ANALYSIS OF MAINSTREAM TRADE POLICY RELATED TO FOOD SECURITY IN DEVELOPING COUNTRIES

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Abstract: *Food security represents a multidimensional challenge for developing countries, influenced by global trade dynamics, import dependency, price volatility, and domestic production capacity. This study employs a mixed-methods approach combining quantitative indicators of food-trade dependency with qualitative analysis of policy frameworks to examine how trade policies shape food security outcomes. The findings reveal that countries such as Indonesia, the Philippines, and several South Asian and African states experience structural dependence on staple food imports—including rice, wheat, maize, and soybeans—creating vulnerabilities during global price shocks and export restrictions. Conversely, leading exporters such as India, Thailand, and Vietnam demonstrate how strategic agricultural development, productivity enhancement, and export-management policies can strengthen both domestic availability and global market positioning. The study concludes that trade policies must balance market openness with domestic capacity-building to enhance long-term food security resilience.*
Keywords: *commodity; developing countries; food security; imports; trade policy*

1. INTRODUCTION

Food security is a global issue that continues to be a concern, particularly in developing countries vulnerable to various external pressures such as climate change, global economic instability, geopolitical conflicts, and pandemics. Food security is not only related to food availability but also encompasses aspects of access, supply stability, and the utilization of safe and nutritious food. In this regard, trade policy plays a crucial role as a bridge between global market dynamics and domestic food availability.

In analyzing food security, we cannot ignore factors such as population density and productivity, natural resources, and climatic conditions. Food security conditions vary across countries. Large countries with low population densities tend to export food products. In contrast, countries with high population densities but unfavorable agro-ecological conditions tend to import food products. Likewise, countries with low population productivity tend to face obstacles to food security.

Several developing and low-income countries show low global food security index scores (CNBC, 2023), including Indonesia (10th globally), Thailand (11th globally), Azerbaijan (12th globally), India (14th globally), Myanmar (15th globally), Uzbekistan (16th globally), Nepal (17th globally), and, sequentially, Tajikistan, Cambodia, Sri Lanka, Bangladesh, Laos, and Pakistan, ranked 18th to 23rd.

Food shortages in several developing countries force them to rely on food imports. Several developing countries' dependence in 2022 was recorded on rice, soybeans, cornstarch, and wheat (Food Trade Dependence Index, Food Security Portal, 2021). For soybeans, Indonesia (70.16%), Peru (85.98%), Bangladesh, and Senegal (100%) depended on the United States. South Africa relied on China for 73.15%. Thailand is 67.97% dependent on Brazil for rice, and Bangladesh is 100% dependent on Thailand. Madagascar is 93.78% dependent on India. Paraguay is 81.59% dependent on Spain. Indonesia is 99.63% dependent on Argentina for corn. Paraguay is 92.01% dependent on Brazil. Peru (81.62%) and Senegal (78.23%) depend on Argentina. Indonesia (54.03%) and Thailand (74.87%) depend on Australia for wheat. South Africa relies 100% on Brazil for wheat imports, and Bangladesh relies 91.96% on Canada.

High levels of import dependence on food carry risks for developing countries, especially import dependence on staple foods. Developing countries (Middle-Income Countries) have a high import share of staple food commodities compared to Developed

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Countries (High-Income Countries) (FAO, 2023), as shown in chart 1.1. One study suggests that countries may be better off adopting food self-sufficiency for a certain period (Mary, 2019). This is intended to build national food independence and security. Although this step conflicts with World Trade Organization regulations and the current liberalization agenda.

Developing countries import staple foods consumed daily by their population. Based on data obtained from Trademap, Indonesia is the highest rice importing country in the world, its value represents 7.1% of global rice imports in 2024. The rice supplier market for Indonesia is Thailand at US$ 862,781 million. The next supplier market is Vietnam at US$ 752,860 million, Myanmar at 480,766 million. Meanwhile, developed countries import staple foods not always used as food for their population. The United States is the highest importing country of Cassava in the world, its value is US$ 32,944 million. The second country that imports cassava is Canada with a value of US$ 13,528. The third importing country of cassava is Malaysia, its value is 13,136. The highest importing country of corn/maizena is Mexico with a value of US$ 5,723,410 million. The second-largest corn importer is Japan, with a value of US$3,941,674 million. The third-largest corn importer is China, with US$3,785,826 million.

The relationship between trade policy and food security continues to show mixed results in the academic literature. A study by Anderson and Martin (2010) suggests that trade reforms can improve market efficiency and lower food prices, but a study by Headey (2011) shows that protectionist trade interventions during crises actually exacerbate scarcity. Research by Ivanic and Martin (2008) found that developing countries experienced a decline in calorie consumption during periods of rising global food prices, highlighting the importance of a resilient and adaptive policy framework.

Various studies demonstrate a gap in understanding how specific interactions between trade instruments such as tariffs, subsidies, and trade agreements relates to dimensions of food security simultaneously and over the long term in developing countries. Furthermore, most studies focus on macroeconomic aspects without considering the characteristics of different regions or groups of countries. Global food import data demonstrate unique relationships between countries, suggesting signals about trade interdependence that can influence food trade policy and decision-making. This study analyzes mainstream trade policies implemented by developing countries and related to their food security conditions.

2. MATERIALS AND METHODS

This research employed a mixed-methods approach, combining quantitative and qualitative research methods. Research using both quantitative and qualitative approaches allows for in-depth, deductive-inductive analysis (Neuman, 2014). Quantitatively, the researchers analyzed statistical data related to food trade and the food dependency index. Qualitatively, the researchers descriptively explained the relationship between trade policies and food security in developing countries.

Food security differs from food self-sufficiency. According to Pelliciardi (2013), food self-sufficiency emphasizes meeting food needs from domestic production as a form of self-sufficiency, while food security encompasses broader supply sources, including commercial imports, food aid, and comparative advantage through international trade. Therefore, increasing self-sufficiency is considered one way to strengthen a country's food security, as it provides greater control over domestic supply and reduces dependence on global markets.

Case studies in Asia show that countries with low domestic production levels, such as some in the Middle East, rely heavily on wheat imports. In contrast, countries like India, with their large agricultural production capacity, are able to maintain domestic food security despite high population growth (FAO, 2008a).

Although resources are abundant, developing countries cannot be optimally managed due to limited skills, technology, and investment (capital). As a result, many developing countries export their raw natural resources to developed countries and import finished products at prices many times higher than export prices.

In the context of food, trade liberalization allows developing countries to access food supplies from the global market when domestic production is insufficient. The relationship between trade liberalization and food security is complex. On the one hand, liberalization helps increase food availability through imports. However, on the other hand, if not balanced by supportive domestic policies, liberalization can actually weaken the foundations of long-term food security. Case studies in Sub-Saharan Africa show that liberalization increases access to food imports but also creates greater vulnerability to volatility in international wheat prices (World Bank, 2008).

Trade liberalization has several positive impacts. First, broader access to food imports can cover short-term domestic production shortfalls (FAO, 2008a). Second, integration with global markets encourages production efficiency and more optimal resource allocation. Third, liberalization can facilitate the transfer of agricultural technology, which increases long-term productivity (Hermawan, 2013). However, its negative impacts cannot be ignored. WTO accession opened up massive import flows, changing domestic consumption patterns, and increasing global interdependence. However, this openness also makes food vulnerable to being

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used as a political instrument (Castellanos-Curiel & Vallejo-Jiménez, 2023).

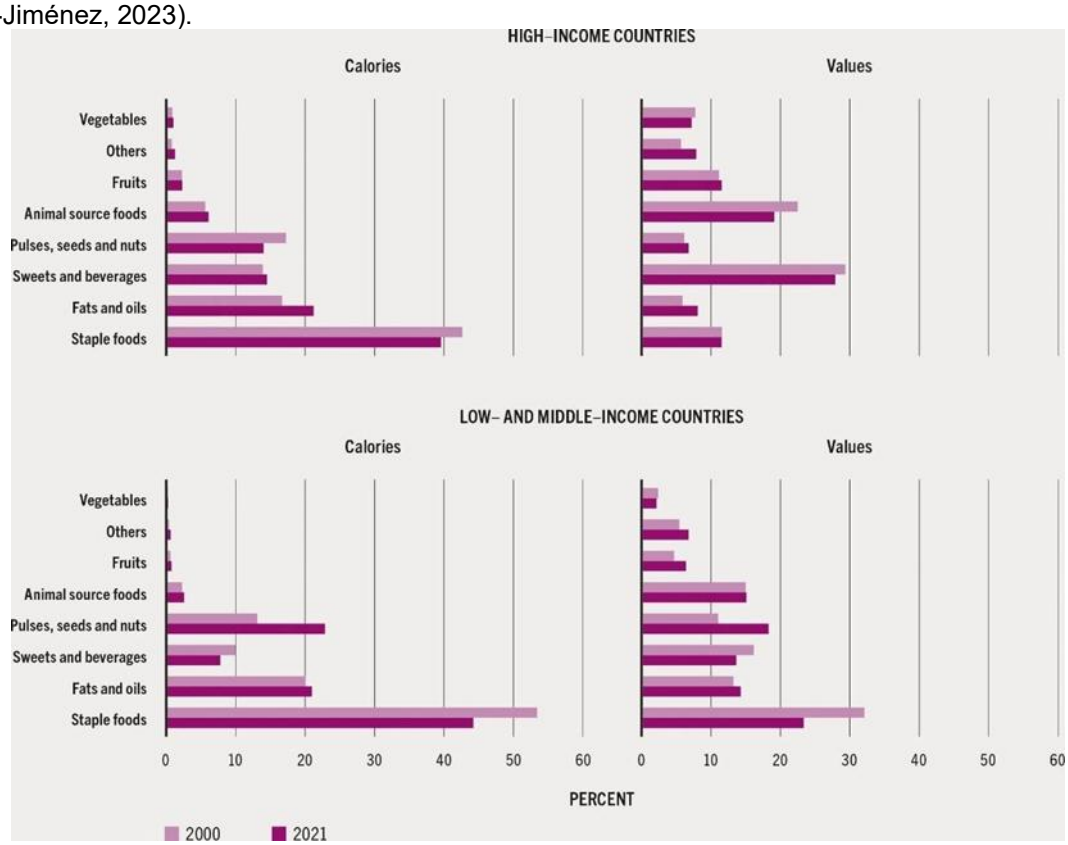

Figure 1. Food Import Portion by Country
Source: FAO 2023

In this study, food security is reflected by the level of food import dependency index. The higher the food import dependency index, the more likely food security is to be disrupted or hindered. The data for the food import dependency index is taken from a study by the International Food Policy Research Institute (foodsecurityportal.org, 2024). The data was collected in 2022 and shows an index calculated based on a country's import share from exporting countries for four basic food items: corn, rice, soybeans, and wheat. Share refers to each country's imports from each partner relative to each country's total imports for the four crops, with the following formula:

$$Share\ r,p = \frac{Imports\ r,p}{\sum p\ imports\ r}$$

Where r is the reporting country for imports, p is the partner country for import sources, and Imports refers to the quantity of imports. This research uses data from developing countries only. The data shows that if a significant share of a country's imports depends on a single supplier country, supply constraints at the import source may negatively impact the food security situation in the importing country. Meanwhile, we have extracted and analyzed our trade policy data from World Trade Organisation (WTO) trade policy review document.

3. Results and Discussions

We divide the discussion into two sub-discussions, namely regarding the food trade dependency index of developing countries which will reflect their national food security, and trade policies which will also reflect actions and efforts towards food security in developing countries.

a. Food trade dependency index related to Food Security

Food trade dependency index data reflects the level of food dependence, which can have consequences for food security. High levels of food dependence between developing and developed countries can indicate a hegemonic relationship. Furthermore, high levels of food trade dependency can pose risks to food security, given that the global food supply chain is highly correlated with the adequacy of a country's national food needs and demand.

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Table 1.1. The Highest Food Trade Dependence Index of Developing Countries

No.	Upper Middle-Income Countries	FDI of each food commodity				Exporter
		Corn	Wheat	Rice	Soybean	
1	Argentina (ARG)	0,927400428	-	-	0,992976622	USA, Paraguay
2	Belize	0,920113869	1	1	1	USA, Mexico
3	Botswana (BWA)	-	0,997652	-	-	South Africa
4	Brazil (BRA)	0,996008847	-	-	-	Paraguay
5	El Salvador (SLV)	0,771277182	-	-	1	Brazil, Guatemala
6	Georgia (GEO)	0,991789206	0,999927	-	1	Russian Federation
7	Indonesia (IDN)	0,996257	-	-	0,706079273	Argentina, USA
8	Kazakhstan (KZA)	-	1	-	-	Russian Federation
9	Mauritius (MUS)	-	1	-	-	France
10	Paraguay (PRY)	0,920091714	-	-	-	Brazil
11	Peru (PER)	0,816179092	-	-	0,859815626	Bolivia (Plurinational State of), USA, Argentina
12	South Africa (ZAF)	-	0,999960319	-	0,731542978	Brazil, China
13	Thailand (THA)	0,748696759	-	-	-	Australia
14	Türkiye (TUR)	-	-	-	0,960616343	Ukraine
15	China, Macao SAR (CHN)	0,989528796	1	-	0,950256801	China, Canada

The blue color indicates that the commodity is imported from the country listed in the exporter column.

Source: Foodsecurityportal.org

Table 1.1 shows the highest food trade dependency indexes for developing countries on four food commodities, including their exporting partner countries. This data indicates that developing countries are highly dependent on several developed food commodity exporting countries. A scale ranging from 0.7 to 1 indicates a high level of food trade dependency.

The data in the table also demonstrates the importance of supply chains and the level of dependence of developing countries on developed countries for food commodities. The table shows that Belize has the highest index for all four food commodities. Belize is highly dependent on the United States for corn, wheat, and rice, while Belize is highly dependent on Mexico for soybeans. The index data indicates that Georgia is highly dependent on Russia for corn, wheat, and soybeans. Meanwhile, Macao SAR is highly dependent on China for corn and wheat.

This food trade dependency index can also indicate the closeness of countries' bilateral relations, strengthened by trade. Several countries with strong bilateral relations, consistent with the data in the table, include Turkey and Ukraine, Indonesia and the United States, South Africa and China. Most of the developing countries in the table have good bilateral relations with their food commodity exporting partner countries. The data shows that Turkey has a high trade dependency index on Ukraine for soybeans. Thailand relies on Australia for corn.

The data in the table also shows several close trade relationships between countries in the South. For example, Brazil and Paraguay have nearly equal trade relations for corn. Argentina has a high food trade dependency index on

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Paraguay for soybeans. Botswana has a high food trade dependency index on South Africa for wheat. Peru has a high food trade dependency index on Bolivia for soybeans. South Africa has a high food trade dependency index on Brazil for wheat.

b. Trade Policy related to Food Security

We analyzed several mainstream policies implemented by developing countries from the national trade policy review document. Some policies can strengthen trade liberalization while simultaneously supporting food security. However, there are also several policies that only strengthen trade liberalization but do not have a positive impact on national food security.

Based on the food dependency index data explained in the previous sub-discussion, it can be seen that developing countries are highly dependent on corn, soybeans, and wheat. The food trade dependency index data also maps food commodity exporting countries, including:
a) Corn: USA, Paraguay, Argentina, Brazil
b) Soybeans: USA, Brazil, Canada, Ukraine
a) Wheat: Russia, Australia, South Africa.

Some mainstream policies include 1) Increasing agricultural capacity and modernization related to various agricultural constraints and problems; 2) Investment to increase exports; 3) Increasing cooperation with international institutions/organizations for trade and improving food security; 4) Strengthening regional partnerships for trade and improving food security; 5) Controlling import tariffs through consultation; 6) Striving for market diversification; 7) Designing special programs for vulnerable food groups.

Meanwhile, several policies implemented by only a few developing countries include 1) Investing in agricultural research and development; 2) Providing minimal subsidies to agricultural producers; 3) Reducing food imports; 4) Increasing subsidies on agricultural products to support the domestic market; and 5) Initiating sustainable agriculture.

Several countries have implemented specific trade policies related to food security. China, in its policy document, has pledged to support the food security of vulnerable, poor, and least-developed countries (LDCs). Meanwhile, Indonesia, as a developing country, has designated priority agricultural products, such as rice, as a food self-sufficiency product. Rice is the staple food for the majority of the Indonesian population. Some priority agricultural products for Indonesia include soybeans, corn, and sugarcane (for processing into sugar). Gabon has implemented special subsidies for its farmers to promote more productive food production and established the Gabonese Food Safety Agency (AGASA) to support effective agriculture. Ecuador, Fiji, Suriname, and Thailand have begun to pay attention and focus on inclusive and sustainable trade and agricultural policies. The Dominican Republic, Jamaica, and Moldova remain focused on addressing the impacts of climate change and the climate crisis on agriculture, which could hamper their food security and trade. Meanwhile, the Maldives continues to strengthen and ensure its food security by adhering to Codex food commodity standards.

India, Thailand, and Vietnam, as the world's largest rice exporters, certainly have their own policies behind their large rice exports. India, with a production capacity of up to 206.7 million tons of rice in 2023, achieved exports consistently exceeding USD 10 million between 2022 and 2024. It apparently banned some non-basmati rice from being exported worldwide in July 2023. This policy created a gap of approximately 10.4 million tons of rice, or approximately one-fifth of global exports (Wulansari, 2017). Research by the Observatory of Economic Complexity shows that Nigeria is a major importer of rice from India. When India stopped exporting non-basmati rice, many rice mills in Nigeria closed, at least until India reopened non-basmati rice exports or exports from other countries.

In line with India, Thailand is empowering its agricultural sector, especially rice. The implementation of a policy where 50% of agricultural land is dedicated to rice production, 55% of which is used for domestic consumption and 45% for export (Yuliana et. al., 2022), has made Thailand the world's second-largest rice exporter, with a production capacity of 33 million tons in 2023 and exports reaching USD 51 million in 2023.

Vietnam, a Southeast Asian country that is one of the global rice granaries, also has its own policies for managing food security and rice exports. A study titled "Vietnam Food Security Policy Review" (Messerli et al., 2019) outlines that Vietnam's food security is achieved through four approaches: agricultural development and increased food productivity, restructuring the agricultural and rural economy, productivity breakthroughs, and new rural development. This is one of the factors contributing to Vietnam's success in consistently producing over 40 million tons of rice between 2020 and 2023, with an export value of USD 4.3 million in 2023.

Indonesia, the Philippines, and Saudi Arabia are the world's three largest rice importers, with each importing over USD 2 million in 2024. They certainly have realistic policies to meet their primary food needs. Indonesia, where the majority of the population relies on rice as a staple food, makes rice the most important staple food. Despite Indonesia's abundant fertile land, Indonesia faces challenges in ensuring its

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citizens have access to nutritious food (Suharyanto, 2011).

In Indonesia, the dimension of food availability also requires serious attention. The Center for Agricultural Data and Information Systems (2022) emphasized that in terms of supply, rice is relatively secure, palm oil is very strong, but sugar, soybeans, and beef still experience structural deficits. This means that policies must be directed at increasing production and supply chain efficiency, rather than relying solely on imports. Food pricing policy is also closely linked to inflation dynamics. The Center for Agricultural Data and Information Systems (2022) emphasizes that food inflation and rural marketing margins (MPP) determine final prices at the consumer level. Meanwhile, the share of food expenditure and wage levels influence people's purchasing power, and poverty factors determine how resilient households are to price shocks.

Finally, food security challenges in Indonesia are also influenced by regional disparities. According to the Center for Agricultural Data and Information Systems (2022), western Indonesia (Sumatra, Java, and Bali) has relatively better access to infrastructure, markets, health services, and education. Conversely, eastern Indonesia and the 3T (United Territories) face inter-island transportation barriers, high logistics costs, limited access to basic services, and a reliance on certain commodities and vulnerability to climate change. In terms of access, poor households tend to allocate a larger proportion of their expenditures to food, so any price shocks have a significantly greater impact on them.

The Philippines, an archipelagic nation in Southeast Asia, is the world's second-largest rice importer after Indonesia. This import policy is not without reason. According to a study (Davidson, 2016) entitled "Why the Philippines Chooses to Import Rice," the Philippines imports rice due to three factors: geography, colonial history, and neoliberalism. Geography is the primary reason. The Philippines imports rice because, as an archipelagic nation, it has few large rivers that can irrigate agricultural land, unlike in Thailand or Vietnam (Dawe et al., 2006).

Unlike Indonesia and the Philippines, whose soil is fertile due to their tropical climate, Saudi Arabia has implemented an export policy due to the dry and desert conditions that make it difficult to grow rice. The staple food of Saudi Arabia, biryani, is rice. Between 2020 and 2023, Saudi Arabia was only able to produce around 800 tons annually. In contrast, Indonesia and the Philippines produce 20-50 million tons, but this is insufficient to meet the basic needs of all its citizens. Therefore, Saudi Arabia imported rice worth 1-2 million USD in the period 2020-2024 every year.

4. CONCLUSIONS

Trade policies influence food security in developing countries. These significant influences, including international market access, government subsidies, infrastructure and technological advancements, global exchange rates, and domestic political stability, determine a country's ability to meet its citizens' food needs. Developing countries that are unable to manage and optimize their resources are more dependent on imports and are vulnerable to national and global political instability, including global prices.

Conversely, developed countries that implement food stability policies, invest in infrastructure and progress, and maintain political stability strengthen food security and competitiveness with other countries. Therefore, with the right strategy, developing countries can strengthen food security and increase their competitiveness in the international market.

Food security in developing countries is a complex issue influenced by domestic production, access, distribution, and the dynamics of international trade. Trade liberalization opens up opportunities for wider food access, but also carries the risk of import dependence and vulnerability to global price fluctuations.

In the Indonesian context, food security is influenced by pricing policies, distribution, inflation dynamics, and regional inequality. Therefore, efforts to maintain food security need to be carried out in an integrated manner, starting from increasing production capacity, improving distribution systems, balancing trade openness and protecting the domestic sector, and strengthening resilience to various global shocks.

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REFERENCES

Agrifood.id (2025). 2020—2025 Kamboja Genjot Ekspor dan Produk Olahan Singkong. Accessed on July 20, 2025 from https://agrifood.id/2020-2025-kamboja-genjot-ekspor-dan-produk-olahan-singkong/ .

Akram, W., Hussain, Z., & Adeel, S. (2024). Water and food security in the Middle Eastern and Northern African countries. In *Water Resources Management in Arid and*

online at https://conference.lppm.unila.ac.id/index.php/icsiger
DOI: https://doi.org/10.23960/icsiger

Semi-Arid Regions (pp. xx–xx). Springer. https://doi.org/10.1007/978-3-031-50962-9_3 .

Bloomberg (2025). Argentina Slashes Export Taxes to Rescue Drought-Hit Farmers. Accessed on August 12, 2025 from https://www.bloomberg.com/news/articles/2025-01-23/argentina-cuts-export-taxes-to salvage-harvest-struck-by-drought .

Bozsik, N., Cubillos T. J. P., Stalbek, B., Vasa, L., & Magda, R. (2022, July 25). *Food security management in developing countries: Influence of economic factors on their food availability and access*. PLoS One, 17(7), e0271696. https://doi.org/10.1371/journal.pone.0271696

Brenton, P., Chemutai, V., & Pangestu, M. (2021). *Trade and food security in a climate change-impacted world*. World Bank.

Castellanos-Curiel, R., & Vallejo-Jiménez, B. (2023). Trade patterns in food imports to China: Commodities, trends, and shifts (1992–2020). *México y la Cuenca del Pacífico, 12*(35), 55–74. https://doi.org/10.32870/mycp.v12i35.810

CNBC Indonesia (2025). Perang Dagang Makin Panas, RI Terancam Krisis Kedelai. Accessed on July 18, 2025 from https://www.cnbcindonesia.com/research/20250406105316-128-623814/perang-dagang makin-panas-ri-terancam-krisis-kedelai

Colussi, Schnickey, & Paulson (2025). Brazil's 2024-2025 Corn Harvest Grows, But Exports Projected to Decrease. Farmdoc. Accessed on June 2025 from https://www.agriculture.com/partners-brazil-s-2024-25 corn-harvest-grows-but-exports-projected-to-decrease-11751310

Davidson, J. S. (2016) 'Why the Philippines Chooses to Import Rice', Critical Asian Studies. Routledge, 48(1), pp. 100–122. doi: 10.1080/14672715.2015.1129184

Dawe et al., (2006). Why Does Philippines Import Rice?. Agrifood Economics. Accessed on July 12, 2025 from https://www.fao.org/agrifood-economics/publications/detail/en/c/123056/

Devadoss, S., Hall, W., Luckstead, J. (2025). U.S. – Mexico GM Corn Trade Dispute. Choices Magazine. Accessed on June 2-25 from https://www.choicesmagazine.org/choices-magazine/submitted articles/usmexico-gm-corn-trade dispute#:~:text=Oleh%20karena%20itu%2C%20pemerintah%20AS,ekonomi%20atas%20konflik%20perdagangan%20ini.&text=Sumber:%20USDA%2DFAS%20(2023b)

Diaz-Bonilla, E., Thomas, M., Robinson, S., & Cattaneo, A. (2000). Food Security and Trade Negotiations in the World Trade Organization Context: A Developing Country Perspective. *Trade and Macroeconomics Division, International Food Policy Research Institute (IFPRI)*.

Dong, J., Li, S., Huang, L., He, J., Jiang, W., Ren, F., Wang, Y., Sun, J., & Zhang, H. (2024). Identification of international trade patterns of agricultural products: The evolution of communities and their core countries. Geo-spatial Information Science, 27(1), 49-63. https://doi.org/10.1080/10095020.2022.2122875

Fan, F., Jia, N., & Lin, F. (2022). Quantifying the impact of Russia–Ukraine crisis on food security and trade pattern: Evidence from a structural general equilibrium trade model. China Agricultural Economic Review, 15(2), 241-258. https://doi.org/10.1108/CAER-07-2022-0156

FAO. (1996a). *Agro-ecological zoning: Guidelines*. Food and Agriculture Organization of the United Nations.

FAO. (2008a). *The State of Food and Agriculture 2008*. Food and Agriculture Organization of the United Nations.

Guo, J., Mao, K., Yuan, Z., Qin, Z., Xu, T., Bateni, S. M., Zhao, Y., & Ye, C. (2021). Global food security assessment during 1961–2019. Sustainability, 13(24), 14005. https://doi.org/10.3390/su132414005

Hardono, G. S., Rachman, H. P. S., & Suhartini, S. H. (2004). Liberalisasi perdagangan: Sisi teori, dampak empiris dan perspektif ketahanan pangan. *Forum Penelitian Agro Ekonomi, 22*(2), 75–88.

Hermawan, I. (2013). Analisis perdagangan beras dan ketahanan pangan di negara-negara Asia Tenggara. *Politica, 4*(2), 157–172.

Hermawan, Yulius P (editor). 2007. Transformasi Isu dan Aktor di dalam Studi Hubungan Internasional: Dari Realisme hingga Konstruktivisme. Dalam Transformasi dalam Studi Hubungan Internasional. Aktor, Isu dan Metodologi. Yogyakarta: Graha Ilmu.

Hu, W., Xie, D., Le, Y., Fu, N., Zhang, J., Yin, S., & Deng, Y. (2024). Evolution of food trade networks from a comparative perspective: An examination of China, the United States, Russia, the European Union, and African countries. Foods, 13(18), 2897. https://doi.org/10.3390/foods13182897

online at https://conference.lppm.unila.ac.id/index.php/icsiger
DOI: https://doi.org/10.23960/icsiger

Hu, W., Xie, D., Le, Y., Fu, N., Zhang, J., Yin, S., & Deng, Y. (2024). Evolution of food trade networks from a comparative perspective: An examination of China, the United States, Russia, the European Union, and African countries. Foods, 13(18), 2897. https://doi.org/10.3390/foods13182897

Ilham, N., Siregar, H., & Priyarsono, D. S. (2006). Efektivitas kebijakan harga pangan terhadap ketahanan pangan. *Jurnal Agro Ekonomi, 24*(2), 157–177 .

International Food Policy Research Institute. (2022). "Food Trade Dependence Index", accessed on July 2025 from https://www.foodsecurityportal.org/node/1787

Ji, G., Zhong, H., Nzudie, H. L. F., Wang, P., & Tian, P. (2023). The structure, dynamics, and vulnerability of the global food trade network. Journal of Cleaner Production, 434, 140439. https://doi.org/10.1016/j.jclepro.2023.140439

Lehikoinen, E., Kinnunen, P., Piipponen, J., Heslin, A., Puma, M. J., & Kummu, M. (2021). Importance of trade dependencies for agricultural inputs: A case study of Finland. *Environmental Research Communications, 3*(6), 061003. https://doi.org/10.1088/2515-7620/ac02d0

Mizik, T. (2021). Theory vs practice: Patterns of the ASEAN-10 agri-food trade. Open Agriculture, 6, 152–167. https://doi.org/10.1515/opag-2021-0014

Mizik, T., Szerletics, Á., & Jámbor, A. (2020). Agri-food export competitiveness of the ASEAN countries. *Sustainability, 12*(23), 9860. https://doi.org/10.3390/su12239860

Mulyo, J. H., Prasada, I. Y., & Nugroho, A. D. (2023). *Impact of political and security stability on food security in developing countries: Case of Africa, Asia, Latin America and the Caribbean*. *Agricultural Economics, 69*(9), 375–384. https://doi.org/10.17221/142/2023-AGRICECON

Paloviita, A., Kortetmäki, T., Puupponen, A., & Silvasti, T. (2016). Vulnerability matrix of the food system: Operationalizing vulnerability and addressing food security. Journal of Cleaner Production, 135, 1242-1255. https://doi.org/10.1016/j.jclepro.2016.07.018

Pelliciardi, V. (2013). From self-sufficiency to dependence on imported food-grain in Leh District (Ladakh, Indian Trans-Himalaya). *European Journal of Sustainable Development, 2*(3), 109–122. https://doi.org/10.14207/ejsd.2013.v2n3p109

Pusat Data dan Sistem Informasi Pertanian. (2022). *Statistik ketahanan pangan 2022*. Kementerian Pertanian.

Sun, Q., Hou, M., Shi, S., Cui, L., & Xi, Z. (2022). The influence of country risks on the international agricultural trade patterns based on network analysis and panel data method. Agriculture, 12(3), 361. https://doi.org/10.3390/agriculture12030361

Sun, Q., Hou, M., Shi, S., Cui, L., & Xi, Z. (2022). The influence of country risks on the international agricultural trade patterns based on network analysis and panel data method. *Agriculture, 12*(3), 361. https://doi.org/10.3390/agriculture12030361

Wang, J., & Dai, C. (2021). Evolution of global food trade patterns and its implications for food security based on complex network analysis. Foods, 10(11), 2657. https://doi.org/10.3390/foods10112657

World Bank. (2008). *World Development Indicators*. The World Bank Group.

Xu, H., Niu, N., Li, D., & Wang, C. (2024). A dynamic evolutionary analysis of the vulnerability of global food trade networks. Sustainability, 16(10), 3998. https://doi.org/10.3390/su16103998

Yu, B., & You, L. (2013). A typology of food security in developing countries. *China Agricultural Economic Review, 5*(1), 118–153. https://doi.org/10.1108/17561371311294810 .

Zhang, R. (2004). Food security: Food trade regime and food aid regime. *Journal of International Economic Law, 7*(3), 565–584. https://doi.org/10.1093/jiel/7.3.565

online at https://conference.lppm.unila.ac.id/index.php/icsiger
DOI: https://doi.org/10.23960/icsiger