



UDC 332

IS THERE A PRICE DISPARITY BETWEEN MEDIUM AND PREMIUM RICE IN TRADITIONAL MARKETS BEFORE, DURING, AND AFTER THE COVID-19 PANDEMIC?

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ABSTRACT

Rice is a vital commodity for Indonesian society and highly sensitive to price fluctuations. This study analyzes the trends and price disparity of Medium-1 and Super-1 quality rice in traditional markets of East Nusa Tenggara (NTT) before, during, and after the COVID-19 pandemic. Monthly data from January 2018 to December 2023 were analyzed using the Coefficient of Variation and simultaneous testing (F-test) within a Completely Randomized Design (CRD). Results show that prior to the pandemic, Medium-1 rice prices were stable at around IDR 11,000/kg, decreasing to IDR 9,800/kg. During the pandemic, prices surged to IDR 15,000/kg by early 2023, likely due to increased demand from government social assistance programs, and remained high post-pandemic, reaching IDR 17,000/kg in Maumere. The highest price fluctuations occurred during the pandemic, with variations of 12.75% for Medium-1 and 11.89% for Super-1 in Maumere. The F-test indicates that the pandemic did not significantly affect price changes in Alok and Tier markets.

KEY WORDS

Price, covid-19 pandemic, medium-quality rice, super-quality rice, traditional market.

Rice stands as a fundamental dietary staple for over half of the global population, making it essential to global food security frameworks. In Indonesia, rice is not only the primary source of sustenance but also a vital economic commodity, as any changes in its price directly affect food affordability, especially for lower-income households. Research indicates that price fluctuations in staple foods like rice exacerbate food insecurity and push vulnerable populations deeper into poverty (FAO, 2022; Fadlina, 2012). The COVID-19 pandemic amplified these fluctuations worldwide, disrupting supply chains and causing notable price increases due to limitations in production and distribution (Agyei et al., 2021, Schmidt et al., 2021).

In Indonesia, the pandemic worsened price disparities between medium and premium rice varieties, especially in traditional market settings. Studies have revealed how COVID-19-related restrictions affected market integration, contributing to more pronounced price differences (Ys et al., 2022, Olviana et al., 2022). Given Indonesia's heavy dependence on



rice as a staple, such price volatility threatens both economic stability and food security, underscoring the necessity of this research for stakeholders and policymakers.

The concept of price disparity in agricultural commodities is often explained through the principles of supply and demand, along with price stability models. Price disparity, in this context, is the variation in cost between different grades or qualities of a commodity, influenced by factors such as production expenses, consumer demand, and perceived quality (Rahmi & Arif, 2012; Hasudungan et al., 2021). Food security theories and market integration models stress the need for price stabilization in developing economies to protect vulnerable populations from drastic price increases. Vertical market integration, which links prices across different market tiers, is essential for consistent price levels and reduced volatility (Nasir et al., 2021).

Previous research highlights the significant impact of COVID-19 on traditional markets worldwide, amplifying existing disparities in food prices for essentials like rice (Rathod et al., 2022, Adewopo et al., 2021). In Indonesia, for example, medium-quality rice, typically favored by lower-income households, faced erratic price changes due to disrupted supply chains and increased retail operation costs (Sani et al., 2023). These findings provide the theoretical and conceptual basis for this study, which aims to measure the extent of these price disparities and examine the contributing factors.

This study investigates the persistent volatility and price disparity between medium and premium rice varieties in traditional Indonesian markets before, during, and after the COVID-19 pandemic. Persistent price disparities can exacerbate socio-economic challenges, pushing vulnerable households closer to food insecurity, particularly when affordable access to essential food is compromised. When disparities remain unaddressed, they can weaken food policies designed to ensure stable prices for necessary goods (Zahraturrahmi et al., 2021, Bairagi et al., 2022).

Globally, events such as the termination of the Black Sea Grain Initiative and export restrictions imposed by major rice-producing nations like India and Thailand have exacerbated rice price instability (Yu et al., 2020). Indonesia's reliance on imported rice places additional pressure on domestic markets, further widening the price gap in traditional markets (Asrin et al., 2022). Left unresolved, this issue may deepen socio-economic inequality and pose risks to food security, especially in economically vulnerable regions like East Nusa Tenggara.

The primary objective of this research is to analyze the price disparity between medium and premium rice in traditional markets across Indonesia's East Nusa Tenggara province, focusing on the periods before, during, and after the COVID-19 pandemic. The specific objectives of this study are to:

- track monthly price trends for medium and premium rice in NTT's traditional markets from 2018 to 2023, identifying any seasonal or crisis-related patterns;
- assess the extent and drivers of price disparity between medium and premium rice during the pandemic and analyze factors contributing to these disparities;
- evaluate the success of government policies in stabilizing rice prices and mitigating the effects of these disparities on economically vulnerable households by fulfilling these objectives, this study aims to provide insights into how price disparities in staple foods can evolve during crises, offering policymakers critical information on existing measures' effectiveness and areas for improvement to secure Indonesia's food systems.

METHODS OF RESEARCH

The research approach method uses a quantitative approach. Quantitative models are based on numerical data or figures and decision models produce decision variables in the form of numbers (Muslich, 2010). This study focuses on rice price data in Maumere City, especially in Alok Market and Tingkat Market. The selection of this location is based on the consideration that the two markets are the largest markets in Maumere City. These two markets are considered to be representative of the markets in East Nusa Tenggara (NTT).



Maumere City meets the criteria set by Bank Indonesia in collecting strategic food price data in NTT. This study utilizes panel data (time series and cross section) which includes rice prices in the traditional markets of Alok Market and Tingkat Market in Maumere City, which are expressed in units (Rp/Kg). The time span covered in this study is the period from January 2018 to December 2023. The data used are medium rice price data class 1 and super class 1 in Maumere City. The data analysis applied is the Coefficient of Variation analysis and simultaneous test (F Test) using a Completely Randomized Design (CRD).

RESULTS AND DISCUSSION

The price range of Medium quality rice class 1 in the Alok traditional market in the period before the Covid-19 pandemic, namely from January 2018 to February 2020, experienced significant price fluctuations. From January to April 2018, the price of rice per kilogram was stable at around IDR 11,000/kg, then decreased in May by IDR 400/kg, to IDR 10,600/kg. Furthermore, from June to October, there was a further decrease of IDR 800/kg, to IDR 9,800/kg. However, the price rose again to IDR 10,000/kg in November 2018 to October 2022. After that, there was a significant increase of IDR 1000/kg in November 2022 to February 2023 and peaked in February with a price reaching IDR 15,000/kg until December. The price increase is believed to be due to increased demand, especially since Medium rice is a priority in the government's social assistance program during the pandemic.

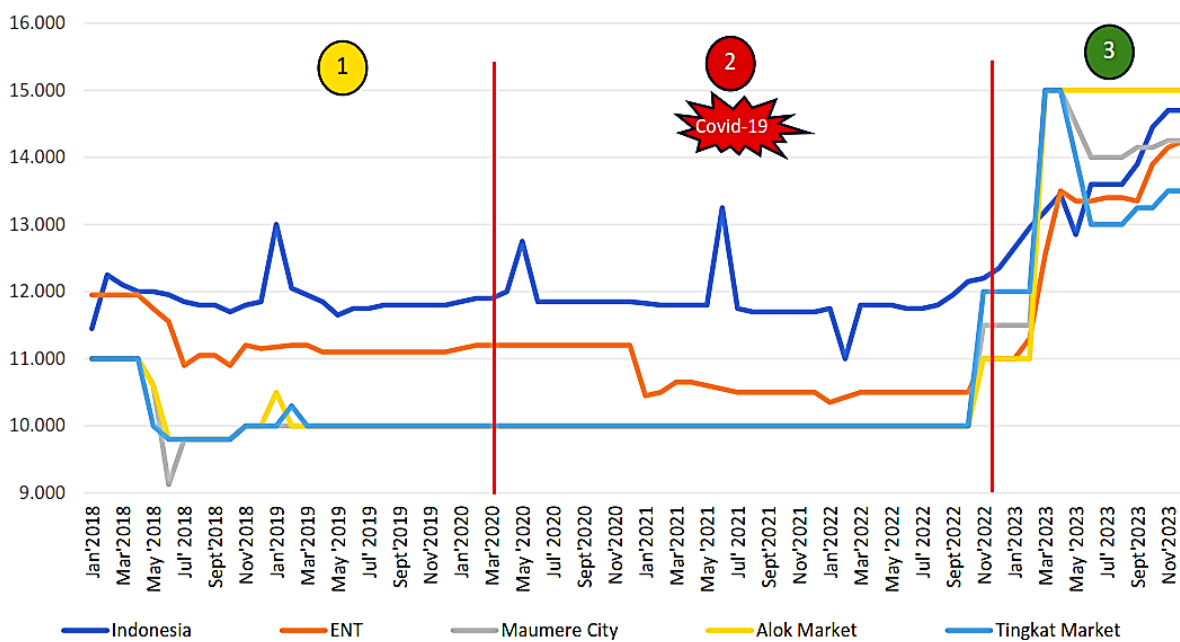


Figure 1 – Price Dynamics of Medium-1 Quality Rice from January 2018 to December 2023, Before the Pandemic (1), During the Pandemic (2), and Post-Pandemic COVID-19 (3)

Furthermore, the price of rice at Pasar Tingkat from January to April 2018 was Rp. 11,000/kg, which then dropped in May by Rp. 1,000/kg to Rp. 10,000/kg, followed by a decrease of Rp. 200/kg each month from June to October, reaching Rp. 9,800/kg. During the period from November 2018 to October 2022, the price increased and stabilized at Rp. 10,000/kg. From November 2022 to February 2023, the price of rice increased to Rp. 12,000/kg, then experienced a drastic increase to Rp. 15,000/kg in March and April, followed by a decrease of Rp.1,000/kg in May to Rp.14,000/kg, and an additional decrease of Rp.1,000/kg to Rp.13,000/kg from June to August. Furthermore, from September to April, the price increased to Rp.13,250/kg, then increased again to Rp.13,500/kg from November to December.

Nationally, the price of rice reached its lowest point in January 2018, at IDR 11,450/kg, while the highest point was recorded in November to December 2023, reaching IDR



14,700/kg. At the provincial level, especially East Nusa Tenggara, the lowest price of rice was recorded in July 2018, at IDR 10,900/kg, and the highest occurred in December 2023, at IDR 14,250/kg. At the Maumere City level, the lowest price occurred in June 2018, reaching IDR 9,125/kg.

It can be concluded that there was a significant price fluctuation, especially starting in March 2023. High price spikes occurred in Alok Market and Tingkat Market in that month, comparable to price changes in Maumere City which reached IDR 17,000/kg. The pattern of rice prices during the period before the Covid-19 pandemic, during the Covid-19 pandemic, and after the Covid-19 pandemic varied. However, compared to the period before and during the Covid-19 pandemic, the period after the Covid-19 pandemic showed a significant increase in prices, especially in Alok Market, Tingkat Market, and Maumere City.

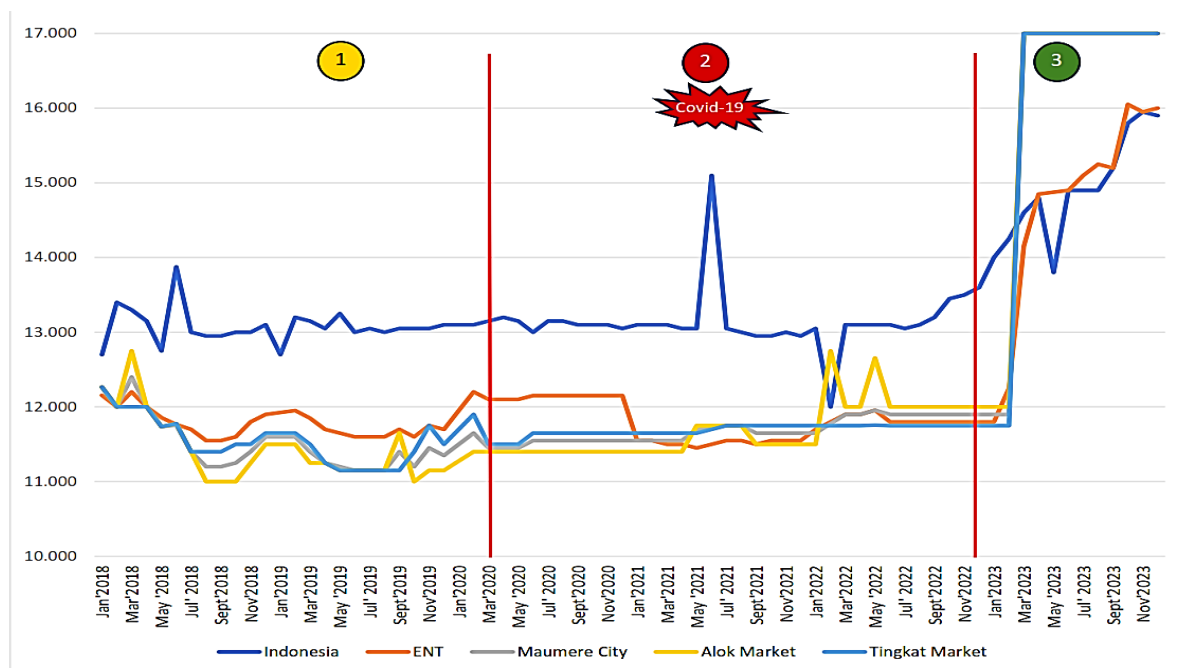


Figure 2 – Price Dynamics of Super-1 Quality Rice from January 2018 to December 2023, Before the Pandemic (1), During the Pandemic (2), and Post-Pandemic COVID-19 (3)

In the period before the Covid-19 pandemic, starting from January 2018 to February 2020, there was a decrease in the price of Super quality rice class 1 in the Alok traditional market. This price decrease was influenced by the dynamics of demand and supply in the market. In 2018, there was a price decrease in February, where the price of rice fell to IDR 12,000 per kilogram from the previous price of IDR 12,265 per kilogram, a decrease of IDR 265. Then, in March the price rose again by IDR 400 to IDR 12,400 per kilogram. The decline in rice prices continued until February 2020, when the price fell to IDR 11,400 per kilogram. From March 2020 to April 2021, the price of rice stabilized at around IDR 11,400 per kilogram. However, from May 2021 to August 2021, there was an average price increase of IDR. 350 per kilogram. The price increased from IDR 11,400 per kilogram in April to July to IDR 11,750 per kilogram in August. In September to October 2021, the price of rice decreased by IDR 250 per kilogram, dropping from IDR 11,750 per kilogram to IDR 11,500 per kilogram. From October 2021 to January 2022, the price of rice remained stable at IDR 11,500 per kilogram. However, the price of rice continued to fluctuate up and down, and from March 2023 to December 2023, there was a very significant price spike to IDR 17,000 per kilogram.

Rice prices at Pasar Tingkat fluctuated from January 2018 to December 2023. There was a price decrease from IDR 12,265/kg to IDR 12,000/kg between February and April, marking a decrease of IDR 265/kg. Then, from May to June, there was a less significant price change. July to September saw a price decrease of IDR 375/kg, although there was



less significant price variation after that. However, in March 2023, there was a drastic price spike to IDR 17,000/kg until the end of the year. This increase was likely due to increased demand, especially since medium rice was chosen as a priority in the government's social assistance program during the pandemic.

The fluctuation of rice prices nationally tends to be not so significant. However, from the graph it can be seen that the price of rice reached its lowest point in January 2020, at IDR 12,000/kg, and its highest point occurred in November 2023, reaching IDR 15,900/kg. Meanwhile, data on the price of rice per kilogram in East Nusa Tenggara (NTT) Province shows that the minimum price was recorded in August 2018 at IDR 11,550/kg, while the maximum price occurred in October 2023, reaching IDR 16,050/kg. In Maumere City, the lowest price of rice occurred in May 2019, at IDR 11,200/kg, but experienced significant fluctuations, reaching its highest peak in March to December 2020, reaching IDR 17,000/kg.

It can be concluded that there was a significant price fluctuation, especially starting in March 2023. A striking price spike occurred at Alok Market and Tingkat Market in that month, comparable to the price change in Maumere City which reached IDR 17,000/kg. The pattern of rice prices during the period before the Covid-19 pandemic, during the Covid-19 pandemic, and after the Covid-19 pandemic varied. However, compared to the period before and during the Covid-19 pandemic, the period after the Covid-19 pandemic showed a very significant increase in prices, especially at Alok Market, Tingkat Market, and Maumere City.

The Ministry of Trade of the Republic of Indonesia, quoted from Nendissa (2018), stated that the magnitude of price fluctuations is considered relatively low to moderate if it ranges from 5% to 9%, and values above 9% are considered high fluctuations. From the results of the calculation of the coefficient of variation on the price of medium and super quality rice at the national level, East Nusa Tenggara province, Maumere City, Alok Market and Level Market, it shows that high fluctuations only occur during the Covid-19 pandemic period. This indicates that the Covid-19 pandemic has an impact on the price of rice, both medium and super quality in Maumere City, Alok Market and Level Market.

The calculated F value is 0.827198064, smaller than the F table value at the 0.05 significance level of 5.14325285 and the 0.01 significance level of 10.9247665. This indicates that the null hypothesis (H_0) is accepted and the alternative hypothesis (H_1) is rejected, which means that the independent variables together do not have a significant effect on the dependent variable. Thus, neither the period before the Covid-19 pandemic, during the Covid-19 pandemic, nor after the Covid-19 pandemic, had a real impact on rice prices at Alok Market.

The calculated F value is 0.332575771, smaller than the F table value at an error level of 0.05 of 5.14325285 and an error level of 0.01 of 10.9247665. This indicates that the null hypothesis (H_0) is accepted and the alternative hypothesis (H_1) is rejected, which means that the independent variables together do not have a significant effect on the dependent variable. In other words, neither the period before the Covid-19 pandemic, during the Covid-19 pandemic, nor after the Covid-19 pandemic had any real influence on rice prices at the Level Market.

The calculated F value in the table is 0.827198064, which is smaller than the F table value at the 0.05 significance level of 5.14325285 and at the 0.01 significance level of 10.9247665. This indicates that the null hypothesis (H_0) is accepted and the alternative hypothesis (H_1) is rejected, which means that the independent variables together do not have a significant effect on the dependent variable. In other words, there is no real influence from the period before the Covid-19 pandemic, during the Covid-19 pandemic, and after the Covid-19 pandemic on the price of super quality rice group 1 at Alok Market.

The calculated F is the F statistic value generated from the observed data, while the F table is the critical value of the F distribution determined based on the level of significance (usually symbolized as α) and degrees of freedom. In the table presented, the calculated F value of 4.32211E-13 is smaller than the F table value at the 0.05 (5.14325285) and 0.01 (10.9247665) levels of significance. This implies the acceptance of the null hypothesis (H_0) and the rejection of the alternative hypothesis (H_1), which indicates that the independent variables together do not have a significant effect on the dependent variable. In other words,



there is no real difference in the price of rice at Pasar Tingkat either before, during, or after the Covid-19 pandemic.

From January 2018 to February 2020, prior to the onset of the COVID-19 pandemic, Medium-1 rice prices in traditional markets such as Pasar Alok in Indonesia exhibited relatively stable fluctuations, with occasional seasonal variations. The price trend for this rice type remained around IDR 11,000/kg from January to April 2018 before declining to IDR 9,800/kg in October 2018. This reduction can be attributed to seasonal harvest patterns, where increased rice supply led to lower prices. Nasir et al. (2021) revealed that, before the pandemic, rice prices in traditional markets across Indonesia, especially on the island of Java, showed high integration between producer and consumer markets, contributing to price stability (Nasir et al., 2021). During this period, the government's policies on food distribution and price control were effective in maintaining price stability. The national distribution system enabled rice from surplus areas, such as East Java, to fulfill the demand in deficit areas, such as Jakarta and East Nusa Tenggara. Olviana et al. (2022) also noted that before the pandemic, rice prices in traditional and wholesale markets were generally well-controlled, with minimal fluctuations due to government efforts to stabilize supply and food prices (Olviana et al., 2022).

With the arrival of COVID-19 in early 2020, market conditions changed dramatically. Medium-1 rice prices experienced significant increases, mainly driven by supply chain disruptions caused by social restrictions and transportation limitations. These restrictions led to shortages in regions previously reliant on supplies from other areas, triggering rice price spikes. Schmidt et al. (2021) found that movement and transportation restrictions during the pandemic directly affected food price stability in Indonesia, particularly in traditional markets dependent on local and inter-provincial distribution networks (Schmidt et al., 2021). Panic buying at the start of the pandemic further worsened the situation, as increased demand for rice amid economic uncertainty caused Medium-1 rice prices to rise to IDR 12,000/kg in some regions during the first year of the pandemic. Yudha & Roche (2023) reported that transportation restrictions imposed by the government led to increased provincial-level marketing margins, forcing consumers to pay higher prices for rice in traditional markets (Yudha & Roche, 2023).

The Indonesian government implemented various social assistance programs focusing on the distribution of medium-quality rice to populations affected by the pandemic. The increased demand for this rice as part of social assistance contributed to rising prices. Sani et al. (2023) observed that rice distributed as social assistance further strained market supply, as the sudden demand from these programs pressured local rice stocks, particularly in remote areas with limited distribution access (Sani et al., 2023). While these programs were critical in maintaining food security for low-income households, their impact on general market prices was significant. During this period, Medium-1 rice prices peaked in some local markets due to the demand surge from the assistance programs. Olviana et al. (2022) also noted that without strict price stabilization policies, social assistance programs could exacerbate price pressure in local markets due to the sudden increase in demand not matched by adequate supply (Olviana et al., 2022).

From March to December 2023, prices range between IDR 13,250 and IDR 15,000/kg. This increase was influenced by several factors, including rising demand as the economy recovered and climate phenomena such as El Niño, which affected rice production in various regions. Hasudungan et al. (2021) found that climate changes, including El Niño, could impact rice prices by driving prices up due to reduced production resulting from unfavorable weather conditions (Hasudungan et al., 2021). Additionally, lingering logistical challenges from the pandemic further complicated rice distribution to geographically isolated areas such as East Nusa Tenggara. Susanti (2023) indicated that although pandemic conditions had subsided, remote areas continued to face obstacles in securing consistent rice supplies, causing prices to remain high compared to regions closer to production centers (Susanti, 2023).

The Medium-1 rice price fluctuation pattern was similar to that in Pasar Alok, with stable prices during the early pre-pandemic period and sharp increases during the pandemic.



Nasir et al. (2021) indicated that Pasar Tier, like other traditional markets in Indonesia, faced distribution challenges that affected rice price stability, primarily due to reliance on inter-provincial distribution vulnerable to disruption during the pandemic (Nasir et al., 2021). After the pandemic, prices in Market Level remained high, indicating ongoing logistical barriers and sustained high distribution costs. Zahraturrehmi et al. (2021) also noted that rice price increases in traditional markets are often influenced by distribution constraints and rising transportation costs, which have escalated since the pandemic, especially in regions with limited distribution infrastructure (Zahraturrehmi et al., 2021).

CONCLUSION AND RECOMMENDATIONS

This study demonstrates that the COVID-19 pandemic significantly impacted the price dynamics of Medium-1 and Super-1 quality rice in Indonesia's traditional markets, exhibiting varied fluctuations across pre-pandemic, pandemic, and post-pandemic periods. Before the pandemic, prices for Medium-1 rice remained relatively stable, averaging around IDR 11,000/kg from January to April 2018, before declining to IDR 9,800/kg in October 2018, supported by adequate supply and efficient distribution. During the pandemic, Medium-1 rice prices saw substantial increases, reaching between IDR 12,000/kg and IDR 15,000/kg in markets such as Pasar Alok. These increases were largely driven by supply chain disruptions, mobility restrictions, and panic buying behaviors that disrupted the demand-supply balance. Similarly, prices for Super-1 rice spiked, reaching IDR 17,000/kg in early 2023. In the post-pandemic phase, prices for Medium-1 rice remain elevated, fluctuating between IDR 13,250 - IDR 15,000/kg by the end of 2023, indicating persistent distribution challenges and external market pressures.

These findings highlight the need for Indonesia to adopt a more resilient and robust food security strategy to withstand future crises. Significant price volatility, with fluctuations up to 12.75% for Medium-1 rice and 11.89% for Super-1 rice in regions such as East Nusa Tenggara (NTT), underscores vulnerabilities in the national food distribution framework. High reliance on inter-provincial supply chains, which are susceptible to logistical disruptions, emphasizes the necessity for increased investment in local transportation infrastructure and decentralized distribution systems. Additionally, flexible policy mechanisms for rice stock management are critical to stabilizing supply without driving up local market prices, particularly in emergency contexts.

To maintain price stability and ensure rice availability, several policy measures are recommended, including diversifying food sources to reduce dependency on rice as the primary staple food. Social assistance programs should be carefully calibrated to avoid demand spikes that disrupt market equilibrium. For example, during the pandemic, focusing on Medium-1 rice for social assistance programs created sudden demand, resulting in significant price increases in traditional markets. Data indicates that during the pandemic, Medium-1 rice prices peaked with fluctuations of 12.92% at Pasar Alok and 12.81% at Pasar Tier, while Super-1 rice experienced fluctuations of 12.18% at Pasar Alok and 11.85% at Pasar Tier. A distribution strategy that takes market price impacts into account is essential during crisis periods.

Future research should focus on developing food security policies that are both resilient and responsive to crises. Leveraging technology for real-time inventory and distribution monitoring can reduce distribution delays and minimize logistics costs. Further investigation into climate change impacts on rice production is also critical, as phenomena such as El Niño have the potential to disrupt production and increase price volatility in local markets. Given that national price fluctuations reached 4.28% for Medium-1 rice and 4.27% for Super-1 rice during the pandemic, implementing mitigation strategies to address climate change effects on food supply is crucial.

These findings indicate that structured policy interventions, sustainable infrastructure investment, and food source diversification are essential strategies for maintaining long-term food price stability. Continued research will be necessary to support adaptive policies that mitigate reliance on centralized supply chains, thereby enhancing Indonesia's resilience to



future food security challenges. With substantial reliance on international markets for premium rice and logistical challenges for domestic distribution of medium-quality rice, Indonesia must strengthen food security through local production optimization, efficient distribution, and adaptability to global crises.

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