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REGIONAL TRADE OPPORTUNITIES FOR ASIAN AGRICULTURE

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FOREWORD

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ABSTRACT

Trade in food and other agricultural products is increasingly important across East and Southeast Asia, where high income Asian economies have driven significant agricultural expansion and China's momentous growth promises more stimulus to agro-food activity in the region. China is expected to become a net importer of agro-food in the coming decades, which will have significant implications within the region. China is predicted to emerge as a direct competitor of High-income Asian countries, which will result in several Southeast Asian countries emerging as suppliers to China. This paper consists of three parts. First, it examines the history of High-income Asia and how it has driven agro-food trade since the 1970's. Next, China's growth is discussed and how it will alter China's agro-food trade patterns. Finally, the Greater Mekong Subregion's role is analyzed as a potential supplier of agro-food products for China.

INTRODUCTION

1. Loss of momentum in the latest round of multilateral trade negotiations, combined with higher freight costs, has improved the prospects for regional trade within Asia. This is particularly true for agriculture, a primary obstacle to WTO negotiations and a sector in which Asia has significant demand and supply potential. To elucidate the means by which Asia can improve its agricultural productivity and food security and promote economic growth, this study uses a multi-country general equilibrium (GE) model to assess agricultural trade growth between China and the Greater Mekong Sub-region (GMS) countries. The former has over the last decade gone from being a small net exporter of agricultural products to become one of the world's largest importers, a trend that appears likely to continue. At same time, the Mekong region has agricultural capacity well beyond its current production and this sub-region encompasses some of the poorest countries in Asia.

2. Increased agricultural trade with China could make a significant contribution to growth and poverty alleviation in the GMS, thereby contributing to two important ADB policy objectives – greater Asian cooperation and more inclusive development. By focusing on GMS engagement, the study will also showcase one of ADBs most important infrastructure commitments, the two road corridors that transect the sub-region. The consultant has been collecting detailed information on the corridors' contributions to local development, and these will be intensified with greater use for regional agricultural trade.

3. The objective of this paper is to demonstrate longer term benefits of enhanced trade extending across and between developing Asian economies. Because indirect effects can far outweigh direct or negotiated trade effects, a GE assessment gives a more complete picture of the inclusive benefits of such cooperation. More comprehensive assessment like this implicates a much larger universe of stakeholders, and represents an essential justification of both the policy agenda (integration, inclusion, etc.) and supporting investments like the GMS corridors.

MOTIVATION AND BACKGROUND

4. This report begins with an extensive background review of the drivers of agro-food trade in East and Southeast Asia over the last few decades. The rise of higher income Asian economies provided an early wave of demand stimulus, accompanied by agro-food supply chain development and technology transfer around the region. This was

followed by rising middle class consumption in rapidly emerging Asian economies and, finally, with the dramatic emergence of Chinese demand in the last two decades.

Evidence from High Income Asia

5. High-income Asian (HIA) countries such as Japan, Korea, and Taiwan are useful for predicting the scope of China's agro-food trade patterns for two reasons. First, these countries were also densely populated before industrialization and can therefore serve as a model of what to expect as China industrializes. Second, compared to western consumption preferences, these countries have similar preferences and diets, and as China industrializes, its diet will shift in a similar fashion to other HIA countries. Therefore reviewing the history of how HIA food consumption patterns have changed and have driven agro-food trade patterns over the past decades is essential to the understanding of how China will impact global agricultural markets.

Table 1: Annual Food Consumption in Taiwan, kg/year

Item	1956	1960	1970	1980	1990	1995
Polished Rice	132.6	137.7	134.5	105.5	65.9	59.1
Sweet Potatoes	64.2	65.4	18.4	4.1	2.7	2.5
Wheat Flour	16.6	20	25.4	23.6	28.7	31.9
Sugar	9.4	9.4	15	24	29.8	24.2
Pulses, nuts and seeds	10.9	11.4	18.3	18.8	29	31.7
Vegetables	58.4	61.1	84.8	129.6	93.3	101.9
Fruits	14.5	22.1	45.8	70.2	131.5	137.4
Meat	17	16.2	25.3	39.6	62.9	76.1
Eggs	1.6	1.6	4.1	8	12.1	16.2
Fish	18.8	21.7	34.2	38.7	47.5	38.4
Milk	6	3.2	11	27.6	43	58.8
Oils and Fats	3.7	4.7	7.7	10.8	23.3	26.3

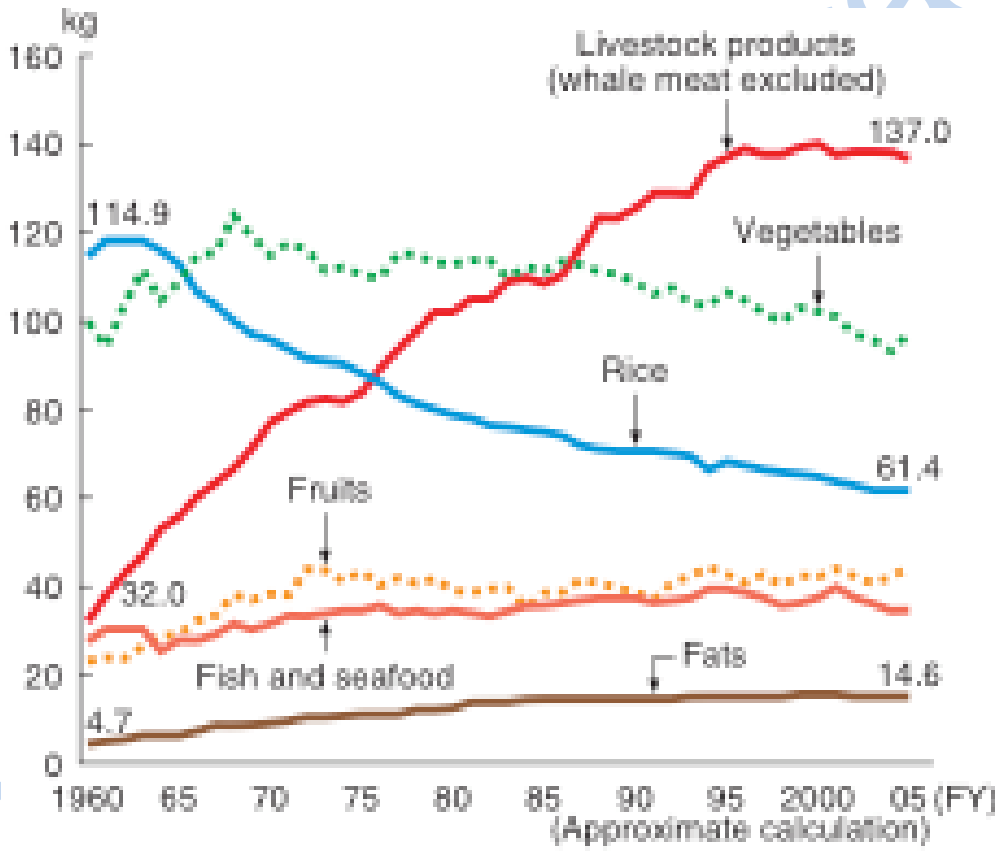
Source: Sun et al. 1998

Rice Consumption

6. Any discussion on HIA food consumption patterns must begin with rice. Rice is by far the most important crop throughout Asia as 90% of the world's production and consumption occurs in this region (Chern et al. 2003). In general, as per-capita incomes rise, diets will begin to diversify away from a starchy staple (such as rice) to a more diverse offering including meats, fresh fruits and vegetables, and dairy products. Japan, having reached a higher per-capita income much faster than any other Asian nation clearly demonstrates this pattern. Looking at annual per capita rice consumption in

Japan, quantities have been declining for several decades. From a peak of almost 120 kg/year in the early 1960's, rice consumption has fallen drastically to almost half this level by the late 1990's (Figure 1). Korea has also seen a fall in its rice consumption. In 1985, Korea's annual per capita rice consumption was 128.1 kg/year, but by 2004 this number had fallen to 82 kg/year (MAF Republic of Korea 2006). Taiwan provides even further evidence. In 1956, per capita levels were 132.6 kg/year, and by 1995 rice consumption had fallen to 59.1 kg/year (Table 1).

Figure 1: Transition of per Capita Annual Consumption of Food by Category in Japan



Source: MAFF of Japan 2006

7. Because there is such a clear trend that rice consumption decreases as income rises, many Economists have claimed rice is an inferior good. In fact, it is often argued that rice became an inferior good in Japan as long as several decades ago. Understanding this relationship is crucial for future rice projections throughout Asia, because if rice is an inferior good, classical economic theory predicts rice consumption will fall as per capita income rises. It is generally accepted among economic researchers that income elasticities for food staples decline as per capita income increases. While the initial data suggests rice is an inferior good, there is conflicting evidence on the

subject. Perhaps the most influential study on rice consumption in Asia comes from Ito, Peterson and Grant in 1989. The authors concluded that rice was an inferior good in HIA by looking at aggregate national-level data and estimating income elasticities. In Japan, the authors found the income elasticity of rice to be 0.091 in 1964 and -0.708 in 1984, which signals rice as an inferior good. Another study produced in 1997 by Kako, Gemma and Ito further strengthened the claims that rice is an inferior good. These authors projected rice demand using a log-linear function estimated by OLS using time series data from the period of 1970 to 1991. They estimated own-price elasticity at -0.130 and expenditure elasticity at -.308. In 2001, Price and Gislason utilized time series survey data from 1963 to 1991 to investigate the habit of Japanese consumption. The authors concluded that the expenditure elasticity of cereal (including rice) was -0.01 in the short term and -0.015 in the long term, signaling rice as an inferior good.

8. Looking at the other side of the argument, Bouis (1991) objected to the study produced by Ito, Peterson and Grant, claiming that the estimates of grain consumption have a downward bias due to the urban-rural migration pattern and the decreasing importance of rice production. Other studies produced by Bouis and Haddad in 1992 and Bouis in 1994, claimed that cross-sectional data estimates of income elasticity are upwardly biased due to leakage of actual consumption from meals for guests and animal feeding in developing countries. Finally, others have pointed out (Chern in 2000, Huang and Bouis in 1986) that plotting aggregate consumption against per capita income simply showed the correlation between variables, and does not reveal the causation.

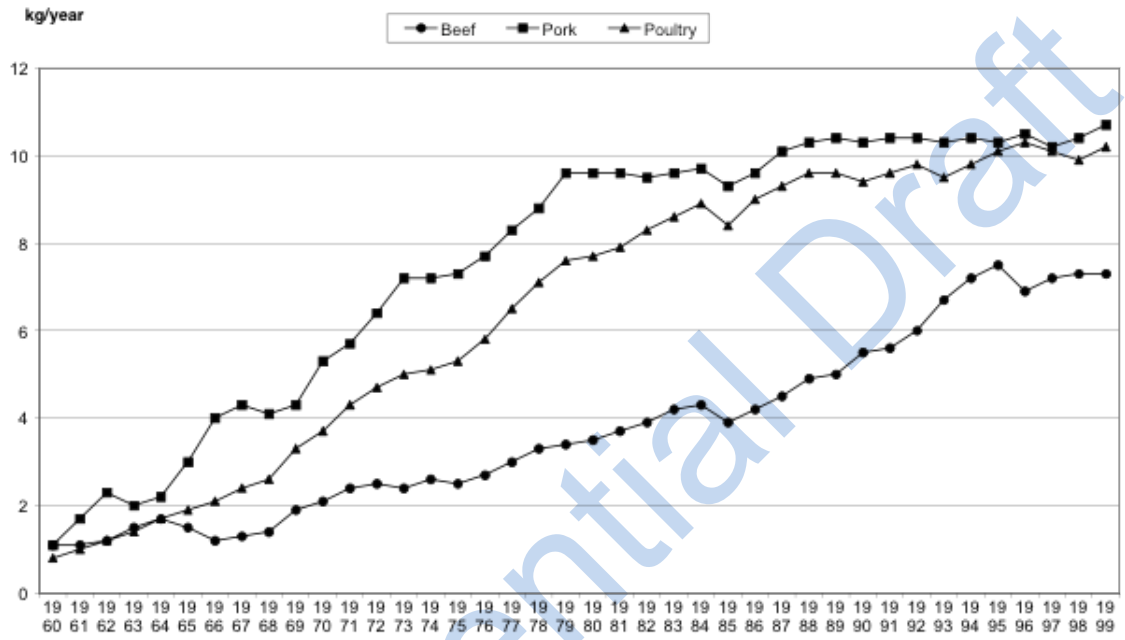
9. Although there are conflicting arguments, the data for HIA clearly shows a significant reduction in rice consumption over the past several decades. Whether or not rice is an inferior good is not certain, but if China is to behave similarly to other HIA countries than rice consumption should decrease significantly as China continues to industrialize.

Meat Consumption

10. Looking at data on meat consumption in HIA is another strong indicator of how tastes and preferences change taste as per capita income rises. As income increases so does the consumption of meat, because it transitions into the daily diet and is no longer a rare luxury. In Japan, meat consumption has increased significantly over the past decades. The Japanese diet has become increasingly “Westernized” in the sense that people are consuming more meat and poultry than traditional grain products. Since the 1960’s both meat and poultry consumption has increased steadily. Relatively more pork is consumed more than Beef, but consumption appears to have leveled off sine the 1980’s. Initially, beef consumption did not increased as rapidly as pork and poultry, but since the mid 1980’s beef has been increasing more rapidly (Figure 2). However, according to the most recent data, beef consumption per capita appears to have leveled off around 8 kg/year per year (FAOSTAT). Compared to 1960 levels, beef consumption was 7 and a half times greater by 1995, and poultry consumption had increased by nearly 14 times. Japanese households still consume more fish than meat and poultry by weight, which is

a unique feature of the Japanese consumption patterns and is a result of cultural and geographical reasons. However, in terms of caloric intake, meat and poultry have become a larger source of calories than fish since the 1980's. Meat and poultry provide a higher caloric intake than fish, which explains this discrepancy.

Figure 2: Annual Per Capita Beef, Pork and Poultry Consumption in Japan, 1960-1999



Source: MAFF**.** 2001. *Food Balance Sheet*.

11. Korea shows similar trends to Japan. Pork is the preferred meat in Korea as well and consumption per capita increased from 6.3 kg/year in 1980 to 17.8 kg/year in 2004. Beef consumption has also increased from 2.6 kg/year in 1980 to 6.8 kg/year in 2004. Poultry consumption is much lower in Korea than Japan, but has increased nonetheless from 2.4 kg/year in 1980 to 6.6 kg/year in 2004 (MAF Republic of Korea 2006). In Taiwan, similar trends occurred although the data is not disaggregated. Meat consumption per capita increased from 17 kg/year in 1956 to 76.1 kg/year in 1995 (Table 1).

12. Meat is unquestionably a normal good, and as per capita income increases meat and poultry consumption is bound to increase as well. This has significant implications because newly industrialized economies (NIE) demand significant amounts of meat, which in turn require even larger amounts of resources such as animal feed to produce the livestock. This will have a tremendous impacts in the global economy as China continues to industrialize and increase its demand for meat.

Other Food Consumption Categories

13. Although rice and meat are two of the most important categories for assessing food consumption patterns in HIA, there have been a variety of other changes as well. Much has been said about Japan's diet becoming increasingly westernized in the past 30 years, as the purchases of traditional Japanese foods have decreased while purchases of non-traditional foods have increased. In terms of food categories this is represented as a significant increases in meat (especially beef) and dairy products, while consumption in rice, fish, fresh fruits, and fresh and processed vegetables have all decreased (Table 2). When comparing Japanese household food expenditure shares of 10 aggregate food groups in 1997 with those in the United States, the countries' profiles look very similar. The only large differences are fresh vegetables (10% in Japan versus 5% in United States), dairy (6% in Japan versus 12% in United States), and meat and fish (12% and 18% in Japan versus 22% and 3% in United States). However, if meat and fish are aggregated into one category their shares are approximately the same. Generally speaking, foods that had a significantly higher expenditure share in Japan than in the United States have decreased their shares over time in Japan. Conversely, foods that had a lower share in Japan than in the United States have increased their shares over time in Japan (Chern 2003).

Table 2: Changes in Quantities Purchased in Japan, 1970-1995

Decrease		Neutral	Increase	
Cereal		**Oil/fats**	**Meat**	**6%**
Non-glutinous rice	-50%		Beef	41%
Fish	**-24%**		Pork	-13%
Fresh vegetables	**-24%**		Poultry	8%
Fresh fruits	**-45%**		Ground beef	19%
Processed vegetables			**Dairy**	
Dried mushrooms	-60%		Milk	20%
Bean curd	-10%		**Non-alcoholic beverages**	
Pickled radishes	-46%		Black Tea	13%
Non-alcoholic beverages			Coffee	143%
Green tea	-33%			

Source: FIES, various issues.

Source: Chern et al. 2003

14. In Korea another significant trend since the 1970's has been the reduction in consumption of food crops (rice, barley, wheat, soybeans, corn, and potato). While consumption per capita in wheat, soybeans, and corn have actually increased slightly, large decreases in rice, barley, and potatoes have shrunk the entire category. Since 1980, food crop consumption per capita has decreased from 195.1 kg/year to 142 kg/year in 2003. The decline in food crop consumption can be attributed to the increase in livestock products, as well as fresh fruits and vegetables. Vegetable consumption per

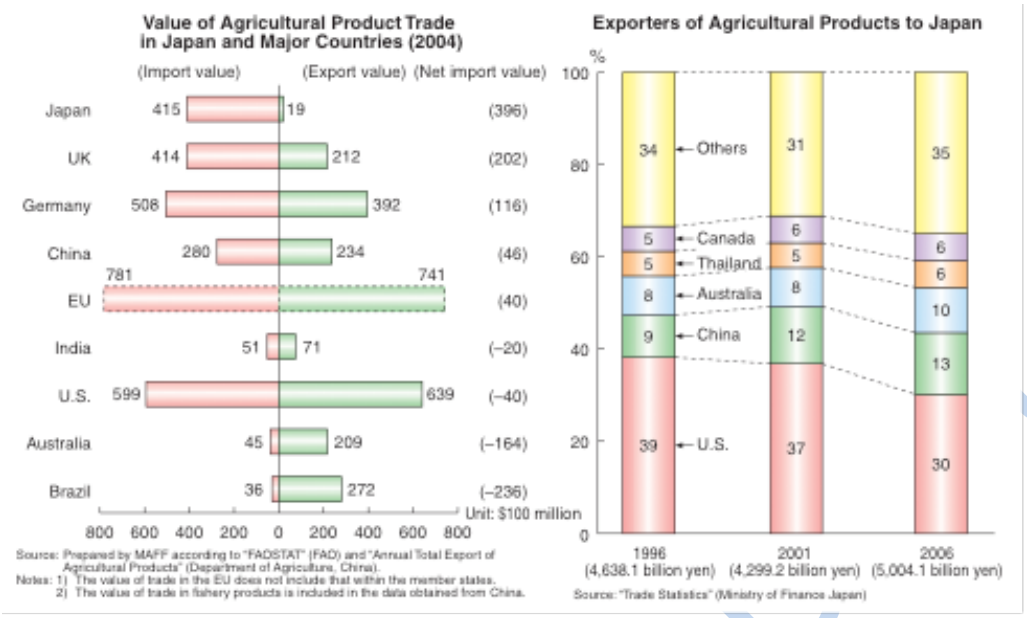
capita has increased from 120.3 kg/year in 1980 to 145 kg/year in 2003, while fruit consumption per capita has increased from 22.3 kg/year in 1980 to 55.8 kg/year in 2003 (MAF Republic of Korea 2006).

15. In Taiwan many of the same trends can be seen. In addition to the large decline in rice consumption, sweet potato consumption has declined drastically as well. From 64.2 kg/year per capita in 1956, consumption has fallen all the way to 2.5 kg/year in 1995. The steep declines in both rice and sweet potato consumption in Taiwan has been replaced by increases in animal products, fish, vegetables, and fruits. Vegetable consumption per capita has increased from 58.4 kg/year in 1956 to 101.9 kg/year in 1995, while fruit consumption per capita has increased from 14.5 kg/year in 1956 to 137.4 kg/year in 1995. Other big increases included milk (from 6 kg/year in 1956 to 58.8 kg/year in 1995) and wheat (from 16.6 kg/year in 1956 to 31.9 kg/year in 1995) (Table 1).

HIA Agro-Food Trade Trends

16. HIA countries have all had similar shifts in food consumption preferences, which have resulted in profound effects on agro-food trade. Looking at Japan first, it is one of the largest importers of food and agricultural products, and its shifting preferences have significantly altered food balance sheets. Domestically, Japanese rice producers have been hurt as the wholesale price of rice has fallen approximately 30% since 1990, matching the large decrease in demand. Rice represents a quarter of Japan's total value of agriculture production, which has put significant pressure on many lower income commercial farms (MAFF of Japan 2003). In terms of imports, Japan imported a record level of agricultural goods in 2007, worth 5,530.4 billion Yen. Japan is the world's biggest net importer of agricultural products, and is characterized by a heavy dependence on specified countries as demonstrated by the fact that more than 60% of imported agricultural products are from just five countries, including the US, China, and Thailand (Figure 3).

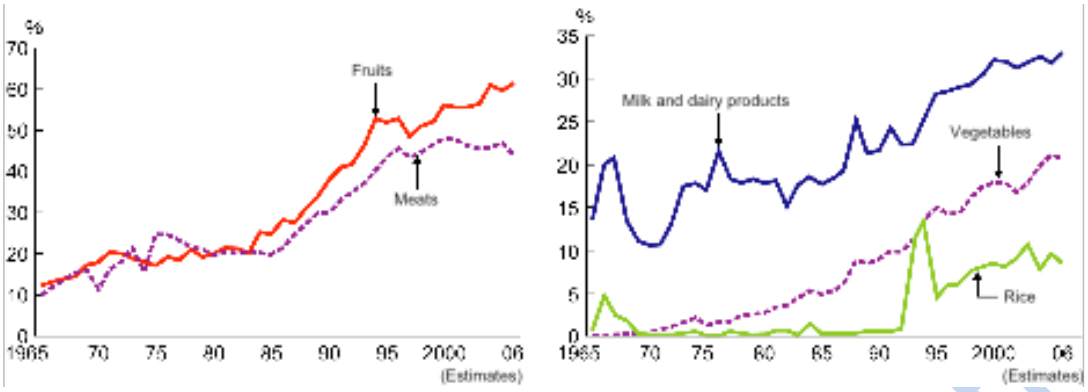
Figure 3:



Source: MAFF of Japan 2006

17. Japan's large reliance on agricultural imports has caused Japan's food self-sufficiency ratio to decrease for numerous years. The ratio has decreased from 73% in 1965 to 40% in 1998 where it has remained since. This decrease in the self-sufficiency ratio can be attributed to the dietary changes in Japan, namely the increase in imports of agriculture products that are difficult to supply through domestic production, matched with the decline of rice consumption, which can be self-supplied. On a caloric basis, Japan's food self-sufficiency ratio is the lowest among the major developed countries. In terms of grain self-sufficiency, Japan ranks even lower at 124th among 173 countries in the region. This is due to Japan's increased appetite for meat, but a drastic shortage of land requiring Japan to rely on imports. Vast agricultural lands are needed to produce the feed grains necessary for the production of livestock that is demanded. Estimates for the amount of land needed to match Japan's main imported agricultural products is approximately 12.45 million hectares, which is roughly 2.7 times larger than the current farmland area (MAFF of Japan 2007). Since the mid 1980's, a continuing appreciation of the Yen, matched with increased demand, has fueled a large increase in the rate of imports of fruits, meats, milk and diary products, and vegetables (Figure 4). Additionally, there has been a significant increase in imports of processed food, due to changing taste preferences. The total value of imported food products and groceries is now equivalent to half the output of domestic agriculture and fisheries (MAFF 2007).

Figure 4: Average Import Rate for Key Agricultural Products in Japan



Source: MAFF of Japan 2007

18. Much like Japan, Korea is a net importer of agricultural products. The majority of Korea's imports are food crops such as corn, flour, and beans and represented 50.9% of the total share in 2003. The rest of the agricultural imports are comprised of livestock products (mainly beef), forestry, and fish. These categories represent roughly the same share each at approximately 16%. Korea receives most of its agricultural imports from the United States followed by China, Australia, and Indonesia. Due to the increase of livestock production to meet the growing demand for meat products, Korea's demand for wheat as feed has been rapidly increasing, all of which is served by imports (Table 3).

Table 3: Korea's Supply & Demand of Wheat

Table Supply & demand of wheat (Unit : 1,000M/T)

Year	Carry over from the previous year	Supply			Demand					Carry over to the next year	Self-sufficiency rate(%)
		Production	Import	Total	For Food	For processing	For feed	For seed	Total		
1985	249	11	2,996	3,256	1,005	1,031	932	20	2,988	268	0.4
1990	237	1	2,239	2,477	903	992	98	12	2,005	472	0.05
1995	910	10	2,777	3,697	1,070	1,024	1,225	16	3,335	362	0.3
2000	472	2	3,266	3,740	1,363	880	1,026	20	3,279	461	0.1
2001	461	3	3,251	3,715	1,263	887	1,051	63	3,264	451	0.1
2002	451	6	3,830	4,287	1,294	884	1,661	36	3,875	412	0.2
2003	412	10	3,753	4,175	1,138	932	1,656	30	3,756	419	0.3
2004(P)	419	10	3,397	3,826	1,200	971	1,162	30	3,363	463	0.3

Source: MAF Republic of Korea 2006

19. Another large category of agricultural imports comes from soybeans resulting in trade liberalization and the growing demand for processing and feed. Consequently, the self-sufficiency ratio has collapsed in recent years as imports rise, falling from 20.1% in 1990 to 7.3% in 2003. Corn is another category that is almost exclusively served by imports due to increased demand for processing and feed for livestock. Imports have increased from approximately 3 million tons in 1985 to 9 million tons in 2004, resulting in the self-sufficiency ratio to fall from 1.9% to 0.8%. In the 1970's the import of beef was introduced to stabilize the supply and price of livestock to meet the rapidly growing demand. The rate of imported beef has grown from 6.9% in 1980 to 47.5% in 1990, and all the way to 65.1% in 2000. As expected, the self-sufficiency ratio for beef has fallen as imports increase, and has decreased by 43.3% since 1980 (Table 4). Pork however, has been largely self-supplied and has a relatively high self-sufficiency ratio compared to other forms of livestock. During the same period, pork's ratio fell by only 8.5% (MAF Republic of Korea 2006).

Table 4: Korea's Supply and Demand for Beef

Table Annual Supply and Demand for Beef (Unit: M/T, kg, %)

	Demand	Supply		consumption per capita	Self-sufficiency
		Domestic	Import		
1980	100.0	93.1	6.9	2.6	93.1
1985	120.4	115.7	4.7	2.9	96.1
1990	180.6	94.8	85.8	4.1	52.5
1995	301.2	154.7	146.5	6.7	51.4
2000	402.4	214.1	261.8	8.5	52.4
2004	327.9	144.9	183.6	6.8	44.2

Source: MAF Republic of Korea 2006

20. Taiwan's story is a little different than Korea and Japan. Taiwan's agricultural industry was fueled by large amounts of Foreign Direct Investment (FDI) in the 1950's and 1960's. This increase in FDI gave Taiwan the capital goods it needed for industrial development, while simultaneously producing enough food to satisfy domestic food requirements and produce exports as well. Agricultural products became a key part of Taiwan's export industry representing over 90% of all exports in the 1950s. However as Taiwan industrialized, its share of agricultural exports decreased significantly (to 4.7% in 1996), even though the total value was increasing. The vast majority of these exports went to Japan, which was also one of the largest donors of FDI. In 1996, Japan received 44.8% of the total of Taiwan's agricultural exports followed by Hong Kong (18.1%) and the United States (9.1%). Total agricultural imports began to increase rapidly as Taiwan moved into a more industrialized society. Agricultural imports increased from $75.8 million USD to $9,986.6 million USD, a 132-fold increase in a period of 36 years. The sharp rise in agricultural imports reflects the shift in Taiwan's diet, as it must import large

quantities of feed grains, oilseeds, meats, fruits and vegetables to meet changing consumer preferences. The United States is Taiwan's main supplier of agricultural imports, providing 54.5% of the total in 1996. Other sources of imports come from Malaysia (9.3%), Australia (5.5%), Indonesia (4.5%), Thailand (3.4%), and Japan (2%) (Sun et al. 1998 and Table 5).

Table 5: Agricultural Trade in Taiwan

Year	Agricultural Exports	Agricultural Imports	Agriculture's Share of Total Exports	Agriculture's Share of Total Imports
	-----Million US $ -----		-----Percent-----	
1952	114.2	66.5	95.5	32.1
1955	124.4	65.5	92.8	34.5
1960	121	75.8	71	30.1
1965	286.5	153.8	63.7	27.7
1970	388.1	376.5	26.2	24.7
1975	1,041.70	1,244.70	19.6	20.9
1980	2,251	3,088.70	11.4	15.7
1985	2,294.70	3,413.50	7.5	17
1990	3,661.40	6,088.30	5.5	11.1
1995	5,638.80	9,763.90	5.1	9.4
1996	5,484.90	9,986.60	4.7	9.8

Source: Basic Agricultural Trade Statics of Taiwan, 1996

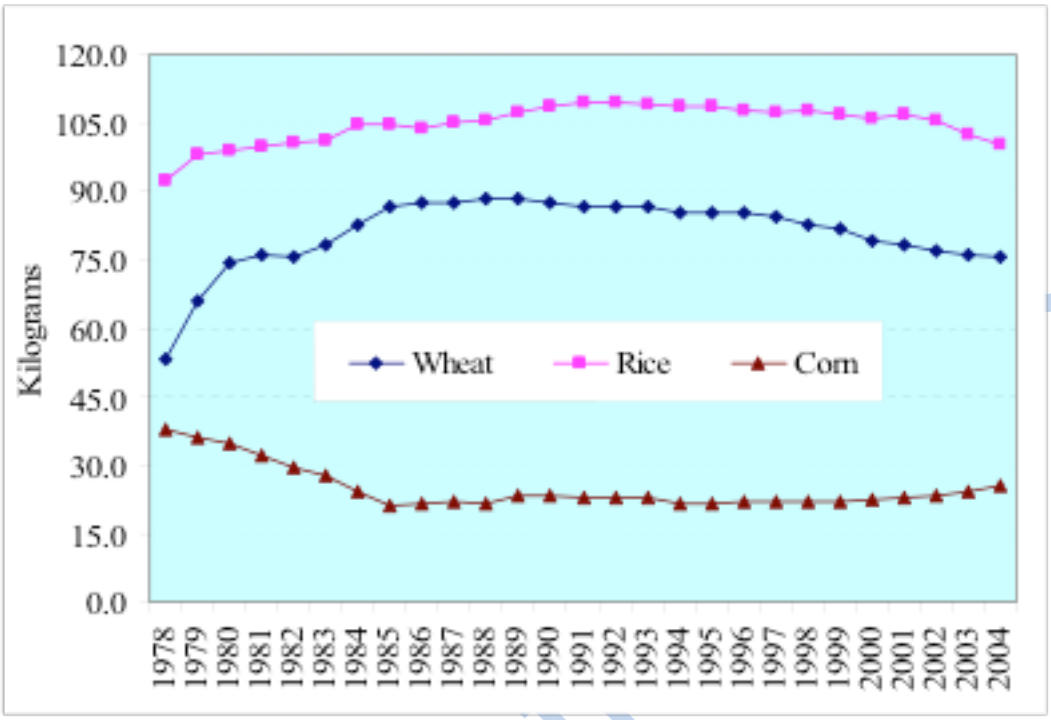
21. There are clear trends that emerge when looking at HIA agricultural trade patterns. Most noticeably, HIA countries have all had significant increases in meat imports as well as feed grains to fuel domestic production. Vast areas of farmland are needed to yield the grains necessary to raise cattle and other livestock, and as HIA countries are densely populated and industrialized, they simply cannot produce the quantities needed. Therefore, HIA Asia is dependent on imports of grain in addition to meat products in many cases, and the self-sufficiency ratios have been declining for numerous years. By 1980, HIA accounted for 16% of world grain imports and 8% of all meat imports, up from 8 and 1% respectively in 1960 (Tyers and Anderson 1985). These trends present a very interesting issue in terms of China, because as China continues to increase its meat demand, vast quantities of grain will be needed, which will create tremendous pressure on global agricultural markets. Another important trend has been the emergence of Southeast Asia as a food supplier for HIA. Traditionally, the Mekong Region has been the rice basket for many of these countries, but more recently meat has been playing an increasingly important role, especially poultry from Thailand. Thailand represents one of the most important trading partners in HIA and has had success that other Southeast Asian countries will hope to attain as China transitions into a net importer of agricultural products.

People's Republic of China

China's Consumption Patterns

22. Since market reforms in 1978, China's economic growth has been phenomenal. Due to China's ever rising GDP levels and growing middle class, there has been a great deal of discussion as to how China will impact agricultural markets in the world. China has already begun industrialization, and Chinese consumer taste preferences have started to shift as more people are lifted out of poverty. There have been numerous studies of food demand in China that have found Chinese households tend to consumer more meats, poultry, fish, dairy products, and fruit as their incomes rise, while their consumption of tradition staple grains remains stable or declines (Chern 1997, Gould 2002, Guo et al. 2000, Xin et al. 2005). Looking first at food staples, China exhibits similar characteristics to HIA countries. Prior to 1990, per capita consumption for rice and wheat increased at an average annual rate of 1.3% and 4.4% respectively, which was fueled by raising incomes allowing the poor to be able to consume more. Since the early 1990's however, per capita consumption of rice and wheat has started to decline slightly, due to the fact that more individuals are able to diversify their diets. Looking at corn, per capita consumption initially fell after market reforms due to the fact that people prefer fine grain to coarse grains and were able to consume more fine grains as income increased. All together, since 1985, per capita consumption in all three grain categories has been quite stable. From 1985-2004, per capita rice consumption averaged 106.5 kg/year, wheat consumption averaged 83.8 kg/year, and corn consumption averaged 22.5 kg/year (Figure 5). Although these categories have stabilized somewhat in recent years, they can be expected to decline as Chinese citizens continue to diversify their diet.

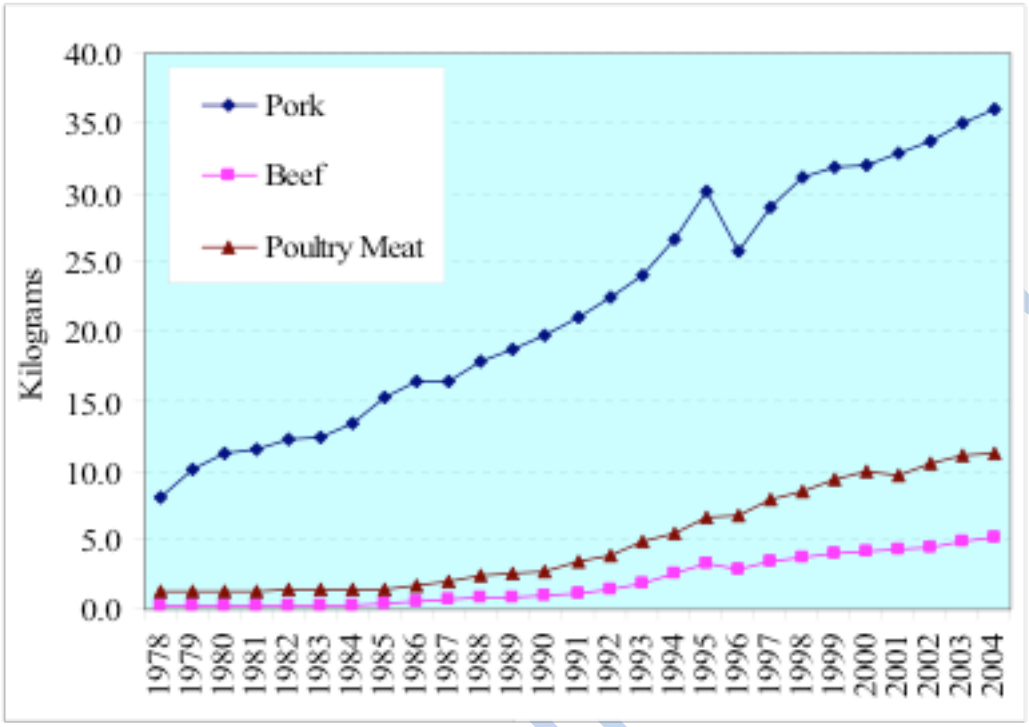
Figure 5: China's Per Capita Consumption of Rice, Wheat, and Corn, 1978-2004



Source: Zhuang and Koo 2007

23. Much like HIA, meat consumption in China has been steadily increasing for the past several decades. In 1978, per capita consumption of pork, beef, and poultry meat was 8, 0.3, and 1.3 kg/year respectively. However by 2004, these numbers increased to 35.9, 5.2, and 11.3 kg/year (Figure 6). These amounts are well within the bounds of HIA and have already begun to create massive reverberations for Chinese agricultural trade.

Figure 6: China's Per Capita Consumption of Pork, Beef, and Poultry Meat, 1978-2004



Source: Zhuang and Koo 2007

24. Clear trends can be seen that demonstrate the shifting consumer preferences in China. However, as China is a country characterized by large inequality it is worth examining how food consumption patterns vary across income classes. Income and food expenditure growth have been disproportionately concentrated in the upper classes. Therefore, the consumption patterns of high-income households may have been disproportionally influencing driving food demand and market developments. As incomes rise, Chinese households tend to change the structure of their diets, but different classes behave differently. For low-income urban households, pork and eggs are the dominant source of animal protein, but purchases of fish and poultry rise more quickly as income increases. Among the lowest income households, pork purchases are more than double fish and seafood purchases. However, among China's highest income households, purchases of pork are roughly equal to purchases of fish and seafood. Another discrepancy occurs with eggs and poultry. Low-income households will purchase more eggs while high-income households purchase roughly equal amounts of eggs and poultry. In terms of traditional staple foods, average rice and wheat flour consumption is lower among high-income households, while consumption of grain products tends to rise as income increases in low-income households. Consumption of cooking oil is nearly the same across all income levels. The demand for quantity diminishes as income rises, and the upper-income households appear to have reached a saturation point in quantity consumed of most food items. Most additional food spending by high-income consumers is spent on higher quality or food in restaurants. The vast majority of Chinese are rural

households (about 60% of the population) and low-income urban households (20%) that still demand increased quantities of many foods as their income rises. These patterns suggest that the growth in the quantity of food demanded has been much slower than would be expected by China's rapid economic growth. High-income households are purchasing greater value added products rather than increased quantity, which has caused much of the food expenditure growth. Low-income households have been experiencing less rapid income growth and thus growth of their food spending has been slower. This slow growth in quantity of food demanded is one possible explanation as to how China has been able to remain largely self-sufficient for many food items. However, as more and more low-income individuals incomes continue to increase the true test of China's agricultural production will be seen (Gale and Huang 2007).

China's Agro-Food Trade Trends

25. With 25% of the world's populations and only 7% of the world's arable land, agro-food trade is a crucial sector of China's economy. However, China's agriculture industry has been surprisingly self-sufficient given their resource constraints and it has even emerged as an exporter of vegetables, fruits, and aquacultural products. Despite rising exports, China remains a net importer of agricultural products.

26. While many researchers have cited the rising demand for meats to lead to an increase in China's agricultural imports of meat and/or feed grains, China's agricultural imports have only really begun to take off in recent years. This has been driven by an increasing demand for vegetable oils, animal feed, and industrial inputs such as soybeans. Soybean imports have increased from $294 million USD in 1978 to $8.1 billion UDS in 2006 (FAOSTAT). However, agricultural import growth was sluggish for many years until 2002-2004 when imports more than doubled. This happened as a result of large economic growth, lower barriers to imports, higher commodity prices, and tightening domestic commodity supplies. In total terms, agricultural imports increased from less than $11 billion USD in 2002 to $25.9 billion USD in 2004 (Gale 2005). Soybean imports were responsible for more than 30% of this growth, increasing from $2.5 billion USD in 2002 to $7 billion USD in 2004. Soybeans are used for making vegetable oil as well as high-protein animal and fish feed. However all these soybeans were not able to meet China's demand for vegetable oil as imports of vegetable oil increased by $2.6 billion USD during this time period accounting for another 17% of agricultural import growth. Wheat was another major food commodity that was responsibly for China's large agricultural import growth. Wheat imports rose from $100 million USD to $1.6 million USD during 2002-2004, accounting for 10% of the increase in imports. Commodities used as raw materials were also significant contributors to agricultural import growth. Cotton was the biggest sector, increasing from $308 million USD in 2002 to $3.4 billion USD in 2004, representing 21% of the increase of the import growth total (Gale 2005).

27. Although China's food demand is rising, the majority of food-related imports are concentrated in just two sectors: vegetable oils and soybeans. While there have been sharp increases in other imported food items, such as meats, milk, cheese, wines and fruits, these represent a relatively small share of China's overall agriculture imports. Other than the large imports in vegetable oils and soybeans, China remains very self-sufficient in nearly all food categories. China is even mostly self-sufficient in poultry and meat production although it relies on imported soybeans for animal feed. However China produces its corn domestically, which is the largest ingredient in animal feed. Even China's large imports of wheat represent a small fraction of the total consumption. Wheat imports in 2004 only represented 7% of China's estimated wheat consumption (Gale 2005).

28. Looking at future agricultural import demands, China is expected to continue its reliance on soybean and vegetable oils, and a sharp decline in these imports is unlikely. Meat imports are expected to grow as well, due to increasing demand. Demand for imported pork is especially strong, as domestic outbreaks of avian influenza and a ban on United States beef imports have induced many consumers to substitute pork for beef and poultry products. In addition to meat imports, feed grains are also expected to rise in the coming decades, eventually reaching 25 to 35 million tons by 2020. Although China's wheat imports represent a small percentage of its total consumption, in sheer numbers China is still a very large importer of wheat. In terms of global wheat markets, China is responsible for nearly 15% of all wheat imports and thus predictions about world wheat markets rest heavily on the assessments of China's future role. These predictions are difficult to make as China's wheat markets have unique characteristics in the sense that China is the only country in East and Southeast Asia that has both a large wheat-producing and wheat-consuming rural population (Rozelle and Huang 1998). China's unique characteristics have caused many analysts to make conflicting claims. Some argue that China will continue to demand large quantities of imported wheat, while others forecast that China will gradually move to a position where domestic supply will meat the nation's demand. One of the most sweeping reports conducted by Rozelle and Huang in 1998, claims that China's wheat imports will raise before peaking and gradually declining through 2020.

29. While China's agricultural imports may seem like a great potential for the Greater Mekong Subregion to capitalize on, other countries may largely fulfill China's requirements for non-cereal and high-value agriculture. China is still a net exporter of agricultural products and is mostly self-sufficient in agricultural production. It's most important imports are soybeans and cotton and large agricultural suppliers such as the United States and Brazil primarily meet demand. This means there are only a limited amount of imports China needs and current demand is filled. For example, the United State alone exported over 14 million metric tons of soybeans to China in 2008. This is a massive number considering Chinese exports of corn, wheat, and rice totaled only 4 million metric tons that same year (Lohmar et al. 2009). Therefore small countries like Laos and Cambodia might find it hard supply China in its current state, especially considering it must compete with global export giants. Of course as China grows its

demands will change, but without current opportunities this would be a risky investment without guaranteed demand.

30. China's agricultural exports have also begun to take off in recent years, although at a slower pace than imports. During 2002-2004, exports increased by $3 billion USD with the most important categories being processed foods, vegetables, and fruits. Pork exports rose by $250 million USD, but were offset by a decline in poultry exports. China's corn exports peaked at nearly $1.8 billion USD in 2003, but declined significantly to $324 million USD in 2004 as the government cut corn export quotas. Japan is the largest market for China's agriculture exports, accounting for approximately 1/3rd of the total in 2004 (Huang and Gale 2006). This is not surprising given that a large number of Japanese manufactures have invested in China. From 1985 to 2003, a total number of 310 Japanese food industry subsidiaries were set up in China, and it is often remarked that China has become the farm of Japan (Jin et al 2006). Most of China's other major markets are neighboring countries or regions and include Hong Kong and Southeast Asia (each accounted for 12% of China's exports in 2004), South Korea (7%), and Russia (3%). The United States is also one of China's largest agricultural export markets, representing 9% of the total share. The United States is one of China's fastest growing markets with agricultural imports increasing by 43% from 2002-2004 (Gale 2005).

Greater Mekong Sub-region

31. Growth in the Greater Mekong Subregion (GMS) has been robust for several years. From 1992-2006, the seven economies of the GMS grew 8.3% per year on average. This strong growth has been fueled in part by a very strong export sector. Exports from the GMS rose from $37 billion USD in 1992 to $154 billion USD in 2005. This corresponds to an annual rate of growth of 11.6%, which is larger than the world average of 8.4%. Growth in Viet Nam was the largest of all the GMS economies at 22%. By value, Thailand's exports are by far the largest, although its share of exports has declined from 87% in the early 1990's to 71% in 2005. Viet Nam has become a more important player in the GMS, increasing its share from 7% to 21% during this period. The vast majority of the GMS trade has been in manufactured goods. With a relative abundance of agricultural resources, the GMS economies stand to benefit significantly from the globalization of processed food markets. The agricultural sector accounts for 50-70% of employment in Cambodia, Laos, and Viet Nam (CLV), and therefore growth in production and exports from this sector will be necessary to improve incomes and reduce poverty. Furthermore, the GMS economies are close to China, and as China continues to grow and demand more food, the GMS can be an important supplier ("The Mekong Region Trade: Trends, Patterns, and Policies.").

32. China's growth, along with increasing integration into world markets and reduced trade barriers with GMS, is expected to have significant effects on the structure of

regional production and trade. The GMS resource-abundant economies are expected to become more intensive in natural resource-based exports and transition away from the current labor-intensive manufacturing industry. This transition is expected as a result of two parts: first, through direct bilateral trade growth as China demands more natural resource based products, and second through direct competition with China in global markets. China's WTO accession has increased its market access and reduced the cost of intermediaries for its manufactures, which in turn has reduced the international competitiveness of key GMS manufacturing sectors (Ianchovichina and Walmsley 2003). Additionally, the implementation of the Agreement on Textiles and Clothing (ATC), which has dismantled the Multifiber Arrangement (MFA), is significant for China's competiveness. Through the elimination of the MFA's national quotas on apparel exports to the United States and European Union, China has become much more competitive in the global marketplace (Coxhead 2004).

33. One important tool for assessing how much China will compete with other GMS economies comes from revealed comparative advantages (RCA). China shows very low RCA for most agricultural sectors and natural resource sectors, while it has very high values for all types of assembly, furniture, garments, footwear, and accessories (Coxhead 2004). Looking at the GMS, Cambodia's advantage in primary products has shrunk over the years, reflecting its specialization in garment exports. Laos however, shows an increase and high levels in RCA in a number of agricultural and natural resource products. These categories include, cereals, vegetables, crude rubber, coffee, spices, silk, jute, copper, and zinc. Although Lao PDR's RCA in wood and wood products has decreased, the levels are still quite high overall. Viet Nam also possesses an advantage in a large number of agro-based products such as fresh and processed fish, rice, fresh fruit, nuts, coffee, tea, and spices ("The Mekong Region Trade: Trends, Patterns, and Policies."). Looking at the correlation coefficients of RCA values demonstrates how complementary GMS economies are with China. Negative values of this measure indicate a tendency for countries to specialize in products other than those in which China is specialized, while positive numbers indicate a greater overlap. Both Thailand and Viet Nam have positive correlations, meaning they are direct competitors with China (Coxhead 2004). Therefore it would be prudent for Viet Nam and Thailand, along with the other GMS economies, to focus on agricultural products to become major suppliers to the Chinese market. With the continued growth and size of China, these opportunities are too important to pass up and this pattern is expected to become increasingly dominant in overall GMS trade.

34. There are also indirect effects that are pushing this trend. Clothing exports in Cambodia comprise close to 90% of total exports, and in Lao PDR they represent 80% of the manufactured exports ("The Mekong Region Trade: Trends, Patterns, and Policies."). In Viet Nam, textile and apparel production accounted for more than 24% of the manufacturing labor force and employed 4.6 million people in 2004. The loss of these revenue sources, and the lower wages that this will cause, will reduce labor costs in agricultural industries contributing directly to increased profitability, which will compliment the direct effects from growth of Chinese demand of these products. Another

indirect driver will be changes in FDI inflows. Although the evidence is ambiguous, there are expected decreases in FDI into industries in Southeast Asia where competition with China is intense. China's growth and globalization is likely to cause GMS economies to experience negative terms of trade shocks for their manufacturers and positive shocks for agricultural produces (Coxhead 2004).

Trends in Trade

35. There have been a variety of factors that have helped fuel the tremendous growth in trade in the GMS. Starting in the latter half of the 1980's, many of the GMS economies began the process of transitioning to a market-based system. Generally speaking, the dominance of state-owned enterprises were reduced, prices and trade of goods and services were liberalized, and restrictions on the private sector were eased.

36. More specific examples of trade liberalization can be drawn from Cambodia, Laos and Viet Nam. In 1987, Cambodia abolished the state monopoly for foreign trade and allowed the private sector to engage in foreign trade in 1989. The reform program further accelerated following national elections and the establishment of a democratic government in 1993. In the mid 1990's, quantitative restrictions on trade were mostly eliminated and by 2002 import tariffs were streamlined to a four-band structure (0%, 7%, 15%, and 35%). Despite political instability and notorious corruption, Cambodia was able to achieve success in revamping and stabilizing its war-torn economy through greater outward orientation.

37. In Laos, economic liberalization has brought on substantially lower tariffs with a major reduction in 1995 when a complex multiple tariff rate system with a 150% maximum rate was replaced by a simpler six-band structure (5%, 10%, 15%, 20%, 30%, and 40%). However, under this-band structure all imports are still subject to some form of licensing. For example, importers must submit an annual business plan to the provincial trade unit and the One Stop Service six months or a year in advance to obtain licenses.

38. In 1988, Viet Nam's enactment of the Law on Import and Export Duties marked the beginning of trade reforms. The original tariff schedule was replaced in 1992 by a detailed scheduled based on the Harmonized System of tariff nomenclature. The structure was fine tuned in the following years and the maximum rate fell from 200% in 1997 to 113% in 2004. However this maximum rate is rarely used in practice as less than 1% of total tariff lines, accounting for about 4% of import value, had tariff rates above 50%. Additionally, quantitative restrictions have largely been dissolved being replaced by tariff rate quotas.

39. In addition to trade liberalization, private sector development and the encouragement of FDI have also been crucial elements of the market-oriented strategies of GMS countries. Over the past few decades policies towards FDI have become increasingly liberal. Full foreign ownership is allowed in most industries, and major reforms have

been legislated to provide equal treatment to foreign and domestic investors as well as streamlining procedures for approval and registration.

40. FDI has been a major facilitator of growth in many of the GMS economies. While the stories of China and Thailand are particularly well known, FDI has also played important roles in less-developed countries. In Cambodia for example, FDI from Northeast Asia (primarily from Korea, Taiwan, and China) helped propel its now flourishing garment export industry. This shift in production from countries with large manufacturing sectors occurred due to the eroding competitiveness of garment production with rising wages. Additionally, by shifting production to Cambodia, Chinese investors were able to bypass the quotas in the main markets on garment imports from China. FDI has also played an important role in Laos. Inflows in agriculture and forestry, as well mining and hydropower projects as of late, have helped contribute to export growth. In Viet Nam, FDI was originally concentrated in the extraction of crude oil and gas. However, FDI has shifted over the last decade to manufacturing. Viet Nam is becoming linked to regional production chains, which is clearly reflected in the structural shift in export composition toward assembled electrical and electronic products. This process has been driving largely by foreign-invested enterprises (FIEs). While most FIEs have been small to medium-scale assembly plants, there are some large players as well. For example in 2006, Intel invested $1 billion in a chip assembly and testing factory that has provided a marked boost to the industry. FIEs are also driving exports in other crucial products, such as footwear and garments. Overall, they accounted for 44% of total non-oil merchandise exports in 2005, up from only 3% in 1991 ("The Mekong Region Trade: Trends, Patterns, and Policies").

Direction of Trade

41. Trade has been increasing intra-regionally faster than with the rest of the world. Excluding China, intra-subregion exports have surged at an annual average rate of 19% from 1994-2006, compared with 11% for exports to other countries. The rate of trade with China is even greater, increasing at an average annual rate of 22% during the same time period. Exports to non-GMS members of the ASEAN Free Trade Area (AFTA) and to other East Asian countries rose slower than exports to the rest of the world at 9% annually on average. The patterns for imports were similar with the exception that imports from non-GMS AFTA rose faster than those from other countries outside the subregion. The GMS trade with ASEAN, as well as the United States and EU, has mostly been determined by most-favored nation (MFN) statuses, rather than favorable tariff rates ("The Mekong Region Trade: Trends, Patterns, and Policies").

42. Generally speaking from 1994-2006, the share of trade with other GMS countries, especially China, rose significantly. The share of trade with non-GMS AFTA countries was stable, represented by a decrease in exports offset by an increase in imports. Trade shares with other East Asian countries and the rest of the world declined modestly.

However, countries outside the ASEAN region still represent the GMS countries' largest trading partners due to their significantly larger markets and greater wealth (Figure 7).

Opportunities to Enhance Trade

43. Thanks to the diverse economies and abundance of natural resource wealth in the GMS, regional cooperation can provide numerous opportunities to facilitate growth. The diversity of the GMS can be its greatest strength. Thailand, China, and Viet Nam all provide large markets and regional knowledge from which they can continue their own strong rates of growth, and from which other less developed GMS countries can learn. The process of regional cooperation has already begun and needs to continue for future economic development. Economic structures are in transition with the roles of public and private sector undergoing transformation, especially in the poorer countries. Furthermore the economies are becoming more diversified and open to trade, and are attempting to integrate smoothly into both the regional and global economies. One of the most positive trends has been increased flows of intra-sub-regional trade, investment, and technology. China and Thailand are especially important as private capital and technology flows to the other countries can better utilize land and labor to produce goods efficiently for the sub-region or for export. Although flow has already begun, it will increase as the investment climate improves, transport and trade facilitation gets better, and goods can move more easily across boarders ("Strategy Note on World Bank Regional Support for the Greater Mekong Sub-Region").

44. Trade and transport facilitation (TTF) are crucial for the development of the sub-region, which makes cooperation and policies particularly relevant. The World Bank has identified key policy recommendations it believes will help facilitate sub-regional trade. The creation of a sub-regional TTF initiative or project is necessary to build on what national TTF projects have achieved. Regional efforts can leverage collective will and motivate all to work together towards common TTF goals. Of course, creating any regional project will be difficult, especially given the varying degrees of economic interest in trade and investment within the GMS. For example, Laos would stand to benefit more from a sub-regional TFF initiative than Cambodia or Viet Nam, given the formers high share of GDP from intra-GMS trade and investment. Both Thailand and China's direct economic interest is low, but they have significant interest in the economic, social and political stability of the sub-region ("Strategy Note on World Bank Regional Support for the Greater Mekong Sub-Region").

45. The importance of the private sector in each of the GMS countries must be addressed as well. Private capital and technology of the more developed countries of this region (particularly China and Thailand) can combine beneficially with the abundant land and low cost labor of its neighbors. However, this is assuming that such investments can be moved across borders to the export markets competitively, which means a protectionist policies such as tariffs must be reduced. Additionally, infrastructure is crucial as well so that goods from investments can move quickly and

cheaply across boarders (“Strategy Note on World Bank Regional Support for the Greater Mekong Sub-Region”).

46. There are three road corridors (East-West, North-South, and Southern) in the GMS that must be completed to add to the available sea and air links for sub-regional trade. Costs, both financial and time, of moving goods across land boarders must come down to be competitive with the alternative of sea-transport, and improved TFF will be critical for achieving this goal. The recent signing of the Cross- Border Transport Agreement (CBTA) by all governments in the GMS was an important step in this direction (“Strategy Note on World Bank Regional Support for the Greater Mekong Sub-Region”). The improvement of the GMS roads has resulted in savings in vehicle operating costs and reduced travel times. Border-crossing in Cambodia, Laos, and Viet Nam have all also been reduced. However, the road network still needs work as the implementation of the CBTA is still pending, and missing infrastructure links have reduced the effectiveness of completed project. While improved roads have increased national traffic, international traffic has been slow to grow partly due o the absence of an agreement to facilitate cross-border movement of vehicles (“Transport and Trade Facilitation in the Greater Mekong Subregion – Time to Shift Gears”).

47. Additionally, the observed comparative advantages of GMS countries represent an opportunity to further enhance trade. Comparative advantages depend on a number of factors in addition to resource endowments. Some examples include trade policy (such as tariff and nontariff barriers), technology, geography (such as a country’s proximity to large markets and easy access to ports and navigable waters), quality of institutions and infrastructure, and the level of education and knowledge of its workers. While some of these factors, such as geography, are relatively fixed others are able to evolve over time because of government policy or because of feedback effects as a country develops. As these determinants change over time, so does a country’s comparative advantage along with its pattern of trade. Therefore the further facilitation of trade by GMS countries will depend on directly on the factors countries can control, such as trade policy, social and physical infrastructure, and the development of institutions, matched with policies to maintain macroeconomic stability (“The Mekong Region Trade: Trends, Patterns, and Policies”).

48. Taking a closer look at geography, we can see how a distant landlocked country such as Laos, faces natural disadvantages in foreign trade both in terms of cost of transportation and the time involved in meeting customers’ demand. However there are still opportunities to enhance trade flows. For example, improvements in infrastructure would lower the cost and time of trade thus increasing flows and benefit sectors that use infrastructure services more intensively (“The Mekong Region Trade: Trends, Patterns, and Policies”). This was found to be true in a study of Latin American countries, which found the main beneficiaries of a reduction in transport costs were agriculture, natural-resource-intensive and labor-intensive sectors (de Ferranti et al. 2002). In a country like Laos, rich in all these sectors, the improvement of infrastructure to facilitate trade should be a priority.

Impediments to Trade and Challenges

49. As previously discussed, increasing integration into world markets should place more competitive pressure on GMS domestic industries. These competitive pressures both from within the subregion as well as other countries, demonstrates the need to further reduce impediments to trade, improve the business climate, and raise overall economic competitiveness.

50. Although tariff rates have fallen over the past decade and a half in the GMS, there is potential to further improve trade policy. Laos for example still has numerous licensing requirements for imports and exports, especially at the provincial level. Additionally, Laos, as well as Cambodia and Viet Nam, has a cascading tariff structure where rates escalate with the degree of processing. Tariffs and nontariff barriers are especially damaging because they raise the cost of imported inputs for companies. This hurts CLV countries especially, because they are small in relation to world markets and are unable to raise prices in international markets to absorb these higher costs. Exporters are at a disadvantage relative to producers in the domestic market as producers are protected by these tariffs. Furthermore, as tariff rates escalate with the degree of processing, the effective rate of protection is even higher than the implied nominal tariff rate ("The Mekong Region Trade: Trends, Patterns, and Policies").

51. However there are other trade costs that need to be addressed as well, such as regulatory burdens, inadequate infrastructure, and inefficient customs procedures and logistics of moving goods across boarders. In fact, as tariffs and quantities restrictions have been reduced in the GMS, these problems have become more significant. For example, trade costs from inadequate infrastructure and cumbersome regulatory environment are thought to be significantly higher than those from tariffs and nontariff barriers (Anderson and van Wincoop 2004). The costs of transit delays are especially high for time-sensitive goods, such as perishable agricultural products and seasonal or fashion apparel. As these are some of the products in which CLV countries have a comparative advantage, the importance of infrastructure and logistics can be seen. Additionally as GMS countries begin to specialize in particular stages of production in regional or global supply chains, the improved quality of transport infrastructure becomes even more pertinent. The frequent need to import intermediate goods for processing and re-export requires a reliable and well function transport and logistics network ("The Mekong Region Trade: Trends, Patterns, and Policies").

52. In all of the GMS countries, most of the time required to trade is spent on document preparation and the time required in CLV countries is significantly higher than Thailand and China. Laos has the longest process for document preparation, reflecting elaborate licensing and approval procedures for imports and exports. For example, it requires 16 documents for imports in Laos compared with 12 in Cambodia and 9 in Viet Nam. For exports, 12 documents are required in Laos, versus just 6 in Viet Nam and Cambodia. The customs procedure also takes longer in Laos as well as Viet Nam. In Laos and Viet

Nam it takes an average of 7 and 5 days for exports and imports respectively to clear customs, versus just 2 days in China and Thailand (Figure 8).

53. Other important constraints to address include impediments on the domestic investment environment, which can impose substantial costs on businesses, decreasing the ability to compete in international markets. The top constraints vary by country. In Cambodia, businesses state that governance issues such as corruption, crime, legal, and regulatory uncertainty are the main constraints. In Laos, businesses perceive deficient infrastructure, regulatory uncertainty, and access to financial markets as the large handicaps. Vietnamese businesses state that inadequate access to land, financial markets, and poor infrastructure as the main obstacles ("The Mekong Region Trade: Trends, Patterns, and Policies").

Cambodia

54. Although Cambodia has emerged as a large garment exporter in recent years, agriculture is still a crucial part of the economy. Agriculture accounted for 39% of GDP in 2006, and is the relied upon by many rural households. With 81% of the population classified as rural, the development of the agricultural industry is crucial to the growth of Cambodia. The Cambodian Ministry of Agriculture, Forestry and Fisheries (MAFF) estimates the most growth in this sector can come from the development of the livestock and fishery industries. As a result, the expansion of these industries has been made a top priority. In 2004, Cambodia was admitted membership to the WTO, which has helped fuel the tremendous growth in Cambodia's clothing manufacturing industry. However, exports of logs, rice, sawn timber, and fish products are all rising (Burgos et al 2008).

55. Agricultural land makes up 30.1% of the total land available in Cambodia. While this is higher than neighboring countries such as Laos, it is still far below countries such as China, and signals the potential for development. Growth in agricultural land, and especially pastureland has been increasing since the 1980's ("Livestock Sector Brief: Cambodia").

56. The livestock industry represents approximately 21% of agricultural GDP, and 7.6% of total GDP. Smallholders currently dominate the livestock sector. Most poor families own chickens and may raise a pig or two as well. More wealthy farmers generally own a pair of draught and breeding cattle. In Cambodia, cattle tend to be more important than swine as farmers rely on them for a variety of fieldwork activities. Recently there has been an emergence of large-scale commercial businesses entering the livestock industry, but they are few in number and represent less than 1% of livestock owners ("Livestock Sector Brief: Cambodia").

57. Cambodia is a net importer of goods. Its main exports are garments, which account for almost 40% of all exports and are followed by forestry products that account for 18%

of exports. Livestock trade is very minimal as Cambodia exports a small amount of live animals. Cambodia's main imports are cigarettes, petroleum products, rice and sugar. Cambodia's major trading partners include neighboring countries, Japan, and the United States. It has signed bilateral trade agreements with the United States, China, and South Korea ("Livestock Sector Brief: Cambodia").

58. The Cambodia Government plans to increase both livestock production and productivity and has created the following seven development objectives: 1) promotion of 'household animal raising'; 2) reduction and elimination of selected animal diseases; 3) increasing feed quality and improvement of breeding and animal husbandry techniques; 4) encouragement of medium-scale businesses and investment in animal raising; 5) development of the meat-processing industry to stimulate exports; 6) promotion of better management and control of animal drugs; 7) development of community-based and private livestock services ("Livestock Sector Brief: Cambodia").

59. Cambodia's direction of trade has shifted rapidly since 1994. From 1994-96, the GMS and non-GMS AFTA represented 76.1% of Cambodia's direction of trade. However, by 2004-06 this number had dropped sharply to 33.7%. This shift can be explained by Cambodia trading much more with the rest of the world, and by 2004-06, over 50% of Cambodia's direction of trade was in this category. Exports show an even more striking transition. In 1994-96, 42.3% of Cambodia's exports were within the GMS compared to 33.9% for the rest of the world. By 2004-06 however, exports to the subregion almost vanished at only 2.8%, while exports to the rest of the world more than doubled to 87%. This can be explained by Cambodia's specialization in garment manufacturing, with most of its exports heading to the United States and to a lesser extent the EU. Imports show a slightly similar trend, with imports falling from the GMS excluding China. Imports from China actually increased from 3.8% during 1994-96 to 16.9% during 2004-06. Despite falling percentages of imports from the GMS excluding China, Cambodia still received 27.9% of imports from the subregion during 2004-06, the largest percentage in any category (Figure 9).

60. The successful development of the Cambodian livestock industry presents a tremendous opportunity for the country. As China continues to increase its demands for meat, Cambodia can become an important regional supplier.

Lao PDR

61. Much like Cambodia, Laos is a low-income rural country. Agriculture accounted for 40.7% of total GDP in 2007, and employs more than 80% of the population ("Agricultural Biodiversity in Lao PDR"). Since New Economic Mechanisms (NEM) were adopted in 1986, Laos has enjoyed a steady increase in the national output and improvements in the general standard of living. The current strategic objectives for agricultural development are to improve rural livelihoods, reduce vulnerability of poor households,

create opportunities for diversifying livelihoods, and maintain environmental quality in rural areas. Increased rice production to achieve self-sufficiency contributes directly to these goals and has been made a top priority (Bestari et al. 2006).

62. Rice is an extremely important crop in Laos as it a staple food and contributes to almost 70% of the caloric and protein intake of its citizens. Therefore self-sufficiency in rice has been equated with self-sufficiency in food, and has been a top priority goal for the country since the introduction of the NEM. Rice self-sufficiency was reported to have been achieved in 1999 at more than 2 million tons, but there is debate among observers if this is an accurate claim (Bestari et al. 2006).

63. Currently, rice represents over 80% of the total cropped area (Bestari et al. 2006). However, total cropped area in Laos remains very small as it only represents 4.3% of the total land area. Therefore, there is tremendous potential for both the expansion of cropped area, and the overall expansion of agricultural land in Laos. Agricultural land only represents 8.1% of the total land area (8,780 square km out of 230,800 square km) ("Livestock Sector Brief: Laos, People's Democratic Republic"). In this sense, Laos has a relative abundance of agricultural land, especially compared to neighboring countries such as China. Thus, the successful development of this land is necessary as Laos has the opportunity to eventually become an important supplier of agricultural products to China.

64. Livestock is another important sector for potential development. As of 2005, livestock was responsible for 14.3% of agricultural GDP and 9% of total GDP. Virtually all of the livestock production is traditional, extensive, and low input. Different regions have preferred productions of animals. The central region is home to mostly cattle and buffalo, where they are grazed on the vacant cropping area for most of the year. In the highlands, pig production is an important livelihood, and most farmers tend to raise local chickens as well. Commercial pig and poultry operations can be found large urban areas such as Vientiane, and are mostly small cottage industries with a few employees. Over the past two decades meat supply has witnessed positive growth, however this was a result of increased number of animals while productivity levels remained stagnant. In fact, productivity levels are particularly low compared to developing countries' average. The National Growth and Poverty Eradication Program recognizes this low productivity and livestock diseases as priority issues for the poor, and furthermore that the loss of livestock is one of the main causes of poverty. Development targets included a meat supply of 60 kg/year per capita as well as increased export of meat products for a total value of around $50 million USD by 2020 ("Livestock Sector Brief: Laos, People's Democratic Republic").

65. Laos is a net importer of goods, with approximately 20% of the imbalance due to agricultural trade. Main exports are coffee, live buffalos and cattle, and hides. Approximately 75% of cattle and buffalo in Laos are produced and consumed domestically, and the remaining 25% are exported. Thailand is the most significant export market, and Laos is believed to supply up to 20% of Thailand's livestock demand,

accounting for about 100,000 animals per year. However, much of this export occurs through unrecorded and unregulated border trade so exact numbers are not known. Primary imports include non-alcoholic beverages, sugar, and rice. Laos applied for WTO membership in 1997, is a current member of ASEAN, and has signed bilateral trade agreements with Mongolia, China, and Viet Nam in the region ("Livestock Sector Brief: Laos, People's Democratic Republic").

66. Laos' direction of trade is dominated by two categories: the GMS and the rest of the world. The GMS is arguably Laos' most important trading partner as it represented 62% of all trade activities from 2004-06. However, this large percentage of trade is largely explained by imports and China, as exports to the GMS excluding China fell from 62.6% during 1994-96 to 44.6% during 2004-06. Exports to China have increased modestly from 1.9% during 1994-96 to 3.5% during 2004-06. The largest growth in exports has come from the rest of the world, increasing from 34.1% to 47.9% over the same time period. Out of all the GMS economies, Laos is most dependent on the subregion for trade due to its landlocked geography and relatively greater remoteness from other major markets. However, its export dependence is decreasing as it becomes more linked with regional and global economies through cross-border infrastructure improvements and greater market access ("The Mekong Region Trade: Trends, Patterns, and Policies"). Looking at imports, this trend is actually reversing as the percentage of imports from the subregion has increased, while those from the rest of the world have fallen. From 1994-96 and 2004-06, imports have increased from 51.5% to 72% from the GMS excluding China, and have increased from 3.5% to 10.4% from China alone. During the same time the percentage of imports from the rest of the world has fallen from 32.8% to 10.3% (Figure 10).

Viet Nam

67. Viet Nam faces different challenges than Cambodia and Laos. While it too is a poor country, it has been making rapid economic gains recently, with GDP growth above 7% per year since the late 1980s. However this has been fueled largely from a booming manufacturing industry as Viet Nam continues to industrialize. Agriculture is only responsible for approximately 22.6% of GDP, with 66.5% of the population employed in this sector. Agricultural land represents 29.3% of Viet Nam's total land area ("Livestock Sector Brief: Vietnam"). Viet Nam is densely populated for a country of its size and as a result faces significant constraints on its agricultural resources. Arable land per person is low even by Asian standards. Nonetheless, Viet Nam makes good use of what agricultural resources it has.

68. Undoubtedly Viet Nam's most important crop is rice. It produced an estimated 35.3 million tons of rice in 2007, an increase of 1.5% over 2006. Rice production utilizes 75.5% of Viet Nam's agricultural land. While domestic rice consumption has been declining over the past decade, Viet Nam has emerged as the second largest rice exporter in the world. As estimated 4.5 million tons valued at $1.45 billion USD were

exported in 2007 (Quan 2008). Rice exports are expected rise to 5 million tons in 2009, according to the Vietnamese government ("Vietnam to export up to 5 million tons of rice in 2009."). Asia represents Viet Nam's largest export market, accounting for 70% of total exports. The majority of these exports head to the Philippines, Indonesia, Malaysia, Japan and Singapore. The Philippines was the single largest buyer of Vietnamese rice, importing 1.5 million tons in 2007. Indonesia was the second largest buyer at 1.2 million tons. Japan is seen as the most promising high value market, however only about 64 thousand tons of rice was exported to Japan in 2007. Viet Nam also imports a significant quantity of rice from neighboring countries Cambodia and Laos. Import volumes were estimated at approximately 450 thousand tons in 2007, although accurate data is hard to obtain, as there is a large amount of informal trading along the boarders. Reportedly, several Vietnamese farmers also have paddy rice investments in Cambodia for additional rice production (Quan 2008).

69. Currently livestock production is mostly in the hands of small farmers. They own approximately 40% of the cattle stock, 75% of the poultry stock, and 80% of the pig stock. However, semi-intensive to intensive pig and dairy farms are growing fast, as is Viet Nam's domestic demand for meat. Therefore domestic production of livestock is expected to increase in the coming decades. The government is prioritizing pig and diary cow sectors with the objective of increasing pig meat exports as well as reducing reliance on imported milk products. As a result, the poultry sector has not developed many large commercial operations and processing plants, as the pork sector receives the most attention and funds in the Ministry of Agriculture and Rural Development's plans ("Livestock Sector Brief: Vietnam"). Viet Nam is already a large importer of feed and feed ingredients to meet livestock production, and these imports are expected to increase as consumption of livestock products grows (Quan 2008).

70. Viet Nam is a net importer of goods with total exports valued at $48.4 billion USD and imports valued at $60.8 billion USD in 2007. In addition to rice, major agricultural exports include coffee, cashews, pepper, rubber, and pig meat. Thanks to Viet Nam's abundant rainfall and vast network of waterways and estuaries, Viet Nam has begun to develop an expansive aquaculture system that supports its large and growing fish and seafood export industry. Viet Nam is now currently the world's third largest fishery producer and the sixth largest exporter of seafood products (Huong and Quan 2008). Viet Nam also relies on a significant amount of agricultural imports. It must import most, if not all, of its domestic consumption of wheat, cotton, wood, hides and skins, and dairy products ("Agricultural Economy and Policy Report (Viet Nam)"). Other large agricultural imports include soybeans, palm oil, and cigarettes (FAOSTAT). The government is actively trying to increase domestic production of corn, soybean, cotton, and dairy, but has arguably unrealistic expectation as the amount of resource they can contribution to promote these industries is minimal ("Agricultural Economy and Policy Report (Viet Nam)"). Despite this however, Viet Nam can be considered a successful model for how to use agricultural trade to realize comparative advantages, especially given its significant land constraints.

71. Viet Nam's direction of trade is characterized by a decline of the role of non-GMS Asian Countries. Non GMS AFTA and other East Asian countries accounted for 53% of Viet Nam's total trade during 1994-96, but declined to 35.5% by 2004-06. China has become a very important trading partner with Viet Nam, increasing from 4.2% of total trade in 1994-96 to 12.4% in 2004-06. Looking at the destinations of exports further demonstrates these trends, as exports have decreased to non-GMS AFTA and other East Asian Countries. The GMS excluding China only receives a small percentage of Viet Nam's exports (3.8% in 1994-96 and 4% in 2004-06). The percentage of exports sent to China has increased modestly (5.8% to 8.1%). The largest destination of exports goes to the rest of the world, increasing from 38.1% in 1994-96 to 60.1% in 2004-06. Viet Nam's sources of Imports predominantly come from outside of the GMS, although the percentages are falling, while the role of the GMS is increasing. Most noticeably, China has emerged as a very important source of imports, increasing from 3.2% of total imports in 1994-96 to 16% in 2004-06 (Figure 11).

Thailand

72. Thailand is the most developed economy in the GMS and has thriving rice and poultry export industries. GDP growth rates from 1985 to 1995 were 9%, and were among the highest in the world during this time. However, pressure on Thailand's currency in 1997 led to financial crisis that caused the economy to plunge into recession, although it has been recovering steadily ever since. Agricultural production accounts for 10.3% of national GDP, signaling the role Thailand has created as an important manufacturer. Despite the small roll agriculture plays in the economy, 47.4% of the population still works in this sector. Agricultural land represents 39.5% of Thailand's total land area ("Livestock Sector Brief: Thailand"). These trends demonstrate that although Thailand has become an important manufacture in the region, agriculture is still a large part of the economy although this not necessarily seen in pure value terms.

73. Much like the other GMS countries, rice is an incredibly important crop for Thailand. It is especially important for Thailand, as it is the world's leading exporter of rice. Rice production levels were approximate 18.5 million tons in 2008, up 1.6% from the previous year thanks to better weather conditions and yield improvements. Thailand also has a second crop production system, especially in the lower central area where flooding is minimal and there is a longer winter season. Yields for second crop production were 4.5 million tons in 2008. Some paddy fields have even begun to shift to third crop corn cultivation, particularly in the lower northern region where water shortages are likely to occur. Consumption of rice in Thailand is still considered a staple good at 110 kg/year per capita, although levels have been decreasing as is common in countries with rising incomes. Thai exports of rice were forecasted to decline to 8-9 million tons in 2008-2009 due to a limited amount of exportable supplies. However this is still a very large amount and is approximately double what Viet Nam exports. In 2007, Thai rice exports surged to 9.6 million tons due to competitor rice export bans, most noticeably bans placed in

African countries. In 2007 Thai rice exports to African countries increased to 3.9 million tons, with the largest fraction going to Nigeria (327,025 tons), Senegal (680,155 tons), Cote D'Ivoire (397,569 tons), and South Africa (532,369 tons). In the region, Thailand's largest export markets were China (462,152 tons), Indonesia (456,158 tons), Malaysia (414,028), and Hong Kong (313,843) (Prasertsri 2008).

74. Thailand's livestock industry is dominated by poultry production. Thailand produced 1.4 million tons of broiler meat in 2002, which is significantly larger than its second largest category of pig meat at 646,100 tons ("Livestock Sector Brief: Thailand"). In 2007, broiler meat production had decreased to 1.13 million tons although growth was expected to increase by 8% in 2008. Furthermore, Thailand's broiler meat production is forecast to increase by a further 6% in 2009, as the industry faces strong demand both domestically and internationally. Cooked poultry meat production is also expected to increase in 2009 due to increased export demands. Despite increasing production costs, the Thai poultry industry has continued to perform well by transferring increased costs to consumers in both domestic and overseas markets.

75. The principal reasons costs have been rising are due to global feed costs. Prices for corn and soybean meal, which account for 85-90% of broiler feed, increased by 21% and 60% in the first seven months of 2008 (Preechajarn 2008). Over the last 15-20 years farm sizes have increased significantly largely from increased flows of FDI. The corresponding technology transfers have improved breeds, enhanced feed technology, and housing and farm management. All of these factors have helped contribute to helping Thailand become the fourth largest poultry exporting country in the world ("Livestock Sector Brief: Thailand"). Thailand's major export markets include Japan and the EU (all cooked product), as well as Viet Nam, Singapore, South Korea, and Hong Kong within the region. China currently acts as a major competitor in the Japanese market, although it is forecasted to lose its competitiveness due to growing domestic consumption and increased concern from trading partners about the safety of Chinese food products (Preechajarn 2008). Besides poultry production, domestic meat demand is largely met by domestic production although Thailand does import small amounts of beef and pig meat ("Livestock Sector Brief: Thailand").

76. Thailand is a net exporter of goods, including agricultural products. Despite being the world's largest exporter of rice and fourth largest poultry exporter, Thailand's leading agricultural export product by value is natural dry rubber. Other important exports are sugar, cassava and pineapples (FAOSTAT). Corn exports have been increasing in recent years due to increasing global prices. Most corn exports occur intra-regionally with Laos, Cambodia, Viet Nam, Malaysia and Indonesia being the most important markets (Prasertsri 2008). Thailand's top five agricultural imports by value in 2004 were cotton, soybeans, soybean cakes, dry skim cow milk, and wheat (FAOSTAT). Cotton imports are relied upon heavily for Thailand's extensive textile manufacturing industry. Similarly, soybeans are needed as feed for Thailand's large livestock industry. The large imports of dairy and wheat reflect Thailand's shifts in food consumption preferences as income rises. Wheat consumption has been rising for many years, most noticeably in

urban areas as demand for bakery and instant noodle products continues to grow. Wheat production is insignificant in Thailand limited to just 550 hectares (Prasertsri 2008).

77. Thailand's direction of trade looks similar to Viet Nam's, although it has less volatility. Trade with the GMS excluding China is very small at 3.4% in 2004-06, although it has risen since 1994-96. Trade between China has increased as well, from 2.7% of total trade in 1994-96 to 9% in 2004-06. The rest of the categories have remained fairly constant, with a slight increase to non-GMS AFTA and slight decreases to East Asia and the rest of the world. Thailand's destinations of exports have also remained relatively constant. The role of the GMS has increased with the GMS excluding China rising from 2% to 4.3% of total exports. Exports to China have increased even greater, from 2.8% to 8.3%. Although Thailand is by far the largest exporter in the subregion (excluding China), exports to the rest of the world decreased from 53.8% to 49.4%. Imports show similar trends as well, with China representing a large increase from 2.6% of total imports in 1994-96 to 9.7% in 2004-06. Imports from the GMS excluding China also increased but much more modestly (from 0.4% to 2.5%) (Figure 12).

CONCLUSIONS AND POLICY IMPLICATIONS

78. The rapid expansion of China and its growing middle class, are expected to make it a net importer of agro-food products in the coming decades. If HIA trends are any indication, China is already the world's largest consumer of agricultural products, and income growth will sharply increase the resource requirements to meet this demand, most noticeably meat, dairy, and other animal and specialty products. Because of China's expansion, the structure of the GMS economies can be expected to shift with trade-induced expansion of natural resource-intensive industries. While this presents the GMS with an important opportunity to become a crucial agro-food supplier for China, policies to support this transition should be cautious. In particular, the GMS must be careful to not over exploit their natural resources for immediate short-term gains. The increasing trend of decentralization, must be handled very carefully as a lack of controls can have a disastrous effect on natural resource management. If the additional demand for agricultural products is not met with appropriate regulatory safeguards, the high commodity demands may spark a rapid increase in resource-extracting activities, including clearing of forests and unsustainable land use. This could create permanent damage to the region, and therefore appropriate policies will play a crucial role in the realizing the long term potential of the GMS as a regional agro-food supplier.

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