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Political Economy of Rice Policy in Indonesia: A Perspective on the ASEAN Economic Community

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INTRODUCTION

The quest for Indonesia's sustainable food security currently lies on how the country manages its most important food commodity: rice. The Indonesian government, through numerous instruments, has been involved extensively in intervening the domestic rice market as a way to navigate economic and political dynamics over the years. The combination of price stabilization and other policies related to production of rice has culminated in the current rice policy that is restrictive to international trade. However, the recent development on rice issue, such as import policies, rising rice price, and also local farmers' welfare have forced the need for further examination of rice policy in Indonesia. We argue that getting the right rice policy will be an essential move to further achieve and maintain sustainable food security in Indonesia. This paper is intended to describe historically rice policies that have taken place and are currently implemented in Indonesia. We highlight the key problems related to data reliability and we discuss the main narratives and paradigms that underlie the policies across different periods. We then offer a discussion about the possibility of new platform of rice trade to further achieve sustainable food security in Indonesia, which should be considered in the context of regional cooperation with the other ASEAN members, i.e. ASEAN Economic Community.

RICE IN INDONESIA: KEY ISSUES

Rice is the main staple food for half of the world's population, and especially for people in Asia. It has been cultivated in 113 countries, with China and India leading in the production of half of the world's rice supply, followed by Indonesia, Bangladesh, Vietnam, Thailand, and Myanmar (FAOSTAT, 2017)[1]. Approximately 80% of rice production involves small-scale farmers, making its social economy discourse very contentious. According to OECD-FAO (2018), Indonesia's annual rice consumption per capita in 2017 reached 135 kg, higher than that of the Philippines (115 kg), Thailand (99 kg), and Malaysia (81 kg). Therefore, rice has always been among the top priorities for Indonesian government policies, especially those on trade and agriculture.

Despite the importance of rice in Indonesia, the reliability of data about this food item is still questionable, leading to a policy environment with many related but poorly-grounded policies. Traditionally, the Ministry of Agriculture (MOA) measures the quantity of rice by using paddy productivity data from Statistics Indonesia (BPS) and paddy field area data collected by MOA and later by the Ministry of Agrarian and Spatial Affairs. MOA multiplies the paddy field area with an estimated productivity level of rice that is measured in terms of tons/ha. Separately, the Ministry of Trade (MOT) examines rice market conditions by looking at consumer prices in local markets and at data on stocks provided by BULOG (an Indonesian state-owned company responsible for rice distribution). These different approaches have resulted in confusing, contradictory supply figures. Statistics Indonesia provided rice data in the past, but ceased when it began to prepare a new approach to measurement.

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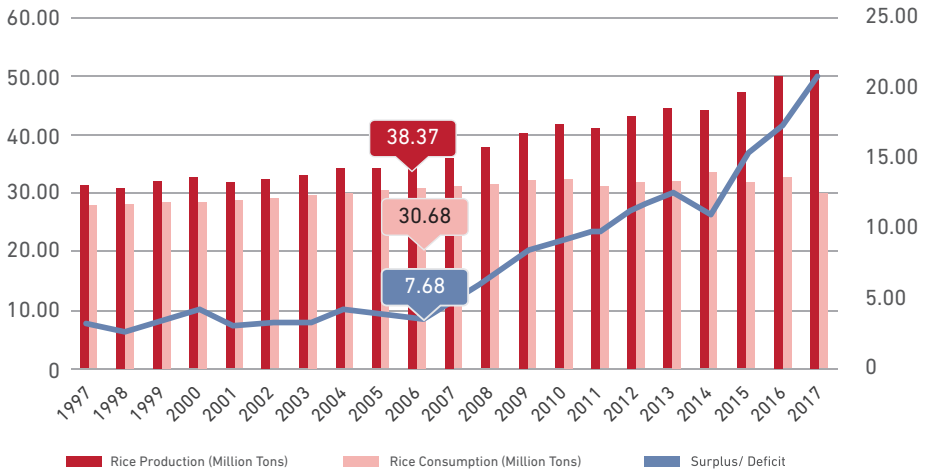
Late in October 2018, Statistics Indonesia provided a new dataset that uses a *Kerangka Sampel* Area/Sample Area Framework (KSA) approach. KSA utilizes satellite images to map paddy fields and these data are supplemented by a ground check (BPPT, 2018). Since this new approach has just been released, it is too early to judge its effectiveness, but the update makes it clear that resolving the rice data controversy is key to improving the policy formulation process and making decisions such as whether or not the government should import rice.

The demand, supply, and price of rice can help to illustrate why there is controversy surrounding their measurement. It is easy to conclude that Indonesia consistently produces a surplus of rice if the rice data released by MOA is taken at face value (Figure 1). According to these data, on average, Indonesia has produced 7.7 million tons more rice than it has consumed every year since the late 1990s. This supports MOA's repeated claim that Indonesia is self-sufficient in its rice supply.

[1] This ranking might be revised as Statistics Indonesia has just revised the rice production for 2018 with a more accurate

Figure 1.
Demand and Supply for Rice Commodity (million tons), 1997 – 2017



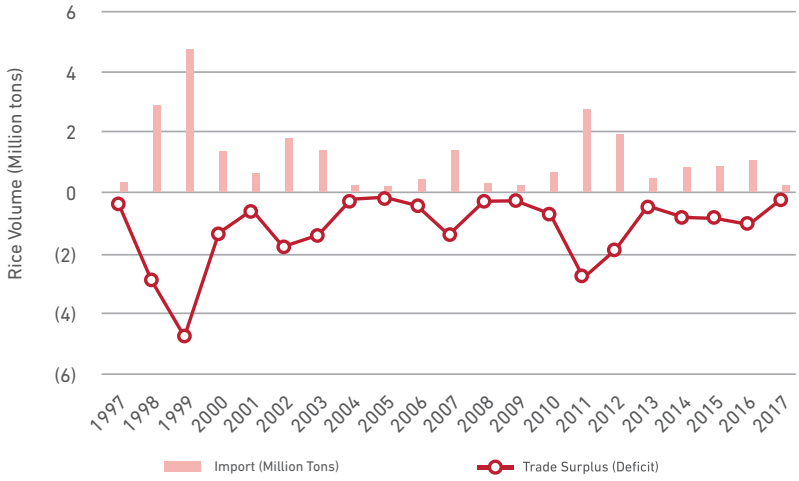
Sources: Statistics Indonesia (2018), Outlook Tanaman Pangan dan Hortikultura (TPH) 2017, and Outlook Padi 2016, calculated by the authors, see Note below

Notes: Statistics Indonesia measured the availability of paddy stocks and provided a depreciation rate for unhusked dry rice. The depreciation rate will be used as a tool for conversion rate from paddy commodity to rice commodity. As for consumption, we convert daily average consumption rate provided by Outlook TPH and Outlook Padi and multiply it by population on each year, provided by Statistics Indonesia.

> On average, Indonesia imports more than 1.2 million tons and exports less than 6,000 tons of rice annually.

However, MOA's claim of self-sufficiency is at odds with data on the rice trade, which shows that Indonesia imports rice every year (Figure 2). On average, Indonesia imports more than 1.2 million tons and exports less than 6,000 tons of rice annually. The trade balance for rice has been negative for the last 20 years, with an average of -1.1 million tons. Most rice imports come from Thailand and Vietnam, and exports go to Singapore, Malaysia, and East Timor. The government claims that these imports were meant to lower rice prices for consumers and to stabilize BULOG rice stocks (Executive Office of the Vice President, 2018; Ministry of Trade, 2008).

Figure 2.
Rice Trade Volumes, 2012-2016

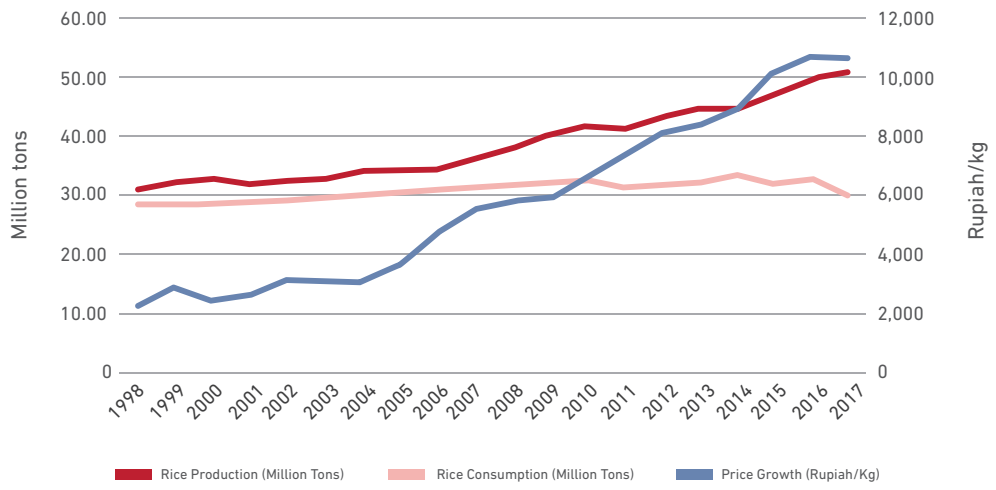


Notes: The export figure was too small to be included in the graph. Please refer to Trade Surplus (Deficit) for overall Rice Trade Ballance

Sources: Outlook THP (2017), Outlook Padi (2016), and Statistics Indonesia (2018)

The decision about whether or not to import rice is almost always contentious. Different ministries and agencies (MOT, MOA, BULOG, and Statistics Indonesia) have different opinion about the best policy direction, and these opinions are often based on different data. Unsurprisingly, this results in inconsistent policy decisions, which in turn harms the government's ability to deal with the issue. In this situation – poor data on rice quantity – using rice prices as supply and demand indicators of the rice market situation may be the best option (Rosner and McCulloch, 2008). Simply put, an increase in rice prices may indicate a drop in supply, an increase in demand, or both. Unfortunately, the insights from changes in price are often at odds with claims about actual rice stocks made by the government (especially MOA). Figure 3 compares the levels of production and consumption (left axis) and well as the price of rice (right axis) from 1998 to 2017. Even though all the data in this figure come from Statistics Indonesia, the quantity data remain at odds with the information conveyed by prices.

Figure 3.
Rice Prices (IDR/kg) and Quantity Produced and Consumed (million tons), 1998-2017



Sources: Statistics Indonesia (2018)

As Figure 3 shows, in spite of the fact that production has consistently exceeded consumption, the price keeps increasing[2]. During this period, production increased by an average of 2.5% per year and rice consumption increased by around 0.4% per year. If this were the whole story, the price of rice should have decreased during this period. Instead, the price increased by almost 0.9% annually. This is in line with findings by Rosner and McCulloch (2008) that indicated that production and consumption data are questionable and price is a more reliable indicator for describing the market in Indonesia.

"If this were the whole story, the price of rice should have decreased during this period. Instead, the price increased by almost 0.9% annually."

[2] As shown later, the story remains even when exports and imports are taken into account.

The next consideration in the decision of whether or not to allow rice imports is whether the price of imported rice is affordable—that is, lower than the domestic price. Figure 4 compares the prices of rice in Indonesia and Thailand from 1995 to 2018.[3] The average wholesale price in Indonesia is above the price in Thailand, sometimes by as much as IDR 1,940 per kg.

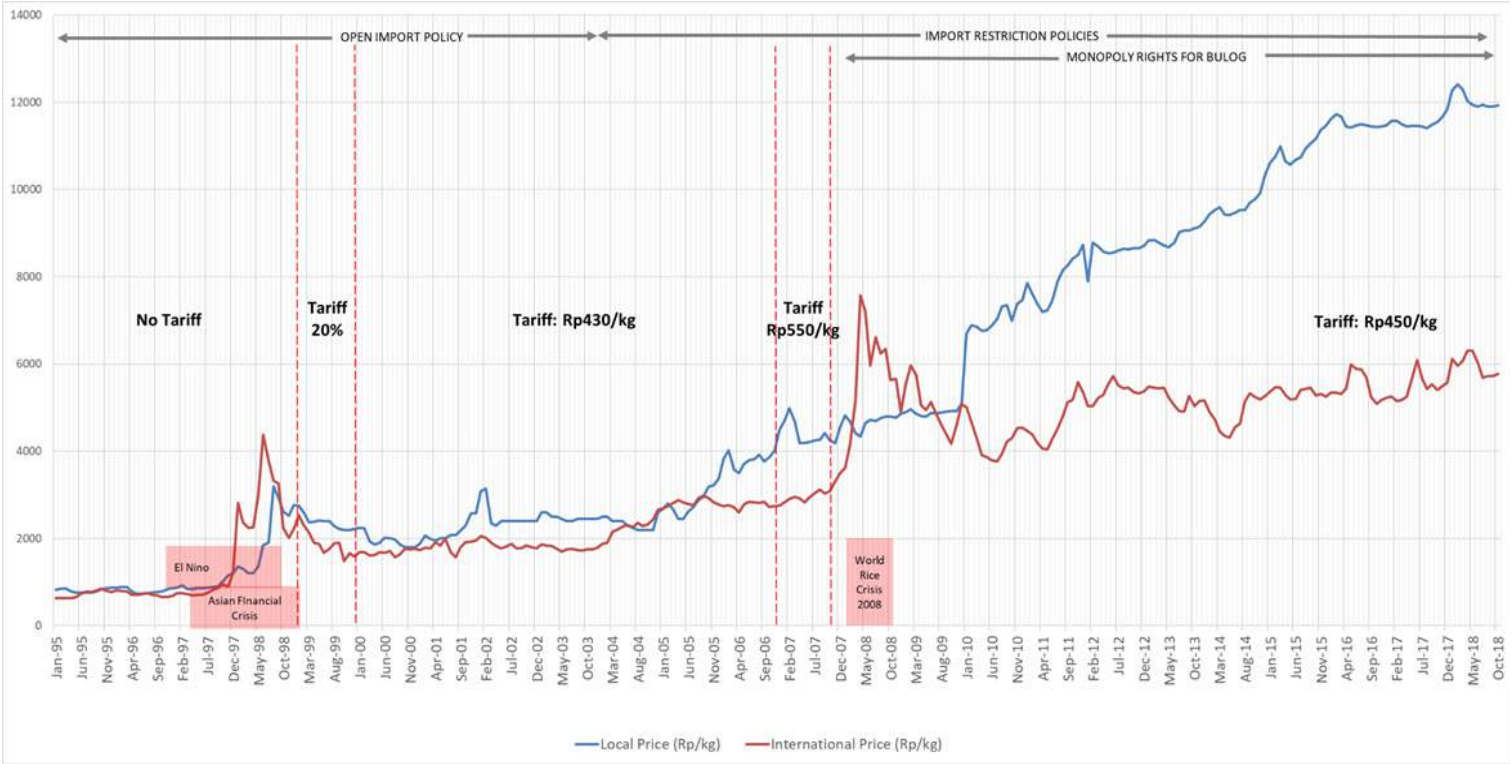
> "Increasing rice prices in Indonesia have contributed to greater poverty. The majority of Indonesians, including rural, low-income families, are net consumers of rice and so pay more than they earn from higher prices."

As discussed in McCulloch (2008) and Patunru (2019), increasing rice prices in Indonesia have contributed to greater poverty. The majority of Indonesians, including rural, low-income families, are net consumers of rice and so pay more than they earn from higher prices. Rising rice prices affect poor households the most as they spent a larger share of their income on food (Statistics Indonesia, 2017). This is in line with the experiences of other developing countries. The high price of rice increased the poverty rate by 0.7% in Burkina Faso (Badolo and Traore, 2012). In Bangladesh a 10% increase in price of rice lowered the real income of poorest 50% of the population by 54% on average (Sayeed and Yunus, 2018). In Liberia, a 10% increase in food prices contributed to an increase of 2.2% in the poverty rate (Tsimpo and Wodon, 2008). And a study by Vellakal et al. (2015) in India found that as the price of rice increased, the wasting prevalence also increased, albeit slightly.

Rice is an essential commodity and shortages and high prices may lead to increased poverty and malnutrition. The government should do all it can to ensure that rice is available in local markets and affordable for everyone. In Indonesia, neither of these goals have been met (see Heufers and Patunru 2018), despite many policy interventions.

[3] We use Thai rice prices as a proxy for the world price because it, along with Vietnam, is one of the two main rice producers in Southeast Asia. The World Bank also uses rice prices in Thailand as an indicator for world rice prices.

Figure 4.
Rice Price Comparisons between Indonesia and Thailand, 1997 – 2017



Sources: Statistics Indonesia through CEIC (2018) for Average Daily Retail Price and World Bank Pink Sheet Commodity Price (2018) for Thailand's Wholesale Rice Price (25% Broken). Exchange Rate from USD to IDR from World Bank's WDI. Compiled by Ho and Ilman (2018). See Note below.

Note: The price of rice in Thailand was chosen as a proxy for the international price as recommended by the World Bank Pink Sheet. The exchange rate used in each year was an average of daily rates. In 1997 – 1998, El Nino and the Asian Financial Crisis occurred, raising the world price. The government imposed a tariff on rice imports of as much as IDR430/kg from mid-2000 until mid-2004. From mid-2004 to 2007, this tariff has changed several times, ranging from IDR450/kg to IDR550/kg. Starting in April 2011, the tariff was adjusted back to IDR450/kg with exception from May – September 2012 when there was a worldwide drought. (Regulation: *Peraturan Menteri Keuangan* (PMK) No.65/PMK.011/2011). All tariffs have been excluded from the chart, while shipping and handling fees from Thailand have been included to the price since the price is adjusted with F.O.B. from the Bangkok Port.

RICE POLICIES IN INDONESIA

A. Soekarno Era (1945-1965)

In this era, rice policies were characterized by the more generally nationalist policies of a country that had just achieved its independence after a long period of colonialism (Wibisono, 2015). The government aimed to enact policies that would move the agriculture sector toward food security by aiming for a self-sufficiency in food production (Sumedi and Djauhari, 2014). The earliest regulation on rice dates back to 1948, when the government regulated the stockpiling of rice and other commodities using a permission scheme that had to be extended every three months, as stipulated in Government Regulation PP No.20/1948. This regulation, which aimed to control food distribution, was strengthened further by the Food Stockpiling Law (UU No.29/1948), which limited the amount of food allowed in storages or houses. This was known as the Kasimo Plan, a program that focused on food self-sufficiency (Piggott et al., 1993).

The Kasimo Plan had five policy components:

(i) Planting food crops in abandoned lands of East Sumatera.
(ii) Increasing various seed planting as a part of intensification program in Java.
(iii) Preventing the slaughtering of animals deemed to have important roles in food production
(iv) Building seeds nurseries in every village.
(v) Migrating around 20 million people from Java Island to Sumatra Island for 10–15 years.

Ultimately, the Kasimo Plan failed due to political instability and poor coordination between the central and local governments (Sumedi and Djauhari, 2014).

In 1950, the government established an institution to help improve farmers' productivity named BPMD (*Badan Pendidikan Masyarakat Desa*/Villagers Education Board) (Saragih, 2016). Due to insufficient funding, the board did not have a significant impact and the government was eventually forced to increase rice imports from 334,000 tons in 1950 to 800,000 tons in 1959.

Saragih (2016) explains that the government had aimed to become self-sufficient and not reliant on trade for food by the end of 1961. To this end, they constructed a production plan for rice from 1959–1961 under a central command system that extended to the village level with the help of village-level food task force called Pamong Tani Desa (PTD – *Village Farmer Taskforce*). In the same period, the government established a committee, *Organisasi Pelaksana Swa-Sembada Beras*/ Rice Self-Sufficiency Executor Organization (OPSSB), that enforced policies meant to achieve self-sufficiency in rice. OPSSB consisted of small plot farmers who were categorized into sub-groups and were assisted by local agriculture officials and a group of academics.

OPSSB also established *Badan Perusahaan Bahan Makanan dan Pembuka Tanah*/ Food and Land Clearance Holding (BP-BMPT) to support farms and farming facilities. BP-BMPT had two subsidiaries, Padi Sentra and Mekatani. The former was assigned to provide access to production resources such as seeds, fertilizers, and chemical goods, while the latter conducted land clearance operations for new paddy fields, focusing on areas outside the Island of Java. Sentra was shut down due to insufficient funding, logistical challenges, credit mismanagement, and a

failed pricing strategy. In 1963, rice became scarce and the government was eventually forced to designate maize as a substitute commodity.

In its early years of independence, Indonesia's government was dedicated to establishing a rice farming ecosystem with production centers across the country, using a program that centralized control of the rice stocks. In this era, even though imports were needed from 1950–1959, the regime banned all imports in 1964 due to insufficient foreign exchange (Timmer, 1975 p.209). Despite the success of the policies of this era in increasing rice production, rice shortages resulted and prices rose. This partially contributed to the downfall of Soekarno (Manning, 1975).

B. Suharto Era (1966-1988)

Indonesian economic development under Suharto (1966-1998) relied heavily on the agricultural sector, especially in Suharto's early years. Under his government, rice policies aimed:

(i) To achieve and maintain food security,
(ii) To trigger economic growth and improve economic stability, and
(iii) To improve farmers' welfare (Falcon and Timmer, 1991).

Since rice is the most important agricultural product in Indonesia, policies from the era focused on improving the rice market. Suharto believed that rice security would secure his power and improve economic welfare and political stability (Fahmid, 2004).

Suharto constructed an incentive system for rice-producing regions through the passage of Presidential Decree 2/1968, but this was repealed in 1969 before being integrated into the Green Revolution Agenda that was inserted in the first Repelita (*Rencana Pembangunan Lima Tahun*/ Five-Year Development Plan), Repelita I, which targeted food production programs.

Farmer's Formula (Rumus Tani) was one of the earliest programs established in the Repelita I. It focused on stabilizing the prices of main crops, including rice by stipulating that the price of 1 kg of rice at the farm gate must equal the price of 1 kg of fertilizer. The intention of this formula was to guarantee farmers that they would make a profit from their harvest (Afiff and Timmer, 1971), and thereby encourage them to produce a rice surplus (Djurfeldt et al., 2005, p.45).

The government also transformed BULOG into a single purchasing agency that controls national food supply (as stipulated in President Decision 272/1967). BULOG conducts its operations through its monopoly on imports and through purchasing activity from local farmers, which affect the supply and thereby help the government to influence rice prices. During the Suharto regime, BULOG attempted to impose price floors or ceilings. These operations helped to stabilize the rice price compared to the price in the final years of the previous regime (Ashari and Aprianto, 2015). Finally, the government established the Rice Team, which was assigned to help farmers in processing, marketing, and storing rice (as stipulated in President Decision 75/1970) and encouraged private firms to distribute fertilizer to farmers.

All of these programs worked smoothly in the beginning. BULOG was able to achieve some limited price stability by purchasing rice from millers to keep the price below IDR 36 per kg, supporting the Farmer's Formula as this was intended to translate into a profit of IDR 13.2 per kg. Despite these efforts, the Farmer's Formula policy was unable to dictate the farm gate price

and guarantee profit for farmers (Afiff and Timmer, 1971). Without guaranteed profits, farmers did not produce rice at the rate the government had hoped for. In 1972, El Nino contributed to the rice crisis, further complicating agricultural policy. All of Southeast Asia suffered from a drought that damaged rice production, and BULOG was unable to control prices (Piggot et al., 1993)—even though the agency imported 1 million tons of rice, the high world price meant that the domestic price did not fall.[4]

In response, the government issued Presidential Instructions 2/1973 and 1/1974 (later revised with Presidential Instruction No.17/1974) on buying local rice stocks from 1973–1975. The government also created nationwide village cooperatives (Presidential Instruction 4/1973) with the name of BUUD (Badan Usaha Unit Desa – Village Enterprises Unit), which later evolved into KUD (Koperasi Usaha Desa – Village Cooperation Unit). This initiative aimed to encourage the rural population to engage in economic activity and grow the local rice industry by participating in the agricultural sector, from harvesting to distribution, and by providing credit supports to the KUD members (Suradisastra, 2006).

BULOG was finally successful in maintaining the rice price after it increased the price floor and set a price ceiling to try to control affordability of rice for consumers (Timmer, 1996). This approach was based on the Pricing Regulation for Unhusked Mill Rice, as stipulated in Presidential Instruction 17/1974 and was adjusted annually afterward from 1979 until 1984.

From the mid-1970s through the 1980s, a sudden increase in the price of oil gave Indonesia the financial resources to pursue more aggressive rice policy, including the creation and expansion of a national fertilizer industry and additional subsidies for various farm inputs including as fertilizers (30–40%) and credit (25%). All of these programs, along with the intensification program (BIMAS) and the distribution of the HYV rice seeds (high yield varieties) contributed to Indonesia's farmers reaching self-sufficiency for various foods in the first half of the 1980s, including rice in 1984/1985 (Manning, 1987). After this time, the government committed itself to the creation and expansion of import substitution programs, shifting its focus to the manufacturing industry and leaving the agriculture sector more independent.

Damardjati et al. (1985) made the case that changing economic conditions, including the end of the oil crisis, affected the sustainability of the Suharto government's self-sufficiency program. Falling oil prices at end of the 1980s decreased government revenue and resources to maintain subsidy programs. The price of rice collapsed, falling below USD 200/tons. Gerard (2010) discussed in more details how the government tried to manage the rice surplus, in part through eliminating the fertilizer subsidy program. Maintaining such a large rice stock was expensive and BULOG was forced to export surplus rice at a loss. In spite of these efforts, BULOG maintained a price floor in an effort to support the welfare of producers. This culminated in BULOG's inability to control rice stocks and prices by the end of 1987. The government eliminated the price ceiling, allowing prices to rise on in Indonesia's outer islands, in order to incentivize private traders to undertake rice distribution and lower BULOG's costs.

[4] The world price jumped from USD 129/ton in 1971 to USD 330/ton in 1973 (World Bank, 1981).

In 1988, village cooperatives (KUDs) were invited to join fertilizer distribution programs to help lower the cost of fertilizer distribution (Suradisastra, 2006). These KUDs helped to distribute 76% of all targeted fertilizer distribution from 1988–1992 (Prawiranegara, 1993).

In the early 1990s, in spite of the government's continued desire for self-sufficiency, BULOG was forced to make conditional net imports in order to stabilize the market price of rice (Fane and Warr, 2007). A domestic rice shortage in 1994 suggested that in spite of the many policies aimed at self-sufficiency, it was ultimately unsustainable (Timmer, 2006).

In 1995, the government attempted to boost rice production by initiating the Mega Rice Project in Central Kalimantan in another attempt to achieve self-sufficiency in rice. This project, stipulated in Presidential Decree 82/1995, aimed to turn unproductive peatlands in Kalimantan (Borneo) into rice paddies to help prevent a food shortage. The project included clearing 1 million ha of peatlands, but this turned out to be disastrous when another El Nino and the Asian Financial Crisis struck Indonesia in 1997. The project failed to achieve its target rice stocks, and in fact yielded very low rice production (Goldstein, 2016) and the dried peatlands were prone to fire, making the environment more hazardous.

The Asian Financial Crisis eventually brought about the end of President Suharto's government. Trade policies were liberalized in line with an agreement with the International Monetary Fund (IMF)—cutting all tariffs on food imports to a maximum of 5 percent and eliminating import and export quotas. These changes were temporary, however. The government returned to restrictive trade policies for rice in the early 2000s, reintroducing a tariff on rice imports, which increased from IDR 430/kg in 2000 to IDR 450/kg in 2007.

C. Post-Soeharto (1998–present)

While the Soekarno era is remembered for its nationalist policies and emphasis on building up rice stocks, the Suharto era enforced the Green Revolution by improving production capabilities, allowing Indonesia to attain rice self-sufficiency in the 1980s. However, these policies were too expensive to be sustainable by the early 1990s. The Asian Financial Crisis changed both the economic and political landscape, which also transformed rice policy, liberalizing Indonesia's rice market until the mid-2000s, when price and trade restrictions were re-introduced with the intention of protecting domestic farmers.

Modern Indonesian trade policy uses concerning rice uses tariffs, quotas, and monopolized imports to try to control the market. A uniform tariff rate, which applies to all types of rice, was stipulated in MOF 6/2017 and has been as high as IDR450/kg. In fact, tariffs were re-introduced as early as 1999, when the post-Suharto government imposed a price floor for husked paddy field rice to encourage local farmers to plant and respond to decreasing international prices (Malian et al., 1999). The current government has also introduced import quotas and limited BULOG's import rights. These non-tariff trade barriers, stipulated in MOT 1/2018, are meant to protect domestic farmers from competition with imported rice. This regulation also allows private parties to import certain types of rice for industrial inputs. In 2018, the total import quota was set at 2 million tons.

In addition to controlling imports, the government is trying to maximize purchasing from local

farmers and has imposed a price floor (HPP – *Harga Pembelian Pemerintah*). These policies are intended to guarantee farmers' revenue, especially in harvest seasons, when prices tend to drop significantly (Bappenas, 2011) and thereby promote their welfare and encourage rice production. The price floor applies to rice in the categories: ready-to-mill rice paddy (GKG), stored rice paddy (GKS), harvested rice paddy (GKP), and unspecified paddy, with prices ranging from IDR4600/kg to IDR3700/kg. Rice prices are set from IDR7300/kg (farm gate) to IDR9000/kg (retail).

The government also imposes a price ceiling (*Harga Eceran Tertinggi*/HET) of IDR 9,450/kg to IDR 10,250/kg for medium rice in an attempt to ensure the availability of rice and the stability in its price. In practice, this regulation is often outpaced by changes in the market and is complicated by the government's import quota.

The government has also re-introduced seed and fertilizer subsidies. The seed subsidy program is stipulated in MOA 4/2016 and requires the government to provide top quality seeds for hybrid and non-hybrid paddies at affordable prices. Sayaka (2018) found that the subsidy may not be necessary for farmers since subsidized seeds not only tend to be delivered late but are still relatively expensive. In 2019, the Ministry of Agriculture allocated IDR 29.9 trillion, or almost 10 million tons of subsidized fertilizers to help farmers reduce their production costs. Susilowati (2016) argued that the fertilizer subsidy program was prone to illegal smuggling and misallocation, resulting in higher costs and fertilizer overuse.

The government also launched several land expansion projects as a way to increase production to reach self-sufficiency. Despite the lessons from the failed Mega Rice Project, the government has introduced two similar projects named Ketapang Food Estate and Merauke Integrated Food and Energy Estate (MIFEE). The Food Estate is an integrated project of the Masterplan for the Acceleration and Extension of Economic Development of Indonesia (MP3EI - *Masterplan Percepatan dan Perluasan Pembangunan Ekonomi Indonesia*) 2011–2025, as stipulated in President Regulation 32/2011. The project started at the end of 2012, after a six month postponement. Ketapang Food Estate aimed to increase rice production on targeted lands to 5 tons/ha, but after a year production remains at 2 ton/ha (Antaranews.com, 2013). The progress of this project has been slowed by land disputes and rejection by local citizens, who were not consulted about this project (Antaranews.com, 2019).

MIFEE faces similar challenges. This project was created through various regulations (including Law 27/2007, Presidential Regulations 40/1996, 26/2008, No.2/2008, 24/2010, and 10/2010, and Presidential Instruction 5/2008) and was launched on 12 February 2010 (Bina Desa, 2012) as a food production site that integrated farms, poultries, dairies, and fisheries. Thirty-six investors from various industries were involved and the project covered 1.2 million ha (Asian Human Rights Commission, 2011). This program has also been subject to land disputes with the indigenous population and a transparency dispute regarding a contractual agreement (antaranews.com, 2010, 2014; Asian Human Rights Commission, 2011).

D. Summary

Indonesia's rice policy has been production-focused since independence, as summarized in Table 1.

Table 1.
Summary of Policies Related to Rice in Indonesia (1945–2019)

Period	Key policies	Description
Sukarno Era (1945–1965)	Regulation on Stockpiling Action (Government Regulation PP 20/1948)	Limited the amount of food in storage or houses, requiring a new permit every three months for storing rice. Upgraded into Kasimo Plan.
	Kasimo Plan (Law 29/1948 on Food Stockpiling)	Food self-sufficiency through planting of foods crops in East-Sumatra, intensified seed planting in Java, forbidding the slaughter of animals deemed productive food sources, seed nurseries in every village, and the migration of 20 million people from Java to Sumatra. Failed due to political instability and poor coordination between levels of government.
	BPMD (Villagers Education Board) 1950	Institution that helps improve farmers' productivity. Scrapped due to lack of funding.
	Production Plan 1959 – 1961	*Establishment of PTD (Village Farmer Taskforce) and OPSSB (Rice Self-Sufficiency Executor Organization).* A group of experts and government officials that helped small plot farmers in designated sub-groups to improve their farming skills.
Suharto Era (1966-1998)	*Establishment of BP-BMPT (Food and Land Clearance Holding)*	Established Padi Sentra to improve accessibility of production resources such as seeds, fertilizers, and chemical goods. Also established Mekatani for conducting land clearance for new paddy fields. Failed due to lack of funding, logistical problems, mismanagement, and poor pricing strategy.
	Regional Incentive Scheme - Presidential Decree 2/1968	Incentivized regions to produce surplus rice (monetary incentive)
	Rumus Tani (Farmers Formula)	A part of Repelita I (Five Year Plan). The price of 1 kg of rice had to equal the price of 1 kg of fertilizer to ensure farmers would make profit.

	Presidential Decree 272/1967 on BULOG Establishment	Established the National Logistic Agency (BULOG) and made them the single purchasing agency and rice importer.
	Presidential Instructions 2/1973, 1/74	Regarding purchasing local rice stocks from 1973–1975.
	Presidential Instruction 4/1973 (Badan Usaha Unit Desa, later Koperasi Usaha Desa)	Supported farmers' livelihoods by providing credit and assistance with harvesting and distribution.
	Presidential Instruction 17/1974 (Pricing regulation for unhusked mill rice)	Regulated prices in an attempt to ensure food self-sufficiency.
	KUD involvement in distributing fertilizers during 1988 – 1992	Intended to reduce government spending on the self-sufficiency agenda, the government involved KUD to help distribution of subsidized fertilizers.
	Imports by BULOG 1993-1994	BULOG conducted imports in response to a rice deficit and volatile rice prices.
	Presidential Decree 272/1967 on BULOG Establishment	Established the National Logistic Agency (BULOG) and made them the single purchasing agency and rice importer.
	Presidential Decree 82/1995-Mega Rice Project)	Intended to turn unproductive rice paddies in Borneo into crops to prevent food shortage. But failed due to lack feasibility studies and natural disaster.
	IMF Agreement on Market Liberalization	Cut all tariffs on food imports to a maximum 5%, eliminated import quotas. Some special treatment remained for rice. Almost 6 million tons of rice imported.
Present (1998–)	*Tariff Implementation* (MOF 6/2017)	Uniform tariff rate for all types of rice, up to IDR450/kg.
	HET and HPP	HPP (price floor) and HET (price ceiling) intended to ensure profit and incentivize higher rice production.
	MOT Regulation 1/2018	Import license is only given to BULOG, with private parties able to import if the rice is used as an industrial input. This is motivated as a way to protect local farmers
	Seed and Fertilizer Subsidy (MOA 4/2016, MOA 47/2017)	Government-provided top-quality seeds at a subsidized price to targeted villages to encourage rice production. MOA allocated 10 million tons of subsidized fertilizer to reduce production costs.
	Ketapang Food Estate	Land expansion projects to extend land use for food security. Productivity is still below target.
	MIFEE	Land expansion projects to extend land use for food security. Ongoing despite numerous conflicts with indigenous people.

Early in the country's history, imported rice was not seen as a viable option for a financially struggling young nation and the government instead pursued a comprehensive plan to increase domestic rice production. Soekarno's economic policies were heavily influenced by anti-colonial sentiment, and so focused on pursuing self-sufficiency (Supriyono, 2014).

Under Suharto, rice became not only a primary food source in Indonesia but also a tool to gain political power. Suharto's obsession with rice policy stemmed from his belief that rice was the key to secure his position as president. Empowered by high oil revenues, his government spent a great deal on programs that were in fact successful at achieving self-sufficiency in rice in 1984 and boosted farmers' welfare through increasing their income. Self-sufficiency lasted only a couple of years, and in the remaining decades of Suharto's leadership, the rice sector struggled, failing to retain self-sufficiency and marred by a failed land expansion project.

After Suharto stepped down, a new era called *Reformasi* (Reformation Era) began. The Indonesian government had to apply full liberalization in many agricultural sectors as a part of an IMF Loan Agreement to address the country's worsening financial situation, but liberalization was short-lived. In the last two decades, following the financial crisis, Indonesia's government has reverted to protectionism, mostly through introducing non-tariff barriers.

Throughout the country's history, rice policy has focused on promoting productivity in the domestic market with the expectation that this will improve farmers' welfare. However, these policies have never addressed the fact that domestic rice prices are consistently higher than international prices (as shown in Figure 4). Despite more affordable rice in the international market, Indonesian policy has failed to produce more affordable rice, affecting poorer Indonesians in particular. It is therefore important to deepen our analysis to understand the motive behind these decisions.

“Rice policy has focused on promoting productivity in the domestic market with the expectation that this will improve farmers' welfare. However, these policies have never addressed the fact that domestic rice prices are consistently higher than international prices.”

POLITICS AND ECONOMICS OF RICE POLICY IN INDONESIA

Because it is an important staple food for almost all Indonesians, government policies on rice are always contentious and involve many political and economic considerations (Timmer, 1975). The government's emphasis on supporting domestic rice production has resulted in numerous barriers to accessing international rice, which is cheaper even after accounting for subsidies and price ceilings in Indonesia. The government has a bigger incentive to protect stakeholders in the rice sector than to provide access to more affordable rice from international market. It is therefore essential to analyze the factors that have contributed to the creation of policies in rice sector and how these will eventually affect policy reform in Indonesia.

Politics inevitably influence the policy-making process. Public policy is not necessarily formulated and implemented on a rational basis, but is a result of political power, cultural values, competing priorities, and the facts of the matter that were considered during the policy-making process (MacLennan, 1980). A government may establish popular-but-poor policy instead of more credible evidence-based or even technocratic policy in order to maintain their power.

Food policy has always been influenced by political interests. A study in Bangladesh found that policies in food sector are influenced by interest groups including agricultural/rural and industrial/urban groups (Islam, 2014). Furthermore, the political intervention is not limited to how it influences the creation of policy or the policy context, but can also influence how policy is implemented. Chemutai (2016) found that political will was a crucial determinant of policy implementation in the Ugandan food sector.

Studies in the Philippines and Thailand found that the effect of rice policies on rural voters (many of whom are rice farmers) make politicians see rice policy as a way to patronize these voters (Fang, 2016). In Thailand, rice policies were often designed particular rice stakeholders—the rice millers (Ricks, 2017). In Indonesia, as the main food staple and a sector that employs many people, rice continues to be a strategic essential commodity. The rice sector is always mentioned in political campaigns.

In the 2004 Presidential election, self-sufficiency in rice was promoted as a policy goal by all candidates. The election was won by Susilo Bambang Yudhoyono, whose food policy focused on revitalizing agriculture production, specifically through fertilizer and seed subsidies (Lassa, 2005). In 2009 one candidate, Megawati, campaigned on self-sufficient rice production by strongly opposing rice and food imports.

In 2014, Joko Widodo (Jokowi) won the election after campaigning on several food-related policies, mostly regarding the rice industry, which were combined with his broader campaign theme of infrastructure development—including his ambition to make Indonesia self-sufficient in rice by the end of 2017. This ambition was not realized and on the contrary rice imports were high in 2018, when as much as 2 million tons was imported to maintain stable prices. Things were much the same in the 2019 Election. Jokowi announced his intention to accelerate rice distribution (Kompas, 2018) prior to announcing his candidacy in the election. His opponent,

Prabowo, appeared more protectionist, proposing self-sufficiency and opposing all imports, especially of food commodities. A similar pattern could be seen in regional elections—both Jakarta's provincial election in 2017 and West Java's provincial elections in 2018 featured many policy proposals regarding the rice sector, specifically establishing rice funds to help citizens to purchase rice in Jakarta (Merdeka.com, 2016). Candidates also campaigned on building wholesale rice markets and supporting agriculture through regional fertilizer and seed subsidies (Kompas.com, 2018; Detik.com, 2018).

Previous studies have observed this tendency in Indonesian political campaigns. Davidson (2018a) studied how Indonesian political candidates often consider rice imports to be the one issue that matters most in election years by observing rice import volume in Indonesia and the Philippines through election cycles. He found that the government of Indonesia tends to decrease imports in the run-up to an election, likely in reaction to Indonesia's cultural values, which might be seen as a way for them to be perceived as "pro-people/society" and economically nationalist. Simply put, Indonesian political candidates see populism as good electoral strategy, and supporting domestic farmers is a populist policy.

"The government of Indonesia tends to decrease imports in the run-up to an election, likely in reaction to Indonesia's cultural values, which might be seen as a way for them to be perceived as "pro-people/society" and economically nationalist."

In another study, Davidson (2018b) studied the popularity of rice self-sufficiency in Indonesian society. He pointed out that agrarian economic populism is a part of the country's ideology that was cultivated through growing agrarian radicalism in Java during the Soekarno era and boosted by the Green Revolution policies of the Suharto era. Aspinall (2015) found that politicians running in rural areas were more likely to campaign on economic populism and nationalism in rice. Strengthening the role and scope of the state is also an underlying motive that is implicit in food sovereignty in Indonesia, as explained by Neilson (2018).

Indonesia's previous experience in dealing with financial crisis may also affect the rice policy-making process. The fallout of the 1997–1998 Asian Financial Crisis substantially reduced the Indonesian government's ability to set the price of rice, and farmers face increasing prices for vital inputs (FAO, 1998). Because Indonesians struggled to buy rice during the financial crisis while farmers faced rising production costs, it was harder for the government to set its policy goals. This eventually resulted in a supply gap and policies that temporarily allowed private companies to import outside the BULOG monopoly for industrial purposes, while BULOG also imported rice to lower its price (Irawan, 2008). The IMF bailout loan package in the late 1990s, worth USD 43 billion, also came with the requirements for liberalization discussed in the previous section.

Indonesia's Ministry of Trade responded to rising international food prices by lowering the rice tariff from IDR550/kg (MOF No.93/PMK.011/2007, in September) to IDR450/kg (MOF No.180/PMK.011/2007, in December), a measure undertaken by 43 other countries (mostly rice importing countries) to counter high rice prices (Demeke et al., 2009). By lowering the tariff, BULOG was able to distribute imported rice at a more reasonable and stable retail price. BULOG's monopoly on rice imports likely raised the cost rice importation. Furthermore, rice exports were to be allowed only if the availability of rice was considered adequate and price stability and emergency rice stocks (as much as 148,000 tons) could be maintained and fuel price increases could be delayed

until main harvest season (Saifullah, 2010). These policies were reversed back in the following years, resulting in today's policy environment.

Political considerations and external financial shocks inevitably influenced how the Indonesian government designed its rice policies. Political considerations suggest protectionist promises in every election, while financial shocks apparently make short-term policy reforms possible but do not have long-term impact on policy. Yearly elections may make the pressure toward populism and protectionism too strong to overcome. Even though the government is aware that its policies have nearly doubled the domestic price of rice compared to the international price, rice's status as a 'sacred' commodity make efforts to reform rice policy incredibly difficult. Further study has shown that enacted rice policy has been biased in favor of the government's interest rather of rice producers, consumers, or other interest groups (Nuryanti et al., 2017).

WORKING WITH OTHER COUNTRIES: A POSSIBLE AVENUE

The previous section highlighted that the policy-making process in the rice sector is subject both to political forces and external shocks. While the latter may have helped to open the rice sector to international trade and potentially reduce rice prices, more frequent political elections has the dominant influence on this progress. This makes policy reform hard to accomplish.

One alternative to domestic policy reform in the rice sector is to use international agreements to help shape policy. Indonesia signed ASEAN Free Trade Agreement (AFTA) in 1992 and joined the WTO in 1995. The AFTA grew into agreements with countries beyond ASEAN—China (ACFTA), Japan (AJCEP), South Korea (AKFTA), Australia and New Zealand (AANZFTA), and India (AIFTA)—originally intended to be consolidated into a single Regional Comprehensive Economic Partnership (RCEP), but negotiations are ongoing. These agreements have forced the Indonesian government to lower trade barriers.

“One alternative to domestic policy reform in the rice sector is to use international agreements to help shape policy.”

While RCEP involves many countries, it is important to note that not all of them consider the rice sector their main concern in the international trade agreement. Discussion and regulation in rice sectors only happened in AFTA through the Common Effective Preferential Tariff (CEPT) scheme, which granted exemptions to tariff reductions for sensitive agricultural products such as rice. The AFTA evolved further into ASEAN Economic Community (AEC), established in 2015. The objective of AEC is to make ASEAN into a single market and production base, enabling the free flow of goods, services, investment, and skilled workers between ASEAN members (ASEAN, 2012). The AEC also hopes to boost trade between member countries since it allows the reduction or removal of existing trade barriers on many commodities. The goal of AEC is to strengthen each member's economic and political scope through a dynamic plan to maintain relevance in the global economy. The AEC Blueprint 2025 aims to guide the next phase of regional integration.

AEC has a major focus on the agricultural sector, pursuing enhanced connectivity and sectoral cooperation in Food, Agriculture, and Forestry (FAF) by 2025 (AEC Blueprint 2025, 2015). While the initiative was emphasized in the Blueprint, it is important to acknowledge the previous efforts by ASEAN State members to build such framework of agricultural cooperation through the establishment of ASEAN Integrated Food Security (AIFS). The AIFS was established in response to the 2008 rice crisis and it is intended to address long-term food security in ASEAN (AIFS Framework, 2009) by promoting a favorable food market and trade between the nations, also intended to strengthen shortage relief. This was further extended to action programs such as the establishment of ASEAN Plus Three Emergency Rice Reserve (APTERR) and full compliance and implementation of the ASEAN Trade in Goods Agreement (ATIGA).

APTERR seeks to strengthen rice production and prevent post-harvest loss on rice commodity. Ewing-Chow and Slade (2016) describe how APTERR may become a solution to the problem of poor ASEAN rice security. This agreement was signed in 2011 by ASEAN and China, Japan, and Korea, and gives each member a responsibility for taking part in establishing a rice reserve to prevent future rice crises such as the one that occurred in 2008 or to provide disaster aid. A

country that needed to access the reserve would make a request to the APTERR Secretariat, which would recommend an appropriate trading partner and price based on a pre-agreed formula rather than current market price. Ewing-Chow and Slade (2016) argue that this arrangement may be a solution only in emergency situations, and not for ongoing high prices such as those in Indonesia.

The ASEAN Trade in Goods Agreement (ATIGA) is a first step toward the AEC through connecting different stages of economic development between ASEAN Member states and addressing development gaps by facilitating technical and development co-operation, so that all member states are ready to face AEC (ASEAN, 2009). This agreement, which started in 2007, lists rice and sugar as highly sensitive commodities. This means that they are given special treatment that allows postponement of tariff adjustment as mandated in ATIGA. In terms of rice commodity, The Indonesian government has classified it as a commodity that should be exempted from tariff concessions. The ATIGA mandates all ASEAN State members to reduce trade barriers partially, including in rice commodity, up until 2015. Until 2015, Indonesia was still allowed to put a 25% tariff on rice. But with the AEC in 2015 all tariffs had to be reduced to a maximum of 5%. Still, however, the 2015 AEC blueprint allowed for the implementation of this rule to be postponed for years to come through a waiver scheme, in which countries that want to delay the implementation must get permission from other member countries and also from exporting countries.

"Revisions on Food Law that, to some extent, contradicted with AEC is not on the Priority List for Legislation *(Prolegnas)*."

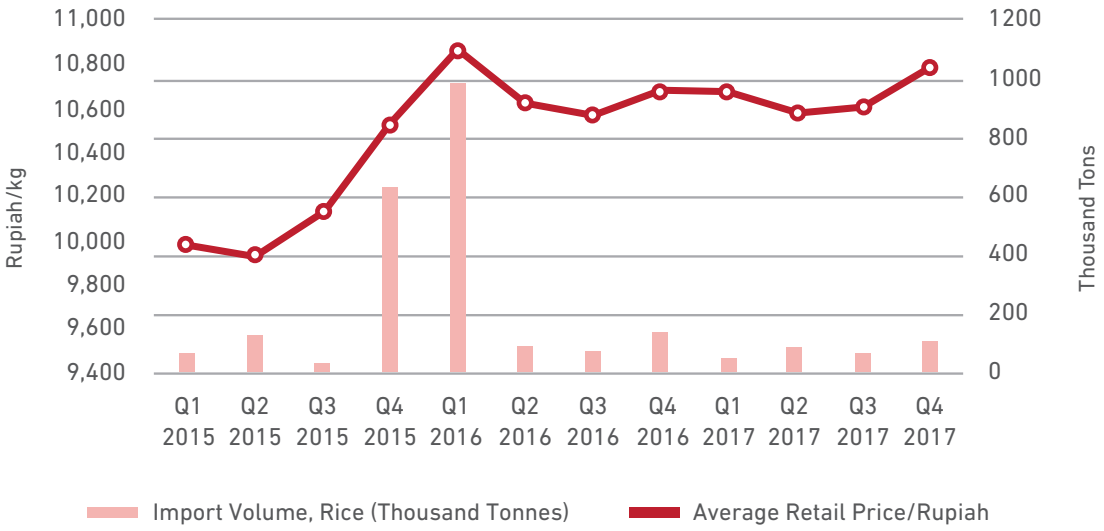
Further reviews in terms of Indonesia's deeper participation in rice trade was seen as less important (according to Interview with ES, Legislative Member, 2018). Revisions on Food Law that, to some extent, contradicted with AEC is not on the Priority List for Legislation *(Prolegnas)*.[5] Indonesia must still face a slow adjustment toward eventually removing rice from the list of sensitive commodities. Another reason that Indonesia is reluctant to remove rice from the list is its high production costs, which make it difficult for Indonesian producers to compete globally (interview with TA, Government Official, 2018).

As of 2018, rice imports were still subject to an applied tariff of as much as IDR 450, equal to a 5% tariff. Other regulations related to rice are mostly aimed at responding to local price instability through price ceilings and floors, import permissions, and imports by BULOG. Figure 5 illustrates rice market trends after the establishment of AEC.

"Other regulations related to rice are mostly aimed at responding to local price instability through price ceilings and floors, import permissions, and imports by BULOG. Figure 5 illustrates rice market trends after the establishment of AEC."

[5] Prolegnas is an instrument that helps plan legislation in Indonesia. It is systematically constricted for a certain period that covers topics that is seen as something important to be intervened by the legislative or executive powers. The topics is also based on a proposal made by party fraction, commissions, a legislative member, and/or public

Figure 5.
Price Comparisons and Trade Volume for Rice, Quarterly 2015-2017



Sources: Statistics Indonesia through CEIC (2016) for Average Daily Retail Price, Statistics Indonesia (2018) for Import Volume

As Figure 5 shows, imports have been in response to rising prices and not necessarily because of the AEC. We can only find one regulation that has been adjusted to conform to ASEAN, namely MOF 6/2017, which regulates import tariff adjustments with respect to changes in ASEAN Harmonized Tariff Nomenclature. However, we have not seen substantial change in trade activities in rice.

International agreements, and especially the AEC have not made a significant contribution to policy reform in Indonesia. While a rice reserve may provide a better platform for accessing the international rice market, its use is limited by its intended purpose as an emergency reserve. Further, the ATIGA allows member countries to postpone changes to tariff rates or designate rice for special treatment as a sensitive commodity. Understanding the perspectives of the ASEAN states who helped design these agreements is essential to understanding ASEAN members' perspectives on rice trade policy how AEC may lead to more substantial reform of Indonesian rice policy.

"International agreements, and especially the AEC have not made a significant contribution to policy reform in Indonesia. While a rice reserve may provide a better platform for accessing the international rice market, its use is limited by its intended purpose as an emergency reserve."

The AEC Blueprint 2007 envisioned a region with free movement of goods. Previous efforts to achieve this vision have been made, including the first ASEAN Free Trade Agreement (AFTA), which also faced challenges as each member tried to maintain policies seen as supporting the national interest of each country over the broader regional commitment. These barriers can be linked into the implementation of CEPT, which provided a mechanism for gradually reducing trade barriers between ASEAN member states within a certain time frame. CEPT was replaced by the ATIGA.

Despite progressive trade liberalization, these frameworks have also created an ever-expanding exclusion system that takes sensitive commodities off the table through the Temporary Exclusion List, the Sensitive and Highly Sensitive

List (on which Indonesia has placed rice), and the General Exclusion List. These mechanisms allow ASEAN member states to waive on their obligation to eliminate tariffs and non-tariffs barriers—primarily rice and sugar (ADB, 2014). This loophole, along with a lack of authority and commitment from ASEAN members, delayed implementation of AEC from 1 January 2015 to 31 December 2015 (Nipawan, 2015).

Following AEC implementation, intra-regional tariffs have decreased but non-tariff protectionist measures for rice have increased in number, from 94 in 2000 to 400 in 2018 (OECD, 2018). Without diminishing the progress made toward market integration in ASEAN, including the establishment of the AEC, we can conclude that the AEC is unlikely to realize the dream of free movement of goods in the near future. The ASEAN group recognizes that it is often "trapped" by their own principle of the "ASEAN Way," defined as "flexible consensus" and "soft regionalism" that trace their roots back to respect for national sovereignty, non-interference, and non-interference of domestic affairs (Acharya, 1997).

While AEC is still slowly progressing to be able to achieve the goal, it worth investigating whether other ASEAN countries are working individually toward market integration in the rice sector. In the next section, this report examines four countries, two of which are rice exporters (Thailand and Vietnam) and the other two are from the rice importing countries (the Philippines and Malaysia).

A. APTERR Utilization

APTERR aims to strengthen food security, poverty alleviation, and malnourishment eradication without distorting normal trade in the global market. In its implementation in the ASEAN region, APTERR has been mostly limited in its capacity to provide rice aid when disaster occurs, even though the reserve is supplied by some of the world's biggest rice producers (Desker et al., 2013). There is only capacity to store 787,000 tons in the reserve, which can only supply ASEAN member states consumption levels for a day and a half (Ma and Montesclaros, 2015). Furthermore, some ASEAN countries revealed their weak interest in using or strengthening the APTERR reserves for further food security. For instance, in 2012, when Thailand's rice exports dropped dramatically due to internal policies, including a planned rice cartel that would have contradicted the APTERR agreement (Yoshimatsu, 2016). The already-established APTERR mechanism is not seen as a strategic platform—its core function as an emergency reserve has already been undermined.

B. Tariff Policies

ATIGA is meant to facilitate gradual tariff reduction gradually in ASEAN countries, but has been influencing member countries differently. As rice exporter countries, Thailand and Vietnam imposed no import tariffs, unlike rice importers such as Indonesia. Malaysia applied 20% import fees under CEPT, compared to 5% by Indonesia. The Philippines, which had recently implemented a Rice Tariffication Law that replaced all quantitative restrictions with tariffs, imposes tariffs ranging from 35-180% on rice (USDA, 2019). ASEAN countries will be uniformly affected with a 35% tariff, but these policies are in response to rising food inflation in the Philippines and rates have been adjusted through an agreement between the Philippines and its trading partners. The law further led to the creation of "Rice Competitiveness Enhancement Fund", which aims to increase Filipino farmers' welfare through several programs that are mostly aimed at reducing production costs.

In spite of these challenges, some rice importing countries in ASEAN still applied rice tariffs that fell in the agreed upon range. This may be a good sign, since ATIGA was meant to gradually reduce barriers to rice trade between ASEAN countries, and after all has not been fully implemented.

C. Parastatal Roles in Rice Trading

Parastatals are companies or agencies that have a political interest and the authority to serve the state indirectly. The practice of establishment of these institutions for rice trade activities in ASEAN countries is common. The Public Warehouse Organization of Thailand (PWO) performs market interventions and routinely conducts rice trading (domestically and internationally) and was not established to compete with the private sector. Interventions conducted by PWO vary from temporary sales to price stabilization policy, acting as an importing agency, and exporting rice government-to-government and through directly negotiated contracts. This is similar to Vietnam's VINAFOOD. The capacity of VINAFOOD was expanded by its dedicated rice processing factory with its capacity to secure one-year worth of supply. VINAFOOD participates in government interventions to attempt to control the price of rice (Nguyen et al., 2017). Also in Vietnam is the Vietnam Food Association (VFA). While VINAFOOD, as stipulated in Decision 609/QD-TTg and 339/QD-TTg, conducts domestic food trading to stabilize prices, VFA serves more as a guide to administer the import and export of rice and other food as stipulated in Ministry of Home Affairs Regulations of VFA Dated 3/10/2006. Both countries' rice sector parastatals play a similar role to Indonesia's BULOG, but Indonesia does not administer imports and exports as directly as the VFA does.

As in Indonesia, other rice importing countries such as Malaysia and the Philippines have parastatals. Malaysia's BERNAS attempts to support national food security through stabilizing rice prices, ensuring sufficient rice supply, and supporting the sustainability of domestic rice production, and, like BULOG, has a monopoly on conducting imports. Although BERNAS was privatized in 1996, it has consistently followed government instruction ever since, including the instruction to impose a minimum rice price of USD 246.42 per ton and a range of ceiling prices, participating in rice manufacturing, acting as an import monopoly, licensing paddy and rice traders, and administering farmer subsidies (Ismail and Ngadiman, 2017). BERNAS's import monopoly was revoked in 2018 and the Malaysian government decided to open participation in reaching the 30% import quota to private players (New Straits Times, 2018). In contrast, BULOG maintains its import monopoly.

The Philippines has an institution that works like a parastatal, the National Food Authority (NFA). Both BULOG and NFA work on a command-and-control approach, rather than market-based approach (Department of Agriculture of the Philippines, 2018). This means that any import decisions and also purchasing and selling activities are subject to instruction by government ministries. Unlike BULOG, the NFA has the sole right to determine quotas for its own and for private sector imports because, unlike Indonesia, the Philippines does not limit imports to the parastatals.

Parastatals have been influential in the ASEAN rice markets. Since there are little to no regulation regarding the involvement of these institutions in the AEC, it is easy to see that these institutions have carried the political agenda set by the AEC Blueprint. Although they seem like a problem, parastatals can play an important role in agricultural sector where they help regulate the

activities of other stakeholders in the industry, as was the case in the Ghana's cocoa market (Quartey, 2013).

D. Production Support

Every ASEAN member state has its own policy framework to boost domestic rice production and address its internal situation, but there is a pattern among rice exporting countries. The Vietnamese government established a "Rice Land Preservation" policy,[6] which attempts to improve land management for paddy farming in order to increase farmer incomes, maintain land for rice production, and increase rice exports. Giesecke et al. (2013) estimate that around 40% of agricultural land is strictly designated for paddy rice cultivation. Likewise, the Thai government has established special zones for rice production in order to match the production level with the current demand by scrapping land areas that are classified as "unsuitable for rice crop" but are planted with paddies. To induce rice farmers to plant other crops, the government has created an incentive system in the form of equipment support and branding development (Pongsrihalduchai, 2012). Lands classified "suitable for rice crop" will undergo production efficiency improvements such as scheduled plantation changes or not planting in the dry season.

The Vietnamese government established the Rice Market Development Strategy 2017-2020 Guidebook in order to execute the production policy shift from medium to premium rice production in order to improve the welfare of farmers, who have been unable to increase their incomes through improved productivity in low value crops, which have small profit margins. Highly competitive international trade has reduced the bargaining power of Vietnamese exporters and complying with the rules and regulations of destination market is costly (Sothy et al., 2017). Through this guidebook, the Vietnamese government aims to gradually reduce the volume of rice exports while increasing their value—while Vietnam's annual rice export volume is expected to reach around 5 million tons by 2020 with a value of USD 2.3 billion per year, they aim to reduce export volume to around 4 million tons and increase its value to USD 2.5 billion yearly over the next ten years. To achieve this, the Vietnamese government plans to restructure rice exports so that fragrant and other premium rice account for 40% of all rice exports, followed by glutinous and white rice exports at 25% each. The other 10% will be allocated to high quality, high-value organic and nutritious rice and rice products (Vietnamnet, 2017). If successful, this will intensify competition with Thailand, which is the country known for exporting premium rice.

The Thai government intervened in paddy rice prices by encouraging farmers to stockpile through "On-Farm Paddy Pledging" a government provided low-interest, six-month loan to postpone

[6] Decree 42/2012

selling their crop. Although the program was first applied to fragrant and glutinous rice, it has been extended to white rice in 2016/2017 (USDA, 2017). To lower production costs, the government aims to further improve crop quality by transferring technology and certification with good agricultural practices (GAPs) to rice farmers (Pongsrihadulchai, 2018). While the Vietnamese government does not have similar policies, the Indonesian government uses BULOG's purchasing and selling capacity to accomplish similar policy goals.

Other rice importing countries have implemented programs similar to Indonesia's domestic policies. Malaysia imposed input and output subsidies to lower farmers' production costs. Output subsidies took the form of the government purchasing farmer's crops at a reference price, while input subsidies covered inputs such as fertilizer or machinery subsidies of as much as MYR 25/100 kg stored in a drying facility. Malaysia also distributes coupons for as much as MYR 200/ha for purchasing pest control (Harun, 2015). In the Philippines, the government implemented a subsidy for good quality seeds to regions meeting its requirement (for instance, irrigated and rain-fed lowlands with yields below 3.8 tons/ha), distributed 7,000 post-harvest and 90,000 on-farm machinery units and provided technical assistance to farmers in cooperation with the private sector under the Special Area for Agriculture Development (SAAD) program.

We found no similar programs to Indonesia's food estate projects. Other ASEAN countries focused on supporting farmers through subsidies to lower production costs, land management, and buffer stocks.

E. Challenges to Rice Market Integration

An examination of the policies of key ASEAN member states does not suggest that there is a real effort to achieve rice market integration. APTERR is not being used to pursue lower rice prices, and ATIGA applications have not been optimized. The regulations meant to gradually reduce tariffs in ASEAN member states were not implemented by all countries, and the actions of parastatals highlight the political influence at play in rice ASEAN rice markets. Several ASEAN member states have implemented policies aimed at achieving self-sufficiency, rather than integrated trade that would allow farmers to access cheaper inputs. The main ASEAN rice exporting countries are attempting to improve their competitiveness by shifting to the premium rice market, rather than allowing cheaper products to benefit importing member states. The table following this section summarizes the policies explained on this chapter.

Vietnam faces decreasing soil fertility due to unsustainable practices using chemical fertilizers to improve yields. Although the policies encouraging these practices boosted the productivity of paddy fields and initially gave the country an advantage in the production of low-to-medium quality rice, farmers' welfare has been stagnant in recent years, which suggests that old policies may no longer be relevant. The Vietnamese government is planning to shift the type of rice produced to a higher quality to be able to compete with Thailand in order to improve farmers' welfare. By producing higher quality rice output, the Vietnamese government expects improvements in local farmer's welfare. In order to support the action, the Vietnamese government will substitute locally produced low-medium quality rice for imports from Cambodia. Meanwhile, Thailand faces its own challenges, including growing competition in the international market and internal problems such as land use diversion— the economy is industrializing rapidly, reducing the area available for farm land. The government has responded with interventions in rice prices and farm assistance designed to maintain competitiveness by lowering production costs and maintaining production.

The effort to shift rice production to a higher quality type by Vietnam could improve its price competitiveness in the international market. Other smaller rice producer countries such as Cambodia and Myanmar may benefit from this shift and importing countries may benefit if it pushes the price down. However, Indonesia and other importing countries seem uninterested

in taking advantage of the international market to access more affordable rice. Malaysia, which is 70% rice self-sufficient, is trying to be fully self-sufficient in 2020 through its National Agro-Food Document and continues to apply numerous protectionist trade policies for its rice sector including an import quota, tariffs, and price interventions.

The Philippines, although it has recently shown interest in importing rice and has loosened its rice trade protections, applies a tariff on rice ranging from 35% to 50%. Although it is unlikely to limit factors that motivate the protectionist policies that are being implemented in both the Philippines and Malaysia, these countries share the experience of the World Rice Crisis in 2008. The Philippines experienced a rapid increase in wholesale and retail prices that somehow did not benefit local farmers and instead resulted in higher prices after the crisis (Balisacan et al., 2010). Similarly, although Malaysia had a slightly better experience than the Philippines, as a rice importer, Malaysia responded to the volatile market conditions by increasing Bernas reserve stocks from two weeks (92,000 tons) to three months (550,000 tons) (Slayton, 2009) by sending delegates to Thailand who managed to buy only 200,000 tons. In response to the crisis, importing countries such as the Philippines and Malaysia aim to be less dependent on the international market.

Indonesia has historically been a pro-farmer and nationalist country, sees the sovereignty and welfare of the domestic rice sector as a symbol of country's independence (Davidson, 2018). The urgency with which political candidates call for self-sufficiency in rice remains in every election. This is further strengthened as members of parliament seem not to have embraced the idea of using the AEC to address rice market stability (Interview with Parliament Speaker, 2018). In response to the World Rice Crisis in 2008, Indonesia managed to relatively isolate itself from international rice market volatility, but rice prices have increased after the crisis, and so the country's position is in line with the other importing countries.

Comparison of Rice Policies Between ASEAN Countries

Policy Type	Indonesia	Vietnam	Thailand	The Philippines	Malaysia
National Grand Strategy		**Rice Market Development Strategy 2017 - 2020**. A guide book that aims to reduce rice export volume while increasing the value of exported rice.	**Revising national rice production** from 33 million tons to 27 million tons of paddy rice in 2017.	Duterte's propaganda of self-sufficiency.	**National Agro-Food Policy 2011-2020** aims for Malaysia to be more self-sufficient in food, raising product value, reinforcing supply chains, and increasing technical capacity.
		Agricultural Restructuring Towards Raising Added Values and Sustainable Development Program that; 1) Increase agricultural GDP, 2) Improve rural living standards, 3) Ensure food and nutrition security, 4) reduce greenhouse gas emissions and increase forest coverage to 45% by 2020.		**Food Staples Sufficiency Program (FSSP)** identifies; 1) sustaining R&D in new varieties and crop management, 2) pushing greater production, 3) management of food staples consumption.	
National Parastatal	**BULOG.** Regulates import quotas and the timing of imports.	**Vinafood 1 & Vinafood 2** ensures food security, manages logistical issues, and coordinates food companies at province and city levels.	[not specified]	**National Food Authority (NFA)** conducts imports and regulates import quotas for public and private importers.	**BERNAS** conducts procurement and transformation of local paddy, imported rice, warehouses, distribution, and marketing. Also involved in implementing price floors and ceilings, rice manufacturing, has an import monopoly, and manages subsidies for farmers.
		Vietnam Food Association (VFA) conducts procurement for rice and other food commodities export and import.			

Crops Specification		**System of Rice Intensification (SRI).** Encourages farm workers to plant seeds at certain intervals complemented with water management and use of organic fertilizer.	Incentive system to induce rice farmers to plant other crops.		
		Shift of production to high-value crops.			
Land Affairs		**Decree 35/2015.** The government covers 50-70% harvest loss from disasters, 70% of the cost of establishing new rice fields, and 100% of the cost of rice seeds.	**Rice Famer Assistance Measure Program** which; 1) finances farmers who are affected by drought, 2) grants suspended debt for two years at the same interest rate, 3) partial compensation of harvest losses, 4) handles partial cost of harvest and post-harvest.	FSSP credit system and crop insurance.	**SUBUR Program** which acts like food voucher that give discount for specific type of rice for the poor.
		2012 Cooperative Law. Farm workers union recognized as companies get easiness to acquire credit from the banks.	Loan provision to farmer institutions and agricultural cooperatives.	**Rice Competitiveness Enhancement Fund** aims to increase farmers' welfare by reducing production costs.	Subsidy of production cost to buy qualified fertilizer and chemicals.
			Credit loans to promote green and sustainable farming.		

Productivity Improvement	**Ketapang Food Estate and Merauke Integrated Food and Energy Estate (MIFEE).** A program that integrates farms, poultries, dairies, and fisheries through the establishment of new farming plots.		Transfers of technology to rice famers along with certification of good agricultural practices (GAPs).	**Special Area for Agriculture Development (SAAD)** improves productivity in agriculture based on local potential by providing technical assistance to farmers and by cooperating with the private sector.	Improvement of irrigation infrastructure, newly improved seeds, implementation of agriculture technology, and integration of paddy fields.
	MOA Regulation 4/2016 stipulates that the government provides top quality seeds and fertilizers.				
	MOA Regulation 47/2017 stipulates that the government provide seeds to farmers in selected villages to create more rice outputs.			Seed subsidy program.	Machinery subsidy of as much as MYR 25/100kg of paddy rice for rice farmers.
Rice Stockpiling			**On-Farm Paddy Pledging Program.** The government offered low-interest, six-month loan to hold their sales.		Rice storage zoning system.
			The government holds 100,000 tons of rice that will be released if a shortage occurs in the domestic market. [not specified]		

Import Regulation	Free trade barriers - tariff and non-tariff measures. Procured by BULOG.	Import quota from Lao PDR has been abolished.	[not specified]	Import quota is regulated by NFA and is enabled for private enterprises. **Republic Act No 11203** introduces a new tariff policy for rice and replaces the quantitative restriction on import.	Import tariff on food of 20 - 40%.
Export Regulation	[not specified]	Sets of minimum export rice Exported rice procured by VFA Establishment of **Rice Export Management Working Group**, an inter-ministerial management deals with rice export management.	[not specified]		
Marketing strategy	Price floors ceilings.		Promotes value-added products for Thai rice farmers through packaging equipment and branding development training.		

JOINTLY ADDRESSING THE PROBLEM: IS AEC UP TO THE TASK?

Based on the observations in the previous sections, it is clear that the already-thin international rice market seems unlikely to change in the years to come. The main exporting countries in Southeast Asia will move improve their competitiveness in the premium rice market while the importing countries are determined to become more self-sufficient. It seems that ASEAN countries are internally constrained from implementing the established AEC frameworks. An alternative must be found to push for further integration of the rice market in ASEAN.

A. Redefining the Problem

According to the United States Department of Agriculture (USDA, 2019), Thailand and Vietnam, as dominant rice exporter countries, exported around 17.3 million tons in 2018. Importing countries in Southeast Asia rely on Thai and Vietnamese rice, which offer a competitive price with support from multilateral trade agreements. While international rice markets are known to be thin (around 8-10% of all rice produced worldwide), the Vietnamese government plans to shift production from milled and broken rice to start competing with Thailand in aromatic (higher quality) rice, which may have decreased the supply of milled and broken rice. This might cause deeper concern in the rice market as it represents around 54.3% of all internationally traded rice (USDA, 2017).

Importing countries tend to conduct imports based on the condition of the domestic crop. In the case of Indonesia, import decisions were made by considering production estimates and the stocks available in BULOG's storage. In practice, the import decision was made due to high rice price. As Indonesia historically has historically had questionable rice production datasets, the most recent and improved datasets are yet to be examined. Considering these datasets when deciding whether to import rice may put Indonesia's rice sector into a vulnerable position. Furthermore, Indonesia and other importing countries still apply numerous trade barriers that are designed and likely to distort rice prices.

In response to the World Rice Crisis and also to Thailand's failed attempt to control rice prices in 2011-2014, exporting countries also tend to conduct exports based on the condition of their internal markets. For instance, growing domestic fuel costs in 2008 motivated India and Vietnam to ban the export of rice and created further chaos in the world market. Furthermore, Thailand's attempts to control rice prices by stockpiling rice to sell at a higher price failed because other exporting countries suddenly eliminated their export bans, pushing rice prices further down. These unpredictable decisions created further volatility in the rice market.

Indonesia's rice market is maintaining stable-but-high prices. Politically, Indonesian elites are against rice trade liberalization that may push the price down, but their motivation to control domestic prices was based on datasets that are still problematic. This makes Indonesia's decision about whether or not to import difficult. Furthermore, the international market is not in good shape to support existing policies in Indonesia due to its thin-volatile characteristics and the potential for adjustment to a production shift by large exporters like Vietnam. But it is important

for Indonesia to utilize international trade given its limited domestic capacity. It is clear that current applied trade barriers and import decisions made based on the faulty datasets Indonesia has relied on in the past have not produced substantial change to rice prices in Indonesia.

B. Building Rice Future Markets

The international rice market's heavy dependence on ASEAN member states' domestic rice sectors and policies may create asymmetric market information. Simply put, a rice importer country may need to import rice in response to domestic concerns just as international rice prices change in response to another member's policies that make imports cost-inefficient. Likewise, a rice exporting country may fail to optimize their revenue. It is therefore beneficial to establish a market that provides greater and much more measurable price insights.

Previously commodity trades, such as in rice, wheat, coffee, cocoa, and sugar, have taken place in commodity markets. The practice of commodity markets started with future contracts (futures), or legal agreements to exchange a commodity at a fixed price agreed upon by buyers and sellers at a specified time in the future. Unlike conventional (spot) markets, where traded commodities are delivered immediately, futures sellers and buyers might abandon the futures if the market is more favorable than their agreement.

Theoretically, futures markets might be seen as an opportunity for farmers to push down the risk of selling at a loss. Agriculture products are known for price rigidity. Farmers might spend some amount of money to produce certain commodities but face the risk that they will only be offered prices below their production costs in the next harvesting season. In the spot market, farmers must face the price at the time of harvest, especially if their crop will spoil with time. However, the futures market allows farmers to hedge the risk by selling the commodity at certain price level today through futures that guarantee the current price level (or an agreed upon price level between sellers (short futures position) and buyers (long futures position)), at which farmers thought it was worthwhile to plant their crops, until the delivery date. Thus, if the price level in the future is below the farmers' production cost or below their desirable rate, the loss that farmers incur in the spot market may be cancelled out by the profit earned from futures. Furthermore, futures support price discovery by allowing more negotiation between buyers and sellers to reveal their expectations. Madre and Devuyst (2016) estimate that the selling price early in the production process is essential information for farmers who work in unstable agricultural markets.

However, farmers are not the only players in futures markets—they may also involve stakeholders such as wholesalers, middleman, parastatals, and even those who do not work in the industry but participate as speculators. Although speculators might disrupt the market and even increase prices or price volatility, they can also benefits futures markets by providing market liquidity. While in the past, speculation in the United States has had a significant influence on global food prices, U.S. commodity futures only cover 8% of all available financial derivatives product (IATP, 2008).

Several commodity markets trade agricultural products. The Chicago Mercantile Exchange (CME) in the United States is the biggest futures exchange in the world. In Asia, there are the Agricultural Futures Exchange of Thailand (AFET), Tokyo Commodity Exchange of Japan (TOCOM), Zhengzhou

Commodity Exchange of PR China (ZCE), and Singapore Commodity Exchange of Singapore (SICOM). Only TOCOM and SICOM do not trade rice. CME operates its futures for rice commodities through the Chicago Board of Trade (under CMO Group). The exchange is considered successful at managing rice futures contracts (Ewing, 2012). Ewing describes key factors to this success, including a free market in the futures exchange and a corresponding low level of government price controls, a supportive regulatory environment, and a financially sound clearing house.

In Thailand, AFET is the only agriculture futures exchange. Established in 2001, AFET was first funded by the Government of Thailand and trades in rubber, rice, and tapioca futures. AFET differentiates market stakeholders into brokers and traders. The exchange sets a limit of 20 brokers, but new traders are always welcome. In China, ZCE trades in several types of rice: Early rice, Japonica rice, and Late Indica rice. ZCE was established as China's first rice future market that has been running since 1993.

Previous policy reviews of rice markets in Indonesia and similar reviews in other ASEAN countries have found that the path to integrating the rice market is politically unpopular. All ASEAN members consider rice a staple commodity – making it very important. This designation has motivated countries to pursue policies that support domestic rice production, which are sometimes effectively protectionist and lead to higher rice prices—as in Indonesia and the Philippines (OECD, 2018). The urgency for all state members to integrate through ASEAN Economic Community (AEC), ASEAN Integrated Food Security (AIFS) Framework, and Strategic Plan for ASEAN Co-operation in Food, Agriculture and Forestry has further pushed these internal policies to adjust to regional regulations, including those that intervene or protect the livelihood of local rice sector. While the AIFS Strategic Plan frameworks have been built by policy makers, the OECD (2018) reports that there is limited empirical evidence on the extent of rice market integration, though rice prices tend to move together, which suggests some level of market integration. OECD observations show that price changes across the region are quite similar, albeit with some adjustment delays. Despite this evidence of market integration, the internal policies in each country may create price gaps between the countries, diminishing the effective integration of the rice market. This is unfortunate—several studies have found that fuller integration in the ASEAN rice market would close the price gap and help reduce undernourishment in ASEAN households by as much as 5% (OECD 2017, 2018).

Considering current situations and how several ASEAN member states, including Indonesia, are still reluctant to pursue rice trade liberalization, the establishment of joint rice futures market may help improve insights from prices and the management of farmers' risk. This will at least improve the trade connectivity between ASEAN countries and eventually help households across importing Southeast Asian countries to access more affordable rice without the fear of facing uncertain price levels. Appointed parastatals or state trading enterprises that deal with rice imports may join the futures market and better manage their rice stocks without having to establish reliable national supply data, which it still seems questionable that Indonesia can do today.

While it may substantially impact ASEAN rice trade, feasibility studies about the establishment of a rice futures market have produced mixed opinions. RSIS (2012) reported on an expert working group meeting on an Asian Rice Futures Market. According to this report, it is challenging to create such a market due to:

(i) Diverse rice varieties, which need different market treatment,
(ii) The politicized nature of rice as a crop, which makes it hard to establish a fair trading system, and
(iii) The possibility of widening spot and futures pricing.

Another feasibility study in the ASEAN region by McKenzie (2012) found that ASEAN rice futures contracts may help improve price discovery and risk management. While this might help all market participants in marketing and production decisions, the study also highlights that the futures market may play limited role in stabilizing rice prices across multiple years or seasons because futures market are not an instrument to reduce price volatility, but a tool to manage the risk that comes within the price volatility. Furthermore, rice price volatility, despite being seen as a problem, is essential to attracting hedgers and speculators to futures markets.

McKenzie (2012) stated that a spot market with large, competitive, well-defined, minimal government intervention a free flow of market information influence the success of a futures contract. Furthermore, the success of a rice futures market depends not only on the situation in the spot market but also the following measures:

- Greater involvement of the private sector in international rice marketing
- Increased regional cooperation on rice trade policies, along with harmonization of rice quality and grading standards
- Improved infrastructure in the rice sector, specifically storage facilities and financing for market participants
- Establishment of an independent institution responsible for rice market price and production data
- Adequate regulatory framework to supervise futures exchange
- Educational support for potential market participants and government trade and commerce officials
- Creation of a regional forum in which future exchange stakeholders can discuss the policies conducive to developing futures contracts
- Increased price transparency in existing spot markets and the development of a cash price index for ASEAN region

These points suggest that creating a rice futures market will require systemic changes in many aspects of the rice sector. These changes must take place in each country and together at the ASEAN level.

Currently, ASEAN countries lack private sector participation in the international rice marketing system. Rice farmers in Southeast Asia are relatively less engaged with the international market and especially so in the case of Indonesian farmers. Since Indonesian rice farmers generally have very small land plots (less than 0.5 ha per capita), it is very unlikely they will directly participate in a rice futures market. In fact, the already-running rice futures markets, such as in CME, have relatively low participation from small farm enterprises in spite of numerous efforts by the USDA to teach them about this financial instrument (McKenzie, 2012). Only large farm enterprises (with over 800 ha crop ownership) use futures.

In contrast, small farm enterprises are relatively more interested in joining forward contracts (rather than futures contracts), which are offered by the merchandising sector (rice millers).

Rice millers later use futures contracts to hedge their risk. Merchandisers, rice millers, traders, and retailers are relatively more involved in the international rice market than rice producers, but this is largely because of the involvement of parastatals that have monopoly rights or other special status from the government. As a result, the private sector is not very involved and may be constrained their involvement, negatively affecting the possibility of creating a successful rice futures market. It is hard to generalize the involvement of merchandisers, rice millers, and retailers in the international market because there are not reliable data from every country, but they can participate and might improve liquidity in futures markets.

Regional cooperation in the ASEAN region has been established in various ways. The formation of APTERR (ASEAN Plus Three Emergency Rice Reserve) was motivated by the desire to create physical rice reserves that would serve the rice demands for ASEAN member states when local production and the international market are incapable of fulfilling demand (Mujahid and Kornher, 2016). Aside from this reserve agreement, ASEAN member states had previously agreed on a multilateral trade agreement (AFTA) that reduced trade barriers for commodities (although these barriers still exist many forms in almost all countries). Despite the fact that these platforms continue to face challenges to implementation, APTERR has adopted a system similar to a futures market (Tier 1 scheme), but this has rarely if ever been used. APTERR is currently utilized only to support rice stocks in regions affected by disaster.

Quality standardization for rice across Southeast Asian countries is currently conducted through individual adoption of the standards set by FAO (CODEXSTAN 198:1995), ISO, and other international institutions. A regional standard may be essential to easing transactions to enable the creation of a rice futures market. The East African Community (EAC) implemented regional standardization in order to harmonize not only rice quality but also product and service requirements for the region (EAC, 2011).

The need to improve rice sector infrastructure, specifically storage and financing schemes, is evident in Indonesia. Currently, there are few to no studies of the quality of storage at BULOG, in Indonesia, or in Asian countries overall, in spite of the fact that infrastructure is a key factor influencing the quality and durability of rice (Swastika, 2012). IRRI (2013) found that the existing on-farm staple storage situation across Asia is open (bags or open granary) and exposed to pests. The situation commercial storage is similar, as products are exposed to the atmosphere and to pests. Box 1 explores an attempted solution to this problem in Ethiopia through the creation of the ECX.

Several financing programs and subsidy schemes have been implemented in Indonesia, including *Kartu Tani*, KUR (credit scheme). Similar schemes can also be found in other Southeast Asian countries in the form of seasonal credits and subsidies for farmers. However, low financial literacy in Indonesia (29.7%, according to OJK, 2018) and also in Southeast Asia (34%, S&P Global Finlit Survey, 2014) it is unlikely that there are many stakeholders already involved in financial markets.

C. Supporting Facilities for Rice Futures Market

As with other futures exchanges, the establishment of ECX (see Box 1) was aligned with the creation of two supporting facilities: clearing houses and storage/warehouses. Backer (2016) found that clearinghouses are a set of institutional arrangements designed to enhance contracts between private market actors. The aim of futures clearinghouses is to manage the credit risk (default risk) associated with trading futures contracts. If the creditworthiness of a trading party deteriorates over the duration of a future's contract, no recourse existed for losses or risky behavior until the end of the contract.

In response, informal groups/clubs of traders developed, enabling the multilateral netting of transactions by members who had agreed to accept each other's' contracts as substitutes[7]. Futures exchanges also developed rules for managing credit risk, which enabled exchanges to prohibit defaulters from trading, to review a trading firm's books if concerns about its solvency arose, and to require that firms post their trade margins.

A clearinghouse essentially steps into the middle of a trade and creates two new transactions through a legal process known as *novation*. The new transactions replace the original one, including the replacement of the original contractual agreement between the buyer and seller. In one of the new transactions, the clearinghouse takes the place of the buyer, and in the second it takes the place of the seller. This has the benefit of reducing the credit risk of original parties, as well as allowing multilateral netting, transactional efficiency, and increased transparency, and facilitating clearing portability. The costs of clearinghouse use include the netting between Over-the-Counter (OTC) derivatives[8] required to be cleared and those bilaterally cleared and settled is disrupted. Clearinghouses also create moral hazard problems in at least two ways: by reducing the concern by exchange members about high-risk deals and about their own credit management.

In the case of ASEAN, a rice futures market may be supported by an independently managed clearinghouse that is financed jointly by ASEAN member states. As the story of the ECX shows, it is possible to create a public-private partnership in the management of a marketplace. While it might be challenging to gather private institutions representing people from every ASEAN member state (which might be required to strengthen exchange independence), it is possible to open for such recruitment as AEC already facilitates labor mobility through AEC Blueprints.

[7] 'Multilateral netting' is an investment term that refers to an arrangement among numerous parties to integrate their transactions in order to help avoid the need for multiple invoicing and payment settlements among parties. Existing implementation of this concept commonly lies on a settlement cases between companies for transactions conducted by each company's subsidiaries using different currencies.

[8] OTC derivative is a derivative contract that is traded off between parties without going through exchange mechanism. Clearing houses requires this type of contracts to be cleared as it poses credit risk due to unavailability of exchange/intermediaries.

Box 1.
Lessons from the Ethiopia Commodity Exchange

The Ethiopia Commodity Exchange (ECX) is a state-owned firm with private sector management that runs technology-based food trading. This firm envisioned a non-profit business model to improve social welfare, but members are allowed to get income from exclusive trading rights (Gabre-Madhin, 2012).

Before the ECX was created, the food trade in Ethiopia was limited by geographical barriers and high transportation costs, a lack of clear trade contracts and certified standards for commodities. The Ethiopian government established the ECX in 2006 to regulate commodities such as legumes, vegetable oils, nuts, and coffee. The government also established regulation of storage system, warehouses centers, clearing houses, quality and contract standardization, and market surveillance system.

Farmers may trade their commodities to all of Ethiopia by depositing their goods into ECX storage in Nekempt. They will be paid an agreed upon price level set by the ECX and farmers on the next day. The law guarantees that this exchange is independent and autonomous, representing no burden or potential earnings for the government. Thus, despite government ownership of ECX, its private management makes it independent. Government pressure on decisions influencing the ECX's efficiency is also insignificant. While policies and regulation are mostly controlled by the government, other things such as key management and operational decisions are entirely independent.

While ECX is seen as a monopoly firm that deals with commodity exchanges, the marketplace is more diverse, containing brokerage firms and private participants in the market. It is important to have all players in one marketplace for a commodity futures exchange like ECX to allow price discovery. The ECX has yielded good results, valued at USD 820 million, and adding 5510 participants after just three years.

Storage and warehouses must also be established to facilitate the creation of a futures market. Solid, efficient supply chains are crucial to the functioning of such a market, and so investment must be made in storage, transport, and port facilities. Optimization of the ASEAN framework can help in the establishment of these facilities. FAO (2017) describes the ideal infrastructure for storage servicing a rice futures market. This includes materials and equipment required for packaging and handling bagged grain and storage pest control. Ideally, these items should be stored separately.

The Philippines and Singapore have large international ports that are experienced in transferring and storing commodities to and from the world market. The government of the Philippines manages two important fish port complexes in Navotas and General Santos. Navotas is the premiere fishing center and also among the biggest in Asia, followed by General Santos in second place. These two fish ports serve many functions, including business markets, cold storage, ice plants, and fish processing facilities, that are necessary to support the fishery sector. In Singapore, the warehouses and storage facilities were built by the private sector and have been expanding. For instance, DHL Supply Chain has launched its new Advanced Regional Center

(ARC), which includes a €90m warehouses. This provides more evidence that member states can benefit from allowing their storage to be managed by the private sector.

In order to create a storage house that has the proper standards, ASEAN member states may collaborate to create a regulation and management system to operate warehouses across trade posts all over ASEAN. The storage should be owned by ASEAN, but operational technicalities may be conducted by independent private firms in order to prevent political interference arising from the domestic concerns of ASEAN member states. The financial cost of building and operating storage facilities may be able to be financed by the already-established ASEAN Infrastructure Fund (AIF), created in 2011. This type of storage may not be limited to the public parastatals, since a rice futures market should be open its marketplace to private players and speculators in order to make it easier to discover prices. All users of these storage facilities should provide the necessary data about their business in order to enhance the free flow of information needed for the futures market.

A partnership with the private sector for warehousing is also possible. In the U.S. grain industry, the private sector plays a huge role in rice marketing chains and the improvement of storage and transport facilities. In Thailand's rice futures market, market players were reluctant to participate because of the government's heavy involvement, especially in warehousing and storage through the Public Warehousing Organization. Government storage crowds out private investment and discourages private sector involvement in futures markets

CONCLUSION AND RECOMMENDATION

Rice is the staple food for most Indonesian people and people across ASEAN countries. In Indonesia, high rice prices contribute to the large monthly expenditures by households on food. The Indonesian government regulates the rice sector based on the datasets that have been proven unreliable, and this negatively influences decisions about imports and other interventions in the rice sector. Furthermore, the domestic price of rice has tended to increase over the time since the World Rice Crisis in 2008. This trend is repeated in other major importing countries such as the Philippines, and may contribute to extreme poverty and increasing malnutrition in the region. Historically, the Indonesian government has aimed to be self-sufficient in rice production. While Soekarno-era policies tended to be anti-colonialism and emphasized only the building of basic infrastructure for rice cultivation, Indonesia in the Suharto era implemented the Green Revolution and achieved self-sufficiency in 1984–1985. This remarkable achievement came at a high price, and so ultimately lasted less than a decade. In the early 1990s and through the Asian Financial Crisis in 1998, Indonesia was forced to import a staggering 6 million tons of rice due to harvest failure, El Nino, and the failed Mega Rice Project.

After Suharto resigned, the government responded with a massive liberalization of the rice trade in order to secure loans from the IMF. Liberalization was short-lived, and the policies of this era are transforming back toward protectionism with a government parastatal monopoly on imports (BULOG) and tariff and non-tariff trade barriers to protect domestic farmers from international competition.

Numerous studies during the so-called reformation era found that political elites in Indonesia also promote for self-sufficiency in rice, but Indonesia continues to import rice every year. While the intention behind protectionist measures is to improve farmers' welfare, the government has failed to realize that the real effect of such measures is to harm consumers' purchasing power. Even among rice farmers, 75% of those the policies are intended to help are net rice consumers, and so they are harmed rather than helped by high rice prices (McCulloch, 2008).

Indonesia's consistent aim of self-sufficiency as a political and economic goal is in part motivated by the achievement of self-sufficiency in 1984 and by downplaying the hefty cost and short-lived nature of the achievement. This study supports findings by Davidson (2018) that the motivation behind these goals are also linked back to the strong anti-colonialism of the Soekarno era, boosted by the Green Revolution in Suharto era, and eventually strengthened by rising inequality in Reformation era.

This study also documented the political and economic considerations behind the rice policies of several ASEAN member states. Net importing countries such as the Philippines, Malaysia, and Indonesia have historically sought self-sufficient status in rice, while net exporting countries such as Thailand and Vietnam plan to disrupt the rice market by shifting their production to premium rice, a move that, if successful, will affect net importing countries. Holding all else equal, these net importing countries may respond with protectionist measures to avoid the already thin and volatile international rice market. The Global Rice Crisis in 2008 weakened the willingness of net importers to rely on international markets for food security, due to the threat of price

volatility. Their unwillingness is expected to last for years to come, as evidenced by the fact that the establishment of ASEAN Economic Community and its trade agreements excluded rice from liberalization measures. In Indonesia, the legislative, executive, and independent competition authorities do not see trade liberalization as a policy goal, and there are no plans to discuss the AEC in parliament.

As a reduction in trade barriers is unlikely to happen in Indonesia or other net importing countries in Southeast Asia in the near future, it is essential to seek other means to improve the affordability of rice through the international market. This study recommends the Indonesian government and other ASEAN member states pursue the establishment of a rice futures market in order to facilitate trade.

Theoretically, an exchange market can improve rice price insights and help industry players to manage their risk when facing the volatility of the international rice market. However, along with the creation of this platform, the rice futures market also encourages massive structural changes to the rice sector, such as involvement of the private sector in the rice trade, harmonization of standards across countries, the establishment of institutions that supervise and hold discussions for futures exchange updates, and education and knowledge sharing of and between rice stakeholders. These efforts, especially the last one, will take time, as can be seen from the experiences of the AFET and CME markets. It is difficult to know how a futures and exchange market will benefit small-scale farmers, who make up the majority of farmers across Southeast Asia. The low financial inclusion rate in Southeast Asia is one real challenge to a successful, liquid rice futures market in ASEAN. Finally, since feasibility studies of this endeavor are limited and have so far resulted in mixed opinions, countries must not limit their options to futures, and should consider other financial products such as swaps and forwards.

The quality of rice pricing and production data in Indonesia needs to be continuously examined. Although it is hard to say whether other countries face similar challenges with such data, it is important to highlight that there are no independent institutions that document, publish, and disseminate rice market information in the ASEAN region, and this situation should be remedied. The existing institution that might most easily take on this role is the ASEAN Food Security Reserve Board (AFSRB), which manages risks associated with extreme price volatility in rice markets. The AFSRB might extend its service to offer an ASEAN Cash Price Index to support rice futures trading. To avoid solvency issues in futures trading and to support improved storage systems for rice, the ASEAN member states could jointly explore the possibility of creating information clearing houses and building storage facilities and operations systems using the already established ASEAN Infrastructure Fund.

A. Knowledge Gap in Rice Futures Studies

Despite providing substantial price insights and also a platform to hedge risk in rice farming, along with emphasis on how Indonesia and other Southeast Asian countries may move towards establishing a rice futures market, there is limited information about the likely impact of a rice futures market on farmers in Indonesia and across Southeast Asian countries. Ewing (2012) suggests that an international rice futures market might boost the transparency, certainty, and stability into the rice market, but it is unclear how the market will affect the small-scale, rural farmers.

Given the heavy hand of political influence in Southeast Asian rice policies, it is hard to guarantee that the steps needed to establish a functioning rice futures market situation will take place. The example of AFET suggests that the potential for political intervention, as in the case of AFET's close relationship with Thailand's Ministry of Commerce, has weakened trust in the AFET futures market (McKenzie, 2012). It is important to consider that it took thirty years for stakeholders in CME's rice futures market to create a successful working market (Ewing, 2012).

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