

## Food Security Review

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ERS research shows that in 2005, 777 million people were food insecure in 70 lower income countries. Our projections indicate a 14-percent increase in this number in the next decade, with the situation becoming particularly severe in the poorest countries. Ironically, most of the hungry live in rural areas, where food is produced. Food security is dependent on food availability, food access (ability to purchase food), and proper food utilization, which is affected by many factors such as safe water, education, and health. Food insecurity can be either temporary or chronic, and overcoming each requires a different set of strategies. The reasons for food insecurity are many: war, poverty, inadequate agricultural technology, inappropriate policies, high population growth, environmental degradation, and poor health.

Noticeably absent from that list, however, is large-scale food scarcity. The growth rate in food production worldwide—nearly 3 percent per year during the last decade—has surpassed the population growth rate, leading to increased food availability per person. This abundance, however, is distributed unevenly. Many low-income countries do have difficulty producing adequate supplies of food and are thus food insecure at the national level. But more widespread is inequality in food consumption within countries—the result of uneven purchasing power, which can afflict even the highest income countries such as the United States.

At the World Food Summit in November 1996, 186 countries committed themselves to reducing the number of undernourished people by half by 2015. Donors pledged to provide support, in particular, in the area of technological transfers. The commitment to providing food aid was also reinforced. Ten years later, there is growing concern about the slow progress toward meeting the goal. There are many cases of failure that raise questions about the effectiveness of the strategies adopted and the adequacy of the resources devoted to meeting the challenge. These failures have dire implications for millions of people. Despite the gloomy overall picture, there are many success stories of countries achieving improvements that appeared very unlikely a decade ago.

This report provides an overview of the food security indicators developed by ERS and compares them with other complementary global indicators. This is followed by an examination of the forces that have shaped food production and consumption trends, and an evaluation of the likely changes in food security using alternative scenarios. The final section presents the projections for 2015 (see box, “How Food Security is Assessed: Methods and Definitions”).

### ***Food Availability and Access Are the Basic Elements of Food Security***

Daily per capita calorie consumption and its change over time are one measure of nutritional well-being closely connected with food security. Changes in food production affect changes in consumption because most of the food is consumed where it is produced. Access has two components:

## How Food Security Is Assessed: Methods and Definitions

Commodities covered in this report include grains, root crops, and a group called “other” which is the remainder of the diet. The three groups account for 100 percent of all calories consumed in the study countries and are expressed in grain equivalent. The conversion is based on calorie content. For example: grain has roughly 3.5 calories per gram and tubers have about 1 calorie per gram. One ton of tubers is therefore equivalent to 0.29 ton of grain (1 divided by 3.5), and one ton of vegetable oil (8 calories per gram) is equivalent to 2.29 tons of grain (8 divided by 3.5).

Food consumption and food access are projected in 70 lower income developing countries—37 in Sub-Saharan Africa, 4 in North Africa, 11 in Latin America and the Caribbean, 10 in Asia, and 8 in the Commonwealth of Independent States (see Appendix for a detailed description of the methodology and definitions of terms and Appendix table 1 for a list of countries). The projections are based on 2002-2004 data. The periods covered are 2005 (current), 2010 (5-year forecast), and 2015 (10-year forecast). Projections of food gaps for the study countries through 2015 are based on differences between consumption targets and estimates of food availability, which is domestic supply (production plus commercial and food aid imports) minus nonfood use. The estimated gaps are used to evaluate food security of the study countries.

The **food gaps are calculated using two consumption targets:** 1) maintaining base per capita consumption or status quo (SQ), which is the amount of food needed to support 2002-2004 levels of per capita consumption; and 2) meeting nutritional requirements (NR), which is the gap between available food and food needed to support a minimum per capita nutritional standard (for definitions of terms used see Appendix). Comparison of the two measures, either for countries, regions, or the aggregate, indicates the two different aspects of food security: consumption stability and meeting the nutritional standard.

The aggregate food availability projections do not take into account food insecurity problems due to food distribution difficulties within a country. Although lack of data is a major problem, an attempt was made in this report to project food consumption by different income groups based on income distribution data for each country. The concept of the income-consumption relationship was used to allocate the projected level of food availability among different income groups. The estimated “distribution gap” measures the food needed to raise consumption in each income quintile to the minimum nutritional requirement. Finally, based on the projected population, the number of people who cannot meet their nutritional requirements is projected.

The common terms used in the reports are: **domestic food supply**, which is the sum of domestic production and commercial and food aid imports; **food availability**, which is food supply minus nonfood use such as feed and waste; **import dependency**, which is the ratio of food imports to food supply; and **food consumption** which is equal to food availability.

access to the domestic market that is determined by income level and income distribution, and access to the international market that is determined by the ability to import.

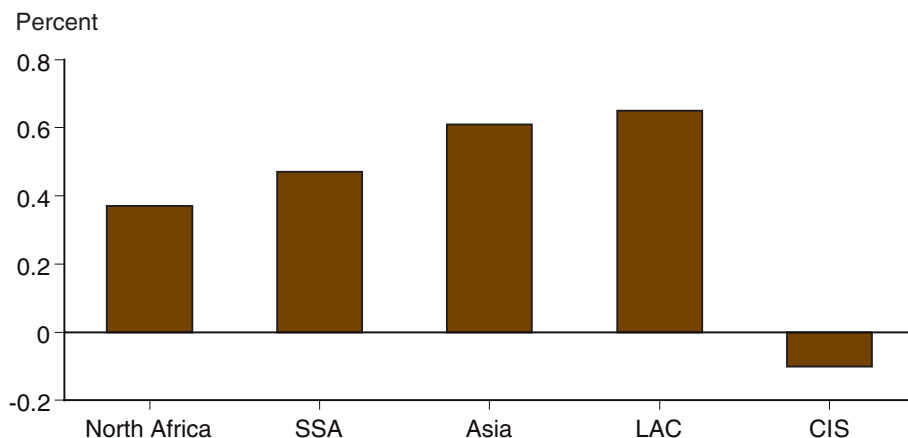
### **Trends in Food Consumption**

Per capita calorie consumption at the global level has increased 0.4 percent per year since 1992, and in 2002 was roughly 2,800 calories. Consumption in developed countries grew at a slower rate during that time, but was still significantly higher than the world average, measuring over 3,300 calories in 2002. While growth in consumption in the developing world exceeded that at the world level (fig. 1), absolute intake levels were still lower than the global average, equaling about 2,660 calories in 2002. The 70 study countries consumed an average of 2,360 calories per capita per day in 2002, 11 percent lower than the average for all developing countries and almost 30 percent lower than the average of the developed countries (fig. 2).

In North Africa, calorie consumption increased at a slower rate than the developing-country average, but actual consumption levels are much higher than those in the rest of the developing world. Consumption in the region is only about 5 percent below levels in developed countries. The problem of food insecurity in North Africa is one of great variability in food supplies due to susceptibility to losses from drought. While per capita consumption in Asia, Latin America and the Caribbean (LAC), and the Commonwealth of Independent States (CIS) is roughly equal at more than 2,400 calories, consumption growth rates differ widely, with Asia and LAC far ahead of the CIS region. Sub-Saharan Africa (SSA) has by far the lowest intake levels of the study countries. Per capita consumption in the region averaged only 2,200 calories in 2000-02. Within this region there are large variations. Eritrea, Burundi, and the Democratic Republic of Congo have an average per capita consumption of less than 1,700 calories, which indicates severe food insecurity. Nigeria and Mauritania, on the other hand, have surpassed 2,700 calories.

Figure 1

#### **Growth in calorie consumption between 1990 and 2002**

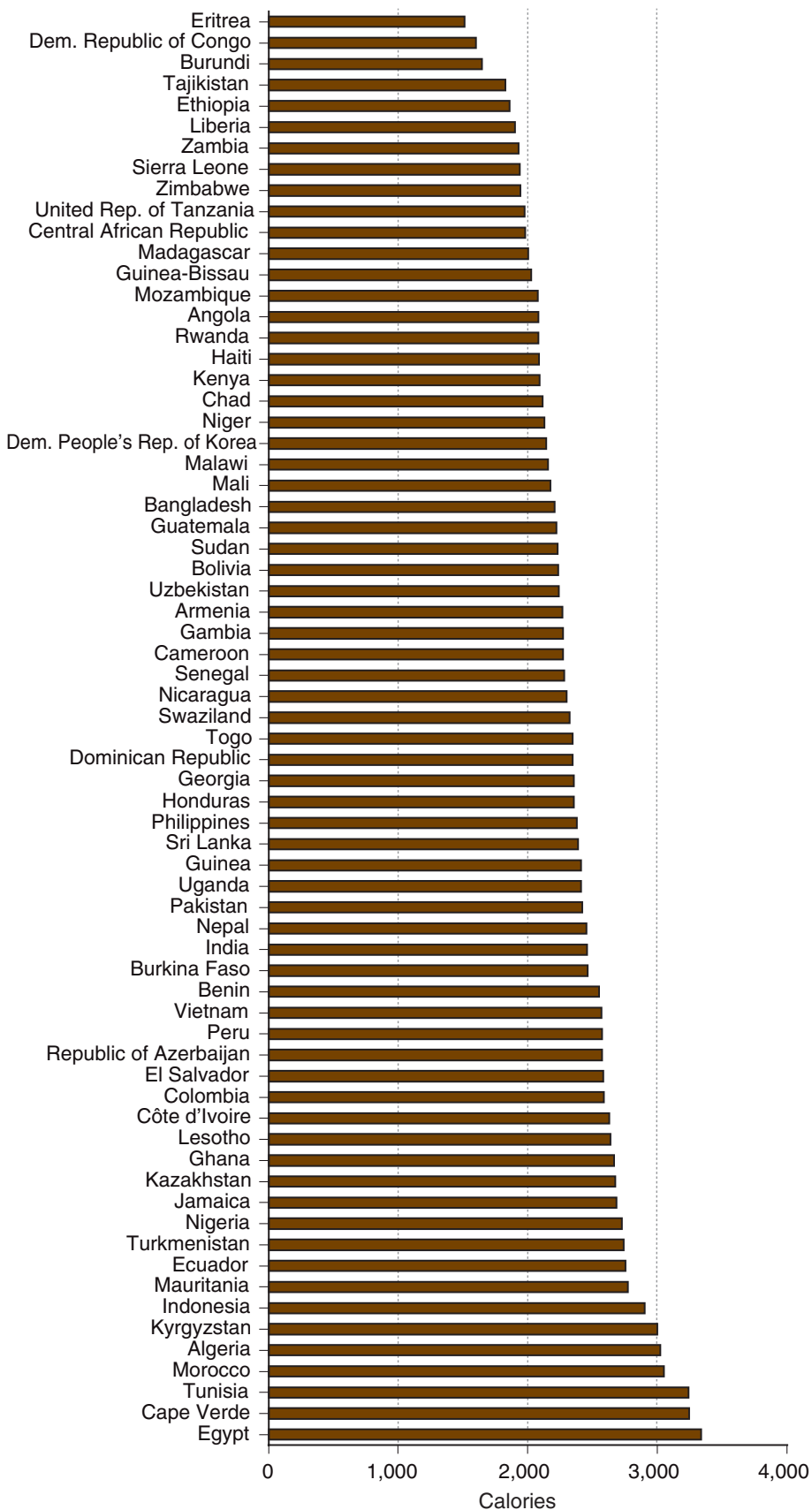


Note: SSA = Sub-Saharan Africa; LAC = Latin America and the Caribbean; CIS = Commonwealth of Independent States.

Source: USDA, Economic Research Service, using data from FAOSTAT, (<http://faostat.fao.org>).

Figure 2

**Daily per capita calorie consumption in 2002**



Source: USDA, Economic Research Service, using data from FAOSTAT, (<http://faostat.fao.org>).

Most of the countries studied in this report had positive per capita consumption growth over the last decade. Only 14 out of 70 countries experienced declines. Progress is slowest in SSA, with 0.4-percent growth per year. Growth was higher in Asia and the LAC regions—0.6 percent. In the CIS region, Kazakhstan, Tajikistan, and Uzbekistan faced a serious contraction in consumption, while steady growth was the norm in Armenia, Azerbaijan, and Georgia.

Grains account for the bulk of the consumption in the study countries. In North Africa, grains comprise the largest share of the diet—58 percent in recent years. This share has held steady over the last two decades. The most notable change with respect to diet composition in the region has been the increase in the shares of fruits and poultry meat, although these shares remain negligible relative to the overall diet.

While grains account for the largest share of the diet in SSA, this share is lower than that for other developing countries—less than half. The reason for this is the high level of consumption of low-priced roots and tubers. The share held by this group—more than 16 percent—far exceeds that of any other world region. Mirroring the change in the rest of the world, the share of vegetable oils in the diet increased notably over time and reached 8.6 percent in 2000-02, thus surpassing the developing-country average.

In the Asian study countries, the share of grains in the overall diet was about 63 percent. In Bangladesh, Nepal, and Vietnam, this share exceeds 70 percent. Rice accounts for the bulk of these cereals. As in the other regions, consumption of vegetable oils has risen as a share of the total diet, now at more than 6 percent. The shares held by meat and milk also increased considerably, reflecting rapidly rising incomes in several of the countries. In Vietnam, for example, the meat share of the diet increased more than 40 percent in the last decade to 8.5 percent in 2000-02.

In the LAC countries, grains comprise a much smaller share of the diet than other developing countries—roughly 40 percent. Conversely, the sugar share is the largest in the world at more than 16 percent. Again, consistent with the pattern observed in other regions, the vegetable oils share has jumped considerably and now accounts for more than 10 percent of calories consumed. Another notable change is the increase in meat consumption, particularly that of poultry. This reflects higher incomes in countries such as the Dominican Republic, Ecuador, and Guatemala.

During the last decade, the countries of the CIS region were in transition from state-controlled economies to market-based economies and many of the consumer and producer subsidies they enjoyed were eliminated. As a result, there were vast changes in the production sectors and, in turn, in consumption patterns. Therefore, it is difficult to draw any definitive conclusions from trends in the data. In general, the grain share of the diet has risen considerably. Prior to the breakup of the Soviet Union, grains accounted for less than 40 percent of the diet in these countries. In recent years, this share was closer to 60 percent. During the same time, the shares declined for sugar and meats. Meat and sugar production and consumption were subsidized during the Soviet era, thus resulting in higher consumption. When markets were liberalized, meat production and consumption fell.

## **Review of Production Performance**

As indicated above, cereals remain the key component of consumption in most of the study countries. In most cases, the bulk of these cereals come from domestic production rather than imports. As a result, production performance plays an important role in the food security of the countries. Since 1990, Sub-Saharan Africa (SSA) had the highest growth in grain production—1.65 percent per year—but this growth was outstripped by the region's high population growth. In fact, all regions except Asia experienced negative per capita growth in grain production. In Asia, grain production and population growth rates were virtually identical. In SSA, nearly 90 percent of the growth in production came from area expansion. The region's yields are the lowest in the world, measuring about one-third of the world average. In the other regions, yields were the driving force behind the growth. In fact, yield growth in Asia accounted for 97 percent of production growth. In the other regions, area devoted to grains actually declined through the 1990s. The yield growth was realized as a result of increased fertilizer use, adoption of higher yielding varieties, or increased irrigation. Many developing countries are close to their maximum technical potential for growing crops. Therefore, maintaining recent growth rates will be unlikely in these areas with current technologies and practices. However, in many countries—particularly those in SSA—potential exists for improved productivity. In order to achieve these goals, these countries must promote investment in agricultural research, education, and rural infrastructure.

## **Imports**

Domestic food production is less critical to food security if countries can import required foods. For low-income, food-insecure countries, however, financial constraints severely limit their ability to do this. These countries depend on imports not only for food, but for other essential commodities like fertilizers, fuels, medicine, and essential manufacturing inputs and products. These nonfood items can comprise a large share of the total import bill. In Sub-Saharan Africa (SSA), for example, fuel imports were about 14 percent of the total value of imports in 2002. Given the current hike in oil prices, these countries must make hard choices in importing commodities.

Of the regions studied in this report, North African countries spend the largest share of import budgets on food, 15 percent in 2001-02. The SSA countries devoted 14 percent of import budgets to food, and Latin American and Caribbean countries spent 10 percent of their import budgets on food in 2001-02. These import shares have not changed much through time. In the Commonwealth of Independent States (CIS) countries, the share of food in import budgets dropped from 55 percent in 1992-93 to 8 percent in 2001-02. The reason for this significant decline is both a rebound in domestic production and a more than twofold expansion of import budgets during this period. In the Asian countries, food captured just 5 percent of the total import budget for much of 1992-2002.

Therefore, with the exception of the CIS countries where food markets have undergone a major transition, the food share of total imports has remained stable. This pattern holds despite the differences in import budget growth



among regions. On average, there is almost a one-to-one relationship between growth in food imports and total import budgets in the regions studied. This means that foreign exchange earnings will largely determine whether imports can contribute to food security in these countries. Food import prices, of course, are critical. Given the constant share of food import value in total imports, any increase in food prices would mean a reduction in the quantity of food imports and, in turn, a reduction in food available for consumption.

Food aid has been a major means by which the international community improves food access and reduces food insecurity in low-income countries. The global quantity of food aid has fluctuated during the last two decades, and its share has declined relative to both total exports from food aid suppliers and total food imports to low-income countries. The share of food aid in total cereal imports was around 18 to 20 percent in the early 1990s, but has since declined to about 7 percent in 2002. SSA and Asian countries have been by far the largest recipients of food aid, receiving more than 60 percent of the volume during the last 15 years.

### ***Purchasing Power and Access To Food***

Hunger in many of these lower income countries is primarily a result of households having insufficient resources to purchase the food they need from available food supplies. This is a function of both the level of income and its distribution among households. Average gross national income (GNI) per capita in 2003 was \$727 for the 70 countries studied. This is about 57 percent of the average for the low- and middle-income countries. Incomes in these countries vary considerably, from GNI per capita as low as \$90 in Burundi and Ethiopia to \$2,980 in Jamaica. North Africa and Latin America and the Caribbean (LAC) have the highest average per capita GNI at \$1,718 and \$1,650, respectively. The 37 countries in Sub-Saharan Africa (SSA) have an average per capita GNI of \$381 per year, less than half the average in Commonwealth of Independent States countries and 40 percent lower than the Asian countries included in this study, which have the second lowest average income.

Even in countries in Southeast Asia and the LAC region, where per capita income is relatively high, poverty and hunger continue to be major problems. Income inequality is measured by the Gini index that ranges from 0 to 1, with 1 indicating perfect income inequality. Income inequality among the study countries ranges from a low of 0.27 in Uzbekistan to a high of 0.63 in Lesotho. The degree of inequality also varies by region, with Asia having the lowest rate of inequality at 0.36 and LAC, at 0.49, the highest.

While the Gini index measures the degree of income inequality, it provides no insight into its determinants. For the low-income countries, the size and productivity of the agricultural sector is an important factor in income inequality. Most of the poor live in the rural areas and they depend greatly on the agriculture sector for employment and income.

Overall, income inequality compounds the problems of chronic hunger in low-income countries. Increasing the growth rate of the economy and devel-

opment of the rural/agricultural sector can reduce inequality in income distribution. These results are important to countries that are not only faced with income distribution problems, but also have very low per capita income.

### ***Review of Food Security Progress of the Last Decade***

As mentioned earlier in this report, the objective of the World Food Summit of 1996 was to reduce the number of hungry people by half by 2015. With only 10 years left to reach this goal, we focus on the progress made so far. Obviously, there is great variation within and among regions with respect to rates of success or failure.

We use 1992-94 as our base reference point—a period of time prior to the 1996 Summit. We then compare that base period to the most recent 3-year average of our historical data—2002-04. We use two criteria: changes in the number of hungry people (or the number of people who fall short of consuming the nutritional target of 2,100 calories per day), and changes in the distribution gap (or the amount of food needed by income groups within a country to meet the nutritional requirement), which is an indicator of the severity of food insecurity. The countries included in this report are low- and middle-income countries with a population of close to 3 billion people or about 46 percent of the world population in 2005. The countries are in North Africa (4 countries with about 150 million people), Sub-Saharan Africa (SSA) (37 countries with about 690 million people), Asia (10 countries with 1.89 billion people), Latin America and the Caribbean (LAC) (11 countries with about 150 million people) and the Commonwealth of Independent States (CIS) (8 countries, close to 74 million people).

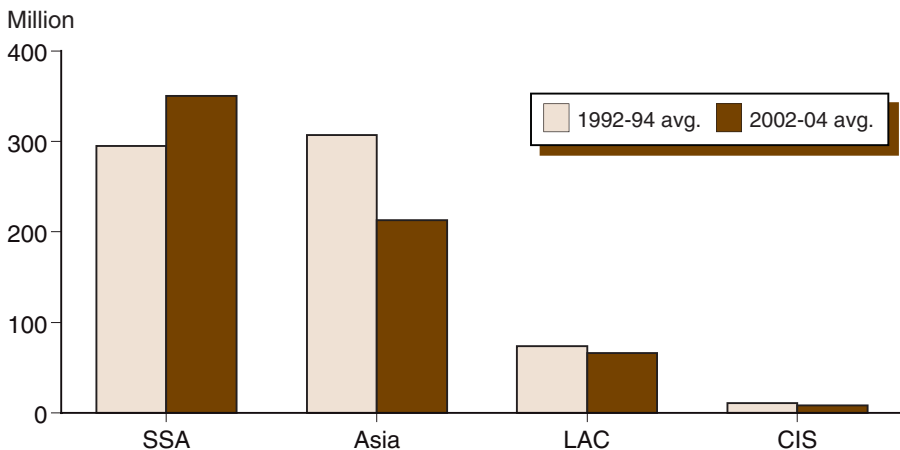
For the 70 countries, on average, there has been a slight—7 percent—decline in the number of hungry people: from 688 million to 639 million between 1992-94 and 2002-04. With the exception of SSA, all regions experienced a decrease in the number of hungry people during this 10-year time frame (fig. 3). According to the data, the largest decrease occurred in North Africa. This result should be put in the context of the fact that, in most years, there are no hungry people in the region—calorie consumption, on average, equals that of the high-income countries in Europe. However, the climate in Algeria and Morocco is volatile and severe drought often cuts the production of staple crops by more than half leading to a surge of hunger among the poorest segment of population. This happened during 1992-94 in Morocco and again during 1999-2000. These shocks are, in general, followed by consumption recovery, as was the case during 2002-04. This means that the hunger situation in these countries is transitory and what seems like a decline in the number of hungry people in the region is in actuality a recovery from a weather-induced shortfall.

Both Asia and the CIS regions experienced a 30-percent drop in the number of hungry people. In the CIS, this result was due principally to improvements in three countries: Armenia, Azerbaijan, and Georgia. In Azerbaijan—where grains account for nearly 60 percent of the diet—grain production nearly doubled between 1992-94 and 2002-04. Armenia and Georgia also experienced smaller increases in grain production, but it was the decline in popula-



Figure 3

**Number of hungry people: Change during the last decade\***



\* North Africa is not included because, according to our assessment, there is not a significant number of hungry people in the region.

Note: SSA = Sub-Saharan Africa; LAC = Latin America and the Caribbean; CIS = Commonwealth of Independent States.

Source: USDA, Economic Research Service.

tion that contributed most significantly to rising per capita food supplies in the countries. In Armenia, population declined about 1 percent per year during this period. In Georgia, the decline was even greater.

In Asia, the decline in the number of hungry people was largely driven by successes in Bangladesh and Vietnam. In Bangladesh, per capita food consumption increased roughly 2 percent per year from 1992-94 and 2002-04; as a result, the number of hungry people in the country declined 70 percent. During this time, grain output grew more than 3 percent per year and a rapidly growing export sector—which resulted in increased export earnings—supported strong import growth. Most of the gains in agriculture were a result of increased productivity rather than expansion of area. Bangladesh is one of the most densely populated countries in the world and therefore there is little room to increase area. Policy reform undertaken by the government to encourage private sector involvement in the supply and trade of inputs such as irrigation equipment, seeds, and fertilizer had a positive impact on the sector. For example, irrigated area has increased nearly 50 percent during the last decade. Also during this time, Bangladesh’s food supplies were boosted by higher imports which were made possible by its strong export performance; export earnings tripled during the last decade. Textiles account for more than half of the country’s export earnings and guaranteed textile quotas protected Bangladesh from competition with China and India. However, these quotas were removed in early 2005, which may make it difficult for the country to compete with its Asian neighbors.

Vietnam enjoyed even higher growth in per capita consumption—2.5 percent—than Bangladesh. All indicators support the sustainability of Vietnam’s progress. As a result, the country has more than achieved the goal of the World Food Summit in that the number of hungry people fell from an average of nearly 19 million in 1992-94 to close to zero in 2002-04. Grain production expanded rapidly at more than 4 percent per year from 1990

through the present. At the same time, population growth slowed and averaged around 1.5 percent per year. The dramatic growth in the agricultural sector occurred at a time when the economy was moving from a centrally planned system to one that was more market oriented. The country evolved from a food importer to a major food exporter at the global level. This growth, coupled with gains in the oil and textile industries, allowed for strong growth in imports, further expanding food supplies. Revenues from oil—which account for more than 20 percent of the country’s export earnings—increased as global prices strengthened through the 1990s to the present.

The number of hungry people in the LAC region has varied slightly over time, but there has been no discernible trend across the region as a whole. However, there are success stories among individual countries, most notably the Dominican Republic. This country has met the World Food Summit goal as the number of hungry people was cut in half from 1992-94 to 2002-04. During this time, export earnings grew more than threefold. This allowed for an increase in imports, and, in turn, food supplies. Once dependent on sugar, the country has diversified its economy and export sector by promoting mining, manufacturing, and tourism. The experience of Peru is also noteworthy because of the major policy changes during the last decade that brought prosperity for large segments of the population. Although Peru’s economy faltered by the end of the 1990s, policy initiatives in the early 2000s are expected to revitalize the situation.

Despite strong growth in food production, SSA is the only region where the number of hungry people has risen—over 19 percent—during the last decade. In 2002-04, roughly 350 million people, more than half of the region’s population, fell into this category. The region’s production of grains and root crops (staple foods) grew at a rate of 2.4 percent per year, much higher than the growth achieved in the Asian countries (1.7 percent) or LAC countries (1.9 percent). However, SSA’s high population growth, relative to other regions, negated these gains in production. While population growth has slowed from historical levels, it is still by far the highest of all the regions included in this study—2.6 percent per year since 1992. In contrast, in Asia and LAC, population growth was, on average, roughly 1.8 percent per year. Moreover, SSA’s import capacity is more limited by financial constraints than other regions, thereby increasing the dependency on domestic production. Roughly 90 percent of the region’s food supplies come from domestic production.

There were a handful of countries in the SSA region, however, where improvements did occur and the number of hungry people actually fell. These countries include Angola, Mozambique, and Ghana. Angola has far exceeded the goal of the World Food Summit. According to ERS estimates, in 1992-94, consumption for the entire country—roughly 12 million people at the time—was below the nutritional requirement. By 2002-04, however, consumption was below that target for only about 3 million people. This progress was achieved during a time when the country reached a peace agreement following more than two decades of civil war. As a result of the new-found security and stability, food production and export earnings rose considerably. For example, grain area harvested nearly doubled between 1992-94 and 2002-04, resulting in nearly 6-percent annual growth in grain

output. Roots are a staple of the diet, accounting for more than one-third of all calories consumed. During this same time period, root crop output roughly tripled as area harvested and yields soared. Oil accounts for the bulk of the country's export earnings and the combination of political stability and higher oil prices led to considerable earnings growth and thus allowed for higher food imports.

The experience in Mozambique mirrors that of Angola. The end of a long-standing civil war in 1992—coupled with strong growth in food production and import capacity—led to marked progress toward food security. In 1992-94, consumption for the entire population of roughly 15 million was estimated to have fallen below the nutritional requirement. By 2002-04, this was the case for only a third of the population. During this time, production of corn, a significant part of the country's diet, increased more than 10 percent per year as area harvested doubled and yields rose. Production of another important crop—roots—nearly doubled during this time. Export earnings have more than tripled since 2000 as a depreciated currency has made the country's exports relatively less expensive. Expanded output, coupled with record-level prices, has boosted earnings of aluminium, which now account for more than half of the country's total export earnings. Production of cashews—an important export crop that suffered during the war—is now at a 25-year high.

One of the key factors that influenced the achievements of Angola and Mozambique is that both countries benefited from strong support of donors during their peace process. For Mozambique, external assistance accounts for 86 percent of gross domestic capital formation and in Angola it accounts for 12 percent. In Angola, foreign direct investment related to the oil industry also played a key role in economic recovery of the country.

In contrast, Ghana's success in food security was achieved during peacetime as the country gained external support by demonstrating improvement in governance. In Ghana, the number of hungry people fell from an average of 10 million in 1992-94 to roughly 4 million in 2002-04. This was achieved through increased import capacity as well as a reduction in population growth. Export earnings have doubled in the last decade due to a depreciating currency, which has made the country's exports more competitive, and a strengthening of prices for major exports. Gold and cocoa comprise nearly two-thirds of the country's export earnings. The price of gold has increased nearly 50 percent since 2000. While the price of cocoa has not matched that growth, it has generally risen during the last decade. Also contributing to the increase in food supplies on a per capita basis was a slowdown in population growth over the last decade—from an annual rate of 2.75 percent to 2.2 percent.

### ***Growth Needed to Cut Hunger***

Hunger and poverty are highly correlated, and food insecurity tends to be deep in the lowest income group in the study countries. As discussed earlier, the food security situation has deteriorated in many countries during the last decade. In this section, we used the 1992-94 food consumption level of the lowest income group in these vulnerable countries as a benchmark, and esti-

mated the consumption growth required to meet the World Food Summit (WFS) goal. We then compared that growth to actual growth during the last decade. The estimation of the consumption growth requirement was based on two scenarios: the consumption growth that is mainly achieved by increasing food production, and the consumption growth that is achieved by growth in food imports.

In Latin America and the Caribbean, Honduras is the only country where the situation deteriorated between 1992 and 2004. Grain production peaked in the mid-1990s, then decreased an average of 2.4 percent per year due to a decline in area planted. Area was shifted into other commodities including fruits, vegetables, potatoes, beans, and oilseeds. Honduras, like other countries in the region, has grown increasingly reliant on imports to compensate for production shortfalls. Between 1992 and 2004, grain imports grew nearly 11 percent per year. However, to move toward cutting hunger in half by 2015, imports would have had to have grown at nearly twice that rate, an unlikely scenario.

The Democratic Republic of Congo is one of the most vulnerable countries in the world with respect to food security. Per capita calorie consumption was 1,600 in 2002. Between 1992 and 2004, grain production fell 0.5 percent per year largely due to political instability which disrupted agricultural activities. In order for the country to move toward the WFS goal, production would have had to grow over 1 percent per year. During the 1980s, output grew roughly 2 percent per year, so the target growth rate was not unattainable. On the other hand, the required import growth of over 9 percent per year far exceeded actual growth of 3.3 percent.

Another vulnerable country in Sub-Saharan Africa is Ethiopia. Following the end of the civil war in 1992 and the return of farmers to their land, grain production expanded rapidly—by 5.4 percent per year. However, production would have to grow by over 7 percent per year in order to cut hunger in half by 2015. Imports account for only a small share of Ethiopia's food supplies and most imports are in the form of food aid. Therefore, meeting the WFS goal through imports is not a viable option.

Per capita consumption in Tanzania declined almost 1 percent per year from 1992 through 2004. Grain production growth of 1.5 percent per year—well below the projected 2.6-percent rate needed to reach the WFS target—was not sufficient to offset high population growth. The situation in Madagascar was nearly identical, only population growth was even higher at nearly 3 percent per year and production growth was slightly lower.

In Zambia, a decline in area growth and stagnant yields led to a slow decline in grain output between 1992 and 2004. Grain output growth needed to exceed 2 percent per year to move toward the WFS goal. Imports declined by more than 2 percent annually, so meeting the goal with higher imports was not realistic.

The estimated domestic production growth rates needed to reach a trend line to meet the WFS goal were within a reasonable range (i.e., either these growth rates were realized by the country at an earlier period or achieved by other countries with similar market structures). In contrast, the estimated

import growth rates required to meet the WFS goal are much higher than the range realized by many of the countries, mainly because of financial constraints. Agricultural products, which constitute the bulk of exports from food-insecure countries, are faced with weak global demand leading to declining price trends. However, the fact that the domestic production growth rates needed to meet WFS are within the expected range is a positive factor. Agriculture is the main source of employment and income of the poor. Any rebound in agricultural performance will have a widespread positive impact on global hunger.

### **Assessments from Other Organizations**

Other reports, while varying in scope and methodology, agree that success in food security and reduction in poverty is not distributed evenly. East and Southeast Asia, the regions with the largest absolute number of hungry and poor people, have made the greatest strides in improving food security. Sub-Saharan Africa, however, the region with the largest share of hungry and poor people, has seen little or no improvement.

The United Nations Food and Agriculture Organization (FAO) publishes an annual report, “The State of Food Insecurity in the World,” which compares current estimates with the baseline estimate from 1990-92. It then projects the number of hungry people in 2015, based on past trends. For 2000-02, FAO estimated the number of hungry people to be 852 million, just 19 million less than 10 years earlier. World population increased by 800 million during that time and it can be considered a success that the number of hungry people declined. However, the decline is not sufficient to reach the World Food Summit goal by 2015.

The Millennium Project is an effort by the United Nations aimed at providing guidelines that make it possible to reach the Millennium Development Goals. There are eight Goals, the first of which is to eradicate extreme poverty and hunger. The Project’s report indicates that the world poverty rate has been reduced from almost 1.5 billion people (or 28 percent of global population) to 1.1 billion (21 percent) over the last decade. These estimates present the most optimistic view on the rate of progress made over the last decade and, based on this rate of success, they predict that the number of extremely poor people (those who live on less than \$1 a day) could indeed be halved by 2015.

### **Prospects (10 years out)**

As mentioned above, at the aggregate level, there was an improvement—albeit slight—in food security in the time period starting in 1992, just before the proclamation of the World Food Summit (WFS), through the current period. This is not the case for the projection period, however. Between the 2002-04 base period and the 2015 target, ERS results indicate a 10-percent increase in the distribution gap (the amount of food needed to raise consumption in each income group to the nutritional target) and a 16-percent jump in the number of hungry people (see box, “How Food Security is Assessed: Methods and Definitions”). If these projections are realized, the goal of the

WFS will not come close to being met. It should be noted, however, that there are large variations in these results among countries and regions (fig. 4).

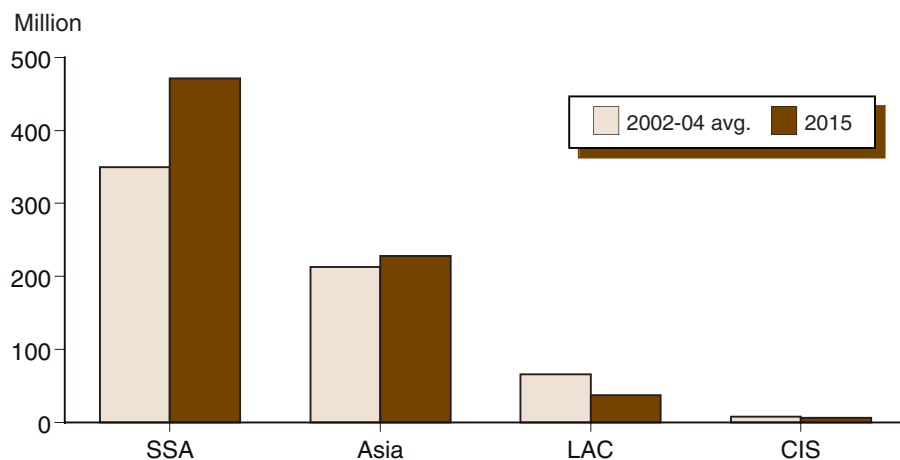
The greatest improvement in food security is projected for the Latin America and Caribbean region. ERS projects a continuation of the positive trend achieved between 1992 and 2004, and as a result, the WFS goal is projected to be met in this region. In 1992-94, there were an estimated 74 million hungry people in the region. By 2015, this number is expected to be cut in half to 37 million. The distribution gap is projected to fall by 32 percent between 2002-04 and 2015. The Dominican Republic and Peru are expected to continue on the path established between 1992 and 2004 and to meet the WFS goal. In fact, the Dominican Republic is expected to eliminate food gaps, as is El Salvador. Both countries are continuing to benefit from large inflows of foreign exchange, which have expanded import capacity. Other countries expected to meet the WFS goal are Bolivia, Colombia, and Ecuador. In contrast, the food security situation is projected to deteriorate significantly in Haiti, where political instability has resulted in limited agricultural and economic growth. The situation is not expected to change drastically in the near term.

The food security situation in the North African region is expected to remain good, although drought continues to be a threat. When drought occurs in this region, production can fall 50 percent and sometimes as much as 80 percent. At these times, imports are required to compensate for the shortfall. In most cases, these countries have the import capacity to fill the gap. However, a decline in oil prices or political instability could increase their vulnerability. Thanks to extensive irrigation, Egypt is the only country in the region that is not vulnerable to consumption shortfalls due to drought.

A slight improvement in food security is projected for the Commonwealth of Independent States region. Both Kazakhstan and Uzbekistan are expected

Figure 4

**Number of hungry people: Present versus future\***



\* North Africa is not included because, according to our assessment, there is not a significant number of hungry people in the region.

Note: SSA = Sub-Saharan Africa; LAC = Latin America and the Caribbean; CIS = Commonwealth of Independent States.

Source: USDA, Economic Research Service.



to eliminate their food gaps. Despite slow growth in production, per capita consumption is projected to rise in Kazakhstan due to stagnating population growth. Uzbekistan's growth in grain production will not match the rapid historical rates of 9 percent per year. However, it will still be strong enough to enable an increase in per capita consumption such that consumption across all income groups will exceed the nutritional target. The food security situation in Tajikistan, which performed poorly between 1992 and 2004 with per capita consumption declining 3.6 percent per year, is projected to deteriorate slightly through 2015. Both the distribution gap and the number of hungry people in the country are projected to rise.

The food security situation in Asia is projected to remain virtually unchanged through the next decade, at the aggregate level. The number of hungry people is projected to rise nominally from 214 million in 2002-04 to 228 million in 2015. Obviously, there will be material changes at the country level. Bangladesh, Indonesia, the Philippines, Sri Lanka, and Vietnam are projected to meet the goals set at the World Food Summit. In fact, all but the Philippines are expected to eliminate their food gaps by 2015. The food security situation is projected to deteriorate in Afghanistan, India, and North Korea. Despite the expected continued recovery in Afghanistan's agricultural sector, growth will not be sufficient to compensate for the high population growth rate of 3.6 percent per year. In the case of India, the deterioration will be relatively slight. In 1992-94, consumption even in the lowest 10 percent of the population was very close to the nutritional target. Therefore, very few people were considered hungry in 2002-04. By 2015, consumption in the lowest 10 percent will fall just short of the target and, as a result, 124 million people will be considered hungry. In North Korea, the agriculture sector suffered along with the economy as a whole during the last decade. Continued financial difficulties are expected to hinder growth in the sector during the decade and, as a result, per capita consumption is projected to decline. By 2015, we project that approximately 60 percent of the population will consume below the nutritional target.

The food security situation in Sub-Saharan Africa (SSA), already the most vulnerable region, is expected to deteriorate even further. The number of hungry people in the region is projected to reach 471 million in 2015, marking a 34-percent increase from 2002-04. The distribution gap is projected to increase 19 percent during the same time period. The greatest declines are expected in Rwanda, Uganda, Angola, Benin, Burkina Faso, Cape Verde, Mauritania, Niger, and Senegal. Even among this group there are some countries where this trend is of more concern than others. Projections of a steady decline in per capita grain production in countries such as Rwanda, Mauritania, and Niger signal a clear food security problem. In all three cases, by 2015, approximately 80 percent of the population in these countries will be considered hungry if current trends go unchanged.

In Rwanda, per capita consumption is projected to decline roughly 1 percent per year through the next decade. The country's agricultural sector is constrained by two main factors: land shortages and low yields. Expansion of arable land is not feasible because the country has the highest population density in Africa. In addition, farming is dominated by smallholders who cannot afford the fertilizer necessary to raise yields. Mauritania is 80

percent desert and therefore unfavorable for agriculture. As a result, the country depends heavily on imports to boost food supplies. Growth in export earnings—more than half of which come from the mining sector—has been minimal, thereby constraining import growth. These factors, combined with very high population growth of 2.8 percent per year, are expected to result in a 2.6-percent annual decline in per capita consumption in the next decade. Niger's population growth is projected at 3.3 percent per year, one of the highest growth rates in the world. This is a poor country that has seen almost no area expansion in recent years for grains—the staple of the diet—and has among the lowest yields in the world. Assuming current trends continue, per capita consumption in the country will decline roughly 1 percent per year through 2015.

There are some potential success stories in the region, however. Most notable are Ghana and Mozambique. These two countries have made progress during the last decade and they are expected to continue on this path. As a result, they will exceed the WFS goal. Approximately 10 million people in Ghana were considered hungry in 2002-04. This number is expected to fall to 3 million by 2015. In Mozambique, the decline is expected to be even more precipitous—from 15 million in 2002-04 to 2 million in 2015. Both countries are expected to benefit from relative strong export sectors, continued growth in grain output, and population growth rates of under 2 percent per year.

In sum, progress toward achieving the WFS goal has been constrained by slow growth in domestic food production, inadequate financial capacity to import, and income inequality. The projection results also show that the study countries as a group would fail to reach the WFS goal in 10 years, and for SSA the food security situation is expected to deteriorate. The projection results do not take into account any positive shocks (such as a major increase in investment) or negative shocks (such as financial breakdown or political unrest in the countries). During the last 10 years, several countries have made remarkable and unforeseen progress in reducing their hunger situations. The case studies of Ghana, Peru, and Vietnam in the following section of this report clearly show that improvements in food security are not constrained by shortcomings in economic structure and resource base.

Table 1

**Food availability and food gaps for 70 countries**

Year	Grain production	Root production (grain equiv.)	Commercial imports (grains)	Food aid receipts (grain equiv.)	Aggregate availability of all food
			<i>1,000 tons</i>		
1996	434,335	62,887	53,987	6,203	690,781
1997	423,638	64,842	58,956	6,458	697,399
1998	440,877	66,169	64,262	7,629	714,966
1999	455,478	71,157	65,054	8,586	745,897
2000	455,840	73,060	66,290	8,700	744,808
2001	472,856	75,422	64,578	9,601	772,191
2002	445,405	76,186	75,215	8,284	784,792
2003	488,817	78,676	64,752	8,595	806,191
2004	487,176	81,307	70,979	7,257	812,734
<b>Projections</b>				<b>Food gap*</b>	
				SQ	NR
2005	488,687	81,679	77,411	<b>5,974</b>	<b>12,977</b>
2010	549,073	88,791	89,961	<b>7,815</b>	<b>15,012</b>
2015	605,044	96,427	104,145	<b>12,153</b>	<b>16,719</b>

\*SQ stands for status quo and describes the amount of grain equivalent needed to support 2002-2004 levels of per capita consumption. NR stands for nutritional requirements and describes the amount of grain equivalent needed to support nutritional standards.

Source: USDA, Economic Research Service, using data from FAOSTAT (<http://faostat.fao.org>).

Table 2

**Food availability and food gaps for North Africa**

Year	Grain production	Root production (grain equiv.)	Commercial imports (grains)	Food aid receipts (grain equiv.)	Aggregate availability of all food
			<i>1,000 tons</i>		
1996	33,267	1,465	16,578	193	42,739
1997	22,439	1,192	20,691	137	45,243
1998	26,699	1,261	20,084	74	42,986
1999	24,476	1,202	21,590	105	46,078
2000	21,312	1,224	24,530	356	46,034
2001	25,442	1,239	23,989	82	47,192
2002	24,852	1,402	27,456	72	51,967
2003	31,903	1,583	19,365	46	49,448
2004	32,521	1,559	22,280	58	50,572
<b>Projections</b>				<b>Food gap*</b>	
				<b>SQ</b>	<b>NR</b>
2005	26,331	1,588	25,080	0	0
2010	32,029	1,735	29,907	0	0
2015	34,120	1,891	35,216	0	0

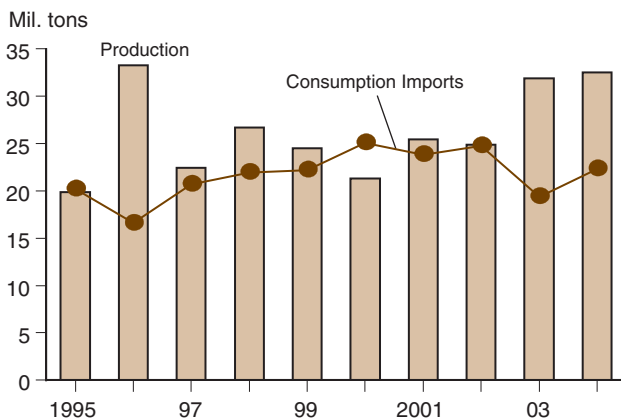
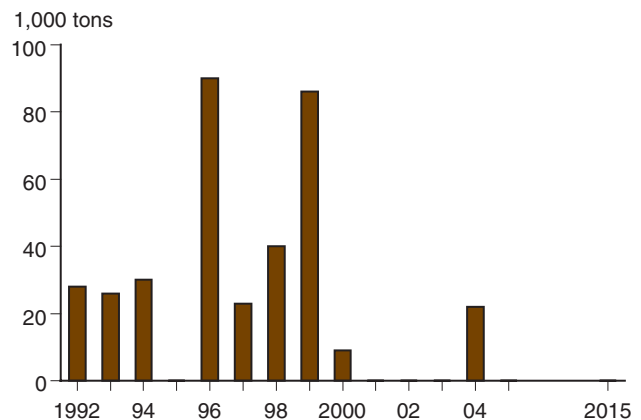
**North Africa**

(146 million people in 2005)

Calorie consumption, on average, is well above the nutritional requirement of 2,100 calories per day.

Although production growth is projected to slow relative to the historical period, food supplies will be adequate to meet nutritional requirements through the next decade.

Imports contribute about 45 percent of food supplies and the share is projected to increase. Therefore the state of the economies of these countries and export potential play a key role in the food security outlook.

**North Africa: Grain production and imports****North Africa: Distribution gaps****North Africa: Consumption trends**

	Daily calorie consumption		Annual growth in calorie consumption	Share of cereals in diet	
	1992	2002	1992-2002	1992	2002
<b>North Africa</b>	<b>3,081</b>	<b>3,162</b>	<b>0.34</b>	<i>Percent</i>	
Algeria	3,011	3,022	0.22	59.9	57.8
Egypt	3,198	3,338	0.45	56.8	56.6
Morocco	2,918	3,052	0.18	65.7	63.3
Tunisia	3,199	3,238	0.48	62.4	62.1
				55.4	50.7

\*SQ stands for status quo and describes the amount of grain equivalent needed to support 2002-2004 levels of per capita consumption. NR stands for nutritional requirements and describes the amount of grain equivalent needed to support nutritional standards.

Source: USDA, Economic Research Service, using data from FAOSTAT (<http://faostat.fao.org>) and World Food Program.

Table 3

## Food availability and food gaps for Sub-Saharan Africa (SSA)

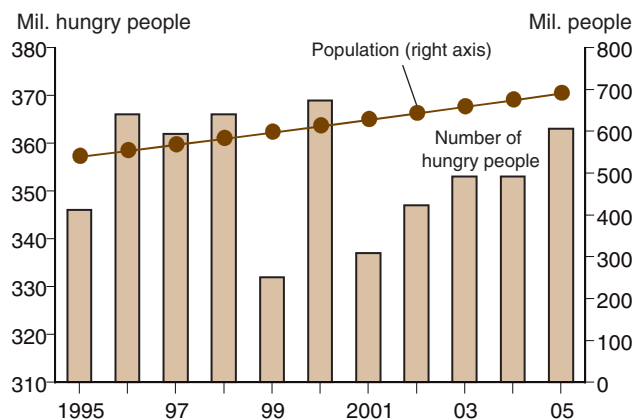
Year	Grain production	Root production (grain equiv.)	Commercial imports (grains)	Food aid receipts (grain equiv.)	Aggregate availability of all food
			<i>1,000 tons</i>		
191996	68,799	41,364	7,581	2,707	138,503
1997	63,592	42,701	9,894	2,497	140,215
1998	71,237	45,493	11,775	2,837	152,091
1999	67,570	47,734	9,587	2,690	151,437
2000	68,512	49,084	11,105	4,027	156,844
2001	73,849	50,880	13,213	3,722	168,339
2002	68,158	50,745	14,477	3,225	167,662
2003	75,829	51,710	12,147	5,495	176,747
2004	77,242	53,858	16,053	3,941	184,246
<b>Projections</b>				<b>Food gap*</b>	
				<b>SQ</b>	<b>NR</b>
2005	80,389	54,117	15,167	4,471	12,362
2010	92,359	59,034	16,215	7,259	14,189
2015	106,200	64,328	17,390	11,198	15,292

### Sub-Saharan Africa (690 million people in 2005)

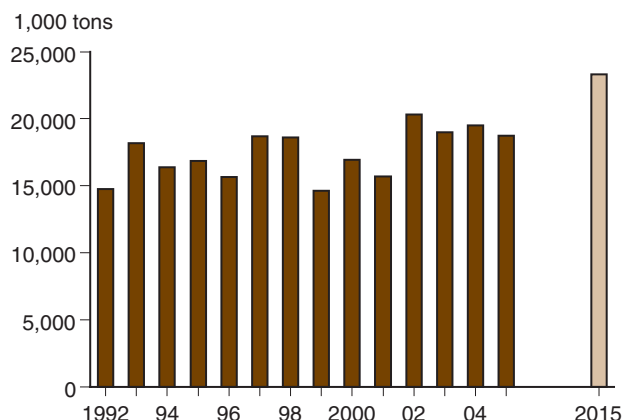
At the regional level, per capita consumption is projected to increase nominally through the next decade. However, at the national level, it will decline in 9 of the 37 countries.

The number of hungry people in the region is projected to rise from 363 million in 2005 to 471 million in 2015. This means that more than half of the region's population will consume less than their nutritional requirements throughout the next decade.

### Sub-Saharan Africa: Trend in number of hungry people versus population



### Sub-Saharan Africa: Distribution gaps



### Sub-Saharan Africa: Consumption trends

	Daily calorie consumption		Annual growth in calorie consumption	Share of cereals in diet	
	1992	2002	1992-2002	1992	2002
<b>Sub-Saharan Africa</b>	<b>2,162</b>	<b>2,207</b>	<b>0.40</b>	<i>Percent</i>	
Angola	1,793	2,083	1.64	48.6	48.1
Kenya	1,913	2,090	1.13	29.1	31.6
Senegal	2,193	2,280	0.10	47.2	47.7
Sudan	2,168	2,228	0.20	63.5	59.5
Tanzania	1,983	1,975	0.13	59.6	52.9
Zambia	1,901	1,927	-0.04	47.4	51.3
Zimbabwe	1,912	1,943	0.57	65.0	63.7
				61.7	53.5

\*SQ stands for status quo and describes the amount of grain equivalent needed to support 2002-2004 levels of per capita consumption. NR stands for nutritional requirements and describes the amount of grain equivalent needed to support nutritional standards.

Source: USDA, Economic Research Service, using data from FAOSTAT (<http://faostat.fao.org>) and World Food Program.

Table 4

## Food availability and food gaps for Asia

Year	Grain production	Root production (grain equiv.)	Commercial imports (grains)	Food aid receipts (grain equiv.)	Aggregate availability of all food
			<i>1,000 tons</i>		
1996	303,603	16,277	16,194	1,834	455,055
1997	307,099	17,183	14,001	2,591	457,123
1998	317,150	15,644	17,048	3,223	463,976
1999	328,699	17,988	19,510	4,259	488,907
2000	333,637	18,374	16,715	3,070	485,308
2001	335,920	18,778	13,574	4,209	496,995
2002	311,374	19,398	18,437	3,345	499,797
2003	341,385	20,660	18,181	2,289	517,676
2004	339,115	21,011	18,163	2,278	517,101
<b>Projections</b>				<b>Food gap*</b>	
				<b>SQ</b>	<b>NR</b>
2005	342,069	20,993	20,901	<b>1,469</b>	<b>226</b>
2010	380,337	22,584	23,260	<b>443</b>	<b>453</b>
2015	416,871	24,278	24,377	<b>665</b>	<b>897</b>

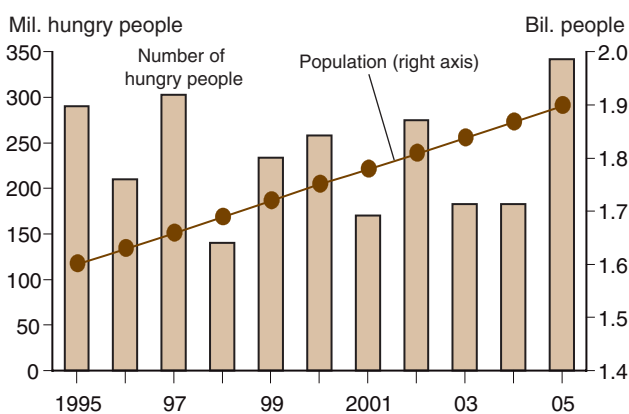
### Asia

(1,898 million people in 2005)

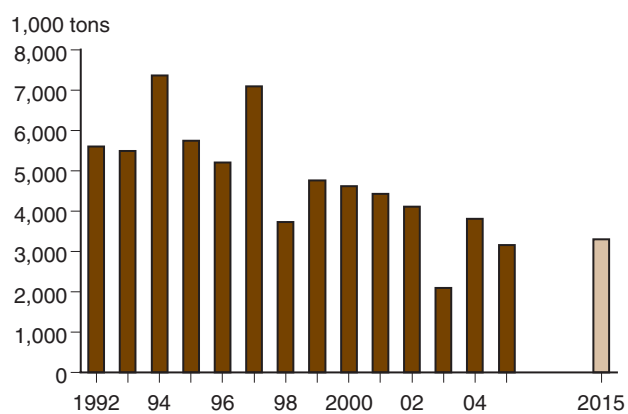
The number of hungry people in Asia is projected to decrease from 342 million people in 2005 to 228 million people in 2015. Twenty percent of India's population of 1.25 billion are projected to be hungry in 2015, which accounts for almost 55 percent of the number of hungry people in the region.

The most vulnerable country in the region is Afghanistan where roughly 80 percent of the country's population is projected to be hungry in 2015.

### Asia: Trend in number of hungry people versus population



### Asia: Distribution gaps



### Asia: Consumption trends

	Daily calorie consumption		Annual growth in calorie consumption	Share of cereals in diet	
	1992	2002	1992-2002	1992	2002
<b>Asia</b>	<b>2,304</b>	<b>2,435</b>	<b>0.60</b>	<i>Percent</i>	
Bangladesh	2,065	2,205	1.22	83.7	81.8
India	2,416	2,459	0.33	63.9	58.9
Indonesia	2,774	2,904	0.36	63.7	63.2
Korea, Dem.R.	2,298	2,142	-0.67	59.9	58.8
Pakistan	2,341	2,419	0.31	54.6	51.7
Vietnam	2,230	2,566	1.46	77.0	76.5

\*SQ stands for status quo and describes the amount of grain equivalent needed to support 2002-2004 levels of per capita consumption. NR stands for nutritional requirements and describes the amount of grain equivalent needed to support nutritional standards.

Source: USDA, Economic Research Service, using data from FAOSTAT (<http://faostat.fao.org>) and World Food Program.



Table 5

## Food availability and food gaps for Latin America and the Caribbean (LAC)

Year	Grain production	Root production (grain equiv.)	Commercial imports (grains)	Food aid receipts (grain equiv.)	Aggregate availability of all food
			<i>1,000 tons</i>		
1996	9,971	3,047	9,035	722	33,016
1997	9,547	3,005	9,773	658	33,741
1998	10,131	2,989	10,460	1,013	34,737
1999	11,120	3,296	9,716	1,178	35,014
2000	11,808	3,424	10,209	887	36,527
2001	11,658	3,376	11,094	1,067	37,794
2002	12,160	3,425	11,837	1,127	39,380
2003	12,131	3,408	11,966	493	39,143
2004	12,194	3,513	11,944	678	39,555
<b>Projections</b>				<b>Food gap*</b>	
				<b>SQ</b>	<b>NR</b>
2005	12,751	3,589	13,524	<b>0</b>	<b>281</b>
2010	13,974	3,918	17,773	<b>113</b>	<b>344</b>
2015	15,112	4,271	24,217	<b>287</b>	<b>442</b>

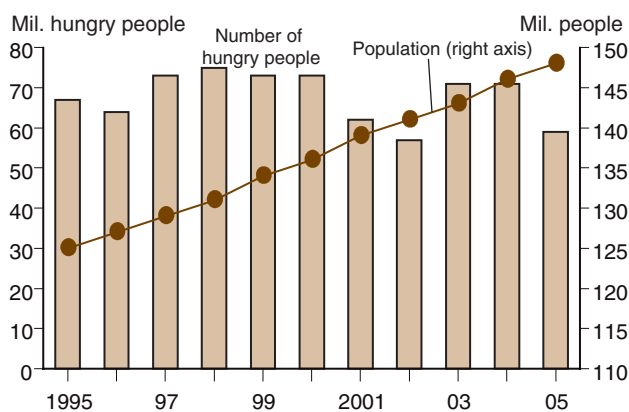
### Latin America and the Caribbean (148 million people in 2005)

Food security in the region is projected to improve over the next 10 years, with the number of hungry people projected to decline from 59 million in 2005 to 37 million in 2015.

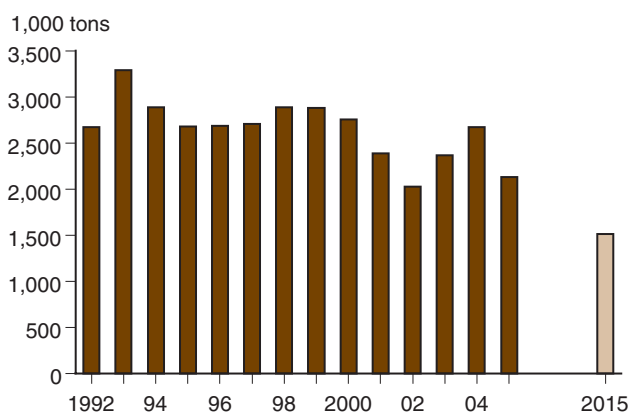
Commercial food imports will increasingly replace domestic production as the main food source.

Haiti and Honduras, the chronically food insecure countries in the region, are likely to continue to require food aid.

### Latin America and the Caribbean: Trend in number of hungry people versus population



### Latin America and the Caribbean: Distribution gaps



### Latin America and the Caribbean: Consumption trends

	Daily calorie consumption		Annual growth in calorie consumption	Share of cereals in diet	
	1992	2002	1992-2002	1992	2002
<b>LAC</b>	<b>2,277</b>	<b>2,429</b>	<b>0.6</b>	<i>Percent</i>	
Guatemala	2,308	2,219	-0.9	60.1	57.5
Haiti	1,765	2,086	2.1	39.6	43.9
Honduras	2,324	2,356	0.1	53.6	51.0
Nicaragua	2,212	2,298	0.5	46.9	50.4
Peru	2,023	2,571	2.4	41.7	43.3

\*SQ stands for status quo and describes the amount of grain equivalent needed to support 2002-2004 levels of per capita consumption. NR stands for nutritional requirements and describes the amount of grain equivalent needed to support nutritional standards.

Source: USDA, Economic Research Service, using data from FAOSTAT (<http://faostat.fao.org>) and World Food Program.

Table 6

## Food availability and food gaps for Commonwealth of Independent States (CIS)

Year	Grain production	Root production (grain equiv.)	Commercial imports (grains)	Food aid receipts (grain equiv.)	Aggregate availability of all food
			<i>1,000 tons</i>		
1996	18,695	735	4,138	747	21,468
1997	20,961	761	3,120	575	21,077
1998	15,660	782	3,113	481	21,176
1999	23,613	937	3,038	353	24,462
2000	20,571	955	3,413	360	20,095
2001	25,987	1,148	2,536	521	21,871
2002	28,861	1,216	2,830	516	25,986
2003	27,569	1,315	2,775	272	23,177
2004	26,104	1,366	2,164	302	21,260
<b>Projections</b>				<b>Food gap*</b>	
				<b>SQ</b>	<b>NR</b>
2005	27,147	1,392	2,739	<b>34</b>	<b>108</b>
2010	30,374	1,520	2,807	<b>0</b>	<b>25</b>
2015	32,742	1,659	2,945	<b>2</b>	<b>88</b>

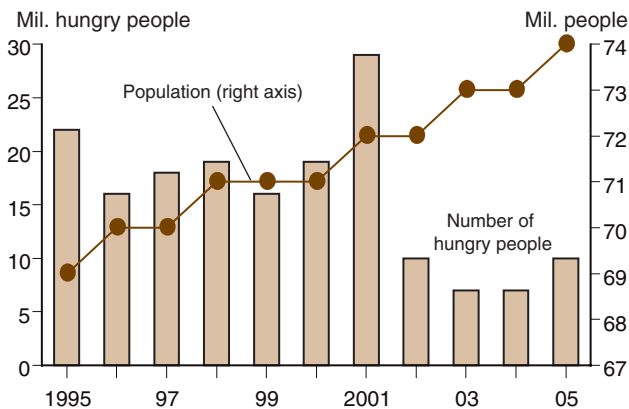
### Commonwealth of Independent States (CIS)

(74 million people in 2005)

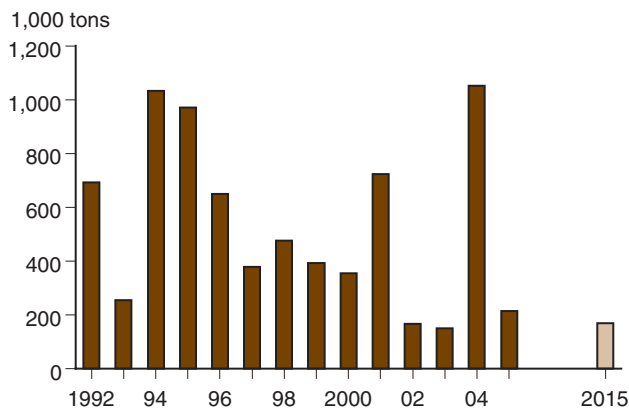
Only Tajikistan is projected to have longrun nutritional food gaps in this region. Food access is a problem for the lowest income quintile in Uzbekistan in 2005, but the situation is expected to improve. The number of hungry people in the region is projected to decline from 10 million in 2005 to 6 million in 2015.

Grain consumption has declined sharply for most countries, primarily related to grain imports for the feed sector. Food aid historically served as an important buffer to shocks in food availability. Only a few CIS countries today still rely on food aid to a significant degree.

### Commonwealth of Independent States: Trend in number of hungry people versus population



### Commonwealth of Independent States: Distribution gaps



### Commonwealth of Independent States: Consumption trends

	Daily calorie consumption		Annual growth in calorie consumption	Share of cereals in diet	
	1992	2002	1992-2002	1992	2002
<b>CIS</b>	<b>2,476</b>	<b>2,460</b>	<b>-0.2</b>	<i>Percent</i>	
Armenia	1,844	2,268	2.0	61.6	56.3
Azerbaijan	2,283	2,575	1.4	65.3	63.1
Georgia	2,179	2,354	1.2	67.2	56.9
Kyrgyzstan	2,665	2,999	2.4	50.5	60.3
Tajikistan	2,338	1,828	-3.1	67.0	62.4

\*SQ stands for status quo and describes the amount of grain equivalent needed to support 2002-2004 levels of per capita consumption. NR stands for nutritional requirements and describes the amount of grain equivalent needed to support nutritional standards.

Source: USDA, Economic Research Service, using data from FAOSTAT (<http://faostat.fao.org>) and World Food Program.