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Research Article

Transaction Cost Analysis of ASEAN Food Security Cooperation on Rice Commodity

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Abstract

Food Security Cooperation was implemented by ASEAN through the ASEAN Economic Community (AEC), focusing on regional market integration. The food security index of its members has not been strengthened beyond the global index through this cooperation. "Special consideration," particularly concerning rice, has consistently hindered food security cooperation. Rice, being a major component of regional food cooperation and security, necessitates this explanative analysis using Transaction Cost Theory to examine the weaknesses of ASEAN Food Security Cooperation within the regional market context. Through the AEC, a nested pattern and cluster of food security issues were established by ASEAN as a key for market-based analysis. However, the failure to establish side-payments resulted in difficulties in reducing the transaction costs associated with sensitive commodities such as rice. A new perspective on sensitive commodities in the context of regional market food security cooperation is provided by this analysis. It is concluded that the weakness of food security cooperation within the regional rice market context is due to ASEAN's inability to create side-payments and manage transaction costs that could support regional negotiations regarding rice.

Keywords: ASEAN; Food Security, Market; Transaction Cost Theory

INTRODUCTION

Food security is considered a non-traditional issue in International Relations as it involves the survival and well-being of people and states without any relation to military issues. Food security is also considered as part of the global political economy because of its ability to influence and be influenced by political and economic issues. The state decision towards food policy is often based on economic and political considerations in domestic, regional, and global level. Securing food is crucial for the state to maintain economic and political stability, particularly in the ASEAN region. Other issues such as wars, global pandemics, unstable markets, and domestic issues could affect the food security of a state (Duarte et.al, 2024, p.3-4; Teng and Montesclaros, 2023, p.4). Therefore, cooperation is needed to ensure the stability of food security in each state. This concern regarding food security is often discussed and negotiated in multilateral and regional cooperations. This research aims to enrich the studies related to the role of ASEAN in providing regional food security cooperation in the context of economics and politics through regional market focusing on rice commodity.

ASEAN Economic Community (AEC) facilitates various regional economic cooperations which covers food security as one of the main issues of its members. ASEAN shows food security concerns through trade patterns and the strengthening of related cooperation in the region. Intra-ASEAN trade pattern of the agriculture and food sector was increasing steadily USD 3.8 billion to USD 18.3 billion in export and from USD 4 billion to USD 16,4 billion in imports within the period of 2000-2015 (Oizumi, 2020, p.4). This growth builds potential for further regional food cooperation to be successful with the main concern of food trade after the period of 2015. Based on those data, ASEAN built cooperation in 2015 to focus on food market integration with the purpose of reducing trade tariffs among intra-ASEAN (Shimizu, 2021, p.10). The foundation of the AEC framework was discussed at the 23rd ASEAN Summit in 2013 which resulted in the "Bandar Seri Begawan Declaration on the ASEAN Community's Post-2015 Vision". This framework was then further developed in the 34th Special SOM ASEAN Ministers in Agriculture and Forestry (AMAF) in 2013 which resulted in the vision, goals, and target of Food, Agriculture and Forestry (FAF) with the target of 2020. The next meeting of the 35th Special SOM produced a new timeline for 2016-2025 as a new vision and strategic plan of FAF and a part of AEC pillars (JICA, 2023, p.7)

The strategic plan of ASEAN Cooperation in FAF 2016-2025 gave foundation such as vision, goals, and priorities of the food sector and built various regional food security cooperations. Food security cooperation uses global and regional contexts according to socio-economic and demographic changes based on 3 main keys such as: (1) rapid economic growth; (2) regional integration and globalization; and (3) pressures on the natural resource base such as climate change (ASEAN, 2020). To understand regional food security cooperations under AMAF, it is divided into three types of cooperation: (1) trade cooperation, (2) food reserve cooperation, and (3) cooperation for future issues such as climate change. The first type of cooperation is manifested as the ASEAN Free Trade Area (AFTA) which builds a single market based on the AEC blueprint which provides a free flow of goods, services, and skilled labor. The second type of cooperation is implemented through the ASEAN Plus Three Emergency Rice Reserve (APTERR) which requires its members to have an agreed amount of rice reserves for emergency purposes (APTERR, 2023). The third type of cooperation is built for the purpose of future issues that will influence regional food security such as the ASEAN Food Security Information System (AFSIS); ASEAN Solutions for Investments, Services, and Trade (ASSIST); and ASEAN Trade Repository (ATR).

Food security cooperation through regional food trade is the best solution to strengthen the food condition of ASEAN members by lowering transaction costs and increasing the opportunity of negotiation among member states. Johnson, Thow, & Nisbet (2023) argue that usually developing countries have a better voice regarding multilateral cooperation negotiation because of the historical context of trade policy at regional levels such as ASEAN. Actors' agenda in cooperation can be influenced by socio-economic and historical institutional processes in trade institutions. Tansuchat et al (2022), conclude that food self-sufficiency is related to supply chain and food logistic systems. Hence, the role of institutions is crucial in facilitating trade in regional markets. Daliani et al (2024)

argue that ASEAN Rice market integration is important to reduce prices and ensure food security through cooperation and regional infrastructure. Kornher & Kalkuhl (2019) argued that regional cooperation is the cheapest option to achieve national interest compared to national-focused policy. These studies conclude that food security cooperations that focus on trade are crucial to promoting the growth of regional food security.

Other perspectives of food trade cooperation argue that lower transaction costs and decreasing taxes have a negative impact on national food security and increasing independence towards imported food commodities. Erokhin & Ivolga (2021) and Kongyong (2020) agreed that bigger nations would likely be more dominating in the negotiation and influence smaller nations which have lower food production. Kongyong (2020), writes about food security with a focus on palm oil, argues that lower tax and transaction costs on palm commodities affect the domestic markets of ASEAN members. Purwanti (2022) argues that market integration brings challenges to food supply and food security issues such as regional rice prices remaining a low priority for ASEAN. This critique towards food trade cooperation is not only rising inside the ASEAN region but also in pacific region. Brewer (2023) concludes that food trade cooperation impacts pacific dependence on rice from South-East Asia, wheat, and meat from Australia, New Zealand, and America to meet domestic food demands.

Table 1. Food Security Index of ASEAN Member Countries 2015-2022

Countries	2015	2016	2017	2018	2019	2020	2021	2022
Philippines	55.5	57	57.5	59.3	59.7	60.6	59.6	59.3
Indonesia	57.9	58.5	60	63.6	61.5	61.6	59.8	60.2
Cambodia	54.2	55.1	56.1	58.9	56.2	52.7	55	55.7
Lao PDR	51.4	51.8	53.5	54.4	52.3	53.2	49	53.1
Malaysia	68.1	66.3	66.8	67.2	68.6	67.9	71.5	69.9
Myanmar	51.8	53	54	57.2	56.2	54.7	58.3	57.6
Singapore	72.1	70.8	70.2	72.4	74.7	74.7	72.8	73.1
Thailand	57	59	60.7	61.7	62.4	61.4	62.1	60.1
Vietnam	64.7	66.2	64	67.3	65.6	65.5	62.7	67.9

Source: Economist Impact (2022), ASEAN (2023a)

This food security index does not show any significant impact on ASEAN members after the cooperation was implemented. Most of the members did not reach beyond the Global Food Security Index which is 62.2. Besides this food security index data, Myanmar, Lao DPR, Cambodia, and Philippines are dependent on ASEAN +3 countries, specifically South Korea and Japan, rather than intra-ASEAN members to fulfill their food rice demand in the case of emergency (Thanormthin, 2020). These data and the debate on literature regarding regional cooperation in the context of food security studies show the inability of ASEAN to strengthen the involvement of intra-ASEAN in regional food cooperation. The food security index covers the availability, access, utilization, and stability of food which are the 4 dimensions of food security in this research. In this context, this research uses the Food Security Index to reflect the food security conditions of ASEAN. However, it is true that rice cannot represent all food commodities and regional

food security. In that case, the importance of rice is also highlighted by member states' interest regarding the stability of rice in domestic, regional, and global.

Food in ASEAN is fulfilled by three sectors such as: Agriculture, Forestry, and Fisheries. Agriculture is a dominating sector in regional trade with a value of 340.8 million USD in 2022. This value is more than twice the value of Forestry and Fisheries which are 95.7 million USD and 40.6 million USD. ASEAN reports that regional food consumption is dominated by cereal. Usually, food consumption data in each country are not specified per commodity but rather classified in the type of its category. Therefore, rice is included in the cereal category. Over 40% of each member country's food consumption is cereals, these percentages are: Brunei (44%); Cambodia (66.8%); Indonesia (60.6%); Lao (58.9); Malaysia (41,9); Myanmar (49%); Philippines (57.2%). Thailand (47.4%); and Vietnam (51.4%) (ASEAN, 2022b). The previous data are still too broad to identify the rice commodity in this category. On the other hand, agrifood production in ASEAN are more specifics than the consumption data and able to identify the significant of rice compared to other agrifood commodity. Agricultural food production in ASEAN is dominated by paddy, cassava, and maize. Between 2013 and 2022, the production of cassava and maize increased by 8.5% and 12.2% respectively. Meanwhile the production of rice fell by 9% to 195.5 million across ASEAN in the same period. However, paddy production is still the majority compared to other food commodities. ASEAN rice market is considered a big influence on the global market which is supported by Thailand and Vietnam as big producing and exporting countries, as well as other member countries as rice importers (Kea, 2019, p.3632). In ASEAN, rice crops dominated 66 percent of the total arable land area in 2020, but some member countries are still importing rice to fulfill their national food needs (East Asia Forum, 2022). In ASEAN, rice is produced by Indonesia, Vietnam, Thailand, Myanmar and Philippines (ASEAN, 2022b). The significant role of rice could be highlighted by these data.

Food is not only an economic issue but also involves significant political decisions within each ASEAN member state. Regional cooperation to ensure food security is complex and challenging for member countries. Despite this, existing literature has not sufficiently explained why trade cooperation has failed to significantly improve the rice trade and strengthen regional food security. This article addresses the research question: Why has ASEAN been unable to enhance its members' food security? The research applies Robert Keohane's Transaction Cost Theory, which examines cooperation within market sectors. The significance of this study lies in offering new insights into regional food security, focusing on ASEAN, regional markets, and the rice trade.

METHOD AND THEORY

Method

This qualitative research focuses on food security cooperation in ASEAN during the AMAF 2015-2025 period. Unlike previous studies that primarily use quantitative approaches, this qualitative approach is better suited to explain the political context of food security issues. A qualitative approach allows for the construction of social reality

and cultural meaning, which helps in understanding the political context surrounding food security beyond mere numerical data and analysis. Decisions regarding rice in cooperation often reflect governments' domestic political conditions or foreign policies.

Empirical evidence is used in this explanatory research to support its arguments, with a link between Transaction Cost Theory and ASEAN food security cooperation, particularly in the rice commodity. The role of institutions, such as ASEAN, in reducing transaction costs to facilitate regional negotiations is explained by Transaction Cost Theory. The research question is addressed by describing how sensitive commodities like rice are affected by reducing transaction costs.

Primary data obtained from ASEAN annual reports and member reports on food security. Additionally, secondary data will be drawn from related literature, academic articles, and third-party reports. Transaction Cost Theory will interpret the data within both economic and political contexts, recognizing food security as a dynamic issue in global political economy studies.

Transaction Cost Theory

Regional institutions are the best solution in cases where global institutions have not been effective for member states. Regional institutions suppress transaction costs, promote sharing of information, and monitor any free-riding or defection (Choi, 2012, p. 60). Institutions have a role to facilitate cooperation by suppressing transaction costs for member states to negotiate and achieve agreement on specific issues (Keohane, 1984, p. 89-92). High transaction costs result in no bargaining in cooperation, however, if it is too low, it results in an unstable coalition in a certain condition (Keohane, 1984, p. 87). Negotiation can be influenced by international economic regimes which provide meeting forums for its members and the secretariat acts as a catalyst for the agreement. When the regime is built, it causes lower marginal cost on the raised issues compared to the cost outside the regime (Keohane, 1984, p. 90). According to Keohane and Martin (1995), cooperation can exist if there are significant common interests.

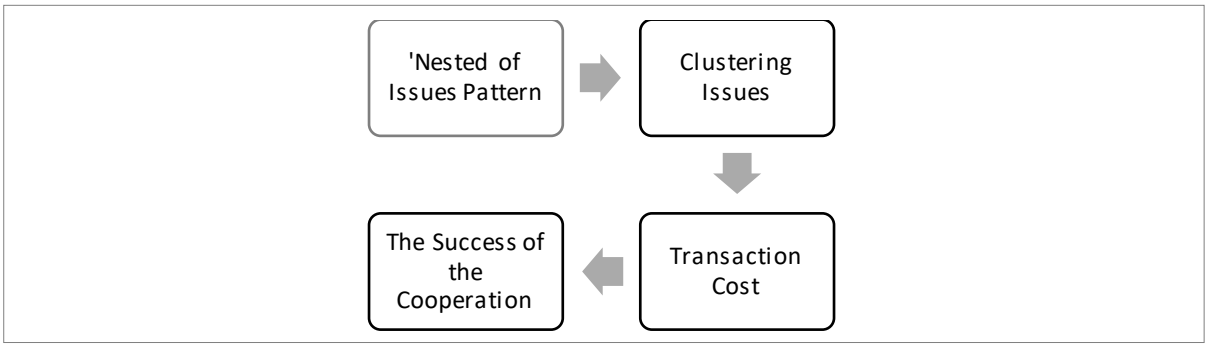
Transaction costs that correspond to regional needs would make it easier for member countries to negotiate and achieve a common agreement in a regime rather than negotiating with outside countries. In the context of markets, transactional cost towards bargains can be increased or decreased in order to suppress the incentive of violation of regime principles. Transaction costs in cooperation according to Koehane are (1) reducing the cost of legitimate transactions; and (2) increasing cost of illegitimate transactions (Keohane, 1984, p. 89-92). Thus, international regimes have a role to suppress or increase the cost of transactions towards any bargain, depending on legitimate or illegitimate the transactions are.

To suppress the transaction costs, 'nested issues' pattern is crucial for the regime to build an interconnection between issues and become a complex pattern in the market-economy among its members. The nested pattern of an international regime would influence transaction cost if it were able to build intercorrelation of issues which means that the decision towards one issue would affect other issues. Without any clustering

issues in the international regime, side payment and linkages of issues in world politics would be difficult to build and hinder beneficial bargains as a result of institutional barriers. A successful regime is a regime that is able to organize issues in order to build linkages according to the principles and suppress any bargains that are not aligned with the principles. In the context of side-payment, bureaucratic losers are needed to achieve agreement in a certain cooperation, hence national interest is a fundamental point to take a decision (Keohane, 1984, p.91).

This article is analyzing ASEAN Food Security Cooperations' barrier to achieve its goals using the theoretical framework of Transaction Cost Theory. As a part of Liberal Institutionalism, this theory focuses on the regional cooperation that is facilitated by institutions, through this cooperation, national interest gains benefits. Therefore, this theory is able to explain the weak points of ASEAN food security cooperation and acts as basic logic for this research article.

Figure 1. Analysis Model of Transaction Cost Theory Towards International Cooperation



Source: Keohane (1984)

Operationalization of Keohane's concept has a few main keys such as: nested issues, clustering of issues; reducing transaction costs; and then the success of the cooperation. Nested patterns can be seen by the relation between at the regional and international level of cooperations. It creates clustering and interconnectivity of food security related issues in ASEAN. Interconnectivity creates side-payment which influences the transaction costs of food security cooperation. Reducing the cost of internal transactions promotes economic motives of ASEAN members to sustain cooperation and negotiate better outcomes of their national interest.

Food Security

Food security in this research is explained through four dimensions. The first dimension, 'food availability,' refers to the necessity of having a sufficient quantity of food accessible to the population. This can include food from domestic production, imported food from regional markets, or food aid from other countries, but it does not guarantee sustainability in the food sector. The second dimension, 'access to food,' emphasizes that states with greater power and income can more easily obtain food at reasonable costs without facing social barriers. This access is influenced by local and regional trade infrastructure, highlighting the importance of understanding regional food trade

cooperation. The third dimension, 'food utilization,' examines how efficiently food is processed within the supply chain, from production and processing to distribution, retail, and household consumption. Efficient utilization reflects the significance of non-food inputs for food security. The fourth dimension, 'food stability,' is shaped by factors such as food prices, climate patterns, political stability, and domestic food conditions, with poorer countries being more vulnerable to external influences. Stability also depends on the consistency of the other three dimensions in the face of sudden shocks or cyclical events (Duarte et al., 2024, p.3; Islam and Kieu, 2020, p.3). It is important to note that this research will not delve into each food security dimension in detail, as they are already encompassed within the Food Security Index.

RESULT AND ANALYSIS

Nested Pattern of Issues in ASEAN

Nested patterns in an institution influence the strength of cooperation through issues interconnection which creates side-payment and reduces transaction costs (Blavoukos & Bourantonis, 2017, p. 5). Therefore, it is important to understand the nested pattern of ASEAN before further analyzing the regional food cooperations. ASEAN Food Security Cooperations are based on AEC, which is one of the ASEAN pillars that focuses on cooperation for stability, prosperity, and economic competition in the context of regional markets. AEC has a vision to be "A competitive, inclusive, resilient and sustainable food, Agriculture, and Forestry (FAF) sector integrated with the global economy, based on a single market and production base contributing to food and nutrition security and prosperity in the ASEAN community" - (ASEAN, 2020b).

Despite ASEAN foundation for regional cooperation in food security, cooperation strategy is inseparable from influences of broader cooperation on an international level. It is shown through the ASEAN Integrated Food Security (AIFS) Framework dan Strategic Plan of Action on ASEAN Food Security (SPA-FS) where ASEAN decided to align the regional strategy to Rice Research Institute (IRRI) Rice Action Plan (ASEAN, 2020a). This plan is further applied to the Global Rice Science Partnership (GRiSP) which focuses on food research, especially rice globally. Harmonized strategies and programs were also shown in ASEAN Ministers on Agriculture and Forestry (AMAF) worked together with IRRI to integrate Rice Action Plan, GriSP, and ASEAN cooperation strategy (IRRI, 2020). Therefore, the direction of ASEAN regional cooperation, specifically rice, must align with GRiSP in the context of export and import with an agreed price.

Understanding the relations between International and regional levels of food cooperation is a very important part of identifying nested pattern of ASEAN. Furthermore, regional nesting patterns are also shown by the collective regional integration framework, both political and economic, which creates a collective entity as ASEAN and joins the international organization as one actor (Blavoukos & Bourantonis, 2017, p. 3). In ASEAN, liberalization of agricultural sector requires an Agreement of Agriculture (AoA) under WTO and the Protocol on the Special Arrangement for Sensitive and Highly Sensitive product of Common Effective Preferential Tariff (CEPT-AFTA) Scheme (Dardak and

Masdek, 2023). The influence of International Organization towards regional programs and strategies is also emphasized in the ASEAN declaration for World Trade Organization (WTO) regarding the global pandemic of COVID-19 which said that ASEAN ensures compliance to WTO rules of food trade in ATIGA (WTO, 2020, p. 3). ASEAN 38th summit in 2021 emphasized the strengthening of regional cooperation and implementation of ASEAN Community Pillars that must align toward global agreement and mechanism, not restricted to just WTO (ASEAN, 2021, p. 3). In this case, ASEAN acts as a collective entity and is also influenced by broader cooperation.

Also, in this context, ASEAN is a sub-optimal solution compared to WTO as an optimizing strategy. ASEAN members' urgency toward regional food security is further explained into six goals: (1) Ensuring equitable, sustainable, and inclusive growth; (2) Alleviating poverty and eradicating hunger; (3) Ensuring food security, food safety and better nutrition; (4) Deepening regional integration; (5) Enhancing access to global markets; (6) Increasing resilience to climate change, natural disasters and other shocks. These goals are manifest of ASEAN members' urgency to focus on regional solution.

It is in line with the concept of Nested patterns in an institution which proves that actors chose sub-optimal solutions through regional cooperation rather than optimizing strategy through broader cooperation (Blavoukos & Bourantonis, 2017, p.2). For ASEAN members, regional food cooperation through AEC, which is an extension of a broader multilateral cooperation and considered as sub-optimal cooperation, is a better strategy to solve the regional issues over broader multilateral cooperations. Regional strategy of food security cooperation cannot be separated from the influence of a broader multilateral framework. Hence, ASEAN trade cooperation does not deviate from WTO rules. In this logic, ASEAN as a collective entity must harmonize its framework and manage to build a nested pattern as a base of its cooperation among its members. Thus, the nested pattern of food security in ASEAN shown by the existence of international cooperation' influence and members preference to focus on regional strategies.

Clustering of Food Security Issues in ASEAN

Clustering issues of food security as a result of a nested pattern in ASEAN institutions creates linkages of issues and side-payment of regional cooperation (Keohane, 1984, p. 91). Complex linkages of issues exist if substantive issues are in a dense policy environment and grouped in the same cluster. Food tariff reduction without disturbing economic conditions can be achieved if there are linkages and side-payment. International regime facilitates side-payment with the purpose of promoting negotiation of complex issues. Side-payment generally difficult to be create in a political context and has a risk of creating new barriers of cooperation and transaction. This linkage of issues reduces relative gain motivation and promotes absolute gain where 'losses' in negotiation can open up for an advantage in the next negotiation or a re-negotiation (Huelshoff, 1994, p. 269). In this logic of linkages of issues, integration of certain issues could be broadened if it has potential side-payment which facilitates the agreement of negotiation (Keohane, 1982, p. 340).

Linkages of issues in ASEAN are shown through regional economic integration under the AEC which is implemented through connectivity among its members. Through clustering of issues, ASEAN manages to create linkages of important issues which are mentioned in AEC cooperation. AEC has concerns for several issues such as: Energy, Minerals; Food, Agriculture and Forestry; Digital Sector; E-commerce; Tourism; Science and Technology; Transport; Standards and Conformance; and Services. However, these issues are clustered into different groups. The first group is people-to-people connectivity and consists of: transportation, ICT, energy, and tourism. The other group is market integration and consists of agriculture, forestry, fisheries, science, and technology (ASEAN, 2024). This market integration group navigates the cooperation based on five key elements such as: (1) free flow of goods; (2) free flow of services, (3) free flow of investment; (4) freer flow of capital; and (5) free flow of skilled labor (Shimizu, 2021, p.5).. Therefore, it shows that AEC clusters ASEAN food security issues into a group that is related to regional markets.

The AEC 2015 blueprint emphasized clustering issues, leading ASEAN to prioritize agricultural cooperation to improve market access and connect regional and international efforts. ASEAN has strengthened alliances through bilateral, regional, and multilateral relations to enhance agricultural cooperation across the region. In 2015, regional agriculture and food exports reached USD 18.3 billion, highlighting the potential of ASEAN integration to boost food trade (Oizumi, 2020, p.4). The ASEAN Food Security Reserve Board (AFSRB) monitors markets, prices, and staple food stocks like rice, demonstrating the link between food security and trade (Tansuchat et al., 2022, p.23). This was further reinforced by the Strategic Plan of Action on Food Security in the ASEAN Region (SPA-FS) 2015-2020, which set goals for improving trade facilitation, ensuring food stability, and establishing regional food emergency relief (Duarte et al., 2024, p.12).

Table 2. Recipient Countries of APTERR in 2012-2022

Recipient Countries	Amount of rice (MT)	Total of receiving (times)
Philippines	11,782	17
Vietnam	10,000	1
Myanmar	5,488.8	11
Lao PDR	3,125	6
Cambodia	1,362	6
Indonesia	200	1
Thailand	50	1
Total	32,007.8	43

Source: APTERR, (2023b)

Despite improvements in regional food trade facilities, initiatives like APTERR, intended to maintain food supply without market disruption, have not significantly impacted intra-ASEAN relations. APTERR data indicates that while rice aid has helped address food emergencies, the aid mainly came from ASEAN+3 countries rather than within ASEAN itself (APTERR, 2023). This is because rice aid agreements require bilateral approval, often prioritizing national interests, leading countries to protect their own food supplies, as reflected in emergency rice stock data.

Table 3. APTERR Rice Stocks (in MT)

No	Countries	Rice stocks
1	Brunei Darussalam	3,000
2	Cambodia	3,000
3	Indonesia	12,000
4	Lao PDR	3,000
5	Malaysia	6,000
6	Myanmar	14,000
7	Philippines	12,000
8	Singapore	5,000
9	Thailand	15,000
10	Vietnam	14,000
11	China	300,000
12	Japan	250,000
13	South Korea	150,000
	Total	787,000

Source: (APTERR, 2023)

Emergency rice stocks of intra-ASEAN countries are much less than those of ASEAN+3 countries. This condition arises because rice is a commodity that is considered strategic and politically sensitive within ASEAN. The sensitivity of rice commodities for intra-ASEAN countries makes it difficult for rice to be used as a bargaining chip in regional food security negotiations due to the absence of side-payment capabilities. Although the issues have been grouped and there is interconnectivity between food security issues and regional markets, side payments cannot be formed because there is no party that is able to provide in the negotiations. In addition, ASEAN as an institution does not establish side-payments that can overcome the sensitivity of rice in the regional market.

The pattern of nested issues through the AEC resulted in the clustering of agricultural or food issues in the market integration group and the linkages between issues make ASEAN regional negotiations easier than if it is negotiated bilaterally. However, rice as a politically sensitive commodity in the regional context hinders the formation of side-payments in ASEAN. Therefore, it will be difficult to use rice as a bargaining chip in ASEAN food security negotiations if ASEAN is unable to suppress the rice sensitivity. As previously explained, rice is the most important agrifood commodity which can influence ASEAN members' foreign policies regarding trade. Rice sensitivity can affect the negotiation of food security and obstruct the cooperation's goals. This sensitivity influences the APTERR rice stock agreement which shows that intra-ASEAN is reluctant to increase the rice stock agreement. Thailand and Vietnam as the top rice-producing countries of ASEAN have relatively small emergency rice stock for APTERR compared to China, South Korea, and Japan. The same thing happened to the prior emergency rice cooperation of ASEAN, ASEAN Emergency Rice Reserve (AERR), which was unable to function properly because of its limited emergency rice stock of 87,000 tons only enough for half a day of emergency for the whole ASEAN members (Mudji & Ramadhani, p.42). In ASEAN case, there is no other agrifood commodity as powerful as rice regionally or even globally in the context of regional agrifood trade cooperation.

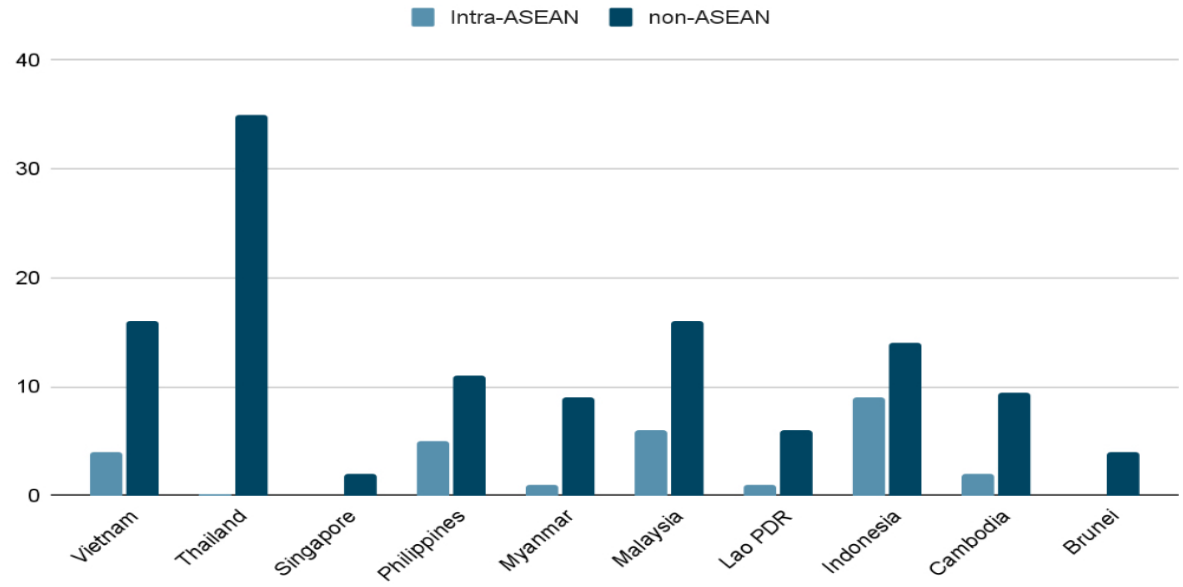
Therefore, it is in ASEAN urgency to find a way to suppress the sensitivity of rice to promote negotiation of food in regional cooperation easilly. Nonetheless, ASEAN is moving on to the next stage of reducing food transaction costs in ASEAN as a form of market liberalization.

Food and Rice Transaction Cost in ASEAN

Transaction cost in cooperation is influenced by international institutions through complex linkages and issue density in a regional context. Transactions that are against the principle will be higher than those that are aligned with the principle. Linkages and bargains that are inconsistent with regime principles are suppressed by cooperation (Keohane 1984, p. 92) Therefore, the potential for agreement depends on the consistency of issues with regime principles. This process promotes the reduction of transaction costs (Keohane, 1982, p. 338-339).

ASEAN has reduced transaction costs by clustering AEC issues, leading to regional food cooperation. By 2015, the AEC implemented 469 out of 506 measures, achieving a 92.7% implementation rate, with its most significant accomplishment being tariff elimination. The trade liberalization rate in ATIGA reached 98.6%, with an average tariff reduction of 1.4% in 2018 (Ishikawa, 2021, p. 29). While tariff reductions have been successful, non-tariff measure reductions have been slower. These efforts aim to double intra-ASEAN trade by 2025 and reduce trade costs (Ishikawa, 2021, p. 30). The AEC focuses on creating an integrated single market with zero tariffs and reduced non-tariff barriers through CEPT-AFTA and other agreements (Hoang, 2020, p. 307). Import duties have been eliminated on most products, except those considered sensitive, with targeted tariff reductions of 1-5% for countries like Vietnam, Laos, Myanmar, and Cambodia (ASEAN, 2018, p. 7).

Figure 1. Average of Agrifood Import tariffs intra-ASEAN and Non-ASEAN in 2016

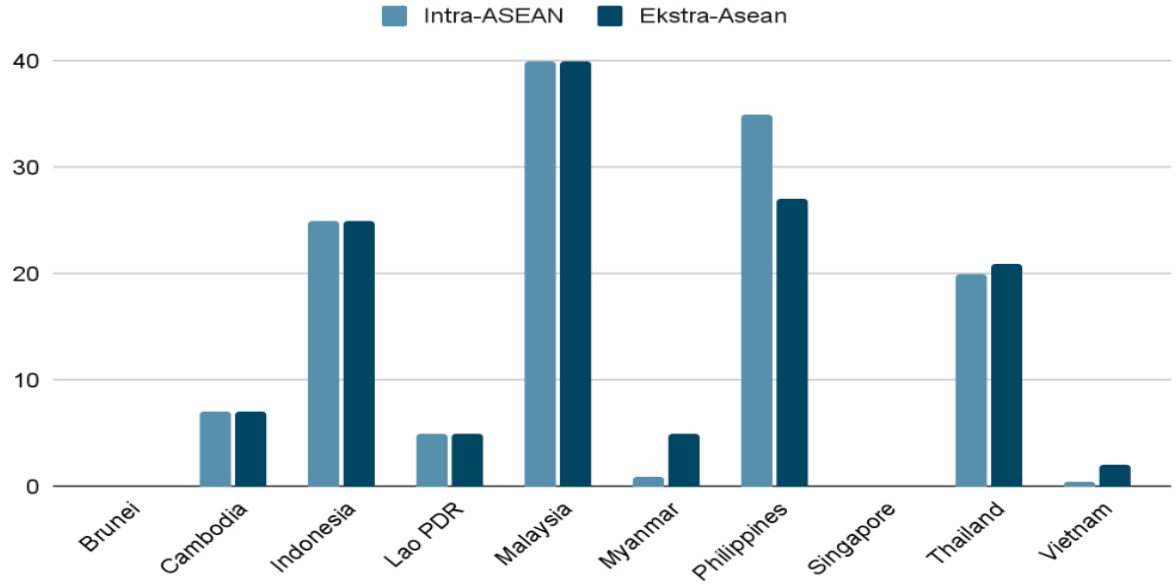


Source: FAO (2022) p. 20

Low tariffs on intra-ASEAN agrifood trade can increase regional trade if agrifood tariffs from outside ASEAN are higher. Intra-ASEAN agrifood trade is not fully liberalized in terms of imports. Brunei Darussalam, Myanmar, Singapore, and Thailand have zero or near-zero tariffs. Indonesia, Malaysia, and the Philippines still have import tariffs that are slowly reduced (FAO, 2022, p. 20). The average intra-ASEAN agrifood import tariff is much smaller than the average of non-ASEAN tariff. Although, Singapore and Brunei Darussalam have smaller average of non-ASEAN tariffs than other ASEAN member states, they still have zero average tariffs for ASEAN. This is intended to promote intra-ASEAN agrifood trade to fulfill domestic food demand. (FAO, 2022, p. 21). Some ASEAN members still applied agrifood tariffs to sensitive food commodities in regional cooperation.

The interconnectivity of food security issues with international trade underpins the importance of reducing transaction costs in ATIGA (Vhumbunu et.al, 2022 p.85). Changes in tariff utilization rates of ATIGA and other FTAs increased intra-ASEAN agrifood trade by 15% in 2010, 25% in 2014, and 35% in 2018. This increased number of trades are more influenced by ATIGA rather than other FTAs. In this context, the highest regional utilization are agricultural and food products, which are comparative advantage products for various ASEAN member countries (ERIA, 2021, p. 6). Therefore, through the ASEAN Free Trade Area (AFTA), ASEAN decided to implement tariff elimination (Vhumbunu et.al, p. 79). However, to achieve the free flow of goods, not only zero tariff is needed but also the removal of non-tariff barriers (Shimizu, 2021, p.16; Bouët, 2022, p.238; Tansuchat et al, 2022, p.22).

Figure 2. Rice tariff for Intra-ASEAN and non-ASEAN in 2015-2016



Source: FAO (2022, p. 20)

This data shows that rice tariffs tend to be more difficult to reduce in regional and international markets because of their sensitivity compared to other agrifood tariffs. Rice as one of the most protected and sensitive commodities in ASEAN (Kea, 2019, p.3631),

makes it difficult to reach an agreement in trade tariff negotiations and food cooperation. Special considerations on rice and sugar were signed in 2007 in the "Protocol to Provide Special Consideration for Rice and Sugar" and approved for implementation in ATIGA (ASEAN, n.d.-a, p. 25). Tariffs on agrifood intra-ASEAN overall have lower tariffs compared to non-ASEAN trade. However, the special consideration of rice shows ASEAN's inability to promote market liberalization cooperation on sensitive commodities.

The political dimension of ASEAN's food cooperation barrier is evident in decisions around transaction costs. While ASEAN aims to reduce tariffs through market integration, member countries' political interests heavily influence the rice market. Exporters like Vietnam and Thailand focus on competing in the premium rice market, rather than lowering prices to benefit other members (Patunru, 2019, p.27). Conversely, Indonesia views its domestic rice sector as a symbol of national sovereignty, using it politically to gain voter support. Meanwhile, Malaysia and the Philippines are committed to achieving self-sufficiency (Patunru, 2019, p.28). These conflicting national interests hinder ASEAN's goal of promoting regional trade through the AEC.

Table 4. ASEAN Rice Export of 2017-2020 (in million USD)

Partners	2017	2018	2019	2020
ASEAN	1,055.5	1,145.9	1,867.0	2,044
China	2,293.7	1,830	940.5	1,299.7
USA	410.5	543.8	636.7	718.6

Source: ASEAN (2021b, p. 215

Table 5. ASEAN Rice Imports of 2017-2020 (in million USD)

Partners	2017	2018	2019	2020
ASEAN	906	2,132.2	1,787.4	1,662.7
India	130.9	278.5	138.5	292.2
Pakistan	85.6	176.5	164.2	111.7

Source: ASEAN (2021b, p. 217)

Table 6. ASEAN Rice Import and Export 2023 (in tons)

Countries	Import		Export	
	Intra ASEAN	Non-ASEAN	Intra ASEAN	Non-ASEAN
Brunei	26,119	2,487	-	-
Cambodia	6,068	1,800	66,970	574,765
Indonesia	263,002	166,205	2,767	213
Lao PDR	55,899	2,747	16,380	51,639
Malaysia	617,699	621,218	113,967	54
Myanmar	-	297	239,847	1,915,967
Philippines	3,386,950	481,982	5	461
Singapore	3,783*	11,343*	332*	202*
Thailand	1,930	4,731	1,695,512	5,999,813
Vietnam	600,884	294,504	122,444	4,259,893
Total	4,962,334	1,587,314	2,258,224	12,803,007

Source: Trade Map, n.d dan BPS (2024) *predicted

The difficulty in reducing intra-ASEAN rice tariffs indicates that regional trade is not a priority, with tariffs and rice prices often serving as protection for this sensitive

commodity (Birthal et al., 2022, p. 189). However, rice export data from 2017 to 2020 shows an increase in intra-ASEAN exports and a decline in two major non-ASEAN markets, though the nominal trade difference is minimal. Import data from the same period reveals much higher nominal imports within ASEAN. Despite this, 2023 data on trade patterns for each member country does not indicate a strong preference for intra-ASEAN trade, highlighting ASEAN's difficulty in effectively implementing regional tariff reductions. The lower cost of intra-ASEAN food transactions compared to non-ASEAN trade is supported by institutions that facilitate negotiations and connect issues. Still, reducing transaction costs for rice remains challenging due to its sensitivity. While intra-ASEAN agrifood trade costs are low, consistent with ASEAN's food security objectives under the AEC, rice's sensitivity continues to hinder tariff liberalization, limiting regional rice trade.

The Success of Rice Food Security Cooperation in ASEAN

Institutions play a crucial role in influencing transaction costs among members, which is key to analyzing cooperation. If regional transaction costs are minimal, institutions for facilitating mutual benefits might be unnecessary. However, when transaction costs are high, these institutions become essential for cooperation (Keohane, 1988, p. 387). Low tariffs on agricultural and food commodities, especially sensitive items like rice, can encourage member countries to negotiate and cooperate in food and trade. Exporting and importing countries both favor lower tariffs, but this concept is challenging to apply to rice in ASEAN due to special tariff considerations. Regional trade, driven by food security cooperation, offers a solution for member countries to meet food demands when self-sufficiency is not possible. Market liberalization, supported by nested issues, issue clustering, and transaction costs, motivates intra-ASEAN trade, allowing countries with rice deficits to meet their needs through easier internal trade compared to international markets.

Table 7. ASEAN Paddy Production in 2014-2020 (in thousand metric tons)

Countries	2014	2015	2016	2017	2018	2019	2020
Brunei	2.1	3.1	3.2	2.5	2.3	3.9	4.1
Cambodia	9,291	9,324.4	9,227	9,952.3	10,891.7	10,885.7	10,935.6
Indonesia	70,846.5	75,397.8	77,245.3	81,148	54,604	54,649.2	55,534.5
Lao PDR	4,002.4	4,048.2	4,300	4,055.4	3,534.5	3,506.8	3,816.8
Malaysia	2,848.6	2,674.4	3,432.9	2,570.5	2,873.3	2,321.6	2,293.8
Myanmar	28,322.2	28,127.2	29,073	27,255.4	27,573.4	26,269.7	25,992.3
Philippines	18,967.8	18,296.7	18,365.3	18,549	18,622.3	18,932.1	19,546.5
Singapore	-	-	-	-	-	-	-
Thailand	36,762.3	31,616.9	27,418.5	31,857.2	32,348.1	28,618	29,811.2
Vietnam	44,972.8	45,215.7	45,640	42,763.7	43,443.4	42,301.1	43,346.6
ASEAN	216,015.7	214,704.4	214,705.1	218,155.2	193,893	187,488	191,280,2

Source: ASEAN (2021b, p. 193)

Self-sufficiency in rice depends on domestic production, making regional markets vital. In 2018, Indonesia's rice output dropped but stayed among ASEAN's top producers,

while Singapore relies entirely on imports. Market liberalization could enhance trade between surplus and deficit countries (Hossain and Delin, 2022, p. 571).

Table 8. ASEAN Rice Production and Domestic Utilization of 2022-2023 (in tons)

Countries	2022			2023		
	Production	Domestic Utilization		Production	Domestic Utilization	
Brunei	2,316	27,627	-25,311	2,827	31,430	-28,603
Cambodia	7,439,278	5,529,409	1,909,869	7,661,688	6,240,320	1,421,368
Indonesia	35,050,295	36,320,696	-1,270,401	36,455,578	35,252,730	1,202,848
Lao PDR	2,268,948	1,952,326	316,622	2,405,250	2,293,158	112,092
Malaysia	1,513,250	2,630,108	-1,116,858	1,555,216	2,539,282	-984,066
Myanmar	17,336,547	15,237,732	2,098,815	16,871,591	15,651,940	1,219,651
Philippines	12,920,681	16,670,261	-3,749,580	13,157,000	16,811,293	-3,654,293
Singapore	0	238,427	-238,427	0	283,500	-283,500
Thailand	21,435,554	14,684,439	6,751,115	22,330,025	13,602,140	8,727,885
Vietnam	27,730,014	21,038,379	6,691,635	28,526,798	21,237,692	7,289,106
ASEAN	125,696,882	114,329,405	11,367,477	128,965,972	113,943,485	15,022,487
	Deficit	6,400,577		Deficit	4,669,797	
	Surplus	17,768,056		Surplus	19,972,950	

Source: AFSIS (2023, p. 8)

Production and utilization data from 2022 and 2023 indicate that Brunei Darussalam, Indonesia, Malaysia, the Philippines, and Singapore did not achieve rice self-sufficiency, relying on imports to meet domestic demand. High consumption pressures food supplies, prompting governments to import rice for stability (Duarte et al., 2024, p.7). In 2022, the total deficit was 6.4 million tons, with a surplus of 17.8 million tons, and by 2023, the deficit was 4.7 million tons, with a surplus of 20 million tons. Regional market integration should address these deficits.

Table 9. ASEAN Rice Export 2022 (in Tons)

Exporter Countries	Countries of destination				
	Brunei	Indonesia	Malaysia	Philippines	Singapore
Cambodia	14,742	-	45,550	-	6,678
Lao PDR	-	-	-	-	-
Myanmar	-	8,630	-	218,327	-
Thailand	-	91,714	132,214	185,714	95,941
Vietnam	-	78,709	-	-	-

Source: Trade Map (2023)

Table 10. ASEAN Rice Import 2022 (in Tons)

Importer Countries	Countries of Origin				
	Cambodia	Lao PDR	Myanmar	Thailand	Vietnam
Brunei	14,744	-	-	11,276	51
Indonesia	-	-	3,830	80,183	81,828
Malaysia	47,117	-	281	142,371	427,862
Philippines	-	-	234,877	197,460	3,187,629
Singapore	-	-	3,714	-	-

Source: Trade Map (2023)

Regional food security cooperation in the market sector does not show any pattern of rice trade to fulfill rice deficits of other ASEAN member states. In 2022, rice surplus countries such as Cambodia, Indonesia, Laos, Myanmar, Thailand, and Vietnam traded with rice deficit countries including: Brunei Darussalam, Indonesia, Malaysia, Philippines, and Singapore. However, from the rice trade data, only Brunei and the Philippines fulfill their food demands through regional trade, while Indonesia, Malaysia, and Singapore fulfill their food demands through non-ASEAN trade. Although some rice demands can be fulfilled regionally, intra-ASEAN trade is not fully prioritized. Therefore, this data shows that ASEAN cooperation does not promote its member countries to trade food, especially rice, regionally.

Rice as a sensitive commodity is one of the barriers in implementing a regional free market, although ASEAN has implemented a 'nested issues' pattern and clustering of issues. The sensitive position of rice encourages countries to be reluctant to trade with other countries on the basis of securing food supply for domestic consumption. Production conditions that can be affected by various factors underlie the country to classify rice as a sensitive commodity. The failure of ASEAN to liberalize rice commodities promotes its member countries to fulfill their rice demands from non-ASEAN. Countries with production deficits not only import from intra-ASEAN but also non-ASEAN.

CONCLUSION

Food Security is not achieved only through domestic production, but also through regional or international trade. AEC lays out vision, goals, and priorities as a foundation of various food security cooperations in ASEAN. These cooperations did not indicate any significant impact for member countries as shown in the food security index of its members which was achieved by only three countries such as Singapore, Vietnam, and Malaysia. These cooperations cover various sectors of food security. The market sector, as one of regional cooperations' sectors, has an important role in helping ASEAN achieved its goal of food security. However, regional rice trade has always been stagnant and has not yet brought any significant improvement to ASEAN food security through promoting regional trade. Therefore, it is important to analyze food cooperation of market sector to unveil the weakness of ASEAN as an Institution in facilitating regional cooperation of food security. Cooperation, in the context of markets, is able to be analyzed using transaction cost theory and it explains the weakness of ASEAN food security cooperation.

Transaction cost theory shows ASEAN's inability to suppress the sensitivity of rice in regional cooperation. The nested pattern in ASEAN cooperation is shown by how a broader multilateral framework, such as WTO, is applied in the regional structure cooperation, especially regarding food trade. This nested pattern resulted in clustering food security issues to be in the same group of regional markets integration of AEC. This clustering into specific groups failed to build side-payment in order to ease the negotiation regionally. The absence of side-payment in food security impacted the next key indicator such as the transaction costs of rice commodities. Suppressing the transaction cost is

successful in the context of the broad food concept, however, rice as a sensitive commodity has a special consideration in regional market liberalization. The weakness of ASEAN regarding providing rice trade cooperation is shown by the insignificant rice trade between surplus production countries and deficit production countries. This concludes that transaction cost has failed to be applied in ASEAN food security cooperations, especially in the context of rice.

The result of this research does not align with the theoretical framework and hypothesis. Transaction cost theory describes how an institution builds a cooperation framework in order to strengthen the cooperation through market and lower transaction costs of trade. Thus, it will ease the regional negotiation of food security. Such things did not work in the case of food security with rice as a sensitive commodity. This food security analysis using transaction cost theory gave a new understanding of food security cooperations in ASEAN and the role of its institution in the context of regional markets. The strength of this article is the ability of the theory framework to involve political context to analyze food security cooperation in ASEAN and focus on one main staple food in the region. However, this region consists of various food diversity and one staple food would not describe the whole context of food security. The market sector is only a part of how to evaluate the success of an institution's role in providing food security cooperation and as a part of liberal institutionalism theory. Food security has various dimensions which could be used to assess the achievement of each country. Therefore, this article could be developed to describe in more detail and to show a better reality of food security in ASEAN and how institutions provide a regional cooperation framework to achieve food security among its members.

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