

## The Paradox of Trade Surplus and Feed Dependency: Re-Evaluating Indonesia's Position Through Unequal Exchange

Aminata Sukriya<sup>1\*</sup>, Subhan Effendi<sup>2</sup>, Ilham Ahmad<sup>3</sup>

Livestock Agribusiness, Animal Science, State Agricultural Polytechnic of Pangkajene Islands

**Corresponding Author:** Aminata Sukriya [aminatasukriya@polipangkep.ac.id](mailto:aminatasukriya@polipangkep.ac.id)

---

### ARTICLE INFO

*Keywords:* Unequal Exchange, Food Security, Fiscal Reform, Livestock Industry, Global Inequality

*Received :* 10 October

*Revised :* 15 November

*Accepted:* 30 December

©2025 Sukriya, Effendi, Ahmad: This is an open-access article distributed under the terms of the [Creative Commons Attribution 4.0 International](https://creativecommons.org/licenses/by/4.0/).



### ABSTRACT

This study aims to analyze the challenges hindering the independence of Indonesia's national livestock industry amidst the country's ambition to achieve developed nation status by 2045. Employing a comparative literature review method, this research synthesizes Indonesia's domestic fiscal strategies with the latest global inequality data found in the World Inequality Report 2026. The findings reveal a structural tension: on one hand, Indonesia records a trade surplus and prioritizes food security through strategic programs such as food estates (lumbung pangan) and the "Free Nutritious Meal" initiative. On the other hand, the asymmetric global financial structure places developing nations at a disadvantage through the mechanism of "unequal exchange." Wealthy nations enjoy an "exorbitant privilege" that allows them to borrow cheaply and dominate productive assets, while developing nations face high liability costs. This analysis concludes that without global structural reforms and aggressive domestic downstreaming (hilirisasi), the dependency on imported livestock feed raw materials will continue to function as a channel for wealth transfer from Indonesia to developed nations, thereby impeding the capital accumulation necessary for economic transformation

---

## INTRODUCTION

Indonesia targets a significant economic transformation to escape the middle-income trap and attain the status of a developed nation. In the short to medium term (2026), the Government of Indonesia, through the Ministry of Finance, has established a strategy for high, stable, and equitable economic growth, aiming for rates above 5% and up to 8% in the long term. A key pillar of this strategy is food security and the enhancement of human capital quality through priority programs such as the 'Free Nutritious Meal' initiative and the development of food estates.

These programs will implicitly drive demand for livestock products (meat, eggs, and milk). However, the sustainability of this sector is often constrained by a reliance on imported components, particularly animal feed. This phenomenon occurs amidst a highly unequal global market structure. The World Inequality Report 2026 highlights that the current global economic system is designed such that wealthy nations act as 'global financial rentiers,' systematically extracting resources from developing countries.

This research utilizes the 'Unequal Exchange' theoretical framework discussed in the WIR 2026 to analyze Indonesia's position. The study examines how global financial and trade mechanisms may impede Indonesia's efforts to achieve food sovereignty in the livestock sector, despite the country recording solid fiscal performance at the macroeconomic level.

Indonesia envisions a transformative economic trajectory to escape the middle-income trap and ascend to developed nation status by 2045. In the short-to-medium term, specifically within the 2026 economic outlook, the Government of Indonesia has prioritized high, stable, and inclusive growth. Central to this strategy is the strengthening of national food security and human capital through flagship initiatives such as the "Free Nutritious Meal" (Makan Bergizi Gratis) program, allocated IDR 43.8 trillion, and the development of food estates (Lumbung Pangan), budgeted at IDR 12.1 trillion. While these policies are designed to stimulate domestic demand for livestock products, the sustainability of this sector faces profound challenges embedded in the global economic architecture.

Global food security is increasingly recognized as a multifaceted issue contingent upon effective policy frameworks and regional economic dynamics (Rosegrant, 2018). In the context of developing economies like Indonesia, the agricultural and livestock sectors are often hampered by institutional rigidities and external shocks (Akbar et al., 2025). A critical vulnerability in Indonesia's livestock industry is its heavy reliance on imported feed components, particularly corn and soybean meal. This dependency exposes domestic producers—predominantly smallholders—to global price volatility and supply chain disruptions, a situation exacerbated by limited access to sustainable finance models and agricultural innovations (Alamsyah et al., 2024).

This structural vulnerability is not merely a matter of trade imbalances but is symptomatic of a deeper "Unequal Exchange" in the global economy. The World Inequality Report 2026 posits that the current financial system is designed to favor wealthy nations (the Global North), granting them an "exorbitant

privilege" to borrow cheaply while commanding high-yield assets in the Global South. Conversely, developing nations face high liability costs and structurally weak currencies, effectively transferring real wealth to richer nations through trade and debt servicing.

The barriers to overcoming this inequality are compounded by technological and financial gaps. Although digitalization and climate-smart innovations offer pathways to sustain food security (Bustos-Terrones et al., 2025; Mudzielwana, 2025), their adoption among smallholder farmers in developing countries remains low due to systemic financial and informational barriers (Obe et al., 2025; Thobane et al., 2025). Without addressing these structural impediments, domestic policies like downstreaming (hilirisasi) may struggle to retain economic value within the country.

This paper analyzes the position of Indonesia's livestock sector through the theoretical lens of Unequal Exchange. By synthesizing domestic fiscal strategies with global inequality data, it examines how international financial hierarchies and trade dependencies obstruct Indonesia's path to food sovereignty, despite the country's solid macroeconomic performance.

## LITERATURE REVIEW

Feed is widely recognized as the dominant cost component in commercial poultry and ruminant production; therefore, the price and availability of feed ingredients strongly shape sectoral competitiveness. In Indonesia, livestock production has long depended on imported feed raw materials, particularly soybean meal and (for some segments) corn and specific feed additives. Indonesia-focused analyses argue that such import dependency transmits global commodity cycles into domestic costs and heightens sensitivity to exchange-rate movements and external supply disruptions (Agustian & Hartoyo, 2023; Rusdiana & Praharani, 2023).

Beyond immediate price effects, import dependency can lock the sector into a low value-added position when domestic capacity for upstream processing and input industries remains limited. When upstream feed components are sourced externally, productivity gains at farm level may not translate proportionally into domestic value capture because commodity pricing, processing margins, and currency-denominated transactions are largely realized offshore. This structural feature helps explain why sector expansion can coexist with persistent vulnerability among producers, particularly smallholders that have limited buffers against input shocks.

This vulnerability intersects with broader rural finance constraints. Access to formal credit remains uneven and often constrained by collateral, administrative requirements, and financial literacy gaps, even where subsidized facilities exist (Ashari & Saptana, 2021). Recent scholarship on sustainable finance models for smallholder farmers also suggests that adoption of productivity-enhancing and sustainability-oriented innovations is closely tied to fit-for-purpose financial products and risk-sharing instruments, which remain limited in many developing-country settings (Alamsyah et al., 2024).

Food security is commonly framed as a multi-dimensional outcome shaped by macroeconomic stability, policy design, and regional market dynamics (Rosegrant, 2018). In Indonesia, food security strategies increasingly combine supply-side expansion (e.g., production centers and logistics) with demand-side interventions linked to nutrition and human capital. Policy analyses highlight that governance quality and coordination among food-related institutions are central to stabilizing stocks, prices, and distribution – especially in archipelagic contexts with uneven infrastructure (Arifin et al., 2021; Marius et al., 2024).

Within this policy landscape, nutrition-oriented programs can act as a demand pull for livestock products – especially eggs, meat, and milk – while also functioning as social protection. Evidence suggests that such programs generate stronger and more inclusive rural multipliers when they are integrated with local procurement, supplier development, and transparent distribution mechanisms that enable participation by local producers (Wibowo & Hidayat, 2024). However, the literature also implies that demand expansion without parallel strengthening of domestic feed supply can increase exposure to imported inputs, thereby amplifying cost pass-through and potentially weakening the affordability and stability objectives of food-security policy.

At the same time, the “food estate” approach is often justified as a means to diversify production centers outside Java, but assessments emphasize that sustainability and social inclusiveness are decisive for long-run outcomes. Environmental and governance evaluations caution that large-scale land-based programs require robust safeguards to avoid ecological degradation and distributional conflict, which can undermine food security objectives (Octavia, 2022).

Technology and innovation are frequently proposed as solutions to productivity and resilience constraints in food systems, including digital tools, improved logistics, and climate-smart practices. Indonesian-focused work on digital transformation highlights potential gains from farm management support, market transparency, and supply-chain coordination, while also noting infrastructure gaps and uneven diffusion across islands (Hermanto & Swastika, 2022). Global perspectives similarly argue that digitalization can contribute to food security through efficiency gains and better risk management, but only when institutional and capability prerequisites are in place (Bustos-Terrones et al., 2025).

Yet, adoption is not automatic. Review and meta-analytic evidence consistently emphasizes barriers for smallholders – financial constraints, limited extension services, information asymmetries, and risk aversion – especially in developing-country contexts (Obe et al., 2025; Thobane et al., 2025). In Indonesia, climate variability (including ENSO-related shocks) further complicates planning and input decisions, strengthening the case for adaptation measures and resilient production systems to reduce systemic risk (Surmaini et al., 2020). This line of literature implies that policies to reduce feed dependency must be coupled with innovation systems (extension, finance, logistics, and standards) so

that domestic input industries and smallholder producers can adopt improvements at scale.

The unequal exchange tradition argues that asymmetries in global trade and finance can generate systematic transfers of value from the Global South to the Global North, even when developing countries record trade surpluses in goods. Contemporary empirical work links such transfers to unequal terms of trade, global value-chain governance, and the financial architecture that shapes borrowing costs, currency hierarchies, and cross-border income flows (Hickel et al., 2022). Building on this perspective, the World Inequality Report 2026 discusses “exorbitant privilege” as a mechanism whereby wealthy economies can borrow at lower cost while holding higher-yield claims elsewhere, whereas developing countries face higher liability costs and weaker currency positions (Chancel et al., 2025).

In resource- and food-related sectors, unequal exchange arguments increasingly incorporate ecological dimensions, highlighting how material and environmental burdens can be externalized to producer regions while financial gains accrue elsewhere (Li et al., 2026). For Indonesia’s livestock sector, this literature is relevant because import-dependent feed chains can become a channel through which currency appreciation, pricing power, and financing asymmetries translate into recurring outflows. This study therefore positions domestic downstreaming (hilirisasi) and feed-industry upgrading not only as industrial policy, but also as a strategy to improve domestic value capture under structurally unequal global conditions (Nievas & Piketty, 2025).

## **METHODOLOGY**

This study uses a Systematic Literature Review (SLR) combined with comparative policy-document analysis to examine how domestic food-security strategies intersect with global financial hierarchies in shaping Indonesia’s livestock-feed dependency.

### **Review Design and Analytical Framework**

The review followed a structured process of identification, screening, eligibility, and inclusion. Analysis was guided by Unequal Exchange theory and the concept of “exorbitant privilege” to connect three analytical layers: (i) domestic demand and food-security policy drivers, (ii) sectoral mechanisms that transmit global input prices into farm costs, and (iii) global financial conditions (currency hierarchy and liability costs) that can facilitate persistent value outflows.

### **Data Sources**

Two categories of sources were used. First, peer-reviewed academic literature was collected to capture evidence on (a) livestock-feed import dependency and its impacts, (b) food security governance and fiscal instruments, and (c) unequal exchange and North-South financial relations. Second, policy and institutional documents were included to represent Indonesia’s domestic strategy context, including relevant Ministry of Finance materials on the 2026

economic outlook and the World Inequality Report 2026 (with emphasis on the chapter discussing global financial hierarchies).

### **Search Strategy and Selection Criteria**

Academic literature was searched using Google Scholar and major indexing databases (e.g., Scopus and Web of Science) with combinations of keywords such as: “Indonesia livestock feed import”, “soybean meal dependency”, “food security governance”, “fiscal policy nutrition program”, “unequal exchange”, and “exorbitant privilege”. Searches prioritized publications from 2018 onward to reflect recent policy and supply-chain dynamics, while allowing foundational theoretical works when directly relevant.

Sources were included when they: (1) focused on Indonesia or offered transferable evidence for comparable developing-country contexts; (2) addressed at least one core construct (feed dependency, food security policy, or unequal exchange/financial hierarchy); and (3) provided empirical results, systematic reviews, or policy-relevant analyses. Sources were excluded when they were opinion-only pieces without methodological clarity, lacked relevance to the livestock-feed nexus, or duplicated evidence already covered by higher-quality sources.

### **Data Extraction and Synthesis**

For each included source, key information was extracted (author/year, context, method, main findings, and implications for feed dependency and value capture). Findings were synthesized using thematic analysis, with codes organized into three thematic clusters: (1) domestic drivers and constraints (program demand, finance, institutions, technology, and climate risks); (2) sectoral vulnerability mechanisms (input price transmission, currency exposure, and market power in upstream inputs); and (3) global structural mechanisms (financial hierarchy and unequal exchange). The final interpretation compared these clusters to identify how domestic policy ambitions may be constrained or amplified by international structural conditions.

### **Reliability and Limitations**

Because the study relies on secondary sources, conclusions are sensitive to publication bias and heterogeneity in study contexts. The analysis does not include primary farm-level or firm-level field data; therefore, causal claims about micro-level outcomes are framed cautiously and discussed as structural mechanisms supported by the reviewed literature. Future research could strengthen the evidence base by combining input-output mapping of feed supply chains with econometric estimation of exchange-rate pass-through and case studies of domestic feed-industry upgrading.

## RESULT AND DISCUSSION

### **Food Security Amidst Fiscal Challenges: An Analysis of Indonesia's 2025-2026 Strategic Outlook**

The Government of Indonesia has established food security as a primary agenda priority within the 2025 State Budget (APBN) and projections for 2026. Specific initiatives, such as the "Free Nutritious Meal" (Makan Bergizi Gratis) program with a budget allocation of IDR 43.8 trillion and the development of Food Estates (Lumbung Pangan) valued at IDR 12.1 trillion, demonstrate a serious commitment to stimulating demand for livestock and agricultural products (Kementerian Keuangan RI, 2024).

Macroeconomically, Indonesia possesses strong capital, evidenced by a trade balance recording a surplus for 64 consecutive months leading up to 2025. However, challenges persist regarding value-added creation. Indonesia's economic structure requires a transformation from low-value-added sectors to high-value-added industries. In the context of livestock feed, the heavy reliance on imported raw materials – such as corn and soybean meal – represents a low-value-added activity where Indonesia remains merely a consumer of commodities whose prices are determined by the global market (Agustian & Hartoyo, 2023).

Addressing food security in Indonesia is a multifaceted issue influenced by economic stability, technological advancements, and environmental sustainability. Managing these issues amidst fiscal constraints requires a comprehensive approach considering supply and demand-side constraints specific to the archipelago.

### **Key Challenges in the Indonesian Context**

#### *1. Economic Constraints and Financial Barriers*

Smallholder farmers, who dominate Indonesia's agricultural landscape, face significant financial constraints that limit their ability to adopt sustainable practices. Despite the existence of the People's Business Credit (KUR) program, many farmers still face administrative barriers and collateral requirements that hinder access to formal financing (Ashari & Saptana, 2021). Furthermore, volatility in global food prices often translates into domestic inflation, reducing household purchasing power and threatening food access for vulnerable populations in urban and rural Indonesia (Nuryanti, 2023).

#### *2. Technological and Institutional Barriers*

The adoption of agricultural innovation in Indonesia is often hampered by the fragmentation of technical support and the uneven distribution of technology across islands. While climate-smart agriculture technologies exist, their dissemination to remote areas outside Java remains slow due to infrastructure gaps (Arifin et al., 2021). Additionally, institutional coordination between the National Food Agency (Bapanas), the Ministry of Agriculture, and Bulog remains a critical area for improvement to ensure policy synergy in stabilizing food stocks and prices (Marius et al., 2024).

### 3. Environmental and Climate Challenges

Indonesia is highly vulnerable to climate change, particularly the El Niño Southern Oscillation (ENSO), which significantly disrupts rice production cycles and increases vulnerability in agrarian communities. Adaptation strategies, such as the development of drought-resistant superior variety seeds (*varietas unggul*), are essential but require scaling up (Surmaini et al., 2020). Furthermore, land conversion from agricultural to industrial use in Java threatens the sustainability of national rice production, necessitating strict spatial planning enforcement.

### Strategic Solutions for Indonesia

#### 1. Policy and Investment: The "Makan Bergizi Gratis" Catalyst

The implementation of the "Free Nutritious Meal" program serves as a targeted social safety net that not only ensures nutritional intake for students but also acts as an offtaker for local agricultural products. To be effective, this program must be integrated with local supply chains to boost the rural economy (Wibowo & Hidayat, 2024).

#### 2. Sustainable Agricultural Practices and Food Estates

The development of Food Estates (*Lumbung Pangan*) outside Java aims to diversify food production centers. However, ensuring these projects are environmentally sustainable and socially inclusive is paramount. Adopting nature-based solutions and agroecological methods in these estates can mitigate the risks of peatland degradation and ensure long-term soil health (Octavia, 2022).

#### 3. Technological Integration and Downstreaming

To address the "value-add" challenge mentioned in the macro outlook, Indonesia must invest in the downstreaming (*hilirisasi*) of the agricultural sector. This includes developing domestic feed industries to reduce import dependency. Leveraging digital technologies, such as Smart Farming and agricultural start-ups, can improve supply chain efficiency and transparency for local commodities (Hermanto & Swastika, 2022).

Achieving food security in Indonesia amidst fiscal challenges requires a multi-faceted approach that integrates the strategic allocation of the APBN with structural reforms. By addressing financial barriers for smallholders, enhancing institutional synergy between food agencies, and reducing import dependency through downstreaming, Indonesia can build a resilient food system capable of meeting its 2045 vision.

### Global Perspective: The Mechanism of Unequal Exchange

The World Inequality Report 2026 provides a theoretical framework positing that cross-country inequality is not a matter of coincidence, but rather a result of institutional design. Wealthy nations (the Global North) enjoy an 'exorbitant privilege,' allowing them to borrow at low interest rates while investing in high-yield assets in developing countries. Conversely, developing nations like Indonesia often bear high-cost liabilities (debt/imports) while holding low-yield assets (such as foreign exchange reserves). In the context of the



animal feed trade, this mechanism becomes evident when developing countries are compelled to pay for imports using foreign currencies (such as the US dollar) that tend to appreciate against local currencies, thereby resulting in a transfer of real income from poor to wealthy nations.

Rising global resource demand is creating a severe ecological burden that disproportionately falls on developing agricultural nations, a situation structurally worsened by an unfair global financial system. As highlighted in the World Inequality Report 2026, wealthy nations enjoy an "exorbitant privilege" allowing them to borrow cheaply, while developing countries like Indonesia face high costs for debts and essential imports – such as animal feed – which must be paid in strengthening foreign currencies like the US dollar. This dynamic results in a "modern form of unequal exchange" where real wealth is continuously transferred from poorer to richer nations, meaning that true sustainability requires global institutional reforms like ecological tariffs and ecosystem service payments to correct these deep financial and environmental imbalances

### **The Paradox of Surplus: Unequal Exchange and the Structural Vulnerability of Indonesia's Livestock Sector**

Despite Indonesia consistently recording a trade surplus, the theoretical framework of unequal exchange suggests that a positive balance of trade in goods does not necessarily guarantee a surplus in net national income. The World Inequality Report 2026 highlights a critical structural imbalance, noting that developing countries systematically transfer approximately 2–3% of their GDP to developed nations through unequal financial and trade mechanisms. This phenomenon aligns with recent studies on global value chains, which argue that while emerging economies may export volumes, the capture of high value-added components often remains with the Global North due to price differentials in labor and resources (Hickel et al., 2022).

The Livestock Sector as a Channel for Wealth Transfer In the Indonesian livestock industry, the heavy reliance on imported animal feed serves as a primary channel for this wealth transfer. The national poultry and ruminant sectors remain highly dependent on imported raw materials, such as soybean meal and corn, making domestic production costs highly sensitive to global market fluctuations (Agustian & Hartoyo, 2023). This vulnerability is exacerbated by currency volatility; the Indonesian Rupiah is projected to trade between IDR 16,000 and IDR 16,500 per USD in 2026.

Such depreciation directly inflates import costs, squeezing the profit margins of smallholder farmers who lack the financial resilience to absorb input price shocks (Rusdiana & Praharani, 2023). On a macroeconomic scale, this dynamic reduces the nation's fiscal space. Funds that are absorbed by high-cost imports and debt servicing are effectively diverted away from essential public investments in health and education, thereby hindering human capital development (Nuryanti, 2023).

Policy Responses and Global Structural Barriers The Indonesian government has responded to these challenges with a robust downstreaming (hilirisasi) strategy aimed at increasing domestic value-added processing and

reducing raw commodity exports. While this policy aims to internalize economic value, its success is contingent upon the broader global economic architecture.

The World Inequality Report 2026 warns that domestic efforts alone – such as downstreaming – may be insufficient to stem the "wealth drain" without comprehensive reform of the global financial system. Specifically, the report calls for a fairer international taxation system for multinational corporations to prevent profit shifting, which erodes the tax base of developing nations. Without these structural reforms, the gains from domestic industrial policies may continue to leak out through financial channels, perpetuating the cycle of unequal exchange (Nievas & Piketty, 2025).

## **CONCLUSIONS AND RECOMMENDATIONS**

An in-depth examination of the national livestock sector's dynamics unveils a critical structural paradox amidst Indonesia's ambition to attain developed nation status by 2045; specifically, that a trade surplus and domestic macroeconomic stability have not yet fully fortified the economy against the mechanisms of unequal exchange embedded within the global financial architecture. Although the Government of Indonesia has launched strategic initiatives such as the 'Free Nutritious Meal' program and the development of food estates to strengthen human capital and food security, the sustainability of this agenda is highly susceptible to erosion by a chronic dependency on imported animal feed raw materials—a vulnerability that, from the perspective of the World Inequality Report 2026, functions as a conduit for the transfer of real wealth from developing to developed nations due to currency hegemony and the exorbitant privilege enjoyed by the Global North. This condition underscores that exchange rate volatility and high external liability costs are not merely ordinary market challenges but systemic impediments that erode fiscal space and the profitability of local breeders; thus, aggressive domestic downstreaming efforts must be positioned not merely as industrial policy, but as a vital economic defense strategy to stem wealth drain and ensure that economic value-added is genuinely accumulated domestically to support a structural transformation that is both inclusive and sustainable.

## **ACKNOWLEDGMENT**

We would like to thank the Director of the Pangkajene Islands State Agricultural Polytechnic for providing funding and facilities to facilitate this research. We also extend our gratitude to our colleagues and all parties who assisted in this research.

## REFERENCES

- Agustian, A., & Hartoyo, S. (2023). Analisis Ketergantungan Impor Bahan Baku Pakan Ternak dan Dampaknya terhadap Industri Peternakan Nasional. *Jurnal Ekonomi Pertanian dan Agribisnis*, 7(2), 145-158.
- Akbar, A., Darma, R., Irawan, A., Fudjaja, L., Amandaria, R., & Akzar, R. (2025). An institutional framework for enhanced food security amidst the COVID-19 pandemic: Strategic implementation and outcomes. *Journal of Agriculture and Food Research*, 21, Article 101833. <https://doi.org/10.1016/j.jafr.2025.101833>
- Alamsyah, R. T. P., Wulandari, E., Saidah, Z., & Hapsari, H. (2024). Discovering sustainable finance models for smallholder farmers: A bibliometric approach to agricultural innovation adoption. *Discover Sustainability*, 5(1), Article 107. <https://doi.org/10.1007/s43621-024-00277-4>
- Arifin, B., Nuryartono, N., & Pasaribu, S. H. (2021). *Pembangunan Pertanian dan Ketahanan Pangan Indonesia di Era Disrupsi*. IPB Press.
- Ashari, A., & Saptana, S. (2021). Prospek Pembiayaan Usaha Tani Melalui Kredit Usaha Rakyat (KUR) di Indonesia. *Analisis Kebijakan Pertanian*, 19(1), 21-38.
- Badan Kebijakan Fiskal. (2025). *Kerangka Ekonomi Makro dan Pokok-Pokok Kebijakan Fiskal 2026*. Jakarta: Kementerian Keuangan.
- Bustos-Terrones, Y. A., Tariq, R., Rangel-Peraza, J. G., Torrónategui-Chávez, G., & Loaiza, J. G. (2025). Sustaining global food security through digitalization. In *Climate change impacts on the water-energy-food nexus: Net zero emissions and sustainability* (pp. 289-302). <https://doi.org/10.1016/B978-0-443-22320-4.00013-X>
- Bustos-Terrones, Y. A., Tariq, R., Rangel-Peraza, J. G., Torrónategui-Chávez, G., & Loaiza, J. G. (2025). Sustaining global food security through digitalization. In *Climate change impacts on the water-energy-food nexus: Net zero emissions and sustainability* (pp. 289-302). <https://doi.org/10.1016/B978-0-443-22320-4.00013-X>
- Chancel, L., Gómez-Carrera, R., Mosharif, R., Piketty, T., et al. (2025). *World Inequality Report 2026*. World Inequality Lab.

- Conway, G., & Wilson, K. (2010). New genetic crops in a global context. In *Successful agricultural innovation in emerging economies: New genetic technologies for global food production* (pp. 39–60). Cambridge University Press. <https://doi.org/10.1017/CBO9781139208475.004>
- Direktorat Jenderal Anggaran. (2025). *Realisasi APBN Per 31 Oktober 2025*. Jakarta: Kementerian Keuangan.
- Hermanto, F., & Swastika, D. K. (2022). Transformasi Digital Sektor Pertanian: Peluang dan Tantangan bagi Petani Kecil di Indonesia. *Forum Penelitian Agro Ekonomi*, 40(1), 1-15.
- Hickel, J., Dorninger, C., Wieland, H., & Suwandi, I. (2022). Imperialist appropriation in the world economy: Drain from the global South through unequal exchange, 1990–2015. *Global Environmental Change*, 73, 102467. <https://doi.org/10.1016/j.gloenvcha.2022.102467>
- Kementerian Keuangan Republik Indonesia. (2025). *Bahan Menteri Keuangan pada acara Rapimnas KADIN 2025: Prospek Ekonomi Indonesia 2026*. Jakarta: Kementerian Keuangan.
- Kementerian Keuangan RI. (2024). *Kerangka Ekonomi Makro dan Pokok-Pokok Kebijakan Fiskal Tahun 2025*. Jakarta: Kementerian Keuangan Republik Indonesia.
- Li, J., Pang, X., Zhai, J., & Wang, S. (2026). Reforming trade governance for sustainable resource flows: Ecologically unequal exchange in Pan-Eurasia. *Environmental Impact Assessment Review*, 118, Article 108247. <https://doi.org/10.1016/j.eiar.2025.108247>
- Marius, J. A., Nurmalina, R., & Rifin, A. (2024). Sinergi Kelembagaan Pangan Nasional dalam Menjaga Stabilitas Harga Beras. *Jurnal Manajemen & Agribisnis*, 21(1), 45-56.
- Mudzielwana, R. V. A. (2025). Climate-smart food systems: Integrating adaptation and mitigation strategies for sustainable agriculture in South Africa. *Frontiers in Sustainable Food Systems*, 9, Article 1580516. <https://doi.org/10.3389/fsufs.2025.1580516>

- Mudzielwana, R. V. A. (2025). Climate-smart food systems: Integrating adaptation and mitigation strategies for sustainable agriculture in South Africa. *Frontiers in Sustainable Food Systems*, 9, Article 1580516. <https://doi.org/10.3389/fsufs.2025.1580516>
- Nievas, G., & Piketty, T. (2025). Unequal Exchange and North-South Relations: Evidence from Global Trade Flows and the World Balance of Payments 1800-2025. *World Inequality Lab Working Paper Series* 2025/11.
- Nuryanti, S. (2023). Dampak Inflasi Pangan terhadap Tingkat Kesejahteraan Rumah Tangga Miskin di Indonesia. *Jurnal Ekonomi dan Pembangunan Indonesia*, 23(2), 112-129.
- Obe, M. M., Kpadé, C. P., & Singbo, A. (2025). Identifying and overcoming barriers to climate change adaptation innovations among smallholder farmers in developing countries: A literature review and meta-analysis. *Climatic Change*, 178(3), Article 49. <https://doi.org/10.1007/s10584-025-03892-w>
- Obe, M. M., Kpadé, C. P., & Singbo, A. (2025). Identifying and overcoming barriers to climate change adaptation innovations among smallholder farmers in developing countries: A literature review and meta-analysis. *Climatic Change*, 178(3), Article 49. <https://doi.org/10.1007/s10584-025-03892-w>
- Octavia, Z. (2022). Evaluasi Kebijakan Food Estate dalam Mendukung Ketahanan Pangan Nasional: Tinjauan Aspek Lingkungan dan Sosial. *Jurnal Ilmu Lingkungan*, 20(3), 567-578.
- Ramadan, R., & Castet, A. (2025). Past, present and future of food security in Egypt. In *Pathways to African food security: Challenges, threats and opportunities towards 2050* (pp. 49-58). Routledge. <https://doi.org/10.4324/9781032649696-6>
- Regmi, S., & Gheewala, S. H. (2025). Scaling up nature-based solutions for food security and climate resilience in wetlands: Typologies, barriers and opportunities. *Journal for Nature Conservation*, 88, Article 127062. <https://doi.org/10.1016/j.jnc.2025.127062>

- Rosegrant, M. W. (2018). Global and regional perspectives of food economy and policy. *World Food Policy*, 4(2), 7-18. <https://doi.org/10.18278/wfp.4.2.2>
- Rusdiana, S., & Praharani, L. (2023). Dampak Kenaikan Harga Pakan terhadap Usaha Peternakan Rakyat di Indonesia. *Forum Penelitian Agro Ekonomi*, 41(1), 12-25.
- Surmaini, E., Hadi, T. W., & Subagyono, K. (2020). Strategi Adaptasi Perubahan Iklim pada Tanaman Padi di Indonesia: Studi Kasus Kejadian El Nino. *Jurnal Sumberdaya Lahan*, 14(1), 11-24.
- Thobane, J., Ndoro, J., Molepo, S., Serote, B., Hlophe-Ginindza, S., Mpandeli, S., Nhamo, L., & Mokgehele, S. (2025). A review on the adoption of sustainable agricultural practices in Southern Africa: Focus on smallholder farmers. *Agriculture*, 15(20), Article 2125. <https://doi.org/10.3390/agriculture15202125>
- Wibowo, A., & Hidayat, R. (2024). Analisis Dampak Ekonomi Program Makan Bergizi Gratis terhadap Pendapatan Petani Lokal dan Kesehatan Masyarakat. *Jurnal Kebijakan Kesehatan Indonesia*, 13(1), 30-45.