ANALYSIS OF FACTORS INFLUENCING INCOME FROM RICE (Oryza Sativa L.) FARMING IN PANGARIBUAN DISTRICT, NORTH TAPANULI DISTRICT, NORTH SUMATRA PROVINCE

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Abstract

Rice farming income is the difference between revenue and all costs of rice farming. This study aims to identify and analyze the factors that influence the income of lowland rice farming in Pangaribuan District, North Tapanuli Regency, North Sumatra Province. The type of research used in this research is quantitative research. The population used in this study were lowland rice farmers in Pangaribuan District, North Tapanuli Regency, North Sumatra Province with a total sample of 80 lowland rice farmers. The data analysis method used is multiple linear regression analysis. The results of the research show that the real income received by rice farmers in Pangaribuan District, North Tapanuli Regency tends to increase with an average income of around Rp. 35,230,000/year. The average income received is IDR 20,100,000 – IDR 30,000,000 per harvest, the average land area is 0.5-0.7 per hectare, the average selling price is IDR 10,000. – IDR 11,000 per harvest, average capital IDR 10,100,000 – IDR 15,000,000 per production, average labor 1-3 people, use of fertilizer using urea fertilizer and average production costs IDR 3,100,000. – Rp. 5,000,000 per production. Partially, land area, selling price, production results, capital, labor, fertilizer and production costs have a significant effect on the income of lowland rice farming in Pangaribuan District, North Tapanuli Regency, North Sumatra Province. Simultaneously, land area, selling price, production results, capital, labor, fertilizer and production costs have a significantly significant effect on the income of lowland rice farming in Pangaribuan District, North Tapanuli Regency, North Sumatra Province..

Keywords: *Production, Income, Rice, Rice Fields*

1. INTRODUCTION

Agriculture is a strategic sector as well as the sector that absorbs the most labor and is rural-based because most of the population lives in rural areas and earns their living as farmers. Agricultural development, especially food crops, aims to increase production and expand the diversity of agricultural products (Fitri & Sari, 2018). Rice is the main food source that can support national food security (Sumini et al., 2019). Rice is an important crop for Indonesian people because rice produces rice which is the staple food for most Indonesian people. Therefore, rice is the main pillar in national food security (Keukama et al in Saragih & Panjaitan, 2020). Lowland rice farming is a source of income for farmers, the results of lowland rice farming are expected to provide welfare for farmers (Nurjanah & Fahrial, 2020). North Tapanuli Regency is one of the regencies that has excellent agricultural potential, one of which is Pangaribuan District. Pangaribuan District is one of the sub-districts that uses lowland rice as the main income where most of the population makes a living as lowland rice farmers. The productivity of lowland rice farming in Pangaribuan District can be influenced by production factors so that it can influence the amount of productivity produced including harvest area, production amount and average production which has an impact on increasing family income. The following is the harvest area, production and average rice production in Pangaribuan District.

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Table 1.1 Harvested Area, Production and Average Production of Lowland Rice Crops According to Pangaribuan District (2017-2021)

Year	Harvest Area (Ha)	Production (Tons)	Average Production (Kw/Ha)
2017	2,254.00	12,767.06	56.68
2018	2,254.00	12,767.06	56.68
2019	2,478.4	14,686.99	59.26
2020	2,125.1	10,542.62	49.61
2021	2,125.1	10,542.62	49.61

Source: North Tapanuli Regency Agriculture and Plantation Service, 2021

Based on Table 1.1, it shows that the amount of rice production in Pangaribuan District tends to fluctuate but decreases in 2020-2021 where it only reached 10,542.62 tons, whereas in 2019 the amount of lowland rice production reached 14,686.99 tons with an average production of 59.26 tons. Kw/Ha. The decline in production levels in 2017-2021 shows that there are problems faced by lowland rice farmers. The results of a pre-survey conducted on lowland rice farmers show that farmers have problems, namely lack of capital and production costs so that lowland rice management is less effective. The problem of lack of capital experienced by rice farmers in Pangaribuan District can be influenced by increasingly high production costs so that farmers cannot calculate optimal fixed costs, thus causing the capital used by farmers to be limited due to high production costs, especially prices. Fertilizers and land maintenance can reduce farmers' income levels.

Another problem experienced by lowland rice farmers in Pangaribuan District is the level of selling prices received by farmers. Market prices which tend to fluctuate can affect farmers' income levels, if the selling price received by farmers decreases with production costs increasing, especially land maintenance costs incurred by farmers, of course it can reduce the income level of lowland rice farmers in Pangaribuan District. Lowland rice farmers in Pangaribuan District also experience problems just before harvest, where the production results do not match the farmers' estimates. This can be caused by extreme weather changes and attacks by disease or pests so that lowland rice farmers need fertilizer or pesticides of superior quality so that it often happens that farmers' income is not commensurate with the harvest they receive.

2. IMPLEMENTATION METHOD

The research was conducted in Pangaribuan District, North Tapanuli Regency, North Sumatra Province. This research took the location of 7 villages considering the size of their rice fields, namely: Parlombuan Village, Pangaribuan District, Pacur Natolu Village, Pangaribuan District, Silatom Julu Village, Pangaribuan District, Batunadua Village, Pangaribuan District, Batu Manumpak Village, Pangaribuan District, Najumambe Village, Pangaribuan District, Sigotom Village Pangaribuan District with a population of 357 farmers. The sampling method used in this research was simple random sampling using the Slovin formula with an error rate of 10% so that the total sample was 80 farmers. To see the influence of the independent variable on the dependent variable in this research, multiple linear regression is used with the following mathematical model:

$$Y= a+b_1X_1+b_2X_2+ b_3X_3+b_4X_4+ b_5X_5+b_6X_6+ b_7X_7 \ldots.+b_nX_n$$

Y   = Income (Rp/harvest)
a   = Constant (Y value if X_1, X_2….X_n=0)
b   = Regression coefficient (value of increase or decrease)
X_1 = Land area (Ha)
X_2 = Selling price (Rp/harvest)
X_3 = Production yield (Kg/harvest)
X_4 = Capital (Rp/production)

X5   = Labor (People/production)
X6   = Fertilizer (Type of Fertilizer/ production)
X7   = Production costs (Rp/production)

3. RESULTS AND DISCUSSION

Multiple linear regression analysis in this research aims to determine the direction and influence of the independent variable on the dependent variable. The results of the multiple linear regression analysis test can be seen in the table below:

Table 1. Factors that influence the level of income from rice farming

	Variable	Parameter	Coefficient		Prob.	
	Constant	b0		0.541	,455	NS
X1	Land area	b1		0.088	,045	*
X2	Selling price	b2		-0.210	,006	*
X3	Production	b3		1,156	,000	*
X4	Capital	b4		-0.489	,000	*
X5	Labor	b5		0.325	,000	*
X6	Fertilizer	b6		-0.62	,000	*
X7	Production cost	b7		0.793	,000	*

R-Squared   = 0.976
Adj R-Squared = 0.974
F-Hit   = 423,787
Prob (F-Hit)   = 0.000

Information	*	Significant at $\alpha = 0.05$
	NS	Not significant

The results of the coefficient of determination test in this study obtained an R-squared value of 0.974. This shows that the variables land area, selling price, production results, capital, labor, fertilizer and production costs have an influence on income of 97.4%, while the remaining 2.6% is influenced by other variables not examined in this research. . Simultaneous test results with a significance value smaller than 0.05 (0.000 < 0.05). So it can be concluded that land area, selling price, production results, capital, labor, fertilizer and production costs together influence the income of lowland rice farming in Pangaribuan District, North Tapanuli Regency, North Sumatra Province. The following is an explanation of the variables that influence rice farming income.

a.   Land area

The significance value of the land area variable is 0.045, which is smaller than 0.05, so it can be concluded that the land area variable has a positive effect on lowland rice farming income. The highest average land area (Ha) of lowland rice farmers in Pangaribuan District, North Tapanuli Regency, North Sumatra Province is 0.5 Ha-0.7 Ha with 35 farmers. Meanwhile, the lowest average land area for rice farmers in Pangaribuan District, North Tapanuli Regency, North Sumatra Province is 0.8-1 Ha with 18 farmers. This is because the larger the area of land owned by lowland rice farmers, the greater the amount of rice production produced so that the quantity of rice produced will be greater so that the harvest will increase and this will affect the income generated by lowland rice farmers in Pangaribuan District, North Tapanuli Regency, North Sumatra Province. The results of this research are supported by the results of research conducted by Nugraha & Maria (2021) which states that land area has a positive and significant effect on rice farmers' income.

b.   Selling price

The significance value of 0.006 is smaller than 0.05, so it can be concluded that the selling price variable has a negative effect on rice farming income. The highest average selling price (Rp/harvest) for lowland rice farmers in Pangaribuan District, North Tapanuli Regency, North Sumatra Province is IDR 10,000 – IDR 11,000 for 65 farmers, while the lowest average selling price for lowland rice farmers is in Pangaribuan District, North Tapanuli Regency North Sumatra Province received a selling price of IDR 11,100 – IDR 12,000 for 15 farmers. The lower the selling

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price offered by farmers, the lower the level of income generated by lowland rice farmers, and vice versa, if the selling price offered is higher in accordance with the quality produced, the income of lowland rice farmers in Pangaribuan District will further increase. North Tapanuli Regency, North Sumatra Province. The results of this research support the results of research conducted by Rina Aprilia (2022) which states that selling prices have a partial and significant negative effect on the income of salt farmers in Lam Ujong Village, Baitussalam District, Aceh Besar Regency.

c. Production

The significance value of 0.000 is smaller than 0.05, so it can be concluded that the production yield variable has a positive effect on rice farming income. The highest average production yield (Kg/harvest) of lowland rice farmers in Pangaribuan District, North Tapanuli Regency, North Sumatra Province is 5,100 Kg - 10,000 Kg for 41 farmers, while the lowest average production yield of lowland rice farmers is in Pangaribuan District, North Tapanuli Regency, Sumatra Province North received a selling price of 10,100kg – 15,000kg from 10 farmers. The higher the production yields produced by farmers, the higher the income generated by farmers, and vice versa, if the production yields decrease, the income level of lowland rice farmers in Pangaribuan District, North Tapanuli Regency, North Sumatra Province. will also decrease. The results of this research are supported by the results of research conducted by Pradnyawati & Cipta (2021) which states that the amount of production has a positive and significant effect on income.

d. Capital

The significance value of 0.000 is smaller than 0.05, so it can be concluded that the capital variable has a negative effect on rice farming income. The highest average capital (Rp/production) for lowland rice farmers in Pangaribuan District, North Tapanuli Regency, North Sumatra Province is Rp. 10,100,000- Rp. 15,000,000 as many as 38 farmers, while the lowest average capital (Rp/production) for lowland rice farmers in Pangaribuan District, North Tapanuli Regency, North Sumatra Province received capital of >Rp. 20,000,000 as many as 7 farmers. capital has a negative effect on income, this shows that if the greater the capital spent by lowland rice farmers, it will reduce the level of income generated, but if the working capital owned by farmers is run effectively and efficiently, including seeds, fertilizers and pesticides, it will be able to increase the income earned by lowland rice farmers in Pangaribuan District, North Tapanuli Regency, North Sumatra Province. The results of this research support the results of research conducted by Ambarwati et al., (2022) which states that capital has a significant effect on farmer income with a negative relationship.

e. Labor

The significance value of 0.000 is smaller than 0.05, so it can be concluded that the labor variable has a positive effect on rice farming income. The highest average workforce (people/production) of lowland rice farmers in Pangaribuan District, North Tapanuli Regency, North Sumatra Province is 1-3 people totaling 40 farmers, while the lowest average workforce (People/production) of lowland rice farmers is in Pangaribuan District, Regency North Tapanuli, North Sumatra Province has a workforce of >5 people as many as 12 farmers. labor has a positive effect on farmers' income, so that the higher the amount and more efficient the level of labor used by rice farmers, the more output will be produced in the production process and increase the productivity produced by rice farmers and can increase the level of income received by lowland rice farmers in Pangaribuan District, North Tapanuli Regency, North Sumatra Province. The results of this research are supported by the results of research conducted by Pradnyawati & Cipta (2021) which states that labor has a positive effect on rice farming income.

f. Fertilizer

The significance value of 0.000 is smaller than 0.05, so it can be concluded that the fertilizer variable has a negative effect on rice farming income. The highest average fertilizer (type/production) for lowland rice farmers in Pangaribuan District, North Tapanuli Regency, North Sumatra Province uses urea fertilizer as many as 42 farmers. Meanwhile, the lowest average of lowland rice farmers in Pangaribuan District, North Tapanuli Regency, North Sumatra Province using NKP type fertilizer is 2 farmers. The results of this research show that the more optimal the use of fertilizer and the more efficient the level of fertilizer use, such as the type of fertilizer used,

the dosage and the correct method used, it can increase farmers' productivity activities so that the level of production produced will increase and influence the level of income generated by farmers. rice fields in Pangaribuan District, North Tapanuli Regency, North Sumatra Province. Fertilizer is linked to rice production, if the cost of fertilizer becomes more expensive then farmers will reduce the use of fertilizer which will result in rice production decreasing. If rice production decreases, farmers' income will also decrease (Busyra, 2022).

g.   Production cost

The significance value of 0.000 is smaller than 0.05, so it can be concluded that the production cost variable has a positive effect on rice farming income. The highest average production costs (Rp/production) for lowland rice farmers in Pangaribuan District, North Tapanuli Regency, North Sumatra Province incur production costs of IDR 3,100,000 – IDR 5,000,000 for 35 farmers. Meanwhile, the lowest average for lowland rice farmers in Pangaribuan District, North Tapanuli Regency, North Sumatra Province, incurs production costs of >Rp. 7,000,000 as many as 4 farmers. The research results show that production costs have a positive effect on farmers' income. This shows that if the production costs incurred by lowland rice farmers increase, then automatically the level of production produced by the farmers will also increase. The increased productivity of lowland rice will have an impact on increasing the income generated by lowland rice farmers in Pangaribuan District, North Tapanuli Regency, North Sumatra Province. The results of this research support research conducted by Nurul Nasiyra (2022) which states that production costs have a positive and significant effect on income.

4. CONCLUSION

The income of lowland rice farmers in Pangaribuan District, North Tapanuli Regency tends to increase with an average income of around Rp. 35. 230,000/year. The variables that influence the income of lowland rice farming in Pangaribuan District, North Tapanuli Regency, North Sumatra Province are land area, selling price, production results, capital, labor, fertilizer and production costs.

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