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THE RESPONSE OF RICE PLANTING AREA TO RICE AVAILABILITY IN SOUTH SUMATRA, INDONESIA

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Abstract: South Sumatra has succeeded in meeting local rice needs. Nonetheless, rice production in South Sumatra has not been able to significantly contribute to meeting the ever-growing needs of Indonesia's population. Therefore, the government is always trying to increase rice production by increasing productivity and expanding the rice planting area. Rice is not only an economic good, but has become a political item. Therefore, government intervention is quite intense in stabilizing the availability of rice. One of the interventions carried out by the government of South Sumatra is targeting the planting area as a response to the availability of rice in the previous year. The purpose of this study was to analyze the response of planting area at the farmer level to changes in rice availability and supply elasticity in South Sumatra by using the previous year's planted area and the availability of rice from South Sumatra as determining indicators. The method used in this study is multiple linear regression using secondary data over a period of 20 years. The results show that the availability of rice in South Sumatra significantly affects the area planted with an elastic supply elasticity. Therefore, government programs such as printing new land or adding planting area (LTT), land optimization through increasing the planting index, and using abandoned land are urgently needed to support sustainable rice self-sufficiency in South Sumatra.

Keywords: availability of rice, planting area, supply elasticity, South Sumatra

Abstrak: *Sumatera Selatan berhasil memenuhi kebutuhan beras lokal. Meskipun demikian, produksi beras Sumatera Selatan belum dapat memberikan kontribusi secara signifikan untuk memenuhi kebutuhan penduduk Indonesia yang selalu bertambah. maka dari itu, pemerintah selalu berupaya untuk meningkatkan produksi beras melalui peningkatan produktivitas dan perluasan areal tanam padi. Beras tidak hanya sebagai barang ekonomis saja, namun sudah menjadi barang politis. Oleh karena itu intervensi pemerintah cukup intens dalam menstabilkan ketersediaan beras. Salah satu intervensi yang dilakukan pemerintah Sumatera Selatan adalah menargetkan luas tanam sebagai respon dari ketersediaan beras tahun sebelumnya. Tujuan penelitian ini menganalisis respons luas tanam di tingkat petani terhadap perubahan ketersediaan beras dan elastisitas penawaran di Sumatera Selatan dengan menjadikan variabel luas tanam tahun sebelumnya dan ketersediaan beras dari Sumatera Selatan sebagai indikator penentu. Metode yang dilakukan dalam penelitian ini adalah regresi linier berganda menggunakan data sekunder dalam kurun waktu 20 tahun. Hasil menunjukkan ketersediaan beras Sumatera Selatan berpengaruh nyata secara signifikan terhadap luas areal tanam dengan elastisitas penawaran bersifat elastis. Oleh karena itu, program pemerintah seperti percetakan lahan baru atau luas tambah tanam (LTT), optimasi lahan melalui peningkatan indeks pertanaman dan pemanfaatan lahan terlantar menjadi sangat diperlukan untuk mendukung swasembada beras berkelanjutan di Sumatera Selatan.*

Kata kunci: *ketersedian beras, luas areal tanam, elastisitas penawaran, Sumatera Selatan*

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INTRODUCTION

Maintaining an adequate food supply is vital to creating a healthy, and socially stable population. The agricultural sector is essential for the nation's economy and can meet the food needs of the Indonesian people (Christiano, 2013). The primary source of calories is rice which is the main source of calories for Indonesian people (Faharuddin et al. 2017). According to (Siregar, 2015), food is a vital human need. Therefore humans will not be separated from the need for food. Food crops are the primary staple food producer for 97% of Indonesia's population.

Perfect food security can be achieved through achieving self-sufficiency in food, where the most appropriate step is to increase national food production, both globally induced and locally. Induced to anticipate rapid population growth (McCarthy et al. 2018), shrinking of agricultural land culture (Hou et al. 2019; Qiu et al. 2020); Changes in socio-economic conditions (Garibaldi and P'erez-M'endez, 2019), such as shrinking agricultural land resources for food crops is also expected to reduce overall food production (van et al. 2017). This exacerbates food insecurity with increased demand for food due to population growth (Avery et al. 2019; Mondal and Sanaul, 2019).

Local food production is expected to be able to adjust to some of the changes that occur quickly (Javadi et al. 2022). Rice is the food-crop commodity with the most crucial position in agricultural development (Terano et al. 2015). Rice is the main staple food and tends to be single in various regions in Indonesia, including areas that previously had non-rice staple food patterns, so most of the energy and protein consumed by the people came from rice.

Consumption of rice is essential for Indonesian people. Therefore, the rice must be available in sufficient quantity, meet quality standards, and be at a reasonable price to maintain food affordability for the community. Considering that every Indonesian consumes 139.50 kg of rice annually, it can be argued that rice consumption in Indonesia is quite large. At 60 kg per year, Indonesia consumes more rice than any other country (Hermanto in Christiano, *2013*).

Rice consumption in Indonesia is increasing every year in line with the increasing population of Indonesia. The dependence of the Indonesian people who are very high on rice will be a problem if the availability of rice cannot be fulfilled, which can disrupt national food security (Central Bureau of Statistics, 2009; Janti, Martono, and Subejo, 2016).

Indonesia's rice production has increased from year to year. According to data from the Central Bureau of Statistics, rice production has increased by around 10 tons (Daulay et al. 2016). However, an increase in rice production may not necessarily be able to meet the domestic demand for rice. This is because the population of Indonesia continues to grow. Wibowo (2016 and 2022) examines food security by using the variables of rice production, rice availability, and rice prices as indicators that impact food security. The research analysis results show that rice production positively and significantly affects food security. The availability of rice affects food security. At the same time, the price of rice does not affect food security. This research should have examined how to improve food security through production and food database preparation.

A government program that aims to increase national rice production through increasing planting area (LTt). Studies (Pujiharti, 2017; Santoso and Aryati, 2022) to determine the rice balance by comparing the production and consumption values of rice per month for a year. The research results showed the need for rice was met, although, in some months, there was a decrease due to the smaller planting area compared to other months. Previous research has not provided a solution for elasticity and how much additional land area is needed to meet changes in rice availability. This study is significant in determining how much different land area is necessary for rice self-sufficiency in South Sumatra.

South Sumatra is the fifth-most productive province in the world. South Sumatra can produce 2.75 million tons of dry-milled unhusked rice in 2022. However, rice production is still not sufficient to meet the needs of Indonesia's growing population growth every year. Therefore, the government continues to increase rice production, primarily by increasing rice productivity and expanding the rice planting area. This research is a development of several indicators used in previous studies by (Pujiati et al. 2020; Rahayu, 2021; Santoso and Aryati, 2022) regarding the need for planting areas in Indonesia so that rice availability is met. With the use of several variables from other regions that are applied in South Sumatra.

The availability of rice in South Sumatra has decreased from 2019 to 2021. In 2022 the availability of rice will begin to increase significantly. Rice production in South Sumatra fluctuated but still experienced a surplus of rice. Rice production has fluctuated due to crop failures in several areas, especially in swamp-contoured rice fields caused by continuous rains so that agricultural land continues to be submerged in water due to climate change. This study aims to be able to analyze how much additional land area is needed to be able to adjust and meet the forecast of rice availability in South Sumatra Province so that it can meet provincial and national food needs and look for other alternatives to replace the additional land area, such as increasing IP, using superior seeds , and others (Sasmi et al. 2022).

METHODS

The data obtained or used in this research is secondary data. Secondary data were obtained from related institutions or agencies related to this research. This study obtained data from the Central Bureau of Statistics, the Department of Agriculture, the Office of Commerce, and the State Logistics Agency (BULOG Public Company). The data needed are data on planting area, rice production in South Sumatra, rice entering South Sumatra, and rice out in South Sumatra. The secondary data used is annual time series data with a period of 20 years, from 2003 to 2022.

In quantitative research, data analysis activities are divided into two, namely the activities of describing data and conducting statistical tests (inference). The activity of describing data is describing existing data. The data processing method used to answer the first objective is identifying the phenomenon of changes in rice production behavior, incoming and outgoing rice, which will be carried out descriptively based on the tabulated data obtained. Analyze the effect of rice demand on planting areas in South Sumatra using multiple regression analysis (Mansyur, 2017; Suriyani and Soejono, 2022).

Statistical tests for modeling are carried out using the classical assumption test and then multiple regression analysis is performed which is a statistical technique that is useful for examining and modeling the relationships between variables. In social sciences research, this analysis is a suitable method to solve social problems (Tranmer et al. 2020). The general equation for multiple linear regression is as follows:

$$\gamma i = \alpha + \beta 1X1i + \beta 2X2i + ... + \beta nXni + \varepsilon$$

The dependent variable (Y) in this research is the planting area in South Sumatra (Y_{LTt}) (Abdullah et al. 2022; Santoso and Aryati, 2022) presented that changes in planting area can be measured by one of them using rice availability variables (production, incoming and outgoing rice) (KB_{t-1}) and the previous year's planting area (LT_{t-1}) and many more. In this study only two independent variables were taken. The equation of multiple regression created in this study was:

$$Y_{LTt} = \alpha + \beta 1KB_{t-1} + \beta 2LT_{t-1} + \varepsilon$$

This research was conducted simultaneously with the measurement results, and then it will be seen how far the influence of the independent variables on the output (binding variable). Conducted this research simultaneously with the measurement results, and then it would be seen how far the influence of the independent variables had on output (variable linkages). Regression was used to see whether changes in rice planting areas at the farm level affected rice availability in South Sumatra. Where Y_{LTt} denotes the amount of the planting area in South Sumatra (hectare). α is intercept of model. B1 and $\beta 2$ are estimated parameters. Then, KB_{t-1} + LT_{t-1} independent variables availability of rice (tons) and the area planted in the previous year (tons). ε indicates error term. Availability of rice (Tons)

According to research (Ahmada, Sri, and Qonita, 2018), the variable area of planting area in year (t) is the most dominant variable of rice supply in Klaten Regency. The short-term and long-term elasticity values for the planted area in year (t) were elastic. Based on the findings of previous studies, changes in the availability of rice in South Sumatra are thought to have had a significant impact on the planting area at the farmer level in South Sumatra. Second, the level of elasticity of the response of the planting area to the availability of rice is estimated to be elastic. The stages carried out in this research can be seen in Figure 1.

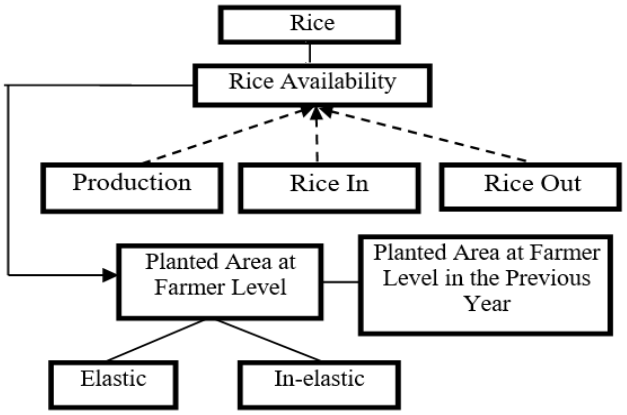

Figure 1. The stages of research

RESULTS

The phenomenon of Development of Planted Area, Production, Rice In, Rice Out, and Availability of Rice in South Sumatra

The planting area of South Sumatra in this study is the total area of rice fields planted by farmers in South Sumatra. The total cultivated area in South Sumatra was obtained from the total of the paddy rice planting area plus the dry field rice planting area in South Sumatra. Regencies/cities with the highest total rice planting area were in Banyuasin, East OKU, and OKI Regencies. The development of South Sumatra's planting area for 20 years can be seen in Figure 2.

Figure 2. represents the growth of rice planting areas in South Sumatra over the last 20 years. The planting area 's development was erratic and fluctuating. The planted area increased by 3.61 percent on average. Between 2007 and 2016, there was a significant increase in cultivated areas. This is because farmers receive a lot of support from both the federal and local governments. The assistance provided consisted of agricultural tools and machinery such as hand tractors and large tractors, rice harvesting machines, fertilizer assistance, and irrigation construction. Tafarini and Yazid (2018) Reported that government assistance and farmer contributions, such as improving irrigation, significantly increased farmers' income, optimizing land, and creating new rice fields. The planting speed has grown with the assistance of agricultural tools and machinery. Food sovereignty special efforts (UPSUS) by the ministry of agriculture because, according to the ministry of agriculture, many districts in South Sumatra are capable of significantly increasing their agricultural production (Purba et al. 2021). Government assistance is essential in implementing sustainable agriculture practices.

The increase in rice planting area from year to year over 20 years is in line with the government's efforts to make South Sumatra a food storage province. An increase in the planting index or IP, from IP 100 to IP 200 (Honorita et al. 2020), optimization of abandoned land, and assistance with agricultural machines. However, when examined closely, the rice planting area in South Sumatra has decreased several times. In 2008, there was a significant decrease in the planting area. In 2008, the rice planting area decreased with a percentage value of growth rate or percentage decrease of 7.62 percent from the previous year due to many farmers converting paddy fields into rubber plantations. At that time, the income from planting rubber was higher, and the maintenance costs tended to be lower than planting rice, so according to farmers, rubber plantations were more profitable. In the last four years, back to 2017 and 2018, the planting area of South Sumatra has decreased (Prasada and Rosa, 2018). In the jawapos.com article (2018), the decline in rice production is due to some swamp land only being harvested once due to flooding. In addition, 20 hectares of paddy fields in East OKU were also attacked by pests.

Development of Rice Production in South Sumatra

Rice production is defined by the value of the conversion of paddy into rice at a conversion rate of 63.20 percent to determine paddy production. Around 36.80 percent of the grain needed to make rice is lost. This low level of technology results in significant quantity losses from grain to rice, negatively impacting rice production. Therefore, technology that can raise paddy's value in rice while making it more efficient and cost-effective is required.

Paddy production in South Sumatra is expected to continue to increase to achieve self-sufficiency in rice. The efforts made by the government in collaboration with farmers are by increasing productivity, expanding planting areas and optimizing land, protecting food crops from pests, reducing yield losses, and increasing rice production. The development of rice production in South Sumatra can be seen in Figure 3.

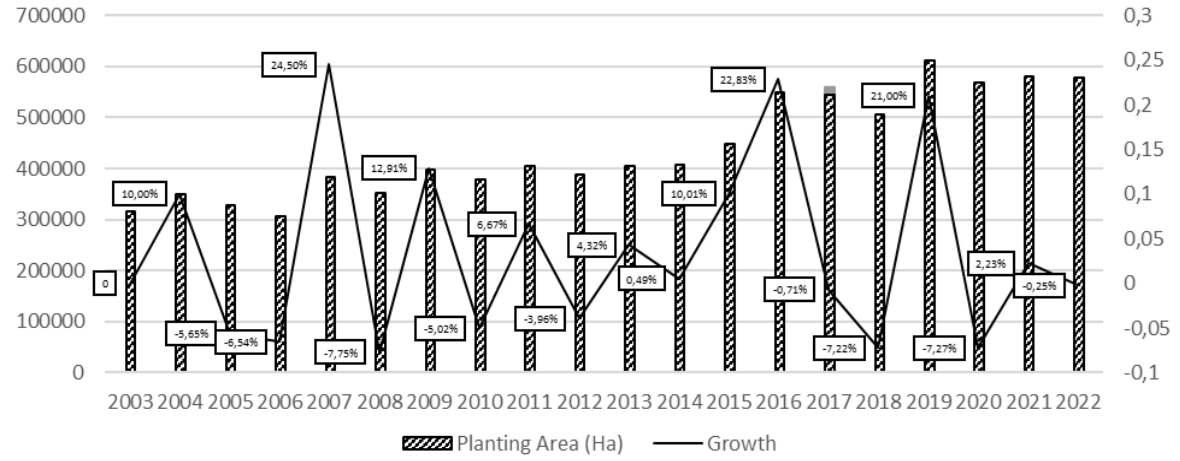

Figure 2. Development of South Sumatra Planted Area in 2003-2022

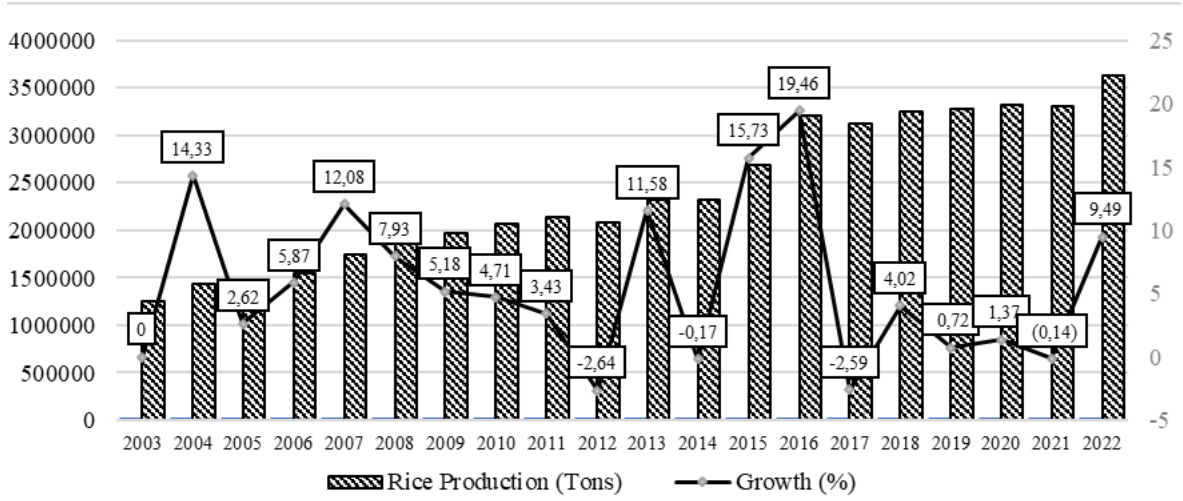

Figure 3. Development of Rice Production in South Sumatra in 2003-2022

Rice production in South Sumatra, for the period 2003 to 2022, experienced a growth rate of around 6.35 percent. Although South Sumatra's rice output has increased on average, a closer examination reveals that it has fluctuated. It is thought that natural circumstances are to blame for the variation in rice production (Afriana et al. 2022). The condition of biological factors greatly influences rice production in South Sumatra because most of the rice fields in South Sumatra rely on rain-fed and tidal irrigation. The dry season causes South Sumatra to experience drought in paddy fields and little rain. In 2017 and 2018, South Sumatra's planting area decreased. This is due to the natural conditions of South Sumatra. The decline in rice production was because some paddy fields were only harvested once due to flooding. In addition, a 20-hectare rice field in East OKU was also attacked by pests.

Since the assistance program for farmers was provided by the government, currently, farmers can harvest twice or even three times a year. Production has tripled because it uses superior seeds and sophisticated technology.

Development of Rice In and Rice Out in South Sumatra Province

Rice in and out refers to the amount of rice coming into and out of South Sumatra. The rice that goes out of South Sumatra is obtained from the sum of rice production plus incoming rice minus the consumption of South Sumatran rice. The development of the amount of rice entering and leaving South Sumatra can be seen in Figure 4.

In Figure 4, it can be seen that the development of rice in and rice out in South Sumatra from 2003 to 2022 has been very volatile. (BPS, 2021) the occurrence of incoming and outgoing rice in South Sumatra is caused because South Sumatra is one of the cross-trade areas

or an open area that causes the rice to enter and exit. Even though the rate of population growth in South Sumatra has increased year after year, the amount of rice produced is always in excess, or there is a rice surplus. But there is still rice coming in from other provinces to South Sumatra Province because the rice has not been distributed evenly because there are still some areas that are categorized as rice deficits and a large amount of food production is sold outside the region

The rice surplus that occurs in South Sumatra can spread to several regions in Indonesia, allowing the demand for rice in these areas to be met. Outside of South Sumatra, such as the provinces of Bengkulu, Jambi, Riau, Bangka Belitung, Lampung, and Jakarta. According to research (Djamaluddin et al. 2019) future forecasting results from changes in the area of paddy fields in Gowa Regency will decrease. They will no longer be able to meet the demand for rice. This research is important to prepare for the possibility in the future of facing rice scarcity because the rice field situation cannot be increased, so it can be planned how much productivity is needed so that the use of production inputs such as using superior seeds, irrigation improvements, the use of technology can be modified so that productivity increases even with rice fields that do not increase.

Development of Rice Availability in South Sumatra as a Function of Rice Demand

In this analysis, it is assumed that the demand for rice in South Sumatra Province equals the rice supply in that province. Figure 5. shows the evolution of rice availability in South Sumatra.

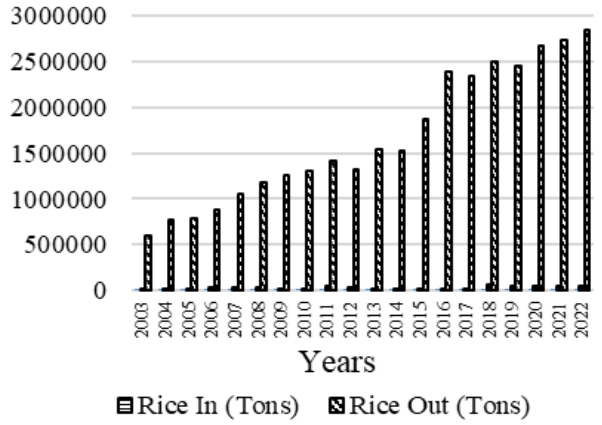

Figure 4. Development of Rice In and Rice Out of South Sumatra 2003-2022 (The data is processed using the following formula: BK = PB + BM – K(Ket. : BK= Rice Out, PB= Rice Production, BM= Rice In, K= Consumption))

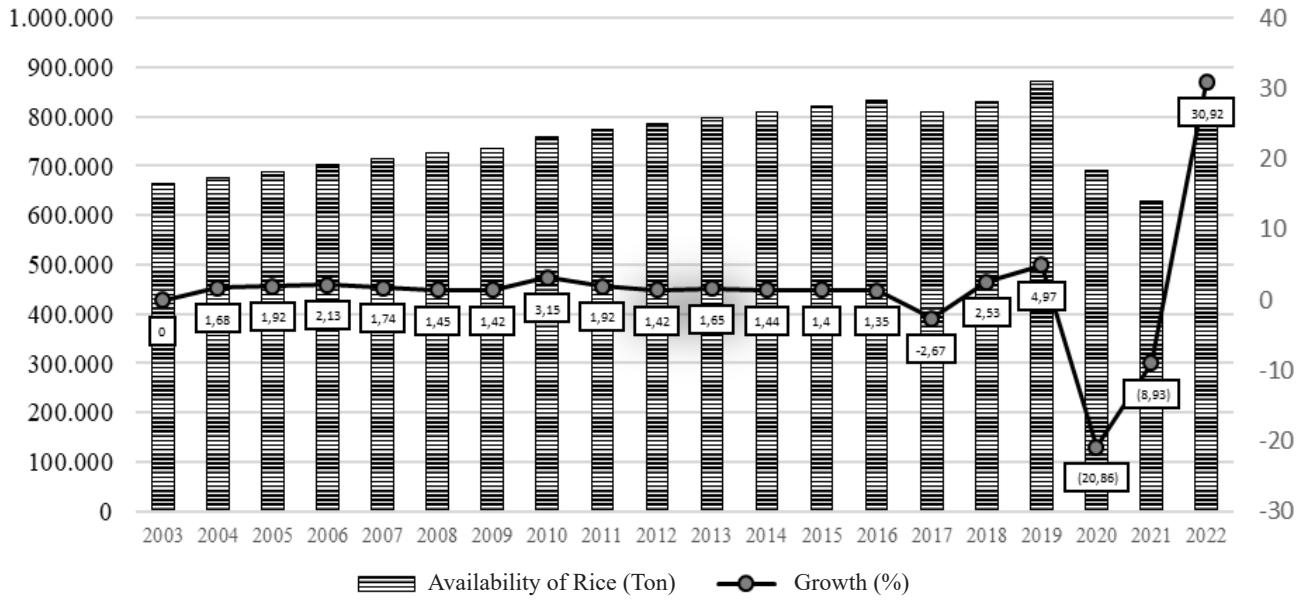

Figure 5. Development Availability of Rice in South Sumatra 2003-2022

It is clear that there has been a consistent annual increase in the availability of South Sumatra rice, with an average growth rate of 1.33 percent. The increasing availability of rice in South Sumatra is in line with both technological support for farmers and an annual increase in population in South Sumatra Province, which fulfills the need for rice by ensuring the availability of rice. The availability of rice in Indonesia is directly and significantly impacted by production and import factors. Ice seed subsidies can impact the availability of local rice, price subsidized urea fertilizer, subsidized NPK fertilizer prices, and irrigation assistance can affect the availability of local rice referred to (Ilyas et al. 2020).

Results of Response Analysis of Planted Area (LT) to Rice Availability (KB) in South Sumatra

In this study, it was hypothesized that the planted area (LT) had an impact on the availability of rice in South Sumatra (KBt). This can be demonstrated using the SPSS software's multiple regression analysis methods. The multiple linear regression model is tested to see if it satisfies the classical assumptions using the heteroscedasticity test, autocorrelation test, and normality test.

Heteroscedasticity Test

An equation without heteroscedasticity is good for a regression equation. The scatterplot graph can be used to analyze the findings of the heteroscedasticity test from the SPSS output. When the scatterplot's data processing results spread irregularly below or above the origin (number 0) on the Y axis, homoscedasticity is found. If the scatterplot displays predictable patterns, narrows, or widens, heteroscedasticity is present. (Sunyoto, 2016).

In Figure 6. It can be seen that the scatterplot of data processing results points that spread below and above the origin point (number 0) on the Y axis and do not have a regular pattern. This means that there is no heteroscedasticity or variance of the residuals from one observation to another having similarities.

Autocorrelation Test

The autocorrelation test serves to test whether, in a linear regression model, there is a correlation between residual errors in period t and errors in period t-1 (previous). To find out whether a linear regression model has autocorrelation or not is carried out with the Durbin-Watson test. The results of the autocorrelation test in this study obtained a dw value of 2,00 while a du value of 1,54 obtained a value of 1,54 <2,00 <2,46. So it can be concluded that in this linear regression study, there was no autocorrelation.

Normality test

The normality test is used to determine whether data is regularly distributed or not. The way to test normality using SPSS is to look at the normal probability plot, which is to compare the cumulative distribution of the normal distribution. If the data is normally distributed, it will form a straight diagonal line (Sugiyono, 2015). If the data distribution is normal, then the line that describes the actual data will follow the diagonal line.

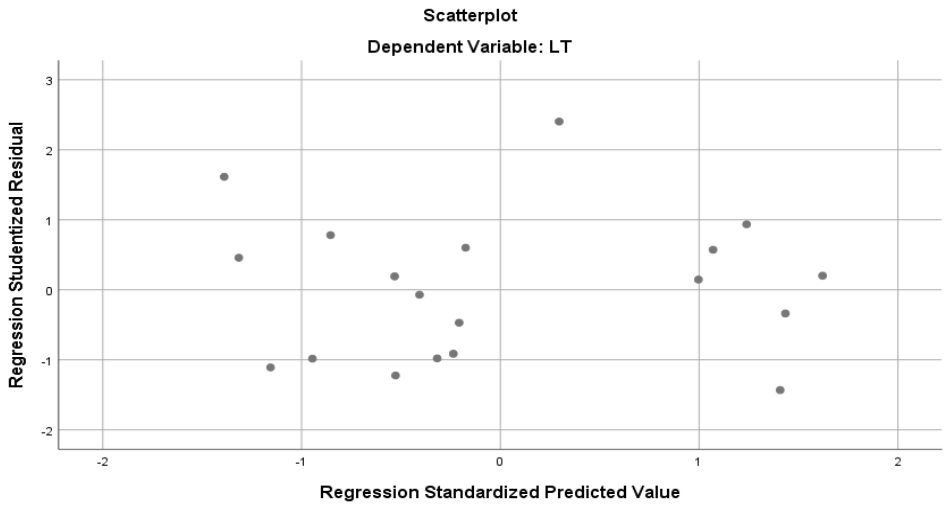

Figure 6. Heteroscedasticity Test Results

It can be seen in Figure 7. that the standard probability plot forms a straight diagonal line. This means that the independent variable data (X), namely rice availability data, and the dependent variable data (Y), namely the planted area data in the linear regression equation in this study, have fulfilled the classical assumption test.

Test Results for the Regression Model

The effect of the independent variable, namely rice availability (KB), on the dependent variable, namely planted area (LT), was analyzed by simple linear regression analysis with the help of SPSS version 25,00. The results of the regression response of planting area to the availability of rice in South Sumatra can be seen in Table 1.

Based on the results of the multiple linear regression analysis that we conducted, listed in Table 1, the relationship between planting area and rice availability can be expressed in a multiple linear equation as follows.

$$LTt = -13442.844 + 0.139KB_{t-1} + 0.923LT_{t-1}$$

Based on the equation above, it is known that the availability of rice has a positive regression coefficient (βi), which means that every addition of 1 unit of rice availability will increase the planting area in South Sumatra by 0,139 and the previous planting area by 0,923. A positive value indicates that if the availability of rice increases, the rice planting area of farmers will increase, and vice versa; if the availability of rice in the previous year decreases, the total rice planting area to be planted by farmers will also decrease. Teori klasik (tanpa intervensi pemerintah, dengan dengan bertambahnya ketersediaan beras akan menurunkan harga beras, selanjutnya direspon pasar dengan berkurangnya luas tanam. Namun berbeda halnya dengan komoditas beras di Sumatera Selatan, dengan adanya penentuan harga penertapan pemerintah (HPP) sebagai acuan harga di pasar sehingga harga relating stabil. Sehingga yang terjadi adalah pemerimtah menentukan target petambahan produksi dan ketersediaan beras selalu meningkat setiap tahun. Oleh karena itu peningkatan produksi danketersediaan tahun yang lalu akan tisgaruhi secara positif terhadap luas lahan tahun selanjutnya. tis proven that rice planting area is affected by the availability of rice. This research is a development of several indicators used in previous studies by (Pujiati et al. 2020; Rahayu, 2021; Santoso and Aryati, 2022) regarding the need for planting area in Indonesia so that rice availability is met. In line with the theory generated from previous research conducted by (Ekaputri, 2008) that rice planting area greatly affects the availability of available rice.

The coefficient of determination test can be used to find out how much the ability of the independent variable (availability of rice) in South Sumatra and the planting area of the previous year can explain the dependent variable (planting area) using R Square. Based on Table 1. It is known that the R square value is 0.841 or 84.10 percent. This indicates that the independent variable (availability of rice) in the previous year and the planting area of the last year influences the dependent variable, namely the rice planting area of farmers is 84,10 percent, according to research by (Rahayu, 2021) which explains that land is the most responsive variable in efforts to increase rice production so that it can increase rice farming income. In contrast, the remaining 15,90 percent is explained by other variables outside the regression model of this study. The variable that may also affect the total rice planting area of farmers in South Sumatra is the price of rice.

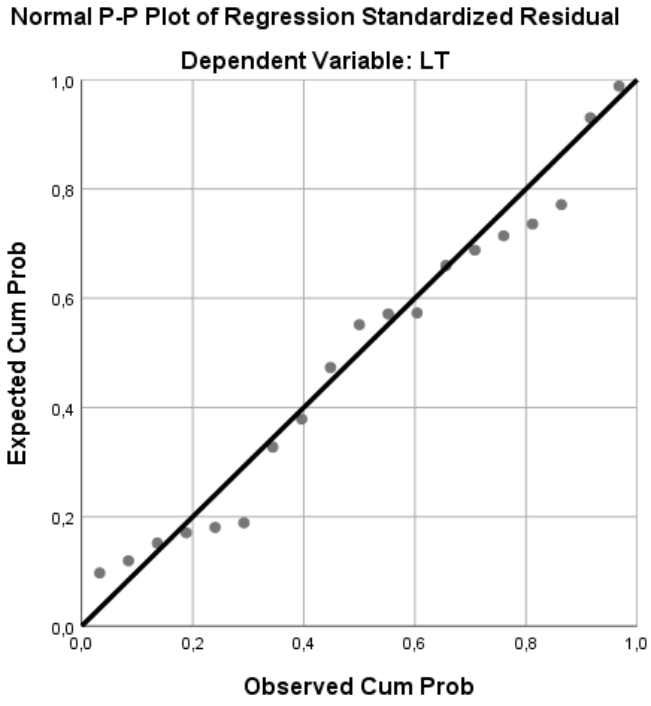

Figure 7. Normality test results

Table 1. Data from simple linear regression test results

Variable	Regression Coefficient	Standard Error	t-count	Sig.
Constant	-13442.844	205984.274	-0.065	0.949
KBt-1	0.139	0.284	0.490	0.631
LTD-1	0.923	0.109	8,484	0.000

Test Results of Effect of Previous Year's Availability of Rice (KBt-1) on Planted Area (LTt-1)

In Table 1, there is a table of significance test results; these values are used to determine the level of significance or linearity of the regression. Criteria can be determined based on the significance value test (Sig), with the condition that the Sig value <0.10. Based on Table 1. it is obtained that Sig. on the availability of rice in the previous year of 0.03, which means Sig. smaller than the significant criterion value of 0.10 (Sig. <0.10), meaning that the availability of rice in the previous year was substantial.

To find out whether or not there is an influence of the independent variable partially on the dependent variable, a hypothesis test or t-test is carried out. The t-count value for the availability of rice in South Sumatra the previous year was 2.40, while the t-table value was 1.78, so it can be concluded that t-count > t-table (2.40 > 1.78). It indicates that fluctuations in rice supply, thought to be caused by rice demand in South Sumatra, affect the total area of farmers' rice-growing fields. Ho is rejected, and Ha is approved. Since rice is the community's primary food source, farmers and the government constantly work to meet community needs. In addition to serving the needs of communities in South Sumatra, farmers also supply food to those outside of the South Sumatra region. The availability of Indonesian rice automatically rises with increased rice production. The government's concern is what caused Special Efforts (UPSUS), which included printing new rice fields and enhancing the irrigation system.

Test Results of the Effect of the Previous Year's Planted Area on the Planted Area (LT_{t-1}) Year t (LT)

The conversion of paddy fields that cannot be adequately controlled can threaten the food security of the population (Prasada and Rosa, 2018). Table of significance test results, this value is used to determine the level of significance or regression linearity. Based on this table, the planting area of the previous year was greater than the significant criterion (Sig. > 0.10), meaning that the planting area of the last year was significantly affected by the availability of rice. The previous year's planting area had an effect because rice farmers were the primary profession, and there was no other job besides planting rice, so the rice planting land owned by farmers was optimally functioned by farmers because farmers were not worried if the rice produced exceeded demand because farmers would distribute the rice. Maximum planting area followed by increased production will increase the availability of rice.

The elasticity of Short and Long-Term Supply

Changes in rice availability cause a percentage change in planted areas. The supply elasticity is computed both in the long and short run (Zamil et al. 2020). Short-term to long-term supply elasticity shifts take time to adjust. The price elasticity of supply in the short term is 1.28. This means that if the total rice supply rises by 1%, supply at the farm level, i.e., total planted area, rises by 1.28% (elastic). Meanwhile, the long-term elasticity value obtained is 2.13, implying that if incremental rice availability increases by 1%, the total planted area increases by 2.13 %.

The increase in the availability of rice is due to farmers and the government trying to increase rice production in South Sumatra with government programs considering that South Sumatra is an area with a potential surplus of rice. The amount offered by farmers exceeds the demand for rice in South Sumatra because farmers can sell rice products out of South Sumatra and increase farmers income.

CONCLUSIONS AND RECOMMENDATIONS

Conclusion

This study investigated how food security can be ensured within Indonesia under population changes with the availability of land in Indonesia. The results demonstrated that the planted area of South Sumatra from 2003 to 2022 experienced fluctuating growth with an increasing tendency, with an average of 3.66 percent. The years with the largest growth rates occurred

because the government provided a lot of assistance to farmers in the form of new technology and the printing of new land. The increase in rice production was in line with the increase in the area planted to rice. The total area of South Sumatra rice planting area of farmers has a significant effect on the availability in South Sumatra. The problem of decreasing planting area due to increasing population and land fragmentation, followed by reduced production inputs, will result in a decrease in rice availability. In the short term and long term, the elasticity of supply is elastic, meaning that changes in the planted area can follow changes in the demand for rice in South Sumatra.

Recommendations

The government help farmers more by providing technical assistance to increase the conversion value of paddy into rice efficiently, and speed up the cultivation and harvesting process. It is hoped that government programs such as creating new agricultural land or increasing planting area (LTt) by using unproductive land, optimizing the land index through increasing planting using superior rice varieties for swamps, optimizing abandoned land , and assisting agricultural tools and machines will continue and expand from year to year, making South Sumatra a food storage province. Future researchers can improve this research by adding other variables related to the availability of rice.

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