

## Factors Affecting Organic And Non-Organic Rice Production In Muara Bulian District, Batanghari Regency

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Article Info	ABSTRACT
<b>Corresponding Author:</b> Name : <b>Hariono S</b> E-mail: hariono20@gmail.com	<p>This study aims to determine 1) the factors that influence the production of organic and non-organic lowland rice in Muara Bulian District, 2) to determine the income and income received by organic and non-organic rice farmers in Muara Bulian District. The object of this research is farmers who cultivate organic and non-organic rice in Muara Bulian District, Batanghari Regency. The data used in this study are primary data and secondary data. The sampling method used a census and purposive selection of research areas. Data analysis used multiple regression analysis. The results showed that the factors that significantly affect the production of organic and non-organic lowland rice were four variables, namely fertilizer (X4), seeds (X1), labor (X5) and pesticides (X3). The average income received by organic rice farmers is Rp. 21,402,500 while non-organic rice farmers are Rp. 16,654,761. The income received by organic rice farmers is Rp. 17,879,913.6 while non-organic rice farmers are Rp. 13,089,941.3. The income and income of organic rice farmers is greater than that of non-organic rice farmers. So it is concluded that the existing production factors affect the production of organic and non-organic lowland rice in Muara Bulian District, Batanghari Regency. The income and income of organic rice farmers is greater than that of non-organic rice farmers. So it is concluded that the existing production factors affect the production of organic and non-organic lowland rice in Muara Bulian District, Batanghari Regency. The income and income of organic rice farmers is greater than that of non-organic rice farmers. So it is concluded that the existing production factors affect the production of organic and non-organic lowland rice in Muara Bulian District, Batanghari Regency.</p> <p><b>Keywords:</b> Non Organic Rice, Organic Rice, Income</p>

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### INTRODUCTION

Agricultural development is directed at increasing agricultural production to meet food needs and domestic industrial needs, increasing exports, increasing farmers' incomes, expanding job opportunities and encouraging equal distribution of business opportunities.[1], [2]. Humans do various ways to develop it and do not realize that the unwise use of inorganic fertilizers and inorganic pesticides will result in changes in the balance, so that it has a negative impact on humans. Based on these conditions, humans are trying to find farming techniques that are safe and good for the environment and humans, so that organic farming systems emerge[3], [4].

Organic farming is the answer to the green revolution that was promoted in the 1960s which caused reduced soil fertility and environmental damage due to the uncontrolled use of chemical fertilizers and pesticides. Organic farming in principle focuses on the principle of recycling nutrients through harvesting by returning some of the biomass to the soil and conserving water which is able to provide higher yields compared to non-organic rice.[5], [6].

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This organic rice farming is not only environmentally friendly, the cost for farming is very low because the fertilizers and pesticides used come from nature around the farmer's environment and when purchased the price is relatively cheap, so it is expected to increase the productivity of rice plants. Some of the advantages of cultivating rice organically are: (1) consumer health; (2) the use of organic fertilizers that restore soil fertility and environmental sustainability; and (3) increase farmers' income, because the selling price is higher than conventional rice (Mayrowani, 2012). Therefore, organic rice farming deserves attention in addition to the high selling price, both for health and organic products free of residue compared to non-organic products.[7]–[9].

The need for organic rice in Indonesia itself is very high from year to year. It can be seen from the 2005 market demand for organic rice which was around 550,300 quintals and continued to increase until 2009 to 1,141,102 quintals. Until 2015, the number of poktan/gapoktan for rice that has received organic certification is 100 poktan/gapoktan for certified organic rice spread across 16 provinces (North Sumatra, West Sumatra, South Sumatra, Jambi, Lampung, West Java, Central Java, East Java, Banten, DIY, Bali, NTT, NTB, South Kalimantan, South Sulawesi, Central Sulawesi)[10], [11].

From the data on harvested area and organic rice production in Pasar Terusan Village, it can be seen that from 2010 to 2014, it can be seen that the average harvested area of organic rice is 783.2 ha with an average production of 5,095.2 tons. and an average productivity of 6.52 tons per ha. The amount of organic rice production fluctuates which tends to increase every year along with changes in harvested area which also tends to increase. The increase in organic rice production is influenced by several factors. Most people already know the advantages of organic lowland rice over non-organic rice, both from the cultivators and consumers. According to organic farming players, the demand for organic agricultural products has recently tended to increase,[12], [13].

There are 6 farmer groups who cultivate lowland rice in Pasar Terusan Village, namely Payo Dry I, Payo Dry II, Sumber Sustenance, Central Pematang, and Berambu Gardens, and Lopak Itik. In 2014 there were 3 farmer groups who continued to cultivate lowland rice organically, namely Payo Dry I, Payo Dry II, and Sumber Rezeki, while for the other 3 farmer groups received chemical fertilizer assistance, namely urea fertilizer from the government.

## **METHOD**

This research will be carried out in Malapari Village and Pasar Terusan Village, Muara Bulian District, Batanghari Regency. The determination of Malapari Village and Pasar Terusan Village was carried out purposively with the consideration that the farmers of Malapari Village were cultivating non-organic lowland rice and Pasar Terusan Village the farmers were managing organic and non-organic rice farming. The objects of this research are farmers who cultivate organic rice and non-organic rice. The scope of this research is to find out the factors that influence production in Pasar Terusan Village and Malapari Village, Muara Bulian District. The field research will be conducted in August 2016 to September 2016. The data taken in this study is 2014,

The types of data used in this research are primary data and secondary data. Primary data is data obtained directly from respondents based on prepared questions. The primary data in this study was obtained by distributing questionnaires to organic rice farmers in Pasar Terusan Village and non-organic rice farmers in Malapari Village in Muara Bulian District. Secondary data is data obtained from references, research reports or various forms of information from agencies related to this research by citing and conducting literature studies from books related to the problem under study.

This research will be carried out in Muara Bulian District which consists of 20 villages, the village that was chosen intentionally is Pasar Terusan Village whose lowland rice farming is organic rice farming as many as 445 farmers and 359 non-organic farmers and Malapari Village which is non-organic rice farming. as many as 462 organic farmers. Sampling in this study was approached by the Accidental Sampling method. The number of samples in this study was determined using the formula from Taro Yamane or Slovin (Riduan, 2007) as follows:

$$n = \frac{N}{Nd^2 + 1}$$

where :

n = Number of Samples

N = Total population of farmers

d2 = precision (15%)

The data obtained from the results of this study is a quantitative descriptive analysis. For the first purpose of the analysis used is the analysis used refers to the formulation of research objectives. The purpose of this study was to analyze the factors of land area, seeds, fertilizers, pesticides, labor, costs and formal education on the production of organic and non-organic lowland rice and see the dominant factors of the existing factors on production in Muara Bulian District. To test the influence model and the relationship of independent variables with more than two variables on the dependent variable, multiple linear regression equations were used with the Ordinary Least Square (OLS) Regression method.

## RESULTS AND DISCUSSION

### Rice Field Farming

Rice farming in the research area is generally carried out by farmers on their own land with an average land area of 0.4-1 Ha. In its management, the labor used in both organic and non-organic farming is labor outside the family. Workers in the family are usually employed during land preparation, seeding, planting, maintenance and harvesting. The seeds used are local and superior seeds. Farmers in Pasar Terusan Village are already using organic fertilizers as used in organic farming in general, or obtained by getting assistance from the government, namely petroorganic fertilizers. Most of the farmers in this area are aware of the positive impact of organic fertilizers on increasing soil fertility. The difference in agricultural activities between Organic and Non-Organic Agriculture in the research area is fertilization and pesticide application. The application of organic fertilizer uses petroorganic fertilizer and manure while the application of non-organic fertilizer uses Urea and NPK. The administration of organic pesticides used Astonis, Explore, Supremo, Abosilin while the administration of non-organic pesticides used Dharmabas, DMA, and Decis.

With a large area of land, the resulting production will also be high even though the costs incurred will also be high. In the research area, the largest area of land owned by farmers is in the interval 0.5 - 0.99 Ha where in organic rice farming as many as 36 farmers and non-organic farming as many as 27 people while the smallest distribution of land area for organic farmers is in the interval 1 - 1.49 and 1.5 - 2 each with 2 people and non-organic in the interval 0 - 0.49 as many as 7 people.

### Organic and Non-Organic Rice Production

Lowland rice production referred to in this study is physical production in the form of milled dry grain in kilograms obtained from farmers from rice crops. The harvested plants are rice grains that have matured according to the criteria for the maturity level of rice grains. In the research area, namely Pasar Terusan Village, the amount of dry milled unhulled rice production of each sample farmer varies, the lowest production is 3000 Kg and the highest production is 12.500 Kg with the average production of the sample farmers in the research area is 4280.5 Kg while Malapari Village the amount of dry milled unhulled rice production each sample farmer varied, the lowest production was 1600 Kg and the highest production was 6000 Kg with the average production of the sample farmers in the research area was 3330.95 Kg.

### Fertilizer Use

The use of fertilizers in organic and non-organic rice farming is different from each other, where organic rice uses manure and Petroorganic while in non-organic rice uses urea and NPK fertilizers. The recommendation for the use of manure on organic rice farming land is 2000 Kg/Ha and 500 Kg/Ha petroorganic. Meanwhile, the recommendation for the use of urea fertilizer on

non-organic rice fields is 150 kg/ha and NPK is 300 kg/ha. The average use of fertilizers in organic and non-organic farming in the study area can be seen in table 1 below.

**Table 1.** Average use of fertilizers in organic and non-organic businesses

farming	Input	Per Farmer	Per Hectare	Recommended (Kg/Ha)	Usage Rate (%)
Organic Rice	Pen	18.7	24.75	2000	1.23
	Pro-organic	213.5	287.7	500	57.54
Non Organic Rice	Urea	57.16	82.5	150	55
	NPK	29.04	40.74	300	13.58

The use of fertilizers in organic and non-organic rice farming is not in accordance with the recommendations, both manure, petroorganic on organic rice fields and urea, NPK on non-organic rice fields, it is hoped that farmers can increase the amount of fertilizer use according to the recommendations.

### Pesticide Use

In controlling pests and diseases of lowland rice, organic farmers in the study area use Astonis, Explore, Supremo, and Abosilin while non-organic rice farmers use pesticides with the brands Dharmabas, Decis, and DMA.

**Table 2.** Average Pesticide Use in Organic and Non-Organic Farming

farming	Input	Per Farmer	Per Hectare	Recommendation (L/Ha)	Usage Rate (%)
Organic Rice	Astonish	0.6	0.85	1.5	56.67
	Explore	1.2	1.63	1	163
	supremo	1.2	1.64	1.5	109.3
	Abolish	0.7	0.81	1.5	54
Non Organic Rice	Dharmabas	0.4	0.45	1.5	30
	Decis	0.6	0.8	0.5	160
	DMA	0.5	0.7	1	70

Pesticides used by farmers of organic rice samples with an average use of 4.95 liters/ha and the average use of pesticides used by farmers of non-organic rice samples is 1.4 liters/ha. The use of pesticides in the study area is mostly used for weed control during maintenance. The frequency of spraying by the sample farmers in the study area was 2-3 times. There are organic rice farmers who have applied the recommended use of pesticides well for Astonis and Abolin pesticides, while for Supremo and Explore pesticides, farmers have used too many pesticides. Meanwhile, non-organic rice farmers have applied DMA pesticides well. In Decis pesticide too much is used and in Dharmabas it is necessary to increase the amount of use.

### Cost of Organic and Non-Organic Paddy Rice

The total cost spent on non-organic farming is greater than the total cost on organic farming, but the difference is not too much. The higher costs are found in labor costs outside the family and equipment depreciation, while the costs for seeds, fertilizers, and pesticides are smaller than organic farming. From all the components of the total cost, it can be concluded that the total cost incurred by non-organic rice farming is greater than that of organic rice farming. The total cost incurred by farmers in organic lowland rice farming is Rp.3.526,002,2, while for farmers in non-organic rice farming it is Rp. 3,564,821. This is in line with Siwi (2009) which states that the average production costs incurred for both organic and non-organic rice are not much different where in organic farming the costs incurred are Rp. 4,684,725 while in non-organic farming the costs incurred are Rp. 4,179,610.

### Organic and Non-Organic Rice Farming Income

The distribution of the highest organic rice farming income is between 11,038,785 < 17,015,070 as many as 25 farmers. The average income of organic rice farming farmers is Rp. 17,879,913.6 and the average income per ha is Rp. 23,616,383.3. Meanwhile, the distribution of respondents from non-organic paddy farming based on income from non-organic paddy farming was the largest between 11,038,785 < 17,015,070 as many as 19 farmers. The average income of non-organic rice farming farmers is Rp. 13,089,941.3 and the average per ha is Rp. 18,814,523.6 . To see the difference in total income in organic and non-organic rice farming, it can be seen in Table 3 below:

**Table 3.** Total Income of Organic and Non-Organic Rice Farming Organic

Total Receipt Details	Total Receipt	
	Organic	Non-Organic
Total income per farmer (Rp)	17,879,913.6	13,089.941,3
Total Revenue Per Hectare (Rp)	23,616,383.3	18,814,523.6

### Acceptance of Organic and Non-Organic Rice Farming

The revenue referred to in this study is the amount of rice production multiplied by the price of grain. A farm is said to be successful if the income received is higher than the total costs incurred in farming both organic and non-organic paddy rice. The distribution of income in organic farming is mostly between 15,500,000 < 22,500,000 as many as 24 farmers, while the distribution of respondents for non-organic paddy farming based on income for non-organic paddy farming is mostly between 8,000,000 < 15,500,000 as many as 21 farmers. To see the difference in total revenue in organic and non-organic rice farming, it can be seen in table 4 below:

**Table 4.** Total Revenue of Organic and Non-Organic Rice Farming Organic

Total Receipt Details	Total Receipt	
	Organic	Non-Organic
Total income per farmer (Rp)	21,402,500	16,654.761.9
Total Revenue Per Hectare (Rp)	28,054,593.17	23,799,340,11

### Analysis of Organic and Non-Organic Rice Farming Regression Models

Based on the results of multiple linear regression, it can be determined that the seed variable (X1) has a positive and significant effect with a coefficient value of 0.48 and a prob of 0.0040 < 0.05 at the 95% level, indicating that if there is an additional 1 (one) year the value of X2 will increase Y by 0.48 . This is in line with Notarianto (2011) seeds have a positive and significant effect on the amount of rice production. The coefficient of seed to the amount of production is 0.281 which means that every increase of 1 value will increase the amount of production by 0.281 units.

The variable area of land (X2) has a positive but not significant effect on rice production with a coefficient value of 0.017 and a prob of 0.9055 > 0.05 at the 95% level. The coefficient value of 0.017 which is positive indicates that if there is an addition of 1 (one) X2 value, it will increase Y by 0.017. This is in line with Isyanto (2012) which states that the area of land whose coefficient value is positive indicates that the level of production will increase if there is an increase in land area but has no significant effect. This shows that there is no application of innovative technology that allows increasing land productivity.

The pesticide variable (X3) has a positive and significant effect with a coefficient of 0.14 and a prob of 0.0428 < 0.05 at the 95% level. The coefficient value of 0.14 which is positive indicates that if there is an addition of 1 (one) kg the value of X3 will increase Y by 0.14. This is in line with Hasugian (2011) that the use of pesticides has a positive but not significant effect on lowland rice production with a regression coefficient of 0.003 which indicates that the contribution of pesticide use shows a positive direction.

The fertilizer variable (X4) has a positive and significant effect with a coefficient value of 0.34 and a prob of 0.0002 <0.05 at the 95% level. The coefficient value of 0.34 which is positive indicates that if there is an addition of 1 (one) X4 value, it will increase Y by 0.34. This is in line with Notarianto (2011) who stated that fertilizer had a positive and significant effect on the amount of organic rice production. The large coefficient of fertilizer on the amount of production is 0.209 which means that every increase of 1 unit of fertilizer will increase the amount of production by 0.209 units.

The TK variable (X5) has a positive and significant effect with a coefficient value of 0.32 and a probability of 0.0454 <0.05 at the 95% level. The coefficient value of 0.32 which is positive indicates that if there is an addition of 1 (one) kg the value of X5 will increase Y by 0.32. This is in line with Mafor (2015) which states that labor has an effect on rice production. The regression coefficient value is 46.52, indicating that if the number of workers increases by 1 HOK, the production will increase by 46.52 Kg.

The cost variable (X6) has a negative and insignificant effect with a coefficient of -0.14 and a prob of 0.3139 > 0.05 at the 95% level. The coefficient value of -0.14 which is negative indicates that if there is an addition of 1 (one) X6 value, it will not increase Y by 0.14. This is in line with Junaidi (2014) which states that the cost variable has a negative and insignificant effect as seen from the coefficient of -0.030 so it can be interpreted that additional costs will not be followed by an increase in rice production of 0.030. The cost variable is not significant because most of the business capital issued by farmers is used for wages for land cultivation and harvesting.

The formal education variable (X7) has a positive but not significant effect with a coefficient value of 0.008 and a prob value of 0.90 > 0.05 at the 95% level. The coefficient value of 0.008 which is positive indicates that if there is an addition of 1 (one) X8 value, it will increase Y by 0.008. This is in line with Isyanto (2012) which states that farmer education has an effect but not significantly on rice production with a coefficient value of 0.013 and a positive sign.

## CONCLUSION

The factors that affect the production of organic lowland rice are the variable number of seeds (X1), organic fertilizer (X4), TK (X5) and organic pesticides (X3) while in non-organic lowland rice farming the factors that affect the production of non-organic lowland rice is the variable number of seeds (X1), fertilizer (X4), TK (X5) and pesticides (X3). The average income received by organic rice farmers is Rp. 21,402,500 while non-organic rice farmers are Rp. 16,654,761. The income received by organic rice farmers is Rp. 17,879,913.6 while non-organic rice farmers are Rp. 13,089,941.3. The income and income of organic rice farmers is greater than that of non-organic rice farmers.

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