DYNAMICS OF RICE PRICES IN INDONESIA IN 2023: THE IMPACT OF AGRICULTURAL REGULATIONS ON RICE QUALITY

(Dinamika Harga Beras Di Indonesia Tahun 2023: Dampak Peraturan Pertanian Terhadap Kualitas Beras)

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ABSTRACT

Rice price volatility in Indonesia remains a critical issue, affecting both consumer affordability and farmer profitability. Despite government interventions, significant price fluctuations continue, driven by regulatory changes, macroeconomic factors, supply chain inefficiencies, and climate-related disruptions. The implementation of Permentan No. 31/2017 modified rice classification standards, potentially altering market price structures and consumer purchasing behavior. This study aims to analyze the dynamics of rice prices in Indonesia in 2023, focusing on the impact of government regulations, seasonal supply variations, and external economic pressures. It examines how Permentan No. 31/2017 influenced rice price differentiation, as well as the effectiveness of BULOG's price stabilization efforts in mitigating price volatility. This research adopts a quantitative approach, utilizing secondary data from BPS Indonesia. Monthly price trends for Premium, Medium, and Low/Non-Quality rice were analyzed from January to December 2023. A comparative assessment was conducted to examine price disparities before and after regulatory adjustments, as well as the correlation between seasonal supply cycles and price fluctuations. Findings indicate that rice prices remained stable in the first half of 2023 but surged significantly between August and December. Premium rice peaked at IDR 13,371.54 per kg, Medium-quality rice reached IDR 13,011.56 per kg, and Low/Non-Quality rice increased to IDR 12,381.31 per kg in October. The narrowing price gap between Premium and Medium rice in early 2023 suggests that regulatory changes influenced classification and market pricing. The study highlights the complex interplay between agricultural regulations, macroeconomic factors, and environmental risks in shaping rice price volatility. While Permentan No. 31/2017 affected price differentiation, broader market pressures drove significant instability. Future research should focus on strengthening domestic rice production efficiency, improving supply chain resilience, and enhancing government intervention strategies. Further exploration of the link between rice price inflation and household food security, as well as adaptive strategies for climate-resilient rice farming, will be crucial for ensuring long-term stability in Indonesia's rice market.

Keywords: Rice price volatility, agricultural regulations, supply chain inefficiencies, , food security, rice classification

ABSTRAK

Volatilitas harga beras di Indonesia masih menjadi masalah kritis, yang memengaruhi daya beli konsumen dan profitabilitas petani. Meskipun ada intervensi pemerintah, fluktuasi harga yang signifikan terus berlanjut, didorong oleh perubahan regulasi, faktor ekonomi makro, inefisiensi rantai pasokan, dan gangguan terkait iklim. Penerapan Permentan No. 31/2017 mengubah standar klasifikasi beras, yang berpotensi mengubah struktur harga pasar dan perilaku pembelian konsumen. Studi ini bertujuan untuk menganalisis dinamika harga beras di Indonesia pada tahun 2023, dengan fokus pada dampak regulasi pemerintah, variasi pasokan musiman, dan tekanan ekonomi eksternal. Penelitian ini mengkaji bagaimana Permentan No. 31/2017 memengaruhi diferensiasi harga beras, serta efektivitas upaya stabilisasi harga BULOG dalam mengurangi volatilitas harga. Penelitian ini menggunakan pendekatan kuantitatif dengan memanfaatkan data sekunder dari BPS Indonesia. Tren harga bulanan untuk beras Premium, Medium, dan Low/Non-Quality dianalisis dari Januari hingga Desember 2023. Penilaian komparatif dilakukan untuk memeriksa disparitas harga sebelum dan sesudah penyesuaian regulasi, serta korelasi antara siklus pasokan musiman dan fluktuasi harga. Temuan menunjukkan bahwa harga beras tetap stabil pada paruh pertama tahun 2023 tetapi melonjak signifikan antara Agustus dan Desember. Beras Premium mencapai puncaknya pada Rp13.371,54 per kg, beras Medium mencapai Rp13.011,56 per kg, dan beras Low/Non-Quality meningkat menjadi Rp12.381,31 per kg pada bulan Oktober. Kesenjangan harga yang semakin menyempit antara beras Premium dan beras Medium pada awal tahun 2023 menunjukkan bahwa perubahan regulasi memengaruhi klasifikasi dan harga pasar. Studi ini menyoroti interaksi yang kompleks antara regulasi pertanian, faktor ekonomi makro, dan risiko lingkungan dalam membentuk volatilitas harga beras. Sementara Permentan No. 31/2017 memengaruhi diferensiasi harga, tekanan pasar yang lebih luas mendorong ketidakstabilan yang signifikan. Penelitian di masa mendatang harus difokuskan pada penguatan efisiensi produksi beras dalam negeri, peningkatan ketahanan rantai pasokan, dan peningkatan strategi intervensi pemerintah. Eksplorasi lebih lanjut tentang hubungan antara inflasi harga beras dan ketahanan pangan rumah tangga, serta strategi adaptif untuk pertanian padi yang tahan iklim, akan sangat penting untuk memastikan stabilitas jangka panjang di pasar beras Indonesia.
Kata Kunci: Volatilitas harga beras, regulasi pertanian, inefisiensi rantai pasokan, ketahanan pangan, klasifikasi beras

INTRODUCTION

Rice is a staple food in Indonesia, consumed by nearly all households, making its availability and price stability crucial for food security. Globally, rice prices fluctuate due to various factors such as climate change, production levels, and market integration. In Indonesia, the government plays a significant role in stabilizing rice prices through regulatory policies and quality classifications. However, external shocks such as the COVID-19 pandemic and climate-induced crop failures have led to significant price volatility (Shaffitri, Suryana, & Sinuraya, 2024).

Public perception of rice price increases is often linked to food security concerns. Consumers expect the government to intervene in the market, ensuring price stability, while farmers demand fair compensation for their produce (Herawati et al., 2024). Recent studies indicate that extreme weather patterns, particularly in 2023, have caused a decline in rice production, leading to increased prices in major rice-producing regions of Indonesia (Syawal et al., 2024).

According to national statistics, the price of premium-quality rice in Indonesia reached IDR 16,410 per kilogram in early 2024, marking a 21.3% increase from the previous year. This trend

highlights the impact of structural inefficiencies in the rice market, regulatory shifts, and supply chain disruptions (Nazilah et al., 2024).

CONCEPTUAL DEFINITIONS, THEORIES, AND PREVIOUS STUDIES

The classification of rice quality is determined by regulatory policies. Before 2018, Indonesian rice quality was categorized into Premium, Medium, and Low, based on the percentage of broken grains. The regulatory framework changed in 2018 with the introduction of Permentan No. 31/2017, which adjusted quality thresholds and renamed low-quality rice as "Non-Standard Quality" from 2020 onward. These regulatory adjustments directly influenced market dynamics and pricing structures.

The theory of market integration suggests that price movements in different segments of a market should be correlated if they are efficiently integrated. Studies on rice market integration in Indonesia have shown that price transmission is often asymmetric, with consumer-level prices reacting more slowly to changes at the producer level (Olviana et al., 2022). This inefficiency contributes to persistent disparities between farmer incomes and consumer costs.

Recent research also highlights the impact of global phenomena, such as El Niño and supply chain disruptions, on rice prices. The Gaussian Kernel Estimator has been used to predict rice price trends, demonstrating that market fluctuations are significantly influenced by weather-related production shifts (Syawal et al., 2024).

The main issue this study aims to address is the impact of regulatory changes and rice quality classifications on price trends at the milling level in Indonesia. Despite government interventions, rice price fluctuations persist, raising concerns about market efficiency and food security. If this problem remains unresolved, consumers will face higher food costs, which will disproportionately affect low-income households, making it more difficult for them to access staple food. Additionally, farmers may not fully benefit from price increases due to inefficiencies in price transmission, where higher retail prices do not always translate into better earnings at the production level. Market participants, including wholesalers and retailers, may experience increased volatility, leading to reduced investment confidence and heightened uncertainty in the rice supply chain. Furthermore, government policies will continue to struggle in balancing affordability for consumers while ensuring adequate financial returns for farmers, creating long-term economic and social instability (Shaffitri, Suryana, & Sinuraya, 2024).

This study contributes to global discussions on food security, market efficiency, and agricultural policy. It provides insights for policymakers in other rice-producing countries that face similar challenges, where regulatory frameworks and pricing mechanisms play a crucial role in maintaining market stability. Understanding the relationship between rice quality classifications, regulatory interventions, and price volatility will help develop better strategies to ensure food accessibility while safeguarding the interests of farmers and market stakeholders (Herliana et al., 2022).

The primary aim of this study is to analyze the price trends of rice in Indonesia in 2023 and examine the influence of quality changes and regulatory standards at the milling level. To achieve this, the study seeks to examine the impact of *Permentan No. 31/2017* on the classification and pricing of rice at the milling level, as this regulation has played a critical role in reshaping the rice market structure. It also aims to investigate the relationship between rice quality changes and price volatility in the Indonesian market, considering how shifts in classification criteria have influenced price variations across different rice categories. Furthermore, the study assesses the effectiveness of government interventions in stabilizing rice prices and ensuring fair pricing for both consumers and farmers, with the objective of identifying potential areas for policy improvement and market efficiency enhancement.

LITERATURE REVIEW

Rice prices in Indonesia are influenced by various structural factors, including agricultural policies, trade regulations, and global market dynamics. In classical economic theory, Marshall (1890) emphasized that the price of a commodity adjusts based on the interaction between supply and demand. In the case of rice, high demand in Indonesia, as the largest rice-consuming country in Southeast Asia, makes price stabilization an ongoing strategic issue. However, in the Institutional Economics Theory developed by North (1990), government regulations play a more dominant role in determining prices compared to free market mechanisms. This aligns with the role of the Indonesian government in controlling rice prices through import tariff policies and market interventions by BULOG (Yusuf et al., 2024).

Schultz (1964) in *Transforming Traditional Agriculture* argued that modernizing the agricultural sector, particularly through policies that support efficiency and production growth, is key to stabilizing food prices. However, in Indonesia, despite various policies being implemented, rice price volatility remains high. A study by Rosyada, Putra, and Gunawan (2022) found that inefficiencies in rice distribution chains cause price disparities between producers and consumers. For example, rice prices at the farm level often do not align with consumer price increases due to long supply chains and the role of speculators, which worsen market instability.

The Market Integration Theory developed by Ravallion (1986) states that well-integrated markets will exhibit relatively stable price patterns across different regions. However, recent studies indicate that rice market integration in Indonesia remains weak. Research using the Vector Error Correction Model (VECM) by Pangesti, Darsono, and Antriyandarti (2023) found that rice prices in Indonesia are more influenced by external factors, such as global rice price changes, rather than domestic supply dynamics. This suggests that despite sufficient domestic production in certain periods, prices remain volatile due to dependence on rice imports and the impact of international trade policies.

From a political economy perspective, the Public Choice Theory developed by Buchanan and Tullock (1962) highlights how food policies are often shaped by political interests and influential stakeholder groups. In Indonesia, rice import policies are frequently debated, where decisions to open or restrict imports are not always based on economic considerations but rather on political pressure from specific interest groups (Amrihani, Eriyanto, & Zulkifli, 2024). The debate over import tariffs on rice demonstrates a conflict between farmers who seek higher prices and consumers who demand more affordable rice prices (Pide, 2020).

The Political Economy of Food Pricing Theory developed by Timmer (1989) is also highly relevant in explaining how rice price policies in Indonesia are often designed to maintain socio-political stability rather than economic efficiency. A study by Yusuf et al. (2024) emphasized that Indonesia's reliance on floor price policies (HPP) and BULOG's market interventions is more focused on preventing social unrest rather than improving market efficiency. In some cases, these policies create price distortions, where government-controlled prices do not always reflect actual market conditions.

The Dependency Theory developed by Frank (1967) provides insight into why Indonesia remains dependent on rice imports despite having vast agricultural land and sufficient domestic production. Research by Octania (2021) found that Indonesia's reliance on imported rice from Thailand and Vietnam has hindered domestic agricultural development, as local farmers struggle to compete with lower-priced imported rice. This issue is exacerbated by ineffective subsidies and weak post-harvest infrastructure, which contribute to high post-harvest losses.

The Structural Transformation Theory proposed by Lewis (1954) suggests that in the long run, the agricultural sector's contribution to GDP will decline as industrialization progresses.

However, in Indonesia, the agricultural sector still plays a crucial role in the economy, with more than 40% of the workforce relying on it for employment (Rosyada, Putra, & Gunawan, 2022). Thus, a more efficient agricultural transformation is needed to enhance farmers' welfare while ensuring price stability in the domestic rice market.

Beyond structural and regulatory factors, climate change has emerged as a major determinant of rice price volatility. The Environmental Economics Theory developed by Nordhaus (1991) explains that weather anomalies caused by global warming have direct effects on agricultural production. A study by Syawal et al. (2024) found that El Niño-related climate disruptions reduced rice production by up to 15% in several Indonesian provinces in 2023, leading to significant price hikes. The imbalance between supply and demand has further worsened price volatility, often contributing to food inflation.

From a Social Welfare Theory perspective, developed by Pigou (1920), rice price instability directly impacts social welfare, particularly for low-income households that allocate a large portion of their income to food consumption. Research by Pangesti, Darsono, and Antriyandarti (2023) showed that rising rice prices have a domino effect on inflation, ultimately worsening income inequality and increasing poverty rates. This highlights the need for sustainable price stabilization policies to protect consumers' purchasing power.

Based on various theoretical perspectives and previous research, it can be concluded that rice price dynamics in Indonesia are driven by a combination of government regulations, structural inefficiencies in the supply chain, international trade policies, and environmental factors. Despite multiple policy efforts to stabilize rice prices, their effectiveness remains questionable. This study emphasizes the need for a more holistic approach, where price policies focus not only on short-term stabilization but also on enhancing food security, improving production efficiency, and mitigating climate change impacts to establish a more sustainable and stable rice market in Indonesia.

RESEARCH METHODOLOGY

This study employs a quantitative research approach using secondary data to analyze the dynamics of rice prices in Indonesia in 2023 and assess the impact of agricultural regulations on rice quality. The research aims to identify how government policies, particularly Permentan No. 31/2017, influence rice price fluctuations at the milling level. By focusing solely on secondary data, this study ensures a comprehensive and objective assessment of market trends without primary data collection.

The primary source of data for this study is Badan Pusat Statistik (BPS) Indonesia, which provides monthly records of rice prices at the milling level categorized by Premium, Medium, and Non-Standard Quality. The dataset covers the period from January to December 2023, allowing for an in-depth analysis of price trends, regulatory effects, and external factors influencing price volatility. Government publications, reports from the Ministry of Agriculture, and relevant academic literature are also utilized to provide additional context and validation for the findings.

The study examines government regulations as the independent variable, measured through changes in rice classification criteria and pricing mechanisms introduced under Permentan No. 31/2017. The dependent variable is rice price fluctuation, captured through monthly average price movements across different rice quality classifications at the milling level. External factors such as inflation rates and climate variability are included as control variables to account for potential influences on price dynamics.

Data analysis is conducted through descriptive statistical methods, which summarize trends and fluctuations in rice prices over the selected period. A regression-based approach is applied to

assess the relationship between policy changes and price behavior, evaluating whether government interventions effectively stabilize market prices or introduce new inefficiencies. The study also compares pre- and post-regulation price movements to determine the extent to which Permentan No. 31/2017 impacted price formation and classification adjustments.

The scope of this research is limited to milling-level rice prices and does not extend to consumer or retail price analysis. While macroeconomic indicators such as inflation are considered, factors like regional distribution disparities and supply chain inefficiencies are beyond the scope of this study. The reliance on official government data ensures credibility, but potential limitations related to data reporting accuracy and possible lag in government statistics are acknowledged.

Since the study is based entirely on secondary data, ethical considerations are maintained through proper citation and transparent data interpretation. No direct human participation is involved, ensuring compliance with academic integrity standards. The findings from this research aim to contribute to policy recommendations on rice price stabilization while offering valuable insights for government agencies, agricultural economists, and market analysts in understanding the implications of regulatory interventions on rice market dynamics in Indonesia.

Results and Discussion

Results

The analysis of rice price dynamics in Indonesia in 2023 reveals a consistent upward trend across all rice quality categories (Premium, Medium, and Low/Non-Quality) throughout the year. Monthly rice price data from BPS Indonesia (Table 1) and the trend visualization (Figure 1) illustrate these fluctuations, highlighting the impact of government regulations, seasonal production variations, and market conditions on rice prices at the milling level.

At the beginning of 2023, Premium-quality rice was priced at IDR 11,345.1 per kg, while Medium-quality rice was at IDR 10,801.71 per kg, and Low/Non-Quality rice started at IDR 10,227.61 per kg. Prices remained relatively stable until June 2023, with only minor fluctuations, indicating limited external disruptions during the first half of the year. However, from July onwards, a steady upward trend emerged, reaching its peak in October and maintaining high levels until December.

The most notable surge occurred between August and September, where Premium-quality rice prices increased by approximately 10.0%, reaching IDR 12,900.47 per kg in September, before further escalating to IDR 13,371.54 per kg in October. Similarly, Medium-quality rice prices rose from IDR 11,474.96 per kg in August to IDR 12,685.36 per kg in September. The sharpest increase was recorded in the Low/Non-Quality category, where prices jumped from IDR 10,525.23 per kg in August to IDR 11,745.50 per kg in September, reflecting a substantial 11.6% price increase in just one month.

Table 1: Monthly Average Rice Prices at the Milling Level in 2023 (Source: BPS Indonesia)

Month	Premium (IDR/kg)	Medium (IDR/kg)	Low/Non-Quality (IDR/kg)
January	11,345.1	10,801.71	10,227.61
February	11,818.17	11,300.76	10,467.91
March	11,681.09	11,121.88	10,475.91
April	11,672.19	11,049.87	10,564.51
May	11,623.61	11,005.56	10,428.81
June	11,525.14	11,079.92	10,315.48
July	11,537.44	11,120.58	10,302.59
August	11,754.39	11,474.96	10,525.23
September	12,900.47	12,685.36	11,745.50

Month	Premium (IDR/kg)	Medium (IDR/kg)	Low/Non-Quality (IDR/kg)
October	13,371.54	13,011.56	12,381.31
November	13,249.90	12,959.50	12,534.91
December	13,347.93	13,070.70	12,530.28

Figure 1 illustrates the monthly price trends of Premium, Medium, and Low/Non-Quality rice at the milling level throughout 2023. The fluctuations in the graph indicate two distinct phases of price movement: a relatively stable period from January to July, followed by a significant price surge from August to December across all rice quality categories.

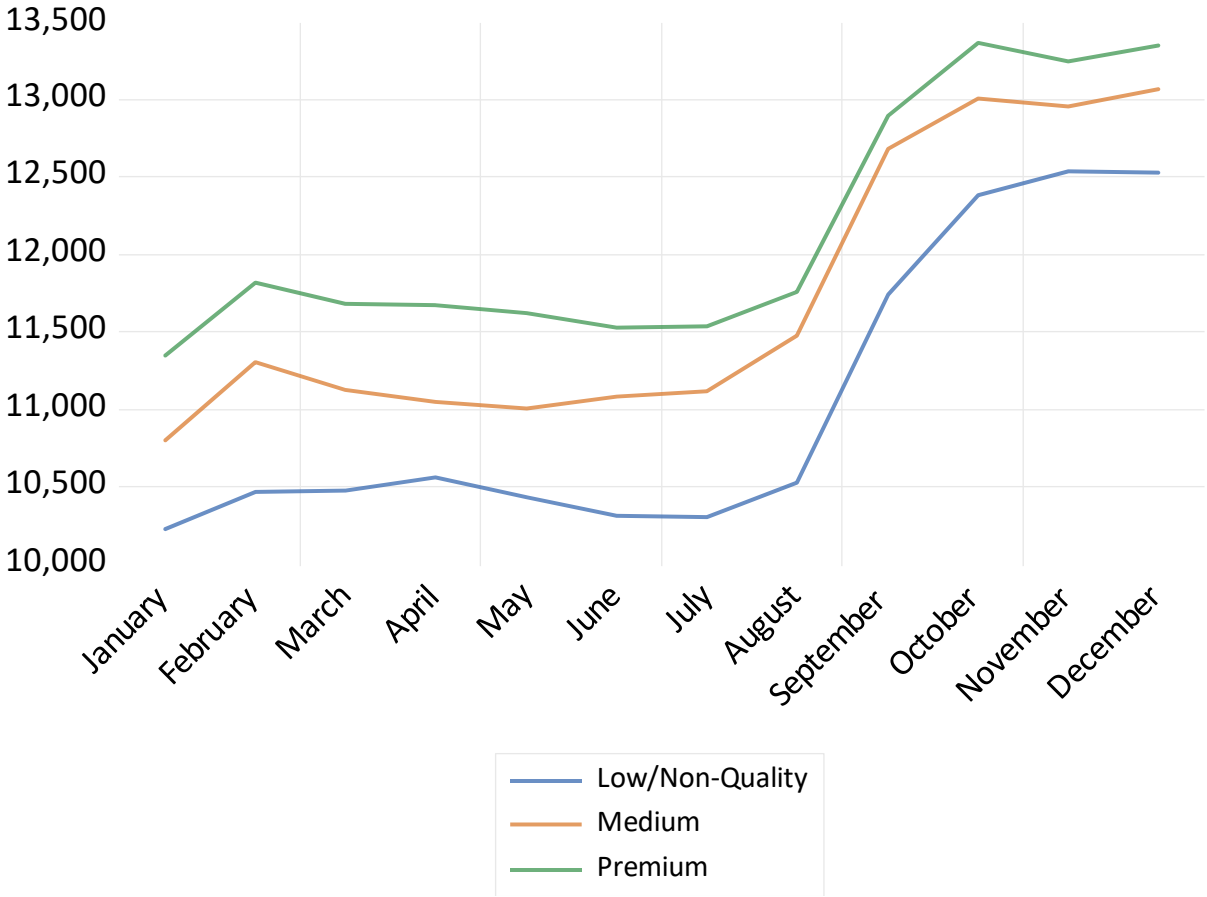

Figure 1 illustrates the monthly price trends of Premium, Medium, and Low/Non-Quality rice In the first half of the year (January to July), rice prices exhibited minor fluctuations with no drastic increases. The Premium rice category consistently maintained the highest price level, while Low/Non-Quality rice remained the cheapest option. The March to May period aligns with Indonesia's main harvest season, which typically leads to a temporary increase in supply and stabilization of prices. However, as seen in Figure 1, the decline in prices was minimal, suggesting high production costs, supply chain inefficiencies, and persistent inflationary pressures affecting price stability.

The most significant price spike occurred between August and October, with all three rice quality categories experiencing sharp increases. The Low/Non-Quality rice category exhibited the steepest rise, which may indicate increased consumer demand for more affordable alternatives as overall rice prices rose. This trend aligns with off-season production declines, extreme weather conditions such as El Niño, and inflationary pressures that intensified in the latter half of 2023.
In the final quarter (October to December), prices remained at their highest levels, reflecting sustained supply shortages, continued demand pressures, and limited government intervention in stabilizing prices. The Premium rice category showed the smallest percentage increase, whereas

Medium and Low/Non-Quality rice categories experienced more pronounced fluctuations, possibly due to changes in classification standards under Permentan No. 31/2017.

Overall, Figure 1 highlights the dual-phase nature of rice price dynamics in 2023, where relative stability in the first half transitioned into significant volatility in the second half. This pattern suggests that regulatory adjustments, supply-demand imbalances, and external economic factors collectively contributed to rice price fluctuations in Indonesia.

The increasing price trend in 2023 can be attributed in part to the implementation of Permentan No. 31/2017, which modified the classification of rice quality. Under this regulation, Premium rice quality standards were relaxed, allowing up to 15% broken grains, compared to the previous limit of 10% under Permentan No. 05/2011. This regulatory change affected market pricing dynamics, leading to a gradual narrowing of price differentials between Premium and Medium-quality rice (Shaffitri et al., 2024).

Several studies have confirmed the role of government policies in rice price fluctuations. Research by Pellokila Marthen et al. highlights that the price disparity between Premium and Medium rice has fluctuated over time, particularly before, during, and after the COVID-19 pandemic. Their findings suggest that market classification and government intervention significantly influence price stability in traditional markets, where external shocks further exacerbate price gaps. The results align with earlier studies showing that government price controls do not always translate into effective market stabilization, as speculative behaviors in the distribution network continue to drive price disparities (Pellokila Marthen et al., 2023).

Macroeconomic factors also play a critical role in price dynamics. Research by Pangesti et al. (2023) confirms that rice prices in Indonesia exhibit a bi-directional relationship with inflation, meaning that price increases contribute to inflation, while inflationary pressures further exacerbate price volatility. Additionally, international trade barriers and import tariff policies have historically impacted domestic rice prices. A study by Pide (2020) found that higher import tariffs on rice lead to significant increases in domestic rice prices, as they limit the availability of cheaper imported rice. The findings are consistent with a broader study by Maria et al., who explored the relationship between food price dynamics and farmer welfare. Their research concluded that rising rice prices do not always translate into better financial conditions for farmers, as price increases at the consumer level do not necessarily benefit small-scale producers due to inefficiencies in price transmission (Maria et al., 2023).

From a climate and production perspective, environmental factors such as El Niño played a major role in 2023's rice price surge. A study by Sari & Sa'adah (2025) found that extreme weather conditions significantly impact rice production, leading to lower yields and supply shortages, which consequently push prices higher. The August - October 2023 price surge aligns with the impact of adverse weather patterns on rice harvests, reinforcing the role of climate change in market disruptions. Additionally, Pellokila et al. (2023) analyzed the implications of altered distribution patterns due to environmental challenges during COVID-19, demonstrating that regions classified as surplus and deficit areas experienced uneven price dynamics, which continue to affect market stability post-pandemic. Their research suggests that price volatility is more pronounced in deficit areas, where local production is insufficient to meet consumer demand (Pellokila et al., 2023).

Furthermore, BULOG's intervention policies in stabilizing rice prices remain a debated issue. A study by Silalahi et al. (2019) found that BULOG's price stabilization efforts have been inconsistent, as interventions often fail to address real-time market needs. This is particularly relevant when considering the delayed response to rising prices in late 2023, where government reserves were insufficient to counteract market shortages. Additional studies have also highlighted that BULOG's distribution policies disproportionately favor urban markets, leaving rural consumers more vulnerable to price fluctuations (Silalahi et al., 2019).

The widening gap between rice prices in surplus and deficit areas has also been examined by Roy et al. (2023). Their research on price linkages between agricultural markets suggests that price

disparities are often driven by logistical inefficiencies and the uneven flow of goods from production centers to consumption hubs. Their findings indicate that the linkages between surplus and deficit regions remain weak, leading to persistent price imbalances despite government interventions. These insights are particularly relevant when considering the sharp price increase observed in the Low/Non-Quality rice category in 2023, which reflects demand-side adjustments as consumers shift toward lower-cost alternatives amid rising food prices (Roy et al., 2023).
The issue of rice price disparities between Medium and Premium rice has been explored further by Pellokila et al. (2023), who found that price gaps between these categories fluctuate based on regional distribution efficiency and government stock releases. Their study suggests that during periods of supply shortages, price gaps widen significantly, particularly in regions where BULOG's intervention is delayed. This explains why the gap between Premium and Medium rice prices remained relatively stable in early 2023 but expanded from August onwards as market imbalances intensified (Pellokila et al., 2023).

Another important consideration in rice price stability is the role of speculative behaviors in wholesale and retail markets. Maria et al. (2023) highlight that increased speculation and hoarding practices among traders contribute to price spikes during periods of uncertainty. Their findings suggest that when production declines, market participants tend to withhold stocks in anticipation of further price increases, exacerbating price volatility. This aligns with the rapid price escalation observed from August to October 2023, where speculative behaviors likely contributed to the inflationary pressure on rice prices.

The impact of rural-urban supply chain dynamics also cannot be overlooked. Fathoni et al. (2024) investigated grain and rice prices along the supply chain, concluding that inefficiencies in transportation, warehousing, and milling operations lead to inflated consumer prices. The study found that millers and intermediaries often absorb a significant portion of the price margin, reducing the direct benefits for farmers while increasing costs for consumers (Fathoni et al., 2024). This supports the argument that structural inefficiencies in the rice market exacerbate price volatility, making stabilization efforts more challenging.

The connection between rice prices and inflation has also been explored in-depth by Setiawan et al. (2024). Their findings confirm that rice prices serve as a key driver of inflation in Indonesia, with upward price movements contributing to broader economic instability. The October to December 2023 price plateau, observed in Figure 1, reflects a combination of policy-driven adjustments and inflationary pressures, where consumer demand softened slightly after months of sharp increases. However, given that inflation expectations influence consumer purchasing behaviors, future price volatility remains a concern if supply chain constraints persist (Setiawan et al., 2024).

From a policy perspective, several recommendations emerge from the discussion. First, enhancing domestic production capabilities is essential to mitigating future price shocks. This includes investing in modernized rice farming techniques, improving post-harvest storage infrastructure, and increasing regional market integration. Second, government intervention strategies should be more responsive to real-time market conditions, ensuring that price stabilization measures are implemented in a timely manner to prevent speculative-driven surges. Finally, trade policies should strike a balance between protecting local farmers and maintaining price stability for consumers, ensuring that import restrictions do not inadvertently fuel domestic inflation.

In conclusion, the findings highlight that rice price dynamics in Indonesia in 2023 were influenced by a combination of regulatory policies, environmental factors, supply chain inefficiencies, and speculative market behaviors. The discussion reinforces the importance of policy interventions that are adaptable to changing market conditions, ensuring both producer and consumer welfare amid ongoing economic uncertainties.

CONCLUSION

The findings conclude that rice prices in Indonesia experienced significant volatility in 2023, with major increases between August and December. At the beginning of the year, Premium rice was priced at IDR 11,345.1 per kg, Medium-quality rice at IDR 10,801.71 per kg, and Low/Non-Quality rice at IDR 10,227.61 per kg. Prices remained relatively stable until mid-year but surged significantly in the latter half, with Premium rice reaching IDR 13,371.54 per kg in October, Medium-quality rice rising to IDR 13,011.56 per kg, and Low/Non-Quality rice peaking at IDR 12,381.31 per kg.

The impact of Permentan No. 31/2017 was evident in the narrowing price gap between Premium and Medium rice in early 2023, but external market pressures, inflation, and climate factors led to further divergence later in the year. The increase in Low/Non-Quality rice prices reflects a consumer shift toward more affordable alternatives, placing additional demand pressure on lower-tier rice.

Market instability was further influenced by seasonal fluctuations, rising production costs, and climate events such as El Niño, which disrupted supply chains and contributed to price hikes. Trade restrictions, currency depreciation, and global inflationary trends also played a role in driving up domestic rice prices. Government interventions, including BULOG's price stabilization efforts, were insufficient to curb the sharp increases, indicating a need for more responsive policy measures.

Future research should explore long-term policy solutions to stabilize rice prices. Studies should investigate the effectiveness of government support for rice farmers, including subsidies, irrigation improvements, and modernized farming techniques, to enhance productivity and market stability. Further analysis is needed on the efficiency of rice distribution networks and supply chain bottlenecks, particularly between surplus and deficit regions.

Since Permentan No. 31/2017 altered rice classification standards, future studies should assess its long-term impact on price formation, market perceptions, and consumer affordability. Evaluating BULOG's price stabilization mechanisms will also be crucial in determining whether government stock management strategies need revision to prevent future shortages and speculation-driven price hikes.

Considering the link between rice prices and inflation, research should examine how rising rice prices contribute to broader inflationary trends and whether external factors, such as energy costs and currency fluctuations, play a more significant role. The impact of climate change on rice production requires further investigation, focusing on adaptive strategies, such as drought-resistant rice varieties and sustainable water management practices, to mitigate climate risks.

Policymakers must prioritize enhancing price monitoring systems, improving market integration, and ensuring strategic rice reserves to better respond to price fluctuations. Strengthening public-private partnerships in rice distribution and implementing targeted food security programs will help mitigate extreme price swings. Future research should continue to explore structural improvements in the rice market to ensure long-term stability, benefiting both consumers and producers.

REFERENCES

Amrihani, H. A., Eriyanto, E., & Zulkifli, M. Y. (2024). Debate on rice import policy in Indonesia: Discourse network analysis in online media. *Jurnal Komunikasi Ikatan Sarjana Komunikasi Indonesia.*

Anggraeni, W., Mahananto, F., Sari, A. Q., Zaini, Z., Andri, K. B., & Sumaryanto. (2019). Forecasting the price of Indonesia's rice using hybrid artificial neural network and autoregressive integrated moving average (Hybrid NNs-ARIMAX) with exogenous variables. *Procedia Computer Science*. DOI: 10.1016/j.procs.2019.11.171.

Aryani, D. (2021). Instrumen pengendalian harga beras di Indonesia: Waktu efektif yang dibutuhkan. *Jurnal Pangan*. DOI: 10.33964/JP.V30I2.538.

Buchanan, J. M., & Tullock, G. (1962). *The calculus of consent: Logical foundations of constitutional democracy*. University of Michigan Press.

Fathoni, A., Suhairin, S., Wahyuni, I., & Indrianti, M. A. (2024). Analysis of grain and rice prices in the rice milling supply chain in Pengadang village, Central Lombok regency. *Jurnal Agrotek Ummat*. DOI: 10.31764/jau.v11i2.22458.

Frank, A. G. (1967). *Capitalism and underdevelopment in Latin America: Historical studies of Chile and Brazil*. Monthly Review Press.

Herawati, H., Harianto, H., Putri, T. A., Dewi, T. G., & Rosiana, N. (2024). Dynamics of demand sensitivity for various rice qualities faced by retailers. *BIO Web of Conferences*, *119*(2), 02019.

Herliana, S., Ratnaningtyas, S., Arifin, S. N., & Lawiyah, N. (2022). Analysis of Indonesia's food security strategy: Rice price volatility. *14th GCBSS Proceedings*, *2022*(2), 35.

Lewis, W. A. (1954). Economic development with unlimited supplies of labor. *The Manchester School*, 22(2), 139-191.

Maria, B., Roy, N. D., Siska, E., & Dinah, L. M. EXPLORING THE DYNAMICS OF FOOD PRICES AND FARMER'S TERMS OF TRADE: REFLECTING ON THE WELFARE OF INDONESIAN FARMERS.

Marshall, A. (1890). *Principles of economics*. Macmillan.

Nazilah, N., Noer, I., & Kurniawan, H. (2024). Vertical integration of the rice market in Lampung Province. *Journal of International Conference Proceedings*, *7*(2), 3254.

Nordhaus, W. D. (1991). To slow or not to slow: The economics of the greenhouse effect. *The Economic Journal*, 101(407), 920-937.

North, D. C. (1990). *Institutions, institutional change and economic performance*. Cambridge University Press.

Novita, D., Suharno, S., Nurmalina, R., & Nuryantoro, N. (2024). The effect of rice price on the Indonesian inflation in a new institutional economic perspective. *Agrisocionomics: Jurnal Sosial Ekonomi Pertanian*. DOI: 10.14710/agrisocionomics.v8i2.24146.

Octania, G. (2021). The government's role in the Indonesian rice supply chain.

Olviana, T., Nendissa, D. R., Pellokila, M. R., Lerik, M., & Khoiriyah, N. (2022). Vertical market integration and behavioral variations of medium-quality rice prices before and during Covid-19. *Journal of Urban Development and Management*, *10*(1), 107.

Pangesti, A. W., Darsono, D., & Antriyandarti, E. (2023). Causality analysis of rice prices with inflation rate in Indonesia. *Agrisocionomics: Jurnal Sosial Ekonomi Pertanian*. DOI: 10.14710/agrisocionomics.v7i3.16460.

Pellokila Marthen, R., Roy, N. D., Santhy, C., Siska, E., Jesika, B. S., & Tamelan, P. G. IS THERE A PRICE DISPARITY BETWEEN MEDIUM AND PREMIUM RICE IN TRADITIONAL MARKETS BEFORE, DURING, AND AFTER THE COVID-19 PANDEMIC?.

Pellokila, M. R., Nendissa, D. R., Kapa, M. M., Sui, J. M., Elbaa, E. F., Kana, Y. R., ... & Charlota Lerik, M. D. (2023). Environmental challenges due to COVID-19: Implications of altered distribution patterns and rice price dynamics in surplus and deficit areas of Indonesia. *Caspian Journal of Environmental Sciences*, *21*(5), 1159-1170.

Pide, A. (2020). Impact of import tariff policies on rice demand and supply in Indonesia. *Advances in Social Sciences Research Journal*, 7(2), 59-67.

Pigou, A. C. (1920). *The economics of welfare*. Macmillan.

Ravallion, M. (1986). Testing market integration. *American Journal of Agricultural Economics*, 68(1), 102-109.

Rosyada, A., Putra, R. E., & Gunawan, W. (2022). Dynamics of competitiveness and efficiency of rice farming in Java Island, Indonesia. *3BIO: Journal of Biological Science, Technology and Management*.

Roy, N. D., Maria, B., Raja, K. Y., Roddialek, P., & Konda, M. A. (2023). PRICE DYNAMICS AND RED CHILI PRICE LINKAGES BETWEEN MARKETS IN SURPLUS AND DEFICIT AREAS. *Russian Journal of Agricultural and Socio-Economic Sciences*, *135*(3), 51-59.

Rustarto, A., & Ali, H. (2025). The effect of price, public purchasing power and consumption level on rice commodity inflation in Pangkalpinang city. *Dinasti International Journal of Economics, Finance & Accounting*. DOI: 10.38035/dijefa.v5i6.3713.

Sari, D. K., & Sa'adah, A. (2025). Forecasting rice prices in traditional markets in Banyumas regency using fuzzy time series Chen. *BAREKENG: Jurnal Ilmu Matematika dan Terapan*. DOI: 10.30598/barekengvol19iss1pp503-510.

Schultz, T. W. (1964). *Transforming traditional agriculture*. Yale University Press.

Setiawan, A. B., Yusuf, M., Prajanti, S. D. W., Prasetyo, F. H., Bowo, P. A., & Maftukhah, I. (2024). Unraveling the interplay among inflation, rice prices, and farmers exchange rate in Indonesia. *Agro Ekonomi*. DOI: 10.22146/ae.86078.

Shaffitri, L. R., Suryana, E., & Sinuraya, J. F. (2024). Market integration and rice price transmission in Indonesia. *BIO Web of Conferences*, *119*(2), 02007.

Silalahi, N. H., Yudha, R. O., Dwiyanti, E. I., Zulvianita, D., Feranti, S. N., & Yustiana, Y. (2019). Government policy statements related to rice problems in Indonesia: Review. *3BIO: Journal of Biological Science, Technology and Management*. DOI: 10.5614/3BIO.2019.1.1.6.

Syawal, A., Sadikin, A., Reswara, A. A., Fariz, M., Mardianto, F., & Kurniawan, A. (2024). Comparison of rice price prediction results in East Java using Fourier series estimator and Gaussian kernel estimator simultaneously. *BAREKENG: Jurnal Ilmu Matematika dan Terapan*, *18*(3), 1963-1974.

Timmer, C. P. (1989). *Food policy analysis*. Johns Hopkins University Press.

Yusuf, M. A., Sundari, S., Purwanto, I. D., & Kurnia, R. R. (2024). Rice production, policies, and their implications on food security: Indonesia - Thailand perspective. *Jurnal Multidisiplin Madani*.

Yusuf, M. A., Sundari, S., Purwanto, I. D., & Kurnia, R. R. (2024). Rice production, policies, and their implications on food security: Indonesia - Thailand perspective. *Jurnal Multidisiplin Madani*. DOI: 10.55927/mudima.v4i1.7927.