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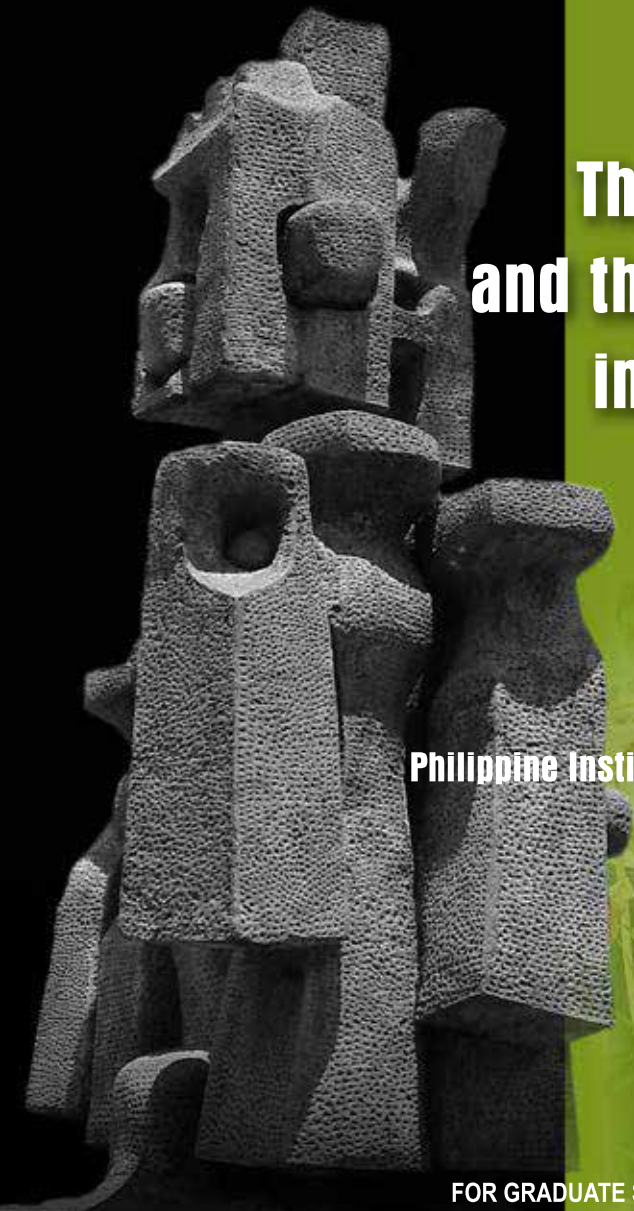
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No. 2017-3

The Rice Economy and the Role of Policy in Southeast Asia

Roehlano M. Briones
Philippine Institute for Development Studies

SOUTHEAST ASIAN REGIONAL CENTER
FOR GRADUATE STUDY AND RESEARCH IN AGRICULTURE

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INTRODUCTION

Rice is the key staple of Southeast Asia (SEA), as well as one of its most widely grown crops. The region includes some of the largest rice producers in the world, together with two of the top three exporters (Thailand and Vietnam), and two of the world's top importers (Indonesia and the Philippines). The region has gained prominence as an early adopter of key production innovations, such as modern inbred varieties and hybrid rice.

Policy is a key driver of the rice economy, alongside market forces, technology, and the environment. Production support policies, such as public investments in irrigation, the extension bureaucracy, as well as credit and input subsidies, were instrumental in the spread of modern rice varieties. Up to now, rice commands the most public resources in SEA compared with any other crop. Governments have also intervened actively in rice markets, invoking the key role of rice in food security and livelihoods.

On the other hand, the region is also active in the promotion of regional economic integration, spearheaded by the Association of Southeast Asian Nations (ASEAN). Its 10 member states: Brunei Darussalam, Cambodia, Indonesia, Lao People's Democratic Republic, Myanmar, Malaysia, the Philippines, Singapore, Thailand, and Vietnam, cover all the independent territories of SEA, except for Timor-Leste.

This background paper for the Rice Policy Roundtable¹ takes a timely look at rice policies in SEA to offer guidance for policymakers and other stakeholders under current and future market realities. It focuses on developing economies in the region, namely, the CLMV countries (Cambodia, Lao PDR, Myanmar, and Vietnam), and the ASEAN-4 (Indonesia, Malaysia, the Philippines, and Thailand).

The objectives of the Roundtable were:

1. To examine rice policies across the countries in SEA;
2. To abstract lessons from the country experiences;
3. To understand knowledge gaps, and where appropriate, list activities

¹ SEARCA held the 14th Policy Roundtable Discussion titled *Rice Policies Across Southeast Asia* at the SEARCA Headquarters in the Philippines on 8 December 2016.

such as research and knowledge management that could be undertaken per country or across the region; and

4. To craft possible policy inputs to be presented to governments, particularly the Philippines.

The remainder of this background paper is organized as follows: Section 2 provides a background on Southeast Asian rice economies by examining long-term trends and outlook on the future of the rice economy; Section 3 presents the various policy regimes for rice in developing SEA; Section 4 provides a synthesis and critical assessment of these policies; and Section 5 concludes and identifies knowledge gaps as a guide to future policy research.

LONG-TERM TRENDS AND FUTURE SCENARIOS

Demography and Income

Populations in Southeast Asian nations grew rapidly in the 1960s and 1970s, but the pace has since decelerated.

In the 1960s, population growth ranged from 2.0 percent in Cambodia to as high as 3.1 percent in the Philippines, with Thailand not far behind at 3.0 percent (Table 1). Cambodia, suffering from decades of conflict and totalitarian rule, suffered an absolute decline in population in the 1970s. Population in the rest of developing SEA continued to grow but at a decelerating pace.

Table 1. Average decadal population growth of developing SEA 1961–2015 (%)

	1961–1970	1971–1980	1981–1990	1991–2000	2001–2010	2011–2014
Cambodia	2.0	-0.4	3.0	3.1	1.6	1.6
Lao PDR	2.4	1.9	2.7	2.3	1.6	1.7
Malaysia	2.9	2.4	2.8	2.5	1.8	1.5
Myanmar	2.4	2.4	2.0	1.3	0.8	0.8
Philippines	3.1	2.8	2.7	2.3	1.8	1.6
Thailand	3.0	2.5	1.8	1.0	0.6	0.4
Vietnam	2.9	2.3	2.3	1.6	1.0	1.1

Source: FAOSTAT online database (FAO 2017)

The share of urban population has also been increasing over the decades.

The urban population in all developing SEA has been increasing, not only in absolute terms, but as a share in population (Table 2). The Philippines alone has apparently defied the trend of increasing urbanization since 1990.

Rural dwellers are moving out of farming, either by relocating to cities, or residing in erstwhile rural towns that eventually convert into urban centers. Not only have livelihoods changed, food consumption is also shifting towards more varied diets, based on purchased food that is increasingly in packaged or processed form.

Table 2. Share of urban population in total for developing SEA, 1961–2014 (%)

	1961	1970	1980	1990	2000	2010	2014
Cambodia	10.3	16.0	9.9	15.5	18.6	19.8	20.5
Indonesia	14.8	17.1	22.1	30.6	42.0	49.9	53.0
Lao PDR	8.0	9.6	12.4	15.4	22.0	33.1	37.6
Malaysia	27.2	33.5	42.0	49.8	62.0	70.9	74.0
Myanmar	19.6	22.8	24.0	24.6	27.0	31.4	33.6
Philippines	30.6	33.0	37.5	48.6	48.0	45.3	44.5
Thailand	19.8	20.9	26.8	29.4	31.4	44.1	49.2
Vietnam	15.8	18.0	19.0	19.6	23.6	29.9	32.3

Source: FAOSTAT online database (FAO 2017)

Growth in per capita incomes has been rapid and fairly sustained, though at different starting points in Southeast Asia.

Relative to the global average (Table 3), per capita incomes of developing SEA countries have mostly grown faster since the 1960s (or since data on per capita Gross Domestic Product (GDP) became available). Over the longest period, the fastest growing has been Thailand, and the slowest, the Philippines. The highest base, though, has been Malaysia, which posted the second highest growth since the 1960s. Hence, its per capita income in 2014 has been highest at over USD 10,000 per capita. The lowest income is still Cambodia, owing to the delayed start of its rapid growth phase, though it has posted since the 2000s the most rapid growth of per capita income at 6 percent per annum. Again, rising per capita income and a burgeoning middle class will reinforce the dietary shift already initiated by urbanization.

Developing Southeast Asia has made great gains in terms of nutrition since the 1990s, though prevalence of undernourishment persists at high levels.

United Nations members committed to the Millennium Development Goals, which include halving the prevalence of undernourishment by 2015 from the baseline figure in 1990 (or nearest year). That goal has been well surpassed by developing SEA (Table 4), in contrast to developing countries worldwide on average.

Undernourishment prevalence, nonetheless, remains serious among CLMV countries, including the Philippines. On the other hand, child stunting prevalence is disturbingly high for CLMV countries, except Vietnam, as well as the Philippines and Indonesia.

Table 3. Per capita income GDP for developing SEA, 1961–2015 (in constant 2010 USD)

	1961	1970	1980	1990	2000	2010	2014
World (1.9)	3,684	5,130	6,222	7,131	8,113	9,476	10,031
Cambodia (6.0)	NA	NA	NA	NA	427	783	969
Indonesia (3.6)	577	660	1,096	1,653	2,143	3,125	3,703
Lao PDR (4.9)	NA	NA	NA	467	676	1,147	1,461
Malaysia (3.9)	1,408	1,974	3,309	4,492	6,939	9,069	10,512
Philippines (1.7)	1,059	1,257	1,687	1,526	1,608	2,145	2,530
Thailand (4.4)	571	929	1,404	2,503	3,473	5,112	5,636
Vietnam (3.8)	NA	NA	NA	446	788	1,334	1,596

Source: World Bank (2016)

Notes: NA - not available

Figures in parenthesis denote annual average growth rates over the longest time series where data is available

Table 4. Indicators of undernutrition prevalence, 1991–2014 (%)

	Undernourishment Prevalence				Stunting, Aged 0–5 (2015)
	1990–1992	1999–2001	2009–2011	2014–2016	
World	18.6	14.9	12.1	10.8	NA
South-eastern Asia	30.6	22.3	13.4	9.6	NA
Cambodia	32.1	28.5	17.0	14.2	32.1
Indonesia	19.7	18.1	13.5	7.6	36.4
Lao PDR	42.8	37.9	22.8	18.5	43.8
Malaysia	5.1	<5.0	<5.0	<5.0	17.2
Myanmar	62.6	49.6	20.2	14.2	35.1
Philippines	26.3	20.3	13.0	13.5	33.4
Thailand	34.6	18.4	9.3	7.4	16.3
Vietnam	45.6	25.4	14.5	11.0	19.4

Source: For undernourishment prevalence, FAOSTAT online database (FAO 2017)

For childhood stunting, International Food Policy Research Institute (IFPRI 2016)

Consumption and Production of Rice

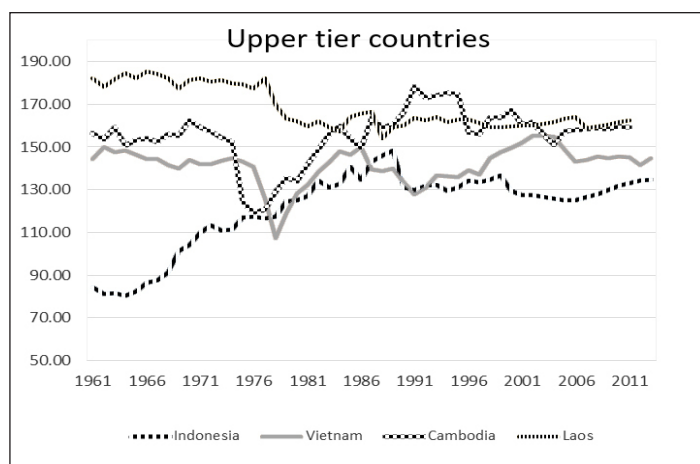
In the following charts, developing SEA countries are sorted under each indicator from highest to lowest, with the top four forming the “upper tier” and the bottom four the “lower tier”.

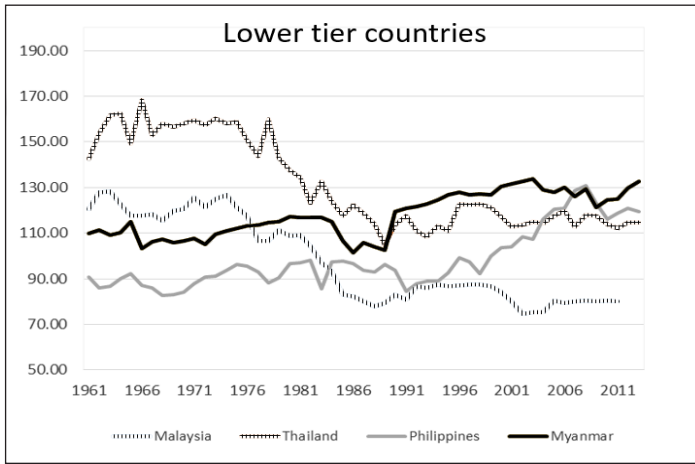
Trends in per capita consumption are mixed, with a clear drop among higher income economies, and an erratic upward trend among lower income economies.

First, we consider per capita consumption of rice (Figure 1). The data are rather flawed as they are calculated using the residual method, i.e., rice net supply (production plus imports less exports, seed, feed, processing, and waste) is divided by population. Hence, the erratic behavior of consumption estimates. The data, nevertheless, are useful for revealing underlying trends.

Among the upper tier countries, per capita consumption was hit hard by conflict in the 1960s and 1970s in Cambodia, Lao PDR, and Vietnam. Malaysia and Thailand, the wealthier countries in developing SEA, have clearly gone through a sustained decline in per capita rice consumption since the 1960s. Meanwhile, Myanmar and the Philippines have seen an inconsistent increase since the 1980s and 1990s. The upward trend was fairly pronounced in Indonesia in the 1960s and 1970s, and again in the 2000s.

Figure 1. Per capita rice consumption of developing SEA, 1961–2015 (kg/yr)





Source: FAOSTAT online database (FAO 2017)

Table 5. Share of rice in per capita calorie supply in developing SEA, decadal averages, 1961–2014 (%)

	1961–1970	1971–1980	1981–1990	1991–2000	2001–2010	2011–2014
World	19.1	20.3	20.8	20.1	19.3	19.0
Developing SEA	57.8	59.4	56.9	53.5	49.6	44.3
Cambodia	75.5	75.8	79.9	77.5	64.8	63.0
Indonesia	48.6	56.1	55.6	53.0	50.2	48.0
Lao PDR	80.8	78.8	73.3	71.1	63.9	61.0
Malaysia	48.0	43.4	32.2	29.5	26.5	26.3
Myanmar	67.8	69.1	62.8	65.5	54.7	46.9
Philippines	44.5	42.9	43.0	39.9	46.3	45.7
Thailand	72.8	68.2	57.0	47.6	42.5	40.7
Vietnam	72.3	68.8	71.7	66.8	57.5	50.8

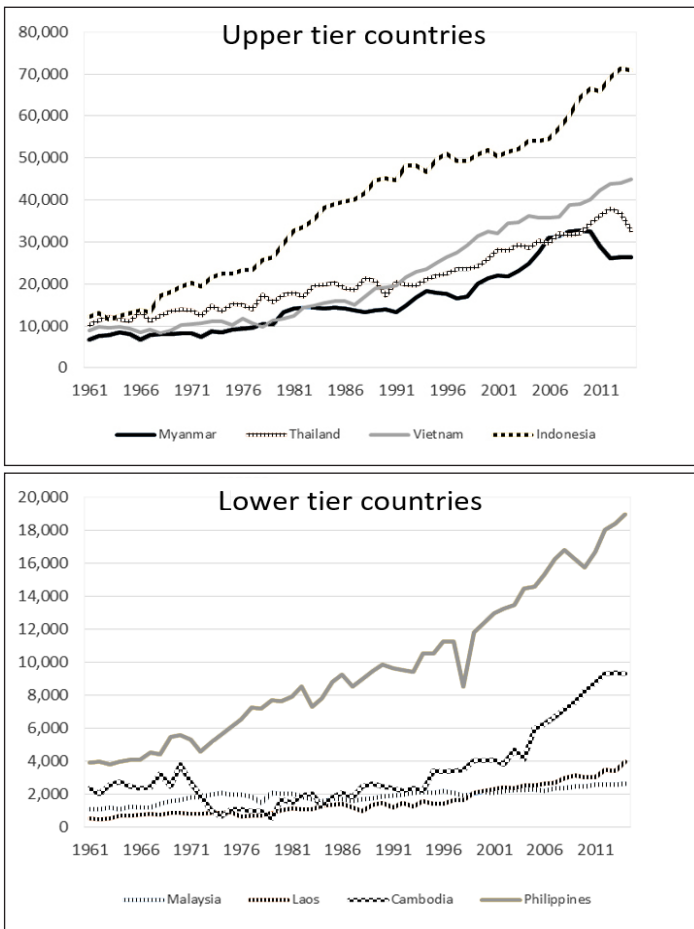
Source: FAOSTAT online database (FAO 2017)

Production of paddy rice has been increasing at a rapid pace, driven in part by increasing yield. Recently though, growth has begun to slow for majority of developing Southeast Asia.

Figure 2 shows that the largest paddy rice producers in Southeast Asia are Myanmar (above 20 million tons), Thailand (above 30 million tons), Vietnam (above 40 million tons), and Indonesia (above 70 million tons). It is noteworthy that these upper tier producers had a much tighter cluster of production levels

in the early 1960s. Indonesia, with its huge land area, increased its production levels fastest over the ensuing decades. Production expansion was fairly steady in Thailand since the 1960s, though accelerated growth was more noticeable in Vietnam and Myanmar from the 1990s. Lower levels are observed for the rest of Southeast Asia, though the Philippines is approaching 20 million tons. For the lower tier countries, production levels at the baseline (1961) have already diverged, and this divergence widened further in the succeeding decades.

Figure 2. Paddy production in developing SEA, 1961–2015 ('000 tons)

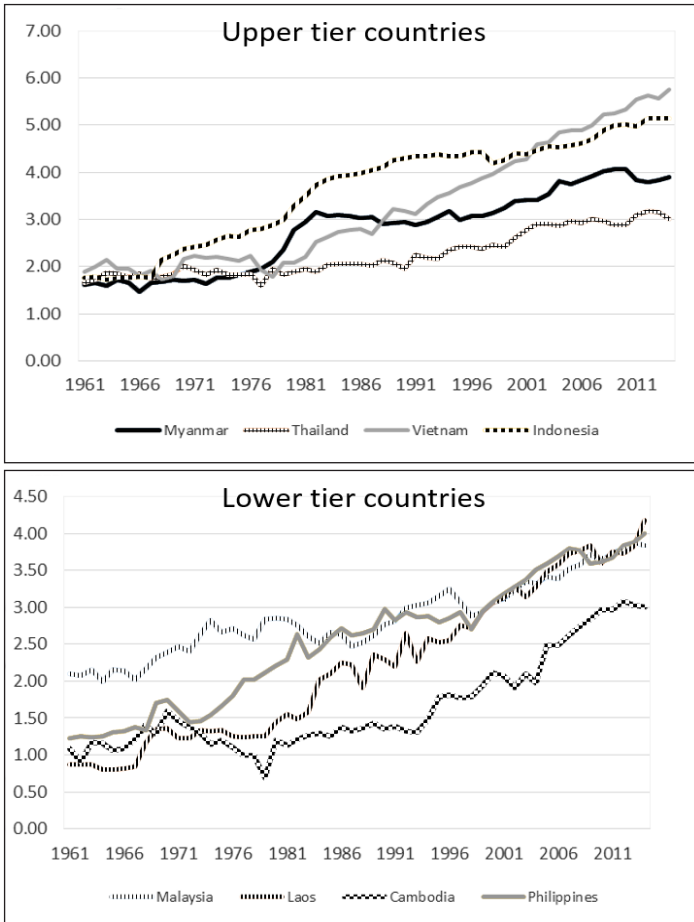


Source: FAOSTAT online database (FAO 2017)

Figure 3 presents paddy rice yield data. The upper tier countries in terms of production have yields reaching 5–6 tons per ha in 2015 (Indonesia and Vietnam), though two are in the 3–4 tons per ha range (Thailand and Myanmar). In 1961 though, yields tended to cluster in the 1–2 tons per ha range, with productivity surging in the intervening decades.

Meanwhile, the lower tier countries in terms of production have yields clustering in the 3–4 tons per ha range. Yields have tended to trend upwards as well, although these seem to move more erratically than in the upper tier countries.

Figure 3. Yield of paddy rice in developing SEA, 1961–2015 (tons/ha)



Source: FAOSTAT online database (FAO 2017)

Yield has been the more important source of production growth in some countries in developing SEA compared with area (Table 6). For most decades, this holds for Malaysia, Lao PDR, the Philippines, Vietnam, and Indonesia. In other countries, therefore, growth in area harvested was the bigger contributor to production growth, i.e., in Cambodia and Thailand since 2000, and in Myanmar since 1990.

Table 6. Production growth and contribution of yield in developing SEA, 1960–2015, decadal averages (%)

	1961–1970	1971–1980	1981–1990	1991–2000	2001–1010	2011–2014
Production						
Malaysia	2.10	0.85	-0.35	0.55	0.61	0.77
Lao PDR	2.48	0.67	1.51	1.69	1.44	2.88
Cambodia	2.27	-3.47	1.63	2.07	3.11	1.33
Philippines	1.71	1.37	1.12	0.98	1.05	2.00
Myanmar	0.86	2.13	0.21	1.84	1.84	-2.27
Thailand	1.50	0.98	-0.04	1.77	1.24	-0.58
Vietnam	0.59	0.59	2.18	2.28	0.90	1.27
Indonesia	2.27	1.86	1.83	0.60	1.07	0.69
Contribution of Yield						
Malaysia	29.3	66.2	34.7	78.8	116.5	89.9
Lao PDR	86.6	31.2	115.2	64.3	48.9	113.8
Cambodia	69.0	-3.2	20.1	80.3	45.5	4.2
Philippines	100.2	74.5	112.7	12.5	68.3	101.3
Myanmar	33.0	95.2	118.6	32.1	42.7	-23.8
Thailand	57.1	-8.7	135.4	71.4	34.5	39.4
Vietnam	108.9	-5.1	84.1	54.3	110.1	88.5
Indonesia	61.6	74.6	62.8	17.2	52.0	23.7

Source: FAOSTAT online database (FAO 2017)

Note: The contribution of yield is the share of yield in production growth. The remainder is growth in harvested area.

The share of paddy rice in area harvested has fallen throughout Southeast Asia, though it remains the most important crop in terms of area.

In 1961, paddy rice accounted for two-thirds or more of total area harvested, except in Malaysia and the Philippines, countries with cash crop economies formed during their respective colonial periods (Table 7). However, diversification of agriculture throughout Southeast Asia

has eroded the area share of rice over the ensuing decades. Area share has fallen most precipitously in Indonesia, Lao PDR, and Myanmar (declines of over 30 percentage points). Significant declines have also been observed for Thailand and Vietnam (over 20 percentage points). Nonetheless, paddy rice continues to be the largest crop in terms of area harvested in every country of developing SEA, except Malaysia (where it is the third largest crop, after oil palm and rubber).

Table 7. Share of rice in total area harvested, developing SEA, 1961–2014 (%)

	1961	1970	1980	1990	2000	2010	2014
Cambodia	87	88	85	86	84	75	76
Indonesia	65	62	61	56	48	43	29
Lao PDR	91	89	86	79	70	60	56
Malaysia	23	25	19	14	12	11	10
Myanmar	65	62	61	56	48	43	29
Philippines	38	33	27	26	32	32	33
Thailand	74	63	57	51	55	58	52
Vietnam	75	75	68	66	63	56	55

Source: FAOSTAT online database (FAO 2017)

Rice Markets and Trade

Developing Southeast Asia is a mix of rice exporters and importers, some of whom are major players in the global rice market (Thailand and Vietnam for exports; the Philippines and Indonesia for imports).

The rice exporters in developing SEA are Cambodia, Myanmar, Thailand, and Vietnam. The rice importers are Malaysia, Indonesia, and the Philippines. Lao PDR, meanwhile, is just self-sufficient or a marginal importer. These are based on official data on rice exports and imports. It is acknowledged that informal exports of rice are fairly widespread over the porous borders of mainland SEA. To a lesser extent, importation is underestimated by widespread smuggling into archipelagic SEA.

Figure 4 shows Thailand, remaining the biggest exporter in SEA and worldwide, at one point (2011) approaching 11 million tons. The second biggest exporter in SEA is Vietnam. Over time, exporters of rice in these two countries have followed a pronounced upward trend, with Thailand moving upwards since the early 1970s, while Vietnam began its export growth phase in the late 1980s.

Annual exports of Myanmar and Cambodia are much lower, averaging about 650,000 tons for the former, and about 160,000 tons for the latter, over the period 2009–2013. For all countries, exports are highly variable over time, with no clear upward trend as yet discernible for Cambodia and Myanmar.

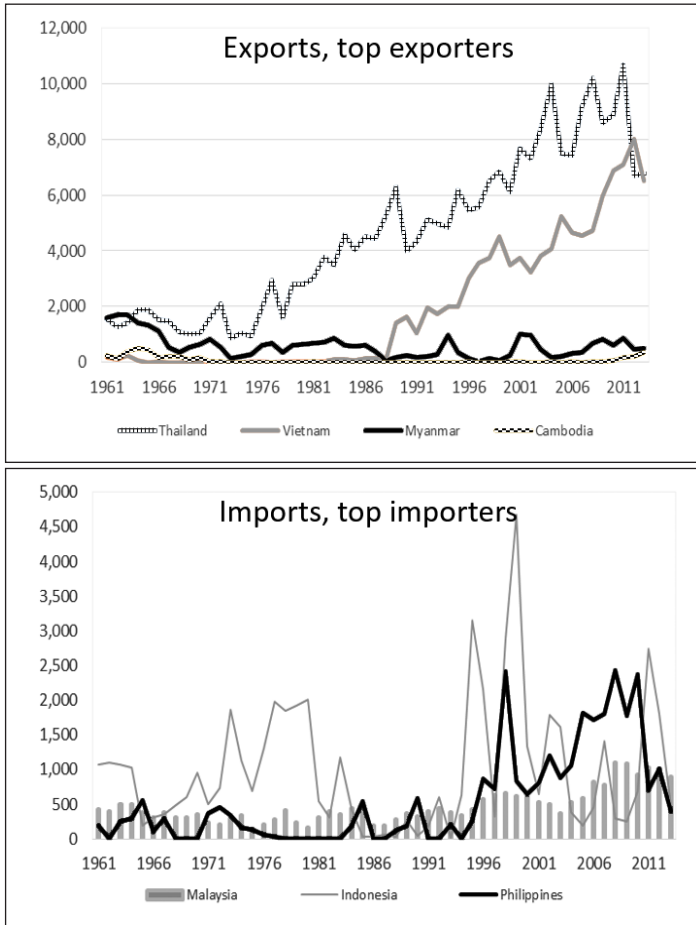
Understandably, Indonesia tends to import the most, at one time approaching five million tons in 1999. Imports have dropped in recent years across the board: in 2009–2013, average annual importation of Malaysia was close to a million tons, and that of the Indonesia and the Philippines, around 1.2 million tons. Imports of the major rice importers are highly variable. Since 2003, imports of Indonesia have ranged from 0.2 million to 2.8 million tons, and in the Philippines, the range was from 0.4 million to 2.4 million tons.

Rice exports of developing Southeast Asia are highly diversified by destination, whereas, rice imports are highly concentrated within the region.

As can be seen in Table 8, aggregate rice exports of developing SEA reached 16.4 million tons in 2014, more than double its level in 2001. Compare this to the level of imports peaking at 3.0 million tons in 2014, up from 2.1 million tons in 2001. Obviously, the export market cannot rely on SEA itself alone. Rice exports to SEA range at about 20 to 30 percent (though once fell to as low as 16% in 2013). The most diversified rice exporter is also the biggest, namely, Thailand, which sells seven-eighths of its exports outside SEA. The share of SEA in Vietnam's exports is much higher but is still very much a minority share, at about 20 to 40 percent annually (except for one year in 2011).

In contrast, imports of SEA from within itself range from 80 to 95 percent. SEA share in imports is broadly similar for the importing countries of developing SEA. Imports of developing SEA tend to be heavily influenced by policies or market conditions within SEA exporting countries. However, SEA exporting countries are far less vulnerable to import policies or demand conditions in SEA importing countries.

Figure 4. Rice exports and imports in developing SEA, 1961–2013 ('000 tons)



Source: FAOSTAT online database (FAO 2017)

Table 8. Rice exports and imports of ASEAN countries ('000 tons) by destination/source, 2001–2015

	2001	2005	2010	2011	2012	2013	2014
SEA exports	8,056	9,069	14,828	16,720	13,916	12,857	16,433
to SEA (%)	24.3	22.4	28.3	30.9	26.5	16.0	22.5
Thailand's exports	6,335	6,049	7,590	9,185	5,772	5,899	9,515
to SEA (%)	19.9	11.7	13.6	15.3	8.8	6.3	12.2
Vietnam's exports	1,705	2,888	6,694	6,833	7,477	6,308	6,122
to SEA (%)	40.5	45.0	46.3	53.6	40.8	23.5	37.4
Cambodia's exports	7	5	48	168	194	357	341
to SEA (%)	99.7	45.6	3.2	9.2	14.6	15.6	14.4
SEA imports	2,074	2,839	4,162	4,549	4,091	2,053	3,039
from SEA (%)	77.3	93.0	91.7	95.0	85.4	83.5	86.0
Philippines' imports	811	1,820	2,372	694	1,003	402	1,070
from SEA (%)	86.1	96.0	93.2	99.9	86.2	96.0	98.4
Malaysia's imports	495	565	915	1,027	997	875	916
from SEA (%)	79.1	94.4	86.8	86.3	86.6	85.4	79.1
Indonesia's imports	287	123	545	2,435	1,542	270	505
from SEA (%)	25.0	90.6	99.7	99.7	87.3	93.2	99.5

Source: Basic data from the International Trade Center (Intracen 2017)

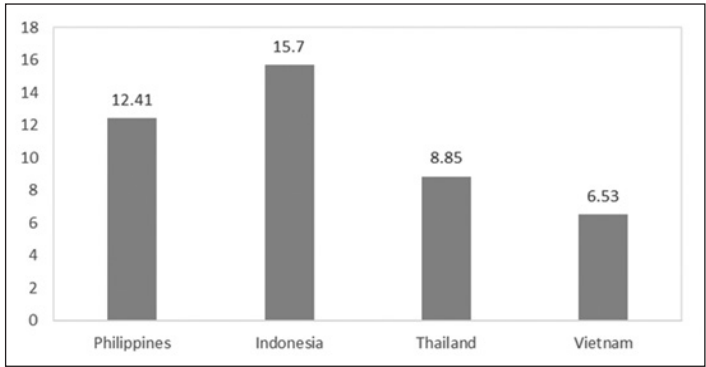
Rice exporting countries tend to be inexpensive sources of rice, compared to rice importing countries.

Figure 5 contrasts cost of paddy production in selected SEA countries. As the data was collected by a Philippine-funded study, currency units are in Philippine pesos (PHP)². Lowest production cost in 2014 is observed in Vietnam and followed by Thailand, in the range of PHP 7–9 per kg. Cost of production is much higher in rice importing countries, which falls between PHP 12–16 per kg. Hence, production in the rice exporting countries is cost-competitive, allowing them to become a global rice supplier.

Similarly, domestic price tends to be lowest within rice exporting countries, where rice is available at more or less the world price (Figure 6).

² USD 1 = PHP 44.40 in 2014 (http://www.bsp.gov.ph/statistics/spei_new/tab12_pus.htm)

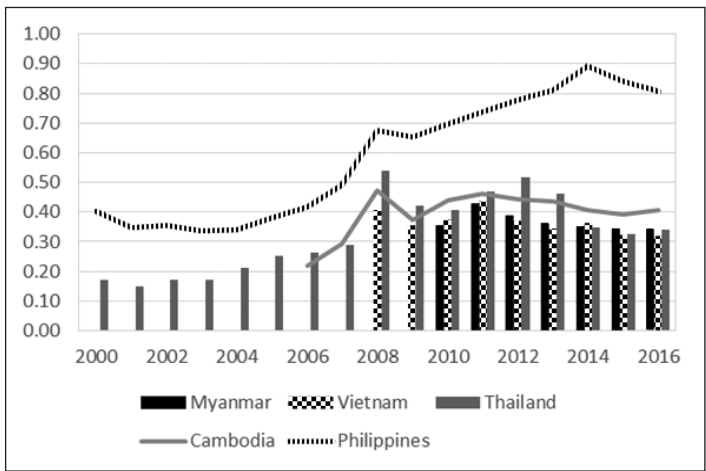
Figure 5. Cost per kg of paddy rice in selected SEA countries, 2014 (PHP/kg)



Source: Moya et al. (2016)

Domestic wholesale prices are inclined to cluster within a lower band in the rice exporting countries. Thailand tends to stand out, probably due to differences in quality relative to the rice in other exporting countries. Wholesale price in the Philippines, a major rice importer, lies far above domestic prices in exporting countries. The divergence has widened in recent years.

Figure 6. Domestic wholesale rice prices in developing SEA, 2000–2016 (USD/kg)



Source: FAO Global Information and Early Warning System, Food Price Monitoring and Analysis (GIEWS, FPMA) Tool online database (2017)

Future Scenarios

Medium term trends will continue to be driven by demand. Within developing Southeast Asia, exports are expected to grow, while imports will remain stable.

Table 9 presents medium term projections (up to 2025) for the rice market, culled from various sources.

Table 9. Medium term projections for the rice market, global and in Southeast Asia (2015–2025)

	2015	2020	2025	Total Change (%)
Global, 2015–2025, (million tons)				
Production	493.4	531.0	562.6	14.0
Consumption	490.8	532.3	563.2	14.8
Exports	44.3	47.1	51.4	16.0
Price (USD per ton)	454.7	407.0	416.3	–8.4
Southeast Asia, 2015–2020				
Production (million tons)				
Indonesia	38.9	40.7		4.6
Philippines	13.5	13.9		3.0
Thailand	11.2	11.6		3.6
Vietnam	21.9	22.3		1.8
Consumption per capita (kg per year)				
Indonesia	152.4	149.8		–1.7
Malaysia	95.7	97.0		1.4
Philippines	125.2	128.8		2.9
Thailand	160.1	158.8		–0.8
Vietnam	236.0	230.5		–2.3
Exports (million tons)				
Cambodia	1.3	2.4		84.6
Vietnam	6.5	7.1		9.2
Thailand	10.0	11.6		16.0
Imports (million tons)				
Indonesia	1.5	1.6		6.7
Malaysia	1.0	1.2		20.0
Philippines	1.6	1.8		12.5

Sources: Global projections from Organization for Economic Cooperation and Development (OECD)-FAO (2016)
Per capita consumption from Hoang and Meyers (2015)
Southeast Asia production, exports, imports from International Grains Council (IGC 2015)

Global projections from IGC (2015) show a continued increase in production, totalling 14 percent over a decade (2015–2020), adding 31 million tons (in milled rice). Production growth keeps pace with consumption (which adds about 15% across the 10-year interval). Exports as a share in global production tends to be low at only 10 percent, in contrast with other traded cereals—hence, the notion of a thin global market for rice (John 2014). This low share will improve slightly with global exports rising faster than production (at a rate of 16%).

Within developing SEA, Hoang and Meyers (2015) project a decline in per capita consumption, specifically of Indonesia, Thailand, and Vietnam. Malaysia and the Philippines will experience stable (and slightly increasing) per capita consumption. With continued population growth, demand will likely continue to increase for all these countries, hence, imports will increase at fairly rapid rates. Given low baseline imports, however, the absolute increases in import quantities are fairly modest, i.e., 0.2 million tons per year. Exports will also increase significantly, both in proportion to the baseline and in absolute quantity increase, implying greater market penetration of SEA rice exports.

Long term trends will be a continuation of the medium term, but face a changing physical environment worldwide brought about by climate change.

In the long run, population will continue to grow, except in Thailand. Its rate of growth will outpace the global average for Cambodia, Lao PDR, Malaysia, and the Philippines. Meanwhile, the share of urban population in total will be higher than the global average for Indonesia, Malaysia, and Thailand. Urban populations will remain a minority share only in Cambodia and Vietnam, which began with low baselines in 2015. Urbanization, plus rising incomes, will imply a lower per capita consumption, though demand will still increase purely from the increase in population.

The other key long-term factor is climate change. Since the 1960s, warming and rising temperature extremes have been observed in SEA, at the rate of 0.14 to 0.2 degrees Celsius. Climate shifts are introducing greater variability in the monsoon rainfall. For example, in the Lower Mekong River Basin in the past 50 years, rainfall in the wet season has increased, while that of the dry season has decreased. Lastly, sea level rise has been observed at significant rates in the western tropical Pacific over the period 1993–2010, with Southeast Asian coastal zones undergoing saltwater intrusion and even inundation (Chen and Dame 2015).

Rosegrant et al. (2014) incorporates climate change in the production and price projections in the lower panel of Table 10. Due to rising demand, production still

manages to increase, but at a far lower rate than in the past decades. From 2010 to 2050, global production grows from 10 to 12 percent overall, with developing countries at the lower end of the range. The production growth slowdown translates to an amplification of the trend towards increasing world price, which became evident by the mid 2000s. On average, world prices may be expected to increase by about two-thirds over the span of 40 years to 2050.

Table 10. Projections for population, rice output, and rice price (%)

Variable	Change	Urban Share of Population
Population (2015–2050)		
World	25	66
Cambodia	34	36
Indonesia	19	71
Lao PDR	38	61
Malaysia	26	86
Myanmar	13	55
Philippines	37	56
Thailand	–9	72
Vietnam	15	48
Production (2010–2015)		
Developed countries	12	
Developing countries	10	
Price	64–66	

Sources: Population from United Nations Department of Economics and Social Affairs, Population Division (UN 2015)
Production and price from Rosegrant et al. (2014)

RICE POLICIES IN DEVELOPING SOUTHEAST ASIA

Overview of Rice Policies

Rice policies may be broadly categorized based on geographic scope. Domestic (i.e., behind-the-border) measures are those undertaken by government to provide support for, exact payments from, or otherwise promote or restrict rice production, consumption, and related activities (e.g., marketing). Production support, in turn, may be broadly classified into spending on private goods and spending on public goods.

Private goods are those already provided by the private sector. Government funds, nonetheless, are utilized to subsidize its provision to farmers, such as provision of free or subsidized fertilizers, seed, credit, and farm equipment. Meanwhile, public goods are generally not provided by the market. Broadly speaking, goods become public due to indivisibilities. Indivisibility, in the sense of non-rivalry, implies that benefits to one party do not reduce benefits to other parties, e.g., a smartphone app for unlimited download. Indivisibility, in the sense of non-excludability, implies that the cost of restricting access to multiple parties is high. A classic example of this is a village road for which user fee systems are generally infeasible.

In between these polar extremes of private and public goods are a large class of goods and services, which are privately provided, but for which market failure may lead to undersupply—this class of goods may be deemed “quasi-public”. For instance, research and development (R&D) is done by private companies, but generally oriented towards innovations, whose benefits can be commercially captured, e.g., hybrid seeds. R&D to generate knowledge with large spillovers will be underprovided. Similarly, private extension is focused on servicing utilization of commercial products, rather than maximizing benefits from knowledge spillovers. Producer services that facilitate buyer-seller matching and build individual or organizational capacity may be largely unavailable to smallholders and rural enterprises.

Gravity irrigation is a special case. Private provision of irrigation service is typically stymied by a coordination problem: water passing through upstream farms to reach farms downstream is vulnerable to diversion. Transaction cost of building, operating, and monitoring a system might be prohibitive under private provision. Hence, governments have opted to invest in and organize these systems, as well as charge for irrigation service under various schemes, ranging from full cost recovery to full subsidy.

Border measures, meanwhile, pertain to the treatment of goods, services, or capital that are inbound or outbound with respect to a country's border. Border measures cover the following:

- Exchange rate policies and regulations on capital flows
- Import restrictions: tariff and non-tariff barriers (NTBs)
- Export restrictions, taxes, or subsidies
- Regional cooperation on border policies, such as free trade agreements

Domestic Measures

In developing SEA, governments have committed to spending on agricultural programs, with a strong emphasis on rice.

Government support is usually exercised by allocating public funds to finance its expenditure program to provide support to consumers (usually retail price subsidy), as well as various forms of support for producers. Where data is available (Table 11), these commitments for agriculture range from 1 percent of all government outlays (Indonesia) up to nearly 8 percent (Thailand). Note that in all countries, the share of agriculture in the budget is always lower than the share of agriculture in GDP, with the disparity being largest in Indonesia and Vietnam.

The FAO data set does not cover Cambodia and Myanmar, though perhaps outlays for agriculture will not exceed the proportionate commitment level of Indonesia.

Since 2008, public spending on agriculture has increased worldwide, and SEA is no exception. In Cambodia, public spending on agriculture increased from 1.3 percent of GDP in 2007 to 1.5 percent of GDP in 2009. The increases in spending have largely been fueled by increases in expenditures in their respective rice programs (Zorra and Santos 2014).

Table 11. Share of agriculture, in budget and GDP in selected countries, 2001–2015 (%)

	2001	2005	2010	2011	2012	2013	2014	2015
Indonesia								
In budget		1.4	0.9			1.0		
In GDP	15.3	13.1	13.9	13.5	13.4	13.4	13.3	13.5
Malaysia								
In budget	2.9	3.4	3.2	2.6	2.5	3.0	3.2	3.1
In GDP	8.0	8.3	10.1	11.5	9.8	9.1	8.9	8.4
Philippines								
In budget	4.4	4.2	5.9	3.5	4.8	4.7	4.3	4.4
In GDP	13.2	12.7	12.3	12.7	11.8	11.2	11.3	10.3
Thailand								
In budget	7.4	5.2	3.9	2.0	6.7	5.9	7.1	7.6
In GDP	8.6	9.2	10.5	11.6	11.6	11.3	10.5	
Vietnam								
In budget			2.2	2.6	2.3	3.7	3.4	
In GDP	21.5	19.3	18.4	19.6	19.2	18.0	17.7	17.0

Source: FAOSTAT online database (2017)

The ASEAN-4 economies focus their rice programs on provision of irrigation and private goods. Cambodia, Lao PDR, and Myanmar are still mostly focused on public goods such as R&D, extension, and irrigation.

Quantifying the allocation of expenditure programs to private and public goods requires a careful assessment outside the scope of this paper. Nonetheless, a few summary descriptions appear to justify the preceding characterization:

Cambodia

The government of Cambodia does not implement price support or intervention programs for rice. Government maintains a food reserve system, including rice stocks. There are modest outlays for seed stockpiles and free support in case of emergencies (FAO 2014). Meanwhile government provides R&D, extension, and irrigation services as part of its mandate for supporting agriculture as a whole.

Indonesia

A large share of Indonesia's public spending on agriculture was devoted to a consumer subsidy scheme, as well as a fertilizer subsidy program (Suryana 2016).

Lao PDR

Explicit transfer payments (following the methodology of the Organisation for Economic Co-operation and Development or OECD) were estimated at around USD 9.2 million in 2010, mainly in the form of subsidies for irrigation and electricity subsidies, with smaller outlays for free extension and subsidized credit. Transfers are equivalent to 10 percent of gross farm receipts in rice (Eliste and Santos 2012).

Malaysia

Currently, market interventions exist from the farm to retail levels, in the form of guaranteed minimum price, input subsidies, price controls, and private-government joint ventures. Liberalization had begun in the early 1990s, but policies reversed course in 2008, with renewed dependence on subsidies and market interventions (Arshad 2016).

Myanmar

World Trade Organization (WTO 2014), in its Trade Policy Review, finds that support for rice farming, though at modest levels, is delivered mainly through R&D and irrigation. It has not used domestic support measures such as preferential taxation, support price, input subsidies, or food subsidies. Tin Htut (2016) notes that government strategies have been anchored on improving technologies—starting from the Green Revolution of the 1970s, dry season technology in the 1990s, and sustainable agriculture from the 2000s. Recently, the policy thrust has been oriented towards private sector engagement, relaxation of price controls, reducing government subsidies, and promotion of industrial zones and private banking.

Philippines

Government spending prior to 2011 was heavily concentrated on subsidies. From 2011 onwards, the biggest share has gone to irrigation (39% of the budget). Banner programs (32% of the budget of the Department of Agriculture–Office of the Secretary) cover distribution of farm inputs and implements, postharvest, and other farm machinery (Oliveros 2016).

Thailand

Prior to 2000, government spending for rice focused on public and quasi-public goods. From 2001 onwards, it ramped up spending on a price support scheme in the form of a paddy pledging program. The scheme set a paddy price that was 100 percent of the market price in 2001, rising to 150 percent of the market price by 2011 (Poapongsakorn and Pantakua 2014).

Vietnam

Government provides subsidized production loans and storage services to stabilize farmgate prices. Since 2009, it has also exempted farmers from paying irrigation service fees. Subsidies are also available for development of new paddy rice land. Subsidized provision of farm and postharvest equipment is also folded into various extension and farm assistance schemes (OECD 2015). While numerous reforms have been pursued since the transition from central planning in the late 1980s, nonetheless, there remains a regime of administrative controls, direct payments, and input support (Van 2016).

Other domestic measures with significant impact on the rice economy are management regimes over natural resources, regulations on land use, as well as product grades and standards.

Aside from rice expenditure programs, governments also affect the rice economy by taxes, regulations, and other interventions. Of these, management of natural resources, as well as regulations on product safety, grades, and standards, are prevalent in SEA. Water use policies determine access to water for rice production, particularly water found in surface water bodies such as rivers and lakes, as well as underground water sources. A special case of resource management measure is land use regulation—nearly all countries implement restrictions on conversion of agricultural land. For example, Vietnam reserves 3.8 million ha for rice cultivation, or 90 percent of cultivated paddy land (Jaffee and Tuan 2014).

Food safety laws and regulations throughout ASEAN seek to ensure that safe food is produced throughout the agricultural value chain. Food safety is also a consideration in rice grades and standards, together with other indicators of quality such as proportion of broken grains, presence of impurities, and the like. Thailand is one Southeast Asian nation, which imposes mandatory grades and standards for rice under the regulation of its Ministry of Commerce. The exception is when buyer and seller both agree to stipulate their own grades and standards, under the approval of the Ministry.

Border Measures

Foreign exchange controls

Currency overvaluation has been abandoned as an instrument for indirect taxation of agriculture, especially after the Asian financial crisis.

In previous decades, especially in the 1960s–1980s, managed exchange rates were often imposed to overvalue the domestic currency. This served as indirect

transfer of resources from export-oriented sectors (agriculture) to import-competing sectors, usually domestic industries, which were promoted to displace imports. Favored industries were also awarded preferential access to undervalued and scarce foreign currency, as well as state sanctioned credit.

The overvalued exchange rate imposed an indirect burden on agriculture. Estimates of the nominal rate of assistance from the 1960s to the mid-1980s are available for the Philippines, Thailand, and Malaysia. Of the -26.4 percent nominal rate of assistance (NRA) for the Philippines, 88 percent was due to the indirect burden of an overvalued exchange rate. For Thailand, the total burden was higher at -40.1 percent NRA. However, its exchange rate regime was more flexible, accounting for only 37 percent of the total burden. Finally, for Malaysia, the NRA was only -17.6 percent, of which nearly half (47%) was due to the indirect burden of the exchange rate.

However, the unsustainability of distorted foreign exchange and capital markets soon became apparent with the balance-of-payments crisis striking developing SEA in the late 1997–1998. After recovery, the countries in the region generally adopted more flexible exchange rate regimes, drastically reducing the role of indirect border measures on agriculture. Only Myanmar maintains an official exchange rate that remains undervalued compared to the market exchange rate; the latter, though, is widely tolerated by the authorities.

Direct border measures

Direct border measures to restrict inbound or outbound rice trade have become increasingly prominent from the 1990s onward.

In rice exporting countries, governments welcome exports of rice to boost incomes and incentivize production of farmers. However, during abnormal periods of unusually high prices, governments are prone to restrict exports as a food security measure for consumers, as exemplified by the price crisis of 2008. In the case of Vietnam, export contracts require registration with a government body known as the Vietnam Food Association (VFA). In early 2008, export contracts were not signed, effectively prohibiting exports, with the unfortunate effect of destabilizing the world rice market (Dawe and Slayton 2010). In the case of Lao PDR, strict regulations on movement and trade in rice are imposed, both internally (between districts and provinces), as well as internationally. The objective is to ensure no domestic or even local rice food deficit exists, before approving of movement (Eliste and Santos 2012).

Meanwhile, among rice importing countries, an overriding policy objective is rice self-sufficiency. This leads to a heavily protectionist regime, characterized

by high tariffs and NTBs. Indonesia imposes a ban on rice importation during the rice harvest season, implementing it through a state logistics agency known as Badan Urusan Logistik or BULOG. Malaysia confers a monopoly on rice importation on Padiberas Nasional Berhad (BERNAS), a private company, in exchange for maintaining food security stocks of the country. The Philippines confers a state trading enterprise, the National Food Authority (NFA), a monopoly on rice importation in the Philippines. The NFA then implements an NTB in the form of a quantitative restriction (QR) on rice imports.

Despite accession of ASEAN member states to global and regional trade agreements, tariff and non-tariff barriers to rice importation remain high.

All ASEAN Member States (AMS) are also part of WTO, which was established in 1995. The WTO Agreement mandates the conversion of NTBs into import tariffs and imposes disciplines on trade-distorting subsidies and tariffs.

At the regional level, economic integration is advanced under the ASEAN Economic Community (AEC), which entered into force in 2015. The AEC aims for a single market and single production base in the region, characterized by free flow of goods, services, investments, and skilled labor, as well as freer flow of capital. The AEC incorporates the ASEAN Free Trade Area (AFTA) of 1992, which implements the Common Effective Preferential Tariff (CEPT). Under CEPT, an AMS imposes zero tariffs for most products imported from AMS, except for sensitive products, where a maximum rate of 5 percent is permitted. Regional trade is now governed by ASEAN Trade in Goods Agreement (ATIGA), signed in 2009. The ATIGA allows ASEAN member states to impose tariffs for rice even higher than the 5 percent cap. By 2015, tariff rates still ranged from 20 percent (Malaysia) to as high as 35 percent (the Philippines), with Indonesia in-between at 30 percent (Table 12).

NTBs plus tariffs cause a wedge between domestic and border prices. This is measured by the nominal protection rate or total implicit tariff, whose sizes are estimated in 2014 and 2015 in Table 12 (projections for 2016 onward are also shown). The most severe non-tariff barriers are applied by BULOG, followed by NFA. The NTBs in the Philippines likewise account for the elevation in domestic prices in the Philippines, compared to those in rice exporting countries seen in Table 12. In Malaysia, restrictiveness in rice importation is not as intense as in the large importing countries, hence, implicit tariff rates are much lower, but still serious (about 30%).

These figures carry serious implications for food security and nutrition. Whereas, incomes seem to account for much of the undernutrition in

Cambodia, Lao PDR, and Myanmar, lack of affordability of the key staple is a critical constraint to household nutrition in Indonesia and the Philippines. For the latter, rice price inflation has been statistically linked to the increase in childhood stunting in 2015 (Briones 2017).

Table 12. Applied and total implicit tariffs on rice imports, selected SEA countries, 2014–2020

		2014	2015	2016	2017	2018	2019	2020
Indonesia	AFTA	30	25	25	25	25	25	25
	NTB	93	96	93	95	97	99	98
	Total	123	121	118	120	122	124	123
Malaysia	AFTA	20	20	20	20	20	20	20
	NTB	10	8	7	8	9	9	7
	Total	30	28	27	28	29	29	27
Philippines	AFTA	40	35	35	35	35	35	35
	NTB	50	53	51	55	58	61	62
	Total	90	88	86	90	93	96	97

Source: Hoang and Meyers (2015)

ASSESSMENT AND RECOMMENDATIONS

Synthesis

As discussed previously, domestic measures may be broadly classified into provision of public goods, provision of public and quasi-public goods, and imposition of management and regulatory interventions. Meanwhile, border policies vary depending on whether they are open to the international economy, or seek to protect the domestic economy from either foreign supply or foreign demand.

This suggests a classification of policies organized as a matrix of categories for domestic and border measures (Table 13). The topmost row cells denote border measures that, on the first column heading, aim at integrating domestic and world markets; and on the second column heading, aim at insulating domestic markets from global market forces. The first involves judicious controls at the border, e.g., ensuring inbound and outbound products maintain cultural values, and manage risks to human health and the environment. The latter involves export restrictions, as well as tariff and non-tariff barriers to imports, both of which essentially seek to insulate domestic economic agents from the incentives offered by global markets.

Table 13. Classification of developing SEA countries, by domestic and border policy combination

Domestic Measures	Border Measures	
	Integrating	Insulating
Enabling markets	Cambodia Myanmar	
Displacing markets	Thailand	Lao PDR, Malaysia, Indonesia the Philippines, and Vietnam

Source: Hoang and Meyers (2015)

Row cells denote domestic measures that, on the first row heading, aim at enabling markets, and on the second row heading, aim at displacing markets. The former involves provision of public goods and interventions aimed at addressing market failures. The latter involves purchasing and transferring goods already provided by the market to producers and consumers of rice at free or subsidized rates.

These categories, of course, represent an artificial classification scheme involving abstracted types. In reality, domestic measures lie on a continuum from fully enabling markets to fully displacing markets. Similarly, border measures fall on a continuum between being completely integrated with world markets and closure of the border to trade. Nonetheless, the classification scheme is convenient, as long as it is understood that its use will require the analyst to make a substantiated, yet ultimately subjective judgment on the array of prevailing domestic and border measures.

Sorting of border measures seems easier than sorting of domestic measures. Countries closer to the integrating type are Cambodia, Myanmar, and Thailand. These are rice exporting countries that have taken the decision to favor rice producers by subjecting them to world prices, even to the detriment of rice consumers. On the other hand, the rice importing countries, together with Lao PDR, have adopted various policies to insulate their domestic markets.

Sorting of domestic measures is more complicated, owing to the variety of interventions to be evaluated and compared. It seems fair though, to classify Cambodia and Myanmar as being largely public-goods oriented. Thailand was also in this group up to the 2000s. Lao PDR is also in this group. However, it implements stringent internal controls on movement of rice behind the border, as well as across. It thus falls under displacing markets type. Similarly, Malaysia, Indonesia, the Philippines, Vietnam, and now Thailand, fall under this category, owing to heavy reliance on transfers for production support. Thailand's classification is due to the enormous public sector allocation for the paddy rice pledging program.

Directions for Rice Policy

Displacement-type policies, as well as insulation of domestic markets, may have served a purpose when agricultural and related markets including global agricultural trade were underdeveloped. Current economic realities, however, favor reliance on markets, as well as integration of domestic markets with the regional and global economy. Cambodia, Myanmar, and Thailand are to be commended for their adherence to international market integration.

Indonesia, Lao PDR, Malaysia, and the Philippines, on the other hand, should re-examine their border measures and move towards a more integrated rice economy. Likewise, Cambodia and Myanmar are on the right track with their reliance on market allocation. Lao PDR should maintain its orientation towards public goods, but liberalize the movement of rice within the country. Malaysia, Indonesia, and the Philippines, should eschew price support and input subsidies, and orient their expenditure programs towards enabling markets.

What does a policy regime conducive to integrating and enabling markets look like? ASEAN has developed a Vision and Strategic Plan for Food, Agriculture, and Forestry Cooperation 2015–2025, based on seven priority areas. The following six are most relevant to rice policy:

1. Enhance quantity and quality of production with sustainable technologies, resource management systems, and minimize pre- and post-harvest losses and waste;
2. Enhance trade facilitation, economic integration, and market access;
3. Ensure food security, food safety, better nutrition, and equitable distribution;
4. Increase resilience to climate change, natural disasters, and other shocks;
5. Assist resource-constrained small producers, and small and medium enterprises (SMEs), to improve productivity, technology, and product quality, to meet global market standards and increase competitiveness; and
6. Strengthen ASEAN joint approaches on international and regional issues affecting food, agriculture, and forestry sectors.

Integration of domestic markets is clearly in view under Area 2 and 6. To address priority areas 1, 3, 4, and 5, the rice expenditure program should be aimed at improving and disseminating productivity enhancement, technological change, and information systems, as well as the enabling of small rice farmers and SMEs. The last part is crucial under a transforming rice value chain, where markets are becoming globally integrated, and consumers shifting towards higher quality, standards-compliant rice in processed and packaged form.

Enabling small and medium producers may involve some temporary subsidy component for the roll-out of new technologies, processes, and standards, aimed at securing adoption, rather than transferring resources. Transfers to farmers must be done in a targeted manner, supporting poor and food-insecure households, preferably in the form of cash.

It may well be that the scale of expenditure programs will need to be seriously expanded in order to address areas 1 to 6. Indeed, this is the primary drawback of expenditure policy in Cambodia and Myanmar—reliance on market forces appears to have been forced upon them by default, owing to fiscal constraints.

Indeed, higher levels of development resources for the rice sector seem associated with greater tendency towards transfer-oriented domestic measures and protectionism. It seems fitting to conclude this section with some thoughts on the political economy of rice policy.

As an economy develops, farmers are able to organize more effectively, political lobbies form, consumers devote a lower share of their household spending on rice and other key staples, and the economic structure changes towards non-agricultural goods. Farmers will feel left behind in the process of development, and will agitate for government support and protection. Consumers in rice importing countries are far less able to organize to resist politicized price-setting in rice markets. Government is able to collect more tax revenues, and is able to increasingly meet political demands for intervention. In democratic countries especially, politicians are prone to curry favor from rural voters by adopting populist measures, rather than policies grounded on economic rationality and long-term sustainability.

The political economy of rice policy warns Cambodia and Myanmar of challenges facing their policymakers to stay the course, even as resources for rice sector development are being expended, as it inevitably must, over the coming decades. The political economy also points to the pitfalls confronting reform in Lao PDR, Indonesia, the Philippines, Thailand, and Vietnam. Champions of reform will need every bit of support, including strong evidence-based policy research on the rice economy.

CONCLUSION AND DIRECTIONS FOR FURTHER RESEARCH

Summary and Recommendations

This background paper has profiled the rice economy in developing SEA, as well as policies being implemented by member states. The rice importing countries (Malaysia, Indonesia, and the Philippines), together with Lao PDR and Vietnam, adopt border measures to insulate their local rice markets. On the contrary, the remaining rice exporters (Cambodia, Myanmar, and Thailand) are oriented toward integrating local with regional and global markets. Meanwhile, most countries are heavily interventionist behind the border. Malaysia, Indonesia, the Philippines, Thailand, and Vietnam emphasize price support and input subsidies, while Lao PDR controls domestic inter-regional trade in rice.

Assessment of these regimes suggests the following recommendations for developing SEA, with respect to internal, domestic measures:

- Re-orient subsidies towards accelerating innovation and providing start-up support for farmers in becoming agri-entrepreneurs. The overall thrust should be empowerment of farmers and the private sector.
- Focus public expenditures towards public goods, namely: R&D, extension activities, information systems, provision of business services, and capacity building for meeting the challenges of global competition and climate change.
- Ensure that public investments take into consideration building climate resilience among rice farmers and their communities.

In the spirit of ASEAN Economic Community's vision of a single market and single production base, and in line with relevant ASEAN agreements, the following recommendations are in order with respect to border measures:

- Continue exploring further trade integration and competitiveness initiatives in rice.

- Strengthen measures to build confidence in regional trade, such as policy dialogue and guarantees on access to supplies and markets.
- Engage actively in regional cooperation initiatives in food security, such as monitoring, food security information systems, and emergency food reserves.

Knowledge Gaps and Agenda for Policy Research

Our review suggests that much is already known about the overall profile of rice policies and their likely economic and social impact. However, many of the specifics are admittedly sparse. This background paper concludes by offering some thoughts on knowledge gaps and setting an agenda for policy research on the rice sector.

A theory of change of policies and programs identifies inputs, which lead to outputs. These outputs have intended outcomes and impacts. This broadly subdivides the set of knowledge gaps into the upstream and the downstream portions.

Upstream, more systematic information needs to be generated on inputs and activities of policy interventions and the resulting accomplishments. Producer support estimates should be available over a wider time series, following OECD methodology, with disaggregation into budgetary support and market price support.

Downstream, deeper evidence-based analysis should be applied to measure outcomes of various policy interventions, and further down the line, on the changes in well-being at the household level. Evidence must be gathered and analyzed with the latest rigorous techniques, such as randomized trials, quasi-experimental evaluation, economic modeling, and similar methods toward disentangling causes and effects.

Aside from outcome and impact measurement, the analytical method may probe even deeper to provide stronger and more actionable decision support for policymakers in SEA. Habito (2016) outlines knowledge gaps under several major headings, most of which turn out to be useful for rice, namely: production, finance, risk, and innovative models.

Production

Currently, there are production systems such as Integrated Pest Management (IPM), alternate wet and dry (AWD) irrigation, system of rice intensification,

organic farming, and the like, which propose alternative and supposedly more sustainable production systems. Deeper research is needed on nature of the trade-offs between increased rice production (an inevitable trend in the coming decades) and environmental impact. This is especially applicable to rice, which is the heaviest user of water in agriculture, as well as fertilizers and pesticides. Rice production imposes, as well, the greatest transformation in land use, and has a high carbon footprint in the form of methane emissions.

Finance

Policies have perennially focused on delivering sufficient finance for rice farmers. Given the failures of subsidy-based schemes, the search is now on for alternative formal financial systems that are, nevertheless, inclusive of small farmers and SMEs in the rice value chain. Some useful models are proposed towards financing the rice value chain (e.g., warehouse receipts, microfinance), but scalability of models is unknown.

Risk

The new world of market and climate-induced uncertainty has reinvigorated interest in risk instruments such as calamity relief, crop insurance, and alternative schemes such as weather-based insurance and futures markets. However, little is known about their effectiveness in facing the challenge of economic and climate resiliency, as well as the proper role, if any, of public support and regulation in their establishment and sustainability.

Innovative models for supporting small farmers and SMEs

Innovative models include public-private partnerships over the rice value chain, as well as inclusive business approaches. These innovations are at a nascent stage, but they offer promise. Again, scalability, principles of effective design over varying socio-economic conditions and agro-climates, will gain much from a governance and institutions agenda in rice policy research.

REFERENCES

- Arshad, F. 2016. "Paddy and rice policy in Malaysia: Some observations." Paper presented at the 14th Policy Roundtable Discussion on Rice Policies Across Southeast Asia, SEARCA, Los Baños, Laguna, Philippines, 8 December 2016.
- ASEAN Ministers of Agriculture and Forestry (AMAF). 2015. Vision and Strategic Plan for ASEAN Cooperation in Food, Agriculture and Forestry (2016–2025). <http://www.aseanfoundation.org/files/publications/vision-and-sp-faf-final.pdf>
- Briones, R. 2017. "Food (In)security and the Price of Rice Self-Sufficiency." In *Unintended Consequences: The Folly of Uncritical Thinking*, ed. V. Paqueo, A. Orbeta, and G. Llanto. Quezon City: Philippine Institute for Development Studies.
- Briones, R., E. Antonio, C. Habito, E. Porio, and D. Songco. 2017. *Food Security and Nutrition in the Philippines Strategic Review*. World Food Programme and Brain Trust Inc., Quezon City. https://docs.wfp.org/api/documents/WFP-0000015508/download/?_ga=2.25079610.1004885139.1517537192-1408643415.1515992569. Accessed 30 December 2017.
- Chen, Z., and B. Dame. 2015. Rice, climate change, and adaptation options. *Rice in the Shadow of Skyscrapers: Policy Choices in a Dynamic East and Southeast Asian Setting*, eds. D. Dawe, S. Jaffee, and N. Santos. FAO, World Bank Group, and International Rice Research Institute, Rome.
- Dawe, D., and T. Slayton. 2010. The World Rice Market Crisis of 2007–2008. In *The Rice Crisis: Markets, Policies and Food Security*, ed. D. Dawe. London: FAO and Earthscan.
- Eliste, P., and N. Santos. 2012. *Lao People's Democratic Republic Rice Policy Study 2012*. Rome: FAO.
- FAO (Food and Agriculture Organization of the United Nations). 2014. Country Fact Sheet on Food and Agriculture Policy Trends. Rome: FAO. <http://www.fao.org/docrep/field/009/i3761e/i3761e.pdf>. Accessed 31 December 2016.
- . 2017. FAO GIEWS FPMA Tool online database. <http://www.fao.org/giews/food-prices/tool/public/#/dataset/domestic>. FPMA Tool version 3.5.0, 2017–11–07. FAO Global Information and Early Warning System (GIEWS). Accessed 24 May 2017.
- . 2017. FAOSTAT (Food and Agriculture Organization of the United Nations Statistics Division) online database. <http://www.fao.org/faostat/en/#data>. Accessed 24 May 2017.

- Habito, C. F. 2016. "Toward a 'Rich' ASEAN Agricultural Community." In *Farms, Food, and Futures: Toward Inclusive and Sustainable Agricultural and Rural Development in Southeast Asia*, eds. C. Habito, D. Capistrano, and G. Saguiguit. Los Baños, Laguna: Southeast Asian Regional Center for Graduate Study and Research in Agriculture.
- Hoang, H., and W. Meyers. 2015. "Price stabilization and impacts of trade liberalization in the Southeast Asian rice market." *Food Policy* 57(1): 26–39. <https://doi.org/10.1016/j.foodpol.2015.07.009>
- IFPRI (International Food Policy Research Institute). 2016. *Global Nutrition Report 2016, From Promise to Impact: Ending Malnutrition by 2030*. Washington DC: IFPRI. <http://ebrary.ifpri.org/utils/getfile/collection/p15738coll2/id/130354/filename/130565.pdf>
- IGC (International Grains Council). 2015. Five-year global supply and demand projections. <https://www.igc.int/en/markets/5yeardownload.aspx?mode=download>. Accessed May 24, 2017.
- Intracen (International Trade Center). 2017. Trademap. www.trademap.org. Accessed 24 May 2017.
- Jaffee, S., and N. Tuan. 2014. "Does Protecting "Rice Land" for National Food Security Harm Farmer Prosperity?" In *Rice in the Shadow of Skyscrapers: Policy Choices in a Dynamic East and Southeast Asian Setting*, eds. D. Dawe, Jaffee, and N. Santos. Bangkok: FAO Regional Office for Asia Pacific.
- John, A. 2014. "Price relations between international rice markets." *Agricultural and Food Economics* 2:1. <https://agrifoodecon.springeropen.com/articles/10.1186/2193-7532-2-1>
- Moya, P.F., F.H. Bordey, J.C. Beltran, R.G. Manalili, C.C. Launio, A.B. Mataia, A.C. Litonjua, and D.C. Dawe. 2016. "Costs of Rice Production." In *Competitiveness of Philippine Rice in Asia*, eds. F.H. Bordey, P.F. Moya, J.C. Beltran, D.C. Dawe. Science City of Muñoz (Philippines): Philippine Rice Research Institute and Manila (Philippines): International Rice Research Institute.
- OECD (Organisation for Economic Co-operation and Development). 2015. *Agricultural Policies in Viet Nam 2015*. Paris: OECD Publishing. doi: <http://dx.doi.org/10.1787/9789264235151-en>
- OECD and FAO. 2016. *OECD-FAO Agricultural Outlook 2016-2025*. Paris: OECD Publishing. doi: http://dx.doi.org/10.1787/agr_outlook-2016-en
- Oliveros, N. 2016. "Budget and Finance." In *A Rapid Assessment of the Agriculture and Fisheries Modernization Act (AFMA)*. Pasig City, Philippines: DAP.
- Poapongsakorn, N., and K. Pantakua. 2014. "Assessing the Thai rice pledging policy: its performance and social costs." *World Food Policy* 1(2): 2–29.

- Rosegrant, M., J. Koo, N. Cenacchi, C. Ringler, R. Robertson, M. Fisher, C. Cox, K. Garrett, N. Perez, and P. Sabbagh. 2014. *Food Security in a World of Natural Resource Scarcity: The Role of Agricultural Technologies*. Washington, D.C.: International Food Policy Research Institute (IFPRI). doi: <http://dx.doi.org/10.2499/9780896298477>
- Schiff, M., and A. Valdes. 1992. "The Political Economy of Agricultural Pricing Policy." *A Synthesis of the Economics in Developing Countries*. Baltimore, MA: Johns Hopkins University Press for the World Bank.
- Suryana, A. 2016. "Rice policies and food security in Indonesia." Paper presented at the 14th Policy Roundtable Discussion on Rice Policies Across Southeast Asia, SEARCA, Los Baños, Laguna, Philippines, 8 December 2016.
- Tin Htut. 2016. "Myanmar Rice Sector Development Strategy." Paper presented at the 14th Policy Roundtable Discussion on Rice Policies Across Southeast Asia, SEARCA, Los Baños, Laguna, Philippines, 8 December 2016.
- Van, T. 2016. "Vietnam Rice Policy: Assessment and Recommendations." Paper presented at the 14th Policy Roundtable Discussion on Rice Policies Across Southeast Asia, SEARCA, Los Baños, Laguna, Philippines, 8 December 2016.
- UN, Department of Economic and Social Affairs, Population Division. 2015. *World Population Prospects: The 2015 Revision, Volume I: Comprehensive Tables*. New York: UN.
- World Bank. 2016. World Development Indicators. www.data.worldbank.org accessed 24 May 2017.
- WTO (World Trade Organization). 2014. *Trade Policy Review: Myanmar*. Geneva: World Trade Organization.
- Zorya, S., and N. Santos. 2014. "Improving the Quality of Agricultural Public Expenditures in Asia." In *Rice in the Shadow of Skyscrapers: Policy Choices in a Dynamic East and Southeast Asian Setting*, ed. D. Dawe, S. Jaffee, and N. Santos. Bangkok: FAO Regional Office for Asia Pacific.

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