Overview: Food Security in Developing Countries, 2007-17

The aggregate food security indicators estimated by USDA's Economic Research Service point to deteriorating food security over the next decade for the 70 countries covered in this report. Average per capita food consumption for the countries stagnated in 2007 and the number of people consuming less than the nutritional requirement is estimated to be higher than in 2006. Food and fuel price hikes, coupled with a slowdown in economic growth, are expected to hinder long-term food security progress.

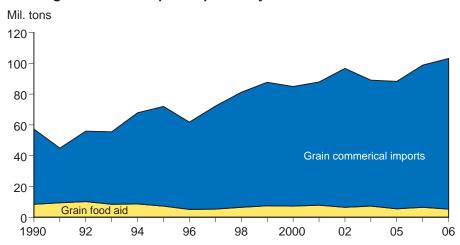
During the last several decades, growth in global production surpassed population growth, leading to an overall improvement in per capita food consumption at the aggregate level. Productivity growth was responsible for the decline in prices of major agricultural commodities despite significant demand pressure stemming from growth in global per capita income. The declining trend in food prices, however, changed direction in 2002. Grain prices jumped about 50 percent from 2005-07. Based on USDA-ERS long-term projections, about 90 percent of that price shift will persist during the next decade. Lower income, developing countries feel the price pressure even more than other countries because food expenditures comprise such a large share of total household expenditures (more than 50 percent for many countries reviewed in this report). The recent oil price hikes add to the financial burden as the higher energy import bill can squeeze out the imports of necessities such as food and other raw materials.

An important factor behind the food price hike was the increase in transportation and input costs, particularly fertilizer costs. In addition, the persistence of higher oil prices deepens global energy security concerns and heightens the incentives to expand production of other sources of energy including biofuels. The use of food crops for producing biofuels, growing demand for food in emerging Asian and Latin American countries, and unfavorable weather in some of the largest food-exporting countries in 2006-07 all contributed to growth in food prices in recent years. During 2002-06, corn prices rose nearly 30 percent, wheat, 20 percent, soybean oil, 18 percent, and sugar, more than 80 percent. These commodities constitute more than 60 percent of the diets in low-income countries and therefore, the rising prices and their subsequent inflationary effects are likely to further constrain consumers' budgets. The impact of these higher food prices on inflation rates will vary by country and often reflects a combination of factors including subsidy policies, the food share of total expenditures, and volatility of the exchange rate. Recent FAO reports indicate that many countries have either reduced tariffs to reduce food import costs or increased subsidies to control food inflation.

Many of the countries included in this report have become more import dependent over time, which means higher food prices constrain their import capacity (fig. 1). However, if prices for export commodities keep pace with those of the imported commodities, the financial pressure can be mitigated. This has been the case for metals, a major export commodity for some of the study countries. For example, prices for aluminum (exported by Egypt, Tunisia, Zimbabwe, India, Indonesia, and Sri Lanka, among others) nearly

Figure 1

Growing commerical import dependency



Source: USDA, Economic Research Service.

doubled from 2002-06, while prices for copper (exported by Zambia and Indonesia) increased more than fourfold. The low-income countries that export other raw materials such as beverage crops (i.e., coffee, tea), another major export group of many of these countries, did not benefit to the same extent and therefore, probably faced a more limited capacity to absorb import price increases.

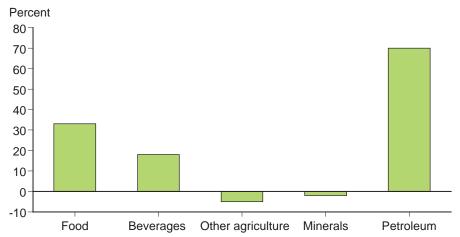
In 2007, the food-security situation took a turn for the worse as food and oil prices continued to grow sharply while those for export commodities for many low-income countries failed to keep pace. From January 2007 to January 2008, the index of aggregate food prices increased by 33 percent, according to the International Monetary Fund (IMF) (fig 2.). The financial pressure of these price hikes on importing countries was considerable because unlike 2006, prices for export commodities did not keep pace with grains and oilseeds. The exception was beverages, whose prices increased by 18 percent, while metal prices declined by 2 percent and prices of other agricultural export commodities declined by 5 percent.

High transportation costs within countries and continents, as well as across oceans (air and ship freight), have intensified the financial burden on most countries by further increasing import costs. The oil price in early 2008 was more than five times higher than the January 2002 price. Between January 2007 and January 2008 alone, oil prices rose 70 percent worldwide.

The economic outlook for low-income countries through 2008 projects further economic difficulties, not only due to persistent high food and fuel prices, but also because of an expected slowdown of the global economy. Developed countries are the major trading partners of developing countries and therefore any slowdown in their economic growth will likely depress developed countries' demand for imports. These reductions, in turn, adversely affect export earnings of the countries studied for this report. The cumulative effect of high prices for imports, reduced demand for their exports, and high transportation costs could be harmful for those developing

Figure 2

Change in global commodity prices: January 2007 - January 2008



Source: USDA, Economic Research Service.

countries with limited foreign-exchange capabilities and high levels of vulnerability to food insecurity.

In This Report

Seventy developing countries are covered in this report. Projections of food availability include food aid, with the assumption that each country will receive the 2004-06 average level of food aid throughout the next decade. All historical and projected data are updated relative to Food Security Assessment, 2006. Food-production estimates for 2007 are preliminary, based on USDA data as of January 2008, with supplemental data from United Nations' Food and Agriculture Organization and World Food Program. Financial and macroeconomic data are based on the latest World Bank data, as of February 2008. Projected macroeconomic variables are either based on calculated growth rates for the 1990s through the mid-2000s or are World Bank projections.

This report includes one special article, "Global Diet Composition: Factors Behind the Changes and Implications of the New Trends." The article reviews the direction of global diet change and examines the differences in diet patterns in developed and developing countries. The article also identifies factors behind the growing trend of obesity in developing countries and reviews policies implemented by different countries to combat this trend.

Food Security Progress May Be Halted

The food-security indicators for the 70 countries covered in this report show an increase in the estimated number of food-insecure people for 2007 relative to 2006 (982 million for 2007 compared with 849 million in 2006). In addition, the number of food-insecure people is projected to increase to 1.2 billion by 2017 (see box, "How Food Security Is Assessed: Methods and Definitions"). Chronic food insecurity is caused by poverty limiting access to food. Short-term shocks, natural as well as economic, can intensify this

¹The estimates of 2007 food-security indicators are based on preliminary 2007 food-production data and the projections of commercial imports and constant country food-aid data at the 2004-06 level. If commercial imports are higher than estimated, or countries decide to draw down stocks, or donors increase food aid commitments to countries in need, these estimates of gaps, as well as the number of food-insecure people, could fall.

How Food Security Is Assessed: Methods and Definitions

The Food Security Assessment model used in this report is based on 2007 data (updated in February 2008), and, therefore, does not reflect any subsequent changes that may have transpired related to the food security situation of these countries. Commodities covered in this report include grains, root crops, and "other" which refers to the remainder of the diet. The three groups account for 100 percent of all calories consumed in the study countries and are expressed in grain equivalent. The conversion is based on calorie content. For example, grain has roughly 3.5 calories per gram and tubers have about 1 calorie per gram. One ton of tubers is, therefore, equivalent to 0.29 ton of grain (1 divided by 3.5), and 1 ton of vegetable oil (8 calories per gram) is equivalent to 2.29 tons of grain (8 divided by 3.5).

Food consumption and food access are projected in 70 lower income developing countries—37 in Sub-Saharan Africa, 4 in North Africa, 11 in Latin America and the Caribbean, 10 in Asia, and 8 in the Commonwealth of Independent States. (See appendix 1 for a detailed description of the methodology and definitions of terms and appendix table 1 for a list of countries.) The projections are based on 2004-06 data and on 2003-05 macro and supply and utilization account data. The periods covered are 2007 (current), 2012 (5-year projection), and 2017 (10-year forecast). Two food gaps nutritional and distribution—are presented where projections through 2017 are based on differences between consumption targets and estimates of food availability, which is domestic supply (production plus commercial and food aid imports) minus nonfood use. The estimated gaps are used to evaluate food security of the study countries.

The food gaps are calculated using the following consumption target: The goal is for average food availability to meet nutritional requirements (NR) of roughly 2,100 calories per capita per day—depending on the region—as recommended by the UN Food and Agriculture Organization. The average *nutrition gap* is the gap between available food and food needed to support a minimum per capita nutritional standard (for definitions of terms used see appendix 1).

The aggregate food availability projections do not take into account food insecurity problems due to food distribution difficulties within a country. Although lack of data is a major problem, an attempt was made in this report to project food consumption by different income groups based on income distribution data for each country. The concept of the income-consumption relationship was used to allocate the projected level of food availability among different income groups (indicator of food access). The estimated distribution gap measures the food needed to raise consumption in each income quintile to the minimum nutritional requirement. In some countries average consumption of the poorest quintile (20 percent) of the population narrowly exceeds nutritional requirements. In such cases we include the lowest decile (10 percent) of the population in our estimation of food gaps. However, when our estimates show no distribution gap for the poorest 10 percent population, we consider the country food secure despite the fact that food insecurity may exist, but for less than 10 percent of the population. Finally, based on the population share below nutritional requirements and total population data, the projected number of people who cannot meet their nutritional requirements is calculated.

The common terms used in the reports are:

- **Domestic food supply**—the sum of domestic production and commercial and food aid imports
- Food availability—food supply minus nonfood use, such as feed and waste
- **Import dependency**—the ratio of food imports to food supply
- Food consumption—which is equal to food availability.
- **Food-insecure**—which is when average per capita food consumption for a country or income quintile falls shorts of the nutritional requirement.

problem. The situation often worsens when political instability is added to the picture, which sometimes leads to famine.

Overcoming chronic food insecurity may be difficult given the recent food price spikes that limit countries' ability to import food and the global economic slowdown that has intensified foreign exchange constraints. The high grain prices should improve production incentives for those countries with productive resources and efficient market economies, allowing them to take advantage of the higher prices. However, in countries that are highly vulnerable to food insecurity, Sub-Saharan Africa (SSA) countries in particular, producers'

responses to price changes are weak because of poor market infrastructure, high input costs, and limited access to new technology.

The food gap to meet nutritional requirements (at the average national level) is estimated at 16.6 million tons in grain equivalent for 2007 (table 1). This gap is projected to increase to nearly 27 million tons by 2017. The distribution gap—the amount of food needed to raise consumption in each income group to meet nutritional requirements—is estimated at about 44 million tons for 2007, almost three times the average national-level gap, reflecting the intensity and depth of the problem that is due to skewed income distribution within countries. By 2017, the distribution gap is projected to increase to more than 57 million tons; this is more than seven times the amount of food aid received by these countries in 2006.

Although weather-related food production shocks as well as political instability continue to be the main factors behind short-term changes in food security, the recent food price hikes have certainly exacerbated the situation. To illustrate the impact of these higher prices and the slowdown in export earnings, we ran the Food Security Assessment model using price trends from the USDA long term projections in February 2008 (USDA Agricultural Projections to 2017). The prices in this scenario were lower than the actual prices we used for the 2007 analysis (fig. 3). Under this scenario, the distribution gap would have been 6 percent lower in 2007 than our current estimate.

Table 1			
Food availability	y and food	gaps for	70 countries

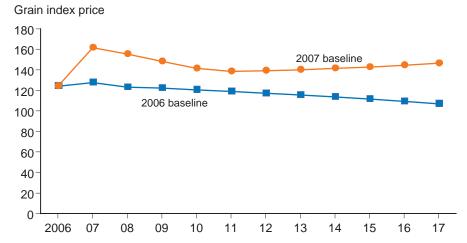
Year	Grain production	Root production (grain equivalent)	Commercial imports		i d receipts equivalent)	Aggregate availability (grains)
			1,000 tons			
1998	538,496	63,711	76,310	7	,629	795,568
1999	568,358	68,532	79,230	8	,586	819,171
2000	564,843	70,250	77,603	8	,700	832,345
2001	582,021	72,497	78,604	9	,601	841,748
2002	554,742	74,163	89,602	8	,284	846,975
2003	613,032	76,276	81,510	8	,599	871,962
2004	602,563	80,181	81,606	6	,654	881,559
2005	634,873	83,971	93,625	8	,245	913,510
2006	652,600	86,579	98,108	6	,632	938,816
Projecti	ons			Foo	d gap*	
				NR	DG	
2007	656,727	87,217	78,633	14,427	41,818	913,695
2012	714,191	94,647	88,590	19,602	51,889	985,814
2017	777,283	102,623	93,235	24,180	54,782	1,057,157

^{*}NR = nutritional requirements (amount of grain equivalent needed to support nutritional standards on a national average level).

DG = distributional gap (amount of grain equivalent needed to allow each income quintile to reach the nutrional requirement).

Source: USDA, Economic Research Service analysis of data from United Nations Food and Agriculture Organization--FAOSTAT; and UN World Food Program.

Figure 3
USDA grain baseline price projections



Source: USDA, Economic Research Service.

For 2017, there was an 8-percent difference in the size of the gaps. Perhaps more important is the impact of the higher prices on the number of people affected. Under the lower-price scenario, the number of food-insecure people would have been 3 percent lower in 2007. That 3-percent figure represents 30 million people. For 2017, there would have been 10 percent, or 100 million, fewer food-insecure people had prices remained on their former path.

As mentioned earlier, the recent challenge that all of these countries are facing is the rising prices for staple foods, such as wheat, corn, and vegetable oils. Grains have historically accounted for the largest share of the diet in the world's poorest countries because, compared with other foods, grains are relatively low-priced. In low-income Asian countries, grains account for 63 percent of the diet, on average. In North African and Commonwealth of Independent States (CIS) countries, grains contribute about 60 percent of diets. In SSA, the region most vulnerable to food insecurity, grains account for nearly half of the calories consumed. The share of grains in the diet is the lowest—about 43 percent—in lower income Latin American and Caribbean (LAC) countries. In all regions, the situation varies by country. In Bangladesh, the share is even higher, 80 percent, and in Eritrea and Ethiopia, both among the most food-insecure countries in the world, the share is around 70 percent. The vegetable-oil share of the diet has risen over time as higher incomes have resulted in diets composed increasingly of processed foods. For example, the vegetable oil share of the SSA diet increased from less than 8 percent in 1980 to 12 percent in more recent years. In lower income Asian and Latin American countries the share is now roughly 10 percent, up from 5 to 7 percent in 1980.

For households in the study countries, food expenditures account for about half of their total expenditures. As food prices rise, families must allocate a larger share of their budget to food in order to maintain the same level of consumption. Similarly at the national level, the more import-dependent countries have to spend a larger share of their budget on food imports. LAC and North African countries are more import-dependent than the other regions. From 2004-06, the import share of total grain supplies was 49

percent in North Africa and 45 percent in LAC, compared to 31 percent for SSA, 24 percent for CIS countries, and 12 percent in Asian countries.

The financial pressure of the growing food prices varies by region and country. From 2002-06, in the LAC countries covered in this report, food inflation was the highest, 43 percent, while in the North African countries it was the lowest, 11 percent. In SSA, Asia, and CIS, the food-inflation rate was in the range of 30 to 37 percent. For comparison, at the global level, food prices grew about 27 percent. The key factors behind the variations in food inflation are differences in macroeconomic policies and the degree of international price transmission that is dependent on government policies. The North African countries, for example, have a long history of consumer food subsidies and that could explain why, despite the high global food prices and their high import dependence, domestic food prices increased very little during 2002-06. Such policies are in contrast to the LAC countries that have more open economies and consequently higher price transmission.

Food Security: Regional and Country Perspectives

Regionally, the most significant change is in the case of the Asian countries. Previous projections predicted long-term improvements in food security. Current analysis shows those improvements slowing to a halt. Food security in LAC and CIS countries is projected to improve in the next decade. Sub-Saharan Africa, already the most vulnerable region with the lowest calorie intake levels, will suffer the greatest deterioration in food security.

North Africa

Per capita calorie consumption in North Africa averages well above 3,000 calories per day, which is comparable to that of most developed countries. Therefore, in most years, the region is food secure, meaning that, at the country level, the number of food-insecure people is less than 10 percent. However, per capita food availability declined from 2006-07, mainly due to a severe drought in Morocco that resulted in a more than 50-percent reduction in grain production. As a result, per capita consumption for 10 percent of the country's population with the lowest income levels (3 million people) fell below the nutritional requirement. For the other countries in the region, consumption in all income groups exceeded nutritional requirements (table 2).

Short-term production variability creates a challenge to the region's food security, with the exception of Egypt, where most of the agricultural area is irrigated. Morocco, in particular, has one of the highest levels of production variability in the world. The coefficient of variation, an indicator of average grain production variation around the trend line, was 49 percent between 1990 and 2006. This means that in a given year, production can increase or decrease by half. Algeria and Tunisia face similarly high variability with coefficients of variation measured 47 and 42 percent respectively. The North African countries, however, tend to respond to a shortfall in production by increasing commercial food imports. Higher food-import prices were expected to depress imports, but the region's relatively strong export earnings allowed for a continuation of imports. These countries have a fairly diversified export base and some of their export commodities, such as oil, phosphates, and citrus, have enjoyed strong price growth. In addition, because of the historical consumer backlash against higher consumer food prices, the governments tend to increase imports by reducing tariffs and fund higher food subsidies to prevent any political disruption.

Through 2017, all income groups in this region, except the lowest 10 percent income group in Egypt, will be food secure as consumption is projected to exceed the nutritional requirement. The main issue for North African countries will be their ability to finance imports. The region depends on imports for about half of its essential food items, and based on the most recent data, the food share of the total import bill averaged about 26 percent (World Bank, 2007). Since 2000, Egypt, Morocco, and Tunisia have had persistent annual trade deficits. The ratio of the value of the trade deficit to export earnings was 27 percent in Egypt, 14 percent in Morocco, and 8 percent in Tunisia in 2002-06, but shows a declining trend in all countries. By contrast,

Table 2
Food availability and food gaps for North Africa

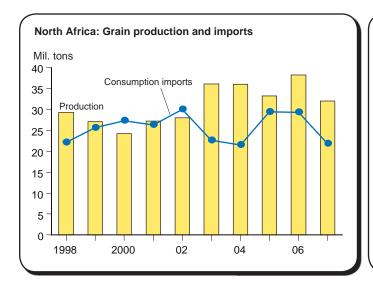
Year	Grain production	Root production (grain equiv.)	Commercial imports (grains)	Food recei (grain e	pts	Aggregate availability of all food
			1,000 tons	S		
1998	29,319	1,354	22,093	7	4	52,608
1999	27,105	1,287	25,628	10	5	52,239
2000	24,160	1,312	27,265	350	6	53,521
2001	27,218	1,329	26,332	82	2	53,881
2002	28,016	1,483	29,961	7:	2	53,769
2003	36,077	1,704	22,612	3	5	57,833
2004	36,046	1,989	21,486	58	3	60,222
2005	33,226	1,928	29,434	53	3	60,719
2006	38,176	1,978	29,309	5	5	64,458
Project	ions			Food	gap*	
				NR	DG	
2007	31,986	2,060	21,806	0	16	50,446
2012	40,355	2,248	24,046	0	0	58,039
2017	43,905	2,446	24,415	0	30	58,114

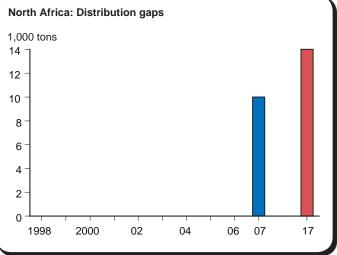
North Africa (149 million people in 2007)

Calorie consumption on average in North Africa is well above recommended levels of 2,100 calories per day for an active adult. Consumption for the highest income quintile in North Africa exceeded 3,500 calories per day. See the special article "Global Diet Composition" for more information.

North Africa has not been as affected by rising food prices as other countries. Food inflation was 11 percent in North Africa. A long history of consumer food subsidies have helped to buffer food price increases in this highly import-dependent region.

^{*} See table 1.





	Percent of household	Percent of household final consumption expenditures:		d spending on:
	Spent on food	Spent on food Spent on alcohol and tobacco		Food
	Percent		US\$	
Tunisia	36.7	1.0	1,947	528
Egypt	41.5	2.5	1,032	377
Algeria	43.7	2.0	1,075	400
Morocco	44.8	1.5	1,213	480

Algeria has benefited from the recent growth in oil prices and its trade surplus was equal to about 40 percent of its export earnings in 2002-06.

Governments in North African countries continue to influence their consumers' food prices by setting prices below free-market levels. Subsidy size varies by country and over time, but in general, the goal of government-backed food subsidies is to improve the purchasing power of consumers. This is particularly true for the lowest income group in each country, to help governments maintain social and political stability. These policies have resulted in much higher average nutritional levels compared with those in countries with similar income levels where the governments do not apply food subsidies. The region's per capita caloric supply averages more than 3,000 calories per day, 23 percent higher than the average for all developing countries, while the weighted average income of the region is slightly lower than the average for all developing countries.

Despite these governments' consumer policies, income distribution in 2007 in North Africa remained skewed in favor of a small percentage of the population. The top 20 percent of the population holds about 47 percent of total income, on average, while the poorest 20 percent holds less than 7 percent. Households in these countries spend more than 40 percent of their income on food, meaning that higher prices for staple foods can significantly reduce the purchasing power of the poor. However, from 2002-06, the higher global prices had a limited impact on these countries, as food inflation measured only about 11 percent. During the past few decades, falling international prices for food reduced the amount of subsidies required for imported commodities, thereby reducing the cost of providing subsidies. However, if the prices of staple foods continue to rise, it is uncertain if countries such as Egypt and Morocco will be able to absorb the costs of the food subsidies without jeopardizing imports of other essential commodities and/or widening their budget deficit that could hamper their long-term growth.

Sub-Saharan Africa

Sub-Saharan Africa is the world's most food-insecure region. Average calorie intake in the region is not much higher than the daily requirement of 2,100 per day, and is by far the lowest in the world. Growth in production of grains, the main food group in the diet, was about 3 percent per year between 1990 and 2006, but on a per capita basis the gain was modest because of the 2.7-percent annual growth in population. Many countries in SSA do not have an adequate supply of food, and the inequality in purchasing power, and resulting extremely low incomes for much of these populations, exacerbates the problem. ERS estimates that the region had 457 million undernourished people in 2007, nearly matching the total estimated for Asia (table 3). So, while SSA has nearly the same number of food-insecure people as Asia, the food-security situation of SSA is far worse because SSA has only about a third of the total population of the Asian countries. By 2017, the region is projected to have even more foodinsecure people than Asia—645 million compared with 487 million. In other words, by 2017, given current trends, SSA will account for more than half of the undernourished people of the 70 countries in this report while accounting for about a quarter of the population.

Table 3

Food availability and food gaps for Sub-Saharan Africa

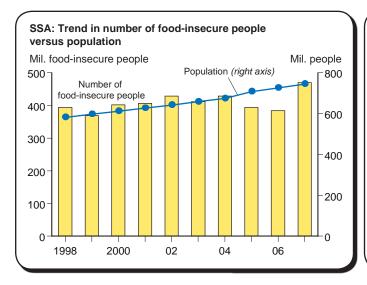
Year	Grain production	Root production (grain equiv.)	Commercial imports (grains)	Food aid receipts (grain equiv.)	Aggregate availability of all food
			1,000 tons	S	
1998	74,606	42,119	15,786	2,837	149,017
1999	76,057	44,219	13,285	2,690	152,444
2000	72,695	45,628	14,650	4,027	157,270
2001	77,373	47,346	18,610	3,722	162,527
2002	75,604	48,278	20,176	3,225	164,412
2003	84,446	49,802	20,225	5,422	171,182
2004	82,358	52,593	22,845	3,717	174,966
2005	93,153	55,725	24,674	4,823	189,226
2006	102,407	57,596	23,533	4,189	198,889
Project	ions			Food gap*	
				NR DG	
2007	99,885	57,247	20,331	12,376 20,521	187,468
2012	112,720	62,567	22,764	16,938 26,072	208,045
2017	127,293	68,312	24,171	20,964 31,639	230,082

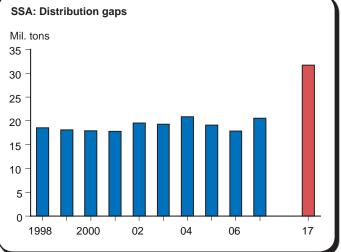
Sub-Saharan Africa (726 million people in 2007)

Sub-Saharan Africa (SSA) is the world's most food-insecure region. Average calorie intake in the region is not much higher than the daily requirement of 2,100 per day, and is by far the lowest in the world.

SSA has also experienced high food inflation leading to riots in Senegal, Mozambique and Cameroon. Purchasing power of consumers has been further reduced by rising oil costs as well. The higher food and fuel prices were of particular concern in 2007 because for the first time since 2002, the region's trade surplus became a deficit.

^{*} See table 1.





	Percent of household	Percent of household final consumption expenditures:		I spending on:
	Spent on food	Spent on alcohol and tobacco	Consumption	Food
		— Percent ———	U	S\$
South Africa	21.4	4.6	3,146	621
Nigeria	40.7	2.5	603	206

¹Food spending data are available for only 2 countries in this region. Source: Euromonitor International; USDA, Economic Research Service calculations.

Economic hardship hit nearly all of the 37 Sub-Saharan countries in this report in 2007. In 2007, 21 countries in the region were estimated to have 80-100 percent of their populations consuming below the nutritional target. In 2006, only 12 countries were in that situation. The main factors behind the deterioration were high food and oil prices, which led to higher inflation. These factors reduced the purchasing power of consumers. This situation is not unique to Sub-Saharan Africa as recent higher energy and food prices translated into inflationary pressures worldwide, but given that the region's per capita income levels are among the lowest in the world, SSA is highly vulnerable.

The higher food and fuel prices were of particular concern in 2007 because for the first time since 2002, the region's trade surplus became a deficit. The region's dependency on grain imports has grown through time, from an average of 16 percent during the 1990s to 22 percent in 2000-06. The rising import dependency was spurred by an increase in commercial imports, not food aid. The share of food aid in total grain import declined from about 30 percent in 1990 to 18 percent in 2006, while commercial imports grew more than 6 percent per year between 1990 and 2006. Import dependency, however, varies by country. Of the 37 Sub-Saharan African countries covered in this report, imports provided more than 50 percent of grain supplies, in 11 countries (Eritrea, Somalia, Angola, Lesotho, Swaziland, Zimbabwe, Cape Verde, Gambia, Liberia, Mauritania, and Senegal) in 2005-06. In 7 countries (Cameroon, the Democratic Republic of Congo, Mozambique, Benin, Cote d'Ivoire, Ghana, and Guinea-Bissau), this share was in the range of 30 to 50 percent. Paying for these imports is a challenge for most of these countries as foreign exchange is limited, and price hikes for imported commodities reduce the countries' ability to import sufficient quantities of grain. The few oil-exporting countries, such as Angola and Nigeria, have experienced financial gains from higher global oil prices, and those gains help ease the burden of higher grain-import prices.

For the countries with low import dependency, the overriding factor affecting their food security is annual weather variability resulting from drought and flood. In these countries, the food insecurity risk created by natural shocks is high because domestic production is strongly linked to consumption and the agricultural sector is the dominant employer in the economy. Additionally, factors that lead to poor food-crop performance often adversely affect cash crops as well. As a result, export earnings are often insufficient to purchase imports needed to compensate for a shortfall.

Another salient regional factor is political conflict, which is present where poverty, food insecurity, and unequal distribution of resources are prevalent. According to the United Nations' Food and Agriculture Organization, average agricultural-output losses in developing countries due to political conflict exceed \$4 billion a year, enough to provide nutritionally adequate food for 300 million undernourished people. In 2007, the situation was of particular concern in Somalia. Political conflict continued there, millions of people were displaced, and adverse weather led to 2 years of belowaverage production. All of these factors put many Somalis at risk of famine. In Kenya, the post-election violence in late 2007 and early 2008 resulted in hundreds of people killed and a quarter-million people displaced, leading to disruption in their economic activities, including farming.

The current dry weather and high cost of inputs such as seeds and fertilizer are likely to deepen Kenya's food insecurity during the next few years. Zimbabwe is another country where political problems have harmed its economy. Only a decade ago, Zimbabwe was a stable Sub-Saharan African country, one of the few that managed to export grain to neighboring food-deficit countries. Now, misguided government policies and nationwide political instability have triggered a collapse of agricultural production, leaving the country with few resources to respond to a regional production shortfall caused by floods in 2007. To satisfy Zimbabwean consumers' food demands, the country must now import roughly the same amount of grains it produces.

Higher food prices since 2006 have intensified poverty and are resulting in political instability, as reported by the 2007 and 2008 food riots in Ethiopia, Mauritania, Nigeria, and Senegal. High food prices hit the region very hard because of deep existing poverty. Per capita income in SSA is the lowest of all the regions and in 2005, average per capita gross domestic product (GDP), was less than US\$1 a day in 17 of the 37 countries. One of the most severe cases is Malawi, where annual per capita GDP is \$160, households spend more than half of their budget on food, and food prices rose 35 percent from 2004-06. The situation in Malawi is not unique since, on average, Sub-Saharan African consumers spend about 50 percent of the household budget on food. In some of the poorest countries in the region such as Madagascar, Tanzania, Sierra Leone, and Zambia, this ratio is more than 60 percent.

Looking ahead, according to the International Monetary Fund, the slowdown in the global economy and continuation of high food and fuel prices threaten the economic outlook in some countries. It is estimated that with every 1-percent decline in global gross domestic product, SSA's GDP will decline by 0.5 percent (International Monetary Fund, February 2008). Inflation pressures arising from food and fuel can further deteriorate the financial situation of the region. During the next decade, the distribution food gap is projected to increase by more than 50 percent and the number of food-insecure people by 36 percent.

How can this trend be reversed? Currently, the World Bank is calling on the international community to provide \$500 million to meet emergency food needs of low-income countries, with a large share targeted to Sub-Saharan Africa. The Bank also announced plans to nearly double agricultural lending in Africa in 2008-09 from \$450 million to \$800 million. Agriculture is the most important sector for the poorest countries in the region, and an increase in investment is an essential step toward improving the performance of domestic food production. SSA has ample arable land that can be brought into production. However, current growth in the production of grains, the most important component of the region's diet, is barely exceeding that of population growth.

SSA's agricultural sector is faced with limited access to essential inputs such as fertilizer and high-yielding seed varieties. Water is scarce and the region's share of irrigated land relative to arable land is the lowest compared to other developing regions. But there are low-input feedstocks that could be grown in this region for biofuels, and those, in turn can enhance farm income and investment in the agricultural sector. An example is the indigenous plant jatropha, which grows wild, requires minimal water and added nutrients, and has a relatively high oil yield (see box "Opportunities and Constraints for Ethanol in Select African Countries").

Opportunities and Constraints for Ethanol in Select African Countries

Expanding global interest in ethanol raises the question of whether other countries could follow the success of the United States and Brazil in producing, marketing and consuming ethanol. With large land masses and many renewable resources, the potential for developing an ethanol industry in African nations is often discussed. But, barring political and social factors, what constraints and opportunities would such development face? In analyzing the potential for developing an ethanol industry in Africa, we should first look at one of the most important factors of production. Land is a fundamental input into production of any agricultural product. The three countries with the largest amount of arable land in Africa are Angola, the Democratic Republic of Congo (DR Congo), and Sudan. With more arable land than other African countries, Angola, DR Congo and Sudan are more likely to develop an ethanol industry than some of their arid neighbors. There are other countries in the region that could also potentially develop an ethanol industry, based on their feedstock production structure, but we will only be discussing Angola, DR Congo and Sudan for this article.

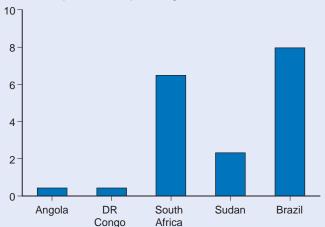
Potential Production Constraints: Issues at the Farm Level

The United States and Brazil have been investing in and supporting their successful ethanol industries for years. Those investments in crop science, genetic research, and agronomy have created productive farm sectors that efficiently use the large endowments of arable land in both countries. Government programs and subsidies helped to start the ethanol industries in both countries and continue to offer support to this day. Additionally, the large size of the U.S. and Brazil offers each country a variety of climates to help mitigate risk as well as crop-growing and processing variability for producers. These factors have encouraged the production of crops to provide ethanol feedstocks in the U.S. and Brazil (see figure). The most common crops grown for biofuels are corn, sugar, and soybeans.

By contrast, Angola, DR Congo, and Sudan have inefficient agricultural sectors that face many constraints. While these countries do have a large quantity of arable land relative to other African nations, the available arable land is not easily converted to productive, accessible farmland. DR Congo, for example, has 16.6 million acres of arable land, yet less than 2 percent of the roads in the country are paved (World Development Indicators, 2007). Furthermore, the agricultural sectors in Angola, DR Congo and Sudan are characterized by low productivity, low crop yields and a high degree of variability in crop quality. There has been little productivity gain in the agricultural sectors of these countries in

Agricultural sector efficiency

Value added per worker as percentage of U.S. indicators



Source: World Bank, World Development Indicators 2007.

recent decades due to limited investment in research and development. Thus, despite having more arable land than other African countries, the three countries lack the ability to consistently produce the quantity of feedstocks that an ethanol refinery demands.

For an ethanol industry to function well, there must be a large, constant supply of feedstocks. Angola, DR Congo, and Sudan have sizable arable land areas but they all have low crop yields. Angola's corn yield averaged 619 kilograms/ hectare from 2002-06 (United Nations Food and Agriculture Organization, FAOSTAT). In contrast, the average corn yield for one of Africa's more efficient agricultural producers, South Africa, was 3,118 kgs/hectare (United Nations Food and Agriculture Organization, FAOSTAT). The low, inconsistent yields have a variety of causes, one of which is lack of water. The vast majority of agricultural land in Angola, DR Congo, and Sudan is rain-fed, which means the land often suffers from lower yields and greater yield variability than irrigated agriculture would. Higher yields would require greater use of fertilizer, pesticides and herbicides that most African farmers can afford or have access to.

Processing Constraints: Issues at the Bio-refinery Level

Another big constraint facing a potential ethanol industry in Africa is the lack of infrastructure linking farms to biorefineries. The scarcity of paved roads is a major hurdle for most African countries to overcome. By contrast, the U.S. has a well developed highway system and a transport sector that is heavily invested in truck and rail infrastructure. A

Continued on page 15

Continued from page 14

large percentage of the cost of ethanol production is the cost of transporting the feedstock from the farm to the ethanol refinery, as well as transporting the liquid fuel to blending terminals. As these costs increase, ethanol quickly becomes cost-prohibitive.

Once the feedstock arrives at the ethanol refinery, the refining requires specific processing technology as well as water and other raw materials. The ethanol conversion process is very water-intensive; it takes roughly 4 gallons of water to produce 1 gallon of ethanol. Access and infrastructure for fresh water is quite limited in the three African countries, especially in rural areas where a bio-refinery would most logically be located. In Angola, only about half of the population has access to an improved water source. If the water resources were to exist, the construction and operation of a bio-refinery would be another obstacle. The raw materials, skilled workers, access to credit and advanced technologies required to build ethanol plants are costly and in short supply in less-developed countries. In the U.S. and Brazil, ethanol industry leaders have addressed these constraints and invested in cost-reducing strategies and technologies that could be cost-prohibitive in developing countries. The added cost of getting materials and knowledge to refineries in parts of the world with poor infrastructure could negate any potential profits.

All the constraints above can also be listed as part of the greatest challenge to developing a biofuels industry in Africa: the competing demand of food versus fuel. Angola, DR Congo, and Sudan are extremely poor countries, with significant shares of their populations struggling to meet even basic caloric and nutritional requirements. To divert food to fuel production is likely to prove difficult in the face of malnutrition, hunger, and rising food prices. The issues that hinder an ethanol industry at the farm level (low yields,

high yield variability, rain-fed agriculture, lack of infrastructure) also affect food production in these countries. Angola, DR Congo, and Sudan are unable to reliably produce enough food to feed their populations, let alone produce enough food to feed people and convert additional feedstocks into fuel.

But with increased interest and investment in Africa, some of those issues may be overcome. Africa's large supply of natural resources attracts foreign investment that often leads to improved infrastructure (roads, railways, etc.). This relationship between developed and developing countries could benefit an African ethanol industry in other ways as well. With research and development in plant genetics, crop breeding and conversion processes many of the high-cost, low-yield issues associated with ethanol feedstocks could be alleviated. With a large rural population that is dependent primarily on agriculture for income, an ethanol industry could be quite beneficial to Sub-Saharan Africa. Poverty in rural areas is greater than urban areas and has resulted in increased migration to cities, straining urban resources and social infrastructure.

Developing an industry that would provide income and employment opportunities for the rural population could help slow this migration to the cities. Crops such as sorghum and jatropha, which are more suited to African climates, require less water and can be grown on marginal soils, could play a larger role for developing countries' potential ethanol industries than they have in developed countries. Drought-resistant crops are currently being bred that could help meet Africa's food needs and possibly fuel needs as well. Continued agricultural research and development, by both the private and public sector, holds the greatest promise for an African biofuels industry.

The challenge is in creating a balance between food and fuel when allocating agricultural investment, land, and labor. The World Bank plans to increase investment in agriculture, and calls for boosting financial support for short-term needs by expanding and improving access to cash transfers and to risk-management instruments such as crop insurance to protect the poor. The United Nations is also asking the international community to increase its assistance both to reduce the short-term impact of higher food prices and to increase investment in the agricultural sector. It is not clear how these actions will affect the situation, but clearly those countries with stable governments are in a better position to take advantage of new initiatives and investment. But food insecurity in politically unstable countries is unlikely to change.

Asia

Asia, with more than 60 percent of the population of the 70 countries, accounted for less than half of the 982 million food-insecure people that ERS estimated for 2007 (table 4). Although in absolute value the number of foodinsecure people in Asia is projected to increase, the number of food-insecure people as a share of the total population of the 70 countries is projected to decline slightly through 2017. From 2007-17, just over 20 percent of this region's population will remain undernourished. After averaging 2 percent per year through the 1990s, Asia's population growth is projected to slow to about 1.4 percent per year through the next decade, thereby reducing pressure on resources. As these countries have further increased their share in the global trade, they have become increasingly dependent on the international economic environment, particularly the performance and policies of the major developed countries. The weakening of the U.S. economy poses a corresponding global risk that affects Asian countries. Any economic downturns for these countries will likely increase food insecurity because of persistent extreme poverty in much of Asia. A third of the region's population earns less than US\$1 per day.

Income growth among the Asian countries has been impressive during the last three decades, driven by growth in India, the most populous of the 70 study countries. While India's per capita income has grown more than 4 percent per year since 1990, the growth came with increased income inequality that negated some of that growth. Even so, food security in India has improved markedly. During 1970 to 2005, average per capita daily calorie consumption increased 19 percent, exceeding 2,400 calories in 2005. Composition of the country's diet also changed, leading to growing shares of vegetable oils, sugar, and processed grains, particularly bread. Indian households spend more than one-third of their income on food, meaning that rising food prices will likely have negative implications on household purchasing power and food security. Until now, however, food inflation in the country was the lowest in the region—about 5 percent from 2004-06. However, recent reports indicated price increases in the range of 10 to 25 percent for essential commodities such as vegetable oils in 2007 (World Perspectives, Daily Wire, March 25, 2008). To limit food inflation, the Indian Government has cut tariffs, such as that for palm oil, from 45 percent to 20 percent. Overall, USDA-ERS estimates that the lowest income quintile (20 percent of the population) was estimated to be food-insecure in 2007 and this is projected to remain the same through the next decade.

Afghanistan and North Korea are the most vulnerable countries in the region. Data remain weak for those countries, but based on available information (assuming no change in external assistance) consumption by all income groups are estimated to fall below the nutritional requirement by 2017. In Afghanistan, grain production increased 25 percent in 2007 from a below-average 2006 output, but the harsh 2007 winter has caused loss of livestock. The high prices for wheat, the main staple food, have adversely affected food security of the poor, particularly in the urban areas. An unstable political and security environment, limited resources, poor infrastructure, and population growth of more than 3 percent per year, are projected to contribute to declining per capita consumption over the next decade.

Table 4
Food availability and food gaps for Asia

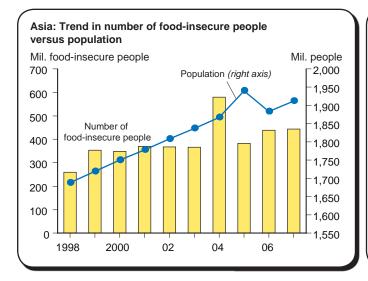
Year	Grain production	Root production (grain equiv.)	Commercial imports (grains)	Food aid receipts (grain equiv.)	Aggregate availability of all food
			1,000 tons	S	
1998	406,397	15,974	22,452	3,223	532,319
1999	426,873	18,495	25,569	4,259	551,332
2000	432,739	18,929	19,841	3,070	557,429
2001	435,437	19,325	17,321	4,209	559,654
2002	406,223	19,823	22,335	3,345	563,984
2003	446,529	20,244	21,467	2,379	578,501
2004	440,808	20,905	19,137	2,009	581,111
2005	462,399	21,547	19,805	2,449	593,849
2006	463,551	22,322	23,574	1,376	603,089
Project	ions			Food gap*	
				NR DG	
2007	475,892	22,207	18,862	1,717 18,675	608,228
2012	511,440	23,738	21,929	2,334 19,795	647,095
2017	553,441	25,356	23,378	2,866 21,110	689,913

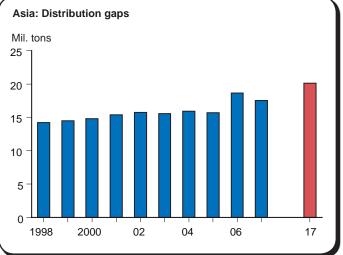
Asia (1.9 billion people in 2007)

Asia has experienced impressive income growth over the last 3 decades as well as strong improvements in food security. This growth is most visible in the rise of the middle class in India and China.

Asia also experienced severe price inflation in 2007-08. The price of rice, a dietary staple many, has more than doubled in some countries. Afghanistan, one of the most food-insecure countries in the region, has seen a threefold increase in the price of wheat, its main staple food.

^{*} See table 1.





	Percent of household	Percent of household final consumption expenditures:		Total annual household spending on:	
	Spent on food	Spent on alcohol and tobacco	Consumption	Food	
Percent		US\$			
India	33.4	2.3	447	143	
Philippines	38.7	1.9	942	345	
Vietnam	39.7	2.9	426	157	
Pakistan	45.2	2.4	634	257	
Indonesia	47.3	6.1	979	439	

Food shortages continue in North Korea. The estimated size of the distribution food gap for 2007 was 1.6 million tons, which is three times the level of the country's grain imports for 2006. The country has chronic food insecurity, but in 2007 it was hit even harder because of flooding. Most of the country's imports consist of food aid, which might decrease because of the higher costs of food prices and higher transportation costs associated with providing the aid. Drought, coupled with the collapse of the country's economy since the 1990s, has put this country in a chronic state of food shortages, with periodic famine that is estimated to have killed as many as 2 million people.

Bangladesh is another highly vulnerable country in Asia where only the top two income groups (40 percent of the population) were estimated to exceed the nutritional target in 2007. The decline in food production due to last year's cyclone intensified food insecurity and the increase in food prices exacerbated the situation. The average household spends more than half of its budget on food, and rising food inflation since 2002 has pressured consumers. The country has become more dependent on food imports, meaning higher global food prices will have additional financial pressure in 2008.

Since 1990, commercial grain imports increased in Bangladesh while food aid has declined. In 1990, the food aid share of grain imports was more than 90 percent, but in 2006 this share equaled only 8 percent. The strong growth in commercial food imports was supported by the export sector, which grew more than 10 percent annually and the 3-percent per year growth in per capita income since 1990. The food security situation in Bangladesh is projected to improve during the next decade, but given the current deep poverty, 40 percent of the population is projected to remain food-insecure by 2017. The amount of food needed to raise consumption in all income groups to the nutritional requirement is estimated at 1.8 million tons for 2007. This is equal to about half of the estimated commercial imports for the year. The food gap is projected to decline by half by 2017.

Not much change in Pakistan's food-security situation is projected during the next decade as food consumption of only the lowest 20 percent of the population is projected to fall below the nutritional target. Production of grains, which account for over half of the diet, depend on yield performance as area has virtually stagnated during the last decade. The recent food-price surge increased food inflation by 19 percent during 2004-06, higher than the 14-percent jump in 2002-04. The higher prices in 2007 and 2008 have reduced purchasing power of the poor further since more than 40 percent of the household budget is spent on food. However, to reduce the consumer food price pressure, the Government has imposed a 35-percent export duty on wheat and wheat product exports. It is not clear how effective this policy will be at easing the burden of consumers because other household costs, particularly heat and transportation costs, continue to reduce the purchasing power of the poor. On the positive side, since Pakistan is a major exporter of grains, the increase in prices has improved farm income during the last several years.

Vietnam and Indonesia have the highest per capita calorie intake in the region. Vietnam, a net grain-exporting country, has benefited from the higher food prices. The country's grain exports grew about 8 percent per year between 1990 and 2007. Overall export earning growth was even higher,

about 20 percent per year. The export sector has tremendous influence on economic growth and reduction in poverty because of its large share in the economy (79 percent in 2005). As a result of continued growth in production, slow population growth, and strong export revenues, per capita consumption is projected to exceed the nutritional target throughout the next decade.

Economic gains in Indonesia, an oil exporter, stem from the recent high levels of oil prices, whose growth has outstripped that of food prices. A current problem, however, is the accelerating inflation rate, particularly food inflation. Food prices grew by 26 percent during 2004-06 after rising only 6 percent during 2002-04. The average household spends about 27 percent of its budget on food. Although disaggregated data are not available, the share spent by the poor would likely be much higher. The lowest income quintile in Indonesia holds only about 8 percent of the country's total income. To reduce the impact of growing food prices, the Government removed the 5-percent and 10-percent duties on wheat and soybean imports in 2007.

Despite slow growth in grain production, per capita food consumption in Sri Lanka has improved because of the country's low population growth of less than 1 percent per year. A recent resurgence of civil conflict, however, has slowed economic activities, leading to increased vulnerability to food insecurity. Food-price increases of 27 percent occurred during 2004-06, and are projected to be even higher in 2007 and 2008. As a result, 20 percent of the Sri Lankan population is projected to fall short of the nutritional target through the next decade.

Food security in the Philippines is projected to remain stable, with food consumption of 20 percent of the population estimated to fall short of nutritional target from 2007-17. The country had a moderate food-inflation rate of 12 percent during 2004-06. But higher food prices in 2007 and 2008 are not expected to significantly change the country's food-security situation because high levels of money sent by Filipino workers in the Middle East to support their families back home are expected to support the growing costs of imports.

Latin America and the Caribbean

Food supplies in the LAC region increased during the last two decades, leading to improvements in food security. The role of food imports grew through time as domestic food production could not keep up with the growing food demand. The rate of production growth was slightly lower than the roughly 2-percent-per-year growth in population. By contrast, the region's grain imports grew more than 6 percent per year between 1980 and 2006. Income growth has been the main force behind the increase in consumption. In terms of nutritional availability at the national level, all countries, with the exception of Haiti, had adequate food for their populations in 2007. However, because of highly skewed income distribution, at least 20 percent of the population in all countries (except for Jamaica) did not have access to adequate food to meet nutritional targets. The most severely affected countries were Haiti, where 80 percent of the population was foodinsecure, the Dominican Republic, and Nicaragua, where 60 percent was food-insecure in 2007 (table 5).

Table 5
Food availability and food gaps for Latin America and the Caribbean

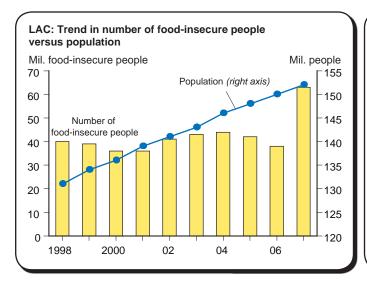
Year	Grain production	Root production (grain equiv.)	Commercial imports (grains)	Food recei (grain e	pts	Aggregate availability of all food
			1,000 tons	S		
1998	12,455	3,274	12,768	1,0	13	39,608
1999	13,977	3,599	12,208	1,1	78	40,722
2000	13,815	3,728	12,517	8	87	41,870
2001	14,944	3,679	13,533	1,0	67	42,872
2002	15,697	3,737	14,173	1,1	27	42,826
2003	16,622	3,384	14,281	4	91	42,687
2004	16,200	3,398	14,930	5	68	43,020
2005	16,924	3,501	14,965	6	38	44,012
2006	16,964	3,464	16,641	6	63	46,209
Project	ions			Food	gap*	
				NR	DG	
2007	16,901	3,558	13,661	334	2,348	42,166
2012	18,690	3,791	15,519	330	6,014	47,619
2017	19,959	4,036	16,770	349	1,983	52,412

Latin America and the Caribbean (LAC) (150 million people in 2007)

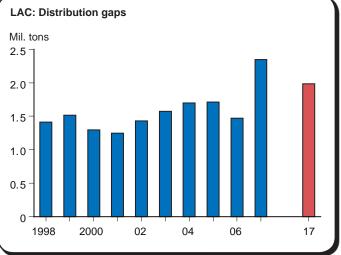
Many countries in the region have experienced food inflation. In Peru, Nicaragua, El Salvador, Honduras, and Haiti, the food share of the household budget is more than 30 percent. Food inflation from 2004-06 alone was 19 percent. Several governments in the region have introduced subsidies to help their poorest consumers.

Haiti, where 80 percent of the population is food-insecure, has experienced severe food inflation. This has led to riots and political instability.

^{*} See table 1.



Source: Euromonitor International; USDA, Economic Research Service calculations.



	Percent of household	Percent of household final consumption expenditures:		d spending on:
	Spent on food	Spent on alcohol and tobacco	Consumption	Food
	Percent		U\$\$	
Colombia	27.8	4.7	1,810	450
Ecuador	28.5	5.8	1,985	530
Bolivia	29.1	2.2	765	207
Peru	29.6	2.0	1,976	555

The distribution food gap for the region was estimated at 2.5 million tons for 2007, but during the next decade, this food gap is expected to decline as food supplies at the regional level are projected to increase. Guatemala and Haiti are the only countries in the region where this food gap is projected to rise as per capita consumption is not projected to rise. In Guatemala, 40 percent of the country will remain food-insecure in 2017 as import growth will not be sufficient to offset the very slow growth in grain production and the relatively high population growth, 2.5 percent per year. In Haiti, 80 percent of the population will continue to be food-insecure. The country relies on imports for roughly three-quarters of its grain supplies, but import capacity will remain constrained due to weak export earnings.

The projections are based on 5-percent annual export earnings growth, which will provide support for the ever-increasing food imports. In the lower income countries, such as Honduras, El Salvador, and Guatemala, staple food imports have grown significantly over time such that grain imports accounted for more than 50 percent of grain supplies during 2004-06. Such high growth in food-import dependency raises concerns about the continued ability of these countries to finance food imports and to adapt to price shocks. Commercial imports are estimated to have decreased 2 percent in 2007 in response to the 30-percent grain-price increase.

The higher food prices put pressure on budgets of the most vulnerable segments of these populations. In Peru, Nicaragua, El Salvador, Honduras, and Haiti, more than 30 percent of the household budget is spent on food. Food inflation in these countries began to accelerate in 2002, reaching 24 percent in 2004, and averaging 19 percent per year during 2004-06. To limit food inflation, these countries are adjusting their domestic policies. In Peru, tariffs on imports of wheat and corn and all grain flours, which ranged from 17 to 25 percent, have been removed. In Ecuador and Bolivia, bread subsidies have been introduced. Although these policies could potentially reduce budgetary pressure felt by households, in Latin America, poverty among the poorest segments of the population is deep and many people are experiencing food insecurity.

According to the United Nations' World Food Program, prices of staple foods such as wheat and corn have nearly doubled during the last year in Central America. The price of beans increased even more because of poor, weather-related growing conditions. The frequent annual weather-related shocks such as hurricanes and floods that hit Haiti, the Dominican Republic, Nicaragua, and Bolivia in 2007 added to the problem, causing loss of lives as well as serious damage to agricultural production that is the key source of livelihood for the poor.

Despite the abundance of natural resources in Latin America, poverty and food insecurity affect a large share of the population, particularly in rural areas. The underlying factor continues to be high income inequality. Although the region's per capita GDP is about five times that of Sub-Saharan Africa, poverty levels of countries like Bolivia, Honduras, Haiti, Guatemala, and Nicaragua, are comparable those in SSA. The lowest income quintile in the region's 11 countries held less than 4 percent of total income, while the highest quintile held 57 percent. In contrast, in the 11 Asian countries included in this study, the lowest group held 7.5 percent while the highest

group held 46 percent. In Haiti, the poorest country in the region, 56 percent of the population lives below the extreme poverty line of US\$1 per day and two-thirds do not have access to US\$2 per day.

Commonwealth of Independent States

Severe weather was the key factor that strongly influenced the food situation of the CIS countries in 2007. Weather-related problems not only caused energy shortages, but also reduced food production in all countries except Kazakhstan, the region's grain exporter. Consequently, the region, much like the rest of the world, was faced with soaring fuel and food prices. But in the CIS nations, the problem varied by country. In Georgia, Kyrgyzstan, and Turkmenistan, food consumption for the lowest income quintile fell below the nutritional target in 2007 (table 6). In Tajikistan, the region's most vulnerable country, an estimated 80 percent of the population fell below the nutritional target in 2007. The harsh winter weather in 2007 hit Tajikistan the hardest. While the country has the region's largest capacity to produce hydroelectric power, it must import electricity from Turkmenistan and Uzbekistan during the winter to meet demand. However, due to the severe cold last winter, electricity supplies from those countries were restricted. The energy shortage and the poor transportation system placed additional upward pressure on food prices. The Tajikistan Government plans to promote wheat production by replacing cotton acreage, but the policy will likely take time to implement due to resistance of farmers to switch to a new crop.

The food-price hike even hit Kazakhstan, the region's main wheat exporter. The Government introduced export tariffs on wheat to protect domestic supplies and curb food inflation. The Uzbekistan Government pressured private grocery-store owners to keep bread prices low despite rising wheat prices. As a result, many merchants closed their stores, thereby reducing supplies. In Turkmenistan, the Government is planning to increase wheat production, but higher production may not be the solution because consumers believe the quality of domestic wheat is inferior to imported wheat.

The long-term food situation of the CIS countries is expected to improve primarily because of the increase in food imports that is expected to be financed by continuing high export earnings (9 percent per year 2000-06), after passing through a difficult transition period. In terms of food security, every country, except Tajikistan, is projected to be food secure across all income groups by 2017. Per capita consumption in Tajikistan is projected to rise during the next 10 years, but in 2017, 20 percent of the population, or nearly 2 million people, will still fall below the target. The economic and political systems of the CIS countries remain weak and political obstacles could derail the projected progress. The change of government in Georgia in 2003 marked a new era for democratization and stability in that country. However, there are few signs of political and economic reform in other CIS countries. Unresolved economic issues include high unemployment, incomplete land and institutional reform, and unstable macro economic environment and high inflation.

Table 6 Food availability and food gaps for Commonwealth of Independent States

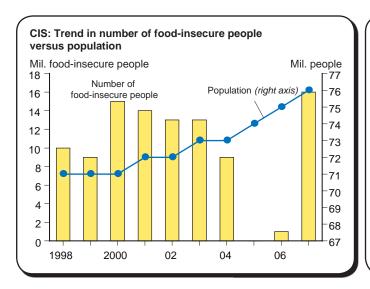
Year	Grain production	Root production (grain equiv.)	Commercial imports (grains)	Food recei (grain e	ipts	Aggregate availability of all food
			1,000 tons	S		
1998	15,718	990	3,212	4	81	22,017
1999	24,346	932	2,540	3	53	22,435
2000	21,434	653	3,330	3	60	22,255
2001	27,050	819	2,808	5	21	22,815
2002	29,202	842	2,957	5	16	21,985
2003	29,357	1,142	2,925	2	72	21,759
2004	27,150	1,297	3,209	3	01	22,241
2005	29,171	1,269	4,746	2	82	25,704
2006	31,503	1,219	5,051	3	48	26,172
Project	ions			Food	l gap*	
				NR	DG	
2007	32,065	2,144	3,973	0	258	25,387
2012	30,986	2,303	4,331	0	8	25,017
2017	32,685	2,473	4,501	0	19	26,636

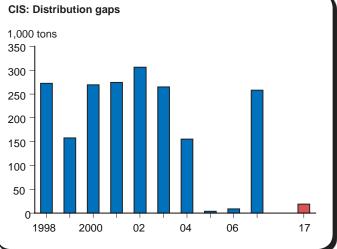
Commonwealth of Independent States (CIS) (75 million people in 2007)

In Georgia, Kyrgyzstan, and Turkmenistan, food consumption for the lowest income quintile fell below the nutritional target in 2007. In Tajikistan, the region's most vulnerable country, an estimated 80 percent of the population fell below the nutritional target in 2007.

In terms of food security, every CIS country, except Tajikistan, is projected to be food secure across all income groups by 2017. It is important to note that economic and political systems of the CIS countries remain weak and political obstacles could derail projected progress.







	Percent of household	d final consumption expenditures:	Total annual household	spending on:
	Spent on food	Spent on food Spent on alcohol and tobacco		Food
	Percent		US\$	
Kazakhstan	36.6	3.5	2,341	813
Turkmenistan	32.7	2.7	2,393	739
Azerbaijan	51.6	2.4	766	374

Role of Food Aid

Food aid is the major international safety net for countries facing food-supply shortfalls, but global food-aid donations have been trending downward during the last decade. In the late 1990s, global food-aid deliveries averaged over 10 million tons (in grain equivalent) per year. In 2004-06, this average fell more than 25 percent to roughly 7.4 million tons. In addition to this decline, the regions receiving food aid deliveries have changed. In the late 1990s and early 2000s, Asia received the most food aid, at 30 to 40 percent of the global total. However, in more recent years, that share has averaged around 25 percent. North Korea and Bangladesh have been the two largest recipients in Asia during the last decade. Central Europe and the CIS countries have also experienced a declining share of food aid. In the late 1990s, these countries were in a transition period from their centrally planned economies to market-based economies and they received food aid in order to stabilize markets. More recently, deliveries to this region fell off considerably. In 2004-06, they held a 5-percent share of global food aid donations.

Sub-Saharan Africa, the most vulnerable region for food insecurity, has seen an increase in food aid. In the late 1990s, SSA accounted for less than a third of the global total. More recently, this share has jumped to well over 50 percent. The increase is a reflection of the region's continuing struggles with production variability caused by weather fluctuations and political strife as well as the ongoing difficulties of having a relatively limited financial capacity to import food to offset production shortfalls. The region's largest food aid recipient by far has been Ethiopia, often receiving more than 1 million tons per year. The region's other major recipients are Sudan, Eritrea, and Mozambique.

The United States has consistently been the world's largest food aid donor, generally accounting for about half of the global total. There have even been years in the last decade when the U.S. share exceeded 60 percent. The European Union (EU-27) is the second-largest donor, with a share ranging around 20-25 percent. The next largest donor is Japan, with a global foodaid share of around 5 percent. One donor whose food-aid donations have increased markedly during the last decade is South Korea. In the late 1990s, its share averaged less than 1 percent. In more recent years, as its donations increased and global donations fell, South Korea's share jumped to more than 5 percent. Donor nations Canada, China, and Australia have each provided food aid in the range of 2-4 percent annually.

The big issues currently confronting the global donor community are rising commodity prices and higher transportation costs, which reduce the quantity of food aid that can be purchased and shipped to vulnerable countries, because donor countries have tended to maintain constant food aid budgets. This is happening at the same time needs are likely to rise as higher prices are creating a tremendous financial burden for many vulnerable countries. Grain prices have increased roughly 40 percent since the fall of 2007 to March 2008. According to the UN Food and Agriculture Organization, the cereal import bill of low-income, food deficit countries has more than doubled in the last 5 years. Just within the last year, this bill is estimated to have jumped 35 percent.

As a result of higher food prices and transportation costs, the amount of food aid provided by the United States has declined roughly 50 percent in the last 5 years. The U.S. Agency for International Development (administrator of the largest part of the U.S. food aid program) has indicated that it will have to cut back on the number of recipient countries and the quantity of its food aid for 2008. As a result, the agency will focus its food aid on emergency needs—cases where countries are facing humanitarian crises, generally due to production shortfalls stemming from natural disasters or civil strife. The principal factor behind this cutback and reprioritization is rising commodity costs, which have taken up a larger share of the food-aid program budget, leaving fewer resources for the aid itself.

The reductions in donations by the United States will certainly have an adverse effect on the United Nations World Food Program (WFP), the largest provider of food aid. The United States provides nearly half of WFP supplies. WFP budgeted nearly \$3 billion this year for operations in 78 countries. However, given record wheat and corn prices, as well as higher transportation costs, the organization needs an additional \$755 million to fulfill its commitments. The 6.7 million tons of food aid delivered in 2006 was the smallest amount in 35 years. Food aid allocations are principally based on donors' cash donations, which have not risen commensurately with costs. Therefore, higher grain prices are reducing the quantities that can be purchased for delivery. In response to the current crisis, Britain's Prime Minister Gordon Brown pledged \$60 million in emergency aid in April 2008 to the WFP to assist in feeding the poor in Africa and Asia. Also in April, the government of Japan decided to provide about \$100 million of food aid from May through July as an emergency measure. About one-half of this aid will be provided to countries in Africa in May through the WFP. Japan has already contributed about \$68 million to the WFP this year. President Bush has responded to this crisis by ordering the release of \$200 million in emergency aid from the Bill Emerson Humanitarian Trust to offset food shortages in vulnerable countries. In early May, the President followed this announcement with a request for Congress to approve \$770 million to support U.S. food aid and development programs.

If commodity prices remain at current high levels, quantities of food aid will not increase measurably from current low levels without significant additional donor funding. This stagnation could have adverse implications for the world's poorest populations, many of whom already fall short of a nutritionally adequate diet. One answer to this problem could lie in local purchases, wherein the donor purchases the food to be provided from the developing countries, thereby reducing operating costs. The World Food Program is engaging in this activity more and more. In 2002, only 11 percent of its food aid was purchased in this manner. By 2006, however, this accounted for more than a third of its total. President Bush has proposed that the United States use up to 25 percent of the food aid budget to purchase food from producers in local countries rather than purchase it in the United States and then pay to ship it. As of May 2008, there has not been a final decision on this proposal.

Currently, nearly all food aid donated by the United States is procured in the U.S. and shipped by U.S.-flagged ships. The rising freight costs are accounting for an increasingly large share of the U.S. food aid budget. The United States is one of the few donors that operate this way. Many donors provide cash to the WFP or to nongovernmental organizations so that the WFP and organizations can then purchase food on the world or local market.

Conclusions

The food-security indicators estimated for the study countries paint a bleak picture of not only the current situation, but also the intensifying of the problem over the next decade, assuming no significant changes in trends in production and financial situation of countries. Recent World Bank statements have been consistent with these findings and have indicated that high food prices are threatening recent gains in overcoming poverty and malnutrition and are likely to persist over the medium term. World Bank President Robert B. Zoellick, in the opening press briefing at the World Bank/International Monetary Fund meetings addressed the challenges ahead: "This is not just about meals foregone today or about increasing social unrest. This is about lost learning potential for children and adults in the future, stunted intellectual and physical growth. Even more, we estimate that the effect of this food crisis on poverty reduction worldwide is in the order of seven lost years. So we need to address this not just as an immediate emergency but also in the medium term for development." (Washington, DC, April 10, 2008)

The situation in SSA is of major concern because of the deep poverty and food insecurity that existed prior to the food and fuel price hikes, particularly in countries that are struggling with political instability. According to FAO, the cereal import bill for low-income, food-deficit countries in Africa is estimated to increase by 74 percent 2007-08. This is happening at the same time these countries are facing a trade deficit. The IMF projects a slow-down in export earnings in SSA because of weak global growth, particularly in the United States and, to a lesser extent, in Europe (IMF, April 2008). Inflationary pressure is compounding the problem by raising production costs as well as reducing consumer purchasing power.

Official development assistance (ODA) plays a critical role in reducing the financial pressure on poor countries. ODA, excluding debt relief, rose only 2.4 percent in 2007. The aid to SSA increased by 10 percent in 2007, but remains far short of the 2005 donor commitment to double aid to Africa by 2010. Food aid, the major international safety net for these countries, has been trending downward during the last decade and its future path is not clear. Since food aid allocations are based on donors' cash donations, the higher grain prices mean a reduction in quantities unless major steps are taken to increase the budget to purchase grains and other commodity staples for delivery to food-insecure countries.

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