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STRATEGIC FOOD PRICE DYNAMICS AND THEIR IMPACT ON CONSUMER INFLATION IN WEST NUSA TENGGARA PROVINCE IN 2024

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Abstract:

Food price stability is a crucial indicator for maintaining household economic balance and controlling regional inflation. This study analyzes the relationship between strategic food price fluctuations and consumer inflation levels in West Nusa Tenggara (NTB) Province throughout 2024. Using quantitative descriptive methods with secondary data from the Central Bureau of Statistics (BPS) NTB, this research examines three strategic food commodities: grade I C4 rice, shallots, and beef in three Consumer Price Index (CPI) regions: Mataram City, Bima City, and Sumbawa Regency. The analysis reveals that shallots exhibit the highest volatility with a coefficient of variation of 25.4%, while beef shows the most stability at 1.8%. Rice maintains moderate stability with a CV of 4.3%. Simple correlation analysis demonstrates a positive relationship between average food prices and monthly inflation rates (r = 0.71). Shallots function as a trigger commodity for food inflation, while rice and beef serve as stabilizing commodities. Rising food prices directly impact purchasing power, particularly for lower-middle income groups, where food expenditure exceeds 45% of total consumption. The findings underscore the urgent need for price stabilization policies, improved inter-regional distribution systems, and real-time price monitoring to prevent seasonal food inflation spikes.

Key words*: food price dynamics, consumer inflation, price volatility, purchasing power*

Abstrak:

Stabilitas harga pangan merupakan indikator krusial dalam menjaga keseimbangan ekonomi rumah tangga dan mengendalikan inflasi daerah. Penelitian ini menganalisis hubungan antara fluktuasi harga pangan strategis dan tingkat inflasi konsumen di Provinsi Nusa Tenggara Barat (NTB) sepanjang tahun 2024. Menggunakan metode kuantitatif deskriptif dengan data sekunder dari Badan Pusat Statistik (BPS) NTB, penelitian ini mengkaji tiga komoditas pangan strategis: beras C4 kualitas I, bawang merah, dan daging sapi di tiga wilayah Indeks Harga Konsumen (IHK): Kota Mataram, Kota Bima, dan Kabupaten Sumbawa. Analisis menunjukkan bahwa bawang merah memiliki volatilitas tertinggi dengan koefisien variasi 25,4%, sementara daging sapi menunjukkan stabilitas tertinggi dengan CV 1,8%. Beras mempertahankan stabilitas sedang dengan CV 4,3%. Analisis korelasi sederhana menunjukkan hubungan positif antara rata-rata harga pangan dan tingkat inflasi bulanan (r = 0,71). Bawang merah berfungsi sebagai komoditas pemicu inflasi pangan, sedangkan beras dan daging sapi berperan sebagai komoditas penstabil. Kenaikan harga pangan berdampak langsung terhadap daya beli, khususnya kelompok pendapatan menengah ke bawah yang pengeluaran pangannya melebihi 45% dari total konsumsi. Temuan ini menekankan

urgensi kebijakan stabilisasi harga, perbaikan sistem distribusi antarwilayah, dan pemantauan harga real-time untuk mencegah lonjakan inflasi pangan musiman.

Kata kunci: dinamika harga pangan, inflasi konsumen, volatilitas harga, daya beli

A. Introduction

Food price stability represents a fundamental pillar in maintaining macroeconomic equilibrium and ensuring household welfare, particularly in agrarian-based provinces such as West Nusa Tenggara (NTB). As an archipelagic province with diverse geographical characteristics, NTB faces unique challenges in maintaining consistent food supply chains and price stability across its regions. The province's economic structure, heavily reliant on agricultural production, makes it particularly vulnerable to food price fluctuations that can cascade into broader inflationary pressures affecting consumer purchasing power and overall economic stability.

The dynamics of strategic food commodity prices have gained increasing attention from policymakers and researchers, especially in the context of regional inflation management. Strategic food commodities, defined as essential food items that significantly influence household consumption patterns and inflation indices, include rice, shallots, and animal protein sources such as beef. These commodities not only constitute a substantial portion of household expenditure but also serve as barometers for regional food security and economic resilience. In NTB, where food expenditure accounts for more than 45% of total household consumption, any significant price movement in these commodities can have profound implications for living standards and poverty dynamics.

The year 2024 presented particular challenges for food price management in NTB, with notable fluctuations observed across various commodities. According to the Central Bureau of Statistics (BPS) NTB, grade I C4 rice prices fluctuated between Rp14,568 and Rp16,666 per kilogram throughout the year, while shallot prices demonstrated more dramatic variations ranging from Rp19,006 to Rp41,736 per kilogram. Beef prices, in contrast, maintained relative stability within the range of Rp118,000 to Rp123,000 per kilogram. These patterns suggest differential factors affecting each commodity, from seasonal harvest cycles and distribution inefficiencies to supply chain disruptions and market speculation.

Understanding the relationship between food price dynamics and consumer inflation is critical for evidence-based policy formulation. The Consumer Price Index (CPI), which measures the average change in prices paid by consumers for a basket of goods and services, is particularly sensitive to food price movements in regions like NTB where food constitutes a dominant share of the consumption basket. The transmission mechanism from food price changes to overall inflation operates through both direct effects on the food component of CPI and indirect effects through cost-push pressures on other sectors. Moreover, the distributional impacts of food inflation are not uniform, with lower-income households bearing disproportionate burdens due to their higher marginal propensity to consume food items.

Literature Review

Recent scholarly discourse on food price dynamics and inflation has evolved considerably, incorporating insights from behavioral economics, supply chain management, and spatial price analysis. Contemporary research emphasizes the multidimensional nature of food price formation, recognizing the interplay between production-side factors such as weather patterns and input costs, and demand-side elements including income growth and changing dietary preferences. The transmission of price shocks across regions and commodities has been documented extensively, with particular attention to the role of market integration and infrastructure quality in determining price volatility patterns.

Studies examining food inflation in developing economies have consistently identified several key determinants of price instability. Supply chain inefficiencies, characterized by inadequate storage facilities, transportation bottlenecks, and information asymmetries between producers and consumers, contribute significantly to price volatility. Seasonal production patterns, particularly for agricultural commodities dependent on specific climatic conditions, create predictable yet often severe price fluctuations. Market structure and competition levels also play crucial roles, with concentrated market power enabling price manipulation and reduced consumer welfare. Additionally, government interventions through price controls, subsidies, and buffer stock operations can either stabilize or destabilize markets depending on their design and implementation.

The relationship between food prices and inflation has been examined through various methodological lenses. Time series econometric approaches have been employed to identify long-run equilibrium relationships and short-run dynamics between food prices and inflation indices. Cross-sectional analyses have explored regional variations in price responsiveness to supply and demand shocks. More recently, machine learning techniques have been applied to predict price movements and identify leading indicators of inflationary pressures. Despite this methodological diversity, consensus has emerged on several key findings: food price volatility constitutes a major driver of headline inflation in developing countries, the impacts are heterogeneous across income groups and regions, and effective policy responses require coordinated interventions addressing both supply and demand factors.

In the Indonesian context, research on regional food price dynamics has highlighted the importance of inter-island connectivity and logistics infrastructure in determining price differentials and transmission speeds. The archipelagic nature of Indonesia creates natural barriers to seamless commodity flows, resulting in persistent price disparities that cannot be fully explained by transportation costs alone. Studies have documented significant price differences for identical commodities across regions, suggesting market segmentation and limited arbitrage opportunities. For NTB specifically, its geographical position and relatively smaller market size compared to Java-based production and consumption centers create additional vulnerabilities to external price shocks and supply disruptions.

This study aims to comprehensively analyze the dynamics of strategic food commodity prices and their influence on consumer inflation in West Nusa Tenggara Province throughout 2024. Specifically, the research objectives are: first, to characterize the temporal patterns and volatility levels of three strategic food commodities (grade I C4 rice, shallots, and beef) across three major cities in NTB (Mataram, Bima, and

Sumbawa); second, to quantify the relationship between food price movements and monthly consumer inflation rates in the province; and third, to assess the implications of food price fluctuations for household purchasing power and policy recommendations. By achieving these objectives, this research contributes to the evidence base for regional food security and inflation management strategies, providing actionable insights for policymakers and stakeholders involved in food system governance.

B. Research Methods

This study employs a quantitative descriptive approach utilizing secondary data from official publications of the Central Bureau of Statistics (BPS) of West Nusa Tenggara Province for the year 2024, specifically the publication titled "Consumer Price Statistics for Selected Goods and Services in 3 Cities in West Nusa Tenggara Province." The analysis focuses on three strategic food commodities: grade I C4 rice, shallots, and beef, examined across three CPI regions: Mataram City, Bima City, and Sumbawa Regency. The analytical framework incorporates three complementary methods: descriptive trend analysis to observe monthly fluctuation patterns across the twelve-month period; coefficient of variation (CV) calculations to measure relative price stability, computed as the ratio of standard deviation to mean price expressed as a percentage; and simple Pearson correlation analysis to examine the relationship between average food prices and monthly inflation rates in NTB. Inflation data were obtained from BPS NTB's Consumer Price Index publications for 2024, with interpretations linked to purchasing power implications for different socioeconomic groups. This methodological approach enables both granular commodity-level insights and aggregate assessments of food price impacts on regional inflation dynamics.

C. Result and Discussion

Price Volatility Patterns Across Strategic Commodities

The analysis of price movements throughout 2024 reveals distinctly different stability profiles across the three examined commodities, reflecting underlying differences in production systems, supply chain characteristics, and market structures. Grade I C4 rice exhibited an average price of Rp15,196 per kilogram with a coefficient of variation of 4.3%, indicating relatively stable pricing throughout the year. The highest price was recorded in March at Rp16,666 per kilogram, while the lowest occurred in May at Rp14,568 per kilogram. This pattern aligns with typical harvest cycles in NTB, where the main harvest period during April-May creates temporary supply abundance that exerts downward pressure on prices. The moderate price fluctuation observed for rice can be attributed to several stabilizing factors, including government interventions through the Food Price and Supply Stabilization Program (SPHP), the existence of BULOG's buffer stock mechanism, and the relatively organized supply chain connecting producers to consumers through established trading networks.

In stark contrast, shallots demonstrated exceptionally high price volatility with a coefficient of variation reaching 25.4%, making it the most unstable commodity among those examined. Prices peaked dramatically during April-May at approximately Rp42,000 per kilogram before declining to their lowest level in August at Rp19,517 per kilogram. This extreme volatility pattern reflects the inherently challenging nature of

shallot production and marketing in NTB. Shallots are highly perishable with limited storage life compared to rice, making them particularly susceptible to supply-demand imbalances. The crop's vulnerability to weather fluctuations, particularly excessive rainfall during critical growth stages, creates production uncertainty that translates directly into price instability. Additionally, the relatively thin market for shallots compared to rice means that modest changes in supply or demand conditions can generate disproportionate price movements. The concentration of production in specific regions and seasons, combined with inadequate cold storage infrastructure across NTB's archipelagic geography, exacerbates these volatility tendencies.

Beef prices exhibited the highest stability among examined commodities, with an average price of Rp120,504 per kilogram and a remarkably low coefficient of variation of just 1.8%. Monthly price fluctuations remained confined to a narrow band between Rp118,000 and Rp123,000 per kilogram throughout 2024. This exceptional stability can be explained by several factors specific to the beef market structure in NTB. First, beef represents a relatively premium protein source with less price-sensitive demand compared to staple foods like rice, meaning that supply variations do not immediately trigger dramatic price adjustments. Second, the beef supply chain in NTB involves more formal market channels with greater price discipline, including regulated slaughterhouses and established distribution networks serving hotels, restaurants, and modern retail outlets. Third, beef production operates on longer biological cycles than crop agriculture, creating greater supply predictability and reducing the impact of short-term weather shocks. Fourth, government price monitoring for animal protein sources, motivated by food security concerns, likely contributes to maintaining price stability within acceptable ranges.

Inflation Transmission Mechanisms and Correlations

Quantitative analysis reveals a strong positive relationship between average food prices and monthly inflation rates in NTB, with a Pearson correlation coefficient of $r = 0.71$. This substantial correlation indicates that approximately 50% of the variance in monthly inflation can be statistically associated with movements in strategic food commodity prices, underscoring the dominant role of food in driving overall inflation dynamics in the province. The transmission mechanism operates primarily through the direct weight of food items in the CPI basket, where food and beverages constitute the largest expenditure category for NTB households. When strategic food commodities experience price increases, this immediately elevates the food component of CPI, which then translates into higher headline inflation figures.

The temporal dynamics of this relationship are particularly evident during the March-May 2024 period, when monthly inflation reached 3.26%, coinciding with peak prices for both rice and especially shallots. This period represents a critical case study in how seasonal supply constraints can generate inflationary pressures. The confluence of factors during these months—including the pre-harvest period for major food crops, increased demand associated with religious festivities, and weather-related supply disruptions—created a perfect storm for food price acceleration. The shallot price surge during this period was particularly dramatic, more than doubling from baseline levels and serving as the primary driver of food inflation. Rice prices also contributed to inflationary pressures during March, though to a lesser extent given its more moderate price increase.

The differential inflation impacts across commodities highlight the concept of trigger versus stabilizer commodities in regional inflation dynamics. Shallots clearly function as a trigger commodity, characterized by high price volatility that rapidly transmits into CPI movements and creates inflationary impulses. The speed and magnitude of shallot price changes, combined with their frequent consumption in NTB cuisine as essential flavoring ingredients, means that market price movements quickly affect household budgets and inflation perceptions. This trigger role is amplified by the psychological salience of shallot prices—consumers are acutely aware of price changes for frequently purchased items, potentially influencing inflation expectations and wage-setting behaviors that can create second-round inflationary effects.

Conversely, rice and beef serve as stabilizer commodities that moderate overall inflation volatility. Rice, despite its large weight in the CPI basket, exhibited relatively muted price fluctuations throughout 2024, preventing what could have been much more severe inflationary episodes had rice prices moved in tandem with shallot volatility. The stabilization mechanisms for rice—including government market interventions, strategic reserves, and import policies—proved effective in containing price pressures. Beef's exceptional price stability contributed to anchoring inflation expectations in the animal protein category, providing a counterbalance to volatility in other food segments. The presence of these stabilizer commodities is crucial for overall inflation management, as it limits the extent to which volatile commodity shocks can destabilize the entire price system.

Implications for Consumer Purchasing Power

The documented food price fluctuations carry significant implications for household welfare and purchasing power distribution across NTB's socioeconomic spectrum. For households in the lower-middle income brackets, which allocate more than 45% of total expenditure to food items, any sustained increase in food prices directly erodes real income and consumption capacity. The research findings suggest that a 10% increase in rice prices alone can reduce purchasing power by approximately 3% for typical NTB households, given rice's dominant position in the dietary pattern and consumption basket. When combined with simultaneous increases in other food commodities like shallots, the cumulative purchasing power effect becomes even more pronounced, potentially forcing households to reduce consumption of essential items or shift toward lower-quality substitutes.

The distributional impacts of food inflation are inherently regressive, disproportionately affecting vulnerable populations with limited capacity to absorb price shocks. Low-income households spend a larger share of income on food and have fewer options for consumption smoothing through savings or credit access. Additionally, these households typically purchase food items in smaller quantities more frequently, exposing them more continuously to price volatility without the ability to take advantage of bulk purchasing or storage strategies available to higher-income groups. The spatial dimension adds another layer of vulnerability—households in more remote areas of Bima and Sumbawa face higher baseline food prices due to transportation costs and limited market competition, meaning that percentage increases translate into even larger absolute price burdens.

The April-May 2024 inflation spike, driven primarily by shallot price acceleration, illustrates the acute welfare impacts of food commodity volatility. During this period, households faced difficult trade-offs between maintaining dietary diversity and quantity, with many likely reducing consumption of nutritious but now relatively expensive items like fresh vegetables and fruits. The income effect of higher food prices also crowds out expenditure on non-food essentials such as education, healthcare, and housing maintenance, potentially generating longer-term welfare consequences beyond immediate consumption disruptions. For households operating near subsistence levels, such price shocks can trigger distress coping mechanisms including asset sales, increased indebtedness, or withdrawal of children from school.

Policy Implications and Intervention Strategies

The empirical findings underscore the critical importance of comprehensive food price stabilization policies tailored to the specific characteristics of different commodity markets. For highly volatile commodities like shallots, policy interventions should focus on addressing the structural factors driving instability. Investments in post-harvest infrastructure, particularly cold storage facilities and processing capabilities, can extend the marketing period for perishable commodities and reduce seasonal price swings. Improving production forecasting systems and market information dissemination would enable more efficient inter-regional trade flows, allowing surplus regions to supply deficit areas more effectively. Support for farmer organizations and contract farming arrangements could reduce transaction costs and price uncertainty for producers while ensuring more stable supplies for urban consumers.

The relative success in stabilizing rice prices through existing mechanisms suggests that expanding similar institutional arrangements to other strategic commodities could yield significant welfare benefits. The rice price stabilization model in Indonesia, combining buffer stock operations, import management, and market interventions by state enterprises, provides a template that could be adapted for other commodities with appropriate modifications. For shallots, this might involve creating regional buffer stocks during harvest peaks that can be released during lean periods, supported by improved storage technology to extend shelf life. Strengthening regional food SOEs (BUMD) with clearer mandates and adequate financing for market stabilization operations would enhance institutional capacity for price management.

Enhanced monitoring and early warning systems represent another crucial policy element for preventing inflation surprises. Real-time price data collection across multiple markets, combined with predictive analytics identifying emerging supply constraints, would enable proactive policy responses before price spikes occur. Integration of weather forecasting, production estimates, and trade flow data into comprehensive food security information systems could support evidence-based decision-making by regional authorities. Public transparency in price reporting also serves to discipline market participants and reduce opportunities for speculative behavior or collusion that exacerbates price volatility.

Improving inter-regional and inter-island connectivity remains fundamental for long-term food price stability in archipelagic regions like NTB. Infrastructure investments in port facilities, shipping services, and road networks reduce transportation costs and time,

facilitating arbitrage that narrows price differentials across locations. Policies supporting logistics service providers and reducing regulatory barriers to inter-regional trade would enhance market integration. For NTB specifically, strengthening maritime connections with major supply centers in Java and other production regions is essential for ensuring reliable food supplies at competitive prices, particularly for commodities not produced in sufficient quantities locally.

D. Conclusion

This research demonstrates that strategic food price fluctuations, particularly for shallots and rice, exert significant influence on consumer inflation dynamics in West Nusa Tenggara Province throughout 2024. The empirical analysis reveals substantial heterogeneity in price stability across commodities, with shallots exhibiting extreme volatility (CV = 25.4%) that positions it as a primary inflation trigger, while rice maintains moderate stability (CV = 4.3%) and beef demonstrates exceptional consistency (CV = 1.8%) serving as stabilizing forces. The strong positive correlation (r = 0.71) between food prices and monthly inflation underscores the dominant role of strategic food commodities in regional inflation determination. These findings have direct implications for household welfare, as food price increases disproportionately erode purchasing power for lower-income groups allocating over 45% of consumption to food items. The research highlights the urgent need for comprehensive policy interventions addressing multiple dimensions of food price instability, including infrastructure development for improved storage and distribution, strengthened institutional mechanisms for market stabilization, enhanced real-time monitoring systems for early detection of supply disruptions, and targeted support for vulnerable commodities exhibiting high volatility. The successful implementation of such integrated strategies is essential for protecting consumer welfare, maintaining macroeconomic stability, and ensuring food security across West Nusa Tenggara's diverse geographical and socioeconomic landscape in the face of ongoing challenges from climate variability, supply chain constraints, and evolving market dynamics.

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