Analysis of Rice Farmer Problems in Improving Community Welfare in Kelurahan Cengkeh Turi Kota Binjai

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ABSTRACT
Indonesia's rice sector was once self-sufficient due to government support, macroeconomic policies, and technological advancements like the Green Revolution in lowland rice cultivation. However, the Cengkeh Turi sub-district in Binjai City, North Sumatra, faces welfare issues such as lack of capital, polluted soil, uncertain rice prices, limited land area, poor quality seeds, plant pests, lack of human resources, and a lack of government involvement in agriculture. This research aims to analyze factors such as seed type, fertilizer type, labor, land conversion, capital, distribution, and climate to improve the welfare of farmers in Cengkeh Turi Village. Data processing using Confirmatory Factor Analysis (CFA) and Multiple Linear Regression was used. Results showed that distribution, climate, labor, and land use change factors significantly impact the welfare of the community in Cengkeh Turi Village, while the type of seed and fertilizer type had a positive effect on the welfare of the community in Kelurana Cengkeh Turi. The study highlights the need for improved agricultural practices and government support to improve the welfare of farmers in Cengkeh Turi Village.

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INTRODUCTION

Indonesia once became self-sufficient in rice, due to, among other things, government support which prioritized agricultural development accompanied by supportive macroeconomic policies, new technological breakthroughs (Green Revolution) in lowland rice cultivation, and agricultural identification policies (BIMAS) which regulated technological development centrally. Until now, rice farming production is still the mainstay of Indonesian society in meeting national food needs. Apart from that, for most farmers in Indonesia, rice is also the staple crop that is most widely cultivated. Binjai has long been nicknamed the City of Rambutan because Binjai Rambutan is very famous. These rambutan seeds from Binjai have been spread and cultivated in various places in Indonesia. Apart from that, Binjai is also a large rice producer, especially in the Cengkeh Turi Village area, whose source of income is from the rice harvest which is sold to middlemen. His family and their daily livelihood depend on the rice harvest they obtain. (Sembiring & Ilmi, 2020)

The area of rice land owned by the community in Cengkeh Turi Village is very large and has potential for the area's environment so that it can meet the needs of every family in Cengkeh Turi Village. Starting from meeting daily needs, children's school fees, capital to buy fertilizer and rice seeds, and some of the rest to be saved for sudden needs. However, there are welfare problems in Cengkeh Turi Subdistrict, starting from farmers' knowledge being a determinant of farmers' success in managing the characteristics of existing resources to improve the welfare of the farming community more evenly. The emergence of other problems in the community, starting from a lack of capital in opening up wider agricultural land, soil fertility which is increasingly polluted which makes it impossible to grow crops, the price of rice being uncertain, narrow land cannot increase the area of land owned, quality bad seeds which cause crop failure or poor results, many plant pests which cause them to die and not produce, lack of human resources in agricultural or plantation management and in addition the lack of government's role in realizing good and correct agriculture so that it can achieve Equal distribution of economic growth can occur through a spatial system that integrates urban and rural development. (Sembiring, 2018a)

LITERATURE REVIEW

Welfare includes various actions carried out by humans to achieve a better level of social life, whereas according to the formulation of Law of the Republic of Indonesia No. 16 of 1974 concerning the basic provisions of social welfare article 2 paragraph 1. Welfare is a material social order of life and livelihood as well as spiritually, which is encompassed by a sense of safety, decency, and inner and outer peace, which makes it possible for every citizen to make efforts to fulfill the physical, spiritual, and social needs as best as possible for themselves, their families and society by upholding human rights and human obligations by Pancasila. (Sembiring & Ilmi, 2020)

Pareto theory (1895), states that the welfare of farmers is Pareto superior. In conditions of increasing one's welfare, it will not reduce the highest welfare of other people. According to Pareto's theory, when society's welfare conditions
have reached optimal welfare conditions, no more government policies can be implemented.

**METHODOLOGY**

This research uses the Confirmatory Factor Analysis (CFA) and Multiple Regression methods, this research lasts for 5 months from September 2023 to January 2024 starting from preparation to preparation of the research, the data used uses primary data taken using questionnaires, the research location is Cenhkeh Turi Village, Binjai City, North Sumatra.

**RESULTS**

The results of data analysis use the Confirmatory Factor Analysis (CFA) method by analyzing groupings, and then interpreting them so that a true picture of the problem under study is obtained. Next, factor analysis is carried out which aims to find a way to summarize the information contained in the original (initial) variables into a new set of dimensions or variables (factors). The first thing to do is test Barlett's test of Sphericity and Kaiser-Meyer-Olkin (KMO), which can be seen in the following table:

<table>
<thead>
<tr>
<th>Table 1. KMO and Bartlett's Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kaiser-Meyer-Olkin Measure of Sampling Adequacy.</td>
</tr>
<tr>
<td>Bartlett's Test of Sphericity</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

The results obtained from Barlett's test of Sphericity were 48,596 with a significance of 0.000, this means that there is a correlation between variables (significant < 0.050). The results of the Kaiser-Meyer-Olkin (KMO) test obtained a value of 0.509, where this figure is already above 0.5. Thus, the variables in this research can be processed further, by analyzing the factors of experience, education, skills, income, palm oil prices, production, labor, and productivity that are relevant to improving the welfare of farmers in Huristak District, Padang Lawas Regency. Significant results can be seen from the following Rotated Component Matrix table:

<table>
<thead>
<tr>
<th>Table 2. Rotated Component Matrix</th>
</tr>
</thead>
<tbody>
<tr>
<td>Component</td>
</tr>
<tr>
<td>Seed Type</td>
</tr>
<tr>
<td>Fertilizer Type</td>
</tr>
<tr>
<td>Labor</td>
</tr>
<tr>
<td>Land Function Transfer</td>
</tr>
<tr>
<td>Capital</td>
</tr>
<tr>
<td>Distribution</td>
</tr>
<tr>
<td>Climate</td>
</tr>
</tbody>
</table>
The Component Matrix resulting from the rotation process (Rotated Component Matrix) shows a clearer and more realistic distribution of variables. Determining the variable input to a particular factor is based on the magnitude of the correlation between the variable and the factor, namely to a large correlation.

Based on the results of the component matrix values, it is known that of the 7 factors, the 4 factors that are suitable for influencing community welfare are 4 factors originating from:

a) Largest Component 1: Distribution with a value of 0.836
b) The second largest component is climate with a value of 0.637
c) 3rd largest component: Labor with a value of 0.734
d) Component 4 largest: Land conversion with a value of 0.835.

The results of data analysis using the Multiple Linear Regression method show the results of hypothesis testing from this research, to look at hypothesis testing and simultaneous testing of factors that are relevant to the welfare of farmers in Huristak District. The results of the influence of the dependent variable on the independent variable can be seen in the following table.

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
<th>Collinearity Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
<td>Tolerance</td>
</tr>
<tr>
<td>(Coinstant)</td>
<td>15.801</td>
<td>2.085</td>
<td>.228</td>
<td>7.577</td>
<td>.000</td>
</tr>
<tr>
<td>Distribution</td>
<td>.052</td>
<td>.088</td>
<td>.129</td>
<td>2.864</td>
<td>.005</td>
</tr>
<tr>
<td>Climate</td>
<td>.033</td>
<td>.116</td>
<td>.208</td>
<td>2.613</td>
<td>.001</td>
</tr>
<tr>
<td>Labor</td>
<td>.063</td>
<td>.083</td>
<td>.182</td>
<td>2.315</td>
<td>.002</td>
</tr>
<tr>
<td>Land Function Transfer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Based on the table above it can be seen that:

a) The calculated t-distribution value is 2.864 > 1.652 then the sig value is 0.005 < 0.05, so Ha is accepted and H0 is rejected, meaning that the distribution is significant for the welfare of the community in Cengkeh Turi Village.

b) The t-calculated climate value is 1.745 > 1.652 then the sig value is 0.002 < 0.05 so Ha is accepted and H0 is rejected, meaning that climate is significant to the welfare of the community in Cengkeh Turi Village.

c) The t-calculated value for labor is 2.613 > 1.652 then the sig value is 0.001 < 0.05, so that Ha is accepted and H0 is rejected, meaning that labor is significant to the welfare of the community in Cengkeh Turi Village.

d) The t-calculated value of land conversion is 2.315 > 1.652 then the sig value is 0.002 < 0.05, so that Ha is accepted and H0 is rejected, meaning that land conversion is significant for the welfare of the community in Cengkeh Turi Village.

Table 4. F-test (Hipotesis Simultan Test) ANOVAa

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Regression</td>
<td>135.528</td>
<td>4</td>
<td>18.882</td>
<td>14.924</td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>261.545</td>
<td>145</td>
<td>1.804</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>297.073</td>
<td>149</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Based on the table above, it can be seen that the results of the ANOVA test with F (Fisher) analysis show that the calculated F value is 14.924 > F table 2.42 so Ha is accepted and H0 is rejected and this means distribution, climate, labor and land conversion together significantly to the welfare of the community in Cengkeh Turi Village.

Table 5. Koefisien Determinasi (R2) Model Summaryb

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
<th>Durbin-Watson</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.246a</td>
<td>.320</td>
<td>.395</td>
<td>1.34304</td>
<td>.822</td>
</tr>
</tbody>
</table>

Based on the table above, it can be seen that the adjusted R Square figure is 0.395 which can be called the coefficient of determination, which in this case means that 39.5% of community welfare in Cengkeh Turi Village can be
obtained and explained by distribution, climate, labor and land, conversion, while the rest explained by other factors or variables outside the model that are not studied.

The reason the adjusted R-squared value is small in this research is that it uses primary data with a lower mass than secondary data. After all, it uses a Likert scale and uses two data processing methods, namely the CFA method and multiple linear regression so that data processing and testing is carried out twice. , then the adjusted R-Square value is lower.

**DISCUSSION**

The results of the analysis in Confirmatory Factor Analysis (CFA) show that from the explained variance table it can be seen that there are only 4 factors formed.

**Distribution Has a Significant Influence on Community Welfare.**

Based on the results of the Confirmatory Factor Analysis (CFA) management of the rotation output (Rotated Component Matrix), it shows that the largest component 1 is a distribution of 0.836, which is worthy of influencing community welfare. So it can be concluded that distribution has a significant influence on the welfare of the community in Cengkeh Turi Village.

Distribution factors are factors that influence farmers' income because the more strategic the distribution channels, the easier it is for farmers to sell their agricultural products. Apart from that, buyers will be happier if they buy close to the agricultural location and are easily accessible to buyers.

Carrying out business activities requires a place of business known as distribution. With the existence of distribution channels, consumers can see directly the goods produced or sold in terms of type, quantity, and price. In this way, consumers can more easily choose and transact or purchase products offered directly. Distribution completely has the power to make (or break) a venture's business strategy. Selecting strategic distribution is one of the factors that influences the success of a business. The more strategic the business distribution chosen, the higher the level of sales and the impact on farmer income.

Choosing a good distribution channel is something that farmers must pay attention to so that their agricultural products can be seen by many people, so several considerations will be taken into account to determine the right distribution. Farmers must pay attention to the distribution determination because they will never be free from responsibility for the surrounding environment, ensuring that it will not harm the surrounding environment and cause damage.

In line with line research (Sembiring & Faried, 2020) states that distribution influences farmers' income. Meanwhile, this research is not in line with research conducted by Irving Clark Kaiya Putri (2013) which states that distribution does not affect farmers' income. One of the factors that is thought to be the cause of this condition is the distribution situation where farmers in the distribution area are very close to each other, causing each trader to have the
same opportunity to get consumers and the distribution they occupy has no effect on income.

**Climate Has a Significant Influence on Community Welfare.**

Based on the results of the Confirmatory Factor Analysis (CFA) management of the rotation output (Rotated Component Matrix), shows that the second largest component is the climate at 0.637, which is worthy of influencing community welfare. So it can be concluded that climate has a significant influence on the welfare of the community in Cengkeh Turi Village.

Rice farming is the main source of income for the people of Cengkeh Turi Village. Therefore, rice productivity is the basis of the community's economy in meeting needs. However, the rice cultivation process is very dependent on climate to optimize its productivity. If there is a change in climate elements, rice productivity will be affected. Bappenas (2010) revealed that in general food crops are most vulnerable to almost all climate components, so adaptation efforts are very necessary. Therefore, to see the effect of climate change on rice productivity, it is necessary to pay attention to the season in planting and harvesting rice. So that it provides optimal results for rice production.

Temperature plays an important role in plant growth and development. Each type of plant has an optimal temperature required for various growth stages, such as germination, vegetative, flowering, and fruit ripening. Extreme temperature fluctuations or temperatures that are too low or too high can disrupt plant physiological processes and reduce production.

Proper and well-distributed rainfall is essential for plant growth. Lack of rainfall can cause drought, while excess rainfall or irregular rain patterns can cause flooding or soil submergence. This condition can inhibit the absorption of water and nutrients by plants, reduce production, or even cause plant damage. Proper air humidity is necessary for photosynthesis and plant respiration processes. Humidity that is too low can cause stress on plants and reduce production, while humidity that is too high can increase the risk of disease and other disorders.

The length or shortness of the plant growing season also affects production. Some plants require a sufficient period to reach certain developmental phases, such as flowering or fruit ripening. If the growing season is too short, plants may not be able to complete their growth cycle optimally, which can affect production. In line with research results (Iffah Luthfiyah 2022) where research results show that agricultural production results are decreasing and unstable as a result of climate change, thus climate change affects agricultural production which has an impact on increasing people's welfare.

**Labor Has a Significant Influence on Community Welfare.**

Based on the results of the Confirmatory Factor Analysis (CFA) management of rotational output (Rotated Component Matrix), shows that the third largest component is labor at 0.734, which is worthy of influencing the
welfare of society. So it can be concluded that labor has a significant influence on the welfare of the community in Cengkeh Turi Village.

The higher the working hours used by the workforce, the higher the welfare that can be generated by farmers, where welfare itself is measured through the income generated by farmers. Labor, which is a production factor, drives other input factors because, without labor, the production process cannot run. The more workers there are, the more output will be produced so that farmers' income can also increase (Mankiw, 2003). Labor is an important factor in influencing income. In economic theory, it is explained that in analyzing production, it is always assumed that the three factors of production, namely natural resources, capital, and entrepreneurship, are constant, while labor is seen as a factor that can change in quantity. Thus, the use of production factors and the level of production produced by the relationship between the amount of labor used and the production achieved will influence the entrepreneur's income level.

Thus, increasing the labor factor greatly influences income, so rice farmers should optimize the use of working hours. If the working hours are devoted by the farmer's workforce, the farmers will intensively care for and maintain their plants so that the quality of the rice they produce is good so that there is no damage to the agricultural land which will have an impact on reducing production yields and the income generated by the farmers.

In line with research results, the results of this research are also supported by (Lubis et al., 2018) and Prapnuwanti (2019) who state that labor has a positive and significant effect on income. This shows that when the labor used increases, the demand that can be met becomes greater and the income received will also increase.

**Land Conversion Has a Significant Impact on Community Welfare.**

Based on the results of the Confirmatory Factor Analysis (CFA) management of the rotation output (Rotated Component Matrix), it shows that the 4th largest component is the land conversion of 0.835 which is worthy of affecting community welfare. So it can be concluded that land conversion has a significant effect on the welfare of the community in Cengkeh Turi Village.

The conversion of agricultural land is difficult to overcome, this is because development will continue to occur to fulfill and support the lives of people living in an area, apart from that, the lack of price elasticity of agricultural products on farmers' income makes this worse, and the price of land makes people intend to convert it or selling land becomes a reality, plus population growth accelerates this.

Farmers in Cengkeh Turi Village, on average, are not pure farmers, the farmers have other jobs to help support the family economy. It can be concluded that the welfare of farmers in Cengkeh Turi Village lies in the other types of business they do, while the reason why farmers have other jobs is because the area of cultivated land is small which cannot provide for the family economically, the types of work that are usually other jobs for farmers are construction workers/handyman, and entrepreneurship.
In measuring the level of farmer welfare, can be measured from several indicators. Welfare indicators are a measure of society's achievements, whether society can be said to be prosperous or not. Health indicators that are components of prosperity are adequate shelter, clothing, and daily health. Development in the health sector aims to ensure that all levels of society can obtain health services easily, cheaply, and evenly.

The impact of the conversion of agricultural land on welfare is not always bad. This depends on what form the land is converted into. From the research results it was found that agricultural land converted into shophouses and pools can increase income because the opportunities for land conversion are better than those in the agricultural sector and less elastic to income, on the other hand, this type of conversion is usually carried out to support businesses outside of agriculture that they are involved in, such as traders making shophouses to expand their business networks and fish farmers converting their land into ponds so that fish production can be increased.

Land conversion has a positive and significant influence because changing land functions can increase farmers' income. Land conversion results in increased farmer income. This condition is caused by several farmers deciding to look for replacement arable land by locating in other places where they have wider control of the arable land. Another reason that results in increased income due to land conversion is the change in business activities from agriculture to rented houses (boarding houses) which can only be carried out by farmers who have land owner status. When compared to farming income on agricultural land in general, it is generally only to meet needs. Meanwhile, income from the new business (after conversion in the form of a boarding house) can be received regularly every month with a value many times greater than that from the previous farming business. This is also the driving force for the increasing number of land conversion activities. In line with research conducted by (Lubis et al., 2018) and (Gunawan, 2019). Based on the results of his research, it was stated that the conversion of agricultural land to farmers' income had a positive impact on increasing farmers' welfare.

CONCLUSION AND RECOMMENDATION

From the results of research on factors that improve community welfare in Cengkeh Turi Village, several conclusions can be expressed as follows:

1. The CFA test on the KMO and Bartlett's Test tables shows that the data is valid and can be analyzed further with factor analysis. The Bartlett test value states that the correlation matrix formed is an identity matrix, or in other words the factor model used is good and in the Rotated Matrix table it is known that of the eight factors 4 factors are worthy of influencing the welfare of the community which has a significant influence on the welfare of the people of Cengkeh Village. Turi, namely distribution, climate, labor, and land conversion.

2. The results of multiple linear regression show that if distribution increases, community welfare will increase, if the climate decreases, community welfare will increase, if labor increases, community welfare will increase,
and if land conversion increases, community welfare will increase. The results of the partial hypothesis test show that distribution, climate, labor, and land conversion have a positive and significant effect on the welfare of the community in Cengkeh Turi Village.

At the end of the writing, the author provides suggestions that can later be used to build and become a study for us so that we can improve the factors that influence the welfare of the community in Cengkeh Turi Village. The suggestions given include:

1. It is hoped that local governments will conduct training or field demonstrations on appropriate fertilizer use, effective weed control, or efficient irrigation techniques.
2. It is hoped that there will be facilitation of network development and partnerships between farmers, agricultural institutions, and related business actors to assist in expanding farmers’ access to resources, technology, financing, and markets that can support increasing farmer production.
3. It is hoped that the government will assist with advanced tools to make it easier for the community to manage agriculture and at the same time provide training in operating or using the tools provided.
4. It is hoped that by evaluating and monitoring farmer production and the practices adopted, an understanding of the successes and challenges faced can be obtained.
5. It is hoped that the government or agricultural empowerment institutions will assist in the form of seeds, sophisticated tools, or capital in managing community agriculture in Cengkeh Turi Village.
6. It is hoped that further research will deepen understanding of the factors that influence farmer production in Cengkeh Turi Village. For example, research could be conducted to evaluate the effects of climate change on farmers' production or identify more specific socioeconomic factors.

FURTHER STUDY

This research still has limitations so further research on the topic still needs to be done “Analysis of Rice Farmer Problems in Improving Community Welfare in Kelurahan Cengkeh Turi Kota Binjai.”

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