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DECIPHERING INCOME, PROFIT, AND THEIR DETERMINANTS OF ORGANIC AND CONVENTIONAL ROJOLELE RICE FARMING IN KLATEN REGENCY

Dyah Rahmawati*, Jamhari, and Irham
Department of Agricultural Socio-Economics, Faculty of Agriculture, Universitas Gadjah Mada, Yogyakarta, Special Region of Yogyakarta, Indonesia

*Correspondence Email: dyahrahmawati1988@mail.ugm.ac.id

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ABSTRACT

Rojolele rice is a superior commodity from Klaten Regency, known for its premium quality and distinctive flavor. Rojolele can be grown both organically and conventionally. Organic farming systems have many advantages, especially in terms of income and profitability; however, most farmers still practice conventional methods. The objectives of this study were: (1) to compare the income and profit of organic and conventional rojolele rice farming, and (2) to determine the factors that affect the income and profit of rojolele rice farming in Klaten Regency. This study used a survey method involving 20 organic farmers and 47 conventional farmers. The analytical method employed is an income and profit analysis, as well as multiple regression analysis. The results of the study showed that the income from organic rojolele rice farming is Rp 30,988,293 per hectare over two growing seasons, which is higher compared to conventional farming (Rp 20,463,484). Meanwhile, the profit for organic farmers is Rp 18,686,701 and for conventional farmers it is Rp 14,106,446. This indicates that organic rojolele rice farming is more profitable than conventional. Statistically, organic and conventional rojolele rice farming shows significant differences in income, though not in profit value. The factors significantly affecting income for organic farmers are land area, while in conventional farming, they are the price of chemical pesticides and land area. Furthermore, the factor influencing the profit of rojolele farmers, both organic and conventional, is solely the land area. Therefore, it may be considered to expand the development of organic rice farming, particularly rojolele rice, in Klaten Regency.

Keywords: *conventional, income, organic, rice farming, rojolele*

BACKGROUND

Organic farming is an agricultural practice that places a premium on the equilibrium of environmental, economic, and social/health considerations (Kardinan, 2016). The development of organic agriculture is motivated by the negative impacts of declining environmental sustainability due to high-input, exploitative agricultural practices, as well as the increasing global preference for safe and healthy food products (Subejo et al., 2019). It is commonly believed that organic farming is healthier than conventional farming because it does not use chemical fertilizer and pesticide in the production process. In 2019, the organic market in Indonesia exhibited a growth rate of 15-20% (Aliansi Organis Indonesia, 2019).

From the perspective of income and profitability in agriculture, rice production continues to be a profitable venture both in Indonesia and internationally (Kulyakwave et al., 2020; Abera &

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Vol 9 (1): 57-70, March 2025

Assaye, 2021; Listiani et al., 2019; Zimah et al., 2023). The implementation of organic rice farming is a promising avenue for development due to its higher profit rate than conventional rice farming (Sibarani & Somboonsuke, 2020). Although organic rice production is likely to decline in the early years of conversion, with appropriate cultivation practices, organic rice production can achieve parity with conventional rice production (Sukristiyonubowo et al., 2011; Surekha, 2013). Revenues and profits obtained by organic rice farming may be higher than those obtained by conventional rice farming because organic rice is premium rice with a relatively higher price (Hazra et al., 2018). The costs of rice farming can vary considerably. Some studies have indicated that organic rice farming costs are lower than conventional rice farming costs (Juni et al., 2022; Sibarani & Somboonsuke, 2020), but other studies have contradictory results (Ariyanto, 2018; Sularso & Sutanto, 2020). The income and profit of rice farming are influenced by several factors, including land area (Nurdiani et al., 2023; Listiani et al., 2019), seed price (Damayanti et al., 2013), fertilizer price (Damayanti et al., 2013), pesticide price (Nurdiani et al., 2023; Listiani et al., 2019), and labor wages (Ariyanto, 2018).

One of the leading commodities from Klaten Regency is the local rojolele rice variety. Rojolele rice has a distinctive taste, where the rice produced is fluffier, delicious and has an appetizing aroma (Dona, 2012). Rojolele rice is widely known as premium rice with a higher price than other rice varieties. In the past, rojolele rice had constraints in cultivation including a long planting period of up to five months and a plant height of 146-155 cm, making it vulnerable to falling (Amanah et al., 2017). The Regional Government of Klaten Regency, in collaboration with the National Nuclear Energy Agency of Indonesia (BATAN), researched on rojolele breeding from 2013 to 2019. The objective was to develop new varieties of rojolele rice, including srinuk and srinar rojolele rice. The rojolele rice resulting from this breeding has a shorter planting period of approximately 105 days and a shorter plant height of roughly 110 cm.

In its development, rojolele rice is directed towards the implementation of farming system with reduced use of chemical fertilizers and pesticides (Dinas Pertanian, Ketahanan Pangan, dan Perikanan Kabupaten Klaten, 2023). Although organic farming has various advantages, especially from income and profitability, most farmers still cultivate conventionally due to concerns about crop failure without chemical input, the productivity level of organic rice not meeting expectations, and the more complex organic cultivation process. Prior to this study, no research had been conducted on the comparative income, profits, and factors influencing them in the rojolele rice farming in Klaten Regency. Comparative analysis of income and profits of rice farming can provide stakeholders with information regarding the profitability comparison between organic and conventional rojolele rice farming in Klaten Regency. Furthermore, the impact of organic farming systems on farmers' income and profits is expected to inform the formulation of policies related to the development of rojolele rice, particularly in Klaten Regency.

RESEARCH METHODS

The selection of the research locations was purposively conducted in the Karanganom and Delanggu Districts of Klaten Regency, considering that these two districts have farmers cultivating rojolele rice both organically and conventionally. Although organic and conventional farmers manage adjacent lands, organic farmers create borders around their fields and install filters along irrigation pathways to minimize contamination from chemical fertilizers and pesticides in their organic fields.

The determination of the sample size using the Yamane's formula resulted in 67 respondents from a total population of 190 rojolele rice farmers. Yamane's formula can be used to calculate the sample size for a population with a known total number (Sugiyono, 2022). Sampling used the disproportional stratified random sampling method, as many as 47 people from 170 conventional rojolele rice farmers and a census of 20 organic rojolele rice farmers. The data collection was conducted from December 2023 to January 2024. The farming data collected included data from two growing seasons in 2023. The primary data obtained was processed using Microsoft Excel and STATA 16.0 applications. The data were then tabulated and analyzed to determine the cost structure, revenue, income, and profit of farming. Furthermore, multiple linear regression analysis using OLS was employed to determine the factors influencing the income and profits of rojolele rice farming in Klaten Regency.

Income

Farm income is the difference between total revenue and total explicit costs. Farm income is formulated as follows (Soekartawi, 1995).

$$I = TR - TC_e$$

Information:
I : Income
TR : Total Revenue
TC_e : Total Explicit Cost

Profit

To calculate the profit of a farm, it is necessary to consider the implicit costs of expenditure. These include family labor costs, rent of own land, and interest on own capital. The profit of farming business is formulated as follows (Suratiyah, 2016).

$$\pi = I - TC_i$$

Information:
π : Profit
I : Income
TC_i : Total Implicit Cost

The independent sample t-test is used to see whether there is a significant difference between the income and profits of organic and conventional rojolele rice farming in Klaten Regency. The null hypothesis is written as follows:

1. $H_0: \mu_1 = \mu_2$
2. $H_1: \mu_1 \neq \mu_2$

The test criteria compare the t-stat with the t-table distribution value at the degree of freedom (df=65) and level of significance (α=1%, 5%, and 10%). If the t-stat falls within the rejection regions, we reject the null hypothesis (H_0), which indicates that there is a significant difference in average

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Vol 9 (1): 57-70, March 2025

income and profits between organic and conventional rojolele rice farming. Conversely, if the t-stat does not fall within the rejection regions, we do not reject the null hypothesis, suggesting no significant difference between the two types of farming.

Factors Affecting Income and Profit

The analysis used to determine the factors influencing the income and profits of rojolele rice farming in Klaten Regency is multiple linear regression analysis using OLS. The Cobb-Douglas profit function based on unit output-price (UOP) is used to estimate income and profit. The model consists of four equations: factors affecting income in organic farming, factors affecting income in conventional farming, factors affecting profit in organic farming, and factors affecting profit in conventional farming. The mathematical models of the equations in this study are as follows:

$$lnIo^* = ln\alpha_0{}^* + \alpha_1 lnCo_1^* + \alpha_2 lnCo_2^* + \alpha_3 lnCo_3^* + \alpha_4 lnCo_4^* + \alpha_5 lnZo_1 + e$$
$$ln\pi o^* = ln\beta_0{}^* + \beta_1 lnCo_1^* + \beta_2 lnCo_2^* + \beta_3 lnCo_3^* + \beta_4 lnCo_4^* + \beta_5 lnZo_1 + e$$

Information:
Io^* : Normalized organic farming income (Rp) with output price
πo^* : Normalized organic farming profit (Rp) with output price
Co_1^* : Normalized organic seed prices (Rp/kg) with output price
Co_2^* : Normalized organic fertilizer prices (Rp/kg) with output price
Co_3^* : Normalized organic pesticide prices (Rp/liter) with output price
Co_4^* : Normalized organic labor wages (Rp/HKO) with output price
Zo_1 : Organic land area (m^2)
α_0^*, β_0^* : Intercept
α_i, β_j : Regression coefficient, i & j = 1,2,…,5
e : Disturbance/error term

$$lnIk^* = ln\gamma_0^* + \gamma_1 lnCk_1^* + \gamma_2 lnCk_2^* + \gamma_3 lnCk_3^* + \gamma_4 lnCk_4^* + \gamma_5 lnZk_1 + e$$
$$ln\pi k^* = ln\theta_0{}^* + \theta_1 lnCk_1^* + \theta_2 lnCk_2^* + \theta_3 lnCk_3^* + \theta_4 lnCk_4^* + \theta_5 lnZk_1 + e$$

Information:
Ik^* : Normalized conventional farming income (Rp) with output price
πk^* : Normalized conventional farming profit (Rp) with output price
Ck_1^* : Normalized conventional seed prices (Rp/kg) with output price
Ck_2^* : Normalized chemical fertilizer prices (Rp/kg) with output price
Ck_3^* : Normalized chemical pesticide prices (Rp/liter) with output price
Ck_4^* : Normalized conventional labor wages (Rp/HKO) with output price
Zk_1 : Conventional land area (m^2)
γ_0^*, θ_0^* : Intercept
γ_k, θ_l : Regression coefficient, k & l =1,2,…,5
e : Disturbance/error term

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Vol 9 (1): 57-70, March 2025

RESULT AND DISCUSSION

The characteristics of the respondents in this study include age, educational level, farming experience, land area, and land ownership. Table 1 indicates that most rojolele rice farmers are within the productive age group. The average age of organic and conventional farmers is nearly the same, with organic farmers averaging 57.5 years and conventional farmers averaging 57.7 years. Farmers in their productive years generally have better energy and farming skills compared to those over the age of 64. Farmers who are past their productive years tend to rely more on the labor of others. The formal education of respondent farmers varies. In general, the education level of farmers practicing organic farming is higher compared to conventional farmers. This indicates that the education level of farmers influences their ability to make decisions regarding their farming activities, including the decision to take risks associated with changing the production system by adopting the latest technologies in rice cultivation (Septiadi, 2022).

Table 1 also shows that both organic and conventional rojolele rice farmers at the research location have considerable experience in agriculture. This is because some of them come from farming families, which has enabled them to learn the techniques of rice farming from their parents from an early age. The longer the farming experience a farmer has, the greater their ability to manage farming activities tends to be (Utami, 2022). The quantity of rice farmers produced by farmers is contingent upon the extent of land under their management. The average plantation area for organic and conventional rojolele rice farmers is less than 0.5 hectares, indicating a relatively narrow land base. In organic farming, a significant proportion of respondents (more than half) are farmers who manage their own land and village treasury (*bengkok*), which means they do not need to incur land rent. In contrast, in conventional farming, most farmers are tenant farmers with a land lease and a profit-sharing system.

Table 1. Characteristics of Respondents Who Applied Organic and Conventional Farming Systems

No	Characteristics	Farming System			
		Organic		Conventional	
		Respondents	Percentage (%)	Respondents	Percentage (%)
1	Age (year)				
	a. 15-64	16	80.00	35	74.47
	b. > 64	4	20.00	12	25.53
2	Length of formal education (year)				
	a. 0-6	4	20.00	15	31.91
	b. 7-9	1	5.00	7	14.89
	c. 10-12	9	45.00	20	42.55
	d. > 12	6	30.00	5	10.64
3	Farming experience (year)				
	a. 1 – 10	5	25.00	12	25.53
	b. 11 – 20	8	40.00	8	17.02
	c. 21 – 30	4	20.00	15	31.91
	d. > 30	3	15.00	12	25.53
4	Land area (ha)				

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Vol 9 (1): 57-70, March 2025

	a. < 0,5	15	75.00	26	55.32
	b. 0,5 – 1	4	20.00	14	29.79
	c. > 1	1	5.00	7	14.90
5	Land ownership (ha)				
	a. Self-owned	2.55	31.91	3.29	11.99
	b. Rent	1.69	21.19	4.63	16.89
	c. Profit-sharing	1.44	18.06	14.87	54.26
	d. Village treasury (*bengkok*)	2.30	28.84	4.62	16.86

Source: Primary Data Analysis (2024)

Comparison of Farming Income and Profit of Organic and Conventional Systems

In Table 2, the results of cost calculation, revenue, income, and profitability of organic and conventional rojolele rice farming in Klaten Regency are presented. The calculations were conducted over two growing seasons per hectare. The calculation presented here employs a production form of Milled Dry Grain/GKG. From the standpoint of cost structure, the variable costs of rojolele rice farming, both organic and conventional, are primarily influenced by the cost of non-family labor. The significant expenditure on labor is a consequence of the fact that the majority of the stages of cultivation rely on the input of labor from external farmers, from the initial land preparation to the final harvest (Sari et al., 2019).The components of production costs between organic and conventional rojolele rice farming do not differ significantly in value, even though the types of fertilizers and pesticides used are different. The fixed costs incurred in organic rojolele rice farming are lower compared to conventional farming, thus resulting in lower overall explicit costs for organic farming compared to conventional farming in Klaten Regency. The explicit costs in conventional farming are higher, primarily due to higher profit-sharing costs incurred by conventional farmers. This is because most conventional farmers manage land owned by others through a profit-sharing system, whereas organic farmers more frequently manage their own land, thus avoiding the need to incur profit-sharing costs. Similar results were obtained by Ariyanto (2018), where the profit-sharing costs of conventional rice farming were higher than those of organic farming because conventional farmers also work on several productive lands that are less utilized to achieve greater yields.

Table 2. Cost and Income Analysis of Organic and Conventional Rojolele Rice Farming

No	Description	Organic		Conventional	
		Value (Rp)	Percentage (%)	Value (Rp)	Percentage (%)
1	Explicit Cost (Rp)				
	Fixed Cost				
	a. Land rent	1,516,109	3.97	1,273,402	2.89
	b. Profit-sharing cost	3,836,790	10,04	15,479,575	35.14
	c. Taxes	265,951	0.70	135,735	0.31
	d. Irrigation	308,275	0.81	315,796	0.72
	e. Eqpt. dep. cost	422,985	1.11	370,351	0.84
	f. Equipment repair cost	7,581	0.02	19,200	0.04
	Variable Cost				
	a. Seed	1,279,596	3.35	1,081,261	2.45

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http://ejournal2.undip.ac.id/index.php/agrisocionomics
Vol 9 (1): 57-70, March 2025

	b. Organic Fertilizer	4,487,176	11.75	1,334,387	3.03
	c. Liq. Organic Fert.	733,207	1.92	325,760	0.74
	d. Chemical Fertilizer			2,989,364	6.79
	e. Organic Pesticide	730,006	1.91		
	f. Chem. Pest/Herbicide			1,922,993	4.37
	g. Labor	24,610,823	64.43	18,803,755	42.69
	Total Explicit Cost	38,198,499	100	44,051,579	100
2	Implicit Cost (Rp)				
	a. Own land rent	6,816,172		2,554,101	
	b. Interest in own capital	2,181,567		1,725,692	
	c. Family labor	3,303,853		2,077,245	
	Total Implicit Cost	12,316,753		6,357,038	
3	Revenue	69,186,793		64,515,063	
	a. Production (kg)	8,528		8,748	
	b. Price (Rp/kg)	8,113		7,375	
4	Income (3-1)	30,988,293		20,463,484	
5	Profit (4-2)	18,686,701		14,106,446	

Source: Primary Data Analysis (2024)

One potential strategy for reducing the cost of organic rice farming is to make production inputs such as fertilizers and pesticides independently (Pratama et al., 2018). Expenditures by farmers for purchasing organic fertilizer at the research location are still relatively high. Therefore, effective collaboration is needed among farmers, farmer groups, extension workers, and agricultural departments to promote the self-production of organic fertilizer in order to reduce production costs. In conventional rice farming, the use of organic fertilizers can result in a reduction in the cost of chemical fertilizers.

Total revenue from organic rojolele rice farming over two growing seasons per hectare is higher compared to conventional farming. Although the amount of organic rojolele rice produced is slightly lower than conventional rice, with a higher price level, the revenue generated by organic rojolele farming is greater than conventional farming. Similar results were obtained by Wibowo et al. (2019), where the land productivity of organic rice farming was lower compared to conventional rice production. The production of organic rojolele rice is not significantly different from conventional rice, as organic farmers tend to use superior seeds, which reduces the risk of pests and diseases affecting the rice plants. Furthermore, the maintenance activities associated with organic rice farming are more intensive, and the soil fertility level increases with the use of organic fertilizers. On average, organic rojolele rice farmers in Klaten Regency have undergone a conversion period from conventional to organic for approximately two years. Consequently, rice productivity, which initially declined by approximately 30% during the conversion period, has gradually increased towards conventional productivity. The application of organic farming, along with all its technological components, will enhance soil fertility, leading to an increase in productivity (Machmuddin et al., 2016). The selling price of organic rojolele GKG ranges from Rp 7.500,00 to Rp 11.250,00 per kg. The price received by farmers is higher if they can sell directly to final consumers. Meanwhile, the lowest price of conventional rojolele GKG is Rp 6.250,00 and the highest is Rp 8.750,00 per kg.

Income is obtained from the difference between revenue and total explicit farming costs (Suratiyah, 2016). The income from both organic and conventional rojolele rice farming is positive, indicating that all cash costs (variable and fixed) are covered. The income value from organic rice farming is higher compared to conventional farming. The results of the Independent Sample t-test analysis indicate that there is a significant difference between average income of organic and conventional rice farming (Table 3). This finding contradicts the research of Tashi & Wangchuk (2016), which asserts that gross income is not significantly different between organic and conventional farming in Bhutan.

To ascertain the actual income received by farmers, it is necessary to determine the profit of farming. The calculation of farm profit is obtained from the difference between income and implicit costs. Unlike explicit costs, which are directly incurred by farmers, implicit costs are costs that are not explicitly paid by farmers but need to be considered. The calculation results demonstrate that the profit of organic rice farming is higher than conventional farming. Although the implicit costs of organic farming are higher, the higher income from organic products means that organic farmers still achieve greater profits compared to conventional farmers. Similar results were obtained by Ariyanto (2018) and Sibarani & Somboonsuke (2020), who stated that the profit of organic rice farming is higher than that of conventional farming. Statistically, there is no significant difference between the profits of organic and conventional farming. Although the implementation of organic farming systems does not show significant differences in profit compared to conventional methods, it can generate higher income. The adoption of organic systems can strengthen household economic empowerment among farmers by enhancing the productivity of production factors to increase income.

Table 3. Results of Independent Sample t-test of Organic and Conventional Rojolele Rice Farming

Description	Organic (20)		Conventional (47)		t-stat
	Mean	Std Dev	Mean	Std Dev	
Income (Rp /ha)	30,988,293	12,499,688	20,463,484	12,196,129	2.045
Profit (Rp /ha)	18,686,701	12,414,491	14,106,446	11,284,021	0.680

Source: Primary Data Analysis (2024)
Information/Notes:
t-table (65, 1%) : 2.654
t-table (65, 5%) : 1.997
t-table (65, 10%) : 1.669

Factors Affecting Farm Income and Profit

Tables 4 and 5 show the results of multiple linear regression analysis using OLS with the assistance of STATA 16.0. The regression models have passed tests for classical assumptions including normality, heteroskedasticity, autocorrelation, and multicollinearity detection. The normality test of residuals in this study using the Shapiro-Wilk test showed that the prob > z value is greater than the alpha levels (1%, 5%, 10%), indicating that the residuals are normally distributed. Next, the heteroscedasticity test using the Breusch-Pagan/Cook-Weisberg test resulted in a p-value greater than the alpha levels (1%, 5%, 10%), suggesting that there is no heteroscedasticity problem. The autocorrelation test using the Breusch-Godfrey LM test revealed that the prob > chi2 value is greater than the alpha levels (1%, 5%, 10%), indicating that there is no autocorrelation in the regression model. Multicollinearity detection was carried out by examining the Variance Inflation

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http://ejournal2.undip.ac.id/index.php/agrisocionomics
Vol 9 (1): 57-70, March 2025

Factor (VIF) values for each independent variable. The results showed that all variables have VIF values less than 10, suggesting that there is no multicollinearity issue.

Table 4. Factors Affecting the Farm Income of Rojolele Rice Farming in Klaten Regency

Variable	Expectation Sign	Organic			Conventional		
		Coeff		Sig.	Coeff		Sig.
Intercept		-2.508		0.154	-0.573		0.555
Seed prices	-	-0.070		0.902	0.289		0.362
Fertilizer prices	-	-0.010		0.833	0.218		0.316
Pesticide prices	-	-0.232		0.409	-0.220	*	0.076
Labor wages	-	0.593		0.285	0.116		0.682
Land area	+	1.024	***	0.000	0.938	***	0.000
Adjusted R^2		0.8755			0.7217		
F-stat		27.72	***		24.86	***	
Sig F		0.0000			0.0000		

Source: Primary Data Analysis (2024)
Note: *) significant at α=10%, **) significant at α=5%, ***) significant at α=1%

The regression analysis results for organic rojolele rice farming income in Klaten Regency indicate an Adjusted R^2 value of 0.8755 (Table 4). This means that 87.55% of the variation in organic income can be explained by variations in seed prices, organic fertilizer prices, organic pesticides prices, labor wages, and land area. The remaining 12.45% is explained by other variables outside the examined model. Meanwhile, the Adjusted R^2 value for conventional income is 0.7217, indicating that 72.17% of the variation in conventional farmer income can be explained by variations in seed prices, fertilizer prices, chemical pesticides prices, labor wages, and land area. Based on the analysis results, the significance value of the F-stat for both income and profit is obtained as 0.000, which is smaller than the α value (1%, 5%, 10%), indicating rejection of H_0. Therefore, it can be concluded that seed prices, fertilizer prices, pesticide prices, labor wages, and land area simultaneously influence the income of both organic and conventional rojolele rice farming in Klaten Regency at confidence levels of 99%, 95%, and 90%. The results of the partial tests (t-tests) for each variable can be explained as follows:

1. Seed prices
   Based on the regression analysis results, the significance values obtained are 0.902 for organic farming and 0.362 for conventional farming, which are greater than the alpha levels (1%, 5%, 10%). This indicates that seed price does not have a significant effect on the income of rojolele rice farmers in Klaten Regency. This is likely because the seed prices are relatively homogeneous in the research area, both for organic and conventional seeds.
2. Fertilizer prices
   Similarly, for fertilizer prices, the significance values for both organic and conventional farming are also greater than the alpha levels. This indicates that fertilizer prices do not have a significant effect on the income from rojolele rice farming in Klaten Regency.
3. Pesticide prices
   The significance value for pesticide prices in organic farming is greater than the alpha level, indicating that pesticide prices do not affect the income from organic rojolele rice farming at the research site. Meanwhile, for conventional farming, the significance value is 0.076. This suggests

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http://ejournal2.undip.ac.id/index.php/agrisocionomics
Vol 9 (1): 57-70, March 2025

that, at a 90% confidence level, pesticide prices do affect the income from conventional rojolele rice farming in Klaten Regency. The price of chemical pesticides only significantly affects the model of conventional farmers' income with a regression coefficient of -0.220. This indicates that a 1% increase in the price of chemical pesticides will decrease income by 0.220%. The significance value for the pesticides price variable is 0.076, indicating that at a 90% confidence level, the price of chemical pesticides significantly affects conventional farmers' income. An increase in pesticides prices reduces farmers' income because it increases farmers' expenses for pest and disease control, thereby reducing their overall income. This study reinforces the findings of Listiani et al. (2019), which stated that an increase in pesticide costs decreases rice farmers' income in Jepara Regency. Similarly, Nurdiani et al. (2023) found similar results where pesticide prices negatively impact the income of rice farming in irrigated fields in Banyumas Regency. This phenomenon indicates that one advantage of organic farming over conventional farming is that the income of organic farmers is not dependent on fluctuations in the prices of pesticides for pest and disease control. The use of natural materials available in the surrounding environment helps to reduce the cost of pest and disease management in organic farming. Thus, reducing the use of chemical pesticides can enhance farmers' income.

4. Labor wages
   Particularly, labor wages do not affect the income of either organic or conventional farmers. This is likely because the wage levels in the research area are relatively homogeneous.
5. Land area
   The significance value for the land area variable in both organic and conventional rice farming is 0.000. This indicates that land area has a significant effect on farming income at a 99% confidence level. The coefficient value for land area in the organic farming income model is 1.024, meaning that a 1% increase in land area can increase organic farming income by 1.024%, assuming other variables remain constant. Similarly, in the conventional farming income model, the coefficient obtained is 0.938, indicating that a 1% increase in land area will increase conventional farming income by 0.938%. Similar findings were obtained by Damayanti et al. (2013), where land area significantly impacts the increase in farming income. Increasing the land area indirectly affects production increases and thereby enhances income and profitability in farming businesses.

Table 5. Factors Affecting the Farm Profit of Rojolele Rice Farming in Klaten Regency

Variable	Expectation Sign	Organic		Conventional	
		Coeff	Sig.	Coeff	Sig.
Intercept		-6.402 *	0.057	-0.588	0.733
Seed prices	-	-1.346	0.215	-0.012	0.983
Fertilizer prices	-	-0.260	0.766	0.579	0.134
Pesticide prices	-	-0.282	0.587	-0.283	0.195
Labor wages	-	0.379	0.708	-0.466	0.354
Land area	+	1.526 ***	0.000	1.146 ***	0.000
Adjusted R^2		0.8088		0.5326	
F-stat		17.07 ***		11.48 ***	
Sig F		0.0000		0.0000	

Note: *) significant at α=10%, **) significant at α=5%, ***) significant at α=1%

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http://ejournal2.undip.ac.id/index.php/agrisocionomics
Vol 9 (1): 57-70, March 2025

Based on Table 5, the multiple regression analysis results for organic farming profit show an Adjusted R^2 value of 0.8088. This value indicates that 80.88% of the variation in farmers' profits can be explained by variations in seed prices, organic fertilizer prices, organic pesticide prices, labor wages, and land area, while the remaining 19.12% is influenced by other factors not included in the model. In contrast, the Adjusted R^2 value for conventional farming profit analysis is 0.5326, meaning that 53.26% of the variation in farmers' profits can be explained by variations in the independent variables (seed prices, fertilizer prices, pesticide prices, labor wages, and land area) studied. The remaining 46.74% is explained by other factors outside the model. The partial test (t-test) results indicate that the independent variable significantly influencing the profit of rojolele rice farming businesses, both organic and conventional, at a 99% confidence level is land area. Meanwhile, the intercept in the organic model is significant at a 90% confidence level.

1. Seed prices
   Based on the regression analysis results for farm profitability, seed prices do not have a significant effect on the profit from rojolele rice farming in Klaten Regency. This is likely because the prices of both organic and conventional seeds are relatively homogeneous.
2. Fertilizer prices
   Fertilizer prices also have a significance value greater than alpha, indicating that fertilizer prices do not significantly affect farm profitability. Similar to seed prices, the fertilizer prices in the research area are relatively homogeneous.
3. Pesticide prices
   The significance value for pesticide prices is greater than the alpha level. Therefore, it can be concluded that pesticide prices do not have a significant effect on the profit from rojolele rice farming in Klaten Regency.
4. Labor wages
   The labor wages paid by farmers are relatively homogeneous between different farmers. Therefore, labor wages do not have a significant effect on the profitability of either organic or conventional farming, as indicated by the significance values being greater than the alpha levels (1%, 5%, 10%).
5. Land Area
   Land area has a positive and significant impact on the profit of rojolele rice farming businesses, both organic and conventional, at a 99% confidence level. This positive influence of land area is also reflected in the profit models, with a regression coefficient value of 1.526 for organic farming and 1.146 for conventional farming. According to Suratiyah (2016), from an efficiency standpoint, larger cultivated land area by farmers leads to higher production and income per unit area. The larger the area of paddy fields managed by farmers, the higher the income and profit from rice farming. On average, organic rojolele rice farmers manage an area of 3,958 m^2, while conventional farmers manage an average area of 5,831 m^2. The findings of this study provide insights that land area is a key factor influencing the income and profit of rojolele rice farming (both organic and conventional) in the research location. Therefore, expanding the cultivation area of rojolele rice could be considered to increase income and profitability in rojolele rice farming in Klaten Regency.

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http://ejournal2.undip.ac.id/index.php/agrisocionomics
Vol 9 (1): 57-70, March 2025

CONCLUSION AND SUGGESTION

The income level and profitability for organic rojolele rice farmers are higher compared to conventional farming in Klaten Regency. This indicates that organic rojolele rice farming is more profitable compared to conventional methods. Statistically, the study finds a significant difference between the incomes of organic and conventional rice farming, but not in terms of profits. Although the adoption of organic farming systems does not show a significant difference in profitability compared to conventional methods, it does generate higher income. Therefore, implementing organic systems can strengthen household economic empowerment among farmers by increasing the productivity of production factors to enhance income.

Income and profit of rice farming are closely linked to the production and output prices received by farmers. Therefore, government intervention is needed in promoting and expanding markets, especially for organic rojolele rice as the flagship commodity of Klaten Regency, to boost the price of organic rojolele rice. The Regional Government of Klaten Regency has intervened in marketing rojolele rice, but only to the extent of conventional rojolele rice with the policy of providing rice for civil servants (ASN) within the scope of the Klaten Regency Government in the form of rojolele rice. The fulfillment of rojolele rice needs for ASN is provided by several mills that purchase conventional rojolele rice from farmers at a minimum price of IDR 5,000.00 per kg (Harvested Dry Grain/GKP). It is necessary to conduct periodic evaluations of the minimum purchase price of rojolele to ensure that it remains aligned with the cost of rice production and the price level of other varieties of rice in the market. A higher price guarantee for rojolele rice would certainly incentivize farmers to continue cultivating and preserve the sustainability of this variety as the iconic rice of Klaten Regency.

Furthermore, efforts to increase production while reducing production costs must be continuously encouraged through training, mentoring, and strengthening farmers’ groups. Most land cultivated for rojolele rice is narrow land below 0.5 hectares. Therefore, another recommendation is the development of farmer institutions through land consolidation and farmer corporation approaches in the research location. The implementation of land consolidation programs has led to increased rice production and productivity, cost efficiency in production, increased use of agricultural equipment, and increased farmers' income (Ekowati et al., 2020). With the increase in production and stable prices, it is expected that the income and profits of rojolele rice farmers will increase.

Significant factors positively affecting both organic and conventional farmers' income and profits include land area. Conversely, the price of chemical pesticides negatively affects farmers' income significantly. Furthermore, the study identifies that only one factor significantly influences the increase in profits for both organic and conventional farmers, which is land area. Government and stakeholders play crucial roles in increasing farmers' income and profits through enhancing production, stabilizing the prices of production inputs—particularly chemical pesticides—and stabilizing output prices. Efforts to achieve these goals may include expanding land area programs, cultivation assistance, training in producing inputs independently, promoting and expanding marketing, as well as strengthening farm management practices.

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Vol 9 (1): 57-70, March 2025

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