International Journal of Education, Vocational and Social Science
https://e-journal.citakonsulindo.or.id/index.php/IJEVSS
E-ISSN : 2963 4954
IJEVSS

Factors Affecting The Income Of Rice Farmers In Puroo Village, Lindu District, Sigi Regency Lindu Kabupaten Sigi

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Abstract

Rice is a food crop that plays a vital role in Indonesia's economy. As a staple food, rice is very difficult to replace with other staples such as corn, tubers, sago, and other sources of carbohydrates. This study aims to analyze the effects of land area, selling price, yield, and production costs on the income of irrigated rice farmers in Puroo Village, Lindu Subdistrict, Sigi Regency. The research was conducted from January to March 2026 using a quantitative method. The study sample consisted of 39 farmers selected using purposive sampling from a population of 273 farmers. The data used consisted of primary and secondary data. Data analysis was performed using multiple linear regression with the aid of SPSS. The results showed that, when analyzed individually, production costs had a significant effect on income (t = 2.179; sig = 0.034), production yield had a significant effect on income (t = 2.904; sig = 0.006), the selling price has a significant effect on income (t = 3.833; sig = 0.037), and land area has a significant effect on income (t = 2.478; sig = 0.017). Collectively, production costs, production output, selling price, and land area have a significant effect on farmers' income (F = 4.914; sig = 0.003). The coefficient of determination (R^2) of 0.856 indicates that 85.6% of the variation in farmers' income can be explained by the dependent variable that were studied, while 14.4% were influenced by other factors outside the research model. The average farmer income was Rp6,769,923 per growing season.

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Keywords: Price, Rice, Income, Influence

INTRODUCTION

The agricultural sector is relied upon to revive the national economy. The well-being of farmers and their families is the primary objective that must be prioritized in all activities related to the development of the agricultural sector. The significance of the agricultural sector is evident from its success—even amid an economic crisis—in providing sufficient quantities of staple foods, as well as its positive growth in supporting the pace of national economic growth. This situation is a key factor in the formulation of policies that favor the agricultural sector to increase employment opportunities, reduce poverty, and promote more inclusive economic growth (Gultom, 2020).

Central Sulawesi Province is one of Indonesia's provinces with abundant natural resources. Most residents of Central Sulawesi depend on the agricultural sector. The majority of the population in Central Sulawesi works in agriculture. Various crops, such as rice, corn, legumes, and oil palm, are widely cultivated in Central Sulawesi (BPS, 2019).

Sigi Regency is one of the rice-producing regencies in Central Sulawesi Province. Rice farming is one of the agricultural activities in Sigi Regency and supports the livelihoods of the people living there. Sigi Regency is able to produce irrigated rice because it possesses adequate conditions, such as the availability of land that can be expanded, sufficient supplies of seeds and fertilizer, a labor force for cultivation, and government policies focused on increasing food production through the expansion of irrigated rice cultivation areas (PAT).

Lindu Subdistrict is one of the areas in Sigi Regency that produces and cultivates irrigated rice to meet the community's needs. This crop is used to supplement the income of residents in Lindu Subdistrict, he explained, referring to the harvested area, production, and productivity of irrigated rice in Sigi Regency.

Puroo Village has demonstrated fairly stable rice paddy performance in terms of land area and production output. With fairly stable productivity, Puroo Village ranks above average, which may indicate that the rice cultivation and management systems in Puroo Village are already quite effective. Production yields could be further increased with more optimal support in terms of irrigation, production facilities, and technical guidance for farmers, as well as reduced costs for managing rice paddy farming in Puroo Village, Lindu Subdistrict, Sigi Regency. The amount of available land in Puroo Village is a crucial indicator for rice paddy farming.

Puroo Village ranks as the village with the second-smallest land area among the villages

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in Lindu Subdistrict. Although it does not have as much land as other villages such as Olu or Langko, Puroo Village still has sufficient agricultural potential to support irrigated rice production. In Puroo Village, the rice harvest is not sold as paddy due to low paddy prices; instead, most of it is processed into rice before being marketed. The process of turning paddy into rice is typically carried out using rice mills owned by several individuals who operate milling businesses in Puroo Village. After milling, the rice is sold directly to consumers in the Lindu Subdistrict area as well as to markets in Sigi Regency. Direct sales to consumers also offer benefits because farmers can reduce their dependence on middlemen and shorten the distribution chain in Puroo Village.

Although rice productivity in Puroo Village is quite good, there are still many factors that affect farmers' income, ranging from land area, selling prices, production, and production costs. To encourage a more significant increase in income, a comprehensive approach is needed—not only from the production side but also from the post-harvest, distribution, and institutional aspects of farmers in Puroo Village. Rice production in Puroo Village involves factors that can pose challenges for farmers in agricultural development, particularly in managing irrigated rice farming operations.

Rice production in Puroo Village is actually quite substantial, but due to limited land availability, yields have not yet reached their full potential. Production costs in Puroo Village are relatively high; farmers in this village must incur significant expenses to cultivate irrigated rice fields—including costs for seeds, fertilizers, pesticides, and labor—yet the harvest yields do not yet match these expenditures.

Farm income is an indicator used to measure the success and well-being of a community based on various combinations of factors of production used during a given period of farming activity, thereby reflecting the community's economic progress. This income is used by the community to meet their household needs (Kahir, 2021).

Based on the background described above, the objective of this study is to analyze the effects of land area, selling price, crop yield, and production costs on the income of paddy farmers in Puroo Village, Lindu Subdistrict, Sigi Regency.

RESEARCH METHOD

This study employs a quantitative research design. Quantitative methods can be defined as research methods grounded in the philosophy of positivism, used to study a specific population or sample, involving data collection through research instruments and

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quantitative/statistical data analysis, with the aim of describing and testing established hypotheses (Sugiyono, 2022). Quantitative research was chosen because its primary focus is to measure the extent to which certain variables—such as land area, selling price, rice yield, seed costs, fertilizer costs, pesticide costs, and labor costs—affect the income farmers derive from irrigated rice farming. In this context, the collected data is numerical and will be analyzed statistically to obtain objective and measurable results.

This study was conducted in Puroo Village, Lindu Subdistrict, Sigi Regency. The study location was selected purposefully, given that Puroo Village is one of the rice-growing areas in Lindu Subdistrict, Sigi Regency. The study was conducted from January 2026 to March 2026.

Respondents for this study were selected using purposive sampling, a technique in which the sample is deliberately selected based on specific, predefined criteria. This method was chosen because not all individuals in the population have a direct connection to the research or the ability to provide the information needed to address the study's focus. By using this technique, the researcher can select respondents who are actually engaged in irrigated rice farming, ensuring that the data collected is more relevant, accurate, and aligned with the study's objectives. Furthermore, the application of this method makes the sampling process more targeted and avoids the inclusion of parties outside the scope of the research, which could compromise the quality of the analysis. Based on the established criteria, 39 respondents were selected from the total population of 273 irrigated rice farmers.

The analytical method used in this study was multiple linear regression analysis using the SPSS (Statistical Product and Service Solutions) software. Multiple linear regression analysis was used to determine the effect of independent variables (land area, selling price, production yield, and production costs—comprising seed costs, fertilizer costs, pesticide costs, and labor costs) on the dependent variable (income). The multiple regression equation is as follows:

$$Y = b0 + b1X1 + b2X2 + b3X3 + b4X4 + e$$

RESULTS AND DISCUSSION

Overview of the Study Site.

Puroo Village is one of the villages in Lindu Subdistrict, Sigi Regency. Puroo Village is located on the Lindu Plain, which is situated in a mountainous region surrounding Lake Lindu. This area is part of the Lore Lindu National Park conservation zone. Geographically, Puroo Village is part of a group of villages surrounding Lake Lindu.

Puroo Village is one of the villages located in Lindu Subdistrict, Sigi Regency, Central

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Sulawesi Province. Geographically, this village is situated in the Lindu highlands, surrounded by mountains and featuring an environment that remains relatively pristine. The Lindu Subdistrict is known for its landscape of valleys, hills, and extensive forest areas. Due to this topography, most of Puroo Village has a very cool climate and relatively high rainfall, which greatly supports the community's agricultural activities. Land use in this village is generally divided into several categories: residential land, rice paddies, plantations, and forest areas. Furthermore, agriculture is one of the primary sources of livelihood for the people of Puroo Village. The village's rice paddies cover an area of approximately 300 hectares, most of which are used by the local community for rice cultivation.

Most of the residents of Puroo Village are farmers who cultivate food crops and work on plantations. In addition to farm laborers, some residents of Puroo Village work as healthcare professionals, teachers, and self-employed individuals (merchants, construction workers, and carpenters). In addition to rice, the commodities cultivated by residents of Puroo Village, Lindu Subdistrict, Sigi Regency, include coffee, cocoa, cloves, and others.

Respondent Characteristics

A person's age can affect their physical and mental work capacity and performance. The more physically demanding the work, the more a worker's performance declines as they age. The following table shows the population of Puroo Village by age group.

Table 1. Population by Age Group in Puroo Village, Lindu Subdistrict, Sigi Regency, 2026

No	Age (Years)	Number (people)	Percentage (%)
1	34-43	18	46,2
2	44-53	12	30,8
3	54-64	9	23,0
	Total	39	100

Source : Processed primary data, 2026

Based on Table 1, it is known that all 39 respondents were aged 34–64 years, falling within the productive age group for farming. The 18 respondents (46.2%) in the 34–43 age group fall into the high-productivity category, with optimal physical condition and the ability to carry out all

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farming activities. The 44–53 age group, consisting of 12 people (30.8%), falls into the mediumproductivity category; while their physical strength has begun to decline, it remains adequate, supported by more mature experience. The 54–64 age group, consisting of 9 people (23.0%), falls into the low-productivity category, where physical strength has declined but they are still able to perform light work and provide guidance based on their experience. Overall, this age structure indicates a fairly balanced labor supply to support rice farming in Puroo Village. Farmers of productive age tend to earn higher incomes compared to younger and older farmers. The productive age group offers an optimal combination of physical capacity, experience, and managerial skills.

Education is one of the key factors in enhancing critical thinking skills, fostering creativity, and improving a person's speech and behavior. Education also influences the maturity of one's thinking when it comes to accepting new information and technology. Education enables individuals to act rationally and professionally when making decisions and managing their lives. However, there are still some segments of society that are not yet aware of the importance of education. Table 2 shows the classification of respondents' educational levels in Puroo Village.

Table 2. Characteristics of Respondents by Educational Level in Puroo Village, 2026

NO	Education Level	Respondents (people)	Percentage (%)
1	Elementary School	12	30.8
2	Junior High School	5	12.8
3	High School/Vocation High School	22	56.4
	Total	39	100

Source : Processed primary data, 2026

Table 2 shows that the percentage of farmers whose highest level of education was elementary school was 12 people (30.8%), junior high school was 5 people (12.8%), and senior high school or vocational high school was 22 people (56.4%). Education enhances an individual's ability to understand information, process knowledge, and make more rational decisions. Farmers with higher levels of education tend to be more receptive to and better able to implement

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innovations, such as the use of high-yielding varieties, balanced fertilization, and modern agricultural technologies. This leads to increased productivity and business efficiency, which ultimately can boost income.

Farming experience is one of the determining factors for the success of a farming business. Extensive experience reduces the risk of mistakes that can occur in farming because decisions or actions taken are well-planned. Farming experience is closely related to the age of the respondents. Generally, the older the respondents are, the longer their experience in farming. The level of experience among rice farmers in Puroo Village, Lindu Subdistrict, Sigi Regency is shown in Table 3.

Table 3. Characteristics of Respondents Based on Their Experience in Rice Farming in Puroo Village, 2026

No	Level of Farming Experience (Years)	Number (people)	Percentage (%)
1	3-9	3	7.7
2	10-23	22	56,4
3	24-44	14	35,9
	Total	39	100

Source : Processed primary data, 2026

Based on the table above, most farmers have moderate farming experience—22 people, or 56.4%, with 10–23 years of experience. This group has a good understanding of cropping patterns, pest and disease control, and land management. Next, the highly experienced group consists of 14 farmers, or 35.9%, with 24–44 years of experience; they possess the insight and maturity to anticipate agricultural risks. Meanwhile, the group with low experience comprises only 3 farmers, or 7.7%, with 3–9 years of experience, who are still in the process of learning to apply good farming practices. Farmers who have long cultivated paddy rice typically have a better understanding of agroecosystem conditions, such as seasonal patterns, soil characteristics, and methods for managing pests and diseases. This understanding enables them to take more appropriate actions during the production process, thereby increasing crop yields and, ultimately, their income.

The number of dependents in a household is one of the factors that determines whether the head of the household's daily expenses are high or low. The more family members there are,

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the more income is spent on daily living expenses. For more details on the number of dependents among the rice farmers surveyed, see Table 4.

Table 4. Characteristics of Respondents by Number of Family Dependents in Puroo Village, 2026

No	Number of Family Dependents	Number (people)	Percentage (%)
1	1-2	6	15.4
2	3-4	27	69.2
3	5-6	6	15.4
	Total	39	100

Source : Processed primary data, 2026

Table 4 shows the characteristics of respondents based on the number of family dependents in Puroo Village in 2026. The data reveals that the majority of respondents have 3–4 family dependents, totaling 27 people, or 69.2% of all respondents. Meanwhile, the number of respondents with 1–2 dependents and 5–6 dependents was the same, at 6 people each, or 15.4%. Overall, the number of respondents in this study was 39 people, representing 100% of the sample. This indicates that the majority of families in the study area have a family size in the medium range, namely 3 to 4 people per family.

Family dependents are defined as household members who do not yet have their own income and are entirely dependent on the income of the head of the household or the primary breadwinner. The greater the number of dependents in a family, the greater the burden of meeting basic needs such as food, clothing, shelter, education, health care, and other necessities of life. This is in line with Maulana's (2023) view, who states that the number of dependents is one of the determining factors in the allocation of family income; the more family members there are to support, the larger the portion of expenditures that must be allocated, which can ultimately affect the family's savings rate and ability to improve its standard of living.

Farm Management Characteristics

Based on data obtained from interviews and direct observations with rice farmers (respondents), the characteristics of farm management include land area, selling price, production yield, production costs, and income.

Land Area

Land area plays a significant role in agricultural production. For more details on the land

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area of the rice farmers who served as respondents, see Table 5.

Table 5. Characteristics of Respondents Based on Land Area in Puroo Village, Lindu Subdistrict, Sigi Regency, 2026

N o	Land Area	Number (people)	Percentage (%)
1	0,50-0,99	34	87,18
2	1,00-1,49	3	7,69
3	1,50-2,00	2	5,13
	Total	39	100

Source : Processed primary data, 2026

Table 5 shows that the land area cultivated by paddy farmers in Puroo Village falls into three categories. The majority of respondents—34 people, or 87.18%—manage plots ranging in size from 0.50 to 0.99 hectares. Furthermore, there were 3 respondents, or 7.69%, who owned land ranging from 1.00 to 1.49 hectares, while the remaining 2 respondents, or 5.13%, cultivated land ranging from 1.50 to 2.00 hectares. These results indicate that, in general, farmers in the study area fall into the category of small to medium-sized landholdings.

Land area is one of the factors of production that significantly influences the volume of production and farm income. The larger the area of land owned and managed optimally, the greater the potential crop yield that can be achieved. Although most farmers own less than 1 hectare of land, with good management and the appropriate use of production inputs, land productivity can still be increased to support higher farmer income. This is consistent with the view of Arianty (2020), who states that land area makes a significant contribution to agricultural output; the larger the area of land used, the higher the potential for production.

Selling Price

Table 6. Characteristics of Respondents Based on the Selling Price of Rice in Puroo Village, Lindu Subdistrict, Sigi Regency, 2026

N o	Selling Price (Rp/kg)	Number (people)	Percentag e (%)
1	8.000- 9.000	1	2.56
2	9.000 -10.000	13	33,33
3	10.000 – 12.500	25	64,10
	Total	39	100

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E-ISSN : 2963 4954
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Table 6 shows that the selling prices of rice received by farmers in Puroo Village fall into three price ranges. The majority of respondents—25 people, or 64.10%—sold their rice at prices ranging from Rp11,000 to Rp12,000 per kilogram. Furthermore, 13 respondents, or 33.33%, sold their rice at prices between Rp9,000and Rp11,000 per kilogram, while the remaining one person, or 2.56%, received the lowest selling price, which fell within the range of Rp8,000 to Rp9,000 per kilogram. The differences in the selling prices received by each farmer are influenced by several factors, such as the quality of the rice produced, marketing methods, and transactional relationships with buyers. Most farmers are able to sell at higher prices because the rice they produce is of good quality and is sold directly to consumers or retailers without going through intermediaries. Conversely, lower selling prices typically occur when farmers sell their harvest to middlemen or collectors, in which case the price is determined by the buyer and is often lower as compensation for capital loans provided earlier.

The selling price is one of the key factors in determining the level of farmers' income. The higher the selling price received by farmers, the greater their total revenue, assuming production levels remain constant. This is consistent with the view of Kotler and Armstrong (2012), who state that price has a direct impact on a business's profit margin; an increase in the selling price will boost income as long as it is not offset by an excessive rise in production costs.

Production Output

Production can broadly be defined as the processing of raw materials into semi-finished or finished goods. Production refers to the activity of generating a certain amount of output. For further details, see Table 7.

Table 7. Characteristics of Respondents Based on Production Output in Puroo Village, Lindu Subdistrict, Sigi Regency, 2026

N o	Production Output (kg)	Number (people)	Percentage (%)
1	350 – 1,549	36	92,31
2	1,550 – 2,749	1	2,56
3	2,750 – 4,000	2	5,13
	Total	39	100

Source : Processed primary data, 2026

Based on Table 7, which shows the characteristics of respondents by production output in

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Puroo Village, Lindu Subdistrict, Sigi Regency, in 2026, it was found that of the total 39 respondents, the majority—36 people, or 92.31%—had a low production output of 350–1,549 kg. One respondent, or 2.56%, fell into the 1,550–2,749 kg production output group, while the remaining two respondents, or 5.13%, achieved the highest production output in the 2,750–4,000 kg range. This indicates that, in general, the production levels achieved by business operators in the study area are still predominantly at a relatively low scale. This situation may be influenced by various factors, such as the availability of business capital, limited production facilities and infrastructure, and relatively simple business management practices, resulting in only a small proportion of respondents being able to achieve higher production volumes.

Production Costs

Production costs refer to all expenditures necessary to achieve the expected outcomes in agricultural production. For further details on production costs, see Table 8.

Table 8. Characteristics of Respondents Based on Average Production Costs in Puroo Village, Lindu Subdistrict, Sigi Regency, 2026

N o	Production Costs	Average (Rp/MT)	Percentage (%)
1	Fixed Costs	124.896	7,93
2	Variable Costs	1.452.948	92,07
	Total Costs	1.577.844	100

Source : Processed primary data, 2026

Based on Table 8 regarding average production costs in Puroo Village, Lindu Subdistrict, Sigi Regency, in 2026, it was found that, overall, the average total production costs incurred by respondents amounted to Rp1,577,844 per metric ton. The breakdown shows that fixed costs averaged Rp124,896 per metric ton, equivalent to 7.93% of total production costs, while variable costs constituted the largest component, averaging Rp1,452,948 per metric ton—accounting for 92.07% of total expenses. This indicates that in the business operations, expenditures are predominantly dominated by costs that vary with production volume—such as the purchase of raw materials, direct labor, and other operational needs—while costs that remain relatively constant regardless of production volume account for a much smaller portion.

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E-ISSN : 2963 4954
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Income

Income refers to the total earnings derived from work, and an individual's income is generally calculated on a monthly or annual basis. For further details on the respondents' income, see Table 9.

Table 9. Average Income of Respondents in Puroo Village, Lindu Subdistrict, Sigi Regency,2026

N o	Revenue (Rp)	Total Costs (Rp)	NetIncome (Rp)	Percentage (%)
1	10.121.538	2.291.025	6.769.923	100

Source : Processed primary data, 2026

Based on Table 9, it is evident that farmers' average income was Rp 10,121,538, with total production costs amounting to Rp 2,291,025; thus, their average net income reached Rp 6,769,923 per growing season. Stable and adequate income is a key factor in improving farmers' well-being, particularly in the face of price and production cost fluctuations in the agricultural sector. Well-being can be achieved when farmers' income is sufficient to meet

In line with this, research by Maulana and Rofiuddin (2023) found that income has a direct impact on farmers' welfare levels, whereby an increase in income enhances households' ability to meet daily living needs, thereby improving their welfare status. Based on this, income is a key factor in determining farmers' socioeconomic conditions.

Multiple Linear Regression Test

To assess whether a multiple linear regression model is suitable for describing the relationship between one dependent variable (Y) and more than one independent variable (X), a multiple linear regression analysis is conducted. To determine the relationship between Production Costs (X1), Production Output (X2), Selling Price (X3), and Land Area (X4) as independent variables and Income as the dependent variable (Y).

Table 10. Multiple Linear Regression Test Coefficients[a]

		Unstandardized Coefficients		Standardized Coefficients		
Model		**B**	**Std. Error**	**Beta**	**t**	**Sig.**
1	**(Constant)**	**2.935**	**16.215**		**.179**	**.859**
	Production Costs	**-.489**	**.224**	**.319**	**2.179**	**.034**

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	Production Output	.461	.159	.439	2.904	.006
	Selling Price	.213	.039	.592	3.833	.000
	Land Area	.539	.217	.363	2.478	.017

The results of the multiple linear regression analysis yielded a constant of 2.935, with production costs (X1) at -0.489, production output (X2) at 0.461, selling price (X3) at 0.213, and land area (X4) at 0.539. This yields the following linear equation:

Y = 2.935 + 0.489X1 + 0.461X2 + 0.213X3 + 0.539X4 + e

Partial Test (t-Test) Table 17. t-Test (Partial) Coefficients[a]

Unstandardize d Coefficients				Standardized Coefficients		
Model		B	Std. Error	Beta	T	Sig.
1	(Constant)	2.935	16.215		.179	.859
	Production Costs	-.489	.224	.319	2.179	.034
	Production Output	.461	.159	.439	2.904	.006
	Selling Price	.213	.039	.592	3.833	.037
Land Area		.539	.217	.363	2.478	.017

The method for determining the t-table value uses a significance level of 5%, with df = n - k - 1 (in this study, df = 39 - 4 - 1 = 34), resulting in a t-table value of 2.032.

Notes:

n = sample size

k = number of independent variables

The significance value for the Production Cost variable (X1) is 0.034 < 0.05. Furthermore, the calculated t-value is greater than the critical t-value, specifically 2.179 > 2.032. This indicates that the Production Cost variable has a significant and partial effect on the Revenue variable. Therefore, Ha is accepted and H0 is rejected. The significance value for the Production Output variable (X2) is 0.006 < 0.05. Furthermore, the calculated t-value is greater than the critical

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tvalue, specifically 2.904 > 2.032. This indicates that the Production Output variable has a significant and partial effect on

Simultaneous Test (F-Test) Table 18. F-Test

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	3.551	4	.888	4.914	.003 b
	Residual	6.142	34	.181		
	Total	9.692	38			

The method for determining the F-table value uses the following values: df1 = 4; df3 = n – k – 1 = 39 – 3 – 1 = 34, resulting in an F-table value of 2.65. Based on the table, the significance value is 0.003 < 0.05, and the calculated F-value is 4.914. Since the calculated F-value is greater than the table F-value (4.914 > 2.65), this indicates that the alternative hypothesis (Ha) is accepted and the null hypothesis (H0) is rejected, therefore, it can be concluded that production costs, production output, selling price, and land area collectively (simultaneously) influence the income of paddy farmers in Puroo Village, Lindu Subdistrict, Regency.

The Effect of Production Costs on the Income of Paddy Farmers in Puroo Village, Lindu Subdistrict, Sigi Regency.

Production costs are expenses related to the manufacture of goods and the provision of services. Production costs can be categorized as direct production costs, labor costs, and factory overhead costs. Production and production costs are like two sides of the same coin. While production refers to the physical use of production factors, costs measure this in monetary terms. In this context, it is intended that the value of production output must exceed the costs incurred, and within that ratio, costs are expected to be minimized. Rising costs are not always bad, as long as the increase in costs leads to a greater increase in production (Slamet & Sumarli, 2002).

The costs required to transform raw materials into market-ready products are called production costs. Production costs are the total expenses incurred by farmers to produce rice, including the costs of seeds, fertilizers, pesticides, labor, and other operational expenses. High production costs will reduce farmers' income, even if production levels remain stable.

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The distribution of respondents is based on farmers' production costs, specifically the costs of fertilizer and land preparation, seedling costs, and labor costs incurred by farmers to increase their yields. The average cost incurred by each respondent was 1,577,844 Rp.

Production costs have a significant effect (0.034 < 0.05) on changes in rice farmers' income; a substantial increase in income must be accompanied by corresponding production costs. Based on the results of the t-test analysis conducted on the data, the production cost variable (X1) was found to influence the income of paddy farmers in Puroo Village, Lindu Subdistrict, Sigi Regency. This indicates that farmers' income is directly influenced by changes in production costs. If production costs are not controlled, farmers' profits will decline.

These findings are consistent with a study conducted by Yani (2022) titled "The Effect of Production Costs on the Income of Paddy Farmers (Oryza sativa L) in Gebang Subdistrict, Langkat Regency," which found that production cost factors such as labor, fertilizer, and pesticides have a significant effect on farmers' income.

The Effect of Production Output on the Income of Paddy Farmers in Puroo Village, Lindu Subdistrict, Sigi Regency.

Rice production refers to the total yield obtained by farmers from the production process. The higher the production volume, the greater the farmers' potential income, provided that prices and production costs remain stable. However, it should be noted that an increase in production does not always correlate directly with an increase in income due to several other influencing factors.

The distribution of respondents based on production output per harvest shows that the highest number—30 people—produced between 500 kg and 1 metric ton of rice. This indicates that farmers' welfare remains low, as their average income is only around 500 kg to 1 metric ton; this low income is caused by weather conditions and pests that attack the rice in the fields. Yield is what farmers look forward to most; they hope for increased yields with each harvest. When rice yields are maximized, farmers' income will also be maximized—in other words, farmers will earn substantial profits.

Based on the results of the t-test analysis conducted on the data, the production yield variable (X2) was found to influence the income of paddy farmers in Puroo Village, Lindu Subdistrict, Sigi Regency. This indicates that rice production yields are related to farmers' income. This aligns with production theory, which states that high production volumes, if managed properly, will increase farmers' income.

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The results of this study are consistent with research conducted by Safiah (2021) titled "The Effect of Rice Production Volume on Farmers' Income (RW 12 Gembira, Sanglar Village, Reteh Subdistrict)." That study found a significant effect of rice production volume on farmers' income, with a significance value of 0.000 < 0.05. If the price With a stable market, an overall increase in production will boost farmers' income. (Mulyanto, 2020).

The Effect of Farm Size on the Income of Rice Farmers in Puroo Village, Lindu Subdistrict, Sigi Regency.

In theory, land area has a significant impact on agricultural production. The smaller the area of land managed, the lower the yield tends to be. Conversely, the larger the area of land cultivated, the higher the yield produced. This production volume directly affects farmers' income. If production increases, the income received will also be higher, while low production will result in lower income (Mubarok, 2023).

Based on the results of the t-test analysis conducted on the data, the land area variable (X4) was found to influence the income of paddy farmers in Puroo Village, Lindu Subdistrict, Sigi Regency.

Land area had a significant effect (p=0.017 < 0.05) and was positively correlated with farmers' income. Based on the study, it was found that the land area most commonly used by rice farmers in Lindu Subdistrict is the 0.5–1 ha range, with 30 farmers (76.9%) in this category, while the smallest land area category (>1 ha) includes 3 farmers (7.7%).

This indicates that, on average, farmers use a sufficiently large area of land for rice production. With the land area they own, they can achieve maximum production yields. The regression coefficient for land area, at 0.539, indicates that every 1 percent increase in land area results in a 0.53% increase in rice farmers' income. The relationship between land area and income is positive (+), meaning that an increase in land area leads to an increase in rice farmers' income. Thus, the larger the rice field area, the greater the production output.

The Effect of Production Costs, Production Output, Selling Price, and Land Area on the Income of Paddy Farmers in Puroo Village, Lindu Subdistrict, Sigi Regency.

Based on the results of the F-test analysis conducted on the data, the F-test value was 0.003 < 0.05, indicating that the variables production costs (X1), production yield (X2), Selling Price (X3), and Land Area (X4) have an effect on the income of paddy farmers in Puroo Village, Lindu Subdistrict, Sigi Regency. This indicates that these four factors collectively make a significant

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contribution to farmers' income. Therefore, it can be concluded that simultaneously controlling production costs, increasing production yield and selling price, and expanding land area will optimally increase farmers' income.

The results of this study are consistent with those of a previous study (Sitti & Hasriani, 2019), which found that the effect of the capital variable on farmers' income levels is positive. The variables of land area (X1), selling price (X2), production yield (X3), and production costs (X4) simultaneously have a significant and positive effect on the income levels of rice farmers in Botto Benteng Village, Majauleng Subdistrict, Wajo Regency.

CONCLUSION

Based on the results of the study conducted in Puroo Village, Lindu Subdistrict, Sigi Regency, it can be concluded that land area, selling price, production yield, and production costs—both collectively and individually—have a significant effect on the income of paddy farmers. Land area, selling price, and production yield have a positive effect; an increase in these three factors will lead to higher income for farmers. Conversely, production costs have a negative effect, meaning that any increase in costs not offset by management efficiency will reduce profit margins. Collectively, these four variables account for 85.6% of the variation in farmers' income, while the remaining 14.4% is influenced by other factors not discussed in this study.

FUTURE DIRECTIONS

Based on the research findings, it is recommended that paddy farmers in Puroo Village continue to optimize the use of their land and implement good and appropriate farming practices to increase production yields. In addition, farmers need to be more careful in managing production costs to remain efficient, so that any increase in costs does not reduce their profit margins. Given that selling prices also have a positive impact, farmers should be more proactive in seeking out the latest market price information so they can sell their harvest at profitable prices. The government and relevant agencies are encouraged to provide support in the form of agricultural extension services, access to capital, and transparent price information to help improve farmers' income and well-being in the region. For future researchers, it is recommended to investigate other factors not covered in this study to provide a more comprehensive picture of the factors influencing the income of irrigated rice farmers in the regio

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