



# Welfare of Paddy Farmers and the Influence of Paddy Prices on Rice Prices in Lumajang Regency

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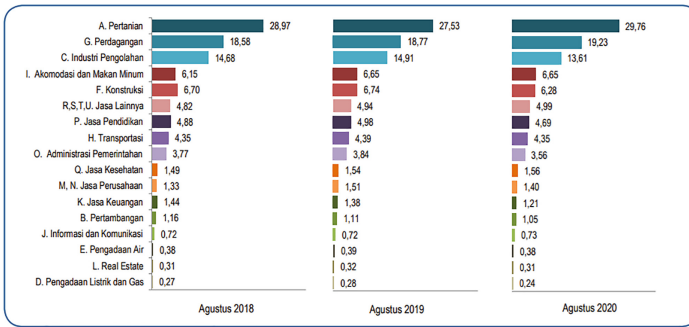
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**Abstract.** Rice products come from paddy cultivated by farmers. Farmers as upstream actors in rice agribusiness obtain lower exchange rates than paddy and rice traders. This condition reflects the low purchasing power of farmers from paddy farming for the products consumed (e.g., rice). This study aims to (1) determine the welfare of paddy farmers and (2) analyze the effect of paddy prices at the farm level on rice prices at the district level. This research was carried out in the Candipuro and Jatiroto districts in Lumajang regency. The regency was chosen as the research site as it is one of the food-storage areas in East Java, with paddy as the main commodity. The respondents were paddy farmers. The Snowball method was operative upon gaining the research sample. The primary research data were obtained from farmers through a direct interview, while the secondary data were obtained from the Department of Agriculture and Central Agency of Statistics (BPS) of Lumajang Regency. To address the first research objective, farmers' share was put under analysis. Multiple linear regression was performed to address the second objective. The results highlighted the following findings: (1) the paddy farmers in Jatiroto district were prosperous, while those in Candipuro district were found to have fair prosperity; and (2) Paddy rice at the farm level in Candipuro district and Jatiroto district influenced rice prices in Lumajang regency. Partially, the price at the farm level in Jatiroto district posed no significant effect on the rice price in the regency level, while the paddy price at the farm level in Candipuro district had a significant effect on the rice price at regency level.

**Keywords:** paddy price · rice price · welfare Introduction

## 1 Introduction

Indonesia is an agricultural country because most of its population work in the agricultural sector. Agricultural sector accounted for the highest percentage of the national business sector from 2018 to 2020 as described in Fig. 1 [1]. The figure reports on the three most dominant business sectors, with the agricultural sector leading the table, followed by the commerce sector and the processing industry. The percentage of the



**Fig. 1.** Percentage of the working population by the main profession in Indonesia from August 2018 to August 2020 [2]

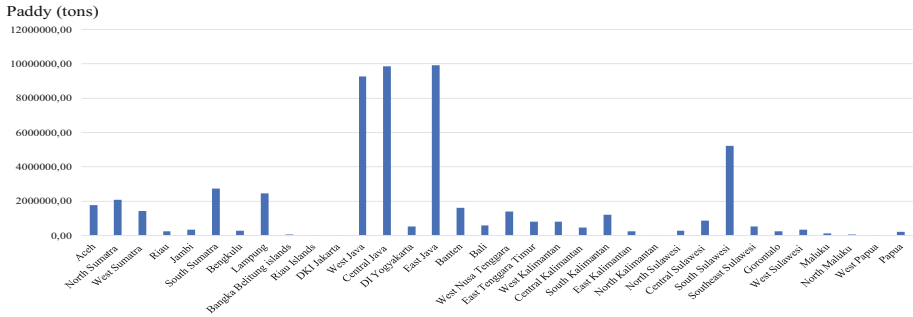
population working in the agricultural sector in 2018 was 28.97%, which fell to 27.53% (a decrease of 0.05%) in 2019. However, the population working in the agricultural sector increased to 29.76% in 2020 (positive growth of 0.08%).

One of the agricultural commodities with strategic value is rice. Rice plants are cultivated by a portion of the Indonesian population in all provinces (see Fig. 2). As seen in Fig. 2, the provinces with the most average rice production in the 2018–2021 period were East Java (9,909,404.28 tons), Central Java (9,852,393.58 tons), West Java (9,275,864.35 tons), and South Sulawesi (5,217,029.95 tons).

Paddy farmers are the main actors in paddy and rice agribusiness. However, their welfare is very low, as the average household income of farmers is reported at only around 30% of the total family income. This could be due to inefficient processes during cultivation (input use), post-harvest, and marketing. Rice farming was not technically efficient [4, 5] and allocative efficiency was hardly achieved [6]. Post-harvest is conducted too early because farming is the only source of income to fulfill farmers’ daily needs. Furthermore, their knowledge about proper post-harvest handling is insufficient. While post-harvesting is problematic, marketing is even more complicated [7].

Paddy and rice are distributed to consumers through various traders. In marketing theory, the more traders are involved in marketing, the more varied the pattern of marketing channels will be. In general, a longer marketing channel leads to a greater marketing margin and a smaller share for farmers [8, 9]. There is a big difference between the prices of paddy at the farm level and the consumer level. Low prices will lead to significant reeducation in farmers’ income. As the prices of basic daily needs are constantly on the rise, farmers find it difficult to afford the main food ingredients (e.g., rice). In other words, the farmer’s exchange rate is low, and this subsequently affects their purchasing power and welfare.

One of the regencies in East Java known as a producer of paddy and rice is Lumajang. In 2021, paddy production was recorded at 499,503 tons of GKP (dry threshed paddy), with rice production marked at 294,865.05 tons [10]. The rice price (GKP) is Rp. 4,600, while that of GKG (unhusked dry rice ready for milling) is Rp. 5,500, and rice at the consumer level (regency) is sold at Rp 10,537.67 [11]. These figures demonstrate significant gaps between actors Grain farmers get the lowest price, while the price of



**Fig. 2.** Average rice production (tons) by the province in Indonesia from 2018 to 2021 ([3], processed in 2021)

rice is almost double the price of paddy. Addressing this issue, the research aims to determine farmers' welfare and the effect of rice prices at the district level on those at the district level.

## 2 Research Method

The research was purposively conducted in Candipuro and Jatiroto districts of Lumajang regency in 2021, as these districts were known for their substantial potential in rice production. It involved farmers in both districts and rice retailers as participants. These participants were recruited using the snowball method. Both primary data and secondary data were put under analysis. These data were garnered through an interview, survey, and documentation.

Farmers' welfare was calculated using the following formula:

$$P = Pf/Pr \times 100\% \quad (1)$$

where:  $P$  = farmer's welfare (%),  $Pf$  = paddy price (Rp/kg), and  $Pr$  = rice price (Rp/kg).  $P$  value is determined by following on farmer's share efficiency.  $P$  value over 40% marks efficiency and decent rate of welfare, while any value below 40% is deemed inefficient or low welfare, and  $P = 40\%$  is moderate [12].  $P$  denotes the ratio of paddy price to rice price, which also represents farmers' purchasing power. This research defines farmers' welfare with respect to the rate of efficiency.

A multiple linear regression analysis was used to determine the effect of paddy prices at the district level on rice price at the regency level by following who recommends the equation below [13]:

$$Y = a + b_1X_1 + b_2X_2 \quad (2)$$

where  $Y$ =rice price in Lumajang regency (Rp/kg),  $X_1$ = paddy price in Jatiroto district (Rp/kg),  $X_2$ = paddy price in Candipuro district (Rp/kg),  $a$ =constant,  $b_1$  and  $b_2$ = regression coefficients. When the  $F$  value is below 0.05, the model is proven feasible, which also implies that rice prices in the districts simultaneously affect that in the regency. Once the model is proven feasible, a  $t$ -test is performed to find out whether paddy price significantly affects rice price.

**Table 1.** Data on Paddy Prices, Rice Prices, Farmer's Share, and by District/Regency in Lumajang Regency in 2021

District/Regency	Paddy Price (Rp/kg)	Rice Price (Rp/kg)	P (%)	Criteria
Jatiroto district	4,550		42	Decent welfare
Candipuro district	4,350		40	Moderate welfare
Lumajang regency		10,855		

Source: primary data is processed, 2021

### 3 Research Result

#### *The Paddy Farmers' Welfare*

To analyze rice farmers' welfare, the criteria for farmer exchange rate were applied. The analysis results of the rice farmer exchange rate in Lumajang regency are presented in Table 1.

Referring to Table 1, the paddy price in Jatiroto district is higher by Rp. 200 than that in Candipuro district. The price of rice in Jatiroto is higher than in Candipuro because Candipuro sub-district is the largest rice-producing area in Lumajang district so that the price of rice in Candipuro sub-district is very competitive with lower prices than in Jatiroto sub-district as a smaller paddy producer than Candipuro district. This is the same as what happened in Sukoharjo district, the price of paddy in Sukoharjo is higher than Tawang Sari districts because not all Sukoharjo areas are rice barns [14].

By implication, this difference also signifies different farmers' share with the rice price in Lumajang regency marked at 10,855. The farmers' share in Candipuro district is 40%, meaning that their welfare remains at moderate level. While the farmers' share in Jatiroto district is 42%, meaning decent level of welfare. Simply put, the farmers in Jatiroto district reach better welfare than those in Candipuro district. Higher rice prices will provide more welfare to farmers [15, 16].

#### *The Effect of Paddy Price at the District Level on Rice*

To determine the effect of rice price at the district level on rice price at the regency level, multiple linear regression analysis was performed. The analysis results are shown in Table 2.

Based on the analysis results in Table 2, the regression model below represents the effect of rice prices at the district level on rice prices at the regency level:

$$Y = -72.947 + 0.56 X_1 + 0.744 X_2 \quad (3)$$

The model feasibility test (F test) was the initial stage in identifying a feasible regression model. The analysis results document an F value of 0.00, which is well below 0.05. This confirms that model (3) can account for the simultaneous effects of paddy prices in both districts on the rice price in the regency.

**Table 2.** Multiple Analysis Test Results

Model	Unstandardized Coefficients)		Standardized Coefficients	Sig.
	B	Std. Error	Beta	
(Constant)	-72.947	669.360		0.916
X <sub>1</sub>	0.356	0.212	0.318	0.127
X <sub>2</sub>	0.744	0.212	0.664	0.007*

Probability F = 0.00  
R<sup>2</sup> = 0.863

Source: primary data is processed, 2021

Description: \*significant at 95% confidence level

A test of coefficient determination (R<sup>2</sup> test) was used to measure the extent to which the model can explain the variation of the dependent variable. An R<sup>2</sup> value of 0.863 means that the paddy price in both districts account for 86.3% of the rice price in the regency, while the rest 13.7% is affected by extraneous variable.

Regression test (t-test) aimed to test whether the parameters (regression coefficients and constants) were able to estimate the equation/model. Besides, this test helped to determine whether the parameters explained the independent variable as the determinants of the dependent variable. The analysis results are presented as follows.

- X<sub>1</sub> (paddy price in Jatiroto district): The coefficient value of X<sub>1</sub> is 0.356 with a p-value of 0.127 > 0.05 meaning that the paddy price in Jatiroto district has no significant effect on the rice price in Lumajang regency, assuming other variables deemed constant. This happens because the price of rice in Jatiroto District among farmers is relatively the same.
- X<sub>2</sub> (paddy price in Candipuro district): The coefficient value of X<sub>2</sub> is 0.744 with a p-value of 0.007 < 0.05 meaning that the paddy price in Candipuro district has a positive significant effect on the rice price in Lumajang regency with a 95% confidence interval, assuming other variables deemed constant. Every increase of Rp 10 in the paddy price in Candipuro district will increase the rice price in Lumajang regency by Rp. 7.44. Paddy prices have a significant effect on rice prices also shown by several researchers [16–18].

## 4 Conclusion

Referring to the findings, this research has drawn two important conclusions. First, the farmers' welfare in Jatiroto district is marked at a decent level, while that in Candipuro district is found neutral. Furthermore, the farmers' welfare in Jatiroto district is proven higher than that in Candipuro district. Second, the paddy prices in both districts simultaneously affect the rice price in Lumajang regency at a 95% confidence interval. Nevertheless, partially, only the paddy price in Candipuro district has a significant positive effect on rice price in Lumajang regency at a 95% confidence interval.

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