AGRICULTURAL TRANSFORMATION & FOOD SECURITY 2040

ASEAN Region with a Focus on Vietnam, Indonesia, and Philippines

Regional Food Security Study

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Contents

Abbreviations

ADB	Asian Development Bank
ACO	ASEAN Commodity Outlook
AFET	Agricultural Futures Exchange of Thailand
AFSIS	ASEAN Food Security Information System
AFSRB	ASEAN Food Security Reserve Board
AFTA	ASEAN Free Trade Area
AIFS	ASEAN Integrated Food Security Framework
AMIS	Agricultural Market Information System
ASEAN	Association of Southeast Asian Nations
APTERR	ASEAN Plus Three Emergency Rice Reserve
AERR	ASEAN Emergency Rice Reserve (forerunner of APTERR)
ATIGA	ASEAN Trade in Goods Agreement
EAERR	East Asia Emergency Rice Reserve
EWI	Early Warning Information
FAO	Food and Agriculture Organisation of the United Nations
G20	Group of Twenty
GHI	Global Hunger Index
HDR	Human Development Report
IEFR	International Emergency Food Reserve
PSC	Project Steering Committee
PPP	Private-Public Partnership
SPA-FS	Strategic Plan of Action-Food Security
WTO	World Trade Organisation

1. Overview

A massive price surge swept the rice market in early 2008. Even as the worst of the crisis had passed by mid-year, rice prices remained elevated compared to pre-crisis levels. Subsequently, the Association of Southeast Asian Nations (ASEAN) Summit of 2009 pledged to "embrace food security as a matter of permanent and high priority policy." It emphasized the need for enhanced ASEAN cooperation as a means to ensure food security; the framework of cooperation is fleshed out in the ASEAN Integrated Food Security Framework (AIFS), supported by a Strategic Plan of Action (SPA-FS).

The AIFS defines food security as a state in which all people, at all times, have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life.[1] This is further unpacked in terms of the following dimensions: availability, accessibility, stability, and utilization. To achieve food security, the SPA-FS identifies the following components:

1. Food security arrangements and emergency short-term relief;
2. Sustainable food trade development;
3. Integrated food security information system; and
4. Agricultural innovation.
5. This paper evaluates how regional cooperation initiatives address the aforementioned dimensions of food security. Here we focus on short-term threats to food security: traditionally these threats have been equated with natural disasters and other calamities, which reduce food supplies or disrupt food distribution. Since 2008, short-term food insecurity has been increasingly associated with market uncertainties, mainly large and sudden price spikes owing to destabilizing actions by key market players, even in the absence of a calamity. We therefore focus on AIFS components 1 to 3, i.e., related to short-term emergency relief, expansion of conducive food trade, and provision of food security information. For reasons discussed below, the paper mostly focuses on rice, though other commodities shall be considered.

The rest of this paper is organized as follows: Section 2 presents the framework and action plan for food security cooperation in Southeast Asia, together with the global and national context. Section 3 tackles the initiative on emergency rice reserves, the first substantive intergovernmental agreement arising from the AIFS-SPA-FS. Section 4 focuses on the information and coordination components of food security cooperation in ASEAN. Section 5 provides conclusions on regional food security.

1 The same as the World Food Summit 1995 definition.

2. Food Security Cooperation: Content and Context

2.1. Global initiatives

International food security cooperation has long been a preoccupation of the global community. The founding of the FAO in 1943 was one of the first tangible outcomes of international cooperation. The next turning point was the world food crisis of 1972–1974: the first World Food Conference was convened in 1974, and in 1975 the UN General Assembly established the International Emergency Food Reserve (IEFR) (Shaw, 2005). At the regional level, ASEAN (then composed of Indonesia, Malaysia, Philippines, Singapore, Thailand) established the ASEAN Food Security Reserve under an inter-governmental agreement in 1979.

After the next major food crisis in 2007–08, the World Food Summit of 2009 acknowledged that the the global food crisis had catalyzed stronger international coordination and governance for food security. Specifically it reaffirmed *the necessity of refraining from unilateral measures not in accordance with the international law and the Charter of the United Nations and that endanger food security.* The Summit endorsed open markets as an "essential element" of global food security.

Most recently, the G20 declaration of 2011 tackled the issue of food price volatility and identified, among others, the following objectives:

1. increasing market information and transparency;
2. reducing the effects of price volatility for the most vulnerable;
3. istrengthening international policy coordination; and
4. improving the functioning of agricultural commodity derivatives' markets.

The G20 launched some specific mechanisms, namely:

1. the Agricultural Market Information System (AMIS);
2. a Rapid Response Forum to improve policy coordination;
3. the development of market-based risk management tools for vulnerable countries, firms, and farms; and
4. the piloting of an emergency humanitarian food reserve.

The AMIS is but one of several global market information systems related to food security. Food and Agriculture Organization (FAO) has been providing agriculture, food, and related information, especially through the Global Information and Early Warning System (GIEWS). Similarly the International Grains Council was established both to monitor implementation of the International Grains Agreement and to promote transparent reporting of grain flows and prices among member countries; only in 2009 did it include rice within its ambit.

2.2. Regional context

Regional initiatives

Table 1 summarizes regional food security cooperation and related initiatives at the national and global levels, together with emerging arrangements or proposals. These are discussed in terms of the main headings (i) and (ii) along the rows.

i) Emergency short-term relief. Discussions at the global level find parallels in regional cooperation in food security; arguably regional cooperation has progressed much further, probably because of far lower costs of coordinating a smaller group of neighbouring countries. Under the emergency short-term relief component of the AIFS, one activity is establishment of a long-term mechanism for ASEAN Plus Three Emergency Rice Reserve (APTERR).

The forerunner of APTERR is the ASEAN Emergency Rice Reserve (AERR), which consists of rice stocks that have been pledged or earmarked by member countries to meet emergency requirements in the region. Initially the AERR was set at 50,000

Table 1 **Summary of regional food security cooperation and related initiatives**

AIFS component	Past initiatives			New/emerging
	National	Global	Regional	
(i) Emergency short term relief	Buffer stock Price stabilization	International Emergency Food Reserve	AERR, EAERR	APTERR Futures market
(ii) Conducive food trade and information exchange	State trading enterprises	WTO	Preferential trading agreements (AFTA)	ASEAN Economic Community Rice trade forum

tons, distributed across the five original member countries. With additions to the roster of ASEAN member states, the AERR grew to 87,000 tons. The amount of reserves has been criticized as being too small, i.e., just 0.4 days of consumption of ASEAN countries (Pacific Consultants, 2002). However 50,000 tons is about 24 percent of intra-ASEAN imports in 1975, or 16 percent of the average of 1973–1975.[1] As the the AERR was viewed as supplementary to regular importation, the size of the reserve at the time seemed appropriate given the constraints of making international commitments for a politically sensitive commodity.

In the 1970s, food security was associated explicitly with the dimension of food availability (and stability); hence the term was defined by the 1974 Conference as *availability at all times of adequate world food supplies of basic foodstuffs to sustain a steady expansion of food consumption and to offset fluctuations in production and prices.*[2] At one extreme are mass starvation scenarios, typically associated with disasters (e.g., drought) or war.

This perspective directly influenced the definition of emergency under the AFSR Agreement, namely: *the state or condition in which an ASEAN Member Country, having suffered extreme and unexpected natural or man-induced calamity, is unable to cope with such state or condition through its national reserve and is unable to procure the needed supply through normal trade.* The calamity trigger, whether natural or man-made (e.g., war) is made explicit. Moreover, the definition is carefully crafted to assign the domestic emergency reserve as the frontline defence against emergency, as well as to prevent displacement of normal imports/exports of rice.

The AFSR Agreement established an ASEAN Food Security Reserve Board (AFSRB) to oversee implementation of the Agreement. It is also vested with an information function, i.e., member countries are tasked to submit regularly to the Board information on government stockholding policies, programmes, and other aspects of food supply and demand situation, with a focus on rice.

In fact, until 2000 no release was made from the AERR to address the emergency requirement. This prompted a review of the mechanism in 2001, and the initiation of a pilot scheme in 2003 at the level of ASEAN Plus Three, called the East Asia Emergency Rice Reserve (EAERR). The reserve incorporated additional earmarks from the Plus Three countries, expanding the regional reserves to 787,000 tons. The earmarked stocks of the EAERR are shown in Table 2. It incorporates the AERR *in toto*; the bulk of the reserves are, however, contributed by the Plus Three countries (sub-total of 700,000 tons). The EAERR was administered by a project steering committee (PSC) consisting of representatives from each member country. It was funded by the government of Japan with in-kind contributions from the other members.

The EAERR also incorporated a new type of reserve called "stockpiled emergency rice reserve" (or simply stockpile), consisting of stocks or cash effectively under control of the PSC (rather than

1 Based on figures provided in Hangpongpandh (1982). Hanpongpandh, Somporn (1982). "Modeling the Impact of the ASEAN Food-Security Reserve." In Anthony Chisholm and Rodney Tyers, Eds., Food Security: Theory, Policy and Perspectives from Asia and the Pacific Rim. Lexington, Mass: Lexington Books.
2 United Nations. 1975. Report of the World Food Conference, Rome 5–16 November 1974. New York.

Table 2 **Earmarked emergency rice reserves of the APTERR (t)**

Country	Amount
ASEAN	
Brunei	3,000
Cambodia	3,000
Indonesia	12,000
Lao PDR	3,000
Malaysia	6,000
Myanmar	14,000
Philippines	12,000
Singapore	5,000
Thailand	15,000
Viet Nam	14,000
Plus Three	
China, People's Republic of	300,000
Korea, Republic of	250,000
Japan	150,000
Total	787,000

Source: apterr.blogspot.com/2011/10/southeast-asia-to-start-emergency-rice.html.

earmarks that remain under the control of the member countries), to be used as humanitarian food assistance for victims of disasters.

The EAERR ended in 2010. In its place is the ASEAN Plus Three Emergency Rice Reserve (APTERR), which formalizes the EAERR earmarks as a permanent commitment. The APTERR was formalized as an intergovernmental agreement in October 2011.[3] The APTERR also adopted the concept of a stockpile (in cash or in kind). Unlike the earmarked stocks, stockpiled emergency reserves are voluntary and are not subject to numerical commitment or obligation.

(ii) Trade coordination and market information. As with other international initiatives, **the AIFS ascribes a great significance to accurate market information and trade coordination.** Two activities under development of sustainable food trade (component 2) are: full implementation of ASEAN Trade in Goods Agreement (ATIGA) provisions for food trade (see Box 1); and to review and analyse international/ regional trade information, including prices, quantities traded, distribution and logistics. The AFSRB has been organized as a technical working group to discuss some proposals, namely: convening of a rice trade forum for information exchange and policy coordination; and examining the feasibility of managing price risk through rice futures market and other measures.

(iii) Early warning information. Lastly, the early warning and information system (component 3) at the regional level is mainly implemented through the ASEAN Food Security Information System (AFSIS), a pilot project of ASEAN and Japan with participation of China and Korea. The aim of AFSIS is to facilitate food security planning, implementation, monitoring and evaluation in the ASEAN region through the systematic collection, organization, management, analysis and dissemination of food security data and information. This entails:

1. capacity building;
2. improved systems and methods of collecting information;

3 The Agreement is awaiting entry into force (requiring six ASEAN countries and one Plus Three country).

Box 1 ASEAN Free Trade Areas

The ATIGA provides for phased elimination or reduction of all import duties for all goods (with some exceptions), under the ASEAN Free Trade Area (AFTA). An explicit exception is made for rice and sugar under a Protocol for Special Consideration. The Protocol calls for bilateral agreements between an importing country, and a rice and/or sugar exporting country. The ATIGA also provides for trade facilitation and harmonisation. ASEAN as a group have entered into various expansion agreements for trade, namely: ASEAN-China Free Trade Area (ACFTA), ASEAN-Indian Free Trade Area (AIFTA), ASEAN-Japan Comprehensive Economic Partnership (AJCEP), and ASEAN-Australia and New Zealand Free Trade Area (AANZFTA). ASEAN also is moving towards a single economic community by 2015, following an ASEAN Economic Community blueprint (AEC), which calls for a single market and production base. Among the priority foci for integration are enhancement of trade among ASEAN member countries, and long-term competitiveness of their food and agriculture products. By harmonizing their standards, quality and trade certifications, their agricultural products are expected to become more globally competitive.

3. better methodologies and techniques for estimating and forecasting food supply and demand; and
4. an information network system to exchange and disseminate statistical data and information.

Importance of rice

Our review of regional initiatives has highlighted the overwhelming importance of rice in regional cooperation. Timmer (2011) has pointed out the contrast between this emphasis, and the declining importance of rice in the global and particularly the Asian market. In 1961, rice accounted for 14.5 percent of GDP for Southeast Asia, and over 0.5 percent worldwide. By 2007 the share had shrunk to just 3.8 percent in Southeast Asia and 0.173 percent worldwide. The share of rice in agricultural output has fallen gradually, from 40 to 32 percent. Likewise, on the consumption side, the share of rice in total calorie intake in Asia has been declining, both on average and by country (except for the Philippines). Similarly, in Southeast Asia, rice no longer plays its traditional role in diets.

In the long-run (i.e., by 2040), it is projected that the typical East Asian diet is likely to be richer in protein, fat, and less dependent on grain or root-based carbohydrates. Driven by greater household purchasing power, agricultural consumption would be increasingly characterized by proliferation of specialty and value-added foods and ingredients (US Grains Council, 2011). The role of rice would likely be eroded further in this scenario.

Nevertheless, at present rice remains a dominant crop (Figure 1). As mentioned previously, it is the most important single source of calories in ASEAN. In the Philippines and Indonesia its share is nearly half, while for Vietnam its share approaches 60 percent. It also remains the largest crop in terms of land area, at least for the VIP countries. In view of the thinness of world rice markets, policymakers have tended to adopt a protectionist stance, targeting either self-sufficiency (for rice deficit countries) or export deflection (for rice surplus countries).

2.3. National context

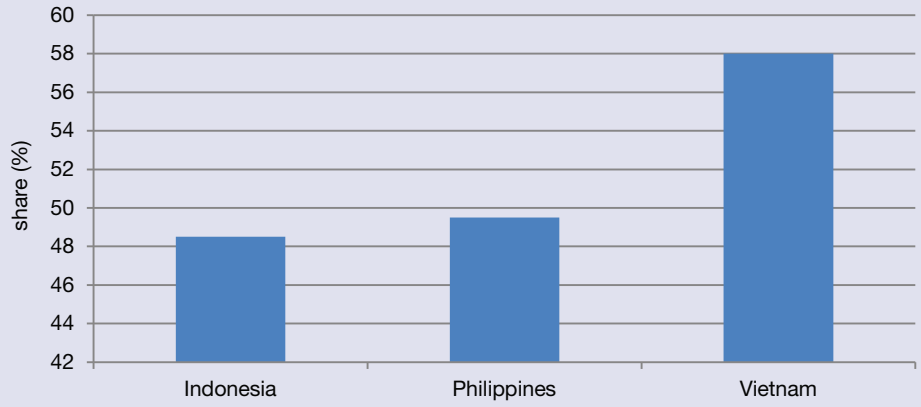
Dimensions of food security

As observed by Rashid, Cummings, and Gulati (2007), by the 1970s, an interventionist food policy regime in grain markets was firmly entrenched in Asia. Governments were directly involved in the procuring-stocking-distribution chain. This involved the following (with varying degrees of application):

1. accumulation and release of buffer stocks to stabilize prices;
2. monopoly controls over international trade;
3. restrictions on movements of grain;
4. cheap credit and access to transportation for the parastatals; and
5. limits on private storage.

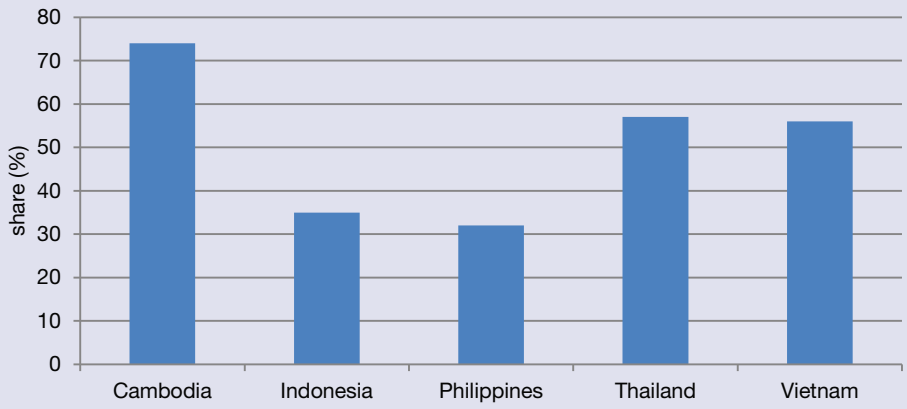
Based on their case study of six countries (Bangladesh, India, Pakistan, Indonesia, Philippines, and Vietnam), they found that until the 1970s, such

Figure 1a **Share of rice in total calore intake and agricultural area: calorie intake**



Source: FAOStat.

Figure 1b **Share of rice in total calore intake and agricultural area: agricultural area**



Source: FAOStat.

a regime may have been necessary, owing to initial conditions of grain markets; however these conditions no longer hold, rendering the interventionist regime obsolete.

The initial conditions are, first: *weak infrastructure and limited flow of price information.* Over the past three decades all indicators of infrastructure and information technology have improved in the VIP countries. Indonesia, for instance, has experienced a nine fold improvement in road length. In all countries ground lines per thousand people has increased nearly fifteen-fold, while mobile phone penetration now exceeds that of ground lines. Hence, various market integration studies almost unanimously fail to detect disintegrated behaviour in rice markets.

The second condition is *risk of adopting new technologies,* which faced farmers at the advent of the Green Revolution. Modern varieties now account for most of cereals grown, hence the risk factor has been overcome.

Third and fourth are: *thinness and volatility of international markets; and inability to participate in the international market.* Today, world grain markets have matured; trade has grown as a percent of

global production and consumption; even rice trade is annually about thirty million tons, far in excess of any one country's historical import requirements. Major importing countries have accumulated sizable foreign exchange reserves, much more than required to finance their food import bill. Additionally, improvements in logistics and reduced transaction costs have increasingly integrated the VIP countries with the world market.

Basically, among the dimensions of food security, **food availability is no longer a pressing issue,** at least under normal conditions. Rather, **what is relevant for developing countries in the region is food *accessibility.*** Among the countries listed in Table 3, purchasing power of households remains low; average per capita income is only around $4,000, compared with $33,000 for countries with high human development. Poverty incidences range from under an eighth of the population (Thailand) to more than a third (Laos). In addition, a substantial proportion of the population, in some cases (Indonesia and Vietnam) larger than the proportion of the poor, are rated as vulnerable to poverty. Not surprisingly, based on the Global Hunger Index (GHI), the countries are rated Serious to Alarming (with only China rated as Moderate).

Timmer (2005) has argued that, in practice, food security in Southeast Asia is associated with rice price stability (more than the idealized, multi-dimensional concept adopted by the World Food Summit). Since 2008, however, these countries have gone further and associated food security with no less than complete insulation of the domestic rice market from world prices.

Protection of domestic suppliers: importing countries

The argument behind protection of domestic rice producers for importing countries is thinness of global rice trade. The share of exported rice in global output is about 7 percent, compared with 11 percent for maize and 20 percent for wheat. Furthermore, since the late 1990s there appears to be increasing degree of volatility in world food prices (FAO, 2011). In the case of rice, the increased volatility, as exemplified by the 2008 crisis, was largely due to trade shocks on both export and import sides (Headey, 2010).

However, this measure of a "thin" market is based on *actual* trade; **what is relevant for food availability at the global level is *potential* trade.** The latter may not be easy to precisely estimate, but some idea can be seen from the amount of rice stocks, which can be readily converted into trade flows. Using figures from FAO (2012) for rice, world trade flow plus available stocks (141 million tons) is 37 percent of world production. Even if amount of stocks is limited to the main exporting countries (India, Thailand, Vietnam), equivalent to 30.2 million tons, the

Table 3 **Income and poverty indicators, and global hunger index (GHI of selected Asian countries)**

	Per capita income, 2009 (PPP $)	Poverty incidence, 1.25/ day line (%)	Population vulnerability to poverty (%)	GHI	GHI category
Cambodia	1,915	28.3	21.3	20.9	Alarming
China	6,828	15.9	6.3	6.0	Moderate
Indonesia	4,199	18.7	22.2	13.2	Serious
Laos	2,255	33.9	14.1	18.9	Serious
Myanmar	--	--	13.4	18.8	Serious
Philippines	3,542	22.6	9.1	13.0	Serious
Thailand	7,995	10.8	9.9	8.5	Moderate
Viet Nam	2,953	13.1	18.5	11.5	Serious

Source: Income, poverty indicators from HDR (2011); GHI from von Grebmer et al.(2010).

ratio is still 14 percent, double the current trade-to-output ratio.

Moreover, the intangible security benefit of self-sufficiency comes at a very tangible cost, given the lack of comparative advantage in countries such as Indonesia and the Philippines in rice. In the former, the nominal rate of assistance (the nominal protection rate incorporating input subsidy) in the 2000s (up to 2004) is about 19 percent (Fane and Warr, 2009). Since then, the government has all but banned imports, except for occasional government-to-government deals by BULOG, the public logistics agency. Input subsidies have also soared, reaching about 12 percent of value of rice production in 2009 (based on figures provided in ADB, 2011a).

For the Philippines, Gergely (2010) estimated the domestic resource cost (DRC) of rice as of 2010 at around 2.60. That is, cost of domestic production is 2.6 units per unit of foreign currency saved. Alternatively, he estimated that the domestic wholesale price of (irrigated) rice is 42 percent above its import parity price. Despite low social returns, farmers find it profitable to produce rice owing to various distortions, namely:

1. high domestic prices maintained by import barriers;
2. subsidized provision of irrigation service; and
3. subsidy on hybrid rice seed.

Subsidies account for 28 percent of economic cost and are borne by taxpayers.

Anderson et al (2012) found that, in the absence of higher agricultural protection, rice self-sufficiency ratios would tend to a long term decline in Indonesia and Philippines, while stable for Vietnam (Table 4). The decline can be arrested somewhat for the importing countries, but only at the cost of lower per capita consumption compared to the base case. On the other hand, real per capita consumption is projected to be higher with global trade liberalization (i.e. reduced barriers to trade).

In short, a self-sufficiency policy is too blunt and heavy an instrument for protecting against outlier events (e.g., failure of international rice trade). The **real rationale for for domestic protection and self-sufficiency policy is populist politics.** As explained in Alavi et al (2011, p.34):

> Behind the rice sector policies, in particular, and the damaging immediate responses lies the perception, deeply embedded in the Asian culture and political psyche, that food security is best defined as self-sufficiency, especially in rice. That definition, understandable in an era of frequent famine and erratic maritime transport, is badly outdated. Establishing a new definition of food security, the study argues, is the essential first step to effective policy making in the production, processing, marketing, and trading of rice in Southeast Asia.

Such a new operational definition of food security should embrace rather than shun the elements of the AIFS already endorsed by the ASEAN leaders.[4] These elements include: widening and sustaining food availability through the market system, maintaining food affordability for the poor and vulnerable, and preparedness for short-term emergencies.

In the long run, a decline in the importance of rice in diets and livelihoods (see Section 2.2) might be seen as eroding the status of rice as a political commodity. On the contrary, the political status of rice may be sustained or even strengthened in the next couple of decades. Southeast Asian countries would likely remain in a protracted middle income period, during which Hayami's (2004) "agricultural disparity problem" holds sway. Policymakers' primary concern would be to alleviate the *relative* poverty of farmers, even as bottom income groups mostly escape absolute poverty in the course of economic development. The experience of Thailand today, and Japan in the inter-war period attest to the gravity of this problem; even now, rice is a major driver of trade barriers and subsidies policies in advanced East Asian countries (e.g., Japan and Korea).

Distortions in rice exporting countries

Distortions are also rife in the exporting countries. In the case of Thailand, the thrust of the distortions are similar to that of importing countries, which is to favor domestic producers. The primary instrument for intervention over most of the 2000s to the present

4 We refer to "operational definition" in contrast to the "standard definition" (stated in the text) which Timmer has rightfully criticized as being unworkable.

Table 4 Results of projections with a CGE model, base case and alternative scenarios

	Change in base case, 2004–2030		Change relative to base case 2030		
			Higher protection		Reduced protection
	Rice self sufficiency ratio	Real per capita consumption (%)	Self-sufficiency ratio	Real per capita consumption (%)	Real per capita consumption (%)
Indonesia	-0.03 [0.99]	113	0.03	-1	1.6
Philippines	-0.11 [0.93]	140	0.05	0	3.4
Vietnam	0.00 [1.22]	251	-0.06	0	5.3

Note: figures in brackets denote self-sufficiency ratio data in base year 2004.
Source: Anderson et al (2012).

is the paddy pledging program.[5] In this scheme, farmers borrow from government and pledge their paddy as collateral, with the price for mortgaged rice set at government rates. Since 2001 the rate was raised 20 to 30 percent above market prices, hence converting the scheme to one of paddy procurement at an elevated price floor. By 2008–2009 government stocks bloated to about 8.5 million tons. The scheme became an instrument not only to deliver generous subsidies, but also to extract rents in favor of millers, traders, politicians, and even preferred exporters who corner the market for releases from government stocks (Poapongsakorn, 2010). In 2011, the price was set at THB 15,000 per ton or the corresponding to $800 for milled equivalent, which is far above the world market price, and is widely seen as driver of high world prices and a disaster for the Thai export industry.

For Vietnam, the thrust is also to protect domestic markets, but directed towards keeping rice affordable to consumers. Up to the late 1990s the government restricted exports by a quota system, which was relaxed and then abolished in 2001, leading to dramatic export growth (Ryan, 2002). However, controls are still maintained through approval of export permits and mandatory registration of export contracts. The latter was the mechanism by which new export sales were effectively halted in early part of 2008. Such erratic policies have seriously worsened the business climate for rice exports, apparently to no avail as domestic prices remain much higher and more volatile than they were a decade ago (Tsukada, 2011).

Direct approaches to address gaps in international trade

The alternative to pursuing self-sufficiency is deploying more direct instruments for addressing shortfalls in international trade during emergencies. One is to guarantee shipments of food, say from reserves of another country, during a crisis period. This is the concept behind an international emergency reserve, discussed in Section 3. The other is to address at a policy level the uncoordinated actions of trading countries, such as unilateral export restrictions (for food surplus countries) or stock build-up (for food importing countries). This is the concept behind the rapid response forum of G20 and the Rice Trade Forum in ASEAN (see Section 4).

5 There was a brief respite in 2009–2011 as government substituted an income guarantee scheme in lieu of paddy pledging. The scheme effectively extended a price insurance to farmers without posing direct competition to traders; unlike paddy pledging, it led to expanded rice supplies.

3. Emergency Rice Reserves

3.1. Theory of storage and emergency reserves

Private storage and emergency reserves

The theory of private storage under competitive conditions has been fairly well understood since Gustafson (1958), as elaborated by Wright and Williams (1982, 1984). The following simplification is from Wright (2011). Let t index the time period, the price of rice, the storage cost per unit (assumed fixed), r the interest rate, E the expectations operator, the consumption, the harvest, the stocks of the previous period carried over to the current period, and the tilde ( ) denote a random variable. Note that this is a rational expectations model, i.e. at equilibrium, subjective expectations of future price is identical to model expectations.

When storage is strictly positive, the price-taking trader carries over positive stocks into the next period up to the point where marginal revenue equals marginal cost:

Each trader's behaviour impacts on the market, which introduces the necessary curvature into the problem to reach a solution. Upon substitution, the efficiency condition leads to the following:

Stocks tend to be lower when the interest rate is higher, storage costs are higher, and when prices are expected to be stable. The competitive storage condition introduces a crucial asymmetry: storage is not bounded from above, but is bounded from below (there is no borrowing from the future). Hence storage can eliminate negative price shocks (from extremely large harvest) but may fail to eliminate positive price shocks (from extremely low harvest).

Rationale of public emergency stocks

This highlights the strengths and weaknesses of the private approach to storage: it allows for "efficient" level of storage, on an *ex ante* basis assuming normal market conditions. However, ex post an extreme shock, by inflicting drastic price increases may have real humanitarian implications. As Wright (2011, p. 39) says, "When stocks run out, aggregate use must match a virtually fixed supply in the short run. Less grain goes to feed animals and the poorest consumers reduce their calorie consumption, incurring the costs of malnutrition, hunger, or even death." In such a situation, the very social order may be threatened, with concomitant breakdown of rights to property, and even to personal safety. **Preventing extreme disruptions to the food system is a public good, which may not be sufficiently incorporated in private storage.** This provides a *prima facie* case for establishing public emergency reserves. Gilbert (2011), citing Gardner (1979), offers a similar argument based on negative externalities.

Larson et al (2011) apply a version of the foregoing rational expectations model to analyze a "strategic reserve", which is deployed in case of extreme price spikes. An "extreme" spike is one that belongs to the upper 10th percentile of price variation. They examine the effectiveness and cost of a strategic reserve based on model simulation. Not surprisingly, they find that the likelihood of staving off a price spike rises when the size of the reserve increase, but this comes at higher cost. Targeting releases of the strategic reserve to a needy group (at pre-crisis prices) dramatically reduces cost.

The reliability of private storage is further undermined by departure of real world markets from rapid adjustment towards market fundamentals, tracking instead erratic (and persistent) market dynamics, as reviewed in Briones (2011). One common, but still largely anecdotal, narrative is that of hoarding; in which traders withhold stocks from the market in anticipation of higher price. Such behavior, if sufficiently widespread, can itself raise prices and further aggravate market instability.

Emergency reserves vs. public buffer stocks

The preceding rationale for emergency reserves is a special case of public buffer stocking. As reviewed in Section 2.3, many Asian countries had applied public buffer stocks in pursuit of price stabilization, well after they had become obsolete and inflicted an excess burden on society. Public traders typically target a price band that is too high compared to the underlying equilibrium price, leading to distortions, widening deficits, and long run ineffectiveness. Often such a high price band becomes subject to speculative attack, causing its rapid collapse (Salant 1983). As argued by Newberry and Stiglitz (1981), sanguine assessments about the need for price stabilization through public agencies have given way to skepticism, due to past overestimation of benefits and underestimation of costs.

The social mandate for a public stocking agency—to procure at prices favorable to producers, while selling at prices favorable to consumers—is inconsistent with profitability. In fact there are few examples of public agencies that have profited from buffer stocking (Berck and Bigman 1993). Lastly, even if effective in stabilizing prices, it is unclear whether public stocks are simply crowding out private storage (Islam and Thomas 1996); lack of commercial motive, together with a soft budget constraint, suggests weaker adherence to operational efficiency on the part of public storage.

In contrast to traditional buffer stock schemes, emergency reserves are only triggered by extremes in harvest failure and/or price surges. Releases may be targeted to the poor, i.e., as part of a safety net package in periods of price crisis or disaster emergency. Releases to the market at market prices may also be justified as an effort to restore calm, allay fears, and manage market expectations (Timmer, 2010).

3.2. How APTERR works[1]

The earmarked rice reserve system

The preceding discussion on emergency reserves is more directly applicable to government stocks, i.e., at a national level. To understand the benefit of international cooperation in emergency reserves, we examine more closely its core feature, which is the *earmarking* system. In the following only the broad outlines of APTERR programs are presented, as procedural details are still under discussion among member countries.

Earmarking was first applied in the AFSR Agreement, which defined the ASEAN Food Security Reserve as *the sum total of the basic food stocks, particularly rice, maintained by each ASEAN Member Country within its national borders as a matter of national policy.* The AERR is a subset of the AFSR, which is a commitment of a certain amount out of its national food security stock to meet emergency requirements in the region.[2]

The same understanding carried over to EAERR, which added earmarks from the Plus Three countries. Based on the experience of the pilot scheme, earmarking was adopted under APTERR. Procedures to monitor and enforce replenishment of earmarks in the event of any drawdown are being explored, to ensure that the pledges are a permanent (not one-off) commitment.

To maintain flexibility in the manner by which a member country commits its earmark to APTERR, there are no detailed conditions imposed on location, quality, or grade of rice. The minimum conditions imposed are as follows:

1. earmarked stocks must be under government ownership and/or control;
2. ithe earmarking country is responsible for quality and cost of storage; and
3. stocks must be available in milled form and fit for human consumption when conditions for their release are satisfied.

Conditions for release depend on which method or *tier* is being applied. There are two tiers, both of which are invoked in cases of emergency, namely:

1 Based on ADB (2012).

2 In principle the earmarks can be "over and above" the national food reserve; in practice countries have opted to source their earmarks from their national rice reserves. This is in contrast to other schemes such as the South Asian Association for Regional Cooperation (SAARC) Food Bank, which explicitly requires country's earmarks to be "in addition to national reserves" (Article III, Paragraph 2).

Tier 1—release under pre-arranged scheme; and Tier 2—release under *ad hoc* scheme.

The pre-arrangement under Tier 1 is structured as a forward contract, patterned after the experience of a Tier 1 contract under the EAERR. This forward contract provided for delivery of 10,000 tons of rice from Vietnam to the Philippines. The Philippines invoked the forward contract on February 2010, to support its domestic efforts to deal with the lingering effects of Typhoon Ketsana (which struck in September 2009). Delivery was consummated in March 2010.

The Tier 1 forward contract is voluntarily made between a supplying country and a demanding country in preparation for a possible emergency in the latter occurring within a given period (say three years). The supplying country is obligated to deliver a specific quantity of rice, of a specific grade, in event of an emergency to the demanding country. Pricing is determined based on the prevailing price of the comparable rice grade in the international rice market. The contract is designed to ensure minimum negotiation and delays in delivery in the event of emergency.

There remains a possibility that emergencies could be so extreme or unanticipated as to lie beyond the preparations made under Tier 1. Release of stocks in this case can be invoked under Tier 2. In Tier 2, terms and conditions of release (size, grade of rice, timing, pricing) are decided on ad hoc basis by negotiation between the demanding and the supplying country or countries. In principle, pricing should also be based on the prevailing international market price, though this Tier permits alternative payment options, i.e., as loan or even grant. It is crucial to note though that, earmarking system notwithstanding, response under Tier 2 is *voluntary* even as an emergency is unfolding in one or more the member countries.

Administration of APTERR

The establishment and release of APTERR stocks is governed by a Council, composed of thirteen representatives, with one from each member country. Decisions are reached by consensus.[3] Regular meetings are held annually. To expedite crisis response, in times of emergency Council members relay their decisions directly through rapid consultation, i.e., without need to call a separate meeting.

Day-to-day management is exercised by the Secretariat under the oversight of the Council. Operational cost of administering APTERR is based on financial contributions mandated by the APTERR Agreement. The Secretariat shall be headed by a General Manager with full powers to constitute and supervise Secretariat staff under Council instructions.[4]

Stockpiled emergency rice reserves are directly administered by the Secretariat. For earmarked reserves, **the APTERR provides, through its Secretariat, a matching service between supplying and demanding countries** involving coordination, facilitation, and technical guidance. In the private sector, this service is typically provided by brokers or agents operating on commission basis. In the case of APTERR, the services are provided for free, as the Secretariat's operational costs are already fully funded by member contributions.

Stockpiled emergency rice reserves

As mentioned earlier, stockpiled emergency rice reserves differ significantly from earmarked stocks. Stockpiles are voluntarily donated to APTERR and are owned and controlled collectively by the member countries, unlike earmarked stock, which is under the ownership and/or control of the earmarking country. Release of stockpiled rice is classified as "Tier 3" and is distributed for free as humanitarian food assistance. In contrast, earmarked stock (at least under Tier 1) is available at market price. The recipient country is expected to shoulder logistics costs. However if this is not practicable, APTERR may finance the cost using the monetary equivalent of a portion of the

3 The APTERR Agreement does not make clear the relationship between the AFSRB and the APTERR Council; implicitly though the Council has taken over administration of the emergency rice reserves (including AERR), hence the AFSRB is left with the more technical and coordinating aspects of food security cooperation among ASEAN countries.

4 The selection of the General Manager and location of the Secretariat office are yet to be determined, pending ratification of the APTERR Agreement.

stocks intended for distribution (i.e., "monetization" in APTERR parlance).

To reduce storage cost borne by the collective scheme, the APTERR Agreement provides for a voluntary storage, that is: a donor country donating stocks to APTERR, a prospective recipient country, or other host country, may volunteer to store or "host" stocks that have been donated to APTERR. In short, **the earmarking system combined with host country arrangement effectively outsources the storage and release functions of APTERR; the collective scheme therefore incurs only the cost of coordinating these functions.**

Given frequency of disaster in ASEAN Plus Three countries, and given the experience of EAERR, Tier 3 would likely exhibit a high degree of activity (conditional on raising donations from member countries or other donors). However, such movements would involve small quantities of stocks, as it is provided as grant. In the case of EAERR, the total quantity of stocks distributed under Tier 3 was about 3,000 t (over a five-year period). A bigger potential for impact (i.e., releases of 10^4 up to 10^5 order of magnitude in tons), but probably with far lower frequency of transaction, would be releases from earmarked reserves, as it is provided at cost.

Safeguards

APTERR shares some features of food aid. In past agricultural trade negotiations, food had as been subject to various disciplines to avoid its abuse as a dump for surplus food stocks. These disciplines include reporting to the FAO Consultative Sub-Committee on Surplus Disposal, the Food Aid Convention, and the WTO Agreement on Agriculture.

In principle, APTERR is an emergency response scheme and hence is an unlikely instrument for dumping of surplus. To tighten safeguards even further, the APTERR Agreement restricts APTERR from making releases that cause a distortion in normal international trade of rice. The rules and procedures of APTERR limit the annual release of each country's earmarked stocks to the amount of its pledge (e.g., Thailand is limited to 14,000 t release per year, etc.)

3.3. Assessment of APTERR

Strengths

One advantage of the earmarking system is cost-effectiveness: it imposes no additional financial burden of procuring and storing stocks for the regional scheme. It does this by **leveraging existing national rice reserves by making them available for international flows.** In a practical way, such leveraging reducing the operating cost of APTERR and underpins its financial viability.

Another way to view this is that international cooperation effectively **increases the size of standby stocks available to meet an emergency in any member country,** without actually requiring increases in total emergency reserves of the region. The premise, of course, is low covariance of food emergencies across countries.

Moreover, **during emergencies releases from APTERR may be quicker and more reliable than normal commercial imports.** Based on APTERR procedures (particularly for Tier 1), these flows dispense with the time-consuming grind of normal commercial imports (initial contact, canvassing or tendering, negotiation, purchase order, delivery).[5] Furthermore, during emergencies, commercial importers may be vulnerable to the hoarding problem, unlike a release from APTERR.

Finally one big improvement of APTERR over its forerunner, i.e., the AERR, is its **clear multi-lateral governance structure.** Releases of earmarked stocks under the AFSR Agreement were decided only through bilateral negotiations, whereas under APTERR releases are subject to Council approval. Additionally, negotiations under APTERR would facilitated by a matching service from the Secretariat. Given the experience of the EAERR pilot project, it is expected that releases from APTERR would be active in making releases (at least Tier 1 and Tier 3) unlike the performance of AERR.

5 Of course, commercial imports can also be arranged under forward contract. These may not however be in place or in sufficient quantity when emergency strikes.

Table 5 **Potential addition to the earmarked emergency rice reserve for ASEAN Plus Three**

	Total stocks in million t	Share of earmarked stocks in total stocks (%)	Potential addition to earmarked stocks, thousand t
Cambodia	1.5	0.20	0
Indonesia	4.5	0.27	33,000
Malaysia	0.2	3.00	0
Myanmar	5.3	0.26	0
Philippines	3.4	0.35	22,000
Thailand	5.6	0.27	135,000
Vietnam	3.4	0.41	136,000
China	70.7	0.42	0
Japan	2.4	10.42	0
Korea	1.4	10.71	0
TOTAL	98.4	0.79	326,000

Source: Author's calculation.

Evaluating the size of the reserve

Even as the APTERR ingeniously avoids a financial burden by resorting to an earmarking system, the fact is storage does have a cost as reviewed in Section 3.1. This consists of the actual logistical cost, as well as opportunity cost (i.e., the interest rate) from postponing sale of stored stocks. The benefits are the social costs avoided from disruptions to the food system in the event of emergency.

Both benefits and costs are difficult to quantify, let alone juxtapose to compute the optimal level of earmarked reserves. Data for making evaluation of optimal stock levels are not readily available; even at a national level, setting of domestic stocks is based more of rule of thumb; FAO itself suggests setting a reasonable level of domestic reserves at about 18–19 percent of domestic utilization.

Rather than attempt to estimate optimal reserves, we evaluate whether there is warrant for increasing earmarked stocks, based on benefit, compared with cost and feasibility. First we consider the benefit side. ADB (2012b) finds that, in cases of severe calamity in Indonesia and China (5 percent reduction in paddy rice harvest), **annual** prices may climb by an average of 30 percent (Indonesia) to 50 percent (China). Further analysis shows if the entire Plus Three stocks (700,000 t) were released to China, Indonesia, or the Philippines, monthly domestic prices in the receiving country would fall by 10.5 percent. This helps blunt the worst of a price spike, but is perhaps too transitory. Doubling the size of the reserves may extend the benefit to two months, tripling may extend the benefit three months, etc.

Meanwhile, on the cost side, expanding earmarked stocks incurs no additional storage cost as long as the earmarked stocks fall within the country's total stocks. However, the downside risk is that earmarked stocks may no longer be available for deployment in the event of a domestic emergency (to ensure compliance with the international commitment). Even if remaining domestic stocks are adequate, domestic political resistance may present a formidable obstacle towards raising the ex ante earmarks. An application of this analysis' results is presented in 5.

Earmarked reserves, as a share in total stocks, are miniscule, generally below 0.5 percent, except for Malaysia, Japan, and Korea. Increasing earmarks within the limits of total stocks would not increase storage cost. Furthermore, raising earmarked stocks to one percent of total stocks would not pose serious downside risk of unavailability in case of domestic emergency. We apply this addition to the middle income countries (i.e., no changes for Cambodia,

Myanmar, and Laos). Furthermore countries with huge rice surpluses for export (Thailand and Vietnam) should be able to easily match the lowest earmark of the Plus Three countries, equal to 150 thousand t, again without comprising response to domestic emergency. Additional stocks from these adjustments lead to **a total of about 1.13 million t for the APTERR, which appears politically and financially feasible in the medium term.**

Evaluating the commodity scope of the reserve

Aside from size of the rice reserve, another aspect of the scheme is the commodity scope. In the 18th ASEAN Summit of 2011, the Chairman's Statement assigned the relevant Ministers "to study the possibility of APTERR incorporating commodities other than rice to secure the alarming risk of food price volatility."

As explained above, the priority food item in the region is rice, although in China the importance of wheat is also recognized. When prices increase, consumers find it difficult to identify more affordable substitutes. This difficulty is less stringent for other basic consumer items such as cooking oil, or low value fish, for which substitution is easier.

The subsequent Ministerial action is expressed in the Statement of the 11th AMAF Plus Three Meeting which "recognised the need to learn from experience and progress made in the implementation of the Agreement by focusing first on rice. The Ministers also recognised the need for adopting a step-by-step approach in considering expanding APTERR as a role model for other food commodities." This sequential approach appears to be a judicious modality in future widening of commodity scope for the emergency reserve scheme.

Weaknesses

Somewhat paradoxically, the strength of APTERR (cost-effectiveness) hints of its first basic weakness: **under earmarking, the scheme becomes completely dependent on each member country's follow through on its commitment *ex post,*** given that APTERR as a collective entity does not own the bulk of its reserves. There is a real possibility that, in a crisis situation, any member country country may plead domestic security and withhold its stocks. The APTERR Agreement in Article X, Paragraph 8 has the following provision

> Each APTERR Party reserves the right to suspend temporarily, either in whole or in part, the implementation of this Agreement, for reasons of its essential national interests including national security, public order or public health. Any such suspension or lifting of suspension shall be effective thirty days after written notifications have been received by the Secretariat.

It is unclear whether such suspension affects even the Tier 1 forward contract. If it does, then the security value of APTERR as an emergency response becomes suspect and the value of the emergency scheme is placed in question.

The need for quick response brings us to the second weakness of APTERR, which is in its governance rule requiring consensus in obtaining Council approval. The rule copies the ASEAN convention which is adopted in virtually all its discussions, proclamations, and decisions. This rule is very effective in building institutions, and resolving political negotiations where divergent interests are at work, however it entails a protracted process of consensus-building. Hence, **decision-making by consensus is ill-suited in an emergency response mechanism.**

The third weakness is related to the official definition of "emergency." **The vagueness in the conditions for defining an emergency can pose an obstacle to rapid response.** How can we ascertain that a country is *unable* to respond to a calamity with domestic reserves or normal trade?[6] Furthermore the definition refers to a "shortfall," but there is no clear benchmark or indicator to ascertain the shortfall.

One commonly used indicator of a shortfall is that demand exceeds supply. However the basic supply-demand model shows that the shortfall disappears by simple operation of the market, i.e., an increase in price. It may be that the market "solution"

6 Work is underway by a technical working group towards addressing these issues.

to the shortfall is socially unacceptable, as argued in Section 3.1, offering a rationale for emergency reserves. Under the existing APTERR Agreement, it is unclear whether this rationale can be invoked should such situation arise.

The absence of price considerations in the definition of emergency raises another problem: world rice markets in 2008 have shown that, even in the absence of a calamity, prices can surge to crisis levels within a very short period. A sizable release from emergency reserves could be useful to calm market panic, or support a safety net scheme targeted to the poor. However, currently the APTERR rules do not permit releases under such circumstances.[7]

In sum: **APTERR can be a relevant scheme for addressing shocks to food security.** To realize this potential, member countries should first of all ensure proper food security monitoring, and governance of the reserve, to ensure rapid response in case of emergency. Second, members need to back up their commitments with action in an emergency situation, despite domestic resistance. Finally, it should be clear that APTERR is no panacea for regional food security; rather, **APTERR is a stop-gap measure that can provide valuable but incomplete protection against market instability.** A more direct approach would be to address the underlying gaps in the food distribution system that make it vulnerable to shocks. **APTERR may in fact be supportive of efforts to deepen specialization and interdependency in the food marketing system, if it can be seen as a credible device in (rare) cases of market failure.**

7 Had EAERR operated with both calamity and price triggers in 2008, earmarked stocks could have been released to support emergency humanitarian food assistance under Tier 2.

4. Coordination and Information Issues in the Rice Market

4.1. The 2008 rice price crisis redux

Dozens of papers have tried to identify the causes of the rice price crisis of 2008. There is widespread agreement that price movements were unrelated to market fundamentals. They are related to two sets of factors, namely *lack of information* and *trade shocks.*

Information

Information may be seen as a conditioning factor that renders markets vulnerable to price spikes. First, as noted by the Inter-Agency Report (2011), there is **insufficient capacity in developing countries to conduct frequent and systematic monitoring of crops, and produce reliable short-run harvest forecasts.** Second, **information on stocks is another critical gap;** reliable data is not collected, not reported publicly, or reported with prolonged lag. The third gap relates to **monitoring and publication of prices.** Wright (2011) notes that, in place of transparent knowledge of prices and shipments, for some markets exports can be understated, prices overstated, and rumors of unverified transactions tend to circulate widely.

Prices are typically understood in terms of current or cash markets. Prices in futures markets may also be informative about possible price *changes.* A futures market fundamentally serves as a hedging tool to mitigate price risk. With sufficiently liquidity and depth in the futures market, the futures price may have the added function of "price discovery", i.e., a *continuous process by which futures prices are reassessed by buyers and sellers as new information becomes available* (Inter-Agency Report, 2011). The establishment of a "robust futures market for rice" as an instrument to address price risk is featured prominently in the Asia Society and IRRI Task Force Report (2010). We shall return to the issue of futures markets in Section 4.3.

Trade shocks

The other set of factors behind the crisis are what Headey (2010) calls "trade shocks". Such shocks arise entirely because of the highly interventionist regime in rice markets worldwide. He reckons that export shocks may have contributed 61 percent on the aggregate to world rice price, while import shocks added another 65 percent; together the increase (126 percent) is within the range of actual price increases in Thai rice for July 2007 to June 2008. These episodes of trade shocks are:

- Vietnam, India place partial restrictions on exports, owing to concerns about domestic food prices: Sep–Oct, 2007;
- Vietnam bans export sales, citing cold weather in Red River delta (Slayton and Dawe, 2009): Feb, 2008;
- Likewise owing to concerns over the domestic market, Egypt restricts exports, China imposes 10 percent export tax and imposes VAT: Jan, 2008;
- Philippines purchases annual import quota over the period Jan–April, 2008; pays $700 per t for the 11 Mar tender, and $1,200 per t for the 17 April tender (Slayton and Dawe, 2009); and
- Saudi Arabia raises imports from Thailand by 90 percent within the Q1 of 2008; Iran orders 800,000 t of Thai rice in Jan–Feb, 2008 owing to drought.

All these policies were pursued unilaterally, assumed exogeneity of world markets, with no consideration for the wider repercussions of individual decision. This causes a collective action problem succinctly explained by Martin and Anderson (2012) as follows: suppose an exogenous shock (say crop loss) induces governments of exporting and importing countries to try to insulate domestic markets from the anticipated increase in world prices. Simultaneous action is ineffective in preventing price increases, and

creates an international "public bad" by amplifying world price volatility. Under plausible short run elasticities and unilateral insulation, the effect of a shock on world price can be amplified nearly seven-fold. In fact, changes in trade policies did have a very substantial contribution to increases in world prices of rice and wheat in both the 1973–94 and 2006–08 price surges. For the latter episode, insulating policies accounted for 45 percent of the increase in the international rice price, and 30 percent for the international wheat price.

The need to resolve the collective action problem accounts for initiatives such as WTO disciplines on variable tariffs and export restrictions. However, WTO disciplines have been completely ineffective. Hence, regional-level initiatives at policy dialogue are being pursued by G20 and ASEAN. We now turn to initiatives in the latter.

4.2. Food security information exchange and policy coordination in ASEAN

AFSIS activities and outputs

As mentioned earlier, the primary mechanism for early warning and information for ASEAN is the AFSIS. The project was begun in 2002 and has gone through two phases of five years each until 2012. Its focus commodities are: paddy rice, soybean, maize, sugarcane, and cassava. It generates several information products, namely:

- Interactive online database (http://www.afsisnc.org/), currently covering the focus commodities. Data are in annual time series (1983–2012) at the national level including the following items: area (planted and harvested), production, yield, imports (quantity and value), exports (quantity and value), and domestic price (farmgate, wholesale);
- ASEAN Commodity Outlook (ACO)—available in two issues (June and December) from 2008 onwards. The December issue provides an annual outlook for the following year for the focus commodities. The June issue provides an updated annual outlook for the current year. The outlook covers the supply-demand balance (beginning stocks, production, imports, utilization, other use, exports, and ending stocks), as well as data on supply-demand balance for the past years; and
- Early Warning Information (EWI)—available in two issues from March, providing updated forecasts of annual harvest for the focus commodities, together with estimates of crop damage.

The AFSIS also organizes training workshops, and provides a network for linking together agricultural statistical agencies in the participating countries. Project oversight is vested in Focal Points, namely heads of concerned government agencies (usually providers of agricultural statistics), in participating countries. Day-to-day management is conducted by a Secretariat based on Bangkok. In October 2011, the 11th ASEAN Ministers on Agriculture and Forestry and Ministers of Agriculture of the Plus Three countries (AMAF Plus Three) endorsed the proposal of post-2012 AFSIS, which is to establish AFSIS network centers (AFSIS NCs) as self-sustaining mechanism. Proposed information products and activities include: ASEAN Food Security Analysis Report, Food Security Forecasting Model, and Broadening Food Security Databases (http://www.aseansec.org/26673.htm).

AFSIS as information service provider

According to ADB (2011b), AFSIS online data are drawn entirely from official data; AFSIS intervention is evident only for the EWI and ACO. The data are typically uploaded with 1–2 year lag. Its strength is that data is directly uploaded by focal points, and hence is fully owned. This contrasts with the global online database, the FAOStat, the country interface is typically through the Ministry of Foreign Affairs which can lead to delays in replies. In case delays exceed the FAO's deadlines, an imputation is made to complete the global database, which is then modified when official data are submitted. Official data are available on a 2–4 year time lag.

AFSIS is being groomed as information service provider for the other regional food security initiatives, namely APTERR (emergency short-term relief) and AFSRB (sustainable food trade). Unfortunately, AFSIS'

current mode of operation does not equip it to be a good information service provider. The reason is that information is confined to official data, mostly from the respective Ministries of Agriculture. Inter-ministry coordination is poor, hence trade and price information are in missing for some countries. Data is not available in real time: information even with just one-year lag would already be considered too passé to serve as basis for interventions.

Moreover, AIFS-SPA-FS would need a variety of information beyond the current food security information menu of AFSIS. One key gap is *qualitative information* which takes the form of non-quantitative assessment of crop condition, business conditions, and so on, from both formal and informal sources, under the rubric of "market intelligence." In view of these problems, AFSIS should seriously consider reinventing itself so as to fulfil its role as information service lynchpin for regional food security.

The role of AFSRB

The AFSRB, despite dormancy of AERR, continued to exercise its other functions, which include:

- coordinating periodic exchange of information on national food policies; undertaking period evaluation of the food situation and prospects in ASEAN and the world; and
- examining immediate, short-term and long term policy actions to assure adequate supplies of basic food commodities, and submit recommendations for appropriate action to the governments concerned.

These are consistent with the tasks assigned to the AFSRB under AIFS. Upon approval of the 33rd AMAF Meeting, the AFSRB is convening an ASEAN Rice Trade Forum on pilot basis, with support from Asian Development Bank.[1] The Forum offers a platform for coherent and coordinated policy actions on rice trade. The participants would include: members of the ASEAN Food Security Reserve Board, rice traders, relevant ASEAN and ASEAN Plus Three bodies, development partners, and civil society organizations. Forum activities scheduled would cover:

1. exchange and analysis of rice market information;
2. identification of areas of coordination to mitigate or avoid extreme rice price volatility;
3. determine long-term and strategic policy reforms for the sustained development of regional rice trade; and
4. discussion of business arrangements involved in organizing a permanent rice trade forum.

One possible format of a permanent Rice Trade Forum is to conduct a regular (annual) meeting around a predetermined theme, with an annual and perhaps medium-term Outlook as a fixed part of the agenda. The forum may also be convened for special meetings to discuss pressing issues that arise from time to time, such as: the aftermath of a severe calamity that may possibly impact the rice market; upon or prior to important policy changes by a large rice trader in the region; and the early stages of an on-going or anticipated rice market crisis.

Ideally, the Forum would institutionalize a new convention or custom among the ASEAN members for each country to first undertake consultations with other members prior to making significant changes to trade policy. The Forum would then serve as the primary mechanism for coordinating policies. Such a convention may be adopted not as a legal obligation but rather as an unwritten custom. Furthermore, there is no guarantee that policies would really be coordinated through this mechanism. Nevertheless, a permanent and active Forum would be a significant improvement over the *status quo* of no dialogue at all.

4.3. Rice futures

Our discussion on information and price discovery broached the subject of rice futures market; this is also part of the agenda of the Rice Trade Forum as a possible long-term strategy for developing rice trade. The feasibility of a rice futures market for ASEAN is evaluated by Mackenzie (2011). Based on interviews of key market players and commodity exchanges, the study finds that an ASEAN rice futures contract could benefit the rice market through price discovery

1 http://www.adb.org/news/events/asean-rice-trade-forum

and price risk management. ASEAN rice markets are opaque and a futures market would improve price transparency to all players. Moreover, a liquid rice futures contract would fill an unmet need for a hedging instrument.

Whether rice futures can actually be organized to meet this need is another matter. Mackenzie (2011) outlines several key features of the cash market needed for a successful futures contract, namely:

1. Adequate cash price volatility;
2. A large competitive and well-defined underlying cash market that lends itself to standardization;
3. Minimal government intervention in the underlying cash market; and
4. Free flow of public information.

As the rice market in ASEAN satisfies only item i), **a rice futures contract is unlikely to be successful under current conditions.** As for item ii) (and to some extent iv), regional and international markets are thinly traded by a few private traders, and a significant amount of trade occurs directly between governments. The cash market is opaque, perpetuating sharp information asymmetries that tend to benefit larger traders. Moreover, the rice market is segmented between different rice varieties, with no international grading standards to measure and standardize variety and quality differences.

As for item iii), we have already discussed at length the policy regimes that restrict the rice market. Even the fledgling futures market in the region, the Agricultural Futures Exchange of Thailand (AFET), has borne the brunt of government interventions. Foremost of this is the reintroduction of the paddy pledging program in October 2011, which all but extinguished domestic market volatility and diverted a large portion of rice supplies to public storage. Second is the large but erratic market participation of the parastatal, the Public Warehouse Organization (PWO), weakens incentives to private sector incentives to participate in the exchange. Since its reintroduction in in April 2011, volume traded of White Rice 5 percent FOB has been virtually nil.

5. Conclusion

The regional food security framework correctly identifies emergency relief, sustainable and conducive food trade, and early warning and information as focal elements in maintaining the smooth and stable functioning of the food production and distribution system. Our study has shown, however, that governance problems afflict the operation of this system. These problems arise from fundamental tensions between unilateral vs. cooperative approaches, as well tensions due to competing domestic interests (i.e., consumers, producers, and trader-processors).

The tension between inward-oriented vs. outward-oriented approaches raises formidable challenges in operating APTERR and ensuring coordination of trade policies in the region. Further reforms are warranted at the regional level to institute a more predictable regime for rice trade. This entails phasing out trade monopolies, quantitative restrictions (upheld by the special protocol on rice and corn), and phasing-in of tariffication. This would still permit some level of protection for domestic produced, but on a rule-oriented basis.

Ultimately however protection and other forms of counter-productive intervention would need to be gradually dismantled, particularly those premised (incorrectly) on the weakness of private sector operations. These include self-sufficiency policies (for importing countries), insulating policies (for exporting countries), as well as costly input and output subsidies.

Withdrawal of government from its traditional role in the region does not rule out all forms of government engagement. Its positive role however lies in facilitating private sector investment and operation of efficient supply chains. World Bank (2012) has a set of recommendations detailing this facilitating role, including the following:

- **Private-public sector partnership** (PPPs)—PPPs can assume many forms, such as performance contracts, build-operate-transfer concession, joint ventures, etc. PPPs may be undertaken for pioneering effect, demonstrating technical and financial viability of developing supply chains for food staples.
- **Improving logistics and infrastructure**—in addition to ports (still a constraint in Vietnam), the major constraint is rural infrastructure, particularly roads in Indonesia and the Philippines. Aside from funding the requisite investments, government should elicit participation from the private sector in the design of an efficient rural road network.
- **Establishment of warehouse receipt system**—negotiable warehouse receipts would greatly facilitate marketing by severing the link between market transaction and physical movement of stocks; at the same time, creating the system of negotiable claims presumes a transparent, credible, and well regulated marketing system which itself encourages market participation, financing, and investment. To this recommendation we add the need for standardization of grades and standards for rice, especially at an international level.

In sum: food markets are prone to sporadic crisis episodes, for which short-term solutions such as a regional emergency reserve are a preliminary stop-gap. However, such instabilities are rooted in underlying distortions and constraints on normal food trade. Hence, the only permanent solutions involve equally deep reforms towards improving efficiency and resiliency throughout the regional food production and distribution system.

Obstacles to reform, mainly rooted in domestic politics, are formidable. However, regional and international cooperation brings to fore a formidable "lobby" by major or potential trading partners. It is easy to be pessimistic about regional or multilateral

cooperation, given prominent examples of failure or at least inaction (e.g. Doha Round). However, its past achievements are on hindsight impressive. The WTO Agreements have institutionalized restraints against protection. ASEAN itself has avowed a vision of a single economic community by 2015, which would have been deemed farfetched during its founding in 1967. The persuasive power of the international community should not be underestimated.

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