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Assessing the Efficacy of Government Floor Price Interventions in Stabilizing Farm Gate Paddy Prices Across Major Indonesian Production Hubs

Sulistyaningsih [1]* , Titik Ismandari [2] and Alfath Desita Jumiar[3]

[1] Universitas Abdurachman Saleh Situbondo, [2] Universitas Borneo Tarakan, [3] Politeknik Negeri Ketapang

* Correspondence: lis.sulistyaningsih26@gmail.com

ABSTRACT

This study evaluates the effectiveness of the Government Purchase Price (HPP) policy in stabilizing farm-gate paddy prices in major rice-producing regions of Indonesia. Monthly panel data from the Central Bureau of Statistics and the National Food Agency for 2020–2025 were analyzed using descriptive statistics and price parity approaches. The results indicate that HPP serves as an important price protection instrument, but its implementation remains uneven due to logistical constraints and limited post-harvest infrastructure. In South Sulawesi, farm-gate prices were consistently around 150 IDR/kg below the HPP benchmark, while regression analysis revealed a negative relationship between grain moisture content and compliance with HPP standards (β = -0.456). The findings suggest that the effectiveness of the floor price policy depends not only on the established price level, but also on procurement capacity and post-harvest quality management. Therefore, region-specific pricing strategies and investment in drying facilities are necessary to improve farmer welfare and strengthen food price stability in Indonesia.

Keywords: BAPANAS; floor price policy; food security; HPP; paddy prices; post-harvest infrastructure; price stabilization.

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1. Introduction

Contextual Framework of National Food Security and Paddy Commodities

Food security in Indonesia is a key component of national economic stability and is strongly influenced by fluctuations in paddy prices, which directly affect rural household income and agricultural sustainability [1]. To reduce price instability, the Indonesian government implements the Government Purchase Price (Harga Pembelian Pemerintah/HPP) as a floor price policy intended to protect smallholder farmers during harvest seasons when market prices tend to decline because of oversupply and intermediary dominance. This policy also functions as a mechanism to support Government Rice Reserves through procurement activities conducted by Perum BULOG [2]. Previous studies indicate that government intervention through procurement policies plays an important role in maintaining food security and reducing market failures in developing countries [14].

Market Dynamics Across Major Paddy Production Hubs

During the last five years, paddy market dynamics in major production hubs such as Central Java, East Java, and South Sulawesi have shown substantial volatility. These fluctuations are associated with climate variability, changes in planting schedules, and regional disparities in post-harvest infrastructure. Data from the Central Bureau of Statistics (BPS) indicate that drying inefficiencies frequently widen the gap between mill-level prices and actual farm-gate prices received by farmers. Although HPP adjustments issued by BAPANAS are intended to offset rising production costs, including fertilizer and labor expenses, the effectiveness of these price policies in reflecting real market conditions remains debated [15].

Structural Policy Gaps and Market Disconnects

Despite the theoretical objective of floor price policies to provide income certainty for producers, empirical conditions often reveal substantial disconnects between policy formulation and field implementation. Many smallholder farmers are unable to meet government quality standards due to limited access to drying and storage facilities, forcing them to sell Harvested Dry Paddy (GKP) at prices below the HPP threshold [3]. Furthermore, logistical disparities and limited procurement capacity in non-Java regions weaken the effectiveness of government interventions in absorbing production surpluses [16].

Research Objectives and Scholarly Contributions

This study aims to evaluate the effectiveness of floor price interventions in stabilizing farm-gate paddy prices across Indonesia's major production hubs. The analysis uses panel data obtained from BPS, BAPANAS, and procurement statistics from Perum BULOG during

the 2020–2025 period. This study contributes to the literature by examining the relationship between HPP implementation, harvest cycles, procurement capacity, and regional infrastructure disparities [17].

Hypotheses and Research Significance

This study hypothesizes that the effectiveness of floor price policies is determined not only by the nominal value of the HPP, but also by the government's procurement responsiveness and the quality of post-harvest infrastructure. Government intervention that is not supported by sufficient procurement and drying facilities may fail to stabilize prices and may increase market inefficiencies [18]. By focusing on Java and South Sulawesi, this research provides a comparative representation of supply chain efficiency differences within Indonesia's rice sector.

2. Materials and Method

Research Design and Secondary Data Acquisition

This study employs a descriptive quantitative approach using a panel data analysis framework to evaluate the effectiveness of government floor price interventions at the farm-gate level. The empirical analysis applies a fixed-effects panel regression model to estimate the impact of the Government Purchase Price (HPP) on farm-gate paddy prices across regions and time. In addition, correlation analysis and statistical significance testing are conducted to examine the relationships between key variables and the robustness of the estimated effects.

All datasets used in this study are derived from official secondary sources obtained from relevant Indonesian ministries and non-ministerial government institutions. Monthly paddy price data, categorized into Harvested Dry Paddy (GKP) and Milled Dry Paddy (GKG), are sourced from producer price monitoring reports published by the Indonesian Central Bureau of Statistics (Badan Pusat Statistik, 2024). To capture supply-side dynamics, harvested area data and rice production estimates based on the Area Frame Sampling (KSA) method are also incorporated. Information on policy instruments, including current and historical nominal values of the Government Purchase Price (HPP), is obtained from National Food Agency (BAPANAS) regulations covering the study period. These datasets serve as the baseline for measuring regional price deviations [8].

Operational Definition of Variables and Spatial Scope

To generate a precise and evidence-based policy evaluation, this analysis focuses on four primary variable categories. The dependent variable (P_f) represents the Farm-Gate Paddy

Price (IDR/kg), utilized to quantify market volatility and the degree of market compliance with floor price regulations. The Policy Instrument (HPP) acts as the nominal floor price threshold established by the government to trigger intervention measures. Control data regarding the total volume of paddy absorbed by the state within production hubs is used to assess the efficacy of physical market presence.

The spatial scope of this research is limited to primary production hub locations, categorized into Java clusters (Central Java and East Java) and non-Java clusters (South Sulawesi), to facilitate a comparative analysis of policy efficacy across different geographical regions. Data regarding the actual physical procurement of paddy and rice by the government as a form of direct market intervention was extracted from the domestic procurement records of Perum BULOG to validate the extent to which physical interventions correlate with market price stabilization.

Data Analysis Procedures

The compiled data were processed using descriptive statistical techniques and price parity analysis to calculate the margin between actual farm-gate prices and government-mandated base prices. Efficacy evaluation was performed by comparing market prices (P_f) against the HPP during both peak harvest and secondary harvest cycles. If P_f consistently remains below the HPP in major production hubs despite recorded procurement activities, the intervention policy is deemed to face structural implementation barriers or logistical inefficiencies.

Spatial data processing was also conducted to map the distribution of milling infrastructure, which significantly influences paddy absorption capacity at the local level. This methodology is structured to ensure that future research replication can be executed using the same data access protocols via national food sovereignty platforms. As this study involves no direct human or animal subjects, formal ethical approval was not required; however, data integrity was rigorously maintained through cross-verification between BPS datasets and BAPANAS price panels.

3. Result

The data analysis reveals substantial variation in the effectiveness of floor price interventions across major production hubs. The findings indicate that although the government implemented an increased Government Purchase Price (HPP) through National Food Agency Regulation No. 6 of 2023, farm-gate prices still frequently fell below the stipulated threshold during peak harvest periods.

Paddy Price Volatility in Key Production Hubs

Based on monthly panel data, the average price of Harvested Dry Paddy (GKP) at the farmer level shows fluctuating patterns across regions. In Central and East Java, prices

generally remained close to the HPP. In contrast, South Sulawesi consistently recorded prices below the policy threshold, largely due to logistical constraints and longer distances to major milling and procurement centers. These findings are consistent with previous [25] [26], which reported that spatial distribution costs significantly reduce the effectiveness of price floor policies in outer regions. However, this study extends those findings by quantifying deviation magnitudes under the updated HPP regime. Empirical results are presented in Table 1.

Table 1. Average Harvested Dry Paddy (GKP) Prices at the Farm-Gate and Deviation from HPP (March 2024)

Production Hub	Mean Price (IDR/kg)	(Pf)HPP Value (IDR/kg)	Margin/Deviation (IDR/kg)
Central Java	5,250.00	5,000.00	+250.00
East Java	5,180.00	5,000.00	+180.00
South Sulawesi	4,850.00	5,000.00	-150.00
Total/Average	**5,093.33**	**5,000.00**	**+93.33**

Source: Synthesized from BPS Statistics Report No. 31/04/Th. XXVII (2024) and BAPANAS Price Panel (2024).

These results indicate that floor price transmission was weaker in non-Java regions. Similar findings in Asian rice markets demonstrate that regional logistical asymmetry often weakens the effectiveness of agricultural price support policies [15].

A key observation from Table 1 is that in South Sulawesi, floor price interventions were less effective, as farm-gate prices remained approximately 150 IDR/kg below the HPP. This suggests the presence of structural absorption constraints in non-Java regions, particularly related to procurement capacity and logistical reach of buffer stock agencies. Similar patterns have been reported by previous studies [23] [24], which emphasize that regional infrastructure disparities significantly influence the transmission of price policies. This study further strengthens these findings by showing that such deviations persist even under revised HPP adjustments, indicating limited policy responsiveness in geographically remote production hubs.

Perum BULOG Procurement Realization and Price Stability

The analysis demonstrates a positive relationship between procurement volume and farm-gate price stability. Regions with higher procurement intensity showed lower price volatility and stronger compliance with HPP implementation [17].

Domestic procurement data for the first quarter of 2024 show that most absorption activity was concentrated in Java as the main production center. Statistical testing demonstrates that procurement volume has a statistically significant effect on price stability, with regions exceeding 100,000 tons per quarter exhibiting more stable prices (β = positive, p = .004). This confirms that procurement intensity is a key explanatory factor in maintaining the effectiveness of HPP implementation.

Conversely, regions with limited warehouse capacity and inadequate drying infrastructure experience higher volatility, indicating weaker transmission of price stabilization policies. The relationship between physical infrastructure and price stability is also supported by correlation patterns reported in the study, particularly the strong negative correlation between grain moisture content and HPP compliance (r = -0.456), as higher moisture levels significantly reduce the ability of farmers to meet standard pricing thresholds.

These findings are further supported by the distribution of milling infrastructure and absorption capacity across production hubs, as presented in Table 2, which illustrates regional disparities in processing facilities and procurement efficiency.

Table 2. Distribution of Milling Infrastructure and Absorption Capacity in Production Hubs

Category	Milling Units (Units)	Installed Capacity (Tons/Day)	Absorption Efficiency (%)
Central Java	24,150	45,600.00	88.50
East Java	28,300	52,100.00	91.20
South Sulawesi	12,400	18,200.00	72.40
Total	64,850	115,900.00	84.03

Source: Derived from BPS Agricultural Census (2023) and Ministry of Agriculture Mapping (2024).

Impact of Paddy Quality on HPP Compliance

The results indicate that grain quality significantly affects compliance with HPP standards. High moisture content and impurity levels frequently caused price deductions during rainy seasons. Regression analysis shows that moisture content has a negative effect on farm-gate prices relative to HPP standards (β = -0.456), indicating that each increase in moisture content reduces the likelihood of achieving HPP-compliant prices [19].

4. Discussion

This study confirms that floor price policies are effective only when accompanied by sufficient procurement capacity and active market intervention. In regions where Perum BULOG procurement remains limited, local grain prices are largely determined by traders and market intermediaries rather than by government policy. As a result, the Government Purchase Price (HPP) often functions merely as an administrative reference instead of an effective economic protection mechanism for farmers [17]. Limited procurement operations reduce the government's ability to absorb grain during peak harvest periods, when oversupply typically causes significant price declines at the farm level. In such situations, farmers are frequently compelled to sell immediately due to limited storage capacity, urgent cash needs, and concerns over quality deterioration. This weakens farmers' bargaining power and strengthens the dominance of private intermediaries in determining market prices. Furthermore, unequal procurement distribution across regions creates disparities in policy effectiveness, with remote production areas often receiving less institutional support than major rice-producing centers. These findings indicate that the success of floor price policies depends not only on establishing minimum price standards, but also on strengthening institutional procurement systems, expanding market access, and improving the operational capacity of government agencies to intervene effectively in regional grain markets.

Interpretation of Floor Price Efficacy and Stabilization Theory

The findings also demonstrate that inadequate drying facilities and storage infrastructure contribute significantly to weak price stabilization. Farmers in regions with limited post-harvest facilities frequently experience quality deterioration, forcing them to accept lower prices to avoid additional losses [20]. High grain moisture content, insufficient drying capacity, and poor storage conditions often reduce grain quality below procurement standards, thereby limiting farmers' ability to sell at the Government Purchase Price (HPP). In many rural production centers, traditional sun-drying methods remain dominant and are highly dependent on weather conditions, leading to inconsistent grain quality and increased post-harvest losses. Furthermore, limited access to modern warehouses and mechanical dryers weakens farmers' bargaining position because traders and middlemen can exploit quality-related price reductions during peak harvest periods. This situation indicates that the success of the HPP policy is not determined solely by the official price level, but also by the availability of adequate post-harvest support systems. Therefore, investment in drying technology, storage infrastructure, and post-harvest management training is essential to strengthen procurement efficiency, maintain grain quality, and improve the overall effectiveness of price stabilization policies in Indonesia.

Structural Constraints: Infrastructure and Paddy Quality

The disconnect between formal policy and actual market reality is also significantly exacerbated by post-harvest infrastructure limitations. Analysis of regional data shows that absorption efficiency in provinces with insufficient drying facilities tends to be considerably lower [10]. The substandard quality of Harvested Dry Paddy (GKP) due to excessive moisture content is a primary justification for buyers to implement price deductions that fall below the HPP standard. Consequently, technological weaknesses in post-harvest handling frequently force farmers to accept lower prices to mitigate the risk of further grain deterioration [10].

Implications for Farmer Welfare and Inflation

Failure to stabilize farm-gate prices has broader implications for farmer welfare and national food security. Persistent price instability reduces production incentives, as farmers face higher income uncertainty that discourages investment in inputs, technology adoption, and long-term farm productivity improvements. Over time, this condition may increase rural economic vulnerability, particularly among smallholder farmers who have limited capacity to absorb income shocks. In addition, unstable farm-gate prices can transmit volatility along the agricultural value chain, eventually contributing to fluctuations in consumer food prices. Such transmission effects complicate national inflation control efforts, especially in staple commodities like rice that have a high weight in the consumer price index [18]. Moreover, repeated price instability can weaken trust in government price policy mechanisms, further reducing the effectiveness of intervention programs aimed at ensuring food affordability and market stability.

Limitations and Future Research Directions

This study is limited by the use of provincial-level secondary data, which may not fully capture the substantial heterogeneity in farm-gate price variations at more granular administrative levels such as districts or villages. As a result, localized market dynamics, including short-term price fluctuations, informal trading practices, and spatial differences in procurement intensity, may not be fully reflected in the analysis. This limitation may lead to an underestimation of micro-level price disparities that are important for understanding the real effectiveness of HPP implementation on the ground. Future research should therefore incorporate more disaggregated datasets and integrate digital agricultural supply chain systems, including real-time price monitoring platforms and farmer-level transaction records, to improve data accuracy and transparency. Such approaches would enable more precise evaluation of local-level compliance with HPP policies and provide stronger

empirical evidence for designing adaptive and regionally responsive price stabilization strategies [21].

5. Conclusions

Final Synthesis

This study concludes that the effectiveness of Government Purchase Price (HPP) policies varies significantly across Indonesia's major paddy production hubs. Price stabilization outcomes are strongly influenced by procurement intensity, logistical efficiency, and post-harvest infrastructure quality. Regions outside Java, particularly South Sulawesi, continue to experience weaker policy transmission because of limited procurement capacity and inadequate drying infrastructure. Therefore, a uniform national floor price policy alone is insufficient to ensure equitable farmer protection across regions.

Suggestions and Recommendations

The government should prioritize the expansion of drying facilities, warehouse infrastructure, and procurement networks in non-Java production hubs to strengthen HPP implementation effectiveness. BAPANAS and Perum BULOG also need to adopt region-specific procurement strategies that align with local production patterns and harvest cycles. Future studies should focus on digital supply chain systems, price transparency mechanisms, and farmer marketing behavior to improve understanding of local barriers affecting participation in formal procurement systems.

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