation coefficient means that each independent variable is increased, the productivity will increase.

3.2 Coefficient of Determination (Adjust R2)

The results of the analysis of the coefficient of determination use the value of adjust square, because the research shows that there are different units of variables. The value of adjust square is 0.524 which means that the variables of urea fertilizer, organic fertilizer, seeds and scarcity of fertilizer are able to explain the productivity of 52.4% while the remaining 47.6% is explained by variables outside the model.

3.3 F . Test

Simultaneously the use of urea fertilizer, organic fertilizer, seeds, and scarcity of fertilizers have a significant effect on the productivity of lowland rice, this can be seen from the value of sig F which is smaller than the alpha value of 0.05 (0.000 < 0.05).

3.4 T Uji Test

The results of testing the results of each variable are as follows:

3.4.1 Urea Fertilizer

The urea fertilizer variable has a significant effect on lowland rice productivity as evidenced by its significant value of 0.000 < from 0.05 alpha. The variable urea fertilizer has a regression coefficient of 1.427 which means that the use of urea fertilizer has a positive effect on productivity, every 1 percent increase in the use of urea fertilizer will be followed by an increase in productivity of 1.427 percent. Urea fertilizer in the field looks very difficult to find at the right time and amount, this greatly affects the productivity of lowland rice. Farmers prefer to use other fertilizers first. Even though the recommendation for the use of urea fertilizer is 250 Kg/Ha, in reality the amount is still below this figure.

3.4.2 Organic fertilizer

The organic fertilizer variable has no significant effect on the productivity of lowland rice as evidenced by its significant value of 0.383 > from alpha 0.05. A negative coefficient of organic fertilizer means that if the amount of organic fertilizer is increased, it will be followed by a decrease in productivity.

The use of organic fertilizers in the right amount and at the right time greatly affects the productivity of paddy rice. Most paddy rice farmers in Sawang District, North Aceh Regency use organic fertilizers during the vegetative period. This will affect rice productivity, because the nature of the elements contained in organic fertilizers cannot be directly absorbed by plants. In the rules for using organic fertilizer, it is recommended to use it during land processing (1-2 weeks

before planting), so that when planting is done, rice can absorb it directly with the right level of use as well.

3.4.3 Seed

The seed variable has no significant effect on the productivity of lowland rice as evidenced by its significant value of 0.245 > from alpha 0.05. The seed variable has a positive coefficient value which indicates that farmers who use superior seeds produce higher productivity than farmers who do not use superior seeds. Respondent farmers prefer to use superior seeds compared to non-superior seeds to increase productivity but in reality they use superior seeds in the second generation, even though there are superior types of seeds that can only be used once in a harvest season.

Farmers in Sawang District, North Aceh Regency use superior seeds more than twice, this will result in decreased productivity due to seed quality that is no longer superior. This is something that farmers often don't pay attention to, so they still think that these superior seed derivatives are still called superior seeds. Whereas in the market there are three types of certified seed label colors, namely white, blue and purple. Of the three, two colors are usually used by farmers in addition to the white label which is usually used at the seed breeding level.

3.4.4 Scarcity of Fertilizer

The variable scarcity of fertilizers has a significant influence on the productivity of lowland rice as evidenced by a significant value of 0.071 < from alpha 0.10. The fertilizer scarcity variable has a negative coefficient which indicates that farmers who experience fertilizer scarcity produce lower productivity than farmers who do not experience fertilizer scarcity. This is in accordance with community complaints in several other sub-districts in North Aceh Regency which have difficulty meeting the needs of fertilizers to increase lowland rice productivity.

4. CONCLUSION

Based on the results that have been carried out, it can be concluded that simultaneously the variables of urea fertilizer, organic fertilizer, seeds and the scarcity of fertilizer used have a significant effect on the productivity of lowland rice in Kuta Meuligoe Village, Sawang District, North Aceh Regency. Partially, the variables that have a significant effect on the productivity of lowland rice are urea fertilizer and the scarcity of fertilizers, while the variables of organic fertilizer and seeds have no significant effect on the productivity of lowland rice in Kuta Meuligoe Village, Sawang District, North Aceh Regency.

REFERENCES

Ahyari, A., 2004. Manajemen Produksi. Edisi Kedua, Yogyakarta. BPPE UGM.
Amirin, T.M. 2011. “Populasi dan sampel penelitian 4: Ukuran sampel rumus Slovin. Diakses dari http://Tatangmanguny.wordpress.com.
Arikonto, S. 2008. Prosedur Penlitian. Yogyakarta. Rineka Cipta.
Arsyad, L. 1993. Ekonomi Manajerial. Edisi Ketiga, Penerbit Balai Pustaka, Yogyakarta. Fakultas Ekonomi.
Daniel, M. 2002. Pengantar Eknomi Produksi. Yogyakarta UGM Press.
Daniel, M. 2003. Pengantar Ekonomi Produksi. Jakarta. Bumi Aksara.
Djojosumarto, P. 2008. Pestisida dan Aplikasinya. Jakarta. Agromedia Pustaka.
Gujarati. 2003. Ekonomitrika Dasar. Terjemahan. Jakarta. Penerbit Erlangga.

Hamdan. 2013. Analisis Efisiensi Penggunaan Faktor Produksi pada Usahatani Padi Sawah di Bengkulu. Bengkulu. Balai Pengkaji Teknologi Pertanian.

Hasibuan, M.S.P. 2002. Manajemen Sumber Daya Manusia. Jakarta: PT. Bumi Aksara.

Hasibuan, B.E., 2006. Pupuk dan Pemupukan . Universitas Sumatera Utara, Medan. Fakultas Pertanian.

Jamaluddin. 2016. "Analisis Faktor-Faktor Yang Mepengaruhi Produksi Padi Varietas Unggul Nasional Pada Sawah Tadah Hujan Di Kecamatan Bangkinang Kabupaten Kampar". Jurnal Dinamika Pertanian, Volume XXXII No. 2: 107-114.

Joersran & Fathorrozi. 2003a. Basic econometrics, fourth edition. New York. McGraw Hill.

Joersran & Fathorrozi. 2003b. Teori Ekonomi Mikro. Edisi Pertama. Jakarta. Penerbit Salemba Empat.

Kasniari, D.N. & Nyoman Supadma, A.A., 2007. Pengaruh Pemberian Beberapa Dosis Pupuk (N,P, K) dan Jenis Pupuk Alternatif terhadap Hasil Tanaman Padi (Oryza sativa L.) dan Kadar N,P, K Inceptisol Selemadeg Tabanan. Jurnal Agritrop. 26 (4), 168-176.

Melda R. Sirait. 2008. Analisis Pemasaran Pupuk Bersubsidi (Urea, ZA, SP-36, NPK Phonska) di Kabupaten Simalungun. Fakultas Pertanian Universitas Negeri Sumatera Utara. Medan: USU Repository.

Mubyarto, 1994. Pengantar Ekonomi Pertanian. Edisi Ketiga. Jakarta. LP3ES.

Muhajirin, Yusma Damayanti dan Elwamendri. 2014. "Analisis Faktor-Faktor yang Mempengaruhi Produksi Usahatani Padi Sawah di Kecamatan Batang Asai Kabupaten Sarolangun". Jurnal Sosio Ekonomi Bisnis, Vol 17.(1).

Miller, R. L. R. E. & Meiner, 1999. Teori Ekonomimikro Intermediate. Jakarta. Raja Grafindo Persada.

Novianto dan Fajar Widayat, 2009. Analisis faktor-faktor yang mempengaruhi padi organik di kabpaten sragen tahun 2008. Enstripsi thesis, Universitas Muhammadiyah. Surakarta.

Novizan, 2007. Petunjuk Pemupukan yang Efektif. Jakarta. Agrobimedia pustaka.

Onibala G.A, dkk.2017. "Analisis Faktor-Faktor Yang Mempengaruhi Produksi Padi Sawah di Kelurahan Koya Kecamatan Tondano Selatan". Jurnal Agri-SosioEkonomi Unsrat, Volume XIII. No. 2A: 237 – 242.

Pongoh, D. 2014. Efisiensi Penggunaan Faktor Produksi Pada Usahatani Padi Sawah Di Kelurahan Tondangow Kecamatan Tomohon Selatan. Manado UNSRAT.

Riyadi. 2007. Analisis faktor-faktor yang mempengaruhi produksi jasung di kecamatan wirosani kabupaten grobongan. Tesis (i), 42-110 diakses dari http://eprints.undip.ac.id/18736/.

Sawasta, B. 1995. Pengantar bisnis modern. Jakarta: PT. Liberty.

Soekartawi. 2002. Prinsip Ekonomi Pertanian. Jakarta. PT. Raja Grafindo Persada.

Soekartawi. 2003. Teori Ekonomi Produksi. Analisis Fungsi Cobb-Douglas. Jakarta. Rajawali Press.

Srirande, 2012, Pertumbuhan Provinsi Agraris. Jakarta. Kencana.

Sudaryati, Endang. 2004. Faktor-Faktor Yang Mempengaruhi Produksi Kopi Di Kabupaten Temanggung (Studi Kasus di Kecamatan Candiroto Kabupatren Temanggung) Fakultas Ilmu Ekonomi Dan Studi Pembangunan. Semarang. Universitas Diponegoro..

Sugiyono. 2008. Metode Penelitian Bisnis. Bandung. Penerbit Alfabeta.

Sugioyono. 2010. Metode Penelitian Pendidikian. Bandung. Penerbit Alfabet

Suprihanto, J. 1992. Manajemen personalia. Yogyakarta: penerbit BPFE.

Walpole. 1997. Pengantar Statistika. PT Gramedia Pustaka Utama. Jakarta.

Yasa, LN.A dan Handayani. 2017. Analisis Produksi Dan Pendapatan Padi Sawah di Desa Bonemarawa Riopakava Kabupaten Donggala. Jurnal agroetekbis, 5 (1), 111-118.

Zulkifli. 2009. Analisis Efisiensi Penggunaan Faktor Produksi pada Usahatani Jagung Studi Kasus Petani Jagung .Kel, Panreng Kec. Sidrap.