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Analysis of Production Factor Efficiency in Organic Rice Farming (*Oryza sativa*) (A Case in Sukorejo Village, Sambirejo Sub-district, Sragen District)

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ABSTRACT

Central Java Province is the third largest rice producer in Indonesia (BPS, 2019). Sragen Regency has started developing organic rice since 2010 and the slogan for agriculture is "Go Organic". Sukorejo Village is one of the villages in Sambirejo sub-district as the center of organic rice production which is still under development. The problem faced is a low productivity due to a limited availability of production factors i.e. fertilizer and bio pesticides. It is engendered by the majority of farmers provide input traditionally. The allocative efficiency using the regression coefficient value of Cobb-Douglass was applied to analyze the efficiency of those production factors. The result of analysis showed that the value of using bio pesticides has not been efficiently obtained by NPMx/Px of 2.66. It displayed that the allocation use of the bio pesticides was still dearth of. The respondents used pesticides at 54 Lt/ha in average have not been efficient, therefore it needs to be enumerated to get the maximum production reaching 104.04 Lt/ha. While, the results of analysis revealed that the value of NPMx/Px allocation of labor was 1.28 in which the value was greater than one so that the allocation of labor in the study area was not efficient. With the use of labor at 93.6 HOK per hectare in one planting season, it indicated that the allocation was still inefficient. Farmers need to add the optimal use of labor to reach 120.25 HOK per hectare in one planting season.

Keywords: organic rice; production factors; allocative efficiency

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1. Introduction

The agricultural sector has an important role in the contribution of the economy in Indonesia. The cause of agriculture has an important role because it has a large and diverse potential resource. It becomes one of the drivers for the national economic system. Central Statistics Agency (2019), gross domestic product based on current prices in the agricultural business sector for 2014-2017, revealed that GDP for food crops continuously increase year by year from Rp 482,377.1 billion to Rp 621,832.7 billion. The commodity which is the government's concern in increasing its production is rice. Central Java Province is the third largest rice producer in Indonesia (BPS, 2019).

Sragen Regency has started developing organic rice since 2015 and Sragen Regency slogan for agriculture is Go Organic. Sragen Regency also exports organic rice to several countries i.e. Japan, Malaysia, and Philippines. The emergence of organic agriculture is largely influenced by environmental and resource issues, farmers' welfare, and socio-political issues. Organic farming systems are grounded in soil fertility as a key for a successful production by taking into account the natural capabilities of the soil, plants, and the availability of agricultural and environmental inputs (Winangun, 2015). Sukorejo Village in Sambirejo sub-district considered as a center for organic rice production is still under development.

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Sragen Regency's organic agriculture association, particularly in Sukorejo Village, Sambirejo sub-district, received an organic food certification from INOFICE in 2015. This region has demonstrated its competence as an organic food producer by consistently implementing the principles of organic farming. Based on the description mentioned, the present study was conducted to investigate the efficiency of the production factors on organic rice farming in order to obtain input which can increase the income of organic rice farming in Sukorejo Village. The objectives of this research were as follows:

1. Analyzing the costs, revenues, and income of organic rice farming.
2. Analyzing the production factors affecting organic rice production.
3. Analyzing the allocative efficiency of the production factors use in organic rice farming.
4. Analyzing the business risks in organic rice farming.

Research conducted by Rachmawati (2008) analyzed the profits, factors affecting profits, factors affecting production, and the level of efficiency in the use of production factors of paddy farming by pumping well irrigation in Paron Subdistrict, Ngawi District. The data analysis method used the Cobb-Douglass production function and the calculation of the farmer's income. Her results showed that the profits obtained from rice farming in 2007 during the rainy season amounted to Rp 7,029,976 and during the dry season amounted to Rp 6,389,832 per one hectare of paddy land. The benefits of lowland rice farming were jointly affected by the price of seeds, insecticides, fuel for irrigation diesel engines, labor costs, prices for urea fertilizer, ZA fertilizer, phonska fertilizer and SP-36 fertilizer, age, education level, farming experience, extensive land and season. Paddy production was influenced by the amount use of seeds, insecticides, fuel for irrigation diesel engines, labor, urea fertilizer, ZA fertilizer, phonska fertilizer, SP-36 fertilizer, age, level, education, farming experience, land area and season. The use of seed production factors, fuel for irrigation diesel engines, urea fertilizer in the rainy season had been efficient. On contrary, the use of seeds and urea fertilizer has been efficient but the use of fuel for irrigation diesel engines has not been efficient in the dry season, and it needs to be added to get optimal benefits.

Another research conducted by Salma (2012) analyzed the influence of production inputs use, the level of efficiency, and the feasibility of corn farming in Kramat Village, Bangkalan District. The analytical method used a Cobb-Douglass production function and cost analysis. The results of the study confirmed that the influential production inputs were land, seeds, and chemical fertilizers, while the allocation of land use, seeds, and fertilizers was inefficient. Corn farming in the area was feasible because the R / C ratio was 3.91.

Indroyono (2011) analyzed the allocative efficiency of corn farming inputs in Sukolilo Village, Wajak District, Malang Regency. The research used the Cobb-Douglass production function analysis method. The results of the study uncovered that the factor of production that significantly affected production was the area of land, due to the condition of the land in the study area was suitable for a cultivation of maize resulting several companies engaged in corn seeding was interested in establishing partnerships with local farmers. The results of the allocative efficiency analysis showed that the NPMx / Px value of land allocation was 1.77 indicating that the allocation of land in the study area was inefficient and needs to be analyzed business efficiency. Corn farming in the study area had an R / C ratio of 4.53 so that farming has been efficient and profitable.

Notarianto (2011) analyzed the effect of the use of organic rice and inorganic rice production factors in Sambirejo sub-district, Sragen Regency, analyzed the level of efficiency in organic and inorganic rice farming production and compared the level of production benefits between organic and paddy rice inorganic in the study area. The research used Cobb-Douglass production function method, analysis of technical efficiency, and analysis of income and profits in farming. The results obtained in the study were the area of land, seeds, and fertilizer together had a positive effect on the amount of organic rice and inorganic rice production which significantly affected the production including the area of land and fertilizer. The labor variable did not have a positive effect on the amount of organic and inorganic rice production. From the four factors of production, only the use of land area was inefficient. Based on

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the value of the technical efficiency obtained less than 1 for both organic and inorganic rice farming, organic and inorganic rice farming in the study area was technically inefficient so the use of inputs must be reduced. In this research, it is known that the R / C ratio of organic rice farming was 4.10 and the R / C ratio for inorganic rice was 1.70. These results indicated that organic rice farming in the study area was more profitable compared to inorganic rice farming.

From previous studies, it can be concluded that there are similar analytical methods used to analyze the factors influencing production in organic rice farming, namely by transforming the Cobb-Douglass function into a linear form. Another similarity between previous studies and this present study, the measurement of the level of efficiency of the use of production factors used an allocative efficiency analysis tool. The difference between this study and previous research is the use of the old organic rice farming variable in this study which is thought to influence the production of organic rice farming in the study area. Another difference is that in previous studies used farm feasibility analysis or R / C ratio, while in this present study there is a business risk analysis using standard deviation analysis methods and coefficient of variance. In organic rice farming, risks existed will hinder the farming activities. Therefore, it is necessary to have a business risk analysis to find out how much risk arises because of the uncertainty income of farmers.

According to Andoko (2002), organic farming is a farming activity that is suitable for the environment. Organic farming tries to minimize the negative effects of the surroundings. The main characteristic of organic farming is to use local varieties that are still relatively natural, followed by the use of organic fertilizers and organic pesticides. Organic farming mainly uses natural varieties because the natural varieties do not require chemical fertilizers to spur growth, while non-natural varieties require chemical fertilizers as growth promoters.

Organic rice is rice derived from organic paddy; paddy cultivated without applying synthetic chemicals, such as chemical fertilizers and synthetic pesticides. The entire cultivation process uses natural substances, starting from the process of hatchery, tillage, eradication of pests and post-harvest treatment. The milling process also must be ensured that ordinary rice is not mixed. Organic rice has several advantages i.e. healthier for consumption and more durable (Widayat, 2013).

Farming is an activity, carried out by a farmer, to obtain and to integrate the use of limited resources e.g. land, labor, capital, time and management. The farmers can achieve their best goals in an environment full of risks and other difficulties when do a farming. The farmers combine inputs to create outputs in farming activities (Soekartawi, 2011).

According to Beattie and Taylor (1994), the notion of production is the process of combining and coordinating materials and forces (inputs, factors, resources, or production services) in the production of an item or service (output or product). Meanwhile, Sugiarto et al. (2005) defined that production is an activity that converts inputs into outputs. These activities in the economy can be expressed in the production function. The production function shows the maximum amount of output that can be produced by using some inputs.

Soekartawi (2002) said that efficiency is an effort to achieve goals by using sources as minimal as possible. In economic terminology, there are three kinds of efficiency: technical efficiency, price efficiency (allocative), and economic efficiency. The use of production factors is said to be technically efficient if the production factors used can produce maximum production. Price efficiency occurs if the value of the marginal product is equal to the price of the production factor (NPMxi = Pxi). It is economically efficient if the farm achieves both technical efficiency and price efficiency.

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2. Research Method

2.1. Research Design

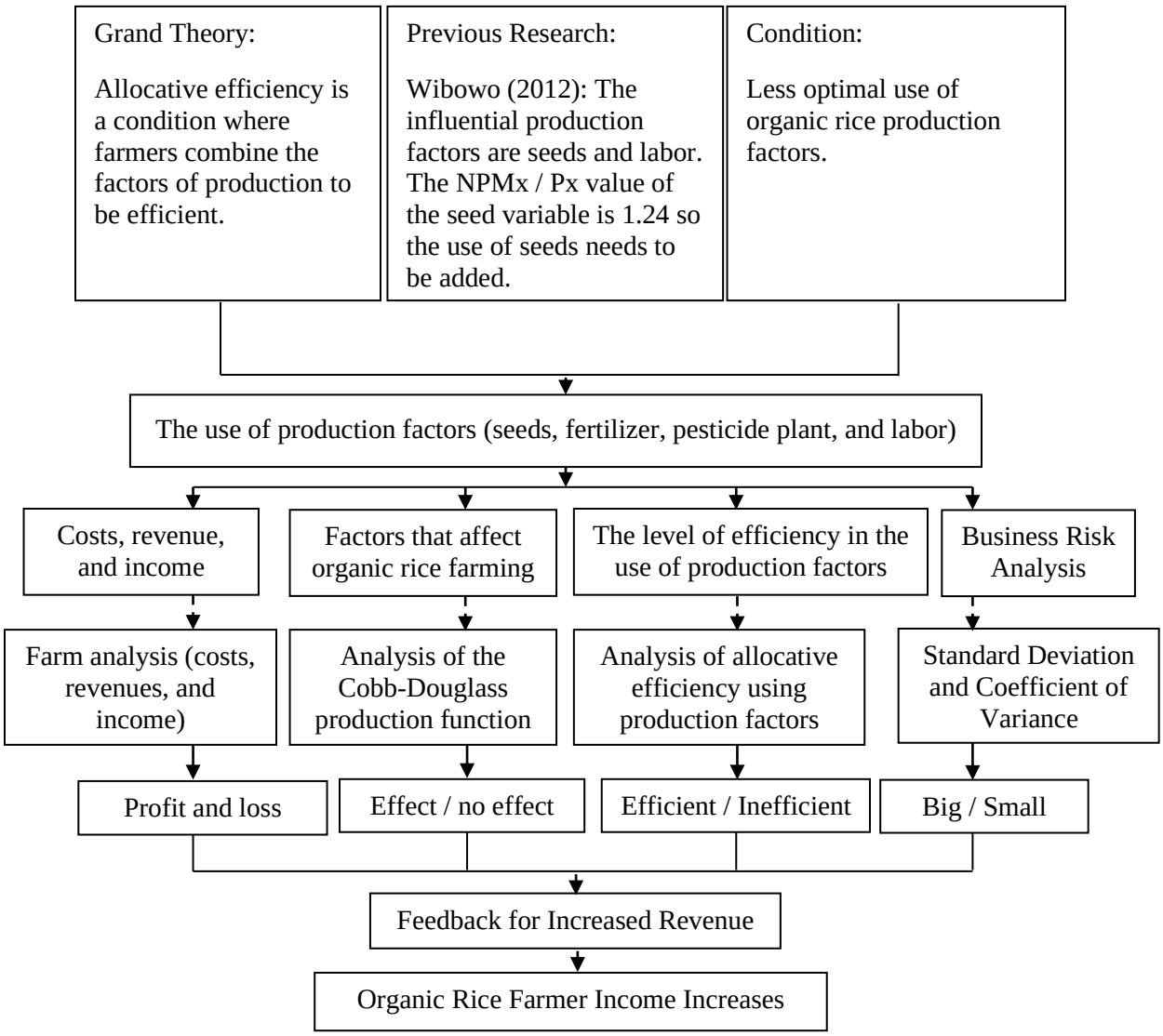

Figure 1. Theoretical Framework Scheme

The population in this study were members of farmer groups in Sukorejo Village, Sambirejo sub-district, Sragen Regency (n= 203 farmers). The respondents were selected by stratified random sampling based on the area of land owned by farmers to obtain samples which truly represent the entire population. The respondent selection used stratified random sampling because each member of the farmer has a varying land area. In this study, strata of the land area were divided into 3 parts i.e. narrow land area (<0.62 ha), medium (0.62-1.0 ha) and wide area (> 1.0 ha). The calculation of land area strata can be seen in Table 1.

Table 1. Population Distribution and Land Area Sample

Strata	Population	Sample
I (< 0,62 ha)	166	38
II (0,62 – 1,0 ha)	23	6
III (> 1,0 ha)	14	3
Total	203	47

The sample number of large chili farmers used Parel, et al. (1973) formula as follows:

$$n = \frac{N Z^2 \sigma^2}{N d^2 + Z^2 \sigma^2}$$

Information:

n = minimum number of samples that must be taken from the total population

N = total population

σ2 = population variance

d = accepted maximum error 5% (0.05)

Z = Z value at the reliability level is 95% (by value of 1.96)

$$\sigma^2 = \frac{\sum_{i=1}^{N}(Xi - \mu)^2}{N}$$

$$\sigma^2 = \frac{40,16}{203}$$

$$\sigma^2 = 0,20$$

Information:

Xi = land area of each population member (i = 1, ..., 203)

μ = average of population area

$$n = \frac{N Z^2 \sigma^2}{N d^2 + Z^2 \sigma^2}$$

$$n = \frac{203.\ (1,96)^2.(0,20)^2}{203\ .(0,05)^2 + (1,96)^2.(0,20)^2}$$

n = 47 Sampel

Based on the calculation using the Parel et.al formula, it is known that the total sample of large chili farmers in the study area was 47 farmers. The sample allocation for each stratum was calculated by the number of subpopulations in each stratum so that each strata sample obtained was as follows (*see the results and discussion part*).

3. Results and Discussion

3.1. Cost Analysis, Revenues, and Incomes of Organic Rice Farming

Fixed costs analyzed by researchers included land tax, tractor rental fees, rental costs for thresher machinery, and depreciation costs of equipment (hoes, sickles, and diesel) which can be seen in Table 2:

Table 2. The Mean of Fixed Costs of Organic Rice Farming per Hectare during June – September Planting Season

No.	Component	Average cost (Rp)	Percentage (%)
1	Land tax	14.751,77	4,13
2	Tractor rent	185.957,45	52,12
3	Thresher machine rent	78.723,40	22,05
4	Shrinkage of tools (hoe, sickle, diesel)	77.432,25	21,70
	Total (TFC)	356.864,87	100,00

Tools frequently used in organic rice farming activities included hoes, sickles, and diesel. The mean of equipment depreciation expense incurred by organic rice farmers per hectare per planting season was IDR 77,432.25/ha/planting season. The cost of equipment depreciation per hectare per planting season can be seen in Table 3.

Table 3. The Mean Cost of Equipment Depreciation per Hectares during June-September 2019 Planting Season

No	Tools	Average cost (Rp)
1	Hoe	26.288,-
2	Sickle	18.977,-
3	Diesel	32.167,-
	Total	77.432,-

Variable costs (VC) for organic rice farming in Sukorejo Village, Sambirejo District, Sragen Regency were the purchase of seeds, organic fertilizer, bio pesticides, and labor.

Table 4. The Mean of Variable Costs for Organic Rice Farming per Hectare during June – September 2019 Planting Season

No	Component	Average Use	Average cost (Rp)	Percentage (%)
1	Seed	40 kg	302.781,-	4,78
2	Organic fertilizer	1889 kg	1.889.362,-	29,80
3	Bio pesticide	54 lt	812.296,-	12,82
4	Labor :			
	L	52,6 HOK	2.104.085,-	33,20
	P	40,9 HOK	1.229.553,-	19,40
	Total (TVC)		6.338.077,-	100,00

Costs incurred by respondents for the needs of male workers were Rp2,104,085/ha/planting season and labor needs for women were Rp1,229,553/ha/planting season. The total labor costs incurred by respondents in organic rice farming reached Rp3,333,638/ha/planting season. The mean costs incurred by each labor-farmer in organic rice farming can be seen in Table 5 as follows:

Table 5. The Mean of Organic Rice Farming Workers per Hectare during June - September 2019 Planting Season

No	Activity	Labor cost (Rp)		
		Male	Female	Total (Rp)
1.	Land Processing	1.291.449	0	1.291.449
2.	Cultivation	543.404	1.088.459	1.631.863
3.	Fertilization	15.447	37.563	53.010
4.	Weeding	62.766	50.329	113.095
5.	Spraying	30.297	0	30.297
6.	Irrigating	19.148	0	19.148
7.	Harvesting	141.574	53.202	194.776
	Total	2.104.085	1.229.553	3.333.638

Table 6. The Total Cost of Organic Rice Farming per Hectare during June - September 2019 Planting Season

No	Component	Average cost (Rp)	Percentage (%)
1	Permanent Cost	356.865,-	5,34
2	Variable Cost	6.338.077,-	94,66
	Total	6.694.942,-	100,00

Based on the data in table 7, the mean revenue garnered by farmers from organic rice farming activities was Rp. 20,383,404 / ha / planting season. It implies that the average price of unhulled organic rice harvested was Rp. 4,200 / kg, and the production of organic unhulled rice harvested per planting season was 4,853 / kg.

Table 7. The Mean Revenues of Organic Rice Farming per Hectare during June - September 2019 Planting Season

No	Component	Notes
1	Grain production (Kg)	4.853,-
2	Price (Rp/kg)	4.200,-
	Revenue (Rp)	20.383.404,-

Organic rice farming income can be calculated from the difference between the recipient (TR) obtained and the total cost (TC) incurred. The mean of income received by each respondent farmer in farming activities can be seen in table 8.

Table 8. The Mean of Organic Rice Farming Income per Hectares during June - September 2019 Planting Season

No	Component	Average total cost (Rp)
1	Penerimaan	20.383.404,-
2	Total Biaya	6.694.942,-
	Income (Rp)	13.688.462,-

3.2. The Analysis of Organic Rice Farming Production Function

The production function used in this study was Cobb-Douglass production function to find out the factors significantly affected organic rice production. The Cobb-Douglass production function used multiple regression tools and one quantitative data analysis with the following equation:

$$Y = b0X_1^{b1} X_2^{b2} X_3^{b3} X_4^{b4} \ldots\ldots X_n^{bn} e^{u}$$

Therefore, the production function can be estimated using Ordinary Least Squares method. Then, it was transformed into a linear function as follows:

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$$LnY = Ln\ b_0 + b_1\ LnX_1 + b_2\ LnX_2 + b_3\ LnX_3 + b_4 + LnX_4 + e^u$$

Information:
Y = Production (kg)
b0 = Interception
b1.5 = Production elasticity of production factor from X1, ... X5
X1 = Seed (kg)
X2 = Fertilizer (kg)
X3 = Bio pesticides (Lt)
X4 = Labor (HOK)
E = natural number (2,718)
U = Error

The results of the regression test are elaborated in table 9.

Table 9. Regression Test Results

Variable	Regression Coefficients	Std. Error	t value	Sig.
Permanent	7,447	0,412	18,090	0,000
Seed (ln X1)	-0,012	0,050	-0,241	0,811
Fertilizer (ln X2)	0,041	0,052	0,778	0,441
Pesticide (ln X3)	0,106	0,048	2,234	0,000
Labor (ln X4)	0,236	0,053	4,474	0,000
R^2 = 0,727				
F value = 21,797				
F table α 0,05 = 2,44				
t table α 0,05 = 2,020				
Confidence level 95%				

Based on Table 9 above, the regression equation is as follows:

$$LnY = 7,447 - 0,012\ LnX^1 + 0,041\ LnX^2 + 0,106\ LnX^3 + 0,236\ LnX^4 + e^u$$

Based on the regression test results in table 9, the R2 value was 0.727 or reaches 72.7%. It implies that the independent variables such as seeds, fertilizers, bio pesticides, and labor had an effect of 72.7% on the production of organic rice farming, while the remaining 27.3% is caused by other factors outside the model.

In this study, the factors affecting organic rice production were analyzed using multiple linear regressions with 47 samples. The statistical test on the model of multiple linear regression equations in this study was t-test which was an individual test. T-test was performed to compare the value of t arithmetic with the value of t table at a 95% confidence level (α = 0.05) and degree of freedom (df) with the n-k formula of 41, obtained a t table value of 2.020. If the significance of t arithmetic> t table, it is significant. However, if the significance of t arithmetic <t table, it is not significant. If this happens then there is no effect of the independent variable on the dependent variable. The discussion of significance tests are elaborated as follows:

a. Seed

Based on table 9, it shows that the calculated t value of the seed variable was -0.241 <t table value of 2.020. It indicated that the seeds did not significantly affect the total of organic rice production.

b. Fertilizer

The t value of the fertilizer variable was 0.778 <t table value of 2.020. It indicated that the fertilizer did not significantly affect the total of organic rice production.

c. Bio pesticides

T value for the variable plant pesticides was 2.234> t table value of 2.020. It indicated that bio pesticides significantly affected the total of organic rice production. A regression coefficient of 2.234 indicates that increasing the number of bio pesticides by 1%, it will increase production by 2,020% in average.

d. Labor

T value on the workforce variable was 4.474> t table value of 2.020. It indicated that the labor force significantly affected the total of organic rice production. The value of the regression coefficient on the labor variable equals to 4.474. It indicates that an increase in the allocation of labor by 1%, it will increase production by 4.474%.

3.3. Efficiency Analysis of the Use of Production Factors in Organic Rice Farming

The allocative efficiency of production factors is measured with the assumption that farmers can combine the production factors to achieve optimal organic rice output so that

maximum profits will be obtained. The results of the allocative efficiency analysis of the use of production factors in organic rice farming in are presented in Table 10.

Table 10. Analysis of Allocative Efficiency of the Use of Production Factors in Organic Rice Farming

Variable	Bi	RataY	PY	X	Px	PMx	NPMx	NPMx/Px
Bio Pesticide	0,106	4853	4200	54	15000	9,52	40009,20	2,66
TK	0,236	4853	4200	93,60	40000	12,23	51391,20	1,28

From Table 10, it showed that the use of production factors was inefficient. The use of production factors is still dearth of (vegetable and manpower pesticides) at the price level. The following elaborates the allocation of the use of the production factors.

3.4. Allocative Efficiency of the Use of Bio pesticides

From the analysis, it revealed that the use of bio pesticides was inefficient. The results of the analysis of the use of bio pesticides obtained NPMx / Px of 2.66. It implies that the allocation of the use of bio pesticides is still lacked of. The respondents used pesticides at 54 Lt / ha in average which was inefficient. Thus, it needs to be increase the amount. The bio pesticides needs 104.04 Lt / ha to obtain optimal results. The respondents need to add 50.03 Lt / ha from the initial use. However, the addition of bio pesticides must refer to the recommendations based on attack rate and the right dosage. Bio pesticides used were insecticides and fungicides to control pests e.g. insects and fungi that attacked organic rice. From interviews, pests attacked the organic rice were plant hopper (*Nilaparvata lugens*) and blast. Blast disease was caused by fungus *Pyricularia oryzae*. The fungus attacked a lot of organic rice; even it has decreased production and respondents' income. Therefore, farmers used bio pesticides to naturally control disease attacks without degrading soil conditions.

In the results of the allocative efficiency calculation to answer the third hypothesis that the use of bio pesticide production factors is not efficient due to the value of NPMx / Px> 1, so that H0 is rejected and H1 is accepted, which means that at the price applicable at the time of research, the use of bio pesticide production factors is not yet optimum or not yet optimal efficient.

3.5. Allocative Efficiency of Labor Use

From the analysis, it revealed that NPMx / Px value of labor was 1.28 in which the value was greater than one meaning that the allocation of labor was inefficient. The labor use reached 93.6 HOK per hectare in one planting season implied that the allocation was still inefficient. Farmers need to add the labor to reach optimal results. It needs to add the use of labor reaching 120.25 HOK per hectare in one planting season. From the results of the interview, it showed that it was difficult to find workers so that the respondents brought in workers from outside the area. It has become one of the causes of inefficient use or of labor.

The results of allocative efficiency of labor use were inefficient due to the value of NPMx / Px> 1. Thus, the hypothesis test showed that H0 was rejected and H1 was accepted meaning that at the price prevailing during the research conducted, the use of labor was not yet optimum or inefficient.

3.6. Risk Analysis of Organic Rice Farming

Table 11. The Risk Analysis Results of Organic Rice Farm

No	Explanation	Information
1	Average income (Rp)	291.243,9
2	Std. Deviation (Rp)	255.762,2
3	Variance Coef. (%)	87,8
Note: the greater the CV value (CV> 0), the greater the risk		

The risk analysis results of organic rice farming on farming income are presented in Table 11.

Based on table 11, the coefficient of variance (CV) of organic rice income was firstly conducted, then the risk of organic rice farming was tested. The conclusions were drawn from the value of CV. CV values > 0 means that the risk of organic rice farming arises. From the table 11, the CV value for organic rice farming is 87.8%. It can be concluded that organic rice farming in Sukorejo Village,

Sambirejo Sub-district, Sragen Regency had a high risk of 87.8%. the hypothesis test showed that H0 was rejected and H1 was accepted, which means that organic rice farming has a high business risk with the CV value is far from 0 (zero).

The result of business risk in organic rice farming is caused by several factors. From the results of interviews, the respondents had difficulty to find workers in organic rice processing because many productive youths preferred to work in a non-agricultural sector such as industry.

Organic plants are vulnerable to pests and diseases, so farmers in the study area provided large amounts of bio pesticides. It has lowered the income of farmers obtained if the production was not as much as expected. Another cause was the dearth of and irregularly counseling and monitoring on cultivation techniques and organic rice crop production. The counseling is for profit-oriented not only in the farm family but also for the market globally.

Another cause was the uncertain selling price of dried rice harvested in organic rice. In the harvest season, the government sets a basic price for harvested unhusked rice (GKP) to protect rice producers. In January 2015, according to BPS records, the floor price for the dry grain harvest (GKP) was Rp 4,000 / kg and the highest price (Ceiling Price) for the dry grain harvest was Rp 6,600 / kg, while the selling price for organic GKP in the study area was Rp.4,200 / kg. The government protects farmers against the risk of falling grain prices, especially in the harvest season. The basic price of organic rice in the study area can still be increased so that it can affect farmers' income and revenue to reduce the risk of loss in organic rice farming.

4. Conclusion

Based on the results carried out in Sukorejo Village, Sambirejo Sub-District, Sragen Regency, the following conclusions are drawn:

1. The average total cost for organic rice farming in the study area is IDR 6,694,947 / Ha / Planting Season and the average revenue obtained is IDR 20,383,404 / Ha / Planting Season (June-September 2019). The amount of profit or income is the difference between revenue and total costs, which is Rp. 13,688,462 / Ha / Planting Season. This value explains that the income received by farmers is greater than the total costs incurred. Therefore, organic rice farming in the study area is still profitable.
2. Production factors affecting organic rice farming activities in Sukorejo Village, Sambirejo District, Sragen Regency are bio pesticide production and labor. It shows that an increasing amount of the use of bio pesticides and labor will affect organic rice production.
3. The analysis results of allocative efficiency on the use of production factors have revealed. The value of NPMx / Px allocation of bio pesticides and labor is 2.66 and 1.28, respectively. These figures are greater than 1 (one), so the allocation of those two production factors was inefficient. The respondents in the study area use bio pesticides at 54 Lt / Ha. Thus, it needs to add bio pesticides reaching 104.04 Lt / Ha to obtain optimal results. The use of labor in the study area is 93.6 HOK / Ha / Planting Season. It needs to add labor reaching 120.25 HOK / Ha / Planting Season to get optimal results.
4. The analysis results of farm risk show that business risks arise in organic rice farming. It is indicated by the value of CV equals to 0.878 or 87.8% meaning that organic rice farming in the study area has a high business risk because it is far from 0 (zero).

Based on the conclusions mentioned above, the following suggestions are made:

1. To maximize farmers' income in organic rice farming, farmers need to add the use of bio pesticides for their optimal value (104.04 Lt / ha) because it is still inefficient. The addition of pesticide production factors must be based on recommendations. Besides, it should also look at the existing field conditions in which bio pesticides are used if pests and diseases occur during an organic rice planting season.
2. To maximize the income of farmers in organic rice farming, the addition of labor production factors also needs to be done because its use is still inefficient. Farmers

can still increase their income by adding labor to their optimal value (120.25 HOK).

3. A regular monitoring and counseling to organic rice farmers needs to be improved, especially cultivation techniques and yields of organic rice to reduce business risk or crop failure, as well as gain global benefits in order farmers can meet market demands and meet the needs of their families with maximum profits.
4. For further research, it is necessary to examine production factors that have not been included in this study such as comparison using chemicals and land area, and other more detailing production factors used, such as organic fertilizer used in analyzing liquid fertilizer and solid fertilizer.

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