

Ensuring Food Security – A Case for ASEAN Integration

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ABSTRACT

The ASEAN member countries can be grouped into three sub-groups, each of which exhibits a distinct pattern with respect to food security issues. The first group is made up of the relatively food-secure countries of Singapore and Brunei. The second group consists of Malaysia, Thailand, Philippines, Indonesia, and Vietnam. In these countries, except for Vietnam, agriculture has contributed a declining share in GDP, employment, and international trade. In addition, food habits in these countries have changed dramatically in recent decades. The third group is composed of Cambodia, Lao PDR, and Myanmar—economies in transition that require special attention.

A simple exercise shows that the area can collectively achieve food security via trade in rice and maize. Trade facilitation measures and the harmonization/equivalency of food regulation and control standards will reduce the cost of trade in food products. While specialization and revealed comparative and competitive indices point to complementarities between trade patterns among the ASEAN member countries, intra-ASEAN trade in agriculture is quite small. However, integration could address this problem. Further, if integration is to be used as a venue for ensuring food security, the member countries must agree on what food security collectively means to them, and what food items are important to each of them and the region, in general, so that regional integration and cooperation under the auspices of ASEAN can be promoted.

INTRODUCTION

In the fast-paced world we live in, globalization is inexorably integrating more and more of the world economy. A prominent Filipino businessman, Jaime Augusto Zobel de Ayala, quoting McKinsey & Co., said that there are four global forces at work, namely, liberalization, mobility of capital, the digital world, and common standards.¹ Trade boundaries between nations are slowly being eroded, international capital flows have grown exponentially, information technology and digital networks have become venues for wealth creation, and global standards are becoming the norm in the management of organizations.

How have the countries belonging to the Association of Southeast Asian Nations (ASEAN) fared? Ayala claims that the context within which

ASEAN operates has changed because of three reasons: (a) the financial crisis of 1997 reduced the group's attractiveness to investors and changed the political balance in some countries; (b) ASEAN's consensus-based decision-making process has allowed the less-developed new members to set a slower pace in responding to crisis and opportunities; and (c) the resurgence of China, the rapid technological and regulatory changes, the unstoppable globalization, and productivity improvements have increased competitive pressure.

Ayala argues that by the usual measures, ASEAN should have remained competitive. Its regional consumer market of more than 600 million people augurs for this. Furthermore, ASEAN is blessed with rich primary resources and a sizeable pool of highly skilled and inexpensive labor.

¹ From a speech delivered by Mr. J. Zobel de Ayala II during a joint Management Association of the Philippines – Philippine Chamber of Commerce and Industry general membership meeting held in April 2004.

However, ASEAN cannot compete on low labor costs alone since China and India have brought down global wage standards. ASEAN can compete through economies of scale with a single production platform as well as a large home market. A strong argument can thus be made for a move towards regional economic integration, i.e., towards making ASEAN more of a unified market for goods and services rather than a collection of ten disparate markets.

Among the benefits of economic integration is the intensification of competition within the region and the convergence towards regional best practices. It also allows for greater economies of scale. Third, it reduces transactions costs and enables companies to exploit their comparative advantages. It creates a larger market that is more attractive for foreign direct investments and stimulates domestic policy reforms. Finally, it gives the regional trading bloc greater leverage in trade negotiations.

The Strategic Plan of Action in Food, Agriculture, and Forestry

In the area of agriculture and food security, what has the ASEAN done? The ten ASEAN member economies of Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand, and Vietnam have established a strategic plan of action for cooperation in food, agriculture, and forestry. Seven priority areas of cooperation have been identified which include strengthening food security² in the region; facilitating and promoting intra- and extra-ASEAN trade in agriculture, fishery, and forestry products; technology generation and transfer; and private sector involvement and investment, among others. Sectoral action programs were endorsed which cover policy coordination, research, technology transfer, production, marketing, and investment promotion. These strategic measures undertaken were intended to help facilitate the realization of the ASEAN Free Trade Area (AFTA) and strengthen the ASEAN collective position in international forums through the coordination of joint approaches on international and regional issues relating to food,

agriculture, and forestry.

The ASEAN Food Security Reserve. As early as 1979, the Committee on Food, Agriculture, and Forestry was tasked to study the feasibility of establishing buffer stocks and buffer stock arrangements particularly for rice, which resulted in the establishment of a regionally coordinated system of food security reserve. An ASEAN Food Security Reserve Board was established whose duties included managing a regional emergency rice reserve, the periodic evaluation of the ASEAN food situation, and providing information on food security policy development in the member countries. A regional emergency rice reserve of 50,000 tons was initially set. At present, the earmarked quantity of emergency rice reserve stock is 87,000 metric tons (Table 1).

An emergency refers to states or conditions in which an ASEAN member country, after suffering extreme and unexpected natural or man-made calamity, is unable to cope with such state through its national reserve and is unable to procure the needed supply through normal trade. Procedures for releasing rice from the Emergency Reserve were likewise formulated and include the member country directly notifying other ASEAN member countries of the emergency and the amount of rice required. The prices, terms, and conditions of payment shall be subject to direct negotiations between the countries concerned. Thus, the reserve is not meant to fill persistent food deficits of the member countries, which are normally met through imports.

In addition to the above rice emergency reserve stock, the ASEAN, in 1997, agreed to pursue further cooperation by promoting ASEAN food, agricultural, and forestry products in the international markets. A common quality standard on specific commodities was agreed upon especially for products that would be recognized internationally. In 1998, in Thailand, it was decided that the Strategic Plan on ASEAN Cooperation in Food, Agriculture, and Forestry should cover overall cooperation in the three major sectors but with greater emphasis on: 1) strengthening food security arrangements in the region;

² Food security is defined by the World Bank as the availability and affordability of food to all the citizens of a country, with the essential elements being the availability of food and the ability to acquire it.

Table 1. The ASEAN emergency rice reserve system

Country	Reserved Stock (metric tons)
Brunei Darussalam	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
Vietnam	14,000
Total	87,000

2) enhancing the international competitiveness of food, agriculture, and forest products; and 3) strengthening the ASEAN position in international forums.

The ASEAN Food Security Reserves Agreement likewise seeks to strengthen the ASEAN food security statistical database. A study on the long-term supply and demand prospects of major food commodities (rice, maize, soybean, sugar, pulses, and oilseeds) is among the programs identified, together with a proposal to strengthen the food marketing system of agricultural cooperatives to enhance food security in ASEAN. The need to develop a common framework to analyze and review regional trade policies is also recognized as a priority (International Trade Strategies 2004).

The Food and Agriculture Organization (FAO) of the United Nations lists the ASEAN as one of 21 Regional Economic Organizations (REO). These REOs aim to promote economic integration as well as enhance food security, and agricultural and socioeconomic development. Twelve of these REOs, in collaboration with FAO, have prepared Regional Programs for Food Security (RPFS). The RPFS has three major components: trade facilitation, harmonization of national agricultural policies, and support to national Special Programs for Food Security (SPFS).

ASEAN hopes that by 2020 its member economies will be fully integrated into an ASEAN Economic Community as a result of a liberalized flow of goods, services, and factors of production under an environment of competition, with prices

converging across national boundaries. Towards this goal, in 2003, the acceleration of integration in eight goods sectors and three services sectors was endorsed. The eight goods sectors (agro-based products, fisheries, healthcare products, rubber-based products, wood-based products, textiles and garments, automotive, and electronics and information and communication technology) and the three service sectors (e-ASEAN, healthcare, and air travel and tourism) have been identified as priority sectors for integration (Austria 2004).

OBJECTIVES

This paper aims to document the trends in agricultural trade for three key agricultural produce, describe the food security situation for the ASEAN member economies using a crude estimate of national food requirements for three types of grains, and analyze how regional cooperation can fulfill the challenge of food security. The paper uses the three commodities only to illustrate the potential role that enhanced trade under the umbrella of economic integration can play to help improve food security among the member economies. This does not imply that food security issues are limited to the basic staple foods. Global trends show that as income rises, the consumption of proteins shifts to meats rather than cereals, and the consumption of processed goods increases. Likewise, fresh and healthy foods are in greater demand as incomes rise.

This paper posits that the ASEAN member countries represent a continuum of countries ranged according to their stage of development and food security situation. While displaying many similarities, these countries also portray striking differences. Though basically agricultural in nature, some countries have since become more advanced and thus enjoy higher per capita incomes and do better in terms of human development indicators. The share of agriculture in economic activity is also remarkably varied. As a result, the nature of agricultural policies in each of these countries is bound to be different. The manner in which food security concerns are addressed will correspondingly be different.

METHODOLOGY AND DATA SOURCES

This paper employs Ohkawa's³ equation:

$$d = p + ng$$

where p and g are the rates of growth of population and per capita income, respectively, and n is the income elasticity of demand⁴ for agricultural products. This will be used to measure the annual rate of growth in national food requirements for three selected commodities among the ASEAN member countries.

Ohkawa's equation posits that in addition to population growth, income growth will also increase the demand for food. Admittedly, Ohkawa's equation is a very crude estimate of the needed rate of growth in national food requirements. More sophisticated models have been developed. For instance, Rosegrant, Paisner, Meijer, and Witcover (2001), using IFPRI's International Model for Policy Analysis of Agricultural Commodities and

Trade (IMPACT) Model, have projected world food supply and demand, trade, and prices to the year 2020. In addition, Engel's law has been verified in a number of studies showing that over time, the proportion of total expenditures allocated to food declines as income rises. Thus, beyond marginal changes in income, the income elasticity coefficient estimates become invalid. However, while more complex models exist, Ohkawa's equation provides a quick and quite reliable base figure to project changes in food demand. Furthermore, its data requirements are more modest.

After computing for the rate of growth in national food requirements, this rate is then compared to the rates of growth in productivity. The model is therefore a projection of two compounding growth rates where any deviation from these rates either leads to food gaps or food surpluses.

The selected commodities are rice, wheat, and maize. These three are among the top seven food exports and imports for the period 2000–2003. The main reference used was the FAOSTAT Database. Projected rates of growth of population were taken from the *2004 World Population Data Sheet* of the Population Reference Bureau, and projected gross domestic product (GDP) growth rates from the Asian Development Bank's *Asian Development Outlook 2004 Update*. Income demand elasticities were from Rosegrant et al. (2001) and Hossain and Sombilla (1999).

Effect of Income Growth on Consumption Differs by Income Level

As cited by Hayami and Godo (2004), the income elasticity of direct calorie consumption per day per capita declines, with the figures ranging from 0.16 in low-income countries to 0.045 for middle-income countries. It even turns negative (-0.055) in high-income countries. Johnston and Mellor in 1961 echoed the same observation. Not only are there higher rates of population growth in the developing countries; the income elasticity of demand for food is also considerably higher than in the high-income countries. Thus, a given increase in per capita income would have a stronger impact on the demand for agricultural products in the low-income countries than in the economically advanced countries.

³ The original equation was $d = p + gn + pgn$. Ohkawa dropped the last term in the final version of his paper because he argued that the last term was of small importance.

⁴ Income elasticity tells us the percentage change in quantity demanded for a certain commodity as a result of a one percentage change in income. A positive sign for income elasticity tells us that the commodity is a normal good while a negative sign implies that the commodity is an inferior good. For instance, ground meat in some countries may be considered an inferior good because consumers switch to better cuts of meat as their incomes go up.

Agricultural Trade Trends

Trade in Rice, Wheat, and Maize. The ASEAN member countries remain to be rice-eating and wheat-importing countries. The biggest producers and exporters of rice are Thailand, Vietnam, and Myanmar. Thailand's milled paddy rice exports averaged 6.2 million metric tons while that of Vietnam was 3.6 million tons. Only Myanmar produces wheat; Singapore and Thailand's wheat exports consist mainly of wheat flour. Indonesia imported an average of 3.5 million tons of wheat while the Philippines bought on the average 2.8 million tons of the commodity.

Maize enjoyed brisk trade in Indonesia, Malaysia, Thailand, and the Philippines, to some extent. Maize for forage and silage had negligible trade. Table 2 shows the value of agricultural trade in these commodities for the period 2000–2003.

Trade in the Priority Sectors. Austria (2004) reports that with regards to the share of the eight priority sectors in total world exports, ICT and electronics accounted for 18%, while fisheries and rubber-based products accounted for 12–15%; the other priority sectors accounted for less than 10% of the same for the period 1997–2001. On the other hand, ASEAN accounted for less than 6% of total world imports of these products except for ICT and electronics which had a 15% share. Relative to the total intra-ASEAN trade, the exports and imports of these priority products accounted for a combined share of 44% and 46%, respectively, for the period 1997–2001.

For the ASEAN – 5⁵, the total share of the priority sectors in the member's total intra-ASEAN trade ranged from 36% for Indonesia to 55% for Thailand. For Cambodia, Lao PDR, Myanmar, and Vietnam (CLMV), the share of the priority sectors in a member's total intra-ASEAN trade ranged from 42% for Vietnam to 76% for Laos for the same period. According to Austria (2004), this highlights the point that the region is a significant market for the exports of CLMV. Agro-based and wood-based products accounted for the largest share in total intra-ASEAN exports of these transition economies.

Total and Agricultural Trade. Since the implementation of AFTA in 1993, the volume of intra-ASEAN trade has grown from US\$82,000 million in 1993 to US\$159,000 million in 2002. In fact, trading among ASEAN countries has increased relatively more than the trade volume between ASEAN and the rest of the world. However, the share of intra-ASEAN trade in total trade averaged less than 25%. Before the 1997 crisis, the trade growth rate was higher at around 15% but sunk to about 1.1% post-1997 (Ahlström and Stålsros 2004).

Only about 22% of agricultural trade is intra-ASEAN. The most important exports from the ASEAN economies are rubber, palm oil, fish, crustaceans, rice, coffee, sugar, copra, and coconut oil. The most important exports common to ASEAN countries are crustaceans, rubber, and rice (International Trade Strategies 2004).

The ASEAN Economies

Looking at the ASEAN member countries, we will find that they display striking similarities and differences (Table 3). In terms of income, Singapore is way up with a per capita GNI of \$20,690, roughly 69 times that of Cambodia. Next down the rung is Malaysia with a per capita GNI of \$3,540. In Cambodia and Lao PDR, some one-third of their population earn less than PPP\$1 a day; compared to only 0.2% and 1.9%, respectively, of the population in Malaysia and Thailand subsisting on the same amount. In terms of daily per capita calorie supply, nine of the 10 member countries posted over 2,000 daily per capita calories.

The percentage of the rural population with access to safe water in 2000 ranged from 26% in Cambodia to 94% in Malaysia. Those with access to sanitation in the urban areas for the same year comprised the whole urban population of Malaysia and Singapore. In terms of HDI rank, Singapore is included in the top 30, followed by Malaysia at rank 58, Thailand at 74 and the Philippines at rank 85.

The agriculture and the services sectors of Cambodia contributed some 36% to the country's GDP in 2003. Lao PDR and Myanmar's economies are dominated by agriculture. Singapore's GDP is fueled by the services sector. In the other economies, industry and the services sectors are the major sectors.

⁵ These are the countries of Malaysia, the Philippines, Singapore, Thailand, and Indonesia.

Table 2. ASEAN agricultural trade in rice, wheat, and maize, 2000–2003

	Exports (in 000 \$)				Imports (in 000 \$)			
	2000	2001	2002	2003	2000	2001	2002	2003
Brunei Darussalam								
Rice	0	0	0	0	17,050	9,840	12,784	12,190
Wheat + Flour, Equiv.	0	0	0	0	1,460	3,035	1,462	2,953
Maize	0	0	0	0	1,200	2,500	456	330
Cambodia								
Rice	180	480	1,691	1,456	8,944	7,507	11,015	6,200
Wheat + Flour, Equiv.	0	0	0	0	6,850	3,510	4,093	5,533
Maize	26	10	1	68	10	1	600	0
Indonesia								
Rice	306	793	1,130	320	319,130	134,912	342,527	332,818
Wheat + Flour, Equiv.	613	606	8,382	5,465	583,764	448,047	694,269	655,323
Maize	4,984	10,500	3,334	5,517	157,949	125,512	137,982	168,658
Lao PDR								
Rice	0	0	0	0	3,800	3,950	3,500	2,504
Wheat + Flour, Equiv.	0	0	0	0	500	800	802	771
Maize	50	117	46	405	80	3	1,584	130
Malaysia								
Rice	60	101	690	1,673	181,585	140,523	135,357	105,425
Wheat + Flour, Equiv.	26,531	26,394	25,356	21,146	198,019	210,421	206,414	176,377
Maize	3,591	3,204	3,598	2,500	255,056	218,431	262,862	275,182
Myanmar								
Rice	31,970	111,607	107,390	12,348	2,680	2,000	850	525
Wheat + Flour, Equiv.	4	240	150	150	18,000	19,464	16,078	10,849
Maize	14,122	8,717	11,887	8,588	360	400	692	171
Philippines								
Rice	115	23	1	186	135,611	136,530	211,763	166,804
Wheat + Flour, Equiv.	359	1,531	1,261	238	396,604	433,632	491,603	471,372
Maize	421	521	322	158	64,479	25,636	49,232	21,557
Singapore								
Rice	1,220	1,266	2,195	1,902	131,825	118,113	119,207	110,872
Wheat + Flour, Equiv.	8,029	10,954	10,561	10,288	49,647	49,321	45,300	51,606
Maize	475	513	1,061	937	4,722	3,071	4,837	4,723
Thailand								
Rice	1,638,431	1,578,431	1,631,963	1,828,480	232	139	389	2,227
Wheat + Flour, Equiv.	4,433	3,403	2,978	2,976	116,822	148,345	166,166	163,898
Maize	8,450	55,453	27,502	36,223	38,026	3,673	3,332	3,488
Vietnam								
Rice	666,667	624,710	725,535	727,000	0	650	5,500	619
Wheat + Flour, Equiv.	0	0	0	0	94,230	112,286	112,600	122,700
Maize	2,008	4,500	870	9,000	22,700	7,000	41,500	27,000

Adopting the flying geese pattern of development (Akamatsu 1962),⁶ we can divide the ASEAN member countries into three smaller groups, with each group exhibiting a distinct pattern with respect to food security issues. The first group would have Singapore and Brunei. The second group would have Malaysia, Thailand, Philippines, Indonesia, and Vietnam. The third

group would be comprised of Cambodia, Lao PDR, and Myanmar.

The first group of countries would be those countries which are relatively more food-secure. In any discussion of food security, with the emphasis on availability and access to food, these two countries, namely Singapore and Brunei, are “outliers.” Each has a small population, high per

Table 3. Key indicators, ASEAN member countries

	Proportion of Population Below \$1 (PPP) a Day (%)	HDI Rank in 2000	Daily per Capita Calorie Supply (calories), 2001	Per Capita GNI in US \$, 2002
Brunei Darussalam	n.a.	n.a.	n.a.	n.a.
Cambodia	34.1 (1997)	130	1,967	300
Indonesia	7.5 (2002)	112	2,904	710
Lao PDR	39.0 (1997)	135	2,309	310
Malaysia	0.2 (1997)	58	2,927	3,540
Myanmar	n.a.	131	2,822	n.a.
Philippines	15.5 (2000)	85	2,372	1,030
Singapore	n.a.	28	3,114 (1990)	20,690
Thailand	1.9 (2000)	74	2,486	2,000
Vietnam	13.1 (2002)	109	2,533	430

Source: ADB, Key Indicators of Developing Asian and Pacific Countries 2005

capita income, and an economic structure dominated by industry and trade. Meanwhile, the third group which comprises economies in transition, may be considered the ‘poorest of the poor’ and thus require special attention (FAO 1999).

The second group, except for Vietnam, has pursued market-oriented policies since the 1970s. Malaysia and Thailand have made significant economic progress. Except for Vietnam, countries in this group have experienced a declining share in the contribution of agriculture to GDP, employment, and international trade.

In addition, food habits in these countries have changed dramatically in recent decades, as evidenced by equally remarkable changes in the composition of the sources of calories. A progressively larger share of calories is now being accounted for by animal sources compared to vegetable sources. The vegetable intake has shifted from cereal to non-cereal sources, and the food grains from starchy roots and tubers to superior cereals. This common shift in direction was more pronounced in Thailand, Malaysia, and, to some extent, Indonesia, Philippines, and Vietnam.

The practice of eating away from the home has led to a reduction in per capita rice consumption. Japan, South Korea, Taiwan and the more industrialized countries have all passed through this demand shift. Among the ASEAN member countries, Malaysia and Thailand are undergoing the same experience. Indonesia, Vietnam, and the Philippines, however, remain to be dominant rice-consuming countries (FAO 1999).

There is “disequilibrium” in ASEAN agriculture and in the food security situation in the sense that there are countries that experience food deficits whereas there are countries with increasing food surpluses. Underlying this disequilibrium are the different agricultural problems confronting these countries depending on their stage of development. The above, in a sense, echoes Schultz’ (1953 and 1978) observation (as cited in Hayami and Godo 2004) that agricultural problems confronted by low-income and high-income economies differ. Low-income countries face a food problem because of rapid population growth and high food demand elasticity, and are under the constant threat of food shortages. High-income countries, on the other hand, face a farm problem (or a protection problem according to Hayami and Godo 2004). Since population growth is slow and food consumption has reached saturation, the problem faced by high-income countries is that of declining food prices and farm income. The polar nature of the agricultural problems underlies the differences between the

⁶ The ‘flying geese’ pattern is based primarily on the historical experience of Japan catching up with the more advanced Western Europe. Instead of Japan following a leader, it is now the NIEs that are in the middle of the flying geese pattern. Completing the pattern is Japan at the leading edge and the ASEAN countries bringing up the rear.

policies, on the one hand, to tax agriculture in the low-income countries and, on the other, to subsidize agriculture in the high-income countries.

Hayami and Godo (2004) identify a third agricultural problem, this time encountered by middle-income countries. Middle-income countries encounter a lag in productivity growth in the agriculture sector as against the non-agriculture sector; thus, farmers' incomes decline relative to non-farmers', which explains the productivity gap.

If the concern at the food problem stage is securing low-price food, while at the protection stage the concern is to keep farmers' income level balanced with that of urban workers, both concerns become more or less equally important for middle-income countries which are in that stage where they are confronted by the disparity problem. Poverty alleviation thus becomes a prime concern.

Patterns in Trade Specialization

Yanagida and Tian (1995) examined trade specialization and trends in selected trade indices, namely the revealed comparative advantage (RCA) and the revealed competitive advantage (RC), for countries in the Pacific Basin and Asia, covering such principal crops as wheat, rice, coffee, cocoa, tea, spices, vegetable oils, and natural rubber.

An RCA index greater than 1 would imply a comparative advantage or specialization of trade in that commodity by the economy, while a positive RC measure demonstrates that an economy has a competitive edge in producing and trading the commodity. Their results show that economies having RCA values larger than one and having positive RC values are similar (Table 4).

None of the ASEAN member countries have a comparative nor competitive advantage in wheat trade. However, Vietnam is becoming a major player in agricultural trade in the region. It has competitive advantage in coffee, tea, spices, vegetable oils, and natural rubber. Meanwhile, both Thailand and Myanmar have competitive advantage in rice. In general, countries that specialize in export trade for a particular commodity have a competitive advantage in the same commodity, as well.

A more recent and updated study of a similar nature for the Asia Pacific Economic Cooperation (APEC) member economies was done by Anderson in 2000; it differed also in that the food and agricultural sector was treated as a whole. Table 5 shows the food and agricultural trade specialization index and grain self-sufficiency for six ASEAN member countries. The index is defined as exports minus imports of food and agricultural products as a ratio of export plus imports of those goods. The index spans the range of +1 to -1; an economy has

Table 4. RCA and RC indices for ASEAN member economies

Commodity	Countries with RCA > 1	Countries with RC > 1
Rice	Thailand, Myanmar, Vietnam	Thailand, Myanmar
Coffee	Indonesia, Lao PDR Philippines, Singapore	Indonesia, Philippines, Singapore, Thailand, Lao PDR Myanmar, Vietnam
Cocoa	Indonesia, Malaysia, Singapore,	Indonesia, Malaysia, Myanmar
Tea	Indonesia, Singapore, Myanmar, Brunei	Indonesia, Singapore, Vietnam, Brunei
Spices	Indonesia, Lao PDR Malaysia, Singapore, Vietnam, Brunei, Myanmar	Indonesia, Lao PDR Malaysia, Singapore, Vietnam, Brunei
Vegetable Oils	Indonesia, Malaysia, Philippines, Singapore	Indonesia, Malaysia, Philippines, Singapore, Vietnam
Natural Rubber	Indonesia, Cambodia, Malaysia, Singapore, Thailand, Vietnam, Myanmar	Indonesia, Malaysia, Philippines, Singapore, Thailand, Cambodia, Lao PDR, Vietnam, Brunei, Myanmar

Source: Yanagida and Tian 1995.

Table 5. Food and agricultural trade specialization index and grain self-sufficiency, for six ASEAN member countries, 1995

APEC Member Economies	Specialization Index	Grain Self-Sufficiency (in %, 1995)
Thailand	0.37	65
Malaysia	0.22	36
Indonesia	0.10	na
Vietnam	0.08	100
Philippines	0.04	95
Singapore	-0.24	na

Source: Anderson 2000.

a stronger agricultural comparative advantage the closer its index is to +1.

Topping the list are Thailand and Malaysia. Singapore is at the bottom. Grain self-sufficiency varies widely among the ASEAN member countries. Most East Asian economies have chosen policies to ensure that they are close to being self-sufficient in rice. However, with the increasing demand for flour and livestock products as incomes and urbanization grow, their wheat and feed grain imports have expanded considerably, leading to a decline in self-sufficiency.

Anderson (2000) also notes the strong complementarities between trade patterns among the APEC economies; therefore, a bias toward intra-APEC trade because of relative proximity and cultural affinities would ensure that most of the benefits from opening up markets would go to other economies in the region. Moreover, about 70% of APEC food trade is intra-APEC. Thus, regional cooperation would promote the welfare of these economies.

INDIVIDUAL COUNTRY EXPERIENCES

The following section documents the different food policies adopted by the ASEAN member countries to ensure food security. In addition to policies designed to boost production, policies on price and market intervention have been implemented to stabilize prices and ensure a stable food supply, particularly in rice. Measures have been instituted to strengthen supply, both by

increasing domestic production and beefing up import stocks. A host of input subsidies to keep costs low, and output price controls to keep prices steady, especially for urban consumers, have likewise been implemented. The countries have also favored economic policies and market mechanisms instead of administrative interventions, for targeting food supplies to the poor. The stabilization of rice prices has remained a major objective. Our primary sources of historical data were the FAO (1999) and Japan FAO (2003) publications.

Since poverty is concentrated in the rural areas and agriculture is the main occupation of the rural workforce, agricultural development has been given high priority in the effort to reduce poverty incidence. Self-sufficiency in food has figured as an important objective of the development strategy. In recent years, though, the urgency attached to agricultural growth has diminished. Malaysia has directed its poverty alleviation in the rural areas toward high value-added agriculture. Since paddy production does not meet this criterion, the small farmers had been encouraged to plant rubber, with infrastructure support from the state. In more recent years, small farmers were encouraged to grow palm oil. By not targeting self-sufficiency, resources have been freed up for high-value crops.

In Thailand, a more concerted approach has been made to encourage non-farm activities in the rural areas. In Indonesia and the Philippines, the emphasis continues to be that of improving productivity in cereals production. The Philippines was the first country to start with a paddy-based

Green Revolution. Indonesia also took the route of intensification of its cereal economy with its Bimas program and later with its Inmas program.

In one form or another, the selected economies have organized public distribution of food grains. Thailand has made arrangements for subsidizing food grains for those who wished to take advantage of the offer. In Malaysia, an administered price regime was introduced with highly subsidized rice distribution, the subsidy element amounting to some 40%. The Philippines has targeted subsidized food in selected areas through special development assistance programs.

Indonesia

Until the 1970s, the Indonesian economy was dominated by petroleum and rubber. The economy has faced boom-and-bust situations mainly due to fluctuations in petroleum prices and partly due to macroeconomic policies. The situation changed in the mid-1980s with greater attention to agriculture, diversification of industrial and foreign trade patterns, greater monetary discipline, and more market-friendly policies.

Indonesia has protected agriculture by instituting input subsidies on fertilizers, seeds, insecticides, and pesticides. BULOG (a National Logistics Agency) has been set up to provide a market for paddy and to set a floor price for farmers. Through the village-level cooperatives or KUDs, stocks have been acquired and stored to be used as buffer stock to meet shortages, as well as for open market operations to regulate prices. The difference between domestic and border prices for rice was 19% in the 1980s and 9% in the 1990s, mainly due to price support. The decline in the rate of protection of rice prices in the 1990s, however, indicates a shift in focus to international competitiveness (FAO 1999). The positive relationship between cost-reduction measures and the fall in the relative prices of paddy helped ensure better access to food (Anderson and Pangestu 1995).

In the period 1995-1999, rice production was very unstable. The tariff cut promoted imports and, since the price of imported rice was cheaper than their domestic counterpart, the policy led to the depression of domestic prices. The cut in the input subsidy worsened the output-input price ratios

while the cut in credit subsidy weakened the small producers (Japan FAO 2003).

Rice imports increased in 1996 but decreased substantially the next year. The major cause of the drop in imports had been the increased import price due to the depreciation of the rupiah. In 1998, BULOG increased its imports of rice but the rupiah depreciation of 251.0% did not allow imports to increase by much. BULOG, until 1998, used to be the sole importer of rice. Thailand and Vietnam have been Indonesia's major sources of rice imports.

The government controls the marketing system for rice and sugar. Market operation is conducted so as to stabilize prices, i.e., buying when the producer's price drops and selling when the consumer prices go up beyond the normal level. Farm credit called "Food Security Credit" is provided to promote domestic production of goods that are generally imported (Japan FAO 2003).

Agricultural business development holds a key position in the economic development of Indonesia. The Guidelines for National Development for 1999-2004 sought to strengthen food security based on diversified food items, local culture and institutions, and the acceleration of rural development. Since 1989, an export enhancement program and several self/reliance sufficiency programs such as *Gema Palagung* 2001, *Gema Proteina* 2001, *Gema Hortina* 2003 and *Protekan* 2003 have been launched to increase the production and the export value of specific agricultural products (International Trade Strategies 2004).

Malaysia

Malaysia posted high rates of growth in the 1970s, with a brief period of stagnation in the mid-1980s. The growth can be traced not only to the favorable terms of trade for its principal exports, i.e., petroleum, palm oil, and rubber, but also to improved productivity, particularly in rubber. Since the mid-1970s, Malaysia has been an open economy. Exports account for a very large share of gross domestic product. Malaysia's pattern of growth is similar to other developing countries in the region, but its pace had been more rapid. For example, agriculture's share in output fell from 22% to 14% in less than a decade. This was

accompanied by a corresponding rise in the share of manufacturing and services, and a marked shift in exports from traditional primary products to industrial products (FAO 1999).

Malaysia, unlike Indonesia, did not favor a cheap food policy to help the poor. Instead it aimed at improving yields. However, the government also arranged to buy rice from small growers not only to provide a steady market but also to provide a support price (FAO 1999). Jenkins and Kwok-kong Lai, in 1991, estimated that the effective protection rate for paddy in the late 1980s was 26%. The rate was much higher in the early 1980s. The buffer stocks had been initially held to provide support against shortages, but in recent years, the main function was to stabilize prices for the producers.

The Third National Agricultural Policy (NAP) sets out the strategic thrusts for agriculture and forestry development. It includes developing Malaysia as an international *halal* food hub and positioning Malaysia as a major regional distribution center for tropical floriculture products and aquarium fish (International Trade Strategies 2004).

Thailand

Thailand had the fastest growth among the Southeast economies in the 1990s, with output growing at over 8% per year. Industry had a major share in the rapid economic growth, with its contributions to national income and exports outstripping that of the primary sector, especially rice. Its economic development is characterized by low government intervention except in the rice and sugar sectors (FAO 1999).

Although Thailand has traditionally been a rice exporter, the Government's concern has also been to protect the urban consumers against excessive increases in rice prices due to rice exports. A Rice Reserve Commission was set up in 1960 to establish buffer stocks through open market purchases. A consumption subsidy in the range of 10% was also offered in the 1960s. This rose to 25-30% in the 1970s with the rise in the international prices of rice. The reserve requirements for exporters were also raised. In the late 1970s, the Government even distributed rice at a controlled price. The scheme was later abandoned as the rich cornered and resold

the bulk of the cheap rice in the open market (FAO 1999). Operations of the Rice Reserve Commission ceased in 1990 as the world price of rice fell and the number of competing rice exporters (i.e., Indonesia, India, and Pakistan) rose (Siamwalla and Setboonsarng 1991).

Previously, Thailand had imposed a tax on rice exports. This was done partly to raise government revenues but more so to lower the domestic price of rice. In the process, the tax lowered the producer price and the real incomes of rice farmers who had a surplus to sell. Recent studies have shown, however, that Thailand's rice export tax worsened the incomes of the urban poor. The tax lowered the income-earning prospects of unskilled workers to such an extent as to more than offset the benefit they received directly in terms of lower food prices (Anderson 2000).

The Thai government is guaranteeing high prices for paddy pledged under a state rice price intervention program. In the 2001–2002 seasons, the government planned to spend up to 10 billion baht in buying 8.7 million tons of various types of paddy. The maximum price for fragrant paddy is 7,000 baht a ton compared to the 5,000 baht farmers have received recently. Year 2001 was a record-setting year for Thai rice exports, with shipments amounting to 7.4 million tons. The Thai government faces two challenges: shoring up rice prices and whittling down its own rice stocks (*Bangkok Post*, December 31, 2001).

The present Agriculture Sector Reform program has the twin objectives of sustaining agricultural growth and enhancing export competitiveness. Thailand has also focused on improving standards for food safety. This would entail such tasks as monitoring farming and food processing, certifying farms and food processing plants, and setting up quarantine points along borders (International Trade Strategies 2004).

Philippines

The agriculture sector accounts for some 20% of GDP and over 40% of employment. However, Philippine agriculture has been posting slower growth through the years, indicating that the country is losing its competitive advantage in the sector. The sector has thus been a net importer

of foreign exchange. Measures of comparative advantage for the sector as a whole and for all major agricultural exports have also declined (David 1999 and 2003).

The Aquino administration sought to correct the policy and institutional distortions introduced during the Marcos regime. Export taxes, and government monopoly over international trade in coconut oil, maize, and soybeans, and the marketing of sugar were removed. However, these reforms had proved difficult to fully implement. Price distortions had been exacerbated by efforts to circumvent the agricultural trade policy reforms stipulated by the GATT-UR agreement. The Estrada administration declared the attainment of food security as the central program of government. But food security was often confused with self-sufficiency in rice and maize, two commodities which are highly political in nature.

The Philippines is a signatory of the World Trade Organization (WTO). Ideally, membership in the WTO can set the path towards a price intervention framework for Philippine agriculture, improved market access, and better world prices for the country's agricultural exports. However, the agreement itself and the manner of implementation suggest that none of the benefits may be realized (David 1999 and 2003). The rice sector, a heavily regulated commodity, was exempted from tariffication until 2004 because as a staple, rice is a politically sensitive commodity. Furthermore, while the quantitative restrictions (QRs) were lifted in April 1996, applied tariffs that are equal to the high binding tariffs (mostly 100%) were applied.

Thus, the Philippine Government, from time to time, intervened in the agricultural markets and fixed prices, primarily to soften the impact of price shocks on both consumers and producers. The domestic price of rice in the 1970s and 1980s was generally below border prices as a result of input subsidies (on fertilizers, credit, and other inputs) and the "stock and release" strategies of the Government. However, in the 1990s, price protection was reduced following the progressive removal of trade barriers.

In the 1970s, the Marcos administration held the exclusive right to import wheat, soybean, and other edible items. A Food Terminal Inc. was set up to process, store, and market food items. It also had the responsibility to sell low-priced basic food

in urban outlets through the *Kadiwa* outlets. This setup, together with measures to increase food production (as a result of superior rice technologies and subsidized inputs), aimed to provide cheap food. The program was formally ended in the late 1980s because of budgetary constraints, inefficient implementation, and poor harvests over prolonged periods.

Export taxes on such commercial crops as sugarcane and soybean were also abolished. Meanwhile, the National Food Authority (NFA) has the monopoly of all rice imports with the government setting the total limit or QRs on the amount that may be imported. The Philippines was granted exemption in 1995 for the removal of QRs on rice. Said exemption from the tariffication of rice QRs expired December 31, 2004.

The Agriculture and Fisheries Modernization Act (AFMA) is the blueprint of the country's agricultural development and modernization plans, with *Ginintuang Masaganang Ani* as the banner program. Priority programs focus on rice, maize, sugarcane, coconut, high-value commercial crops, livestock, and fisheries.

Myanmar

Since 1988, Myanmar has been shifting from a centrally planned economy to one that is market-oriented. The government is now less involved in agricultural marketing, and is encouraging the private sector to play a larger role.

Rice is the most important crop. It is both a staple food and an important export crop. Therefore, all efforts have been made to increase production. The government controlled production and marketing between 1962 and 1988. The government also fixed the price of rice. After 1989, the government monopolized rice exportation while partly liberalizing domestic marketing. Indonesia, Singapore, and Malaysia are among the countries importing rice from Myanmar (Japan FAO 2003).

Vietnam

Agriculture is the backbone of the Vietnamese economy. The sector employs 70% of the labor force and contributes roughly 30% of export revenues. It grew at a sustained level of some 4% per annum between 1990 and 2001 as a consequence of market-

oriented policies, more clearly defined property rights, and an export-oriented strategy.

The sub-sectors under agriculture changed only slightly in the past decade. However, within the crop sub-sector, the emergence of a more diversified agricultural system is noted. There are several reasons why agricultural diversification is being promoted. The success of rice production has been accompanied by declining real prices and diminished incentives for farmers. Second, there is a large surplus of labor in the rural areas. Third, there is a changed pattern of demand from staple foods to other foods. Finally, diversification is seen as a strategy to reduce risks arising from an open economy (Japan FAO 2003). Policies focused on the agricultural sector generally and directly targets promoting agricultural production. Vietnam wants to eventually become a member of the WTO.

Cambodia

Agriculture accounts for about half of GDP and employs about 80% of the work force. Rice is the principal commodity. Rice production is a vital indicator in Cambodia's agrarian society. Severe food shortages were recorded in 1979, 1981, 1984, and 1987. Adverse weather conditions, insufficient numbers of farm implements and draft animals, security problems, and the government's collectivization policies have all contributed to low productivity. Reliable statistics on rice production are hard to get because of political and technical factors.

Rice yield is among the lowest in Asia; in 2003, Cambodia produced some 4.2 metric tons of rice. Much of the harvest in the eastern provinces is exported to Vietnam. Poor transportation makes it difficult for farmers to transport the rice to domestic markets. The government, through the Agricultural Development Plan 2001-2005, hopes to increase rice exports by addressing issues such as land ownership, job creation, increasing technical capabilities, improving crop quality, reducing production costs and raising productivity. Agribusiness development is a top priority (www.investincambodia.com/2006). Cambodia's present agricultural sector development policy is based on two objectives – ensuring food security and achieving sustained growth in production, processing, and marketing.

Lao PDR

Agricultural production is largely subsistence-oriented and farm technology is characterized by low inputs, low risks, and low outputs. Crops account for some 55% of agricultural GDP, with rice contributing about 40%, livestock 30%, fisheries 1%, and forestry 5%. Sticky rice is the predominant crop grown on over 80% of the cultivated land, though some one-third is produced uplands through slash-and-burn cultivation. Agricultural productivity is low. Annual rice imports range from 27,000 to 64,000 tons. Drought and flooding are frequent causes of crop failure and food shortages (FAO 2006).

Brunei Darussalam and Singapore

These two countries are basically food-importing countries. The share of agriculture is less than a percent in Singapore while it is under 3% for Brunei. Industry and trade dominate their economies. Brunei is nearly self-sufficient in vegetables, and the production of tropical fruit is being encouraged. The rearing of cattle (both beef and dairy), buffaloes, and goats is also being promoted. Brunei is self-sufficient in egg production and nearly self-sufficient in poultry. The rearing of pigs has been banned since 1993.

Brunei's 8th National Development Plan in Agriculture (2001–2005) focused on the development of the crop industry, poultry and livestock industry as well as promoting integrated or mixed farming.

Singapore's strategy has been to provide an environment conducive to business via competitive prices, coupled with political stability, stable financial systems, and transparent legal frameworks. Singapore has concentrated on improving productivity because of the limited amount of land devoted to agriculture. Land use for farming is managed by the Primary Production Department (PDD) in the Ministry of National Development. All rice imports are subject to non-automatic licensing for food security reasons. Fish farming is also managed by the PDD.

RESULTS OF OHKAWA'S EQUATION

The basic data used to estimate Ohkawa's equation are presented in Table 6. The projected rates of growth in production and food consumption/intake and the projected production and intake levels (in thousand metric tons) are shown in Table 7. Meanwhile, Table 8 presents the summary of the exercise. It shows the projected production and food consumption gaps. However, it must be mentioned that projections for consumption are understated inasmuch as data for Cambodia, Lao PDR, Myanmar, and Singapore are not available.

The ASEAN member countries will collectively post a surplus in rice and maize. Among the countries that will post significant surpluses in rice are Indonesia, Myanmar, Thailand, and Vietnam. As expected, the region would have to import wheat inasmuch as Myanmar is the only substantial producer of wheat among the ten countries. Modest surpluses in maize will be seen in Indonesia, Philippines, and Thailand.

For the period 2004-2009, the report by the International Trade Strategies states that the dominant issues affecting food and agriculture include: (a) an increased global demand for food because of growth in the developing countries; (b) a shift from cereals to meat consumption in the developing countries; (c) further globalization of the food sectors, which will result in more developed consumer preferences and the growth of processed foods; (d) increased technical standards for safety and environmental reasons; and (e) the increased

impact of technology particularly on genetically modified organisms (GMOs).

IFPRI predicts that growth in the demand for cereals for 1997-2020 will be 1.3% annually, translating into some 2,497 million metric tons (mmt) of which the developing countries will consume 1,675 mmt. Although the growth in cereal demand is slowing down, by 2020, developing countries are seen to be unable to meet their own cereal demands. The demand for meat will jump substantially—by 57% between 1997 and 2020. Annual fish consumption by 2030 is predicted to rise by some 150–160 million tons.

Prices for major agricultural commodities were on an uptrend up to 1995-1996. However, ASEAN agricultural exports recorded long-term declines thereafter. In the long run, the World Bank predicts recoveries in the real prices of most agricultural commodities. This bodes well for ASEAN agri-food exports.

Promoting Regional Integration

Regional cooperation among the ASEAN member countries in the matter of food security is vital. The region is home to close to 548 million people. However, the food sector of several ASEAN countries is much less integrated with international markets because of major obstacles to international food trade and investment. This has unfavorably led to lower product prices for farmers and higher food prices for consumers.

Table 6. Basic data for Ohkawa's Equation

	Rate of Natural Increase in Population	Income Demand Elasticities			GDP Growth Rate 2005	Per Capita GDP Growth Rate 2005
		Rice 2020	Wheat 2020	Maize 2020		
Brunei Darussalam	1.9	0.01	0.28	-0.07	5.0	3.1
Cambodia	2.2	0.01	0.28	-0.07	5.1	2.9
Indonesia	1.6	0.01	0.28	-0.07	5.2	3.6
Lao PDR	2.3	0.01	0.28	-0.07	5.8	3.5
Malaysia	2.1	0.01	0.28	-0.07	6.0	3.9
Myanmar	1.4	0.01	0.28	-0.07	5.0	3.6
Philippines	2.0	0.01	0.28	-0.07	5.5	3.5
Singapore	0.6	-0.20	0.13	-0.26	4.2	3.6
Thailand	0.8	0.01	0.28	-0.07	6.6	5.8
Vietnam	1.2	0.01	0.28	-0.07	7.6	6.4

Table 7. Projected rates of growth in the production and consumption of rice, wheat, and maize in ASEAN member countries

	Actual Rice Prod.	Projected Rice Prod.	Growth Rate	Actual Wheat Prod.	Projected Wheat Prod.	Growth Rate	Actual Maize Prod.	Projected Maize Prod.	Growth Rate
Brunei									
Darussalam	0.4	0.4	0	0	0	0	0	0	0
Cambodia	4,710.0	4,945.5	5.0	0	0	0	200.0	204.0	2.0
Indonesia	53,100.0	53,737.2	1.2	0	0	0	11,359.0	11,904.2	4.8
Lao PDR	2,700.0	2,783.7	3.1	0	0	0	112.0	119.3	6.5
Malaysia	2,184.0	2,190.5	0.3	0	0	0	75.0	78.4	4.5
Myanmar	23,000.0	23,644	2.8	132.0	134.6	2.0	750.0	796.5	6.2
Philippines	14,200.0	14,455.6	1.8	0	0	0	5,000.0	5,075.0	1.5
Singapore	0	0	0	0	0	0	0	0	0
Thailand	25,200.0	25,804.8	2.4	0.8	0.8	7.1	4,270.0	4,351.1	1.9
Vietnam	35,500.0	37,381.5	5.3	0	0	0	2,400.0	2,666.4	11.1

	Actual Rice Intake	Projected Rice	Growth Rate	Actual Wheat	Projected Wheat	Growth Rate	Actual Maize	Projected Maize	Growth Rate
Brunei									
Darussalam	34.5	35.2	1.9	12.7	13.1	2.8	5.7	5.8	1.7
Cambodia			2.2			3.0			1.9
Indonesia	32,245.0	32,772.3	1.6	3,394	3,482.5	2.6	7,103.5	7,199.3	1.3
Lao PDR			2.3			3.3			2.0
Malaysia	1,907.0	1,947.8	2.1	675.5	697.1	3.2	95.1	96.8	1.8
Myanmar			1.4			2.4			1.1
Philippines	15,211.0	15,521	2.0	2,700.5	2,780.9	2.9	475.4	483.7	1.7
Singapore			-0.1			1.2			-0.3
Thailand	8,673.0	8,747.4	0.8	588.2	602.4	2.4	420.2	421.8	0.4
Vietnam	12,911.0	13,074.2	1.3	537.3	553.3	2.9	543.7	547.8	0.7

Note: Actual and projected production and intake levels are in thousand metric tons while growth rates are in percent. Actual intake levels for Cambodia, Lao PDR, Myanmar and Singapore are not available.

Table 8. Projected production and consumption gaps (in '000 metric tons)

	Rice	Wheat	Maize
Brunei Darussalam	-34.8	-13.1	-5.8
Cambodia	4,945.5	0	204.0
Indonesia	20,964.7	-3,482.5	4,704.9
Lao PDR	2,783.7	0	119.3
Malaysia	242.7	-697.1	-18.5
Myanmar	23,644.0	134.6	796.5
Philippines	-1,065.4	-2,781.0	4,591.3
Singapore	0	0	0
Thailand	17,057.4	-601.6	3,929.3
Vietnam	24,307.3	-553.3	2,118.6
ASEAN	192,845.2	-7,993.9	16,439.6

Austria (2004) identifies three factors affecting economic integration. The first factor is the market-led processes through the international production-sharing of multinational corporations, and the rapid development of transportation, and information and computer technology. Under this production scheme, different stages of production are spread across locations that offer significant advantages in production costs and access to export markets. In this scenario, the domestic policies of the ASEAN member economies play an important role in shaping their capacity to take part in the global production chain. While there is greater openness and liberalization in the electronics and ICT sectors, substantial protection is conferred on the agro-based, fisheries, rubber-based, and wood-based sectors, thus leading to competition among the countries.

The second factor is the institution-led processes like the free trade and investment agreements which promote functional cooperation. The creation of the Asian Free Trade Area (AFTA) has reduced the barriers to intra-regional trade. The third factor is the private sector-led processes through sub-regional economic zones (SREZs) in contiguous areas of two or more economies. SREZs help strengthen integration in the region by exploiting the economic complementarities and economies of scale.

The International Trade Strategies report (2004) contends that markets in ASEAN are of four types: (a) the market for sophisticated processed and fresh products, as well as health products, found in Singapore and Brunei; (b) the market for basic packaged food and frozen products, in Thailand and Malaysia; (c) that for unbranded products and basic packaged products with some frozen products, in Indonesia, Philippines, and Vietnam; and (d) the market for unbranded products and some basic packaged food, in Cambodia, Lao PDR, and Myanmar.

An unmistakable trend in agricultural trade in the area is the shift from bulk commodities to processed and consumer-ready products. This finding has made agricultural trade more difficult to analyze. Many of the products are more highly perishable and require higher transportation costs per unit. This change has increased interest and shifted focus to concerns about food safety and

sanitary/phytosanitary issues as well as the trade-off between trade in processed products and direct foreign investment in the food processing sector (Coyle, no date).

Measures promoting trade facilitation such as a program of technical assistance to upgrade SPS procedures, and the harmonization/equivalency of food regulation and control systems will reduce the cost of trade in food products, enable the agriculture sector to play multifunctional roles in each economy, and help achieve food security.

The growth and composition of agricultural trade is the result of rapid economic growth and evolving policy reforms. Economic vigor comes from trade-oriented policies and not protectionist policies that close off a country from the global economy. Thus, it becomes more imperative to harmonize a broad range of policies, including macroeconomic policies, as markets become more integrated through freer trade (Coyle, no date).

Clearly, promoting trade requires ensuring that tariff and non-tariff barriers to trade are not erected. For some countries, issues concerning food safety are non-negotiable; help in harmonizing SPS procedures, and food regulation and control systems will be necessary. Similarly, support in building the institutional framework to support the liberalized trade must be forthcoming. However, the diversity of economic structures and levels of development among the members of ASEAN in the past has been the stumbling block to economic integration.

Austria (2004) contends that to a large extent, domestic policies has shaped and will shape the pattern of intra-ASEAN trade and the model of investment that each of the identified priority sectors took and will take. While intra-ASEAN trade in electronics and ICT is highly concentrated in a few products implying specialization in production, there is no product specialization in the agro-based and fisheries sectors. Each economy produces a wide range of products.

The above pattern is supported by the degree of integration in each sector as measured by the intra-industry trade index (IIT). Austria (2004) used a modified Grubel-Lloyd (GL) index to measure intra-industry trade as well as measure deepening integration. Four-digit Harmonized Commodity Description and Coding System (HS) codes were used.

Among the ASEAN economies, Singapore is the most integrated; it had the most number of products that registered strong or moderately strong intra-industry trade. Among the sectors, ICT and electronics are the most integrated. A moderately strong integration was observed in healthcare products in Malaysia, fishery products in the Philippines, rubber-based products in Singapore, and automotive products in Malaysia and Indonesia. For agro-based, fisheries, wood-based and rubber-based products, integration is, at most, mild; trade in these is basically inter-industry rather than intra-industry.

In the same study, Austria (2004) suggests that ASEAN must remain competitive in the international production chain with Brunei and CLMV being integrated in the same. Thus policies that go beyond trade and investment liberalization are needed. Specifically for the agro-based, fisheries, and rubber-based sectors, integration can be achieved if the value-added of the sectors will be increased through further industrial processing. Each economy can then specialize in the production of a particular manufacturing product for export to the rest of the region. Specialization will be driven by each economy's comparative advantage in these sectors.

As a whole, the locational advantages of the region may be enhanced by lowering the costs of cross-border transactions. This will make the ASEAN economies more attractive as investment destinations and export markets. For the identified priority sectors, Austria (2004) proposed such measures as industrial upgrading, the acceleration of trade and investment liberalization, the elimination of non-tariff barriers, trade and investment facilitation, the enhancement of labor mobility, the improvement of infrastructure, and the adoption of a common framework for bilateralism and regionalism.

Meanwhile, Ahlström and Stålrös (2005), in their thesis, studied the impact of the AFTA on ASEAN member countries in terms of specialization in intra-industry trade using four categories of commodities: resource-based, labor-intensive, scale-intensive, and differentiated commodities. The aims of AFTA were to further the development in the region and attract FDI, and to stimulate intra-regional trade.

Also using the Grubel-Lloyd (GL) index, they looked into the extent of intra-industry trade in ASEAN. Their findings concurred with the theoretical expectation that intra-industry trade will be higher in industries with higher degree of economies of scale and product differentiation i.e., the index will be higher for scale-intensive and differentiated commodity goods. However, intra-industry trade was not significant in the resource-based commodity group.

The positive relationship between per capita income and intra-industry trade is also verified. Singapore, the richest member country, had the highest GL index. The Philippines registered a higher index value than Indonesia, though the latter is a larger economy, and the fact that they have similar per capita income. The authors take this as an indication that economic size does not compensate for a closed economy. However, Brunei, which had the second highest per capita income, had low index values.

Ahlström and Stålrös (2005) conclude that the effects of integration on intra-industry trade are marginal; nevertheless, the better development within ASEAN of the intra-industry trade in the more dynamic commodity groups also indicates a positive influence from integration. The GL indices favor more trade with the world than within ASEAN. The middle-income countries of Thailand, Philippines, and Indonesia show the most positive development in terms of integration due to continuous increases in intra-industry trade in the scale-intensive commodity group.

Another study conducted by the International Trade Strategies (2004) argues that the capacity of AFTA to promote integration at present is limited since only about 22% of agricultural trade of ASEAN economies is intra-ASEAN. However, food security remains a very important issue for most ASEAN economies. Furthermore, there is a positive relationship between international trade and food security. The removal of trade barriers to intra-ASEAN trade would improve the competitiveness of agricultural products while fostering economic integration.

CONCLUSIONS

Progress at integration depends crucially on the preparedness among the members of the ASEAN to commit to long-term programs. It is generally accepted that market access can be increased through regional agreements. The value of the increased access however depends on the importance of the market and the increase in access that is secured. The extent and the value of integration of the ASEAN market also depend on the level of global competitiveness of agricultural production inside ASEAN.

The process of integration takes time. In addition, barriers to integration still exist. Dennis and Yusof (2003) divide these barriers into a number of types: those that are exogenous to ASEAN, e.g., the performance of other economies; tariff and non-tariff barriers; barriers that are related to the implementation process, e.g., those having to do with commitment; actions or measures of ASEAN members that may appear to be detrimental to the interest of ASEAN as a whole; and political factors. There may be conflicts, whether real or perceived, between ASEAN commitments and the national interest which need to be resolved. In an ASEAN Secretariat news release, the Indonesian Planning Minister stated that ASEAN integration should tie in with the national development goals of each member country. Consultations with the relevant private sector might have to be conducted. In addition, the technical capacity to implement the decisions might have to be built up. The absence of effective compliance and dispute settlement mechanisms has to also be addressed.

The simple exercise involving Ohkawa's equation hinted at a possible role for enhanced intra-ASEAN agricultural trade to enhance food security among the ten member countries. The ASEAN member countries can collectively provide for its consumption needs in two cereals. However, trade in agricultural products, especially for certain commodities like rice and fresh fruits can be contentious. International supplies of rice are also sometimes unreliable. The reliability of concessional and commercial supplies differs considerably. Rice and white maize are major cereal staples for certain economies in Asia but their international markets remain thin. Thus, interruptions in trade flows can

be quite costly for those who solely depend on the world markets.

There are also areas where people prefer white maize whereas much of the world trade is in yellow maize. Thus, many economies have sought to address these shortcomings through a policy of self-sufficiency, believing that the solution to the food insecurity problem should begin at the national level (Siamwalla and Valdes 1984). This strategy would entail, however, large investments in food distribution systems, early warning systems that can be very costly, and a mix of stock and trade policies, hence, the need to make these economies seriously consider trade as a real possibility. But first, barriers to trade, both quantitative and non-quantitative, need to be addressed. An example is the issue of food safety and phytosanitary conditions. Institutional constraints should likewise be given attention so that the necessary structures will be in place for the enhanced trade that is projected.

A key ingredient to achieving food security is the formulation of a food security policy framework that is collaborative and multi-disciplinary in character. Food security assessments could be made part of the region's policy framework. Thus, there is a need for a clearer definition of food security for the ASEAN member countries as a whole. For instance, does food security also mean self-sufficiency in rice? Or should Malaysia's policy of not targeting self-sufficiency be the example?

A food policy of de-emphasizing self-sufficiency in rice must take into consideration the establishment of an appropriate and efficient price and supply stabilization strategy. One possible approach is a multilateral buffer stock arrangement in rice in the region just like the ASEAN Emergency Rice Reserve System. However, the present system must be seen as an arrangement not just for emergencies but as part of everyday life. Without such mechanisms, economies would be reluctant to abandon rice self-sufficiency policies despite the great inefficiency costs. Thus, the multilateral approach to pursuing food security in rice must find its way into the discussion agenda of regional economic groupings (Habito et al. no date). A closer study of trade-offs in resource allocation and prioritization within agriculture, e.g., rice vs. maize, coconut, and horticultural products, is also needed.

Therefore, while the empirical results show that the region can collectively achieve food security via trade, and while the specialization and RCA/RC indices point to complementarities between trade patterns among the ASEAN countries, unless the member economies agree on what food security means, there will still be some economies insisting on producing rice to achieve self-sufficiency. In addition, there will be economies hesitant on relying on trade. Food import capacity is affected by prices and the other terms on which food may be imported, as well as the foreign exchange situation. Countries that depend on food imports to a great extent are more vulnerable to shocks arising in the global food market. So unless these fears are addressed, there will still be economies that will strive for food self-sufficiency.

If regional integration and cooperation means moving towards a common goal using a common strategy, then it is essential that the ASEAN member countries agree on what food security collectively means to them, and what food items are important to each of them and the region in general, so that regional integration and cooperation under the auspices of ASEAN can be better promoted.

Food supply security can be enhanced through cooperation and interdependence among the ASEAN member countries. In this scenario, ASEAN countries would be producing and trading food in such a manner that trade complements domestic production and reserves as a means of assuring supply. ASEAN countries should agree not to restrict food trade through embargoes, export taxes, and other restraints except in highly exceptional cases.

Thus, at the level of each national economy, the development of an extensive rural infrastructure, as well as institutions, is an integral component of building an efficient regional food system. The physical infrastructure will link food producers with processors and consumers and will mean more diverse sources of supply and more stable/secure food markets. At the regional level, therefore, the harmonization of policies and the development of funding mechanisms to facilitate and reduce the cost of private sector investment in infrastructure are proposed.

POSTSCRIPT: WHAT THE ASEAN HAS ACHIEVED

Workshops have been conducted regarding the proposal to establish an ASEAN Food Security Information System. The ASEAN *halal* food program promotes intra-ASEAN food trade by providing the industry with an understanding of the concepts and issues relating to *halal* food preparation, processing, certification, and quality assurance.

The ASEAN has agreed to establish a network among the pesticide regulators for sharing information on the control, marketing, and use of pesticides in the region. ASEAN has adopted 264 harmonized Maximum Residue Limits of 20 pesticides in vegetables and fruits. A pesticide database and network has been established among the member countries.

Procedures and guidelines regarding vaccine production and its use by the livestock industry have been formulated while guidelines on risk assessment of agriculture-related genetically modified organisms have been adopted. Consultations between senior agriculture and trade officials regarding import restrictions on fresh tropical fruits, canned tuna, and vegetable oils have been done. The ASEAN task force on CODEX continues to seek consensus on market access for frozen chicken, frozen shrimp, tapioca, and cocoa. ASEAN continues to work on a Uniform Commodity Contract to enhance trade in agriculture commodities by using a simplified and standard agreement.

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