Inovbiz: Jurnal Inovasi Bisnis X (2024) 176-181
INOVBIZ
Website: www.ejournal.polbeng.ac.id/index.php/IBP
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The Influence of Rice Production on the Welfare of Rice Farmers in Perbaungan District, Serdang Berdagai Regency

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ARTICLE INFO

Received: (June 23, 2024)
Received in revised: (June 28, 2024)
Accepted: (December 16, 2024))
Published: (December 30, 2024)

Open Access

ABSTRACT

The agricultural sector is vital in most developing countries' economies, especially in Indonesia. Economic development is carried out to improve community welfare. Improving farmers' welfare is one of the visions and missions of agricultural development in achieving food self-sufficiency and improving farmers' welfare. Deli Serdang Regency is one area with an excellent agrarian sector, especially rice farming. Even though the rice farming sector is still the primary sector in the economy of Deli Serdang Regency, there are still problems related to farmer welfare. Some issues include fluctuating grain prices and rice production, which must still be optimal. Moreover, climate change and a need for more understanding regarding the technical matters of managing rice plants and equipment must be improved, impacting rice farmers' productivity. This research aims to determine the factors of rice production, grain prices, capital, labor, consumption, land area, technology, and education relevant to improving rice farmers' welfare in Perbaungan District, Deli Serdang Regency. Data processing uses Multiple Linear Regression. The results of multiple linear regression testing show that simultaneous hypothesis testing of capital, land area, grain prices, and labor together have a positive and significant effect on the welfare of farmers in the Perbaungan District.

Keywords: Capital, Land Area, Labor, Farmers' Welfare.

1. Introduction

The agricultural sector is vital in most developing countries' economies, especially Indonesia (Nuddin et al., 2022). Economic development is carried out to improve community welfare. Because the majority of Indonesian people live in rural areas and work in the agricultural sector, it is natural that agricultural development is a priority and plays a vital role in the success of economic development. One of Indonesia's food crop commodities is rice, which is still a staple. Rice farmers are people who cultivate crops. Farmers who cultivate agriculture, work the land, plant various plants, and collect the results they will obtain are intended for their interests and to meet general needs, both from the upper and lower layers (Suhardi in Handayani, 2020).

According to the Regulation of the Minister of Manpower and Transmigration of the Republic of Indonesia, No. 5 of 2023, Standards for Workers/Labourers is every person who works and receives wages or other forms of compensation. The need for a decent life to be fulfilled will be related to welfare. So, if the income spent is less than the necessities of a decent living, then it is said that it does not meet the standards of a decent living. Improving farmers' welfare is one of the visions and missions of agricultural development in achieving food self-sufficiency and improving farmers' welfare (Wicaksana, 2023).

In conditions of limited income, food consumption needs will be prioritized. Thus, viewing from groups of people with low incomes, most of the income is used to meet food needs, but along with the shift in increasing income, the proportion of expenditure patterns for food will decrease, and non-food expenditures will decrease. Food increases.

Agricultural development is essential in maximizing the use of Indonesia's geography and natural wealth, combining it with technology to obtain the expected results. The agricultural sector is vital in providing food for the entire

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population, animals for industry, and export trade. Serdang Regency is one area with an excellent agricultural sector, especially rice farming. The economic growth of Deli Serdang Regency is greatly influenced by the agricultural sector, which has a more significant contribution to the formation of its GRDP. In contrast, the sub-sector of food crops and plantation crops has a significant role in the formation of the NTB (Gross Added Value) of this agricultural sector. Thus, it is interesting whether sub-sector I, which forms the agricultural sector, is an essential and highly competitive sub-sector so that it can be used as a basis for designing development strategies that have an optimal impact on economic growth, increasing employment opportunities and improving the welfare of the population, considering that the district This is very dependent on the agricultural sector.

Even though the rice farming sector is still the primary sector in the economy of Deli Serdang Regency, there are still problems related to farmer welfare. Some problems include fluctuating grain prices and rice production, which must still be optimal. Apart from production problems, another problem experienced by farmers in this research area is uncertain climate change. When the rainy season comes, rice fields around the river basin will experience severe damage due to erosion due to abundant water discharge; during the dry season, rice fields located quite far away (radius of 2 km) will have difficulty getting water. This is because the volume of water in the dry season is small, and the water experiences evaporation. It is absorbed into the ground, so the discharge is shallow and impacts water access, making it challenging to reach areas further away from the river. Severe climate change can cause crop failure.

Production factors affect the welfare of farmers, such as small areas of harvested land, superior seeds, fertilizers, pesticides, and expensive labor, making it unaffordable for poor farmers. Another problem that causes the low welfare of rice farmers is that high production costs are not commensurate with the harvest obtained because the selling price to intermediaries is relatively low, and the capital spent is quite large. Low income will cause farmers to be on the poverty line.

To obtain maximum production, farmers must choose the proper use of production factors and combine them optimally and efficiently. However, in reality, many farmers still need to understand how these production factors are used efficiently to increase production and increase farmers' income. With increasing farmer income, the welfare of rice farmers will also improve.

The criteria most widely used in assessing economic welfare are the Pareto criteria proposed by an Italian economist named Vilfredo Pareto 1895. This criterion states that a change in circumstances, take an example of intervention, is said to be excellent or appropriate if, with this change, there is, at least, one party who benefits and no party is harmed. Things that need to be considered in the Pareto criteria are Pareto improvement and Pareto efficiency. These two things will influence economic policy decision-making.

Pareto improvement can be interpreted as the situation if the decision to change is still possible, it can produce at least one party that is better off without making the other party worse off. Pareto efficiency is a condition where it is no longer possible to change strategies to increase economic welfare, resulting in parties benefiting (bettering off) without causing other parties to be harmed (worsening off).

In microeconomic theory, there is also a term known as Pareto theory, which explains three types of welfare levels: Pareto optimal. At the Pareto optimal level, an increase in the welfare of a person or group will reduce the welfare of another person or group. Second, in non-optimal Pareto conditions, one person's welfare will not reduce the welfare of others. Pareto optimal is defined as a condition where it is no longer possible to change the allocation of resources to improve the welfare of economic actors (better off) without sacrificing other economic actors (worse off).

In other words, Pareto conditions occur when all economic actors are in optimum welfare conditions, and conditions that are better than this are called Pareto improvements—third, Pareto is superior. In Pareto's superior conditions, an increase in one person's welfare will not reduce the welfare of other people. According to Pareto's theory, no more government policies can be implemented when the welfare condition of society has reached Pareto's optimal condition. Nurkse's 1953 theory stated that high poverty causes low social welfare. Based on nuclear theory, low levels of welfare are caused by market imperfections, lack of capital, and underdevelopment of human resources, causing low productivity.

Prosperity or well-being can have four meanings (Big et al.). In general terms, prosperity refers to a good condition, a human condition where people are prosperous, healthy, and peaceful. In economics, prosperity is associated with material benefits. Prosperity has a special formal or technical meaning (see welfare economics), as in social welfare function. Social welfare refers to the services that meet community needs in social policy. This is a term used to refer to the idea of a welfare state.

2. Method

This research was conducted for four months, from October 2021 to January 2022, starting from preparing to compiling. The research data used were primary data taken using questionnaires; the research location was in Perbaungan District, Deli Serdang Regency, North Sumatra, and also research using multiple linear regression methods.

Multiple linear regression is a measuring tool used to measure the presence or absence of correlation between several variables, with the form of the regression equation as follows:

$$Y = \alpha + \beta 1\ X1 + \beta 2\ X2 + \beta 3\ X3 + \beta 4\ X4 + \beta 5\ X5 + \varepsilon$$

Where:

Y = Farmer Welfare

a = Price of Y if and = 0 (constant price)

β = Regression coefficient

X1 = Capital
X2 = Land Area
X3 = Price
X4 = Production
X5 = Labor
ε = Error Term.

3. Result and Discussion

The data in this research are distributed, meaning it can be seen from the pp plot image that the points are between the diagonal lines, so it can be concluded that the data distribution is normally distributed. The illustration can be seen from figure below.

Normality test Result

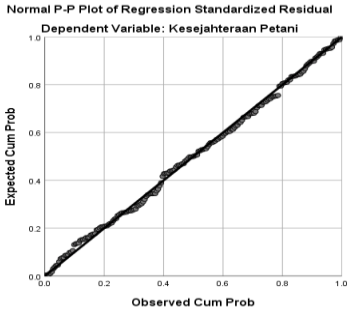

Figure 1. Normality Test

Multicollinearity Test Result

Table 1. Multicollinearity

Coefficients[a]

Model	Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	T	Sig.	Collinearity Statistics Tolerance	Collinearity Statistics VIF
(Constant)	4.769	1.749		5.727	.000		
Modal	.037	.070	.232	3.361	.001	.988	1.012
Luas Lahan	.051	.071	.119	2.707	.000	.964	1.038
Harga	.052	.063	.167	2.425	.002	.987	1.013
Produksi	.037	.059	.044	2.631	.000	.965	1.036
Tenaga Kerja	.048	.055	.059	1.858	002	.988	1.012

a. Dependent Variable: Kesejahteraan Petani

The table above shows that all variables in this research (Capital, Land Area, Price, Production, and Labor) are free from multicollinearity problems, which can be seen from the variable VIF value, which is less than 10, and the tolerance value, which exceeds 0.1.

Simultaneous Correlation Result

The resulting R-value is 0.309 as a multiple correlation value, meaning that capital, land area, price, production, Labor, and farmer welfare are at a relatively close level of relationship.

Table 2. Simultaneous Correlation

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.309[a]	.096	.572	1.12964	1.142

a. Predictors: (Constant), Tenaga Kerja, Harga , Produksi, Modal , Luas Lahan

b. Dependent Variable: Kesejahteraan Petani

Multiple Linear Regression Result

Table 3. Multiple Linear Regression

Coefficients[a]

Model	Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	T	Sig.	Collinearity Statistics Tolerance	Collinearity Statistics VIF
(Constant)	4.769	1.749		5.727	.000		
Modal	.037	.070	.232	3.361	.001	.988	1.012
Luas Lahan	.051	.071	.119	2.707	.000	.964	1.038
Harga	.052	.063	.167	2.425	.002	.987	1.013
Produksi	.037	.059	.044	2.631	.000	.965	1.036
Tenaga Kerja	.048	.055	.059	1.858	002	.988	1.012

a. Dependent Variable: Kesejahteraan Petani

SPSS Output 24 coefficients table results, the regression equation is:
Y = 4.769 + 0.037(X1) + 0.051 (X2) + 0.052 (X3) + 0.037 (X4) + 0.048 (X5) + e

Interpretation of the multiple linear regression equation:

a. If everything in the independent variables is considered constant, the farmer's welfare is 4,769.
b. If capital increases, the farmer's welfare will increase by 0.037 per unit value.
c. If the land area expands, the farmer's welfare will increase by 0.051 per unit value.
d. If the price of grain increases, the farmer's welfare will increase by 0.052 per unit value.
e. If production increases, the farmer's welfare will increase by 0.037 per unit value.
f. If Labor increases, the farmer's welfare will increase by 0.048 per unit value.

T-Test Results

Table 4. T-test Results

Coefficients[a]

Model	Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	T	Sig.	Collinearity Statistics Tolerance	Collinearity Statistics VIF
(Constant)	4.769	1.749		5.727	.000		
Modal	.037	.070	.232	3.361	.001	.988	1.012
Luas Lahan	.051	.071	.119	2.707	.000	.964	1.038
Harga	.052	.063	.167	2.425	.002	.987	1.013
Produksi	.037	.059	.044	2.631	.000	.965	1.036
Tenaga Kerja	.048	.055	.059	1.858	002	.988	1.012

a. Dependent Variable: Kesejahteraan Petani

Based on the table above, it can be seen that:
• The effect of capital on farmers' welfare is t-count 3.361 > t-table 1.653 (n-2=200-2=198 a 5%) and is significant 0.002 < 0.05. Ha is accepted, which states that capital significantly affects farmers' welfare.
• The effect of land area on farmers' welfare is t-count 2.707 > t-table 1.653 (n-2=200-2=198 a 5%) and is significant 0.000 < 0.05, then Ha is

accepted, which states that land area has a significant effect on welfare farmer.

• The effect of grain prices on farmers' welfare is t-count 2,425 > t-table 1.653 (n-2=200-2=198 a 5%) and is significant 0.002 < 0.05, then Ha is accepted, which states that grain prices have a significant effect on welfare farmer.

• The effect of production on farmers' welfare is t-count 2,631 > t-table 1,653 (n-2=200-2=198 a 5%) and is significant 0.000 < 0.05. Ha is accepted, which states that production significantly affects farmers' welfare.

• The influence of Labor on farmers' welfare t-count 1.858 > t-table 1.653 (n-2=200-2=198 a 5%) and significant 0.002 < 0.05, then Ha is accepted, which states that Labor has a significant effect on welfare farmers.

F-Test Results

The F test (simultaneous test) is carried out to see the effect of the independent variable on the dependent variable simultaneously. The method is to look at the significance level (=0.05). If the significance value is smaller than 0.05, H0 is rejected, and Ha is accepted.

Table 5. Anova Test

ANOVA[a]

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	25.948	5	5.190	4.067	.002[b]
Residual	245.007	192	1.276		
Total	270.955	197			

a. Dependent Variable: Kesejahteraan Petani

b. Predictors: (Constant), Tenaga Kerja, Harga , Produksi, Modal , Luas Lahan

Based on the table above, it can be seen that the Fcount is 4.067 > Ftable is 2.26 (N=200-2=198 a 5%). The significance is much smaller than 0.05, namely 0.002<0.05. Ha is received by capital, area land, grain prices, production, and Labor, significantly influencing rice farmers' welfare in Perbaungan District, Serdang Berdagai Regency.

Coefficient of Determination Test Results (R^2)

This coefficient of determination analysis is used to determine the percentage of variation in the influence of the independent variable on the dependent variable.

Table 5. Coefficient of Determination Test Results

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.309[a]	.096	.572	1.12964	1.142

a. Predictors: (Constant), Tenaga Kerja, Harga , Produksi, Modal , Luas Lahan

b. Dependent Variable: Kesejahteraan Petani

Based on the table above, it can be seen that the adjusted R Square figure of 0.572, which can be called the coefficient of determination, which in this case means 57.2% of the welfare of rice farmers in Perbaungan District, Serdang Berdagai Regency, can be obtained and explained by capital, land area, grain price, production, and workforce. Meanwhile, the remaining 42.8% is explained by other factors or variables outside the model that needed to be studied.

Discussion

The Influence of Capital on Farmers' Welfare

Based on the partial hypothesis test carried out, it was obtained that the effect of capital on farmers' welfare was t-count 3.361 > t-table 1.653 (n-2=200-2=198 a 5%) and significant 0.002 < 0.05, then Ha was accepted, which stated capital has a significant effect on farmer welfare. It has a beta coefficient of 0.037, which means that if capital increases, the farmer's welfare will increase by 0.037 percent. Thus, it can be concluded that capital has a positive and significant effect on the welfare of farmers in Perbaungan District, Deli Serdang Regency.

Capital influences the welfare of farmers in Perbaungan District, Deli Serdang Regency; most farmers in Perbaungan District, Deli Serdang Regency use capital from personal money, bank credit, and some even borrow from cooperatives. The people there believe that much capital will be enough to expand their rice land and buy more fertilizer and rice seeds of good quality, so with large areas of land, good seeds, and good quality fertilizer, it will produce quality rice and lots of it at a higher price, thereby increasing the income of the people in Perbaungan District, Deli Serdang Regency.

Increasing capital, such as land, agricultural equipment, and financial capital, will increase agricultural productivity. With higher productivity, farmers can produce more agricultural products in a shorter time. Farmers have easy and affordable access to capital, such as credit, agricultural technology, and training, and they can increase their production. By increasing production, farmers' income and welfare can increase. This can result in increased farmer income and farmer welfare. (Linda, 2020).

The Influence of Land Size on Farmers' Welfare

Based on the partial hypothesis test carried out, it was obtained that land area on farmers' welfare was t-count 2.707 > t-table 1.653 (n-2=200-2=198 a 5%) and significant 0.000 < 0.05, then Ha was accepted, which stated Land area has a substantial effect on farmer welfare. Apart from that, it has a beta coefficient of 0.051, which means that if the land area expands, the welfare of farmers will increase by 0.051 percent. Thus, it can be concluded that land area has a positive and significant effect on the welfare of farmers in Perbaungan District, Deli Serdang Regency.

Land area influences the welfare of farmers in Perbaungan District, Deli Serdang Regency because larger land areas tend to increase agricultural production. In this way, farmers can produce more crops, improving people's income in Perbaungan District, Deli Serdang Regency. It can be seen that the land owned by the community in Perbaungan District, Deli Serdang

Regency, is quite large, so it is enough to meet their daily needs, buy seeds, and buy fertilizer.

This is in line with the theory used in this research, which states that the size of the harvested area is one of the main determinants in increasing rice production, which in turn can also improve farmers' welfare (Wahed, 2020).

The Influence of Grain Prices on Farmers' Welfare

Based on the partial hypothesis test carried out, it was obtained that the price of grain on farmers' welfare was t-count 2,425 > t-table 1.653 (n-2=200-2=198 a 5%) and significant 0.002 < 0.05, then Ha was accepted, which stated The price of grain has a substantial effect on farmer welfare. Apart from that, it has a beta coefficient of 0.052, which means that if the grain cost increases, farmers' welfare will increase by 0.052 percent. Thus, it can be concluded that the price of grain has a positive and significant effect on the welfare of farmers in Perbaungan District, Deli Serdang Regency.

The price of grain influences the welfare of farmers in Perbaungan District, Deli Serdang Regency. The price of grain is the benchmark for farmers in Perbaungan District, Deli Serdang Regency, to sell their rice harvest because the higher the cost of grain sold, the more income they have to meet their daily needs and buy seeds. As well as fertilizer for rice. Also, the people in Perbaungan District, Deli Serdang Regency, every time they sell their rice, first look at the agent who offers a higher price so that they can get an income from the harvest.

The price of rice/paddy has a significant influence on economic life. If rice is too low, farmers' incomes are too low, and they become victims. Meanwhile, consumers will become victims if the price is too high (Juardi, 2022).

The Influence of Production on Farmer Welfare

Based on the partial hypothesis test carried out, it was obtained that production on farmers' welfare was t-count 2,631 > t-table 1.653 (n-2=200-2=198 a 5%) and significant 0.000 < 0.05, then Ha was accepted, which stated that production has a substantial effect on farmer welfare. Apart from that, it has a beta coefficient of 0.037, which means that if production increases, the welfare of farmers will increase by 0.037 percent. Thus, it can be concluded that production has a positive and significant effect on the welfare of rice farmers in Perbaungan District, Deli Serdang Regency.

Production influences the welfare of farmers in Perbaungan District, Deli Serdang Regency. High production generally increases farmer income. The more agricultural products produced, the more significant income farmers can obtain from selling the harvest. With abundant agricultural products, people in Perbaungan District, Deli Serdang Regency, have more resources to meet basic needs, such as food, education, housing, and health services. Production depends on two variables, namely harvest area, and yield per hectare, with the understanding that production can be increased if the harvest area increases. Therefore, adding value to a product/harvest before marketing is a concrete step to increase income. The application of added value will provide an accurate response to increasing revenue, considering that the focus of this stage is carried out post-harvest. (Shodiq, 2022).

The Influence of Labor on Farmers' Welfare

Based on the partial hypothesis test, it was obtained that Labor on farmer welfare was t-count 1.858 > t-table 1.653 (n-2=200-2=198 a 5%) and significant 0.002 < 0.05. Ha was accepted, stating that Labor substantially affects farmer welfare. Apart from that, it has a beta coefficient of 0.048, which means that if Labor increases, the welfare of farmers will increase by 0.048 percent. Thus, it can be concluded that Labor has a positive and significant influence on the welfare of farmers in Perbaungan District, Deli Serdang Regency.

Labor influences the welfare of farmers in Perbaungan District, Deli Serdang Regency; the availability and quality of labor influence agricultural productivity, where farmers who have skilled and efficient Labor can increase rice agricultural yields, which can increase income and welfare of the community in Perbaungan District, Deli Regency Serdang. Because the involvement of Labor in sustainable agricultural management can improve the welfare of farmers in the long term, using environmentally friendly agricultural technology and sustainable agricultural management can improve environmental and business sustainability.

In collaboration theory, when a lot of Labor is used, the income that farmers can generate will be more significant. In this context, the ability to build collaboration and cooperation between workers and farmers has a positive impact on the development and performance of farmers, so that if there are more workers, farmers' income will increase. The results of this research align with the results of research conducted by (Abdul et al. Daulay, 2021) that there is a significant influence between Labor and farmers' welfare.

3. Conclusion

The results of multiple linear regression show that if capital increases, the welfare of farmers will increase, and if the land area increases, the welfare of farmers will increase. If the price of grain increases, then the welfare of farmers will increase; if production increases, then the welfare of farmers will increase. Moreover, if the number of workers increases, the welfare of farmers will increase. The results of simultaneous hypothesis testing indicate that capital, land area, grain prices, production, and labor have a positive and significant effect on the welfare of farmers in Perbaungan District, Deli Serdang Regency.

The author provides suggestions that can later be used to develop and become a study for us to improve the factors that influence the

welfare of farmers in Perbaungan District, Deli Serdang Regency. It is hoped that the government can control the prices of goods to save on household food and non-food consumption expenses, considering the increase in prices of daily necessities, and for the community to minimize the costs, considering that the harvest season only occurs once every three months, to provide savings for the seeding period.

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