# AFFECTING RICE PRODUCTION ON THE INCOME AND WELFARE OF RICE FARMERS IN DESA MANGGA

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**Abstract:** This research was conducted in Mangga Village, Stabat District, Langkat Regency. The purpose of this study was to determine the factors of production on the income and welfare of rice farmers. This study uses quantitative and qualitative data and the model used is Path Analysis then the number of samples used is 100 families of data collected by distributing questionnaires. This research was conducted to determine the direct, indirect and total effect between variables, the variables used include capital (X1), land area (X2), production yields (X3), fertilizer use (X4), water irrigation (X5), income (Y1) and welfare (Y2).

## INTRODUCTION

Stabat sub-district occupies an area of approximately 108.85 km2 (10,885 Ha) consisting of 6 villages and 6 definitive villages. Stabat sub-district is a tropical area. So this area has 2 seasons, namely the dry season and the rainy season. In 2019, rice crop production in Stabat District was recorded at 21,115 tons, a decrease of 5.02 percent compared to 2018 which was recorded at 22,231 tons. Therefore, we need to find out what factors affect the decline in rice production.

Irrigation or irrigation is important in agriculture. Without good irrigation, plants cannot grow optimally. This will also greatly affect the harvest later. Irrigation reduces the risk of crop failure due to the uncertainty of rain and drought, makes available nutrients more effective, creates better moisture conditions and crop quality (Marpaung, 2016). The population's view of agricultural revitalization is successful if it frees farming communities and other rural populations from the shackles and shackles of poverty that previously bound them (Faried, et al., 2022); (Purba, et al., 2021)

The core of the development planning process takes place in the time frame that must be considered while formulating a strategy in order to attain the goal of growth has always been a self-sustaining cycle that unsure of what to do (Faried & Sembiring, 2019). This problem is a bit burdensome for farmers. As we know, water is very important for rice plants. Starting from the seedling stage to producing rice seeds, water is very

influential on the process. Leaky irrigation canals make water not optimally irrigate rice fields. If the dry season comes the water discharge is getting smaller, make. Farmers wait in queues to irrigate their fields. Economy is an inseparable side of the dimensions of human life (Fadlan, 2022). Strategic role in driving the economy of people who have great potential is found in small industries such as tempeh business (Faried, et al., 2022)

Sometimes there is farmer participation so that all farmers get water, farmers work together to improve irrigation canals (Faried, et al., 2023). Closing leaky channels, lifting mud or leaf or wood litter that blocks water and cutting trees that propagate into the channel, this is done so that water flows properly right in the irrigation channel. Water difficulties and smaller water discharge have caused people to change their land to plant corn (Simarmata, et al., 2021). This is because corn does not require as much water as rice. How many important factors do we need to improve to increase rice production sustainably in Stabat District (Hasanah, et al., 2022). We really need supporting factors to produce good rice production, if our rice production is good, the results we receive are also good. In farming, the products produced will be good if the existing production factors are utilized efficiently (Hasanah, et al., 2022) One of the villages in Stabat District that produces rice is Mango Village.

The constraints in rice production are essentially the narrow area of rice fields, limited labor that has inadequate skills and technology. Fertile land is a condition for success for farmers, besides that land has a great influence on the results of rice production obtained, it is necessary to do the best management of farmers in order to be able to produce quality rice (Sartika, et al., 2022). In Mangga Village itself, there are still many rice farmers whose lives can be said to be still lacking. The income they generate from their harvest often cannot meet their needs until the next harvest (Afriansyah, et al., 2023), even though some farmers own their own farmland. In addition, there are also many agricultural lands that are used as residential places (Purba, et al., 2023) because of the increasing population growth every year. When agricultural land is getting narrower, their crops are also getting less so that the income they get is also small (Hasanah, et al., 2022).

Then also often farmers experience fatigue in their land due to lack of irrigation canals or water, so if there is no rain and no one irrigates their agricultural land then their rice production will get bad results, it can cause the selling price of rice to decrease, so

that farmers can experience losses and not return on investment (Hasanah, et al., 2023).

## RESEARCH METHODS

This research uses quantitative and qualitative data and the model used is Path Analysis which is operated through the SPSS program. In this study, the author used a data collection technique, namely by means of a literature study and this data was obtained directly from the Mango Village Office, Stabat District, while primary data was obtained from the results of the distribution of questionnaires (questionnaires that I distributed to farmers. The population in this study amounted to 200 families and the sample used was 100 families.

To answer the hypothesis, the Path Analysis method is used. The path analysis aims to prove the hypothesis of proving whether income is the main / mediating variable in supporting the welfare of rice farmers seen from significant variability, with the following equations:

1. First Equation:

$$Y1 = PY1\ X1 + PY1\ X2 + PY1\ X3 + PY1\ X4 + PYI\ X5 + e$$

2. Second Equation:

$$Y2 = PY2\ X1 + PY2\ X2 + PY2\ X3 + PY2\ X4 + PY2\ X5 + PY2\ Y1 + e$$

**Direct Equation**

$X1 \rightarrow Y1 = PY1\ X1$

$X2 \rightarrow Y1 = PY1\ X2$

$X3 \rightarrow Y1 = PY1\ X3$

$X4 \rightarrow Y1 = PY_{1X4}$

$X5 \rightarrow Y1 = PY_{1X5}$

$X1 \rightarrow Y2 = PY2\ X1$

$X2 \rightarrow Y_2 = PY2\ X2$

$X3 \rightarrow Y2 = PY2\ X3$

$X4 \rightarrow Y_2 = PY_2\ X4$

$Y5 \rightarrow Y_2 = PY_2\ Y5$

**Indirect equations**

$X1 \rightarrow Y_1 \rightarrow Y_2 = (PY_1\ X1)\ (PY1\ Y2)$

$X2 \rightarrow Y_1 \rightarrow Y_2 = (PY_1\ X2)\ (PY1\ Y2)$

X3 $\rightarrow Y_1 \rightarrow Y_2$ = ($PY_1$ X3) (PY1 Y2)
X4 $\rightarrow Y_1 \rightarrow Y_2$ = ($PY_1$ X4) (PY1 $_{Y2}$)
X5 $\rightarrow Y_1 \rightarrow Y_2$ = ($PY_1$ X5) (PY1 $_{Y2}$)

**Total Influence**

X1 $\rightarrow Y_1 \rightarrow$Y2 = ($PY_1$ X1) + (PY1 Y2)
X2 $\rightarrow$ Y1 $\rightarrow$ Y2 = (PY1 X1) + (PY1 Y2)
X3 $\rightarrow$ Y1 $\rightarrow$ Y2 = (PY1 X1) + (PY1 Y2)
X4 $\rightarrow$ Y1 $\rightarrow$ Y2 = (PY1 X1) + (PY1 Y2)
X5 $\rightarrow$ Y1 $\rightarrow$ Y2 = (PY1 X1) + (PY1 Y2)

Information:

Y1 = Revenue
Y2 = Well-being
X1 = Capital
X2 = Land area
X3 = Production Results
X4 = Use of Fertilizer
X5 = Water Irrigation

## RESULTS AND DISCUSSION

### A. Discussion

#### 1. Direct Effect of Capital (X1) on Revenue (Y1)

From the results of path analysis processing, the direct influence of capital (X1) on opinion (Y1) has a positive and significant influence with a significance value of 0.000<0.005. In line with research conducted by (Lina Apriliana, 2019) entitled "The Effect of Land, Capital and Selling Prices on Farmer Income in Tanggulwelah Village, Besuki District" which states. Based on the results of significant processing in this study, it can be concluded that there is an influence and significant between Capital on the Income of rice farmers in Tanggulwelahan Village. The research I conducted in Mangga Village resulted in capital directly having a positive and significant effect on income. This means that the more capital owned by farmers, the greater the chance that farmers can increase their rice production and plant with superior seeds to get better results. Efforts are made to maintain or expand food production in accordance with the environment by taking into account the available resources and the willingness and ability (Faried, et al.,

2021)

**2. Direct Effect of Capital (X1) on Welfare (Y2)**

From the results of path analysis processing, the direct effect of capital (X1) on welfare (Y2) has a significance value of 0.000<0.005, which means that capital has a significant and positive effect on welfare. This is in line with research conducted by (Nasution & Faried, 2020)which states that the results of data analysis show that directly working capital factors have a positive and significant effect on the welfare of sweet corn farmers. The reason capital affects the welfare of farmers in Mango Village, Stabat District, Langkat Regency is because capital is the most important and important thing in starting or doing a business, as well as in agriculture. The greater the capital a farmer has, the greater the opportunity to get more results. With large capital, farmers can increase their agricultural land, so the results they receive are also increasing (Hasanah, et al., 2022). Efforts to empower rural communities can provide stimulation to encourage or motivate individuals to have the ability or empowerment to make their choices (Sembiring, et al., 2023)

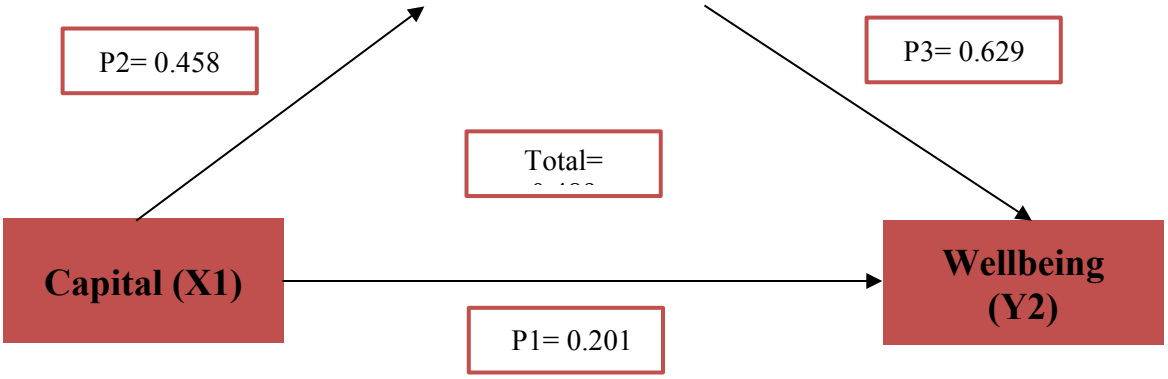
**3. The indirect effect of capital (X1) on well-being (Y2) through income (Y1) as an intervening variable**

From the results of path analysis processing, the indirect influence of capital on welfare through income has a significance value of 0.000<0.005, which means that capital has a significant indirect effect on welfare through income as an intervening variable.

**4. The effect of total capital on well-being through income as an intervening variable**

The amount of the total influence of capital on welfare through income as an intervening variable is 0.489 with a direct influence value (P1) of 0.201 and an indirect influence value of 0.288 so that it can be concluded that the value of direct influence is smaller than the value of indirect influence so that Ha is accepted.

**Revenue (Y1)**




**5. Direct effect of land area (X2) on income (Y1)**

From the results of path analysis processing, the direct influence of land area (X2) on opinion (Y1) has a positive and significant influence with a significance value of 0.000<0.005. My research shows that the variable land area directly has a positive and significant effect on income, meaning that the more agricultural land owned by farmers, the more income will be. In line with research conducted by (Diyah Kusmiyati, Wikan Budi Utami and Suprihati, 2022) entitled "The Effect of Capital, Labor, Land Area on the Income of Rice Farmers in Villages" there is a positive and significant influence between land area and Business Income of rice farmers in Brangkal Karanganom Klaten Village. A positive t-value indicates that the variable land area has a positive influence on operating income.

**6. Direct Effect of Land Area (X2) on Welfare (Y2)**

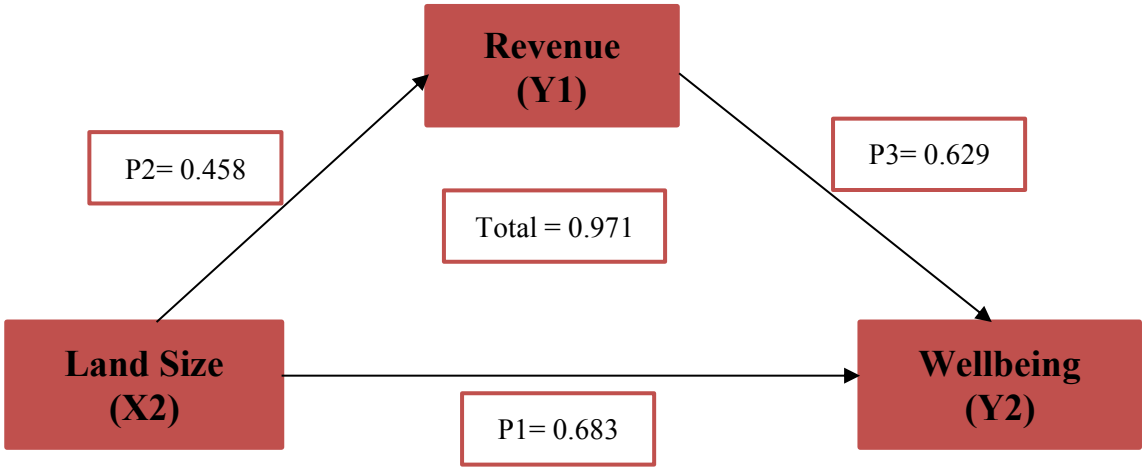
From the results of path analysis processing, the direct influence of land area (X2) on welfare (Y2) has a significance value of 0.000<0.005, which means that land area has a significant and positive effect on welfare. The research I conducted found that land area has a significant effect on the welfare of farmers in Mango Village, Stabat District. The larger the land area will be able to be planted with more crops, the more farmers plant their agricultural seeds, the more results will be received by farmers, so as to increase rice production and the income that will be received is also greater. Similar to the research conducted by (Mohammad Wahed, 2015), entitled The Effect of Land Area, Production, Food Security and Grain Prices on the Welfare of Rice Farmers in Pasuruan Regency, the results of this study stated that land area has a significant effect on the welfare of rice farmers and shows a positive relationship.

**7. Indirect effect of land area (X2) on welfare (Y2) through income (Y1) as an intervening variable**

From the results of path analysis processing on the indirect influence of land area on welfare through income has a significance value of 0.000<0.005 which means that it has a significant indirect effect on welfare through income as an intervening variable.

**8. The effect of total land area on welfare through income as an intervening variable**

The magnitude of the total influence of land area on welfare through income as an intervening variable is 0.972 with a direct influence value (P1) of 0.683 and an indirect influence value of 0.288 so that it can be concluded that the value of direct influence is greater than the value of indirect influence so that Ho is rejected.




**9. Direct effect of production results (X3) on revenue (Y1)**

From the results of path analysis processing, production results on income have a significance value of 0.916>0.000, which means that production results (X3) directly do not have a positive effect and significance on income (Y1).

**10. Direct effect of production yield (X3) on welfare (Y2)**

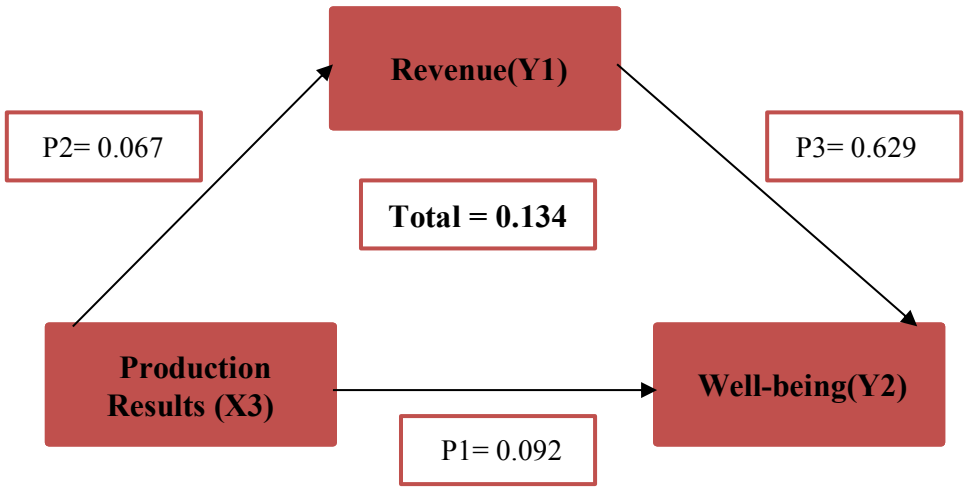
From the results of path analysis processing, the direct effect of production results (X3) on welfare (Y2) has a significance value of 0.004<0.005, which means that directly the production results have a significant and positive effect on welfare. The farmers in Mangga Village, Stabat District, use the best seeds for their agricultural land, it is done solely to obtain perfect production results so as to increase their selling value, the level of production is very important in determining income, where the amount and yield of increased production will increase the income of rice farmers.

**11. The indirect effect of production results (X3) on welfare (Y2) through income (Y1) as an intervening variable**

From the results of processing path analysis on the indirect influence of production results on welfare through income has a significance value of 0.000<0.005 which means that it has a significant indirect effect on welfare through income as an intervening variable.

**12. The effect of total production (X3) on welfare (Y2) through income (Y1)**

The magnitude of the total influence of production results on welfare through income as an intervening variable is 0.134 with a direct influence value (P1) of 0.092 and an indirect influence value of 0.042 so that it can be concluded that the value of direct influence is greater than the value of indirect influence so that Ho is rejected.




**13. Direct effect of fertilizer use (X4) on revenue (Y1)**

From the results of the path analysis processing, the use of fertilizer on income has a significance value of 0.000>0.000, which means that the use of fertilizer (X4) directly has a positive effect and significance on income (Y1). From the results of the research I conducted, the use of fertilizer has a significant and positive effect on income, meaning that using fertilizer for agricultural land is important, because by fertilizing regularly and on time, rice plants will be better and grow optimally, so that they will get maximum results too (Bukhori, 2020).

**14. Direct effect of fertilizer use (X4) on well-being (Y2)**

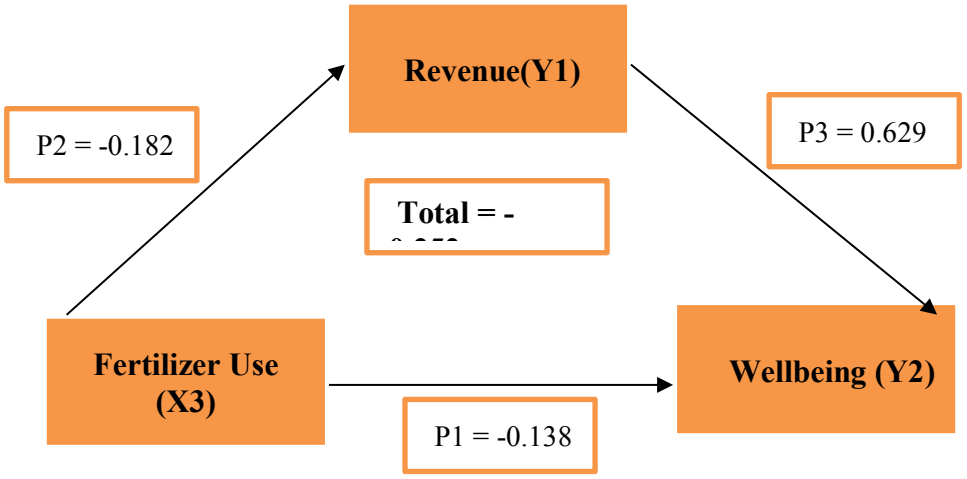
From the results of path analysis processing, the direct effect of fertilizer use (X4) on welfare (Y2) has a significance value of 0.000<0.005, which means that directly the use of fertilizer has a significant and positive effect on welfare.

**15. The indirect effect of fertilizer use (X4) on welfare (Y2) through income (Y1) as an intervening variable**

From the results of path analysis processing, the indirect effect of fertilizer use on welfare through income has a significance value of 0.000<0.005, which means that the use of fertilizer has a significant indirect effect on welfare through income as an intervening variable.

**16. The effect of total fertilizer use (X4) on well-being (Y2) through income (Y1) as an intervening variable**

The magnitude of the total influence of fertilizer use on welfare through income as an intervening variable is -0.252 with a direct influence value (P1) of -0.138 and an indirect influence value of 0.114 so that it can be concluded that the value of direct influence is smaller than the value of indirect influence so that Ha is accepted.




**17. Direct effect of water irrigation (X5) on income (Y1)**

From the results of path analysis treatment, the use of fertilizer on income has a significance value of 0.507>0.000, which means that water irrigation (X5) directly does not have a positive effect and significance on income (Y1).

**18. Direct effect of water irrigation (X5) on well-being (Y2)**

From the results of path analysis treatment on the direct effect of water irrigation (X5) on welfare (Y2) has a significance value of 0.000<0.005 which means that water irrigation directly has a significant and positive effect on welfare. The results of his research stated that partial water irrigation has a positive and significant effect on welfare (Sembiring, et al., 2022). Irrigation canals are one of the important factors in agricultural

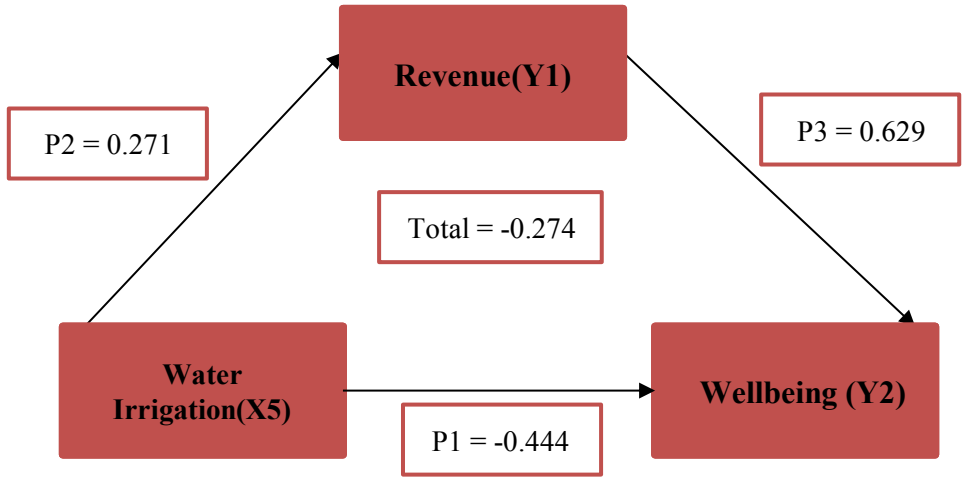
activities. Water irrigation can increase the production yield or productivity of all crops, with automatic water irrigation there will be agricultural land that irrigates and makes the land moist, so that the soil becomes fertile and plants that grow in fertile soil will get maximum yields, it can make the selling value greater and income also increases (Sembiring & Faried, 2020); (Basmar, et al., 2021).

**19. Indirect effect of water irrigation (X5) on well-being (Y2) through income (Y1) as an intervening variable**

From the results of path analysis treatment on the indirect effect of water irrigation on welfare through income has a significance value of 0.015<0.005 which means that water irrigation does not have a significant indirect effect on welfare through income as an intervening variable.

**20. The effect of total water irrigation (X5) on well-being (Y2) through income (Y1) as an interening variable**

The magnitude of the total influence of water irrigation on welfare through income as an intervening variable is -0.274 with a direct influence value (P1) of -0.444 and an indirect influence value of 0.170 so that it can be concluded that the value of direct influence is smaller than the value of indirect influence so that Ha is accepted.




## CONCLUSION AND ADVICE

Based on the results of the analysis and data that have been put forward by the researcher, it can be concluded that:

1. Based on the results of path analysis testing directly capital (X1), land area (X2), fertilizer use (X4) has a significant and positive effect on income, while production

results (X3) and water irrigation (X5) directly do not have a significant and positive effect on income (Y1)

2. Based on the results of path analysis testing, directly capital (X1), land area (X2), production results (X3), fertilizer use (X4), water irrigation (X5) have a significant and positive effect on welfare (Y2).
3. Based on the results of path analysis testing, indirect capital (X1), land area (X2), production results (X3), have a significant and positive effect on welfare (Y2) through income (Y1) as an intervening variable, while the use of fertilizer (X4), water irrigation (X5) indirectly does not have a significant and positive effect on welfare through income (Y1) as an intervening variable.
4. Based on the total results of capital variables (X1), fertilizer use (X4) and water irrigation (X5) affect welfare (Y2) through data collection (Y1) as an intervening variable, while land area variables (X2), production results (X3), do not affect welfare (Y2) through income (Y1) as intervening variables.

Based on the results of research in Mangga Village, Stabat District, Langkat Regency, suggestions that the author can greet are as follows:

1. To improve welfare, farmers must be able to increase their agricultural production by processing agricultural land as well as possible to increase agricultural yields with good tillage, regular irrigation, the use of tall seeds, fertilizing regularly until they absorb to the roots, and eradicating pests and diseases in plants.
2. To increase production for farmers, the government or private sector must direct farmers in terms of marketing the crops obtained and how to use technology in the field of production both in quality and quantity. So that the production results obtained by farmers increase every one harvest. In addition, farmers should form farmer groups or cooperatives that can help in obtaining capital loans, helping to market their production, and exchanging knowledge and information between farmers so that farmers can be more independent.
3. Further researchers are expected to be able to further examine the factors that affect rice production on agricultural price stability and agricultural technology, and it is hoped that further researchers can add other factors that are considered to improve the welfare of farmers and also expand the subject of rice farming.

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