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FOOD BRIEFING

Food Briefing: Agflation in Asia

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Executive Summary

This briefing examines the major causes of surging food prices in Asia and concludes that agricultural inflation, or agflation, is not simply a cyclical problem but reflects deep-seated and potentially dangerous structural changes.

In emerging Asia, increased caloric intake, changing dietary preferences and a growing demand for biofuels are primary drivers of food demand. At the same time, urbanization and climate change, degradation of existing farmland, as well as increases in input

and logistical costs put immense pressure on all of the region's agricultural sectors. If unresolved, a combination of these structural factors will mark the end of food abundance for populations in developed and emerging markets, as well as reduce countries' abilities to feed their poorest populations. Government policies that have been implemented so far have leaned toward protecting food supply in individual countries in the short term but may distort agricultural trade and regional markets, thus further aggravating agflation. While more fully opening up agricultural markets faces huge challenges, a number of immediate op-

portunities exist for governments, the private sector, and non-governmental organizations to improve the functioning of agricultural markets. They include measures to reduce competition between biofuel and food resources, the effective use of biotechnology to improve productivity and reduce environmental impact, practices to increase sustainability of farming, improvements in agricultural research and expertise to raise farmers' incomes, investments in transportation and storage infrastructure to reduce waste, conservation efforts to combat climate change, and targeted relief and rural development policies to help the most vulnerable.



Introduction

The era of cheap food is ending, and populations around the world and in Asia are feeling the pain.

While global attention has long been focused on how to feed the poorest populations in the least developed countries, particularly in Africa, skyrocketing food prices have hit the pockets of not just the poorest, but also broader populations in Asia. With food and fuel protests in many countries in Asia earlier this year and marked increases in prices of day-to-day food products at local food markets, what seemed like remote problems affecting the poorest and most remote populations of the world are hitting closer to home for many Asians.

Since the end of 2006 alone, food prices have almost doubled for rice, wheat, coarse grains,¹ and oilseeds, according to the International Monetary Fund (IMF). From the mid-1970s until 2002, food prices declined as food production growth surpassed global population growth. Since 2002, however, the three-decade-long decline in food prices has reversed. The Food Price Index² compiled by the United Nations Food and Agriculture Organization (FAO) peaked in June 2008, with a growth of more than two-thirds overall since 2006. Price indices for oils and fats, cereals, and dairy have accelerated the most rapidly. Despite falling prices in recent months, the overall index is still 50% above its value in 2006.

This briefing argues that recent agflation patterns do not appear to be simply a cyclical problem reflecting general inflation. Rather, increased caloric intake, changing dietary preferences, the growing biofuel industry, urbanization and climate change, shrinking and increasingly degraded farmland, and skyrocketing input and logistical costs, along with short-term and nationally focused policies, are coming together at the same time, threatening food availability and access for populations around Asia.

WHY THIS IS AN IMPORTANT PROBLEM FOR ASIA

For rapidly growing Asian economies like China and many Southeast Asian countries, continued price inflation threatens to erode the economic

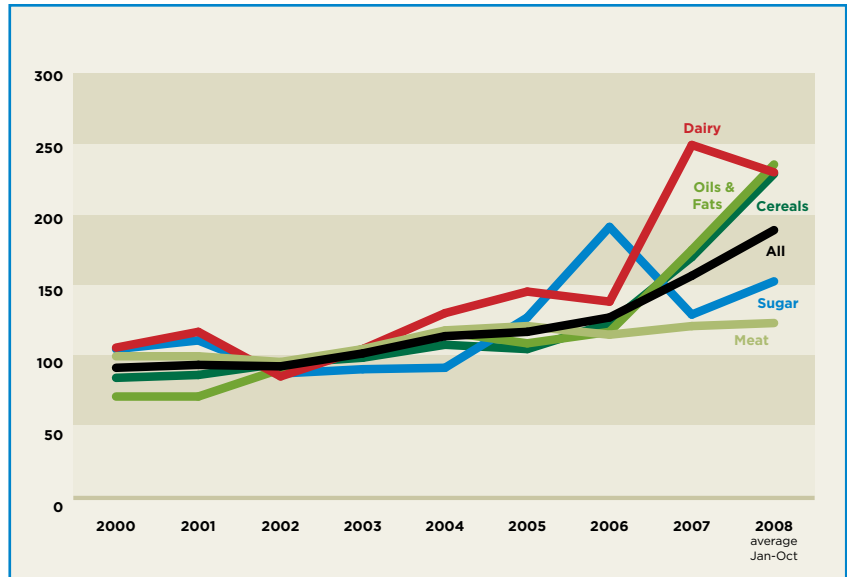
gains of recent years and stunt future economic growth. The average headline inflation for the region in 2008, pushed up by food and fuel prices, is estimated to be more than 6%, double the average rate the past ten years.³ Rising commodity prices have led to deteriorating terms of trade, especially for the net food importers in the region, hurting consumption, investment, and labor markets. Many Asians already spend a third or even a half of their income on food. A proxy for this is the weighting of food in the Consumer Price Index (CPI), as shown in the graph on page 3. **Broadly speaking**, poorer countries and poorer people spend more of their income on food and are hit harder by price increases.

In Asia, the absolute number of people who are hard hit is large and



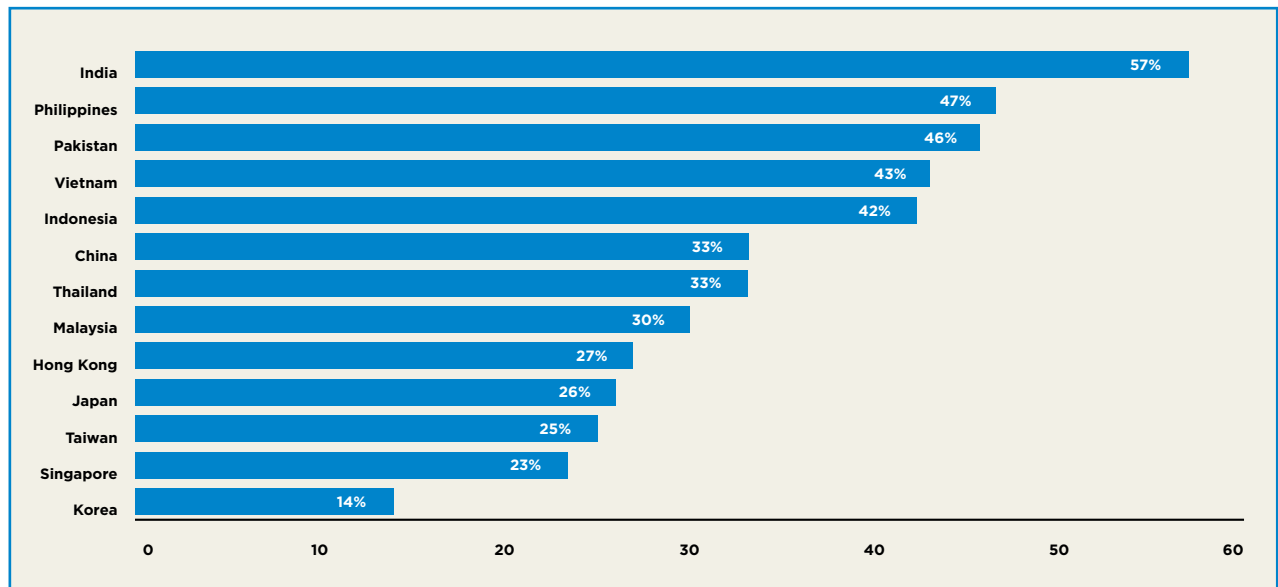
growing. Asia is home to two-thirds of the world's poor, or almost 2 billion people living on less than \$2 a day, who are most vulnerable to food insecurity. The number of food-insecure people in Asia, i.e. those consuming fewer than 2,100 calories a day, a nutritional target set by the FAO, is projected to increase through 2017. According to the U.S. Department of Agriculture (USDA), more than 20% of Asia's population will be food-insecure.⁴ For higher-income consumers in Singapore, South Korea, and even China, the impact may be no more severe than cutting back on non-essentials. But for middle-class and lower-income consumers, hunger and nutritional deficiency may become more urgent issues.

A number of underlying trends suggest that the agflation problem is influenced primarily by structural rather than cyclical factors.



HISTORICAL GLOBAL FOOD PRICE INDICES

SOURCE: UNITED NATIONS FOOD AND AGRICULTURE ORGANIZATION



FOOD WEIGHTINGS IN CONSUMER PRICE INDEX (CPI) BASKET BY COUNTRY

SOURCES: ASIAN DEVELOPMENT BANK; ECONOMIST INTELLIGENCE UNIT; FAO; USDA

Demand Pressures in Asia

INCREASING CALORIC INTAKE

Growing populations in Asia are consuming more calories than before. Asia accounts for almost 60% of the global population. As the world population is forecast to grow by 36% from 6.8 billion in 2008, to 9.2 billion by 2050, Asia alone will add more than 1 billion people, almost the size of the current population of China.⁵ However, population growth alone is only part of the picture. In fact, Asia is seeing falling fertility rates, even in the fastest-growing countries such as India, Indonesia, Pakistan, and the Philippines. The number of people below 40 years of age in Asia from 2007 to 2020 will increase by about 120 million, a relatively small proportion.⁶

More importantly, as incomes rise in Asian countries, these **young populations** are consuming an increasing number of calories. **The emerging middle class** in developing Asia is one of the fastest-growing demographic groups in the world. The Brookings Institution estimates that by 2020, the middle class (as measured by real income) will comprise more than half of the world's population, compared to a **third** currently. The middle class in China alone will be at least several hundred million strong within a decade, by various estimates. As incomes rise, **dietary patterns** evolve beyond subsistence needs.

Per-capita calorie consumption per day across Asia has increased from an average of 2,269 calories in 1978-80, to 2,710 in 1998-2000.⁷ Increased caloric intake means higher food demand.

CHANGING DIETARY PREFERENCES

Growing incomes also mean evolving dietary preferences. First, the composition of calories is changing. Demand for meat, dairy, oil, and vegetables is growing, while cereals make up a proportionally smaller part of diets as incomes rise. Given the resource-intensive nature of growing livestock (8 lbs. of grain is required to produce 1 lb. of meat), meeting this demand will be a challenge. Soaring prices of grain feed will put more upward pressure on meat prices, which so far have not grown as rapidly as those of other food types. Although meat farmers in Asia have been improving the feed-to-meat ratio (meat produced per unit of grain feed) by increasing the scale of breeding and improving technology, the extent to which improved "meat competitiveness" can catch up with projected demand remains to be seen.

Furthermore, growing incomes have increased consumer demand for quality foods. Increasing concerns over health and consumer rights triggered by disease outbreaks and food safety scandals have further raised awareness

and demand for higher-quality foods, organic foods, and ethically sourced or fair-trade foods. Last year, the outbreak of the Porcine Reproductive and Respiratory Disease (PRSS) in China and Vietnam, which led to massive culling of infected animals, led not only to reduced production but also to rising fears about food safety. India and South Korea have also culled poultry in response to recent outbreaks of the H5N1 bird influenza virus. The recent scandal over Chinese milk products contaminated with melamine will likely further increase consumer scrutiny of food quality. Previously, these sorts of worries have been confined to wealthier consumers, but the melamine scandal shows that food safety concerns can cut across all income levels.

DEMAND FOR BIOFUELS

Increased demand for biofuels, including grains and oilseeds, fueled by subsidies in developed markets such as the United States and European Union, accounted for at least a third of the total increase in real prices of cereals in 2007, by various estimates. The FAO estimates that about 100 million metric tons of cereals are being diverted to biofuels globally each year, pushing up food prices and putting stress on natural resources including energy and water. In the United States, 20% of the arable land for corn and soybeans

has been diverted from food and feed production to biofuel crop production. Price inflation resulting from this shift in land use is affecting major importers of corn in Asia, such as Japan and South Korea, and those of soybeans, such as India and China.

Biofuels currently account for a relatively small proportion of crop production. In Europe, only 1% of arable land

is used for biofuels. Two-thirds of Europe's canola is produced for biodiesel but that production accounts for only 2% of global oilseed demand.⁸ However, the fear is that increased future requirements for cheap and abundant biofuel will compete with the need for food. Certainly, the growing hunger for biofuels affects Asian food crops, most notably oil palm, whose fruit is

used to produce palm oil. Over 80% of the world's palm oil is produced in Indonesia and Malaysia. Much of it is used as edible oil, but the fact that palm oil is the cheapest biofuel has led to huge demand, especially in Europe. An increase in palm oil production has also contributed to a crowding out of other agricultural crops as well as clearing of forest land in Southeast Asia.



Supply Pressures in Asia

With declining fertility rates and technological advancement, the perennial Malthusian worries that geometric population growth would outstrip linear food supply growth have not been realized thus far.

Technological advances have vastly increased productivity, bringing about the Green Revolution. However, there is a growing danger that, absent sensible polices, Malthus may yet have his day. A combination of technological limits and strains on arable farmland have

brought down food surpluses and there is little prospect of a turnaround. The World Food Programme (WFP) warns that there are no food surpluses in the world. Data from the IMF show that inventories of major food crops are in decline.

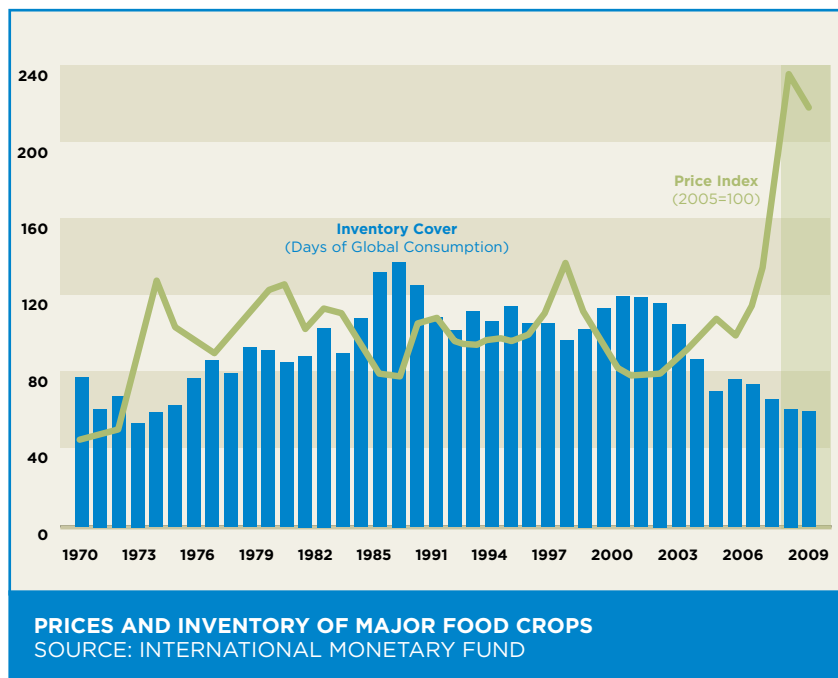
URBANIZATION AND CLIMATE CHANGE

Over the next decade, Asia will be the major driver in urbanization growth. For emerging economies, this is generally an indication of rising incomes. However, urban development poses grave threats to food supply, chiefly by contributing to climate change

(through higher per capita energy use) and decreased farm acreage. The most prominent international body studying this issue, the Intergovernmental Panel for Climate Change (IPCC), contends that human activities do in fact contribute to sea level and temperature rises.

Long-term climate change aggravated by urbanization will cause serious damage to agriculture. These effects could be devastating for Asian farmers. The United Nations estimates that climate change could exacerbate water shortages and rising temperatures, reducing crop yields in Central and South Asia by 30% by 2050. Climate change could halve the produce of farmers in some parts of Africa in 2020 and negatively affect 1 billion people in Asia.⁹ The loss of biodiversity due to the growth of cities and industrialization, coupled with growing demand for forest products abroad (timber, rubber, oil palm), further worsens the problem, as countries such as Indonesia, Cambodia, and Myanmar are already discovering.

Extreme weather patterns are becoming more frequent, posing great damage to farm output. Reinsurers are finding a pattern of extreme weather events. According to reinsurer Munich Re, overall economic losses from weather-related natural hazard events between 1980 and 2004 came to around \$1 trillion, and the number of natural catastrophes has shown an increasing trend from around 615 in 1995 to 950 in 2007.¹⁰ The likely increase in frequency and severity of cyclones, droughts, and floods means that countries heavily dependent on rain-fed agriculture, such

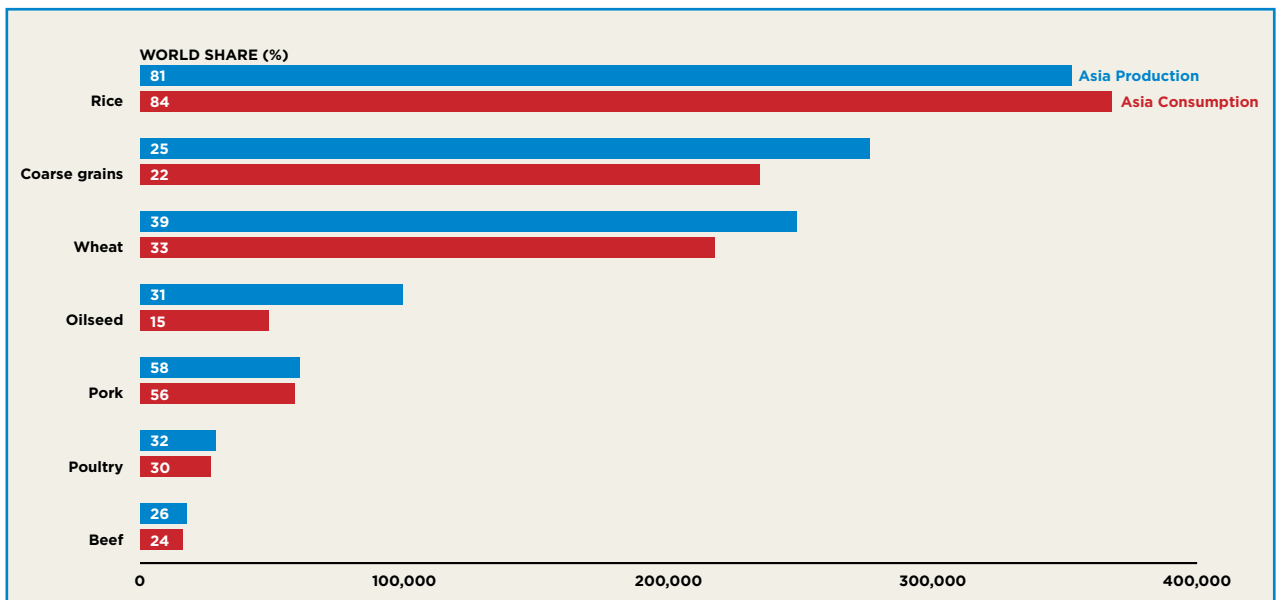


	RICE				WHEAT				CORN/MAIZE				OILSEED				PORK				CHICKEN				BEEF			
	P	C	X	M	P	C	X	M	P	C	X	M	P	C	X	M	P	C	X	M	P	C	X	M	P	C	X	M
China	1	1	8		1	1		7	2	1	3	5	1	2	2	8	1	1			2	2	9	4	3	2		
Japan	10	8						5				1		6				7			10	6		5				
Korea												2				3												6
India	2	2	3		2	2			6	4			2	3	4	4					5	8			9	4		
Pakistan			4		6	5							3															
Hong Kong																			6				7	2				
Taiwan																												
Singapore																												
Indonesia	3	3						8	8	3				1	5						8							
Malaysia				10								7	5															
Philippines	8	7		1																								
Thailand	7	9	1											8	9													
Vietnam	5	5	2														6											

ASIAN COUNTRIES: AMONG THE WORLD'S TOP FOOD PRODUCERS, CONSUMERS, EXPORTERS, AND IMPORTERS

C=MAJOR CONSUMER P=MAJOR PRODUCER X=MAJOR EXPORTER M=MAJOR IMPORTER
(TOP 10 IN THE WORLD BY QUANTITY)

SOURCES: FAOSTAT; UNCTAD/WTO INTRACEN; USDA FOREIGN AGRICULTURAL SERVICE



ASIA'S CONSUMPTION AND PRODUCTION BY FOOD TYPE, 2008 (KILOTONS)

SOURCES: FAO; ASIA BUSINESS COUNCIL CALCULATIONS

as India, Pakistan, and the Philippines, are potentially subject to greater crop and economic losses.

DEGRADATION OF FARMLAND

Asia is seeing a dwindling supply of arable land, both in terms of actual area and topsoil quality. Currently, less than half of the world's Land area is suitable for agriculture, and most of this land is already being farmed. Bangladesh, for example, is losing 2% of farmland annually to river erosion. In addition, dwindling water supply and quality are becoming acute problems in China and India, as sources for irrigation are polluted with algae, excrement, and industrial chemicals. These challenges become more serious when coupled with rising demand for food requiring a larger water footprint, such as beef. According to the FAO, the water requirement equivalent for beef is 15 m³ per kilogram, 6 m³ per kilogram for poultry, and just 1.5 m³ per kilogram for cereal. A meat-heavy diet therefore means much greater water use than a vegetarian one.¹¹

Farmland that remains suitable for cultivation faces serious problems, as increased livestock production leads to overgrazing, deforestation, desertification, and increased emissions (a cow produces several hundred liters of methane per day), while at the same time reducing crop production.

RISING COSTS ALONG THE AGRICULTURAL SUPPLY CHAIN

Beyond the supply of arable farmland and water for irrigation, an important problem affecting Asia is the increasing prices of agricultural inputs. Asia uses fertilizers more intensively than other regions, such as Latin America and Africa. The common overuse of fertilizers isn't only expensive but often environmentally damaging. Asian farmers

saw fertilizer prices more than double in 2007. Fertilizers account for over a third of agricultural costs for farmers on average. The rising price of natural gas, used to produce fertilizers, is aggravating the problem as fertilizer production accounts for about half of the fossil fuel usage in agriculture.

Those affected have appealed at home and abroad for help. In the Philippines, for instance, the government has promised to provide subsidies to offset the losses from lower-than-ex-

pected yields of rice farmers who have cut back on fertilizer use as a result of cost pressures. The Taiwan Fertilizer Co., Taiwan's largest fertilizer manufacturer and supplier, agreed this year to absorb 15% of the rise in fertilizer prices, while the government agreed to subsidize 70%. The world's largest fertilizer cooperative, the Indian Farmers Fertilizer Cooperative Ltd., is appealing to the United Nations for help in curbing what it says is price manipulation by traders and suppliers.¹²



Agflation Consequences

The upward spiral in prices has led to fears of a global food crisis. The key concern is that there may be a global food shortage, one that includes food access and distribution problems disproportionately affecting the poor.

THE END OF ABUNDANCE

The WFP calls the concern that food supply cannot keep up with demand “the silent tsunami” and points out that food reserves are at their lowest levels in 30 years.¹³ To feed the world’s growing population, especially younger populations in developing countries who are consuming more calories, food production needs to grow 15-20% per year in the next few years. The economist Jeffrey Sachs of Columbia University attributes this crisis to the inability of farmers in poor countries to pay for inputs such as seeds, fertilizers, and water for irrigation, which in turn leads to low agricultural productivity. The limited supply simply cannot meet the rising demand for food and biofuels. Author Paul Roberts, in his book *The End of Food*, declared the end of the “golden age” in which food was cheap and available.

FOOD INJUSTICE AND INSECURITY

According to the USDA, 982 million people in 70 developing countries currently are food-insecure. Robert

Zoellick, president of the World Bank, worries that food inflation could push about 100 million people back into poverty, wiping out recent global economic gains.

The current global financial crisis has depressed food prices in recent months, but the adjustment may just be a temporary one, as it reflects a slowdown in speculation of food commodity futures rather than structural changes in demand and supply factors. A global economic recession will depress real wages and incomes in urban households, restraining food spending

for broader populations. It will also affect investment and credit availability for food producers. Amid uncertainties over future economic growth in Asia, governments may face a worsening fiscal crunch, which in turn will force public spending cuts. Not only will they find it even harder to pull populations out of poverty, they will also struggle to improve living standards for middle-income populations, even as demand for food and other public services of these growing populations continues to rise. Citizen activism may turn into larger unrest.



	REDUCE IMPORT DUTIES	INCREASE SUPPLY USING RESERVES	BUILD RESERVES/ STOCKPILES	INCREASE IMPORTS	INCREASE EXPORT DUTIES	IMPOSE EXPORT RESTRICTIONS	IMPOSE SUBSIDIES/ PRICE CONTROLS	IMPOSE MINIMUM SUPPORT PRICES	IMPOSE MINIMUM EXPORT PRICES
China	●	●	●		●	●	●	●	
Japan	●		●				●		
Korea	●	●					●		
India	●		●		●	●	●		●
Pakistan	●		●		●	●		●	
Hong Kong									
Taiwan	●								
Singapore			●						
Indonesia	●	●		●		●	●		
Malaysia			●				●	●	
Philippines			●	●			●	●	
Thailand	●	●	●	●			●		
Vietnam			●	●		●			●

FOOD POLICIES BY COUNTRY

SOURCES: ASIAN DEVELOPMENT BANK; WORLD BANK; VARIOUS NEWS REPORTS

Government Policies in Asia

PROVIDE FARM SUBSIDIES

PROMOTE SELF-SUFFICIENCY

IMPLEMENT CASH TRANSFER

ISSUE FOOD STAMPS/ FOOD RATIONS

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As economies continue to upgrade their industrial structures to focus on higher value-added manufacturing and services industries, public spending on agriculture in Asian countries has shown a declining trend. From 1980 to 2002, public spending on agriculture as a proportion of total government spending fell from 15% to about 9%. Public spending on agriculture as a proportion of agricultural GDP has increased, but only marginally from 9.5% to 10.5%.¹⁴

During the years of declining food commodity prices, the agricultural sector yielded relatively low returns on investment to governments, which in turn deterred investments in the sector. The lack of investment in turn led to lower productivity growth of important staples such as rice and wheat. But as public outcry over agflation begins to shed light on the underlying structural issues, governments are paying attention.

Government policies that have been implemented so far have focused on ensuring food supply in individual countries and stabilizing prices for their populations. If this focus continues, it could usher in a dangerous era in which relatively free trade in agriculture gives way to the tendency to hoard resources out of a fear that food simply will not be available on the open market.

In a worrying sign, once-reliable exporters have imposed export taxes and even outright bans on some crops as a result of price rises. Export bans and price floors have been imposed by grain exporters including China, Pakistan, Vietnam, Cambodia, and India this year. These actions sent shudders through international agricultural markets, even though only 7% of the world's rice is traded internationally.¹⁵ Countries such as Japan and China reserve their stocks for domestic consumption, in turn pushing up rice prices. Export restrictions provide a disincentive for farmers because they discourage production, distort supply, and end up worsening the shortage for those most in need.

These sorts of restrictions are not new, but it would be bad news if they are getting worse. Indeed, a conservative estimate by the International Food Policy Research Institute (IFPRI) calculates that getting rid of trade restrictions such as taxes, quotas, and export bans would reduce world cereals prices by an average of 30% and stabilize price fluctuations.¹⁶

Food subsidies and price controls are becoming more common. Last year, Malaysia's government placed price caps on a range of food products including cooking oil, rice, and wheat flour. This year, the Indonesian government increased spending on food sub-

VIETNAM

KEY STATISTICS

TRADE

A net importer of rice 20 years ago, Vietnam has become the world's second-largest rice exporter.

POPULATION

Over 70% of the population lives in rural areas.

FOOD PRICES

Food prices jumped 74.3% from June 2007 to June 2008. Food has a big weighting in Vietnam's consumer price index (43%).

CLIMATE

Climate change will likely lead to a rise in seawater level—a scenario of sea level rise of 30 cm in 2050 would increase the salinity of the Mekong River as far as 10 km inland. Increased minimum temperatures could lead to decreasing rice yields of up to 17% by 2070 and decreasing corn yields of up to 9% (compared to the average yield in the 1960 to 1998 period) in worst-case scenarios.

Natural disaster concerns have led to diversification into non-farm cottage industries such as handicrafts.

GOVERNMENT ACTIONS

In November 2007, the Vietnamese government approved a biofuel development project aiming to produce 250,000 tons of ethanol and vegetable oil to meet 1% of the country's petroleum demand by 2015.

Vietnam in July 2008 announced the introduction of a tax on grain shipments and fertilizers.

The government blocked the signing of new rice export contracts in early 2008 to combat inflation and then waived a rice export tax in August 2008 to boost sales due to higher-than-expected yields.

sidies by 2.7 trillion rupiah, or about \$290 million. While these measures may provide immediate relief to consumers, they aggravate price increases by limiting supply on world markets and thus do not alleviate the supply crisis. They also add to the fiscal burden but do not yield targeted benefits for those who are the most affected as the lower prices discourage production and investment in food products.

Price distortions prompted by government policies seemingly contributed to China's melamine scandal. Milk prices were capped but feed prices were not, squeezing farmers and leading to low-quality milk that was adulterated with melamine to boost its apparent protein quality.¹⁷

Thailand, the world's largest rice exporter, proposed earlier this year to form a rice cartel with Vietnam, Cambodia, Laos, and Myanmar. The Organization of Rice Exporting Countries (OREC) was proposed to prevent price wars and help farmers in these countries. However, the creation of an oligopoly would have harmed consumers and caused additional supply distortions. The proposal has since been dropped.

Governments are also holding reserves and continuing to promote self-sufficiency. The Chinese government produces more than 90% of the grain its people consume, and has grain reserves of 30% to 40% of annual production. In the case of rice, China holds about 40 to 50 million metric tons, which is about half of the world's rice stocks. While such stocks ensure security of domestic supply and stabilize prices at home, they distort global prices by limiting supplies available for trade.

In a sign of just how worrying the food situation is becoming to policy makers, some governments are leasing farmland beyond their national

borders. For instance, the China's Chongqing municipal government has leased farmland in Laos to grow rice and the Xinjiang government has leased farmland in Cuba. This trend will likely become more prevalent as Asian countries attempt to secure food supplies in the wake of dwindling cultivable soil and water supply, as well as to protect against volatile prices and natural conditions. However, some critics are concerned that this trend might usher in a new era of agricultural "neo-colonialism."¹⁸ It may encourage countries to bypass international trade rules and may also create food security problems for the host countries.



The Way Forward

While national policies aiming to lower prices for consumers and secure national supplies may provide temporary relief domestically, they distort agricultural markets internationally, which in turn aggravate inflation as they reduce supply on world markets.

Agriculture is the most protected part of international trade, and disputes over farm products led to the collapse of the Doha Round of WTO negotiations earlier this year. On a global level, opening up agricultural markets will be a key step forward, although any such measures are likely to face political opposition, especially given popular pressures on governments amid the deteriorating global economic climate.

Apart from trade liberalization, another policy area requiring international vision and political will is biofuels. Most urgently, governments should discourage the competition between food and biofuels by reducing subsidies and other financial incentives for biofuel production. Governments should heed warning calls from international organizations such as the FAO, OECD, environmental groups, and economists and reduce their commitments to cheap biofuels directly derived from food crops, instead developing other alternative energy sources and importing biofuels that cause less damage, such as second-generation cellulosic products and other non-food crops.

A number of immediate measures can help improve the competitiveness of the agricultural sector. Whereas

small- to medium-sized farmers with inadequate capital and scale may not achieve much progress on their own, governments, businesses, and non-governmental organizations are uniquely positioned to provide coordination, expertise, and investments. The effective use of biotechnology improves productivity by reducing damage to crops and the environment; a move from agricultural practices focused on merely getting more out of the land to solutions that rely on smarter and more creative uses of natural resources boosts attainable yields and preserves the longevity of farmland; improvements in agricultural research and expertise contribute to raising income for farmers; and investments in infrastructure and storage facilities reduce waste and help farmers capture more value from their crops.

To help the most vulnerable producers and consumers, governments, and non-governmental organizations can and should focus on conservation programs that help farmers build resiliency against the long-term threats of climate change, and food programs that provide targeted relief to vulnerable populations. In the longer term, countries should also focus on policies to stimulate rural development, which will in turn generate higher and sustained incomes. China and South Korea have seen dramatic poverty reduction as a result of their policies that aim to achieve this goal.

CHANGES IN TRADE POLICY

What would be the effects of more agricultural trade liberalization? The

World Bank estimates that free trade would ultimately raise prices by more than 5% for primary farm products and 1% for processed products.¹⁹ Food and agricultural tariff cuts in rich and developing countries would be beneficial in reducing poverty as they would boost farm incomes, which would also help increase demand for rural labor and increase wages for non-farm populations, according to a much cited World Bank study.²⁰ Among the developing countries modeled, Indonesia, the Philippines, and Thailand would all see significant reductions in populations living on \$1 a day, while Vietnam would see significant reductions in a scenario of developing-country agricultural tariff cuts.

Despite more than six years spent by WTO negotiators to put together a policy package that would cut agricultural export subsidies, lower duties on farm products, and encourage foreign direct investment (FDI), Doha Round negotiations in July 2008 failed. They ended in deadlock over a clause in the special safeguard mechanism, which allows developing countries to raise tariffs temporarily above prior commitments, to deal with import surges and price falls.²¹ Many developing Asian countries support these special tariff rises, arguing that subsidies in developed countries depress agricultural prices. The failure to reach an agreement more broadly reflects the dissatisfaction in developing countries toward domestic policies in the United States and the European Union that subsidize farmers producing food crops and biofuels, which address domestic political con-

cerns but have questionable economic and environmental benefits. The deteriorating global economic climate does not bode well, as governments may be even less likely to give up policy options that protect domestic interests. Despite cyclical problems, however, freer trade is needed to promote agricultural efficiency and welfare in developing countries, as well as more stable prices. A breakthrough will require political will and leadership that look substantially beyond national interest.

CHANGES IN BIOFUEL POLICIES

Governments should target their policies to hedge against the pressures that growing biofuel demand puts on food prices, chiefly by reducing incentives for biofuel production when food prices are high. For instance, China announced a moratorium in 2007 on the production of ethanol from corn and other food crops.²² To reduce competition between food and fuel, biofuels derived from second-generation cellulosic products using non-food crops or waste biomass, rather than directly from food crops such as corn, rapeseed, and oil palm, should be encouraged. Other biofuel crops that can grow in more arid soil and marginal land hold promise. For instance, India is targeting 20% of its diesel consumption by 2017 to come from jatropha, which yields four times as much fuel per hectare as soybean and ten times as much as corn. Second, governments should slow the introduction of biofuels that compete with food as a major energy source and develop a diverse set of alternative energy sources. The European Union's agricultural commission has set low targets for biofuel use in the hopes of reducing the competition for arable land. Britain is considering reducing its target of having 5% of all petrol and diesel made from biofuels by 2010.

THE PROMISE OF BIOTECHNOLOGY

Biotechnology in the form of genetically modified (GM) crops has been a hotly debated political issue, given the lack of robust safety and nutritional data and testing. However, GM crops have gained public acceptance in the wake of skyrocketing food prices. Limits on higher crop yields among existing plants may make GM food even more attractive. According to the Earth Policy Institute, the physiology of plants may be reaching productivity limits, given that major improvements in this area have been thoroughly researched and implemented. The WFP estimates that single-digit increases in supply can be expected under the most optimistic scenarios of good weather and harvests. In other words, productivity increases of conventional plants are limited.

What are the key contributions of biotechnology? The evidence that GM crops help to increase actual crop production is inconclusive. For instance, studies in the United States conducted by Kansas State University and the University of Nebraska found that GM soy produces 6-10% less food than its conventional equivalent. The main reasons are that while the genetic modification process takes place, conventional plants are being improved every year as high-yielding plants are used to produce the following year's seed. The modification process may also suppress yields.²³

However, biotechnology has been proven to help increase herbicide and pest resistance, thereby reducing the damage by pests and weeds. The biotechnology journal *AgBioForum* estimates that farmers around the world save almost \$7 billion by using genetic modification, which helps productivity and reduces the use of insecticide, in turn contributing to a 15% reduction in greenhouse gas emissions. In other

words, although a single GM plant may not be more productive than its natural counterpart, the overall impact on productivity can be dramatic.

China is already spending more than \$100 million a year on biotechnology research and has developed GM rice, tomatoes, corn, and sweet peppers. Indian universities are conducting biotech research. Japan and South Korea expect to spend over \$300 million a year on biotech research. Malaysia, Vietnam, and Singapore are looking to develop portfolios of GM crops for industrial purposes. While food safety remains a concern, particularly in more developed nations like Japan, Asia in general has been more open to GM crops than the West.

The private sector has taken creative steps to tap into the potential of biotechnology also. Monsanto is adding genes to improve the efficiency of nitrogen fertilizer use. More efficient nitrogen use will potentially cut nitrous oxide emissions.²⁴ IBM's World Community Grid supercomputer is helping to speed up development of more nutritious strains of rice. The technology harnesses the collective spare processing power of over 1 million PCs to run a computational model at the University of Washington to map the structure and functions of rice proteins, in order to identify proteins responsible for productivity, pest resistance, and nutritional value that can be selected for cross-breeding.²⁵

PROMOTION OF SUSTAINABLE AGRICULTURAL PRACTICES

A "greener" Green Revolution is needed. Technological innovations are part of the solution, but the ultimate goal should be to achieve high agricultural productivity while sustaining land, water and other natural resources used in farming. This requires no less than an

overhaul in conventional agricultural practices and management.

Combating the threat of water shortage will require investments in technologies like sprinkler and drip systems, as well as the management of irrigation and drainage systems, in order to improve efficiency and reduce waste. Another need is to conserve water in anticipation of droughts and heat waves, by collecting water for emergency irrigation, growing cover crops to slow down water flow, and recycling water.

Smarter fertilizer investments and usage have the potential of increasing the attainable yield by as much as three times in extreme cases, according to the WFP. As fertilizer use will likely increase in the future, teaching farmers to economize on its use will be crucial. And while organic farming has not been widely embraced in Asia beyond Japan and South Korea, studies have found that increased use of organic materials such as livestock manure and crop residue can be used in combination with inorganic fertilizers to help improve long-term crop and soil performance.

Investing in the promotion of organic farming is a key area of opportunity that private sector companies can become involved in as corporate citizens. One example is Citigroup, which supports a joint program in China between the World Resources Institute (WRI) and Fuping Development Institute to provide partnership and technical support, as well as funding for social enterprises in organic foods, fibers, and fertilizers.²⁶

Modifications in conventional agricultural practices may also hold promise. For example, the System of Rice Intensification (SRI), invented in Madagascar in the 1980s and adapted by governments in rice-producing countries such as China, India, and Indonesia, advocates early planting of rice. Doing so may increase productiv-

ity and boost harvests by cutting water and seed costs as well as preventing flooding. The method has been extended to other crops including sugar cane, finger millet, and wheat.

IMPROVEMENTS IN AGRICULTURAL RESEARCH AND EXPERTISE

In the past, farm incomes have been suppressed so that food prices would be low enough for consumers. The perverse effect of low prices has been to limit agricultural investment and output, thus driving up prices. Given the outlook for sustained high prices, governments should now help to improve agricultural research and expertise so that farmers are able to generate more value from their production, and to ensure that farmers capture the value from these higher prices.

In Asia, spending on agricultural research is low and still predominantly funded by the public sector. While agricultural R&D intensity ratios, i.e. agricultural R&D spending as a percentage of agricultural GDP, are increasing, the ratios for much of developing Asia (except Malaysia) remain well below the 2.5% level prevailing in the developed world and even the 0.5–0.8% average for Sub-Saharan Africa.²⁷ Typically, agricultural research intensity ratios in Asia are 0.5% or below.²⁸ Governments should focus investment on boosting research as well as knowledge and technology dissemination across countries in the region. Malaysia has been able to attain high research intensity partly because it has agricultural commodity boards for the major export crops—cocoa, palm oil, and rubber. The research by these boards accounts for a large share of the total government spending on agricultural research. The government has also expanded public grants to help university research on halal food and

agro-biotechnology, increased financing for postgraduate training for research staff, and established joint technological cooperation and training initiatives with agricultural organizations in Australia, China, other ASEAN countries, and Iran (which is self-sufficient in essential agricultural products).²⁹

In addition, businesses should identify opportunities for private-public partnerships where they are able to contribute resources and expertise to meet common goals for public interest. An example of a government partnering with the private sector is the Philippines. According to the Philippines government, Shangri-La Hotel group and the San Miguel Corporation have agreed to join efforts with the government in a program called Feeding the Future, to develop 1 million hectares of land for food production. Farmers' produce would then be bought at competitive rates as part of an assistance program for farmers.³⁰

INFRASTRUCTURE AND STORAGE IMPROVEMENTS

Transportation improvements could vastly reduce economic losses from wasted and rotting food that does not get from farms to markets. Inefficient transportation reduces final food supply and increases costs. In developing countries, up to half the food produced is lost, according to the WFP, because farm produce does not get to the markets on time. Farmers suffer direct income loss as a result. In addition, high fuel prices are pushing up freight rates, and rising transportation costs account for up to two-thirds of final food prices.³¹ Further, a lack of sophisticated storage and preservation practices in less-developed markets leads to wastage of perishable foods and increases costs to farmers. By some estimates, upgrading drying and storage facilities to prevent spoilage

has the potential to reduce post-harvest loss by one-third. Storage also prevents farmers from having to sell right away at times of price volatility.

In India, where modern transportation networks are lacking, Indian farmers on average receive less than one-fifth of the price consumers pay.³² India also produces 60% of the world's mangoes, but accounts for less than 1% of mango exports. One key reason is the lack of infrastructure and cold storage facilities to ensure produce gets to markets. Yet political opposition forced Reliance Retail to delay plans to build a large network of hypermarkets that would buy agricultural products directly from farmers, bypassing middlemen, and that would improve cold storage and distribution for produce. Nevertheless, benefits of improving agricultural supply chain infrastructure in the face of elevated food and fuel prices, including better rates of return on investment and higher income for farmers, should make such investments more attractive.

Other short-term opportunities would be to decrease energy-intensity in farming and produce products closer to the end consumer, in order to decrease transportation and logistical costs. Hong Kong, Shenzhen, and Mumbai are three examples where urban agriculture is practiced. Urban farms are located around the cities to grow fruits, vegetables, and livestock for urban populations. In 2007, local production accounted for 46% of the fresh chickens and 18% of the freshly slaughtered pigs consumed in Hong Kong.³³

INVESTMENTS IN BUILDING RESILIENCY TO CLIMATE CHANGE

As extreme weather events become more frequent, an urgent need is to help preserve arable land and stabilize yields. Governments should design and implement integrated policies for soil conservation, reforestation, wetland conservation, and programs to slow water and soil loss in order to reduce the impact of climate change. The Chinese government is implementing these sorts of programs in the Northeast and Northern China Plain.

TARGETED ASSISTANCE AND CAPACITY BUILDING FOR THE MOST VULNERABLE POPULATIONS

Last but not least, well-targeted safety nets should be scaled up to safeguard the most vulnerable populations, both in terms of food suppliers and consumers.

The Bill & Melinda Gates Foundation and Howard Buffett, the son of Warren Buffett, have provided \$76 million in grants to fund a WFP program called Purchase for Progress, which buys the food for food assistance programs from developing-world farmers rather than shipping it in from abroad, so that farmers can sell their surplus crops at competitive prices. The measure is intended to help small-scale farmers become net producers rather than net consumers of food.³⁴

The Asian Development Bank announced in May 2008 that it would provide \$500 million in immediate budgetary assistance to member na-

tions for safety nets in the face of rising food prices.³⁵ Following the announcement, in September 2008 it approved a \$500 million loan for Pakistan in the face of food and fuel price inflation, and in October, a \$35 million in emergency food aid and grants to Cambodia.

Though food aid provides temporary relief, these programs are also vulnerable to being scaled back at times of high food prices. Programs should thus be designed to provide better-targeted help and improve participation of poor populations in the economy. Targeted food aid could come in the form of temporary subsidies of essential foods, conditional cash-transfer programs, and food programs at schools and workplaces, to provide targeted relief for the most vulnerable. The WFP has been providing free breakfast at schools in Cambodia, which has made children visibly healthier and helped improve reading ability.³⁶ The International Fund for Agricultural Development, a specialized agency of the United Nations, focuses on introducing microfinance to rural public work programs, increasing asset holding to the rural poor, distributing water to increase farm output, and increasing linkages between rural non-farm and farm sectors, all of which are measures to build capacity rather than directly providing temporary relief. China and South Korea have seen rapid increases in rural incomes through their poverty-alleviation policies in the past decade that help build infrastructure and gain skills and employment for the poorest populations.³⁷

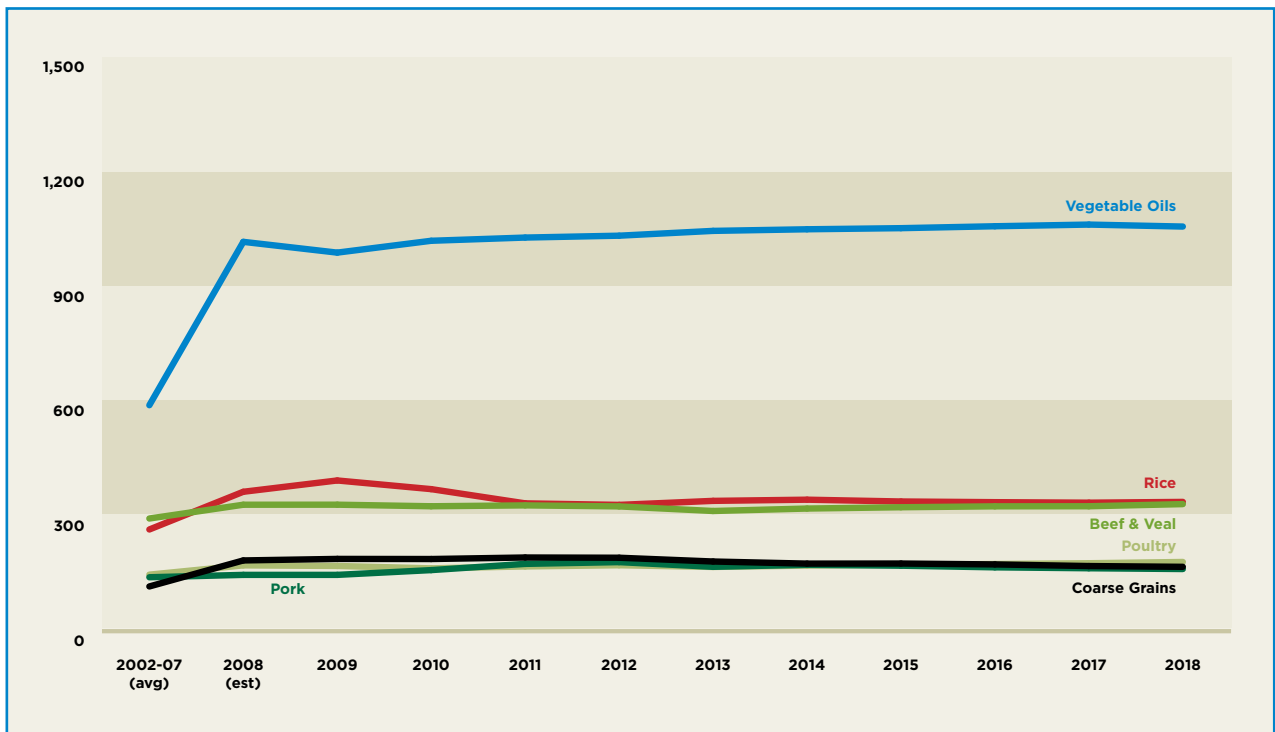
Conclusion

Food prices are unlikely to return to historically low levels. In the short term, price volatility may lead to forced cuts in food consumption, potentially triggering political difficulties, and perhaps even instability, in Asia's poorer countries. Absent concerted long-term measures, structural factors driving up food demand and threats to continued growth in supply will continue to play out, and policies aimed at short-term

goals will not ensure longer-term benefits for food producers and consumers.

Future projections do not predict a continued acceleration of price rises, but rather sustained levels of high food prices. These projections are based on assumptions of moderate income growth in key emerging markets including China and India, continued demand for biofuels, sustained high fuel prices, a progressively stronger U.S. dollar, and conservative increases in food crop

yields.³⁸ The net effect is that food prices will remain considerably higher than historical trends. Rather than hoping that these price increases are temporary, countries should view these sustained high prices as the true cost of feeding the world. Policy goals should not necessarily be focused on depressing prices, but rather on incentivizing efforts to resolve demand and supply imbalances, raising income for rural households, and feeding vulnerable populations.



WORLD PRICES BY FOOD TYPE (\$/TON)

SOURCE: OECD-UNITED NATIONS FOOD AND AGRICULTURE ORGANIZATION

Endnotes

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