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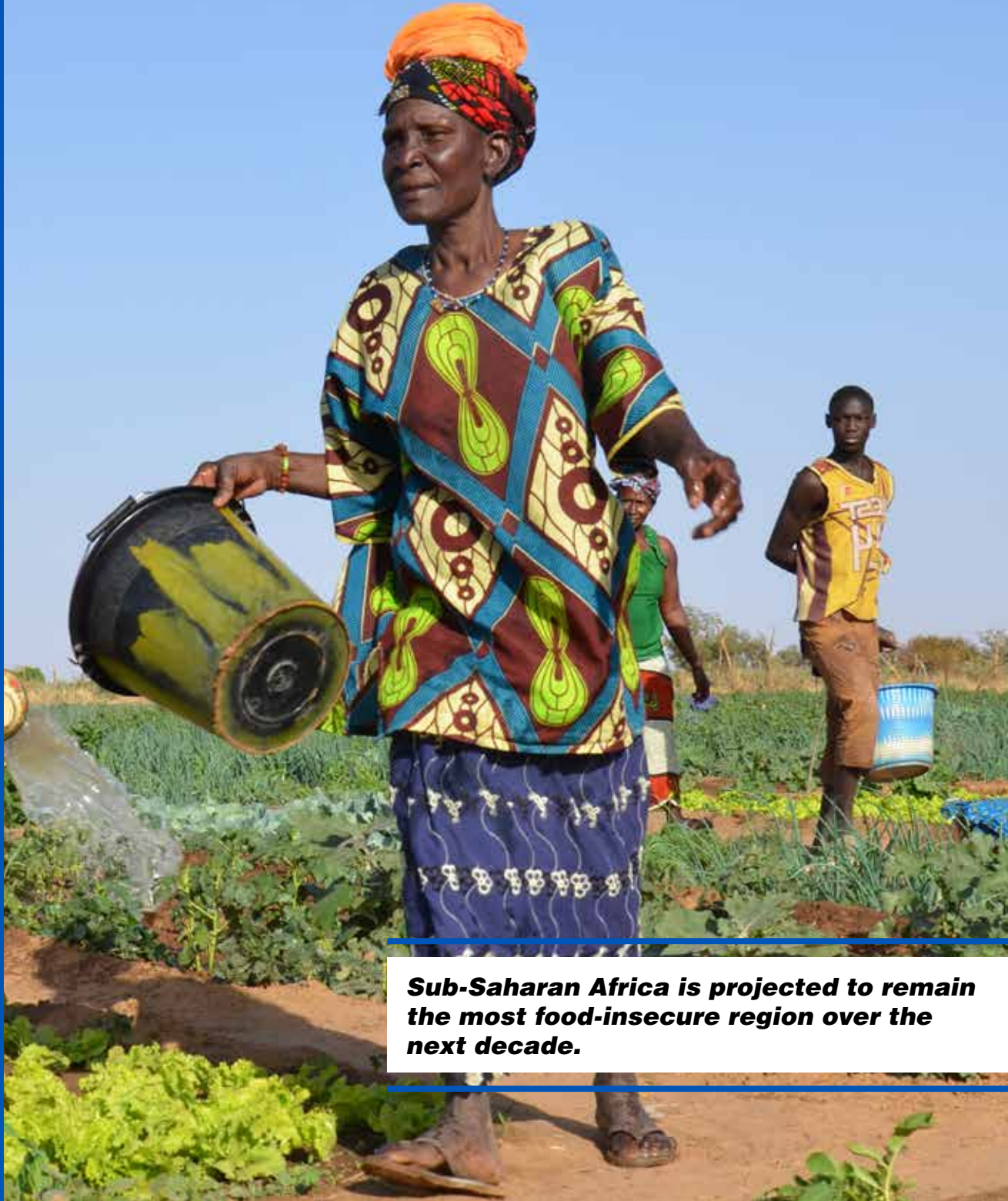
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GFA 24

June 2013

International Food Security Assessment, 2013-2023



Sub-Saharan Africa is projected to remain the most food-insecure region over the next decade.



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Recommended citation format for this publication:

Meade, Birgit, and Stacey Rosen. *International Food Security Assessment, 2013-2023*, GFA-24, U.S. Department of Agriculture, Economic Research Service, June 2013.

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GFA-24

June 2013

International Food Security Assessment, 2013-2023

Birgit Meade, bmeade@ers.usda.gov

Stacey Rosen, slrosen@ers.usda.gov

Abstract

Food insecurity in the 76 countries included in this report (low- and middle-income countries as classified by the World Bank that are or have been receiving food aid and are experiencing or have experienced food insecurity) is expected to remain virtually unchanged, but with some distributional changes, between 2012 and 2013. The total number of food-insecure people is estimated at 707 million in 2013, up 3 million from 2012. Over the longer term, the food security situation is projected to deteriorate. Food-insecure people are defined as those consuming less than the nutritional target of roughly 2,100 calories per day per person. By 2023, the number of food-insecure people is projected to increase nearly 23 percent to 868 million, slightly faster than population growth. As a result, the share of the population that is food insecure is projected to increase from 20.4 percent to 21.5 percent. The distribution gap—the amount of additional food needed to bring people in all income deciles up to the nutritional target—is projected to increase 28 percent by 2023, meaning that food insecurity in these countries is expected to intensify over the next 10 years. Despite improvements over the years, Sub-Saharan Africa is projected to remain the most food-insecure region in the world.

Keywords: Food security, production, area, yield, commercial imports, export earnings, food aid, calories, commodity food prices, consumption, diet composition, protein, fat, sugar, Sub-Saharan Africa, North Africa, Asia, Latin America and the Caribbean

Acknowledgments

Appreciation is extended to Maurice Landes, Deputy Director for Outlook, MTED, Economic Research Service (ERS); Cheryl Christensen, Branch Chief, Food Security and Development Branch (MTED), ERS; Barry Krissoff, Acting Branch Chief, International Demand and Trade Branch, MTED, ERS for valuable comments. We would also like

to thank the reviewers for their feedback, especially John Dyck and Ronald Trostle, MTED, ERS; Jason Hafemeister, USDA's Office of the Chief Economist; David Stallings, USDA's World Agricultural Outlook Board; Hui Jiang of USDA's Foreign Agricultural Service; and Keith Wiebe of the UN's Food and Agriculture Organization. Special thanks are extended to Dale Simms for editorial assistance, David Marquardt for map design, Wynnice Pointer-Napper for layout design and Victor B. Phillips, Jr. for cover design.

Preface

This report continues the series of food assessments in developing countries begun in the late 1970s by USDA's Economic Research Service. *Global Food Assessments* were done from 1990 to 1992, hence the GFA series. In 1993, the title was changed to *Food Aid Needs Assessment* to more accurately reflect the contents of the report, which focuses on selected developing countries with recent or ongoing food deficits. In 1997, we widened our analysis beyond the assessment of aggregate food availability to include more aspects of food security. We therefore changed the title to Food Security Assessment. Starting with the report published in July 2011, we changed the name to *International Food Security Assessment* to clarify that this is not an assessment of U.S. food security.

Errata

On July 3, 2013, the second sentence in the text box on page 27 was corrected to say that the food-insecure share of the Asia region's population is projected to remain under 18 percent. The third sentence was corrected to say that the most food-insecure countries in the region are Afghanistan, North Korea, and Yemen.

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International Food Security Assessment, 2013-2023

Birgit Meade and Stacey Rosen

What Is the Issue?

Although significant gains have been made in improving diets in low- and middle-income countries over the last 10 years, government policymakers, international development organizations, and other stakeholders remain concerned about international food security. The volatility in global food prices since the late 2000s has heightened this concern. This report provides a quantitative assessment of the short-term (2013) and longer term (2023) food security status for 76 low- and middle-income countries to help support decisions on the allocation of food and development assistance. Food security is influenced by a number of factors, including those that determine food availability—domestic food production and the capacity to import food—as well as determinants of food access, including the distribution of food among various segments of the population. A consistent methodology and the most current available data are used to estimate food production, import capacity, and distribution in each country, and provide estimates and projections of food gaps that are comparable across countries.

What Did the Study Find?

Between 2012 and 2013, ERS estimates of food insecurity for the 76 countries analyzed remain virtually unchanged, but with some changes in the distribution of food gaps across countries. The number of food-insecure people is estimated to increase from 704 million in 2012 to 707 million in 2013. The share of the population that is food insecure in these countries is expected to decrease from about 21 percent in 2012 to 20 percent in 2013. The number of food-insecure people in *Sub-Saharan Africa* (SSA) is estimated to increase by less than 2 percent and the distribution gap (the quantity of food required to reach the nutritional target of roughly 2,100 calories/day for each income decile) to fall by more than 4 percent. The share of the region's population that is food insecure is expected to remain just under 30 percent. *Asian* countries are expected to see a small increase in the number of food-insecure people from 2012 to 2013, but a near 21-percent increase in the distribution gap. Afghanistan and Yemen are projected to experience an increase in the number of food-insecure people in 2013 as well as a widening of the distribution gap, counteracting reductions in the number of food-insecure people in Bangladesh and Sri Lanka. In India, lower production and continued problems in improving food access for lower income groups increase the estimated size of the food distribution gap for 2013, while the number of food-insecure people remains roughly unchanged. The share of the region's population that is food insecure is estimated to remain just under 18 percent in 2013.

ERS is a primary source of economic research and analysis from the U.S. Department of Agriculture, providing timely information on economic and policy issues related to agriculture, food, the environment, and rural America.

The food security situation is expected to improve in the *Latin America and Caribbean* (LAC) region as the estimated share of population that is food insecure declines from 32.6 percent in 2012 to 30.7 percent in 2013. The countries in the *North African* (NA) region are expected to remain food secure.

Over the next decade, the number of food-insecure people for the 76 countries is projected to increase by nearly 23 percent (or 161 million), while the share of the population that is food insecure increases from 20.4 percent in 2013 to 21.5 percent in 2023. The distribution gap is, however, projected to increase 28 percent, faster than the number of food-insecure people, indicating a growing intensity of food insecurity. SSA is the only region projected to have a sizable increase in the number of food-insecure people; the share of the population that is food insecure is projected to rise from 29.4 percent in 2013 to 33.8 percent in 2023. Food insecurity is projected to worsen significantly in Chad, Malawi, and Uganda, while Central African Republic, DR Congo, Burundi, Eritrea, Somalia, and Zambia are projected to remain the most food-insecure countries in the region—in most cases because domestic production is not projected to keep pace with population.

After North Africa, the Asian region is projected to be the most food secure; the share of population that is food insecure in these countries is projected to remain virtually unchanged at about 17.5 percent in 2023. Afghanistan, North Korea, and Yemen are projected to remain the most food-insecure countries in Asia, while the share of the population that is food insecure in India—by far the largest country studied in this region—remains at about 20 percent.

The greatest long-term improvement in food security is projected for the LAC region. The number of food-insecure people is projected to decline by nearly 7 percent from 2013 to 2023; as a result, the share of population that is food insecure is projected to fall from nearly 31 percent to just over 25 percent. The projected distribution gap decreases at an even faster rate, 25 percent, indicating an easing in food insecurity. Improvements in food security are projected in Peru, Colombia, El Salvador, and Jamaica, but large shares of the population are projected to remain food insecure in Haiti and Guatemala.

The projections of food security status are based on current USDA projections for world commodity prices. As such, the projections are sensitive to alternative price assumptions that influence a country's capacity to import food. With prices 10 percent lower than the base assumptions, the 76-country totals for both the number of food-insecure people and the food distribution gap are projected about 4 percent lower in 2023. With prices 10 percent higher, the projected number of food-insecure people is about 3 percent higher and the distribution gap about 4 percent higher.

How Was the Study Conducted?

The International Food Security Assessment model used in this report projects food consumption, food access, and food gaps in low-and middle-income countries through 2023. Food security of a country is evaluated based on the gap between projected domestic food consumption (domestic production plus imports minus nonfood uses) and a consumption target.

All historical and projected data are updated relative to the *International Food Security Assessment, 2012-22* report. Grain production estimates for 2012 are based on data from the United Nations' Food and Agriculture Organization (FAO) as of March 2013. Historical production data are from FAO and food aid data from the World Food Programme. Financial and macroeconomic data are based on World Bank data as of March 2013. Projected macroeconomic variables are either based on calculated growth rates for the 1990s through 2011 or are taken from International Monetary Fund (IMF) and World Bank projections. Projections of food availability include food aid, with the assumption that each country will receive the 2009-11 average level of food aid throughout the next decade.

Overview

Food insecurity in the 76 countries included in this study is estimated to remain virtually unchanged between 2012 and 2013, but with some distributional changes. The total number of food-insecure people is estimated at 707 million in 2013, up 3 million from 2012. The share of the population that is food insecure in these 76 countries is expected to decrease from about 21 percent in 2012 to about 20 percent in 2013. The distribution gap (the quantity of food needed to raise consumption in each income decile to the nutritional target of roughly 2,100 calories per capita per day) is also estimated to be virtually unchanged, rising from 15 million tons in 2012 to about 15.4 million tons in 2013. Across regions, the number of food-insecure people in Sub-Saharan Africa (SSA) and Asia is expected to increase slightly between 2012 and 2013 while the number of food-insecure people in the Latin America and Caribbean (LAC) region is estimated to fall 4 percent. North Africa continues to be the most food-secure region included in this study, with less than 10 percent of the population facing food insecurity.

Sub-Saharan Africa Continues To Account for the Largest Food Gaps and Asia the Most Food-Insecure People

The number of food-insecure people in Sub-Saharan Africa (SSA) is estimated to increase slightly from 249 million in 2012 to 254 million in 2013. At the same time, the region's distribution food gap is expected to fall more than 4 percent, indicating a small reduction in the intensity of food insecurity. The share of the region's population that is food insecure is estimated to remain just under 30 percent. There is, however, wide variation in the degree of food security in this region. There are 21 countries, mostly in West Africa, where 20 percent or less of the population is expected to be food insecure. Conversely, in 9 countries, 70 percent or more of the population is estimated to be food insecure, including the Central African Republic (CAR), the Democratic Republic of Congo, Burundi, Eritrea, Somalia, Lesotho, Zambia, Zimbabwe, and Liberia.

The 39 SSA countries included in this study account for about 25 percent of the population of the 76 countries covered, but have 36 percent of the total population estimated to be food insecure in all of the studied countries in 2013. The SSA region accounts for about 60 percent of the total 76-country food distribution gap estimated for 2013, reflecting problems with food access in lower income deciles and the depth of food insecurity in the region. The SSA region has among the lowest per capita food consumption levels in the world.

The 22 countries in the Asian region account for nearly two-thirds of the population of the 76 countries covered in this study. The number of food-insecure people in the Asian region is estimated to remain almost unchanged—increasing by 1 million to 403 million in 2013, accounting for about 57 percent of the total food insecure population in the 76 countries studied. The share of the Asian region's population that is food insecure is expected to remain just under 18 percent. Although the region's share of the overall food-insecure population is high, the intensity of food insecurity in the region is estimated to be low relative to other regions in the study (except for North Africa, which has no food gaps). Asia's share of the overall food distribution gap—at 33 percent—is significantly smaller than its population share, indicating that while the per capita consumption of a large share of the population falls below the nutritional target, it does not fall considerably below the target.

Nevertheless, there is significant variation in food security in the Asian region. Two countries—Afghanistan and Yemen—face particularly severe food insecurity in 2013. In Afghanistan, a forecast

How Food Security Is Assessed: Methods and Definitions

Food security is defined as allowing individuals to reach a nutritional target of 2,100 calories per capita per day. Commodities covered in this report include grains, root crops, and “other,” where the latter represents the remainder of the diet. These three groups are referred to as **food** and account for 100 percent of all calories consumed in the study countries. They are expressed in grain equivalent and 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).

The International Food Security Assessment model used in this report is based on 2012 data (updated in March 2013), and therefore does not reflect any subsequent changes that may have transpired related to the food security of these countries. This annual update includes revisions of historical data, as sometimes new information leads to changes in historical data series. Updates can therefore change food security estimates for past years. The 2012 estimates are based on FAO production and import assessments. The longer term projections—2013 through 2023—are run off a base of 2010-12 grain production and 2009-11 root and tuber production data from FAOSTAT and 2009-11 macroeconomic data from the IMF and World Bank, as well as grain price projections from the USDA Agricultural Baseline Projections. The periods covered therefore include 2012 (estimate) and 2013-23 (10-year projection).

Food consumption and food access are projected for 76 low- and middle- income developing countries—39 in Sub-Saharan Africa, 4 in North Africa, 11 in Latin America and the Caribbean, and 22 in Asia. (See Appendix—Food Security Model: Definition and Methodology for a detailed description of the methodology and definitions of terms and appendix table 1 for a list of countries.) The model analyzes the gap between projected food availability (production plus commercial and food aid imports minus nonfood use) and two alternative consumption standards. The nutritional standard is the per capita nutritional requirements (NR) of roughly 2,100 calories per capita per day, depending on the region. The average **nutrition gap** measures the gap between available food and food needed to support a per capita nutritional standard.

The estimated **distribution gap** measures the food needed to raise consumption in each income decile to the nutritional requirement. In many countries, consumption in the lower income deciles is significantly below average (per capita) consumption for the country as a whole. In these countries, the distribution gap provides a measure of the intensity of hunger—the extent to which the food security of already hungry people deteriorates as a result of income or economic conditions. It also provides a measure of the access dimension of food security—the extent to which lower income groups lack purchasing power to obtain food. When our estimates show no distribution gap for the poorest 10 percent of the population, however, we consider the country food secure despite the fact that food insecurity may exist (but only for less than 10 percent of the population). Similarly, when our estimates show a distribution gap for all deciles, we consider 100 percent of the population to be food insecure despite the fact that up to 10 percent of the population may be food secure. Finally, based on total population data and the population share that consumes below nutritional requirements, the projected number of people who cannot meet their nutritional requirements is calculated.

The common terms used in this report:

- **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, and exports;
- **Import dependency**—the ratio of food imports to food supply;
- **Food consumption**—equal to food availability;
- **Food-insecure**—occurs when per capita food consumption for a country or income decile falls short of the nutritional target of 2,100 calories per person per day.

decline in grain output in 2013, combined with the country's relatively high population growth, is estimated to increase the food-insecure population by 33 percent and the distribution gap by more than 145 percent. In Yemen, an estimated 9-percent increase in grain import prices is expected to lead to a contraction in the quantity of grain imported. This, coupled with rapid population growth, is estimated to nearly double the number of food-insecure people and more than triple the food distribution gap (see Asia chapter for more details on Afghanistan and Yemen). With these two countries included, the 2013 food distribution gap for the Asian region is estimated to rise nearly 21 percent, indicating that food insecurity in the region will deepen, rather than spread. Omitting these countries, the 2013 food distribution gap increases by 15.8 percent.

Table 1

Estimates and projections of food-insecure people

	Region				
	Total	Asia	LAC	NA	SSA
	<i>Million</i>				
2012	704	402	52	0	249
2013	707	403	50	0	254
2023	868	448	47	0	373

LAC = Latin America and the Caribbean, NA = North Africa, SSA = Sub-Saharan Africa.

Source: USDA, Economic Research Service.

Table 2a

Estimates and projections of food distribution gaps

	Region				
	Total	Asia	LAC	NA	SSA
	<i>Million tons</i>				
2012	15.0	4.2	1.2	0	9.7
2013	15.4	5.0	1.1	0	9.2
2023	19.7	5.4	0.8	0	13.4

LAC = Latin America and the Caribbean, NA = North Africa, SSA = Sub-Saharan Africa.

Source: USDA, Economic Research Service.

Table 2b

Estimates and projections of food distribution gaps, per capita

	Region				
	Total	Asia	LAC	NA	SSA
	<i>Kg per capita per year</i>				
2012	4.4	1.9	7.4	0	11.5
2013	4.4	2.2	6.7	0	10.7
2023	4.9	2.1	4.4	0	12.2

LAC = Latin America and the Caribbean, NA = North Africa, SSA = Sub-Saharan Africa.

Source: USDA, Economic Research Service.

Table 3

Food availability and distribution gaps for 76 countries

Year	Grain production*	Root production (grain equiv.)	Commercial imports	Food aid receipts (grain equivalent)	Aggregate availability of all food	
			1,000 tons			
2004	498,311	83,600	75,313	7,482	793,350	
2005	514,828	87,659	84,974	9,003	828,617	
2006	529,389	92,095	95,403	7,386	858,658	
2007	547,729	90,192	96,862	6,246	880,593	
2008	570,792	97,494	102,948	6,719	897,384	
2009	580,460	95,649	101,356	6,255	911,091	
2010	606,695	103,257	108,809	6,174	932,099	
2011	621,305	109,874	119,141	4,004	950,259	
2012(e)	639,292	106,007	112,876	5,478	978,320	
Projections				Food gap**		
				NG	DG	
2013	634,986	107,365	113,892	8,004	15,363	991,754
2018	687,272	114,357	141,312	8,211	17,574	1,069,200
2023	742,284	121,704	159,933	9,914	19,667	1,143,269

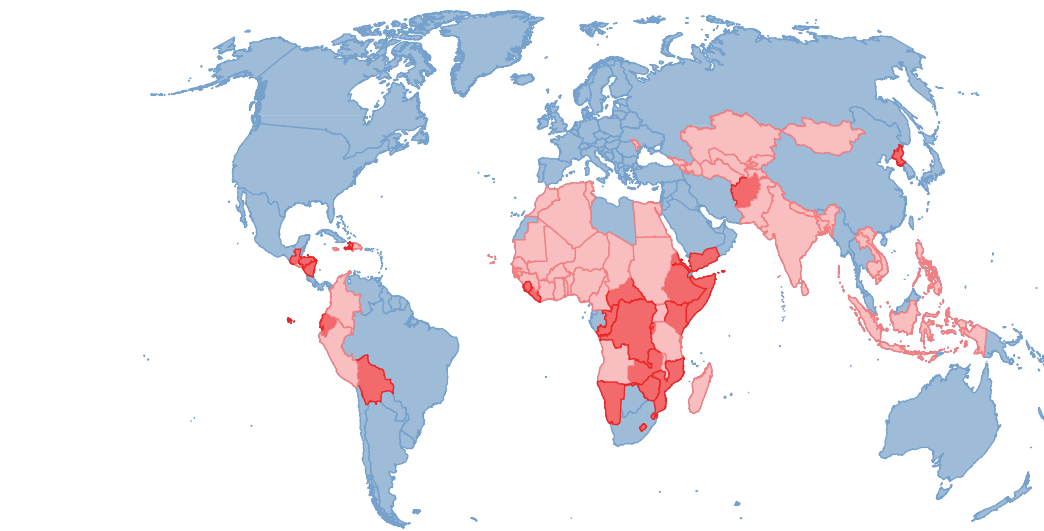
(e) estimate.

*Grain production includes rice expressed in milled-rice equivalent.

**NG stands for nutritional gap and describes the amount of grain equivalent needed to support nutritional standards on a national average level. DG stands for distribution gap, and it describes the amount of grain equivalent needed to allow each income quintile to reach the nutritional target.

Sources: USDA, Economic Research Service, using data from FAOSTAT, UN Food and Agriculture Organization, and World Food Programme, Rome.

Figure 1

In 26 (out of 76) developing countries, 40 percent or more of the population is estimated to be food insecure

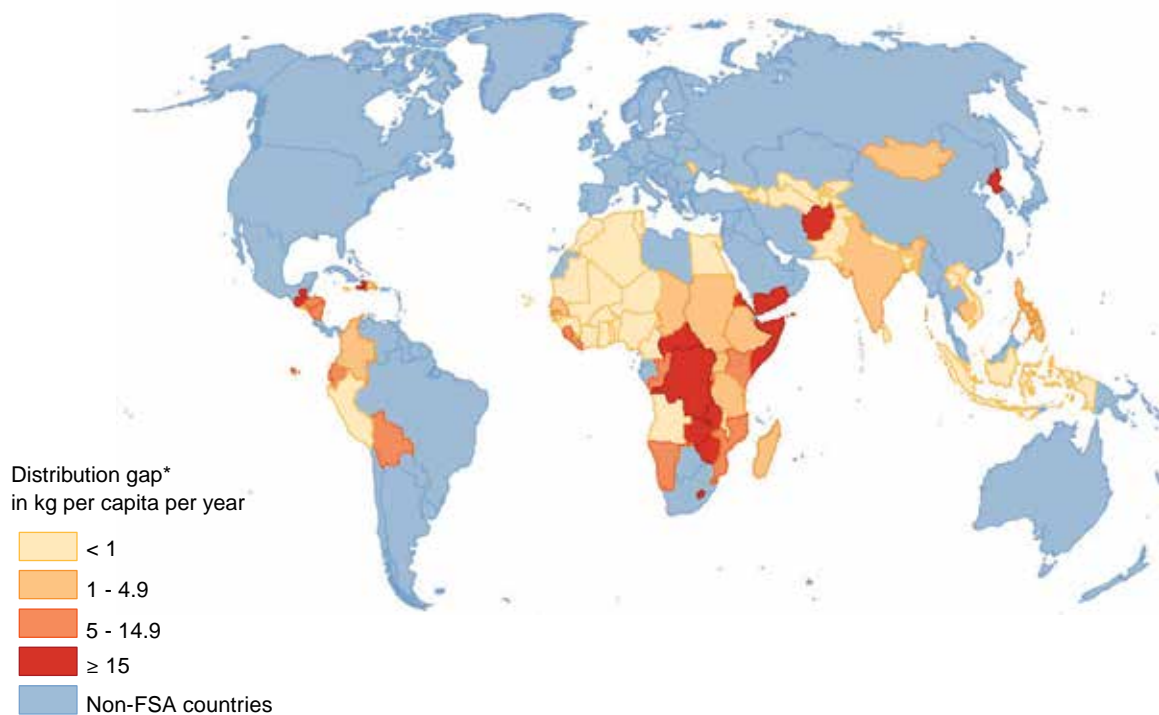
- Study countries with < 40% of the population food insecure
- Study countries with ≥ 40% of the population food insecure
- Non-FSA countries

FSA = Food Security Assessment

Source: Calculations by USDA, Economic Research Service.

Figure 2

Intensity of food insecurity in study countries, 2013



*The distribution gap is defined as the amount of additional food needed to bring people in all income deciles up to the daily nutritional target of roughly 2,100 calories per person. FSA = Food Security Assessment. Source: Calculations by USDA, Economic Research Service.

The number of food-insecure people in the Latin America and Caribbean (LAC) countries included in this report is estimated to fall between 2012 and 2013, decreasing from 52 to 50 million. The region is forecast to have a slight decrease in its food distribution gap, indicating a decline in the intensity of food insecurity in the region. The share of the region's population that is food insecure is expected to fall from 33 to 31 percent. Haiti remains the poorest and most food-insecure country in the region, with 90 percent of the population estimated to fall short of the nutritional target in 2013.

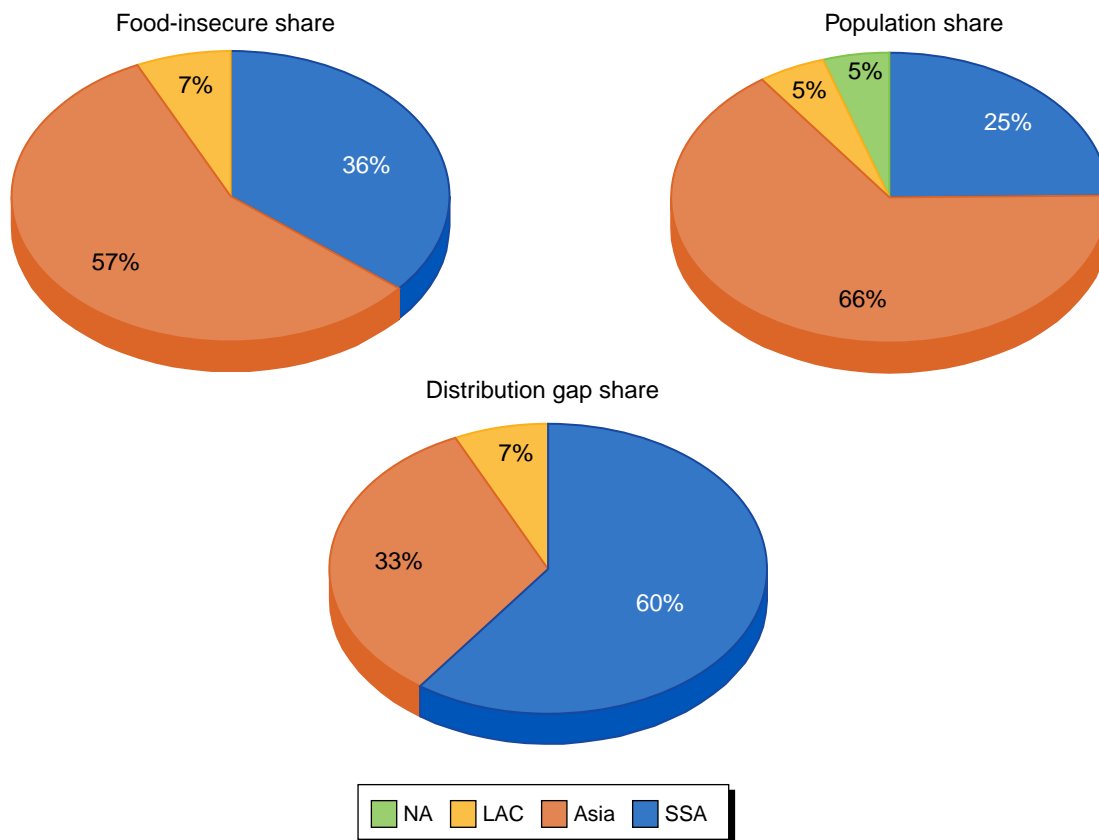
Food Insecurity Projected To Rise in the Longer Term

The food security situation for these 76 countries, at the aggregate level, is projected to deteriorate over the next decade. The number of food-insecure people is projected to rise to 868 million, faster than projected population growth of 16 percent, raising the share of the population in the study countries that is projected to be food insecure from 20.4 percent to 21.5 percent. The food distribution gap is projected to increase 28 percent by 2023, indicating some increase in the intensity of food insecurity across these countries over the next 10 years.

Most of the projected deterioration in food security occurs in SSA, which is the only region projected to have an increase in the number of food-insecure people that is larger than the increase in its population over the next decade. The SSA food-insecure population is projected to rise from about 254 million in 2013 to 373 million in 2023, and the share of the population that is food insecure is projected to rise from less than 30 percent to nearly 34 percent over the same period. While the region is projected to account for 27 percent of the total population of the study countries in 2023, it is projected to account for 43 percent of the total number of food-insecure people.

Figure 3

Total and food-insecure population share and distribution gap share by region, 2013



LAC = Latin America and the Caribbean, NA = North Africa, SSA = Sub-Saharan Africa.

Source: USDA, Economic Research Service and UN FAOSTAT.

The region’s distribution gap is projected to increase 45 percent—about the same as the projected increase in food-insecure people—meaning that the depth of food insecurity is expected to remain nearly unchanged. However, there is significant diversity within the region. In 15 of the region’s 39 countries, per capita consumption is projected to exceed the nutritional target for 80 percent or more of the population in 2023.

The food security situation is projected to remain stable in the Asia region, where the share of the region’s population that is food insecure is projected to remain under 18 percent. The most food-secure countries in the region are expected to be Vietnam, Laos, Mongolia, and Pakistan, where more than 90 percent of the population is projected to consume at or above the nutritional target. In Afghanistan, however, despite a projected increase in per capita consumption, 90 percent of the population is projected to remain food insecure in 2023.

The greatest long-term improvement in food security is projected to be in the LAC region, where the share of the population that is food insecure is projected to fall from nearly 31 percent to roughly 25 percent over the next decade. Bigger changes are projected for the region’s distribution gap, with a more-than-25-percent decline indicating a reduction in the intensity of food security. The countries driving this result are Colombia, the Dominican Republic, El Salvador, Haiti, Nicaragua, and Ecuador, most of which are projected to have growing export sectors that are expected to lead

to improved food import capacity. The food insecurity situation in Haiti is, however, projected to remain dire, with about 70 percent of the population expected to consume below the nutritional target in 2023.

Commodity Prices Continue To Pressure Food Import Capacity

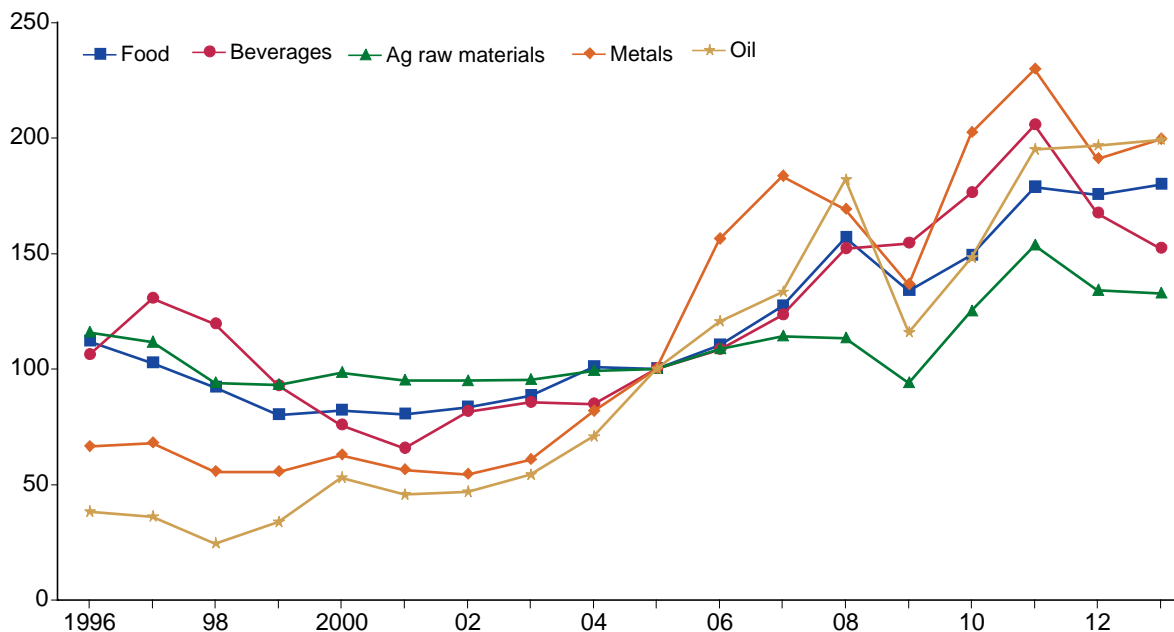
Global food commodity prices remained at relatively high levels in 2012, continuing the pressure on budgets and commercial import capacity in food-importing developing countries. According to the IMF, the 2012 food price index (2005=100) was 75 percent higher than in 2005 and only 1.8 percent below the record levels of 2011. For early 2013, food prices have inched up further.

Terms of trade can be an important factor when considering the financial burden high food prices place on low-income food-importing countries. If the prices these countries receive for their exports keep pace with import prices, assuming no change in foreign capital inflows such as foreign direct investment and remittances, then it is easier to manage higher food prices. While this has been the case for most of the 2000s, the trends diverged in 2012. While food prices dipped marginally, prices for beverages—a category that includes cocoa beans, coffee, and tea, exported by a number of these countries—fell nearly 19 percent, thus reducing export earnings considerably while food import costs declined only slightly. Prices for metals, which several of the SSA countries export, fell nearly as much, almost 17 percent. In addition, prices for oil remain relatively high, inching up from 2012 record highs. While some of the countries in this study export oil, most are net importers. If oil prices do not follow the predicted slow decline (World Bank, 2013), it will become more difficult for low-income food-importing countries, and particularly those that are net oil importers, to afford food or other essential imports.

Figure 4

Commodity prices

Market price index, 2005=100



Source: International Monetary Fund, IFS, 2013.

Grains comprise the largest share of the food imported by developing countries on the whole, accounting for 35 percent of the value of their food imports in 2010, according to FAO. Global corn prices have risen fastest, growing threefold between 2005 and 2012, while rice and wheat prices essentially doubled during that time. These higher prices are reflected in the quantity-value gap in growth. For developing countries, the quantity of imports rose just over 4 percent between 2000 and 2010, while the value rose nearly 14 percent, potentially straining the budgets of lower income countries.

While it is difficult to discern the exact impact of price increases on food security in these countries over the last several years, an adverse impact is apparent in several of the more import-reliant countries. In the LAC region, the estimated share of food-insecure people increased on several occasions in recent years in Colombia, the Dominican Republic, Ecuador, and Honduras, where imports account for 40 to 75 percent of grain supplies. In these cases, either imports declined or did not rise commensurately with a decline in output. The same was true in the SSA countries of Cameroon, Gambia, Guinea Bissau, Liberia, Congo, and Swaziland.

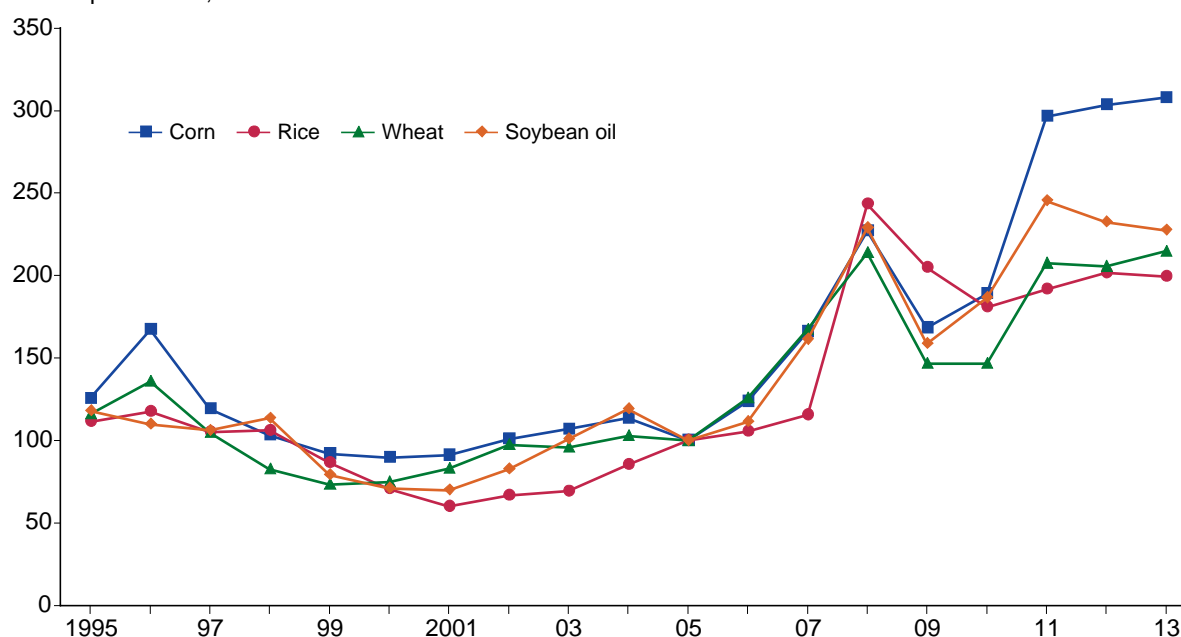
High food prices have sparked interest in strengthening food safety nets and increasing agricultural investment in developing countries. Most poor households in these 76 countries depend on agriculture for at least part of their livelihoods, but most are also net buyers of food; the same is true at the national level. Thus, increases in global food prices can result in increased vulnerability to food insecurity if food expenditures rise more sharply than incomes.

According to the World Bank, G-8 financing for nutrition-related activities reached nearly \$3 billion in 2011, marking a near 50-percent increase from 2009 levels. The World Bank Group's commitments to agriculture and related sectors exceeded \$9 billion in FY12 (ending June 30, 2012), up significantly from the \$4.1-billion annual average in FY 2006-08. The World Bank has also initiated

Figure 5

Grain and vegetable oil prices

Market price index, 2005=100



Source: International Monetary Fund, IFS, 2013.

and or supported several programs designed to protect developing country farmers and consumers from volatile prices. Local governments have also shown commitments to agriculture. Most notable is the Comprehensive Africa Agriculture Development Programme wherein 30 African governments have agreed to allocate at least 10 percent of their national budgets to the agriculture sector in an effort to raise agricultural productivity by at least 6 percent per year.

Alternative Food Price Scenarios Affect Food Security Projections

In an effort to see how sensitive the current findings on international food security are to future trends in global food prices, alternative grain price scenarios were developed. Even though the price outlook in *USDA Long Term Agricultural Projections to 2023* used in this report indicates a declining price trend, recent global food price increases in 2007/08 and 2010/11 raise continued uncertainty about global food price developments and their impacts on food security. Price projections are inherently uncertain for a number of reasons. Food prices are closely correlated with energy prices through such linkages as biofuel feed stocks, fertilizers, fuel for farm machinery, and transportation costs. Energy prices—in particular, oil prices—are highly responsive to political factors in oil exporting regions that are hard to predict. Furthermore, according to USDA-ERS (Trostle, 2008; Trostle et al., 2011), food prices respond to weather patterns that may be exhibiting greater deviations from normal, making prices increasingly difficult to predict.

In order to better understand the impacts of alternative price projections on food security indicators, two alternative world grain price scenarios were analyzed using the IFSA model. The alternative scenarios broadly reflect deviations from trend in global food prices between 1981 and 2012. In 8 of the last 31 years, prices exceeded trend prices by more than 10 percent, and in 17 years they fell below trend prices by more than 10 percent. Here, we examine a high-price scenario where projected grain prices are 10 percent higher than baseline prices in 2023 and a low-price scenario where prices are 10 percent below baseline prices.

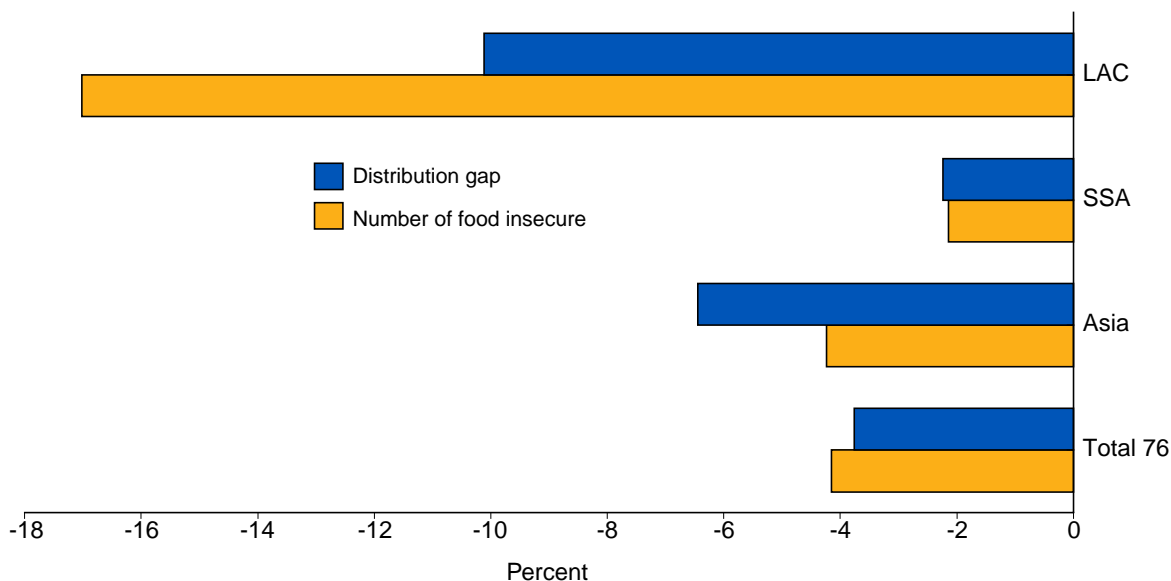
Changes in global food prices influence food security in lower income countries largely through their impact on their capacity to purchase imported foods. Thirty-three of the 76 countries imported more than 40 percent of their total grain and roots/tuber supplies in 2011. For many of these countries, food imports constitute a major share of their budgets. Unless food price increases coincide with increased prices and earnings for their export commodities, the countries face hard budgetary choices. In countries where per capita consumption is close to the nutritional target, a price increase could lead to increased food insecurity. Also, many of the countries studied have recently experienced declines in their foreign reserve position¹, increasing the potential impacts of changes in the cost of food imports.

Low-price scenario impacts. In the low-price scenario, the projected number of food-insecure people for the 76 countries is more than 4 percent lower in 2023 than under the base price assumptions. The distribution gap is projected to be nearly 4 percent lower. By far the largest change is projected for the LAC region, where the number of food-insecure people is projected to fall 17 percent and the distribution gap to decline more than 10 percent from the base scenario. The LAC region imports more of its grain supplies (nearly half) than Asia or SSA, and therefore it is more exposed to changes in global prices. Given that global price changes are often not fully transmitted or transmission occurs

¹International reserves include a country's holding of foreign currency and deposits, securities, gold, IMF special drawing rights (SDRs), reserve position in the IMF, and other claims.

Figure 6

Change in food security indicators under low-price scenario, compared with the base



LAC = Latin America and the Caribbean, NA = North Africa, SSA = Sub-Saharan Africa.

Source: USDA, Economic Research Service.

on a lagged basis, the negative impact on producers from the fall in prices is expected to be offset by the increase in import capacity (Nicholas, 2010). Lower prices therefore allow for an increase in food imports, resulting in increased food consumption and improved food security.

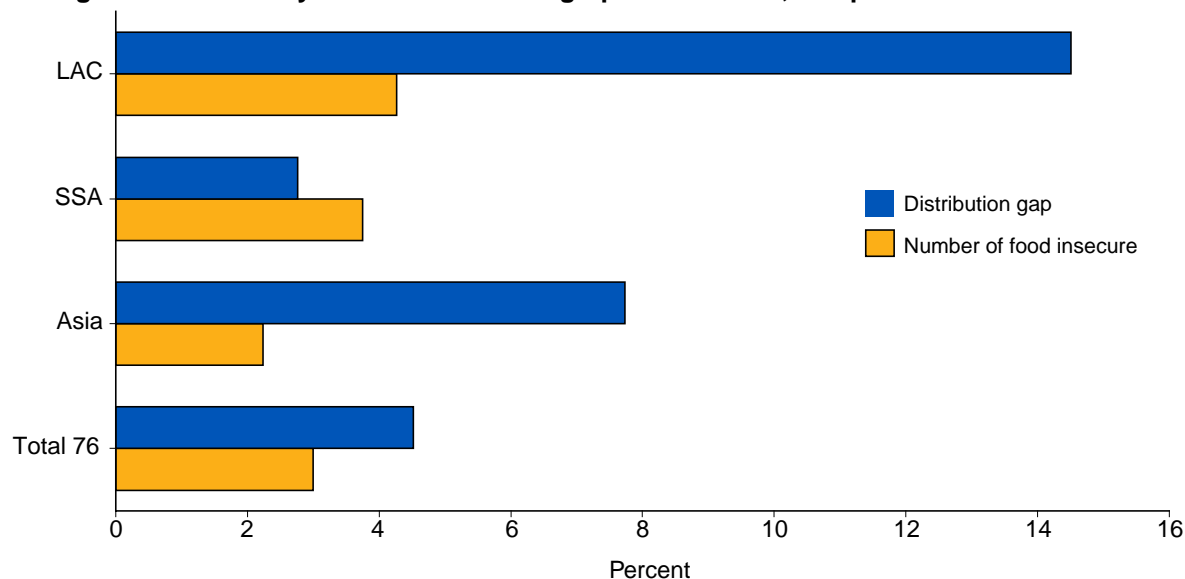
The next most notable changes are in Asia, but they are significantly smaller than in LAC. The number of food-insecure people in the Asia region is projected to decrease just over 4 percent, and the distribution gap is projected to fall 6.4 percent under the low-price scenario. Like the LAC region, the countries driving this result are those importing a relatively high share of their grain supplies, including Afghanistan, the Philippines, and Yemen.

SSA’s response to the lower price scenario is relatively small, with declines in the number of food-insecure people and distribution gap of just over 2 percent. Reliance on imports varies significantly across the 39 countries included in this region. While several of the countries—including Cameroon, Kenya, Angola, Senegal, Sudan, and Côte d’Ivoire—import a large share of their grain supplies, many countries in the region import very little.

High-price scenario impacts. In the high-price scenario, the projected number of food-insecure people for the 76 countries is 3 percent higher in 2023 than under the base scenario, and the projected distribution gap is 4.5 percent higher. As in the low-price scenario, the greatest change is for the LAC region. The largest impact is on the projected distribution gap, which increases by 14.5 percent, while the projected number of food-insecure people increases by 4.3 percent. This result indicates that not only would more people in the LAC region be food insecure with higher food prices, but that food insecurity would intensify—consumption in low-income groups would fall further below the nutritional target. This LAC result is largely driven by Colombia, Guatemala, Haiti, and Peru—all countries where imports contribute a significant share of grain supplies.

Figure 7

Change in food security indicators under high-price scenario, compared with the base



LAC = Latin America and the Caribbean, NA = North Africa, SSA = Sub-Saharan Africa.

Source: USDA, Economic Research Service.

The high-price scenario also indicates a deepening of projected food insecurity in Asia relative to the base price assumption. The countries driving this result are those importing a high share of their grain supplies, particularly Yemen, but also Afghanistan, Indonesia, and the Philippines.

As in the low-price scenario, the high-price scenario did not have a marked impact at the aggregate indicators of food insecurity in SSA. The projected number of food-insecure people rises about 4 percent relative to the base assumption and the distribution gap rises about 3 percent. The greatest impact is in Senegal and Sudan, where imports play a large role in overall grain supplies.

The price scenarios only examine the impact of food import price changes on the amounts of grain that can be imported, if production and government budgets for grain imports remain unchanged. However, governments typically do not keep their food import budgets fixed. In the past, price spikes have had a smaller impact on food security than originally anticipated, in part because policies were introduced to mitigate the impact of higher prices. Governments, therefore, may respond to higher food import prices by reducing other vital imports, or by using other funds not accounted for in our model, such as drawing down international reserves. Recent price spikes in 2008 and 2011 have led governments to resort to such means, as evident in the movement of total reserves measured in months of import cost (figs. 8a, 8b, 8c).

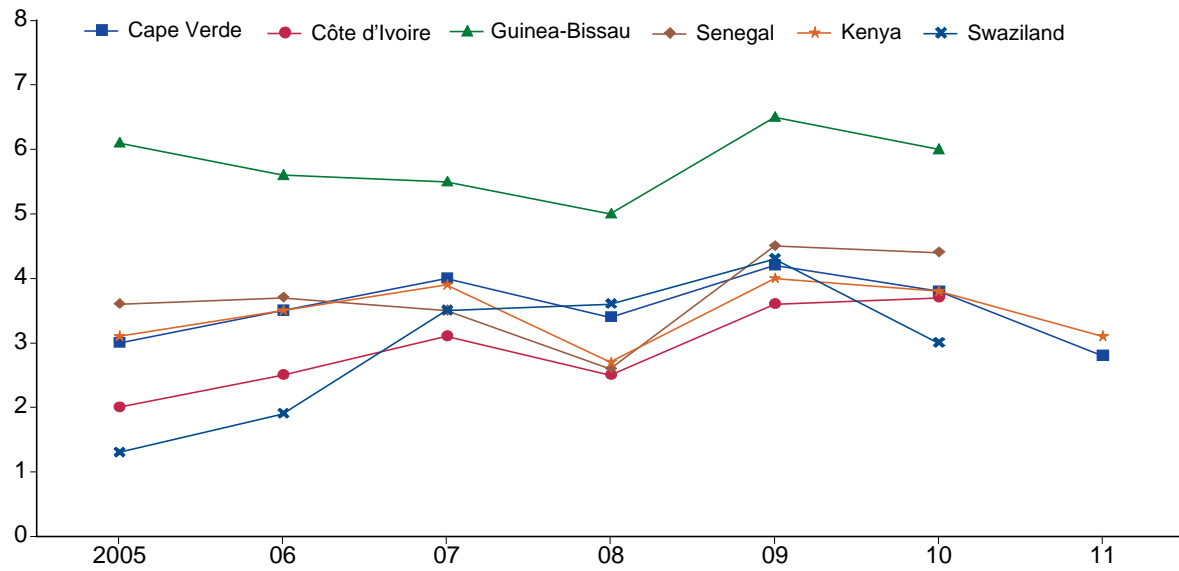
The Role of Food Aid Is Declining

Food aid has declined through the 2000s, with the exception of a brief uptick around 2005. Food aid dipped below 4 million tons in 2011 according to data from the World Food Programme, down from close to 6 million tons in 2010 and more than 11 million tons in 2000. Food aid to Sub-Saharan Africa reached a low of 2.5 million tons in 2011, after ranging between just under 3 million tons to just over 5 million tons during the last decade. The SSA share of global food aid increased from 30-35 percent in the early 2000s to more than 60 percent in 2011. SSA's share of global official development assistance (ODA) has also increased, from about 25 percent in the early 2000s to more than 34 percent in recent years (fig. 9).

Figure 8a

Total reserves in months of imports: Sub-Saharan Africa

Number of months

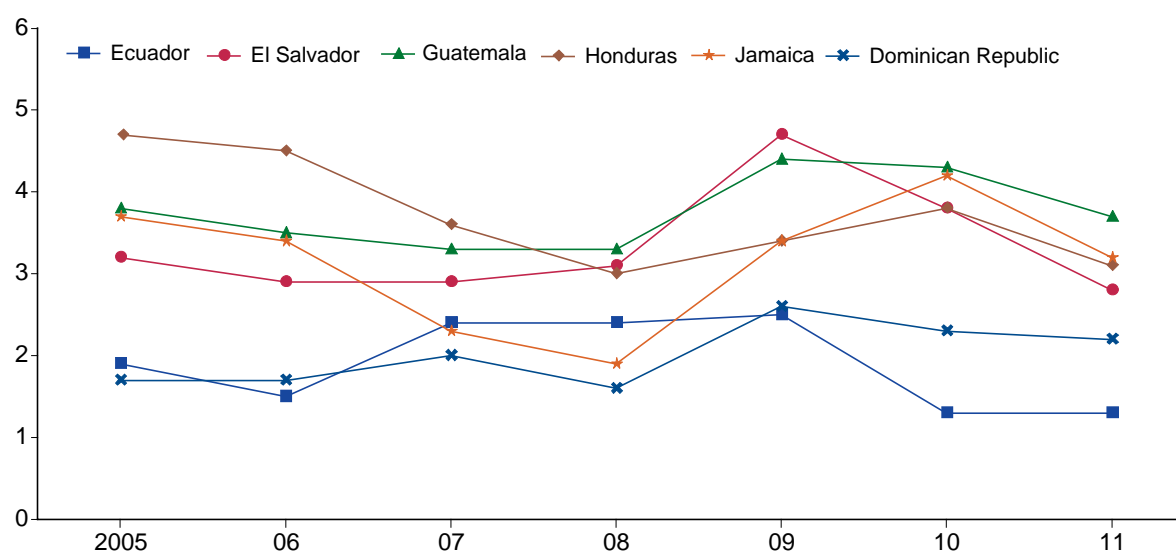


Source: World Bank, World Development Indicators Online, 2013.

Figure 8b

Total reserves in months of imports: Latin America and the Caribbean

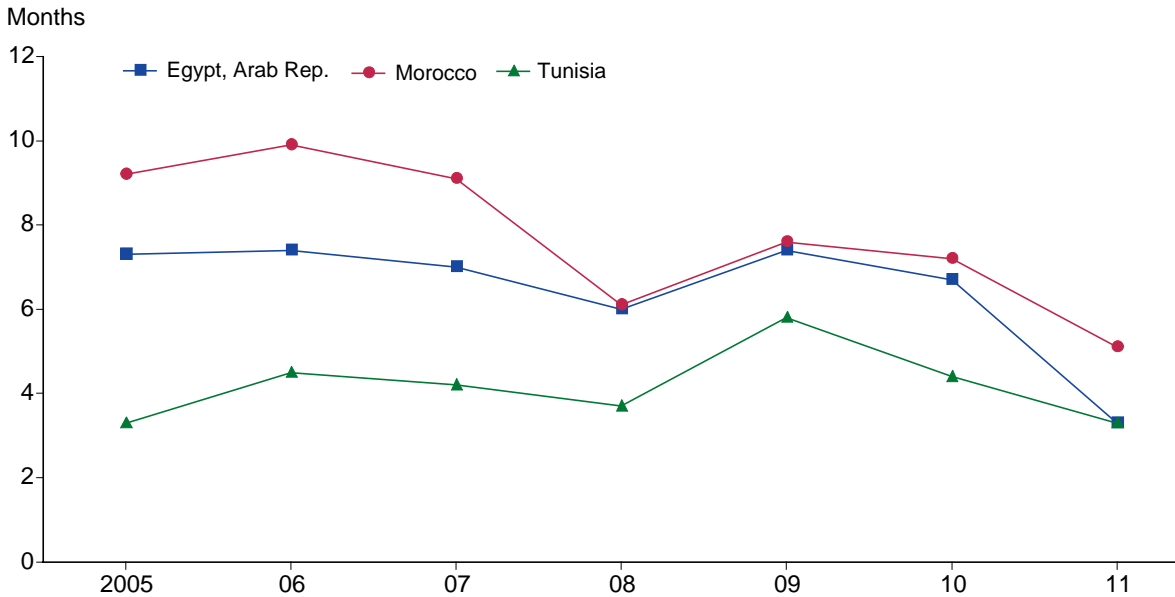
Months



Source: World Bank, World Development Indicators Online, 2013.

Figure 8c

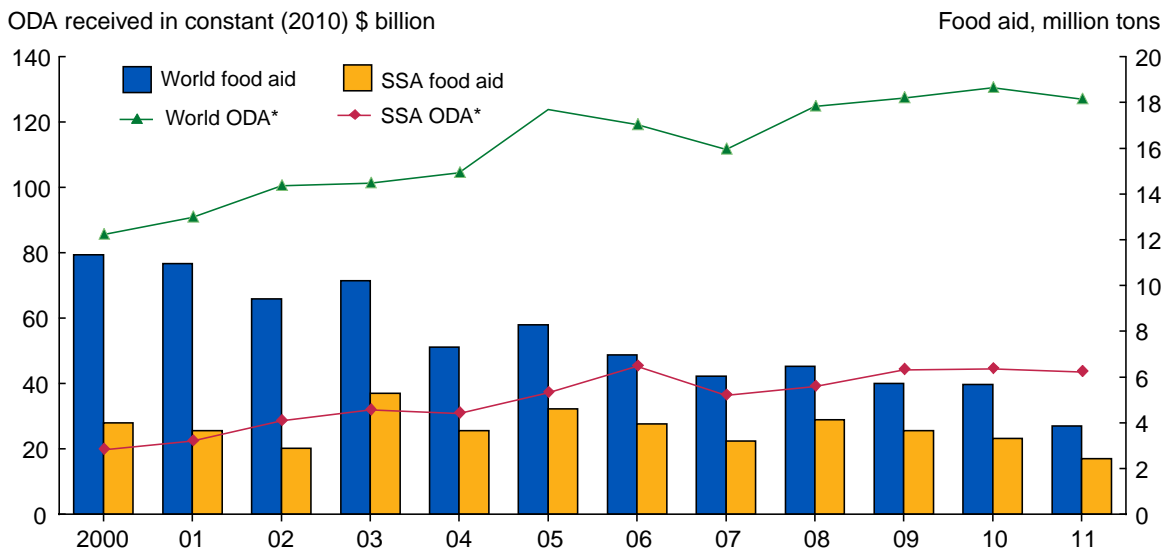
Total reserves in months of imports: North Africa



Source: World Bank, World Development Indicators Online, 2013.

Figure 9

While food aid is declining, SSA's share of the total is increasing



SSA = Sub-Saharan Africa. *Official development assistance.

Source: World Bank, World Food Programme, 2013.

Nutritional Status of Food-Insecure Countries Has Improved

While little change is estimated between 2012 and 2013 in the overall food security status of the countries covered in this report, unmistakable progress has been made over the longer term.

Between 2000 and 2013, all indicators of food security used in this analysis showed marked improvements: the number of food-insecure people declined from over 1 billion to 707 million, the distribution gap declined from 24 to 15 million tons, and the share of people living in food insecurity declined from 37 to 20 percent.

During this period, the regions covered in this report generally experienced robust economic growth between 4 and 6 percent per year. Notably, this growth does appear to have reached into the lower income groups and improved their access to food. Regional studies, as well as household surveys, confirm a widespread decline in poverty (Ravallion, 2012). Rising incomes and improved food security also appear to have led to improved nutritional status in many countries.

In addition to the levels of per capita calorie consumption, increasing emphasis is placed on the nutritional adequacy of diets. The need to ensure a balanced diet by reaching targeted consumption levels of the three macro nutrients—carbohydrates, protein, and fat—is well established. In recent years, governments and aid organizations alike have also begun to stress the importance of micro nutrients, such as vitamins and minerals. The World Food Programme (WFP) now publishes the nutritional content of all food aid products in response to this increased awareness. Missing micro nutrients can lead to serious, often easily preventable, illnesses.² However, since studying micronutrient availability is beyond the scope of this report, we focus our attention on the macro nutrients by analyzing indicators such as average calories consumed per capita per day—total and

Table 4

Number of food-insecure people, 2000 and 2013

	2000	2013
	<i>Million</i>	
Total	1,038	707
Sub-Saharan Africa	323	254
Asia	652	403
Latin America and the Caribbean	64	50

Source: USDA, Economic Research Service.

Table 5

Distribution gap, 2000 and 2013

	2000	2013
	<i>Million tons</i>	
Total	23.9	15.4
Sub-Saharan Africa	12.2	8.9
Asia	9.6	5.9
Latin America and the Caribbean	2.1	1.1

Source: USDA, Economic Research Service.

²UN-FAO's most recent estimates indicate that 2 billion people suffer from deficiencies in one or more micronutrients (UN-FAO, 2013).

by food group—as well as average consumption of protein and fat measured in grams per day. Fat consumption is recommended to represent between 20 and 35 percent of a person’s diet and the target for protein consumption is 10 percent of the diet (World Health Organization, American Heart Association, Food and Drug Administration). We compared calories and grams consumed as well as the ratio of consumption to the healthy threshold target level across countries and over time based on Food Balance Sheets from the UN Food and Agriculture Organization.

For the 76 countries included in this report, overall per capita food consumption (calories) increased 8.3 percent from 2000 to 2009 (the most recent year for which such detailed data are available). This growth occurred in all regions. All regions, on average, now exceed the nutritional standard of 2,100 calories. Average per capita calorie consumption remains the lowest in SSA, but average calorie consumption increased 7.5 percent, the same rate of growth as in Asia. Calorie consumption increased by more than 6 percent in LAC and by about half that rate, 3.8 percent, in NA during 2000-09. North Africa’s consumption has been above target levels and substantially higher than the other regions, due to government programs that subsidize grain consumption, which boosts per capita calorie and protein consumption compared to lower income regions.

Per capita consumption of proteins and fats increased faster than total calorie consumption over 2000-09. Growth in protein consumption (grams per capita) was highest in Asia (18.5 percent), but also strong in LAC (10.3 percent) and SSA (9.6 percent). Fat consumption increased by more than 20 percent in both SSA and Asia, with LAC increasing its fat consumption by 7.6 percent. Per capita

Table 6

Diet composition and ratios to nutritional target, 2000 and 2009

	Consumption per capita per day ¹				Ratio to requirement (per capita daily)		
	Energy (kcal)	Protein (grams)	Fat (grams)	Sugar (grams)	2,100 cal energy	10 percent protein ²	20 percent fat ³
2000							
76 country average	2,210	55	46	46	1.05	1.00	0.93
SSA	2,137	52	41	32	1.02	0.97	0.86
Asia	2,251	54	43	42	1.07	0.96	0.86
LAC	2,316	58	60	95	1.10	1.00	1.16
NA	3,133	86	69	84	1.49	1.10	0.99
2009							
76 country average	2,393	62	55	49	1.11	1.04	1.03
SSA	2,297	57	50	35	1.09	0.99	0.98
Asia	2,420	64	52	40	1.15	1.06	0.97
LAC	2,457	64	64	95	1.17	1.04	1.17
NA	3,292	94	68	92	1.57	1.14	0.93

LAC = Latin America and the Caribbean.

NA = North Africa.

SSA = Sub-Saharan Africa.

¹Calculated based on FAO Food Balance Sheet.

²Based on FDA, recommended threshold target 10 percent of diet.

³Based on American Heart Association, recommended threshold target 20 percent of diet.

Source: USDA, Economic Research Service, based on FAOSTAT data.

consumption of fats is highest in NA, with 69 grams per capita per day, even though this translates into slightly less than the 20 percent fat share due to high total calorie consumption.

However, average consumption of proteins remained just below nutritional targets in SSA and fat consumption falls below target levels in both SSA and Asia, even though both regions made strides in improving their diets. If current trends persist, both SSA and Asia may join the other lower income regions in meeting macro nutritional targets within the next few years.

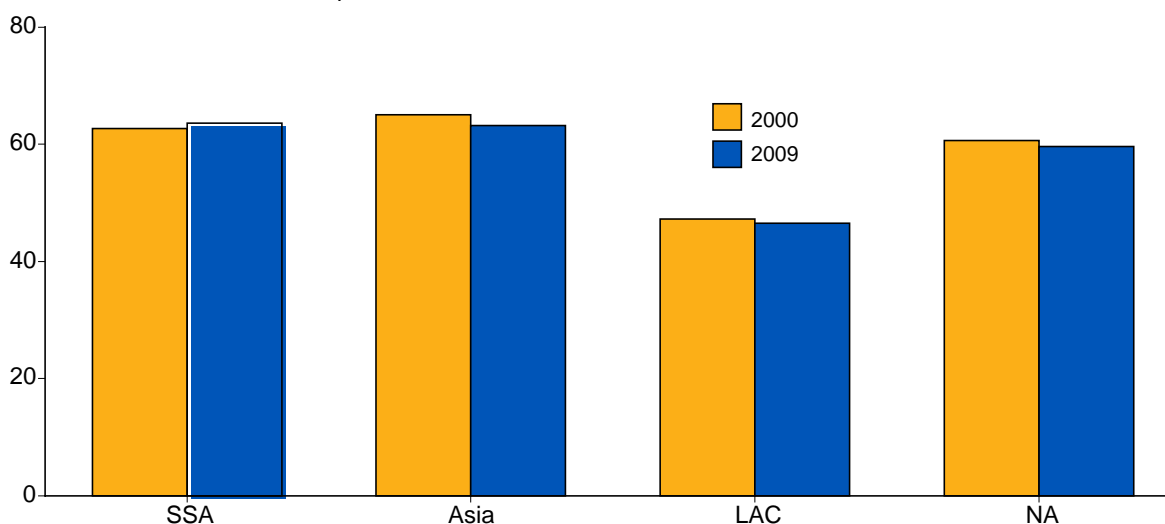
Consumption of all food groups, as measured by average calorie consumption, increased between 2000 and 2009. There were only slight changes in the composition of diets in SSA. Asia and LAC showed some shifts in their diet composition toward meats, fruits, vegetables, pulses, and vegetable oils while decreasing the share of grains and roots/tubers in their diets. Sugar consumption, which has been linked to an increasingly worrisome obesity problem in a number of lower income countries, particularly in Latin America, declined slightly as a share of total consumption from 14.4 percent to 13.5 percent in LAC, and from 6.8 to 5.9 percent in Asia.

Average per capita consumption levels that may exceed recommended targets mask the disparities in consumption by different income groups within the countries. We know that consumption levels vary with income, across countries as well as within a country, and the degree to which the distribution of consumption is skewed is related to income inequality. As in our analysis of grain-equivalent consumption, an income/consumption relationship (Engel curve estimation) and World Bank data on income and income distribution are used to allocate the total amount of available macro nutrients (calories, grams of protein, grams of fat) among 10 income deciles in each country. This allows us to estimate protein and fat consumption, as well as calorie consumption, by income group. This analysis focuses on just the three regions—SSA, Asia, and LAC—where the food security assessment found food gaps at lower income levels within countries (figs. 11a, 11b, 11c).

Figure 10a

Grains and roots and tuber consumption

Percent of total calorie consumption



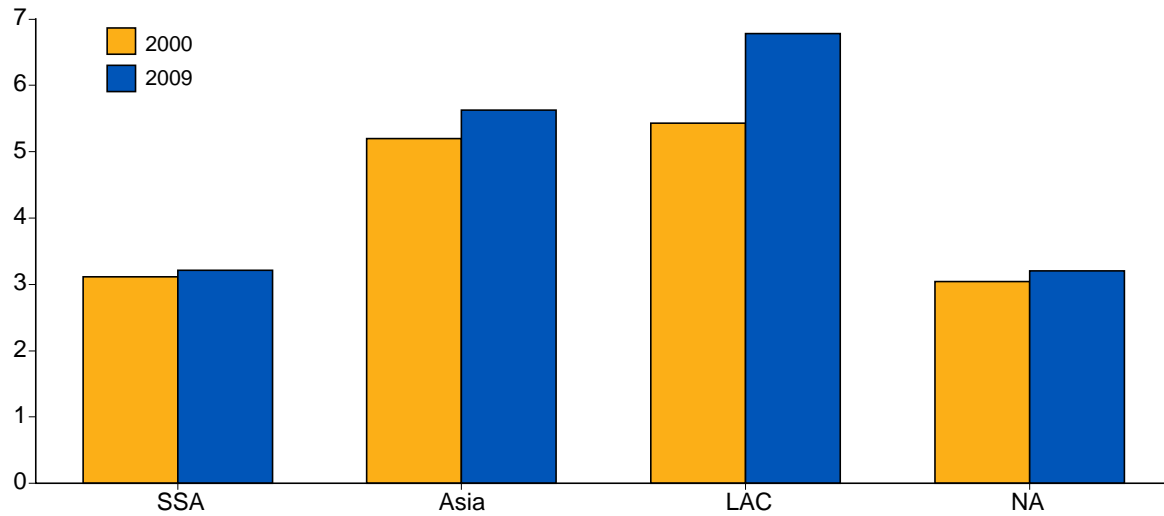
LAC = Latin America and the Caribbean, NA = North Africa, SSA = Sub-Saharan Africa.

Source: USDA, Economic Research Service calculations based on FAOSTAT data.

Figure 10b

Meat consumption

Percent of total calorie consumption



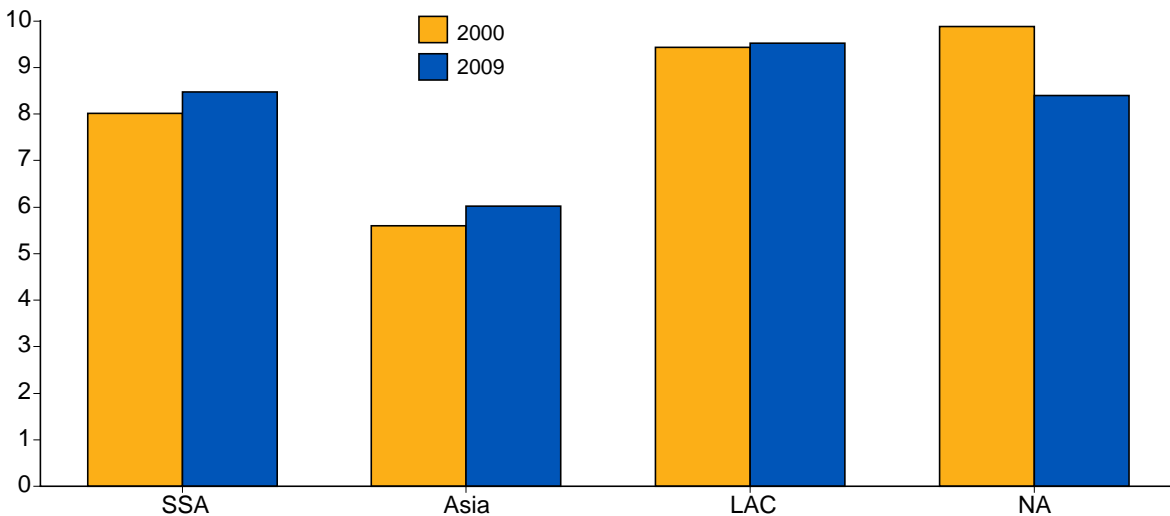
LAC = Latin America and the Caribbean, NA = North Africa, SSA = Sub-Saharan Africa.

Source: USDA, Economic Research Service calculations based on FAOSTAT data.

Figure 10c

Vegetable oil consumption

Percent of total calorie consumption



LAC = Latin America and the Caribbean, NA = North Africa, SSA = Sub-Saharan Africa.

Source: USDA, Economic Research Service calculations based on FAOSTAT data.

While average regional calorie consumption levels were all above the nutritional target of 2,100 calories in 2009, the lowest income groups in SSA and LAC consume below 2,000 calories, and average households in that income group in Asia are estimated to barely exceed the target. At average and higher income levels, average consumption is above the 2,100-calorie target in all regions studied. The LAC region is found to be more food secure than SSA and Asia when using national average measures, but because income distribution is more uneven in this region than in the others, consumption levels of the lowest income groups are lower than in Asia and roughly equivalent to

SSA. Asia, on the other hand, has a more equal income distribution and, despite lower average consumption levels than LAC, the lowest income groups are estimated to have access to more food, protein, and fat than those in either LAC or SSA.

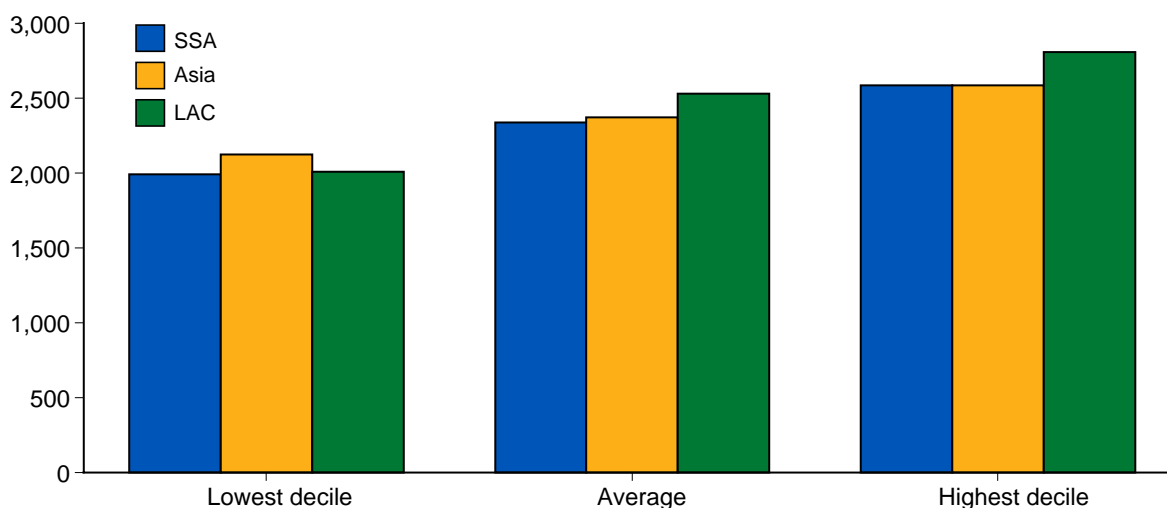
This broad regional assessment suggests progress in improving nutritional status and food security. However, a minimum target consumption level for protein is 53 grams per capita per day and 47 grams for fat, assuming a daily consumption level of 2,100 calories.³ Average consumption levels for these macro nutrients remain below these targets in several of the countries studied, as the regional averages mask the great differences among individual countries. For example, fat consumption in Bangladesh is estimated at 28 grams per day, while it is estimated to be 88 grams in Mongolia. Even within countries, consumption levels vary by income group. For example, the Philippines reaches the target consumption level on average, but 60 percent of the lower income households are estimated to fall below the target. In SSA, fat consumption varies between a low of 18 grams in Burundi and a high of 84 grams in Mauritania.

Food consumption has increased across all countries, with respect to overall calorie levels as well as protein and fat consumption, stemming from higher consumption of foods such as meats and vegetable oils. However, many countries in SSA and Asia still fall short of recommended levels of protein and fat. In LAC, a region with high average food consumption levels but highly skewed income distribution, consumption levels in lower income groups are similar to those seen in lower income households in SSA. If income growth remains strong, protein and fat consumption is likely to continue to increase and reach target levels as consumers allocate relatively large shares of new income to diversifying their diets and increasing consumption of meats, dairy products, and vegetable oils (Muhammad et al., 2011).

Figure 11a

Average consumption masks distributional differences: Total calories

Calories per capita per day



LAC = Latin America and the Caribbean, NA = North Africa, SSA = Sub-Saharan Africa.

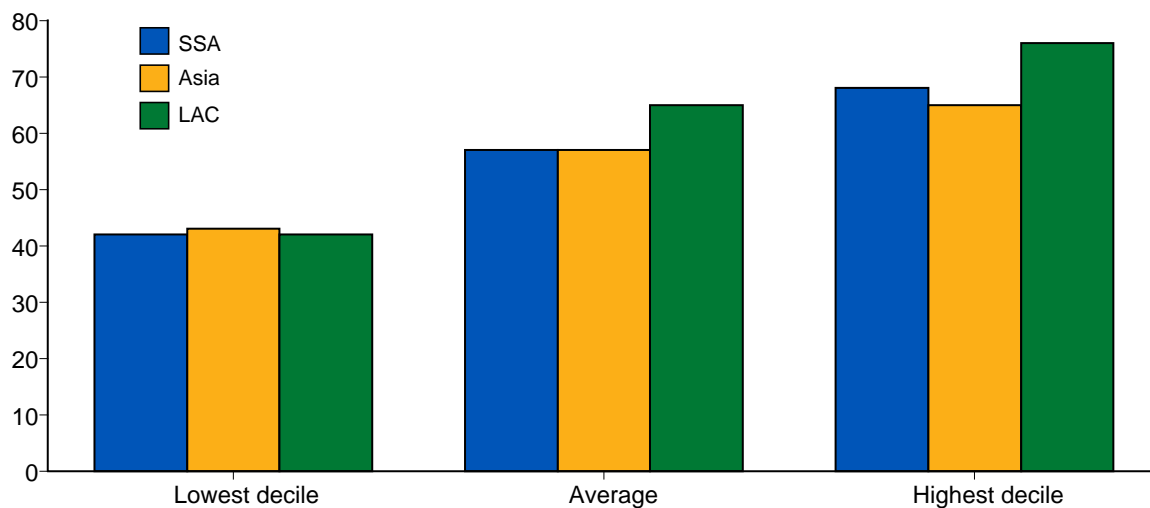
Source: USDA, Economic Research Service calculations based on data from FAOSTAT, 2013.

³One gram of protein translates into 4 calories and 1 gram of fat represents 9 calories.

Figure 11b

Average consumption masks distributional differences: Protein

Grams per capita per day



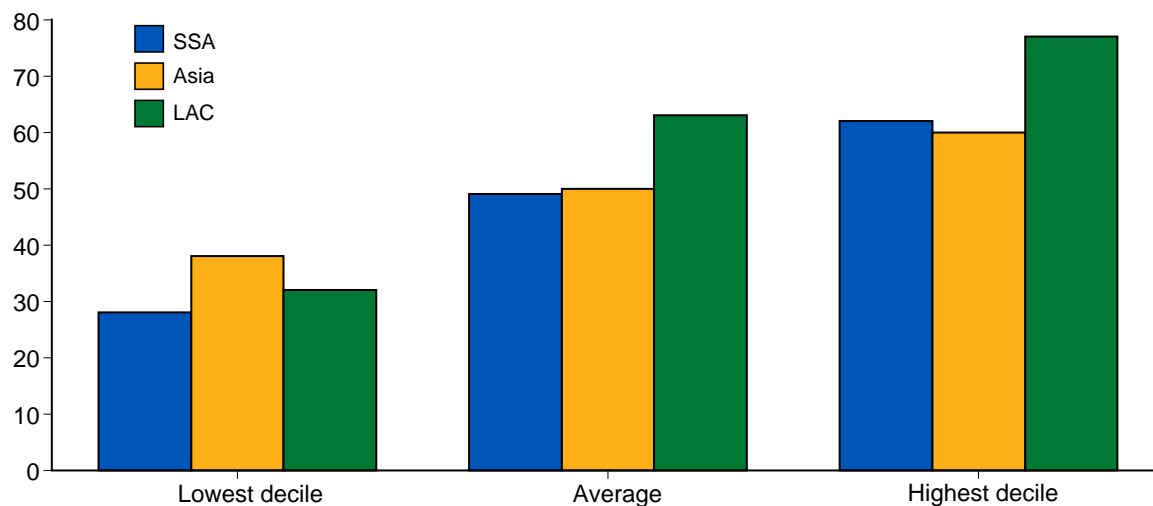
LAC = Latin America and the Caribbean, NA = North Africa, SSA = Sub-Saharan Africa.

Source: USDA, Economic Research Service calculations based on data from FAOSTAT, 2013.

Figure 11c

Average consumption masks distributional differences: Fat

Grams per capita per day



LAC = Latin America and the Caribbean, NA = North Africa, SSA = Sub-Saharan Africa.

Source: USDA, Economic Research Service calculations based on data from FAOSTAT, 2013.

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Food Security: Regional and Country Perspectives

For the 76 countries as a whole, food security is estimated to remain virtually unchanged between 2012 and 2013, but projected to deteriorate slightly between 2013 and 2023. The greatest improvement in food security is projected to be in the Latin America and Caribbean (LAC) region where the number of food-insecure people is projected to fall and the share of the population that is food-insecure falls from nearly 31 percent to roughly 25 percent over the next decade. Food security is projected to be fairly stable in the Asia region where the share of the region's population that is food insecure is projected to remain under 18 percent. SSA is the only region projected to have an increase in the number of food-insecure people that exceeds its population growth over the next decade. As a result, the share of food-insecure people in the region rises from less than 30 percent to nearly 34 percent in 2023. North Africa is projected to remain relatively food secure, with less than 10 percent of these countries' population consuming below the nutritional target.

Sub-Saharan Africa

The number of food-insecure people in SSA is estimated at 254 million in 2013, up only 5 million from 2012. The share of the population that is food insecure is estimated at 29 percent. In historical terms, this marks a significant decline from the 56 percent that were estimated to be food insecure in 1995 and 41 percent in 2005. This improvement was driven by Ethiopia, Kenya, Sudan, and Tanzania in East Africa; Angola, Madagascar, Malawi, and Mozambique in Southern Africa; and Chad, Mali, and Niger in West Africa. Food production growth was the overriding factor supporting these gains in Ethiopia, Malawi, Chad, Mali, and Niger. Grain output grew at an average annual rate ranging from 5.1 percent in Malawi to nearly 7 percent in Mali between 1995 and 2012. In Tanzania, Angola, Madagascar, and Mozambique, a combination of production and import growth drove the improvements.

In Kenya and Sudan, the improved food security was largely due to an increase in imports. In Kenya, grain imports have grown 8.7 percent per year since 1995 and now account for nearly 40 percent of the country's grain consumption. In Sudan, import growth has exceeded 11 percent per year and accounts for about a third of the country's grain consumption in 2013. Both countries have experienced strong growth in export earnings, Kenya due to the high prices for its agricultural exports and Sudan due to its oil and gold exports.

For much of the SSA region, food production only recently began to outpace growth in population. In fact, food production, on average, is still fairly stagnant in West and Southern Africa. According to FAO, per capita food output only started to rise in East Africa (largely driven by Ethiopia, the second largest grain producer in SSA) in 2005, and in what FAO refers to as Middle Africa in the late 2000s, largely driven by Angola (part of Southern Africa in the IFSA report).

Impacts of High Global Food Prices Have Been Relatively Small

Continued high global food commodity prices have not affected SSA as greatly as they have more import-reliant regions, such as LAC and North Africa. In most SSA countries, prices are more influenced by domestic production levels. For example, prices in the Sahelian region in early 2013 were below their levels of the prior year. An exception to this is Chad, where an escalation of civil conflict at the end of 2012 resulted in a spike in food prices.

Table 7
Food availability and food gaps for Sub-Saharan Africa

Year	Grain production	Root production	Commercial imports	Food aid receipts (grains)	Aggregate availability of all food
<i>1,000 tons</i>					
2004	81,244	57,154	18,350	4,012	187,177
2005	84,458	59,945	20,473	5,186	198,818
2006	93,499	63,163	19,659	4,451	208,091
2007	90,383	60,744	21,167	3,523	211,424
2008	98,428	64,682	22,916	4,545	217,491
2009	100,671	62,553	23,833	4,210	223,787
2010	116,062	68,001	22,956	3,618	231,895
2011	107,868	72,155	26,086	2,603	237,100
2012(e)	114,875	69,668	25,152	3,477	244,563
Projections					
				Food gap*	
				NG	DG
2013	118,451	70,555	24,604	6,682	9,245
2018	132,818	75,121	31,480	7,741	10,715
2023	148,165	79,921	35,911	9,311	13,414

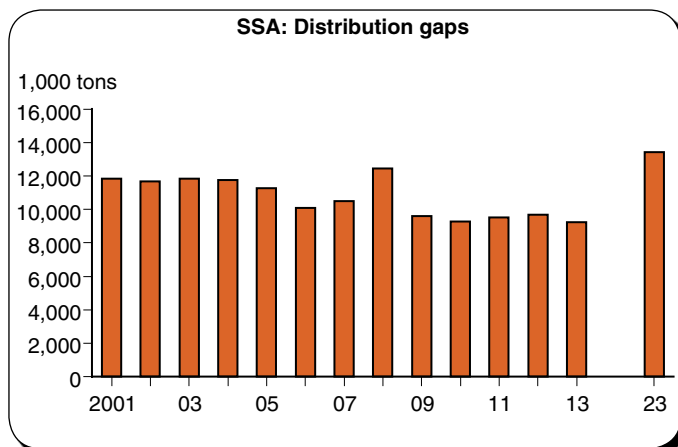
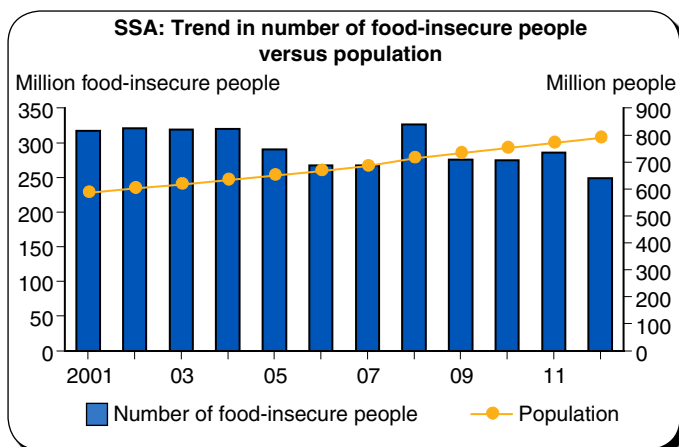
(w/o food aid)

*See table 3.

Sub-Saharan Africa
 (840 million people in 2012)

Sub-Saharan Africa (SSA) is the world's most food-insecure region. For much of the SSA region, food production only recently began to outpace that of population growth. In fact, food production, on average, is still fairly stagnant in West and Southern Africa.

According to FAO, per capita food output only started to rise in 2005 in East Africa (largely driven by Ethiopia, the second largest grain producer in SSA) and in the late 2000s, largely driven by Angola.



Sub-Saharan Africa: Nutritional indicators of selected countries, 2009

	Total kcal/capita/day	kcal change since 2000	Share of total consumption				Percent of recommended nutritional target		
			Grains and roots & tubers	Vegetable oil	Meat	Sugar and sweeteners	Energy ¹	Protein ²	Fat ³
	Number	Percent	Percent				Percent		
Congo, DR	1,566	-1.9	77	7	1	2	75	64	69
Ethiopia	2,097	15.9	77	3	2	3	100	116	52
Kenya	2,092	2.1	53	9	4	8	100	113	110
Nigeria	2,711	5.4	64	13	1	4	129	91	111
Zambia	1,879	-0.7	74	6	3	5	89	100	91
SSA	2,297	9.6	64	9	3	5	109	99	98

¹Recommended target 2,100 calories per capita per day.

²Based on FDA, target threshold 10 percent of diet.

³Based on American Heart Association, target threshold 20 percent of diet.

Source: USDA, Economic Research Service, FAO/FBS, WFP.

In countries where prices were high, many governments attempted to intervene to mitigate the increase. In Tanzania, corn prices were at record levels due to lower domestic output, high domestic and regional demand, and high transportation costs. In an effort to offset the high prices, the Government released 40,000 tons of corn from the National Food Reserve Agency in January 2012. In Zambia, higher corn meal prices at the end of 2012 were the result of an accumulation of stocks by the Food Reserve Agency, strong demand from neighboring countries, and depreciation of the local currency. In response, the Food Reserve Agency released subsidized corn in December 2012 to mitigate the high prices.

Despite Malawi's high national-level production, local corn prices rose due to localized production shortfalls, high transportation costs, continued devaluation of the currency, and localized flooding that disrupted market activities. In order to stabilize prices, the Agricultural Development and Marketing Corporation distributed corn to affected areas at subsidized prices at the end of 2012.

The SSA Food-Insecure Population Is Projected To Grow

In the longer term, the region's food security situation is projected to deteriorate as the number of food-insecure people is projected to rise 47 percent, from 254 million to 373 million between 2013 and 2023 if current trends in population, food production, and export earnings continue. The share of the population that is food insecure is projected to rise from 29 percent to 34 percent, about the level it was in the late 2000s. The distribution gap, however, is projected to rise 45 percent, slightly slower than the growth in the food-insecure population, indicating that the depth of food insecurity in the region is expected to abate somewhat.

The countries where food security indicators are projected to deteriorate the most are Uganda, Chad, and to a lesser extent, Malawi. For Uganda and Malawi, a major contributing factor is population growth rates that exceed projected growth in food production and import growth. Population in SSA, on average, is projected to grow 2.8 percent per year over the next decade, while growth rates in Uganda and Malawi are projected at 3.0 and 3.3 percent, respectively. The share of the population projected to be food insecure in these three countries in 2023 ranges from 30 percent in Malawi to 70 percent in Uganda.

Uganda, projected to be the most vulnerable of the three countries, has been relatively food secure for more than a decade. The share of the country's population estimated to be food insecure has been 20 percent for more than a decade and this is projected to hold for the 2013 projection as well. However, per capita consumption has fallen more than 1 percent per year over the last decade and, although per capita consumption has remained above the nutritional target for all but 20 percent of the population, it has descended toward that target over time. The estimates indicate that growth in production and imports will be consistent with recent trends and fall short of population growth. This is projected to lead to further declines in per capita consumption and an increase in the share of the population that is food insecure.

Historically, Chad has been one of the most food-insecure countries in the world. The country has been characterized by conflict, instability, and poor infrastructure. Recent years have seen relative stability (with the exception of the end of 2012) and a boom in export earnings due to oil, which the country began to export in 2004. Despite these positive factors, per capita consumption for more than 90 percent of the population continued to fall short of their nutritional target until 2012. While a bumper grain crop in 2012—more than double the average level—temporarily reduced the esti-

mated share of the population that was food insecure to less than 10 percent, long-term projections indicate that food insecurity will return to the historical trend, although still better than the lowest historical levels. In 2023, 60 percent of the population is projected to be food insecure.

Malawi's food security is highly dependent on the performance of the grain sector as imports account for very little of overall consumption. Grain production is rainfed and thus subject to wide fluctuations. The coefficient of variation (which measures the variation of production above or below trend in a given year) is estimated at 42.5 percent for Malawi (1990-2012). Therefore, the country's food security situation can change significantly from year to year. Malawi has, however, experienced a marked increase in grain production due to a program that provides subsidized inputs to farmers, with grain output increasing 7.5 percent per year between 2000 and 2012. While grain output continues to be variable, absolute levels of production are now higher. As a result, food security has improved and, due to a near bumper crop in 2012, less than 10 percent of the population was estimated to be food insecure. With estimates for another large crop in 2013, food security is expected to remain unchanged. However, the longer term projections indicate a slowdown in production growth from the high levels of the last decade, which are seen as unsustainable, coupled with continued population growth of 3.3 percent per year over the next decade.

While Chad, Malawi, and Uganda are projected to show the most significant deterioration in food security in SSA during 2013-23, the Central African Republic, DR Congo, Burundi, Eritrea, Somalia, and Zambia are projected to be the most food-insecure countries in the region. In each country, per capita consumption is projected to fall short of the nutritional target for 90 percent or more of the population. These are among the poorest countries in SSA and per capita consumption levels are relatively low. According to FAO, per capita consumption in both Burundi and Eritrea was roughly 1,600 calories in 2009, or nearly 25 percent below the nutritional target of 2,100 calories. All of the countries, with the exception of Zambia, are currently experiencing or have recently experienced some level of civil strife or disturbances.

Zambia is the wealthiest country of this group, although per capita consumption levels are relatively low, at roughly 1,800 calories per day in 2009, according to FAO. Despite recent strong gains in grain output and projections for 2.7-percent annual increases in grain production, per capita consumption is not projected to increase enough to exceed the nutritional target for the majority of the population. Population growth is projected to average nearly 3.3 percent per year.

For about a third of the SSA countries, more than 80 percent of the population is projected to be food secure in 2023. Most of these countries are in West Africa. In many countries—including Benin, Cape Verde, Côte d'Ivoire, Ghana, Guinea, Guinea Bissau, Mauritania, and Nigeria—food security has been good for the last decade or more and the projections have this trend continuing. A common factor supporting these projections in several countries is relatively low annual population growth—around 2 percent or a little higher—which is lower than the regional average. This means that domestic production and/or imports do not have to rise as rapidly to satisfy food demand. In Mali and Niger, food security has improved markedly in the last decade due to strong growth in grain area harvested, which is projected to slow but be sufficient to maintain high levels of food security.

Economic Growth Contributes to Improved Food Security

One aspect of food security, access to food, is enhanced as incomes grow. Some SSA countries have experienced relatively high income growth rates, and this growth is projected to remain strong, at

least in the medium term. According to the World Bank, real GDP growth in the region was estimated at 5.8 percent in 2012 and a third of the region's countries experienced growth of 6 percent or more. By comparison, the overall developing country average growth was 5.1 percent in 2012. These relatively high growth rates were supported by robust domestic demand, strong growth in remittances, high prices for commodities these countries export, and higher export volumes. The discovery of mineral deposits and subsequent exports in countries such as Burkina Faso, Ghana, Kenya, Mozambique, Niger, Sierra Leone, Tanzania, and Uganda have been a significant source of the region's growth.

Another positive development for the region is the continued growth in net foreign domestic investment (mostly to the extractive sector), rising from \$35.7 billion in 2011 to an estimated \$37.7 billion in 2012. This trend is in contrast to the declining investment flows to developing countries as a whole. According to the World Bank, this rising trend in SSA investment is projected to continue and exceed \$55 billion in 2015. Investment in construction, transportation, electricity, and telecommunications is expected to reduce some of the constraints that limited growth in the past and facilitate future growth. The World Bank projects real GDP growth to average 6 percent per year through 2015.

Due to strong per capita income growth over the last decade, 12 of the SSA countries included in this study were classified as lower middle income in 2011 (defined by the World Bank as per capita income between \$1,026 and \$4,035). This compares to just three countries in 2001. Two of the countries, Angola and Namibia, are considered to be upper middle income, both with per capita incomes of roughly \$5,300. The remaining 25 SSA countries are still considered low income as their per capita incomes fall below \$1,025 per year.

The outlook is sensitive to changes in the wider global economy, including a possible downturn in the Chinese economy and continued slow or stagnant growth in the United States and Europe. China has become an important investor and trader in the region. In 2009, it surpassed the United States as the number one trading partner of SSA. In 2000, China accounted for just over 5 percent of SSA's trade. In 2011, that share exceeded 15 percent. SSA growth could also be affected by local political disturbances. While conflicts have lessened across the continent during the last decade, 2012 saw unrest and political conflicts in CAR, Chad, Mali, Guinea Bissau, Guinea, and Madagascar. All of these stifled economic activity. Situations remain fragile in places like DR Congo and Somalia. Finally, given that agriculture remains one of the largest components of GDP and source of exports and employment in the region, poor weather can constrain growth as well.

Both the international community and local governments have focused on strengthening the agricultural sectors in the region during the last decade. In Lesotho, for example, the Government expanded its input subsidy program to include mechanized inputs such as ploughs and tractors in order to encourage expanded area planted for 2013. The country's 2012 output was severely affected by poor rainfall and, in response, the UN Central Emergency Response Fund allocated \$6.2 million to the Government and relief groups to support programs involved in agriculture (i.e., promotion of climate-related technology, inputs to vulnerable households).

In Mozambique, per capita rice consumption has doubled in the last decade and imports have increased. Rice imports averaged less than 100,000 tons per year in the early 2000s, but averaged near 400,000 tons per year by the end of the decade. In response, the Government is investing in irrigation schemes to support the rice sector and increase local output. In an effort to diversify production, the Zambian Government provides subsidized inputs (seeds and fertilizers) to roughly

900,000 farmers through the Farmer Input Support Programme. In an effort to stabilize domestic corn prices, the Government also centralized the permit system for exports.

Perhaps the most extensive agricultural program has been implemented in Malawi, where roughly 1.5 million farmers have benefited from the country's Farm Input Subsidy Programme. Grain production increased 7.5 percent per year between 2000 and 2012 through both area and yield gains. Grain output in 2011 was a record at more than 4 million tons; annual production in 2000-02 averaged about half that level.

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Asia

Grain output in the Asia region reached record levels in 2012 at more than 470 million tons, supported by an increase in planted area and higher yields in response to high prices, subsidized inputs, and, in many countries, favorable weather. This analysis indicates that output for 2013 is estimated to remain high, but fall more than 2 percent from that peak. The number of food-insecure people in the 22 Asian countries included in this report is estimated at 403 million in 2013, nearly unchanged from the 402 million in 2012. The share of the region's population that is food insecure is estimated at 17.7 percent in 2013, compared with 17.9 percent in 2012. There are, however, significant variations among countries. Afghanistan, the Philippines, and Yemen are estimated to have large increases in the number of food-insecure people. Afghanistan and the Philippines are expected to experience a decline in production from bumper crops in 2012. In Yemen, imports contribute roughly 75 percent of grain consumption. With grain prices estimated to rise more than 9 percent over 2012 levels, that country's imports are estimated to fall. This reduction, coupled with population growth of more than 3 percent, results in lower per capita food availability. Conversely, the situation is estimated to improve in Bangladesh where production growth is estimated to exceed relatively slow population growth of 1.3 percent in 2013.

India is the most populous of the countries studied in the region, accounting for 56 percent of the Asian countries' population in 2013. Although India is now carrying surpluses of wheat and rice

Table 8
Food availability and food gaps for Asia

Year	Grain production	Root production	Commercial imports	Food aid receipts (grains)	Aggregate availability of all food
<i>1,000 tons</i>					
2004	369,701	21,302	24,166	2,776	510,240
2005	384,701	22,304	24,325	2,995	528,328
2006	385,496	23,464	34,936	2,087	546,642
2007	413,244	23,951	30,621	2,280	562,356
2008	426,716	26,931	32,377	1,743	571,058
2009	423,046	26,917	32,409	1,632	576,584
2010	442,626	28,622	34,611	1,956	587,638
2011	461,836	30,709	39,537	994	598,677
2012(e)	473,338	29,416	36,395	1,527	618,987
Projections					
				Food gap*	
				NG	DG
2013	462,220	29,796	38,096	1,146	5,022
2018	496,753	31,755	48,239	433	6,000
2023	533,240	33,814	55,113	603	5,433

*See table 3.

Asia

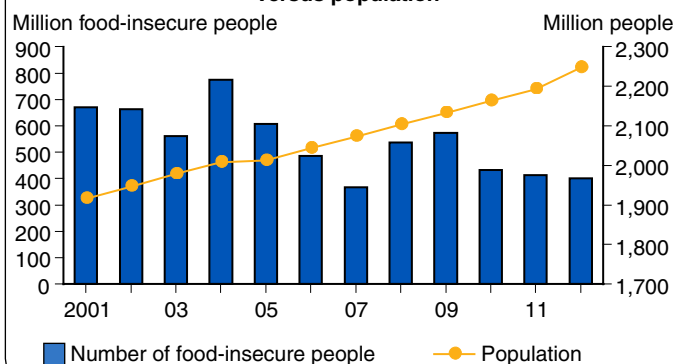
(2.25 billion people in 2012)

The food security situation in Asia is projected to remain relatively stable between 2013 and 2023. The number of food-insecure people as a share of the region's total population is projected to remain under 18 percent during the projection period.

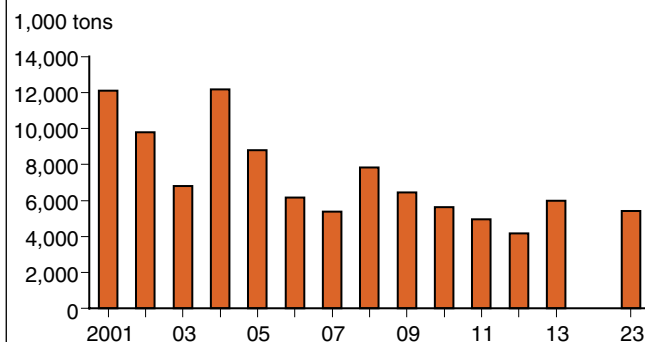
The most food-insecure countries in the region are Afghanistan, North Korea, and Yemen.

India is the most populous country in the region, accounting for 56 percent of the total population. The share of its population that is food insecure is expected to remain at 20 percent through the next decade.

Asia: Trend in number of food-insecure people versus population



Asia: Distribution gaps



Asia: Nutritional indicators of selected countries, 2009

	Total kcal/capita/day	kcal change since 2000	Share of total consumption				Percent of recommended nutritional target		
			Grains and roots & tubers	Vegetable oil	Meat	Sugar and sweeteners	Energy ¹	Protein ²	Fat ³
	<i>Number</i>	<i>Percent</i>	<i>Percent</i>				<i>Percent</i>		
India	2,321	0.3	59	9	1	9	111	98	97
Indonesia	2,646	5.9	69	8	2	5	126	89	94
Pakistan	2,423	4.6	48	12	3	11	115	104	139
Philippines	2,580	7.2	59	5	9	9	123	95	91
Vietnam	2,690	7.9	61	3	15	4	128	112	115
Asia*	2,420	3.3	63	6	6	6	115	106	97

* Asia average without the CIS countries.

¹Recommended target 2,100 calories per capita per day.

²Based on FDA, target threshold 10 percent of diet.

³Based on American Heart Association, target threshold 20 percent of diet.

Source: USDA, Economic Research Service, FAO/FBS, WFP.

in government stocks, improving food access remains a significant problem. Despite large stocks, the food distribution gap is estimated to remain relatively high in 2013, with little change in the number of food-insecure people. With lower grain production forecast for 2013 following record 2012 harvests, per capita consumption is expected to decline, but not enough to pull additional income groups below the nutritional target; the share of the Indian population that is food insecure is expected to remain at about 20 percent. Given India's current large stock levels, constraints on production and restrictions on trade are less significant challenges for near-term food security than finding ways to improve domestic food distribution and access.

The projections indicate that the most food-insecure countries in the Asia region, historically and for 2013, are Afghanistan, North Korea, and Yemen. Per capita consumption for 90 percent of the population of these countries is expected to fall short of the nutritional target of roughly 2,100 calories per day in 2013. All three countries are characterized by poor governance and/or civil strife.

While Afghanistan's food security situation remains poor, conditions appear to have improved from a decade ago. Grain output has more than doubled from the early 2000s to the early 2010s, stemming from gains in both area and yields. Increased availability of seeds through the private sector and subsidized seeds from the Ministry of Agriculture, Irrigation, and Livestock have supported yields. Despite these gains, about 90 percent of the population remains food insecure because of the low levels of food consumption in the early 2000s and one of the highest population growth rates in the world at roughly 3.5 percent per year.

North Korea's agricultural sector has suffered from lack of farm inputs and inappropriate policies. This is exemplified in grain output trends: in the early 1990s, grain production exceeded 7.5 million tons per year, but by 2012 it was estimated at less than 4.3 million tons. Lacking inputs, yields fell roughly 40 percent during this period.

Yemen relies on imports for the bulk of its grain consumption, and food import capacity is largely determined by export earnings and global food prices. In recent years, declining export earnings and higher world grain prices have caused grain imports to grow more slowly than population. The country is also dealing with civil strife, including conflict in the northern part of the country and a secessionist movement in the south.

Bangladesh and Sri Lanka are expected to have the most significant food security improvements in the region between 2012 and 2013. In both countries, per capita consumption, even among the lower income deciles, is close to the nutritional target and even the small estimated increases in food availability are sufficient to raise consumption beyond the target. In the case of Bangladesh, the share of population that is food insecure is estimated to fall from 30 percent in 2012 to 10 percent in 2013. In Sri Lanka, the share is estimated to fall from 30 percent to less than 10 percent.

In addition to Sri Lanka, the most food-secure countries in the region in 2013 are estimated to be Pakistan, Vietnam, Laos, and all the countries of the Commonwealth of Independent States (CIS).

Rising Food Prices Are a Regional Concern

Despite relatively high production and relatively low imports, many countries in the region have experienced high retail food prices from late 2012 to early 2013. In Bangladesh, rice prices rose due to higher fuel and transportation costs. In response, the Government extended a ban on non-fragrant rice exports and also significantly increased the public distribution of rice through Open

Market Sales. In India, higher wheat and rice prices in 2012 and early 2013 have been driven, in part, by higher government support prices. Despite an above-average 2012 wheat crop, Afghanistan's wheat flour prices rose through the end of 2012, reflecting the country's reliance on flour imports, primarily from Pakistan. Wheat and wheat flour prices were at record levels in Pakistan in early 2013, driven by higher producer and world market prices. In an effort to stabilize prices, the Government released 1 million tons of wheat from the Pakistan Agriculture Storage and Services Corporation in January 2013. Indonesia's rice prices are high due to floods that interfered with the marketing of the crop. To combat the high prices, the State Procurement Agency released stocks. Prices have stabilized in early 2013 in the Philippines due to a record rice crop in 2012 and the release of stocks through the National Food Authority.

As incomes have risen in the Asia region, diets have diversified and meat, vegetable oil, and sugar consumption have increased. Vegetable oils and sugar, unlike grains, are often imported, so the region is vulnerable to global prices, which have recently risen for those commodities.

In wheat-import-dependent CIS countries, wheat prices were near record levels. Wheat flour prices were high in Kyrgyzstan due to low wheat output in 2012 and higher import prices. Wheat prices in Georgia were at record levels in early 2013—the country imports roughly 90 percent of its demand. Prices in Tajikistan, which imports roughly half of its wheat supplies, jumped 50 percent from June to October 2012 and reached record levels. Prices have leveled off since that time due to significant imports from Kazakhstan.

Longer Term Food Security Prospects Relatively Stable

The share of Asia's population that is food insecure is not projected to change significantly over the next decade—equaling 17.5 percent in 2023 compared with 17.9 percent in 2012. Asia follows North Africa as the most food-secure region of those included in this study. The region is the most populous, accounting for 63 percent of the total population of the 76 countries covered in 2023. Because of its size, the region is projected to continue to account for the largest share of the total food-insecure population—52 percent in 2023—even though a relatively low portion of the population is projected to be food insecure.

Afghanistan, North Korea, and Yemen are projected to remain the most food-insecure countries in the region in 2023. Conversely, less than 10 percent of the population is projected to be food insecure in Pakistan, Vietnam, Laos, Mongolia, and the CIS countries. In Bangladesh, Indonesia, Nepal, and Sri Lanka, just over 10 percent of the population will be food insecure.

Food insecurity is projected to remain a significant problem in India because of the challenge of improving food access for so many low-income consumers. Over the next decade, the number of food-insecure people is projected to rise about 1.2 percent per year, or about the same rate as population. The per capita distribution gap is projected to rise from 2.4 kg per capita to 2.7 kg, indicating that food consumption for those people who are food insecure is projected to slip further below the nutritional target. The relatively small per capita increase, in addition to the greater number of food-insecure people, translates into a 23-percent increase in the total distribution gap.

Asia is the least import-reliant region in this study, with imports accounting for less than 8 percent of grain consumption. Therefore, food security is highly correlated with domestic production performance. Grain output has grown about 2.5 percent per year over the past decade, the slowest of all the regions in this study. However, the region's population growth has also been the lowest of all the

regions, around 1.5 percent per year, so production growth has been able to support stable or increasing per capita consumption. Roughly three-quarters of Asian production growth can be attributed to gains in yields, and yield growth is expected to remain a key factor in gains over the next decade.

Sustaining Economic Growth Important for Food Security

The stability and further improvement in the region's food security is likely to depend heavily on the strength of the region's economies. According to the World Bank, real GDP in the South Asia region (India, Pakistan, Bangladesh, Nepal, and Sri Lanka) is estimated to grow 5.7 percent in 2013, increasing to 6.7 percent annually in 2014 and 2015. This growth is expected to be driven by demand for the region's exports, policy reform in India, and a boost in investment. Policy reform in India includes liberalization of foreign direct investment regulations, reduced fuel subsidies, efforts to improve infrastructure, and improved targeting of subsidies.

Economic growth in the East Asia and the Pacific region—including the Philippines, Indonesia, Laos, Cambodia, Mongolia, and Vietnam—is estimated to increase nearly 8 percent in 2013, but this includes China where growth is estimated to exceed that level. Growth through 2015 will be around 7.5 percent. Stability in the Euro Zone and the pace of growth in the U.S. economy will be important factors in future economic growth in South and East Asia.

Incomes, particularly in South Asia, are also dependent on remittance flows from the Persian Gulf region. South Asia accounts for 27 percent of remittances to all developing countries. Total remittances to the subregion increased to more than \$100 billion in 2012. The World Bank projects remittances to increase roughly 10 percent per year through 2015. In Nepal, these remittances accounted for 22 percent of GDP in 2012, 11 percent in Bangladesh, nearly 8 percent in Sri Lanka, and nearly 6 percent in Pakistan. Remittances are also important for East Asian countries like the Philippines (10 percent of GDP) and Vietnam (7 percent of GDP).

Income growth in the CIS countries is estimated at 3.6 percent for 2013, the slowest of all the regions included in this study. CIS countries suffer from current account deficits, unemployment, inflation, a lack of competitiveness, and structural constraints. Remittances account for more than 20 percent of GDP in Kyrgyzstan and Moldova and 45 percent in Tajikistan.

A potential threat to Asia's food security, at least at the lowest income levels, is the region's increasing income inequality. Historically, Latin America and Sub-Saharan Africa have had higher degrees of income inequality than Asia, but this appears to be changing as income disparities in Asia grow. For example, Gini coefficients (a measure of inequality where 0 indicates absolute equality and 100 absolute inequality) rose from 33 to 37 in India and from 29 to 39 in Indonesia between the early 1990s and the late 2000s. These changes are occurring in nearly all countries studied in this region. Rising income inequalities lessen gains from income growth for lower income groups. For example, India's income growth would have reduced poverty rates (defined as living below \$1.25 per day) to less than 30 percent in 2008 if income inequality had remained at rates of the 1990s. However, due to the rising inequality, poverty rates fell to just 32.7 percent. In Indonesia, the poverty rate fell to 16.3 percent, but if inequality had not changed, it would have fallen to roughly 6 percent (Asian Development Bank, 2012). These numbers translate into slowed growth in purchasing power for the lower income households, and slower improvements in food security.

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Latin America and the Caribbean

The number of food-insecure people in the Latin America and Caribbean (LAC) region is estimated to decrease slightly between 2012 and 2013. Fifty million people, or nearly 31 percent of the population in the 11 LAC countries included in this study, are estimated to consume below the nutritional target of roughly 2,100 calories per person per day. This number is projected to drop to 47 million, or 25 percent of the region's population, by 2023. Distribution gaps—the amount of food needed to raise consumption levels in food-insecure income groups to the nutritional target—are estimated to drop slightly to about 1.1 million tons in 2013. This most recent projection reflects a trend of improved food security in the region. Favorable crop conditions in 2012 led to large output levels in most countries, except in Haiti which was beset by adverse weather and is struggling to rebuild infrastructure after a devastating earthquake and years of political instability.

The group of countries with improved food security is expanding. El Salvador joined the group of relatively food-secure countries: upper middle-income countries Peru, Colombia, and Jamaica, where 10 percent or less of households are projected to be food insecure between 2013 and 2023. GDP growth has been strong in the LAC region, on average, and is expected to remain at around 4 percent through 2015.

In 2013, between 40 and 50 percent of Nicaragua's and Ecuador's populations are estimated to be consuming below the nutritional target. However, these two countries are projected to see marked improvements over the coming decade: Ecuador and Nicaragua are projected to decrease their share of food-insecure population by 20 percentage points. This strong anticipated improvement is based on estimated consumption levels that are already very close to the nutritional target. Because estimated consumption in lower income deciles is at most 7 percent below the target, only relatively small increases in food availability are required to achieve a relatively large decline in shares of food-insecure people. The results are, however, sensitive to changes in estimated production, population growth, and import capacity.

Table 9
Food availability and food gaps for Latin America and the Caribbean

Year	Grain production	Root production	Commercial imports	Food aid receipts (grains)	Aggregate availability of all food
<i>1,000 tons</i>					
2004	13,867	3,495	12,837	635	39,622
2005	14,564	3,533	13,880	772	41,478
2006	14,628	3,738	14,802	791	42,531
2007	15,988	3,877	15,323	414	43,392
2008	16,191	3,903	15,013	393	44,171
2009	16,832	4,114	15,074	392	44,737
2010	16,259	4,304	16,375	575	45,443
2011	16,408	4,281	16,731	363	46,126
2012(e)	16,967	4,350	16,513	444	46,405
Projections				Food gap*	
				NG	DG
2013	17,156	4,395	16,383	175	1,096
2018	18,321	4,625	19,748	37	859
2023	19,472	4,865	21,785	0	819

*See table 3.

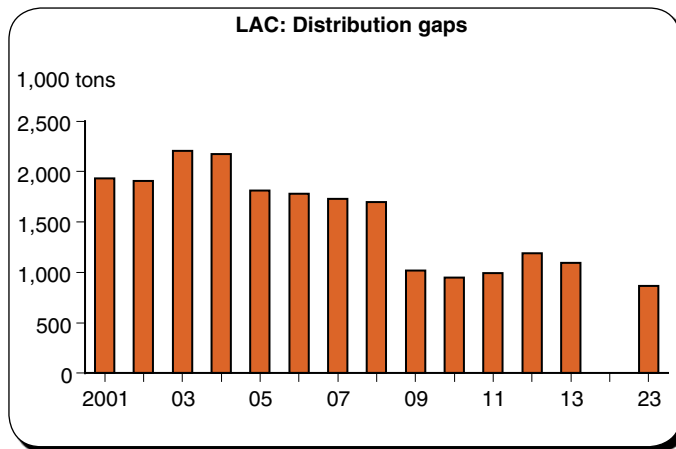
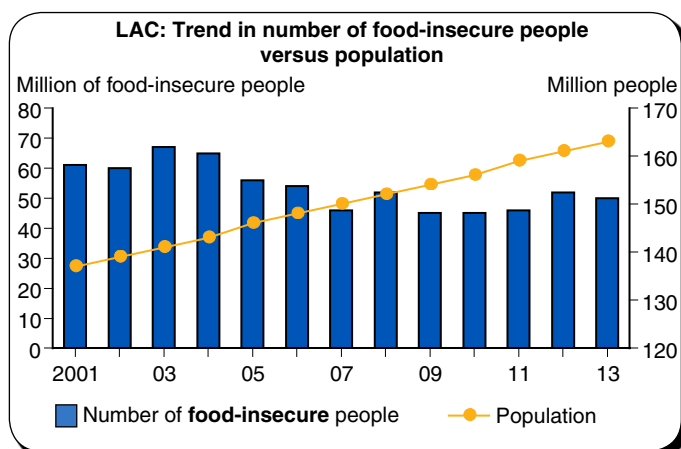
Latin America and the Caribbean

(161 million people in 2012)

Food security is projected to continue improving over the next 10 years, reducing the share of people with insufficient access to food to about one-fifth by 2022.

Progress is uneven, however. Success stories are Peru, Colombia, El Salvador, and Jamaica, where 10 percent or less of the population are projected to be food insecure.

This contrasts with projected 70 percent food insecure in Haiti, which is slowly recovering from political and natural chaos, and 60 percent in Guatemala, which has some of the most extreme income inequality in the region.



Latin America and the Caribbean: Nutritional indicators of selected countries, 2009

	Total kcal/capita/day	kcal change since 2000	Share of total consumption				Percent of recommended nutritional target		
			Grains and roots & tubers	Vegetable oil	Meat	Sugar and sweeteners	Energy ¹	Protein ²	Fat ³
	<i>Number</i>	<i>Percent</i>	<i>Percent</i>				<i>Percent</i>		
Bolivia	2,172	1.2	53	3	12	12	103	91	91
Guatemala	2,244	7.3	51	10	5	15	107	109	118
Haiti	1,979	2.6	55	10	4	10	94	89	93
Nicaragua	2,517	17.8	51	9	4	15	120	106	105
Peru	2,563	8.3	58	5	4	9	122	111	75
LAC	2,457	3.7	46	10	7	13	117	104	117

¹Recommended target 2,100 calories per capita per day.

²Based on FDA, target threshold 10 percent of diet.

³Based on American Heart Association, target threshold 20 percent of diet.

Source: USDA, Economic Research Service, FAO/FBS, WFP.

Nicaragua and Ecuador have both benefited from strong economic growth for at least the last decade and strong growth in export earnings; Nicaragua leads with 8.4-percent annual growth over the last decade. The projections assume continued income growth and the absence of weather shocks. However, the region has recently suffered from major tropical storms, including Hurricane Isaac, which caused loss of harvests and property in the summer of 2012, and Tropical Storm Sandy, which caused destruction later that year. A pattern of increasing storm activity could alter the projected improvements in food security. By 2023, assuming no major trend changes due to extreme weather events, steady increases in food availability are expected to decrease the share of food-insecure households in these countries from 40-50 percent to between 20 and 30 percent.

Haiti, the poorest country in the Western Hemisphere, continues to suffer the most from food insecurity. It has been more than 3 years since the devastating earthquake killed more than 300,000 people and affected millions more, but the food insecurity situation, while improving, is still precarious. About 90 percent of the population is estimated to be food insecure in 2013, and 70 percent are projected to remain food insecure in 2023. Haiti, as well as the Dominican Republic and Jamaica, suffered under Hurricane Isaac and Tropical Storm Sandy in 2012. High winds and rain destroyed infrastructure and crops.

In Jamaica, which imports most of its food supplies, imports have been fast outpacing exports during the last two decades, straining budgets and foreign exchange reserves. Economic growth is projected to be just 1.5 percent per year over the next 10 years. And, while Jamaica's consumption levels are estimated to be above the targets, the lowest three income deciles are estimated to exceed this threshold by less than 10 percent, so small declines in food supplies or food access can trigger food insecurity.

Guatemala is the second most food-insecure country in the LAC region, with about 70 percent of the population or about 9 million people estimated to be food insecure in 2013. Guatemala has the largest economy in Central America and relies heavily on agriculture. Tourism and remittances are other important sources of income. While Guatemala has been praised for its policy commitment to reducing food insecurity, the task ahead is made more difficult by the fact that it has one of the highest population growth rates in the region—above 2.5 percent per year—as well as one of the most skewed income distributions. However, population growth is projected to slow to 2.2 percent per year by 2023. Food production has been growing at 3.3 percent annually, faster than population, but imports have been growing even faster at 4.7 percent annually and accounted for 41 percent of supplies during 2010-12. Rising food import bills are putting pressure on budgets at a time when export earnings do not keep pace. Throughout the 1980s, export earnings were slightly ahead of the cost of imports, but by the early 1990s imports started to increase rapidly. In 2011, import costs were 50 percent higher than export earnings, thus making Guatemala more dependent on remittances and tourism income. Economic growth is projected at 3.5 percent per year, contributing to a slow improvement in consumption levels. By 2023, food insecurity is projected to improve slightly, but still affect 60 percent of the population.

Bolivia, a landlocked lower income country of 10 million people, is projected to show improvements in food security over the next 10 years, reducing its food-insecure population share from 50 to 40 percent. Unlike most of the other LAC countries covered in this region, Bolivia produces most of its grain supplies domestically, with imports accounting for just over 17 percent of supplies in 2010-12. Production growth has been strong, at an average rate of 5.7 percent per year since 1995, with slightly more than half of the increase coming from gains in yields. Government revenues have been expanding quickly in recent years and much of this revenue goes toward public investment programs. Recent

legislation increased the minimum wage as well as the wage for workers in the social sector. These measures may improve food access for those households in the lower income ranges.

In Honduras, the second poorest country in the region, about 40 percent of the population—or 3.2 million people—are estimated to be food insecure in 2013. Grain production has fallen slightly since 1995 as a result of declining crop area and stagnant yields. Grain imports, which surpassed domestic production as the major source of supply at the beginning of the 2000s, have been increasing at more than 6 percent per year since 1995. Population growth in Honduras was 2 percent in 2013, the second highest in the region, and supplies are not projected to grow enough over the coming decade to allow per capita consumption levels to increase, thus keeping food insecurity levels unchanged.

The decline in the number of food-insecure people as estimated by ERS/USDA is supported by household surveys showing a decline in the rate of poverty and indigence over the last few years (ECLAC, 2012). While the average share of persons living in poverty was 58 percent in 2001/02 (all LAC countries studied here, excluding Haiti and Jamaica, for which data are not available), this share declined to 46 percent in 2010.

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North Africa

Average food consumption in the four North African countries included in this report continues to be well above nutritional targets. Calorie intake has averaged around 3,300 calories per capita per day, a level more commonly seen in high-income countries, in part due to government policies that subsidize consumption of basic foods. Even the lowest income deciles in the countries studied in this region are estimated to have average consumption levels 25-50 percent above nutritional requirements in 2013, and consumption is projected to further increase, albeit slowly, over the next decade.

Households in the four North African countries included in this study—Algeria, Egypt, Morocco, and Tunisia—have diets that depend heavily on grains, in particular wheat. All four countries import a large share of grain supplies and, despite spikes in international grain prices, domestic prices remained fairly stable, mainly due to government policy measures. However, these subsidy programs have

Table 10
Food availability and food gaps for North Africa

Year	Grain production	Root production	Commercial imports	Food aid receipts (grains)	Aggregate availability of all food
<i>1,000 tons</i>					
2004	33,498	1,650	19,960	59	56,311
2005	31,105	1,877	26,295	51	59,993
2006	35,766	1,731	26,007	58	61,394
2007	28,114	1,619	29,751	28	63,421
2008	29,457	1,977	32,642	39	64,664
2009	39,910	2,065	30,040	21	65,983
2010	31,748	2,330	34,867	25	67,123
2011	35,194	2,729	36,787	44	68,355
2012(e)	34,112	2,573	34,816	30	68,365
Projections				Food gap*	
				NG	DG
2013	37,159	2,619	34,808	0	0
2018	39,380	2,856	41,845	0	0
2023	41,407	3,105	47,124	0	0

*See table 3.

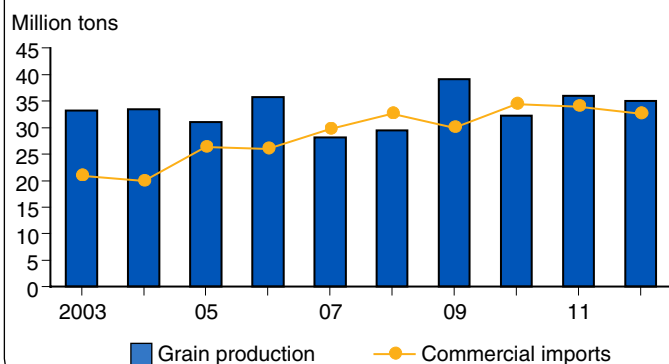
North Africa

(164 million people in 2012)

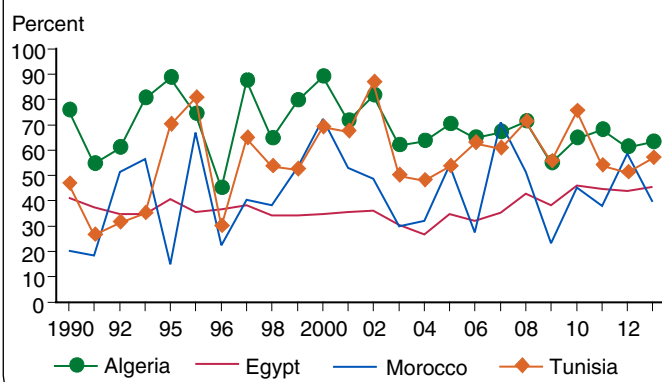
The political transition in several of the region's countries has negatively affected the economic performance because of the uncertainty and turmoil it generated. Oil-importing countries such as Egypt, Morocco, and Tunisia have seen their import bills rise, while incomes from tourism declined. Remittances and exports remained stable and were thus able to provide some relief.

If economic growth resumes and if the high level of food availability in the region continues, to be available, food security is projected to remain stable and food consumption is projected to increase over the projection period.

North Africa: Grain production and imports



North Africa: Grain imports as a share of supply



North Africa: Nutritional indicators of selected countries, 2009

	Total kcal/capita/day	kcal change since 2000	Share of total consumption				Percent of recommended nutritional target		
			Grains and roots & tubers	Vegetable oil	Meat	Sugar and sweeteners	Energy ¹	Protein ²	Fat ³
	Number	Percent	Percent				Percent		
Algeria	3,239	10.8	55	9	3	9	154	112	92
Egypt	3,349	0.9	67	3	3	7	159	116	76
Morocco	3,264	6.8	59	9	4	12	155	110	95
Tunisia	3,314	2.4	53	12	3	11	158	115	112
NA	3,292	4.3	60	8	3	10	157	113	93

¹Recommended target 2,100 calories per capita per day.

²Based on FDA, target threshold 10 percent of diet.

³Based on American Heart Association, target threshold 20 percent of diet.

Source: USDA, Economic Research Service, FAO/FBS, WFP.

become more costly during the last few years when international prices repeatedly reached record levels. Foreign exchange reserves have declined sharply, and the entire North African region has been negatively affected by the economic crisis in the Euro Zone, one of its major trading partners.

The food price spike in 2007/08 corresponded with relatively low domestic production in the region due to adverse weather, resulting in record commercial grain imports. Reliance on imports has always been high, averaging 45 percent of cereal supplies between 1980 and 2005, but this share increased above 50 percent between 2007 and 2012, at a time when the real price for wheat and corn doubled compared to the beginning of the decade.

In order to increase grain self-sufficiency, governments in North Africa have made efforts to increase domestic production and reduce imports. Programs encouraging farmers to increase area and improve yields have been implemented. Favorable government procurement prices alleviate price uncertainty and provide incentives to plant wheat. Other support programs subsidize certified seed, fertilizers, and fuel. The North African region is susceptible to drought and in order to increase wheat production governments introduced programs to improve and expand irrigation infrastructure and to make favorable loans and crop insurance available. Import taxes are used to protect domestic farmers from international competition. However, since the governments in the region are committed to low food price inflation, these import taxes have been suspended periodically to ease consumer prices whenever the international price exceeds a certain threshold.

Egypt is the largest country in the region, with 80 million people. After strong and increasing economic growth for most of the first decade since 2000, the global economic crisis and political uprisings in Egypt in 2011 resulted in a decline in per capita GDP between 2009 and 2011. Government finances are under pressure because of large budgetary food subsidy outlays, shrinking foreign currency reserves because of the high cost of food and fuel imports, and a sharp contraction of foreign direct investment (FDI) as a response to the political uncertainty and volatility. Furthermore, the economic crisis of the European Union, one of Egypt's major trading partners, hurt the entire North African region. Devaluation of the Egyptian currency has contributed to rising food inflation. Egypt's imports were 47 percent of grain supplies during 2010-12, up from 38 percent during 1990-92 and 36 percent during 2000-02. Imports have grown at an annual rate of 3.8 percent since 1990, compared to 2.5-percent growth in grain production. In response to IMF demands as a condition for future loans, Egypt announced a plan to curb its bread subsidy program by introducing a smart card pilot program in two cities later in 2013, with the intention of helping to prevent fraud and the resale of government-subsidized wheat and bread. This plan is opposed by private bakers.

The Government of Egypt aims to become less reliant on wheat imports and set a goal to produce three-quarters of its domestic wheat needs by 2015/16, mainly by increasing yields. In the short run, production increases are expected to result from area expansion in response to favorable government procurement prices. However, area is limited in Egypt due to lack of water and urban expansion. The Egyptian Agricultural Research Center is seeking to increase national average yields from 6.7 metric tons/hectare (MT/ha) to 11.5-12.5 MT/ha by using new drought-tolerant, higher yielding varieties while reducing product losses with improved transportation and storage. While average food consumption is well above target levels, the food security of the lowest income group depends on government subsidy policies that may need to be downscaled.

Algeria's grain output for 2012/13 is expected to exceed 5 million tons, the second highest on record after 2009. Algeria is committed to increasing yields, which are now around 1.5 MT/ha. While this is still far below levels found in Egypt's mostly irrigated agriculture, yields have grown close

to 4 percent per year since 1995. Yield increases are accomplished by support programs for irrigation infrastructure, interest-free loans, and increased use of certified seeds and inputs, especially fertilizers. Algeria remains highly dependent on commercial grain imports, which accounted for 65 percent of supplies in 2010-12. Algeria's mostly rainfed grain production has experienced huge swings, with a coefficient of variation—a measure of production variability, indicating by what percentage production is expected to diverge from trend—of 48.8 for 1990-2012. The current bumper crop is straining existing storage and the Government has announced plans to increase storage capacity from 1 million tons to 6 million tons.

Morocco's grain imports accounted for 48.2 percent of supplies during 2010-12. Like its neighbors, its agriculture depends on erratic rainfall (a coefficient of variation of 46 percent). In 2008, Morocco, in collaboration with the African Development Bank, introduced its "Green Morocco Plan," which aims at improving agriculture through sustainable water management. The program spans irrigation infrastructure, water governance, business climate, and energy efficiency. In 2012/13, grain production dropped below average levels due to drought, but a rebound is expected for the 2013/14 season due to abundant and widespread rains in early 2013.

Tunisia's imports as a share of grain supplies were around 60 percent in 2012, up from an average of 35 percent during 1990-92. Given the country's great production variability, import levels swing from 30 percent of grain supplies in a year with a bumper crop to 80 percent in a year of extreme drought. Tunisia's economy suffered a decline in 2011 and recovery has been slow due to lingering uncertainty and repercussions from the crisis in the European Union. However, a slow recovery in tourism income and FDI inflows may spur economic growth and sufficient foreign exchange earnings to pay for needed food imports. Assuming continued economic growth of 6 percent per year toward the second part of the projection period, Tunisia's per capita consumption should experience the strongest growth in the region, about 20 percent, through 2023.

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Appendix—Food Security Model: Definition and Methodology

The International Food Security Assessment model used in this report was developed by USDA’s Economic Research Service to project food consumption, food access, and food gaps (previously called food needs) in low- and middle-income countries through 2023. Food is divided into three groups: grains, root crops, and a category called “other,” which includes all other commodities consumed, thus covering 100 percent of food consumption. All of these commodities are expressed in grain equivalent.

Food security of a country is evaluated based on the gap between projected domestic food consumption (domestic production plus imports minus nonfood uses) and a consumption target. We include total food aid data (cereal and non-cereal food commodities) provided by the World Food Program (WFP). All food aid commodities were converted into grain equivalent based on calorie content to allow aggregation. For example: grain has roughly 3.5 calories per gram and tubers have about 1 calorie per gram.

While projection results provide a baseline for the food security situation in the countries, the results depend on the specification of the model and the underlying assumptions. Since the model is based on historical data, it implicitly assumes that the historical trend in key variables will continue in the future.

Two kinds of food gaps are estimated and projected:

1. The national average **nutrition gap**, where the objective is to maintain the daily caloric intake standard of about 2,100 calories per capita per day—depending on the region—recommended by the UN’s Food and Agriculture Organization (FAO). The caloric targets (based on total share of grains, root crops, and “other”) used in this assessment are those necessary to sustain life at a moderate level of activity.
2. The **distribution gap**, where the objective is to let each income group reach the nutritional target. If food availability in a given income group is lower than this target, that difference is part of the distribution gap for this country.

The nutrition-based food gaps assist in comparisons of relative well-being. Large nutrition-based needs mean additional food must be provided if improving nutrition levels are the main objective. The national average nutritional gap approach, however, fails to address inequalities of food distribution within a country. Those are addressed by the distribution gap.

Structural framework for estimating and projecting food consumption in the aggregate and by income group

Projection of food availability. The simulation framework used for projecting aggregate food availability is based on partial equilibrium recursive models of 76 low- and middle-income countries. The country models are synthetic, meaning that the parameters that are used are either cross-country estimates or are estimated by other studies. Each country model includes three commodity groups: grains, root crops, and “other.” The production side of the grain and root crops are divided into yield and area response. Crop area is a function of 1-year lagged returns (real price times yield) to crop production, lagged returns to substitute crops, and lagged crop area. Yield responds to input use. Commercial imports are assumed to be a function of domestic price, world commodity price,

and foreign exchange availability. Food aid received by countries is assumed constant at the base level during the projection period. Foreign exchange availability is a key determinant of commercial food imports and is the sum of the value of export earnings and net flow of credit. Foreign exchange availability is assumed to be equal to foreign exchange use, meaning that foreign exchange reserves are assumed constant during the projection period. Countries are assumed to be price takers in the international market, meaning that world prices are exogenous in the model. However, producer prices are linked to the international market through food imports and their impact on domestic supply. The projection of consumption for the “other” commodities is simply based on a trend that follows the projected growth in supply of the food crops (grains plus root crops). Although this is a very simplistic approach, it represents an improvement from the previous approach where the contribution of commodities such as meat and dairy products to the diet was overlooked. The plan is to enhance this aspect of the model in the future.

Food consumption (FC) for grains and root crops (c) is defined as domestic supply (DS) minus nonfood use (NF), where n is a country index and t is a time index.

$$FC_{cnt} = DS_{cnt} - NF_{cnt} \quad (1)$$

Nonfood use is the sum of seed use (SD), feed use (FD), exports (EX), and other uses (OU).

$$NF_{cnt} = SD_{cnt} + FD_{cnt} + EX_{cnt} + OU_{cnt} \quad (2)$$

Domestic supply of a commodity group is the sum of domestic production (PR) plus commercial imports (CI), changes in stocks (CSTK), and food aid (FA).

$$DS_{cnt} = PR_{cnt} + CI_{cnt} + CSTK_{cnt} + FA_{cnt} \quad (3)$$

Production is generally determined by the area and yield response functions:

$$PR_{cnt} = AR_{cnt} * YL_{cnt} \quad (4)$$

$$YL_{cnt} = f(LB_{cnt}, FR_{cnt}, K_{cnt}, T_{cnt}) \quad (5)$$

$$RPY_{cnt} = YL_{cnt} * DP_{cnt} \quad (6)$$

$$RNPY_{cnt} = NYL_{cnt} * NDP_{cnt} \quad (7)$$

$$AR_{cnt} = f(AR_{cnt-1}, RPY_{cnt-1}, RNPY_{cnt-1}, Z_{cnt}) \quad (8)$$

where *AR* is area, *YL* is yield, *LB* is rural labor, *FR* is fertilizer use, *K* is an indicator of capital use, *T* is the indicator of technology change, *DP* is real domestic price, *RPY* is yield times real price, *NDP* is real domestic substitute price, *NYL* is yield of substitute commodity, *RNPY* is yield of substitute commodity times substitute price, and *Z* represents exogenous policies.

The commercial import demand function is defined as:

$$CI_{cnt} = f(WPR_{ct}, NWPR_{ct}, FEX_{nt}, PR_{cnt}, M_{nt}) \quad (9)$$

where *WPR* is real world food price, *NWPR* is real world substitute price, *FEX* is real foreign exchange availability, and *M* is import restriction policies.

The real domestic price is defined as:

$$DP_{cnt} = f(DP_{cnt-1}, DS_{cnt}, NDS_{cnt}, GDP_{nt}, EXR_{nt}) \quad (10)$$

where NDS is the supply of a substitute commodity, GDP is real income, and EXR is the real exchange rate.

Estimations/projections of food consumption by income group. Inadequate access to food is the most important cause of chronic food insecurity among developing countries and is related to income level. Estimates of food gaps at the aggregate or national level fail to take into account the distribution of food consumption among different income groups. Lack of consumption distribution data for the study countries is the key factor preventing estimation of food consumption by income group. An attempt was made to fill this information gap by using an indirect method of projecting calorie consumption by different income groups based on income distribution data.⁴ It should be noted that this approach ignores the consumption substitution of different food groups by income class. The procedure uses the income/consumption relationship to allocate the total projected amount of available food among different income groups in each country (income distributions are assumed constant during the projection period).

Assuming that consumption increases with income, but at a declining rate (semi log functional form) the income/consumption relationship was specified as shown below:

$$C = a + b \ln Y \quad (11)$$

$$C = C_o/P \quad (12)$$

$$P = P_1 + \dots + P_i \quad (13)$$

$$Y = Y_o/P \quad (14)$$

$$i = 1 \text{ to } 10$$

where C and Y are known average per capita food consumption (all commodities in grain equivalent) and per capita income (all deciles), C_o is total food consumption, P is the total population, i is income deciles, a is the intercept, b is the consumption income propensity. A consumption-income elasticity, b/C , is calculated for individual countries. The parameter b was estimated based on cross-country (76 low- and middle-income countries) data for per capita calorie consumption and income. The parameter a is estimated for each country based on the known data for average per capita calorie consumption and per capita income.

Data

Historical supply and utilization data for 1990-2011 are from FAOSTAT, FAO/GIEWS, and USDA as of March 2013. Food aid data are from the UN's World Food Programme (WFP) for 1988-2011, and financial data are from the International Monetary Fund and World Bank. Population data are from the UN Population Division, 2010 Revision, medium variant. The base year data used for projections are the average for 2009-2011.

⁴The method is similar to that used by Shlomo Reutlinger and Marcelo Selowsky in "Malnutrition and Poverty," World Bank, 1978.

Endogenous projection variables:

Production, area, yield, commercial imports, domestic producer prices, and food consumption.

Exogenous projection variables:

Population—data are medium-variant United Nations population projections, 2010 Revision.

World price—data are USDA/baseline projections.

Stocks—FAO data; assumed constant during the projection period.

Seed use—USDA data; projections are based on area projections using constant base seed/area ratio.

Food exports—FAOSTAT data, projections are either based on the population growth rate or extrapolation of historical trends.

Inputs—fertilizer and capital projections are, in general, extrapolations of historical growth data from FAO.

Agricultural labor—projections are based on United Nations population projections, accounting for urbanization growth.

Net foreign credit—World Bank, is assumed constant during the projection period.

Value of exports—projections are based on World Bank (*Global Economic Prospects and the Developing Countries*, various issues), IMF (*World Economic Outlook*, various issues), or an extrapolation of historical growth.

Export deflator or terms of trade—World Bank (*Commodity Markets—Projection of Inflation Indices for Developed Countries*).

Income—projected based on World Bank report (*Global Economic Prospects and the Developing Countries*, various issues); or extrapolation of historical growth.

Income distribution—World Bank data; income distributions are assumed constant during the projection period.

Food aid—World Food Programme, kept constant at 2009-11 average.

Appendix table 1a

List of countries and their food gaps in 2013

	2013 food gaps			2013 food gaps	
	Nutrition ¹	Distribution ²		Nutrition	Distribution
	1,000 tons			1,000 tons	
Angola	0	0	Algeria	0	0
Benin	0	0	Egypt	0	0
Burkina Faso	0	9	Morocco	0	0
Burundi	336	372	Tunisia	0	0
Cameroon	0	8	North Africa	0	0
Cape Verde	0	0			
CAR	53	123	Afghanistan	473	571
Chad	0	26	Armenia	0	0
Congo, Dem. Rep.	5,113	5,559	Azerbaijan	0	0
Congo, Rep.	0	27	Bangladesh	0	36
Côte d'Ivoire	0	0	Cambodia	0	35
Eritrea	498	511	Georgia	0	0
Ethiopia	0	282	India	0	3,101
Gambia	0	5	Indonesia	0	116
Ghana	0	0	Kazakhstan	0	0
Guinea	0	0	Korea, Dem. Rep.	444	606
Guinea-Bissau	0	1	Kyrgyzstan	0	0
Kenya	0	471	Laos	0	0
Lesotho	59	84	Moldova	0	0
Liberia	19	61	Mongolia	0	7
Madagascar	0	60	Nepal	0	29
Malawi	0	0	Pakistan	0	0
Mali	0	0	Philippines	0	117
Mauritania	0	0	Sri Lanka	0	0
Mozambique	0	160	Tajikistan	0	0
Namibia	0	30	Turkmenistan	0	0
Niger	0	0	Uzbekistan	0	0
Nigeria	0	0	Vietnam	0	0
Rwanda	0	119	Yemen	230	403
Senegal	0	14	Asia	1,146	5,022
Sierra Leone	0	38			
Somalia	425	455	Bolivia	0	135
Sudan	0	112	Colombia	0	91
Swaziland	0	8	Dominican Republic	0	33
Tanzania	0	58	Ecuador	0	135
Togo	0	0	El Salvador	0	17
Uganda	0	83	Guatemala	20	247
Zambia	142	333	Haiti	155	316
Zimbabwe	38	238	Honduras	0	69
Sub-Saharan Africa	6,682	9,245	Jamaica	0	0
			Nicaragua	0	36
			Peru	0	16
			Latin America and the Caribbean	175	1,096
			Total	8,004	15,363

¹Nutrition gap: gap between available food and food needed to support a per capita nutritional standard.

²Distribution gap: amount of food needed to raise consumption in each income quintile to the nutritional standard.

Source: USDA, Economic Research Service.

Appendix table 1b

List of countries and their food gaps in 2023

	2023 food gaps			2023 food gaps	
	Nutrition ¹	Distribution ²		Nutrition	Distribution
	1,000 tons			1,000 tons	
Angola	0	0	Algeria	0	0
Benin	0	0	Egypt	0	0
Burkina Faso	0	84	Morocco	0	0
Burundi	284	328	Tunisia	0	0
Cameroon	0	11	North Africa	0	0
Cape Verde	0	0			
CAR	96	176	Afghanistan	344	508
Chad	0	149	Armenia	0	0
Congo, Dem. Rep.	7,047	7,596	Azerbaijan	0	0
Congo, Rep.	0	23	Bangladesh	0	64
Côte d'Ivoire	0	0	Cambodia	0	36
Eritrea	609	626	Georgia	0	0
Ethiopia	0	220	India	0	3,816
Gambia	0	11	Indonesia	0	115
Ghana	0	0	Kazakhstan	0	0
Guinea	0	0	Korea, Dem. Rep.	0	247
Guinea-Bissau	0	0	Kyrgyzstan	0	0
Kenya	0	547	Laos	0	0
Lesotho	0	32	Moldova	0	0
Liberia	0	39	Mongolia	0	0
Madagascar	0	223	Nepal	0	23
Malawi	0	80	Pakistan	0	0
Mali	0	12	Philippines	0	127
Mauritania	0	0	Sri Lanka	0	2
Mozambique	0	289	Tajikistan	0	0
Namibia	0	30	Turkmenistan	0	0
Niger	0	7	Uzbekistan	0	0
Nigeria	0	0	Vietnam	0	0
Rwanda	0	215	Yemen	259	496
Senegal	0	44	Asia	603	5,433
Sierra Leone	0	18			
Somalia	915	950	Bolivia	0	142
Sudan	0	61	Colombia	0	11
Swaziland	0	5	Dominican Republic	0	21
Tanzania	0	287	Ecuador	0	63
Togo	0	1	El Salvador	0	9
Uganda	20	632	Guatemala	0	229
Zambia	339	577	Haiti	0	223
Zimbabwe	0	141	Honduras	0	90
Sub-Saharan Africa	9,311	13,414	Jamaica	0	0
			Nicaragua	0	13
			Peru	0	19
			Latin America and the Caribbean	0	819
			Total	9,914	19,667

¹Nutrition gap: gap between available food and food needed to support a per capita nutritional standard.

²Distribution gap: amount of food needed to raise consumption in each income quintile to the nutritional standard.

Source: USDA, Economic Research Service.

Number of food-insecure people, 2013 and 2023

	2013	2023		2013	2023
	<i>Million</i>			<i>Million</i>	
Asia	403	448	SSA	254	373
Afghanistan	31	41	Angola	0	0
Armenia	0	0	Benin	0	0
Azerbaijan	0	0	Burkina Faso	2	7
Bangladesh	15	17	Burundi	9	11
Cambodia	4	5	Cameroon	2	3
Georgia	0	0	Cape Verde	0	0
India	255	286	CAR	4	5
Indonesia	25	27	Chad	2	9
Kazakhstan	0	0	Congo, Dem. Rep.	71	91
Korea	22	15	Congo, Rep.	2	2
Kyrgyzstan	0	0	Côte d'Ivoire	0	0
Laos	0	0	Eritrea	6	7
Moldova	0	0	Ethiopia	35	32
Mongolia	1	0	Gambia	0	1
Nepal	6	4	Ghana	0	0
Pakistan	0	0	Guinea	0	0
Philippines	20	23	Guinea-Bissau	0	0
Sri Lanka	0	2	Kenya	26	34
Tajikistan	0	0	Lesotho	2	1
Turkmenistan	0	0	Liberia	3	3
Uzbekistan	0	0	Madagascar	7	15
Viet Nam	0	0	Malawi	0	7
Yemen	24	28	Mali	0	2
			Mauritania	0	0
LAC	50	47	Mozambique	10	16
Bolivia	5	5	Namibia	1	1
Colombia	5	5	Niger	0	2
Dominican R.	3	2	Nigeria	0	0
Ecuador	8	5	Rwanda	7	11
El Salvador	1	1	Senegal	1	3
Guatemala	11	12	Sierra Leone	3	2
Haiti	9	8	Somalia	10	13
Honduras	3	4	Sudan	9	6
Jamaica	0	0	Swaziland	0	0
Nicaragua	2	1	Tanzania	10	27
Peru	3	3	Togo	0	1
			Uganda	7	35
North Africa	0	0	Zambia	11	18
Algeria	0	0	Zimbabwe	9	8
Egypt	0	0			
Morocco	0	0	Total	707	868
Tunisia	0	0			

Source: USDA, Economic Research Service.

Country indicators

Region and country	Population, 2013	2013 Population annual growth rate	Grain production		Annual root production growth, 1990-2011	Projected annual growth in supply, 2011-2023
			Annual growth, 1990-2012	Coefficient of variation, 1990-2012		
	1,000		<i>Percent</i>			
North Africa:						
Algeria	36,984	1.4	4.3	48.8	6.3	2.2
Egypt	85,378	1.7	2.5	17.4	4.2	1.9
Morocco	32,926	1.0	1.8	45.9	2.8	2.9
Tunisia	10,814	1.0	1.1	38.8	3.0	2.0
Central Africa:						
Cameroon	20,914	2.2	3.6	23.9	4.2	2.1
Central African Rep.	4,667	2.0	5.0	31.2	1.5	1.7
Congo, Dem. Rep.	71,420	2.7	0.2	3.6	-1.3	2.2
Congo, Republic	4,324	2.1	6.6	40.7	2.8	1.4
West Africa:						
Benin	9,607	2.7	4.6	30.4	5.5	1.5
Burkina Faso	18,012	3.0	3.7	27.7	5.2	1.8
Cape Verde	510	1.0	-2.9	74.4	0.7	1.4
Chad	12,142	2.6	6.2	52.8	1.5	0.2
Côte d'Ivoire	21,057	2.2	0.6	5.4	2.8	2.2
Gambia	1,874	2.7	5.6	40.4	-1.5	2.8
Ghana	26,131	2.3	3.2	24.5	5.0	1.4
Guinea	10,754	2.6	5.4	35.6	2.7	2.1
Guinea-Bissau	1,613	2.1	1.5	17.7	4.3	2.6
Liberia	4,349	2.4	5.4	48.4	3.9	2.9
Mali	16,808	3.0	5.4	43.7	13.8	2.7
Mauritania	3,704	2.2	1.5	30.0	1.2	1.9
Niger	17,240	3.6	4.2	34.2	1.7	1.8
Nigeria	170,901	2.6	1.5	10.9	4.2	1.9
Senegal	13,454	2.6	2.3	29.1	11.2	2.3
Sierra Leone	6,255	2.1	3.5	42.6	5.8	2.5
Togo	6,413	2.1	3.7	24.9	2.6	1.4
East Africa:						
Burundi	8,911	1.9	0.1	7.6	0.7	2.3
Eritrea ¹	5,748	3.0	3.8	58.2	-3.4	2.5
Ethiopia ¹	88,356	2.1	7.0	41.8	4.0	2.1
Kenya	43,924	2.7	1.1	13.9	3.4	2.7
Rwanda	11,608	3.0	5.8	54.7	6.7	2.9
Somalia	10,053	2.6	-1.0	35.2	4.2	1.4
Sudan	46,823	2.4	1.6	28.5	5.2	2.2
Tanzania	49,153	3.1	3.4	28.0	0.6	2.9
Uganda	36,759	3.2	2.9	19.7	3.5	2.2

See footnotes at end of table.

Continued—

Country indicators—continued

Region and country	Macroeconomic indicators					
	Per capita GNI 2011	Per capita GDP growth, 2011	GDP growth, 2011	Export earnings growth, 2011	Official develop- ment assistance as a share of GNI, 2011	External debt present value as a share of GNI, 2011
	<i>U.S. dollars</i>	<i>Percent</i>				
North Africa:						
Algeria	4,470	1.0	2.5	-3.0 '09	0.1	3.4
Egypt	2,600	0.1	1.8	2.6	0.2	15.7
Morocco	2,970	3.5	4.5	1.9	1.3	29.4
Tunisia	4,020	-3.1	-2.0	-3.9	1.5	50.4
Central Africa:						
Cameroon	1,210	2.0	4.2	11.5	2.5	12.2
Central African Rep.	480	1.3	3.3	3.6	12.4	26.5
Congo, Dem. Rep.	190	4.1	6.9	21.0	38.4	37.9
Congo, Republic	2,250	1.0	3.4	18.1	2.4	23.1
West Africa:						
Benin	780	0.7	3.5	3.0 '10	9.3	19.5
Burkina Faso	580	1.1	4.2	61.4	9.5	23.8
Cape Verde	3,540	4.1	5.0	24.2 '10	13.3	55.5
Chad	720	-1.0	1.6	-3.2 '06	4.9	21.4
Côte d'Ivoire	1,090	-6.7	-4.7	2.1	6.2	52.1
Gambia	500	-6.9	-4.3	17.6	15.6	43.6
Ghana	1,410	11.8	14.4	19.4	4.8	29.8
Guinea	430	1.5	3.9	0.2 '10	4.5	65.6
Guinea-Bissau	600	3.5	5.7	--	12.3	29.2
Liberia	330	5.9	9.4	--	53.6	42.9
Mali	610	-0.3	2.7	3.4 '07	12.3	29.1
Mauritania	1,030	1.6	4.0	26.4	9.2	70.8
Niger	360	-1.2	2.3	--	10.9	23.7
Nigeria	1,280	4.7	7.4	--	0.8	6.1
Senegal	1,070	-0.1	2.6	3.1	7.4	30.6
Sierra Leone	460	3.7	6.0	-2.0	14.6	48.2
Togo	570	2.7	4.9	10.7	15.5	18.1
East Africa:						
Burundi	250	1.9	4.2	37.4	24.8	26.9
Eritrea ¹	430	5.5	8.7	-2.3 '07	6.3	40.8
Ethiopia ¹	370	5.0	7.3	2.7	11.8	27.2
Kenya	820	1.6	4.4	6.7	7.4	30.4
Rwanda	570	5.1	8.3	47.7	20.2	17.5
Somalia	..	..	..	..	..	..
Sudan	1,310	2.2	4.7	23.0 '08	1.9	0.0
Tanzania	540	3.3	6.4	27.5	10.4	42.6
Uganda	510	3.3	6.7	13.2	9.6	23.5

See footnotes at end of table.

Continued—

Country indicators—continued

Region and country	Population, 2013	2012 Population annual growth rate	Grain production		Root production growth 1990-2011	Projected annual growth in supply 2012-2023
			Annual growth, 1990-2012	Coefficient of variation, 1990-2012		
	1,000		Percent			
Southern Africa:						
Angola	20,714	2.7	6.7	45.8	11.8	1.8
Lesotho	2,240	1.0	-3.7	47.7	3.2	2.9
Madagascar	22,555	2.9	3.5	27.2	1.6	2.5
Malawi	16,407	3.3	5.2	42.5	15.6	2.1
Mozambique	25,028	2.3	7.7	45.0	3.3	2.3
Namibia	2,404	1.7	3.1	33.6	2.8	1.3
Swaziland	1,237	1.4	-2.1	30.5	1.2	1.3
Zambia	14,315	3.1	4.5	50.8	3.6	2.8
Zimbabwe	13,328	2.4	-1.8	39.9	3.5	3.5
South Asia:						
Afghanistan	34,500	3.3	3.8	34.3	1.6	2.7
Bangladesh	154,394	1.3	3.5	24.1	8.2	1.5
India	1,275,138	1.3	1.6	12.0	3.7	1.2
Nepal	31,536	1.7	2.4	16.9	6.2	1.7
Pakistan	183,189	1.8	2.8	18.9	5.7	1.5
Sri Lanka	21,394	0.8	2.8	22.8	-1.9	1.0
Yemen	26,358	3.1	0.5	21.9	2.7	2.7
East/Southeast Asia:						
Cambodia	14,656	1.2	7.2	48.7	21.4	2.0
Indonesia	247,188	1.0	2.2	16.6	1.9	1.8
Korea, Dem. Rep.	24,654	0.4	-2.1	39.0	5.9	0.7
Laos	6,459	1.3	6.4	43.7	4.6	1.6
Mongolia	2,888	1.5	-2.7	60.7	3.8	2.6
Philippines	98,113	1.7	2.8	20.9	-0.4	1.8
Vietnam	90,657	1.0	4.2	26.6	5.5	1.5
Central Asia:²						
Armenia	3,118	0.3	2.2	22.8	2.7	1.3
Azerbaijan	9,533	1.2	5.5	35.0	13.0	1.2
Georgia	4,278	-0.6	-1.4	29.2	-1.2	2.6
Kyrgyzstan	5,503	1.0	0.8	14.5	8.4	1.9
Moldova	3,496	-0.7	-0.7	26.1	-3.0	3.5
Tajikistan	7,184	1.5	8.4	45.3	12.8	2.5
Turkmenistan	5,235	1.3	3.6	42.8	16.9	1.5
Uzbekistan	28,398	1.1	6.7	36.6	7.6	2.2
Latin America and the Caribbean:						
Bolivia	10,410	1.6	5.1	36.2	0.7	1.6
Colombia	48,165	1.3	1.1	13.5	0.2	2.6
Dominican Republic	10,309	1.2	2.8	20.9	1.4	1.3
Ecuador	15,061	1.3	1.8	15.9	-1.8	1.3
El Salvador	6,303	0.6	1.0	12.4	0.3	0.7
Guatemala	15,528	2.6	1.2	18.4	3.7	2.1
Haiti	10,388	1.3	1.1	18.4	1.7	2.3
Honduras	8,072	2.0	-0.7	11.4	3.8	1.3
Jamaica	2,771	0.4	-3.8	38.8	-2.7	1.0
Nicaragua	6,042	1.5	3.9	26.3	3.8	0.9
Peru	30,075	1.1	5.3	32.8	5.2	1.7

See footnotes at end of table.

Continued

Country indicators—continued

Region and country	Macroeconomic indicators					
	Per capita GNI, 2011	Per capita GDP growth, 2011	GDP growth, 2011	Export earnings growth, 2011	Official development assistance as a share of GNI, 2011	External debt present value as a share of GNI, 2011
	<i>U.S. dollars</i>	<i>Percent</i>				
Southern Africa:						
Angola	3,830	1.1	3.9	--	0.2	23.4
Lesotho	1,210	3.1	4.2	7.1	9.0	27.1
Madagascar	430	-1.9	1.0	0.0 '09	4.2	28.4
Malawi	360	1.1	4.3	4.6	14.5	22.3
Mozambique	460	4.7	7.1	4.2	16.3	32.1
Namibia	4,700	3.0	4.8	0.4	2.4	0.0
Swaziland	1,310	2.2	4.7	0.0	1.9	0.0
Zambia	1,160	2.1	6.5	0.0 '07	6.1	24.7
Zimbabwe	660	7.8	9.4	17.7	7.4	64.8
South Asia:						
Afghanistan	470	2.9	5.7	--	35.0	19.6 '08
Bangladesh	780	5.4	6.7	29.3	1.2	22.6
India	1,420	4.9	6.3	15.3	0.2	18.3
Nepal	540	2.1	3.9	-2.1	4.7	20.8
Pakistan	1,120	1.1	3.0	2.4	1.6	27.3
Sri Lanka	2,580	7.1	8.3	11.0	1.0	41.0
Yemen	1,070	-13.2	-10.5	0.0	1.5	20.5
East/Southeast Asia:						
Cambodia	820	5.8	7.1	18.9	6.5	35.3
Indonesia	2,940	5.4	6.5	13.6	0.1	26.0
Korea, Dem. Rep.	..	..	..	..	..	..
Laos	1,130	6.5	8.0	14.5	5.2	80.3
Mongolia	2,310	15.7	17.5	28.1	4.3	32.7
Philippines	2,210	2.2	3.9	-4.2	-0.1	33.6
Vietnam	1,270	4.8	5.9	12.2	3.0	49.1
Central Asia:²						
Armenia	3,360	4.3	4.6	5.0	3.5	68.3
Azerbaijan	5,290	-0.3	1.0	3.6	0.5	14.9
Georgia	2,860	6.2	7.0	..	3.9	79.1
Kyrgyzstan	900	4.7	6.0	15.7	9.2	0.0
Moldova	1,980	6.5	6.4	28.6	6.0	72.0
Tajikistan	870	5.9	7.4	6.2	5.5	51.6
Turkmenistan	4,800	13.3	14.7	42.5 '06	0.1	2.0
Uzbekistan	1,510	5.4	8.3	5.2 '05	0.5	17.8
Latin America and the Caribbean:						
Bolivia	2,020	3.5	5.2	5.9	3.3	27.6
Colombia	6,070	4.5	5.9	11.4	0.4	24.3
Dominican Republic	5,240	3.1	4.5	8.8	0.4	28.8
Ecuador	4,200	6.3	7.8	8.2	0.3	25.1
El Salvador	3,480	0.9	1.5	9.3	1.3	53.5
Guatemala	2,870	1.3	3.9	5.4	0.9	35.9
Haiti	650 '09	-6.6	-5.4	-7.4	45.5	14.6
Honduras	1,980	1.6	3.6	6.0	3.8	28.5
Jamaica	-	0.0	0.0	..	0.4	98.8
Nicaragua	1,510	3.6	5.1	5.8	7.6	101.0
Peru	5,150	5.6	6.8	8.8	0.4	25.8

¹= data start in 1993. ²= data start in 1992.

GNI = gross national income.

-- = data unavailable or not applicable due to inconsistent data set.

Source: Population = FAOSTAT, UN 2010 revision (medium variant), Macroeconomic indicators = World Development Indicators online (as of May 2013), World Bank.