International Agriculture and Trade Reports

FOOD SECURITY ASSESSMENT

Situation and Outlook Series

United States
Department of Agriculture

Economic Research Service

GFA-13
March 2002

Note: Title page added to electronic version by
USAID Development Experience Clearinghouse

Food Security Assessment. Shahla Shapouri and Stacey Rosen, coordinators. Market and Trade Economics Division, Economics Research Service, U.S. Department of Agriculture, Agriculture and Trade Report. GFA-13.

Abstract

Based on all the indicators developed by USDA's Economic Research Service (ERS), the aggregate food security situation for the 67 low-income countries monitored in this report deteriorated in 2001 relative to estimates in 2000. The main reason is the impact of food production shortfalls in many countries, coinciding with the global economic slowdown that intensified foreign exchange constraints in these countries and limited their ability to import food.

Food access remains a common problem among the lower income populations in almost all countries. In 51 of the 67 study countries, consumption levels for 20 percent or more of the population were estimated to be below nutritional requirements in 2001. This number is projected to decline to 47 by 2011. For these countries, there is an urgent need to reduce inequality in purchasing power and incomes. Increases in food supplies also would reduce food prices and increase the real purchasing power of lower income people in the nonagricultural sector.

Preface

This report continues the series of food assessments begun in the late 1970s. 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 past or continuing 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.

Acknowledgements

Appreciation is extended to Neil Conklin, Director of the Market and Trade Economics Division, and John Dunmore for their support of the food security work and to Cheryl Christensen for valuable comments on the articles. We would also like to thank the reviewers, especially Mary Bohman, Joy Harwood, Ira Branson, Carol Goodloe, Joel Greene, Keith Menzie, and Jerry Rector, for their comments. Special thanks are extended to Lou King, Wynnice Pointer-Napper, and Victor B. Phillips, Jr. for editorial and design assistance.

Cover Photo: FAO; Afghanistan, by M.Griffin.

1800 M Street, NW
Washington, DC 20036-5831

March 2002

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Summary

Based on all the indicators developed by USDA's Economic Research Service (ERS), the aggregate food security situation for the 67 low-income countries monitored in this report deteriorated in 2001 relative to estimates in 2000. The main reason is the impact of food production shortfalls in many countries coinciding with the global economic slowdown that intensified foreign exchange constraints in these countries and limited their ability to import food. Short-term shocks that threaten food security are not uncommon. In fact, ERS' estimates of the number of hungry people in the 67 countries show annually a mix of success and failure at the country level since the mid-1990s.

This year's deterioration, coupled with slow progress in improving food security in the recent past, casts growing doubt on achieving the goal set at the World Food Summit in 1996 to halve the number of hungry people by 2015. The ERS projections for the next decade show a 1.6-percent annual decline in the number of hungry people. This suggests that the situation will improve, but will fall short of the 3.5-percent annual decline needed to achieve the goal of the World Food Summit.

The food security situations of the 67 developing countries included in this report are evaluated by estimating and projecting the gaps between food consumption (domestic production plus commercial imports minus non-food use) and two different consumption targets through the next decade. The two consumption targets are: 1) maintaining per capita consumption at the 1998-2000 level (also referred to as the status quo target) and, 2) meeting recommended nutritional requirements (the nutrition target). This nutrition target is also applied to five income groups within a country.

Despite this year's setback with respect to food security, the situation is projected to improve slightly at the aggregate level during the next decade. The food gap to meet nutritional requirements is projected at 16 million tons in 2011, a decline of 2 million tons from 2001. The distribution gap—the amount of food needed to raise consumption in each income group to meet nutritional requirements—is projected at about 24 million tons in 2011, or 6 million tons less than 2001. The number of hungry people (consuming less than 2,100 calories per day on average) is projected to decline to 765 million by 2011, or 1.6 percent per year.

The slow rate of improvement in food security means that there will be many countries vulnerable to food insecurity over the long term. In 2001, 29 of the 67 countries consumed less than the nutritional requirement; this number is projected to decline only slightly to 23 by 2011. Food access remains a common problem among the lower income populations in almost all countries.

Sub-Saharan Africa continues to be the most vulnerable region, accounting for 23 percent of the population in the 67 countries, but 38 percent of the number of hungry people in 2001. The number of hungry people in the region is estimated at 337 million in 2001, or about 57 percent of the total population. This number has increased by about 19 percent since the mid-1990 level, and this upward trend is expected to continue.

Food aid has been a major tool used by the international community to improve food access and to reduce suffering from emergency conditions in low-income countries. Cereal food aid shipments for 2000 were about 8.5 million tons. The United States continued to be the main source of aid, providing 55 percent of the total.

Depending upon the future availability of food aid, parts of the projected food gaps can be eliminated. If food aid levels in 2001 were the same as in 2000, food aid would fill 80 percent of the calculated gap to maintain per capita consumption (status quo) and nearly half of the nutritional gap. In terms of the number of hungry people, if countries receive the same level of food aid in 2001 as in 2000 (that is, no change in the country or quantity allocations), the estimated number of hungry people would be 691 million, rather than 744 million.

Global Food Security: Overview

The 2001-2011 projection of the number of hungry people provides a positive picture with the expected absolute number of hungry people declining 1.6 percent per year. However, this rate falls short of the 3.5-percent annual decline required to meet the goal of the World Food Summit. Examination of the role of food aid reveals that while it can play a useful role in the fight against hunger, its contribution is limited and cannot be the sole remedy to the hunger problem. [Shahla Shapouri]

Based on all the indicators developed by ERS, the aggregate food security situation of the 67 low-income countries monitored in this report deteriorated in 2001 relative to estimates in 2000. The main reason is the impact of food production shortfalls in many countries coinciding with the global economic slowdown that intensified foreign exchange constraints in these countries and limited their ability to import food. Short-term shocks that threaten food security are not uncommon. In fact, ERS' estimates of the number of hungry people in the 67 countries show a mix of success and failure at the country level since mid 1990s. This year's deterioration, coupled with slow progress in improving food security in the recent past, indicate that the World Food Summit goal to halve the number of hungry people by 2015 may not be feasible without a major effort. In fact, the ERS projections for the next decade show a 1.6-percent annual decline in the number of hungry people. This suggests that the situation will improve, but will fall short of the 3.5-percent annual decline needed to achieve the World Food Summit goal. By FAO's estimates, the rate of progress will be even less—one-third of the required rate—if the recent trend continues. According to a recent FAO report, *The State of Food Insecurity in 2001*, despite the declining trend in the aggregate number of undernourished people at the global level between 1990-92 and 1997-99, a majority of developing countries suffered significant increases.

What Is New in This Report

This report is an updated version of the 2000 Food Security Assessment report, meaning that all of the historical and projected data have been updated. The food production estimates for the year 2001 are based on USDA data as of October 2001. The financial and macroeconomic data are updated based on the latest World Bank data. The projected macroeconomic variables are either extrapolated based on calculated growth rates for the 1990s or are World Bank projections/estimations.

This report provides an assessment of the food security situation at the country level and among income groups within countries in order to take into account both physical access (food availability) and economic access to food. Also, an attempt is made to show the distribution and depth of the problem by estimating consumption levels relative to nutritional requirements by country and region to show the vulnerability to food insecurity.

The food security situations of the 67 developing countries included in this report are evaluated by estimating and projecting the gaps between food consumption (domestic production plus commercial imports minus non-food use) and two different consumption targets through the next decade. The two consumption targets are: 1) maintaining per capita consumption at the 1998-2000 level (also referred to as the status quo target) and, 2) meeting recommended nutritional requirements (the nutrition target). It should be emphasized that the availability of food aid is excluded in these projections. The estimated nutritional gaps only measure the gap in calorie consumption and do not consider other factors, such as poor utilization of food due to inadequate consumption of micronutrients or the lack of health and sanitary facilities.

Because national-level estimates represent average food gaps and mask the impact of unequal incomes on food security, we also estimate a "distribution gap." This gap is the amount of food needed to raise food consumption for each income group to a level that meets nutritional requirements. This indicator captures the impacts of unequal purchasing power on food access. It should be emphasized again that the food security indicators for 2001 are based on actual reported USDA production data as of October 2001,

while the long-term projections do not take short-term weather shocks (such as drought or floods) into account. The long-term projections are based on changes in factors affecting food security (see Appendix) and do not attempt to capture short-term market disruptions.

This report also includes a special article titled, "Market Reform and Policy Initiatives: Rapid Growth and Food Security in China." The core policies used to promote food security in China—grain reserves, grain marketing, and self-sufficiency—are expensive and do not effectively provide food security to poor rural households. Various policies have been implemented since the 1980s to help people out of poverty. The most effective policy seems to be the food-for-work projects coordinated by the Poor Area Development Offices. Poverty alleviation is helped by rapidly growing nonagricultural rural incomes. Job growth in this sector is likely to be spurred with China's accession to the World Trade Organization.

Lower Population Growth Reduces the Size of Food Gaps in the Long Run

Natural disasters such as droughts and floods, in addition to political conflicts, continue to be obstacles toward food security progress, at least in the short term, in many developing countries. These factors were the major reasons for the decline in average per capita food consumption of the 67 countries in 2001 relative to 2000. The food needed (in grain equivalent) to maintain per capita food consumption at the 1998-2000 level (status quo) is estimated at about 11 million tons in 2001, 30 percent higher than the 2000 estimates. The food gap to meet nutritional requirements is 18.3 million tons, 7 percent higher than the 2000 estimates. The distribution gap—the amount of food needed to raise consumption in each income group to meet nutritional requirements—increased by 4 million tons to 30 million tons. Finally, the number of hungry people jumped to 896 million in 2001 from 744 million in 2000. These disappointing results cut across Asia (10 lower income countries), Sub-Saharan Africa (37 countries), and Latin America (11 countries). In Sub-Saharan Africa, the food security situation deteriorated in all subregions, except Southern Africa. The food security situation improved in the New Independent States (NIS, 5 countries) and North Africa (4 countries) in 2001 relative to the earlier period. It is important to note that these results provide only an aggregate regional picture—there is significant variation among different countries' food situations.

High production variability is the dominant characteristic of the production system of the most food insecure countries as production, in general, takes place in rain-fed areas that are subject to unpredictable weather variations. For the countries that are experiencing slow or declining production trends, especially those faced

Table 1--Food availability and food gaps for 67 countries

Year	*Grain production*	*Root production* (grain equiv.)	*Commercial imports* (grain equiv.)	*Food aid receipts* (grains)		*Aggregate availability of all food*
			---1,000 tons ---			
1992	373,218	56,579	43,900	9,334		598,657
1993	380,760	59,340	46,033	7,323		611,206
1994	391,994	59,765	47,905	7,869		630,421
1995	397,050	61,541	54,882	6,475		658,166
1996	420,084	62,619	51,586	4,886		667,600
1997	407,482	64,735	59,311	5,037		672,701
1998	427,281	66,666	64,730	8,225		693,041
1999	436,972	68,906	67,966	6,513		712,275
2000	433,743	69,083	69,530	7,167		723,263
Projections				***Food gap****		
				SQ	*NR*	(w/o food aid)
2001	432,464	70,774	70,388	***10,883***	***18,296***	706,176
2006	494,975	77,290	78,257	***7,278***	***13,446***	804,324
2011	542,325	84,315	87,850	***11,023***	***16,193***	885,405

*SQ stands for status quo and describes the amount of grain equivalent needed to support 1998-2000 levels of per capita consumption and NR stands for nutritional requirements and describes the amount needed to support minimum nutritional standards.

with political instability, weather-induced shortfalls can have serious food security implications. Food production in countries such as Afghanistan, Burundi, Rwanda, Somalia, and Haiti has declined and/or stagnated in the last decade. In Afghanistan, after years of political unrest, the country is again faced with a severe drought this year; grain production estimates are half of the 1999 level and 25 percent lower than output in 2000. A similar situation holds in several Sub-Saharan African countries that are suffering from political instability and food insecurity.

Despite these short-term setbacks, there are several factors that provide a positive outlook for the food security situation in these countries. One notable trend is the decline in the population growth rate. Population growth projections are highest in Sub-Saharan Africa, 2.4 percent per year, and lowest in the NIS, 0.8 percent per year. This simply means that less growth in food supplies is required to maintain per capita food consumption. Another positive factor is the projection of improved global economic growth for 2003 and beyond (according to the World Bank), which is expected to increase the import capacity of the countries.

However, because of the mix of performance across countries, improvements in food security will be limited. Per capita food production is projected to increase slightly at the aggregate level during the next decade. The gap to meet nutritional requirements is projected at 16 million tons in 2011, a decline of 2 million tons from 2001. The distribution gap (an indicator of food access) is projected at about 24 million tons in 2011, or 6 million tons less than 2001. The number of hungry people (consuming less than 2,100 calories per day, on average) is projected to decline to 765 million by 2011, or 1.6 percent per year.

The slow rate of improvement in food security means many countries will remain vulnerable to food insecurity over the long term. In 2001, 29 of the 67 countries consumed less than the nutritional requirement; this number is projected to decline only slightly to 23 by 2011. Food access remains a common problem among the lower income populations in almost all countries. In 51 of the study countries for 2001, 20 percent or more of the population is estimated to consume less than nutritional requirements. This number is projected to decline to 47 by 2011. For these countries, there is an urgent need for concerted efforts to reduce inequality in purchasing power and incomes. Increases in food supply also would reduce food prices and increase the real purchasing power of lower income people in the nonagricultural sector.

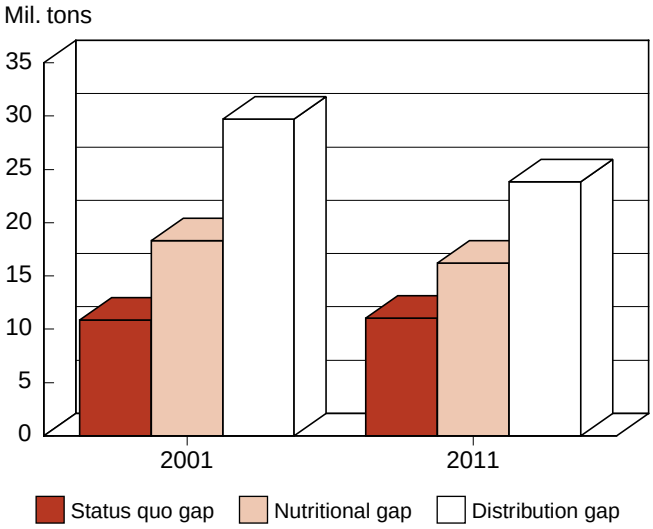
Slow Improvement in Sub-Saharan Africa's Food Security

Sub-Saharan Africa continues to be the most vulnerable region, accounting for 23 percent of the total population in the 67 countries examined in 2001, but 38 percent of the number of hungry people in these countries. The number of hungry people—those consuming less than the nutritional requirement in Sub-Saharan Africa—is estimated at 337 million in 2001, or about 57 percent of the total population. This number has increased by about 19 percent since mid-1990—a move in the opposite direction from the World Food Summit goal. Over the next decade, however, there is projected to be a drop in the percentage of the population classified as hungry people. The absolute number of hungry people is projected to rise to 367 million, but the growth rate is less than the growth in total population. While food supplied by domestic production and imports is sufficient to keep pace with population growth, it does not increase enough to fill the existing food gap and therefore falls short of meeting nutritional standards.

Several factors can alter the projections for the better. For example, the recent peace initiatives in countries such as the Democratic Republic of Congo and Liberia

Figure 1

Food gaps are projected to decline slightly over the next decade



Source: Economic Research Service, USDA.

could bring stability and growth not only to these countries, but also to neighboring countries that are faced with the burden of refugees. Another factor is the recent step by the international financial community to reduce the debt burden in 23 poor countries—most of which are in Sub-Saharan Africa—that is expected to free up resources for domestic investment to increase agricultural productivity.

Success Is Not Uniform Among Asian and NIS Countries

With a few exceptions, the food security situation in the lower income **Asian countries** has been improving, a trend that is expected to continue through the next decade. ERS estimates that about 510 million people were hungry (that is, they did not meet minimum nutritional requirements) in the mid-1990s. That number rose to 579 million people in 1998, but declined to 484 million people in 2001. By 2011, it is estimated that the number of hungry people will drop to around 328 million people, a decline of 3.9 percent per year—clearly more than the 3.5 percent required to meet the World Food Summit goal. The estimate of the share of hungry people in the total population of the countries studied is 30 percent in 2001, declining to 17 percent by 2011.

Not all countries in the region will equally share this success. For example, the situation is projected to deteriorate in Afghanistan. This year, there is a severe shortfall in food availability in Afghanistan and without external assistance (the availability of food aid is excluded in food gap projections) even the highest income groups in this country can barely meet minimum nutrition standards. The situation is expected to improve slowly, provided there is political stability and external assistance and investment for rebuilding.

In the **NIS countries**, the food security situation has improved since the mid-1990s. This trend also is expected to continue over the next decade. The number of people who consumed less than the nutritional requirement in 2001 was about 37 percent of the population, or 10 million. This is projected to decline to 8 million (28 percent of the population) by 2011, a decline of about 2.2 percent per year. For the most part, these positive trends reflect a continuation of political stability and economic recovery, with positive real per capita economic growth since 1996. Only Tajikistan has significant hunger problems related to both inadequate food supplies and access to food, largely due to stagnant food production and widespread poverty. The main long-run concern in the region is related to political instability. The situation in Afghanistan and the recent tensions between Georgia and Russia could expand to other countries. On the other hand, efforts to assist the post-Taliban regime in Afghanistan could lead to external financial support and an increase in investment in the region.

Risk of Financing Imports in North Africa and Latin America

Because of the long-term consumer food price subsidies in North Africa, food consumption in the region is well above the nutritional requirement of 2,100 calories per day. The share of the population that consumes less than the nutritional requirement was less than 10 percent in 2001, much lower than in the other regions. But, this does not mean that these countries are immune from shocks that could affect food security. High production variability in Algeria, Morocco, and Tunisia often results in severe production shortfalls, which exert heavy financial pressures. Among these countries, Algeria is the most vulnerable to food insecurity because of its internal political problems, declining domestic food production (4 percent per year), and slow economic growth (1.5 percent per year) in the last decade. The country is also highly dependent on oil exports to finance food imports and declining global projected prices for oil are expected to have serious food security implications for the country in the long term.

Food security has improved in lower income countries in **Latin America and the Caribbean** over the last two decades. This trend is expected to continue in the next decade. The number of people that are consuming less than the nutritional requirement is estimated at 58 million, or about 42 percent of the population of the study countries, and this number is projected to decline to 30 million (about 18 percent of the population) by 2011. Much of this reduction is expected to occur as a result of income growth in some of the more populous countries, such as Colombia and Peru. However, progress will be uneven among countries. Economic shocks stemming from natural events or policy-related issues continue to be a threat to the food security of several countries. Another important feature of food security of most countries in the region is related to income inequality and the high level of poverty among large segments of the population. Food insecurity among the lower income population in the region is

similar or worse than South Asian countries, while the average income of the region is significantly higher.

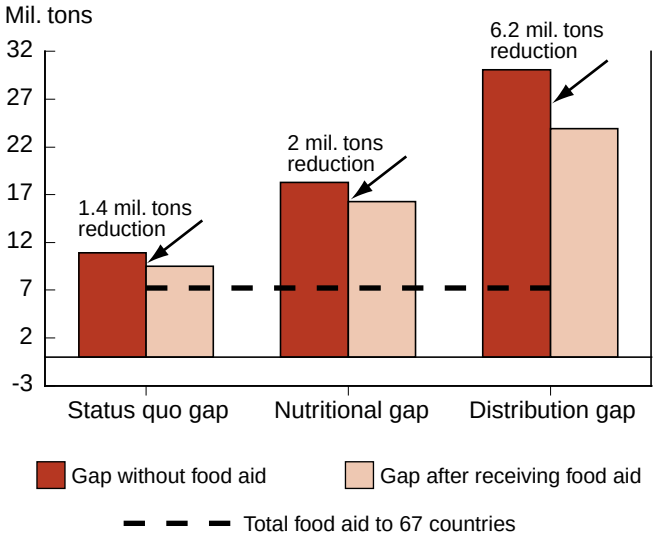
Food Aid Donations Can Play an Important Role

Food aid has been a major way for the international community to improve food access and to reduce suffering from emergency conditions in low-income countries. In many cases, it has significantly reduced loss of life during food emergencies and through different projects also has been used to enhance long-term food security. The quantities of food aid and its distribution to recipient countries vary annually depending on donors' policies. Most food aid is in the form of cereals. Cereal food aid shipments for 2000 declined by 24 percent from the previous year to about 8.5 million tons. This decrease is entirely due to the drop in deliveries to Russia—200,000 tons in 2000 versus more than 2 million tons in each of the 2 previous years. The United States continued to be the main source of aid, providing 55 percent of the total. Japan doubled its allocation, while the European Union allocation was reduced by half. Allocations to Sub-Saharan African and Asian countries remained roughly the same as the previous year, while those to Latin American countries declined.

Depending upon the future availability of food aid, parts of the projected food gaps can be eliminated. If food aid shipments in 2001 were the same as in 2000, food aid would fill nearly 80 percent of the calculated gap to maintain per capita consumption (status quo) and nearly half of the nutritional gap. In terms of the number of hungry people, if countries received the same level of food aid in 2001 as in 2000 (that is, no change in the country or quantity allocations), the estimated number of hungry people would be 843 million, rather than 896 million. In other words, based on the current level of food aid, roughly 50 million people may avoid hunger. On the other hand, this reveals that while food aid can play a useful role in the fight against hunger, its contribution is limited and cannot be the sole remedy to the hunger problem. It is important to note that not all of total food aid is going to the lowest income, food-deficit countries. For example, in 2000 about 7.2 million tons, or 85 percent of total food aid, was given to the countries analyzed in this report.

Figure 2

Food aid reduces food gaps--but not enough



Source: Economic Research Service, USDA.

A major goal of food aid is to provide humanitarian support to critically food-deficient countries. To examine the effectiveness of food aid in the area of reducing hunger in the study countries, we used the food security model and actual data from 2000 to calculate the food gaps with and without food aid (actual level of food aid received by the countries in 2000). It is important to stress at this point that the food security model is based on the simplifying assumption that food aid is not available (since actual food aid receipts are impossible to project). In 2000, the countries received 7.2 million tons of food aid. We compared the estimated food gaps with and without food aid. Surprisingly, the analysis showed that by adding 7.2 million tons to the estimated level of availability, the estimated status quo and nutritional gaps were reduced by only 1.4 and 2 million tons, respectively. These results indicate that a relatively small share of food aid was given to those countries that, according to ERS's definitions and estimations, had average national food gaps. In other words, most of the food aid was given to countries such as India, Bangladesh, Ecuador, Guatemala, Georgia, and Azerbaijan, that did not need any food aid at the average national level according to our estimate. However, most of the food aid went to countries that had distribution gaps. When the 7.2 million tons of food aid was included in the estimation of distribution gaps, those were reduced by 6.2 million tons. This means that most of the food aid (86 percent) allocated to these countries in 2000 was used to reduce the problem of food access, as represented by the distribution gap. This is an impressive achievement at the aggregate level. This also means that countries such as India that did not have any national food gaps (based

on status quo and nutritional indicators) received food aid because of the food access problems of the lower income groups.

In sum, the available food aid clearly remains less than the needs. Allocations of food aid are based on a mix of objectives. In addition to hunger, other factors such as political instability and financial difficulties play an important role in donors' decisionmaking processes. However, it should be emphasized that because of slow progress in improving global food security, and the potential and critical role of food aid and its limited quantities, it is critical to improve the targeting policies of donors to maximize its benefits in terms of alleviating hunger.

Short-term Instability Complicates Any Achievement in Food Security

While short-term shocks are recognized as an obstacle to improving food security in the short run, they affect long-term progress as well.

The vicious circle of food insecurity is well known: it reduces productivity, which in turn increases poverty. Poverty limits the ability to respond to risk and deepens the vulnerability to food insecurity. In a volatile economic environment, the challenge to break the circle is difficult.

While natural disasters, economic shocks, and political conflicts are all major sources of vulnerability to food insecurity, the nature of their damage to long-term productive capacity varies. For example, drought can result in heavy losses in crop production and livestock, while floods and earthquakes destroy market infrastructure (in addition to crops), which will have long-term economic repercussions. In Central America, for example, Hurricane Mitch had a devastating economic impact and caused heavy damage to market infrastructure. This year, several Central American countries are faced with severe drought, the impact of which has been amplified by the decline in export earnings due to low export commodity prices.

Economic crises on the other hand can have mixed results, but in general they affect the entire economy. These shocks are sometimes due to internal policies or are external, such as a decline in the terms of trade. The economic crisis in the Asian countries in 1997-98, for example, was a major shock not only to the countries that were directly affected, but also indirectly to other trading partners in the region. Income in Indonesia, for example, declined by more than 10 percent from 1998 to 1999 and total import values declined by 6 percent for the same period. The result was deterioration in Indonesia's food security despite the receipt of more than 1 million tons of food aid.

In addition to other economic problems, many Sub-Saharan African countries are faced with political instability. Even with several peace initiatives, the economic destruction in the last decade—as evidenced by countries like the Democratic Republic of Congo, Burundi, Rwanda, and Somalia—cannot be turned around easily. In the Democratic Republic of Congo, the civil strife of the early 1990s led to an annual average decline in GDP of 5 percent during 1990-99 and a decline in total value of exports by 6 percent per year. Per capita food consumption also declined annually by 2.6 percent (in grain equivalent) during this period. Similarly, in Burundi, political upheaval and cross-border war with Rwanda led to a 3-percent annual decline in income in the last decade and a per capita food consumption decline by 2 percent per year. In general, increases in poverty and food insecurity that follow political instability inflict such damage on the economies of affected countries that, even with subsequent peace, rebuilding can take years.

There is no method to project these shocks, and there is no estimate of their global costs and their frequencies, but the sheer number of occurrences is alarming. According to a recent UN Food and Agriculture Organization (FAO) report, during October 1999 to June 2001, 22 countries were affected by drought, 17 experienced floods and hurricanes, two were hit by earthquakes, and 14 experienced political conflicts. According to the *World Bank Development Report* (2000/2001), during the last decade the number of natural disasters has increased due to both social and environmental factors. Settlements on and cultivation of marginal lands are prone to landslides and other disasters. The report also argues that the El Niño events that cause drought and floods are becoming more frequent and that the warming of the surface of the Atlantic Ocean is increasing the frequency and severity of hurricanes.

Economic shocks occur both in high- and low-income countries, but the economic and food security implications are much greater in low-income countries. To improve food security of poor countries in the long term, it is essential to reduce the economic impacts of these shocks. There are a variety of policy options that

could be adopted depending on specific risk patterns in each country. With respect to weather-related shocks, for example, building a dam can reduce the risk of flooding. Environmental policies can reduce deforestation and reduce the damage from hurricanes. Investment in research and extension will help production diversification, which reduces vulnerability to price shocks. Since domestic production plays a major role in the food security of low-income countries, efforts to improve agricultural technology could have a significant impact. Drought-resistant and high-yield crop varieties can significantly reduce annual production variability and support long-term productivity growth.

Food security safety net programs also can play a major role. The special article on food security in China indicates that targeted food programs are essential to improving food access of the poor, but most developing countries do not have such policies. Clearly, the types of policies required vary depending on a country's structure, but there is no question that frequent setbacks can weaken the food security foundation of poor people and vulnerable countries. Therefore, it is important to more fully integrate responses to short-term shocks into the longer term strategy for reducing chronic hunger. Through time, food aid and financial aid have significantly reduced loss of life during food emergencies. Integrating international and national resources in designing safety net programs can be very effective instruments for mitigating the effects of shocks, and can in this way serve as adjuncts to longer term food security strategies.

How Food Security Is Assessed: Methods and Definitions

The commodity coverage in this report includes grains, root crops, and a group called "other." The three commodity groups in total, account for 100 percent of all calories consumed in the study countries. This report projects food consumption and access in 67 lower income developing countries—37 in Sub-Saharan Africa, 4 in North Africa, 11 in Latin America and the Caribbean, 10 in Asia, and 5 in the NIS (see appendix 1 for a detailed description of the methodology and appendix 2 for a list of countries). The projections are based on 1998-2000 data. The periods covered are 2001 (current), 2006 (5 years out), and 2011 (10 years out). Projections of food gaps for the countries through 2011 are based on differences between consumption targets and estimates of food availability, which is domestic supply (production plus commercial imports) minus non-food use. The estimated gaps are used to evaluate food security of the 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 1998-2000 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 Methodology in appendix 2). 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 for 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 imports; **food availability**, which is food supply minus non-food 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.

North Africa

Calorie consumption in the region is well above the nutritional requirement of 2,100 calories per day as recommended by FAO. Given the region's reliance on imports—accounting for nearly half of food supplies—the state of the economy and export potential play a key role in the food security outlook. [Stacey Rosen]

North Africa has the highest import dependency of all the regions included in the study with imports contributing roughly 45 percent of food supplies. Between 1990 and 2000, commercial imports grew 5.5 percent per year, far outstripping the population growth of 2 percent. In the early 1990s, food aid accounted for about 10 percent of grain imports, but that figure now averages less than 1 percent. Improved domestic production and commercial import capacity in Egypt and Morocco are the principal factors behind this trend.

Grain production growth measured about 2 percent per year during the last decade, largely due to yield growth. Trends in Egypt influence the regional trend because of its size, and grain yields in the country increased 2 percent per year during the last 10 years, principally due to the expansion of irrigated land area. Yield growth was responsible for most of the growth in output in Tunisia as well.

As a result of positive trends in imports and production, per capita consumption in the region grew 0.4 percent per year during the last decade. Calorie consumption in these countries, at the national level, is well above the nutritional requirements as recommended by FAO—2,100 calories per day. In Egypt and Tunisia, calorie intake averaged 3,300 per day in the late 1990s. In Morocco, calorie consumption averaged just over 3,000 and in Algeria, the average was just shy of 3,000.

While a flat consumption trend will not place these countries in a precarious position with respect to food security, it is important to note that per capita consumption in both Algeria and Egypt is projected to stagnate in the next decade. Algeria's production is projected to grow slowly through 2011. Commercial imports are projected to grow less than 2 percent per year, so food supplies will barely be able to keep up with population growth. Oil exports account for over 90 percent of Algeria's export earnings. The price of oil, although currently strong relative to the mid- to late-1990s, is expected to decline in the long term. Slow growth in export earnings will limit the capacity to raise imports.

Following strong historical growth, production growth in Egypt is projected to slow considerably. Because yields are now so high, we assume that they have basically reached their peak. The potential for irrigated area expansion is severely limited. Egypt's corn yields are roughly equal to those of the United States and rice yields are more than two times those of Vietnam. Egypt's commercial import growth is also expected to slow relative to that of the historical period. Like Algeria, although to a lesser extent, the country is vulnerable to trends in oil prices.

As a result of the projections for relatively steady food supplies and high caloric intake, status quo and nutritional food gaps are projected to be zero for these countries over the next decade.

While the national level food gaps are projected at zero, this does not mean that these countries are not subject to periods of food insecurity. Production variability in Algeria, Morocco, and Tunisia can result in severe production shortfalls and, with import capacity expected to become more limited due to slow growth or declining prices for exports, a production shock could result in food gaps. Variation from the trend in grain production averaged 46 percent in these 3 countries from 1980 to 1999. For example, in Algeria, 1996 grain production was nearly 5 million tons; in 1997, output dropped to less than 1 million tons. Production in 2000 was half the 1999 level.

Given the region's reliance on imports, the state of the economy and export potential play a key role in the food security outlook. If political problems and security concerns in the Middle East have any spillover effects to this region, tourism earnings could suffer. Efforts to privatize state industries, albeit slow, should attract foreign investment and improve efficiencies in the long term. Despite reforms, much of the region's growth in the last couple of years has stemmed from external factors such as favorable oil prices and strong economic growth in export markets.

Table 2—Food availability and food gaps for North Africa

Year	Grain production	Root production	Commercial imports	Food aid receipts (grains)		Aggregate availability of all food
			---1,000 tons ---			
1992	20,765	1,085	15,573	831		39,217
1993	19,082	1,053	17,389	418		40,355
1994	24,645	945	19,639	239		42,510
1995	19,881	1,353	20,189	221		47,275
1996	33,267	1,465	16,628	190		44,417
1997	22,439	1,192	20,979	94		46,666
1998	26,699	1,261	22,149	50		46,264
1999	24,506	1,194	21,890	102		47,642
2000	21,733	1,160	23,686	83		48,129
Projections				**Food gap**		
				SQ	NR	(w/o food aid)
2001	24,140	1,259	23,473	***0***	***0***	47,345
2006	26,747	1,376	24,561	***0***	***0***	50,775
2011	29,001	1,499	25,993	***0***	***0***	54,398

North Africa

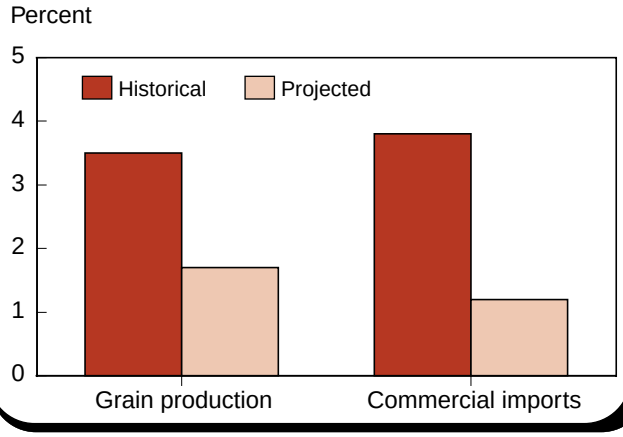
138 million people in 2001

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

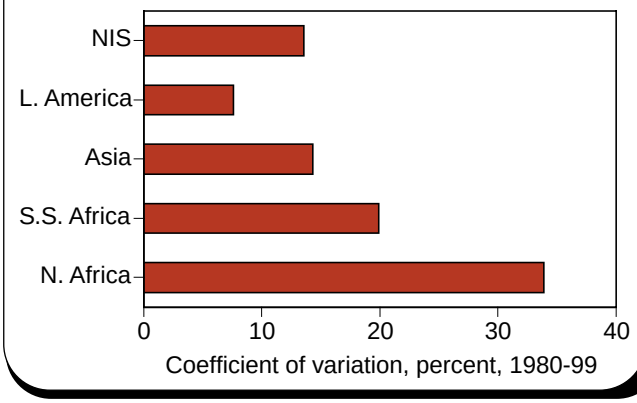
Although production growth is projected to slow relative to the historical period, food supplies will be adequate to maintain per capita consumption levels and meet nutritional requirements through the next decade.

Imports contribute to about 45 percent of food supplies, therefore the state of the economies of these countries and export potential play a key role in the food security outlook.

North Africa's food supply growth rates



North Africa's grain output variability is relatively high



North Africa: Calorie consumption

	Calories per capita per day		Per capita consumption growth	Gini coefficient	GNP per capita
	1994-95	1998-99	1980-99		
	Number		*Percent*		*U.S. dollars*
North Africa	**3,109**	**3,174**	**0.5**	**36.0**	**1,563**
Algeria	2,948	2,955	-1.5	35.3	1,550
Egypt	3,262	3,317	1.4	28.9	1,400
Morocco	3,044	3,055	1.2	39.5	1,200
Tunisia	3,183	3,369	0.7	40.2	2,100

Source: FAO, 2001. World Development Indicators, 2000/1, World Bank.

Sub-Saharan Africa

The number of hungry people in Sub-Saharan Africa is projected to rise during the next decade, although at a slower rate than population growth. Therefore, the share of hungry people in the total population will actually decline over time. Per capita consumption is projected to hold steady through 2011 as growth in grain production—the staple of the diet in the region—is estimated to barely exceed population growth. [Stacey Rosen]

The goal of the 1996 World Food Summit is to reduce the number of hungry people by half the 1996 level by 2015. The number of hungry people—those consuming less than the nutritional requirement of 2,100 calories per day—in Sub-Saharan Africa is estimated at 337 million in 2001. This is equal to 57 percent of the population of the region. This number represents an increase of 19 percent from the mid-1990 level—clearly a move in the opposite direction of the food summit goal. Over the next decade, the absolute number of hungry people is projected to continue on this upward trend, reaching a projected 367 million people in 2011. This increase, however, is smaller than the growth in population, so the share of hungry people in the total population will decline over time. While food supplied by domestic production and imports is sufficient to keep pace with population growth at current consumption levels, it falls short of meeting nutritional standards.

Food insecurity is more severe in Sub-Saharan Africa than in other regions covered in the report. In 2001, Sub-Saharan Africa accounted for 23 percent of the population of the 67 countries included in this report. However, the region's share of hungry people across the 67 countries is significantly higher—38 percent. The situation worsens over the next decade as this share is projected to jump to almost 50 percent by 2011. However, the increase is more reflective of the tremendous strides made in India rather than a strong deterioration in the region.

Sub-Saharan Africa is characterized by natural disasters (droughts and floods) and political strife. These factors preclude food security in the region, especially in the near term. ERS' estimates of 2001 per capita consumption indicate a slight drop relative to the 2000 estimates as commercial imports are estimated to decline. As a result, the food needed to meet the nutritional target is estimated at nearly 13 million tons, 17 percent higher than the 2000 estimate.

Between 1990 and 2000, per capita consumption in the region grew just less than 1 percent per year. If Nigeria were excluded from the equation, per capita consumption would be stagnant. Nigeria is by far the largest country in the region and its performance skews the results for the region as a whole. The region's population growth is projected to slow over the next decade, largely due to the effects of HIV/AIDS, to an average 2.4 percent per year—as compared with the historical rate of 2.8 percent. Growth in production of grains, the most important component of the region's diet, is estimated to just barely exceed that of population growth. Commercial imports are projected to grow 1.3 percent per year, slower than all the other regions in this report (except North Africa), as export earnings performance is expected to be weak. As a result, the region's import share of food supplies is projected to average less than 9 percent during the next decade—placing pressure on domestic production to perform well. Only Asia is projected to have a lower share. In comparison, imports by Latin America and North Africa will account for about 45 percent of supplies. In the NIS region, the share is over 20 percent. As a result of these production and import trends, per capita consumption for the region is projected to virtually hold steady through 2011.

Per capita consumption is projected to rise in 16 of the 37 countries in the region over the next 10 years. The rates of increase range from nearly zero in Togo to more than 2 percent per year in Zimbabwe. The growth in Zimbabwe is not expected to come from outstanding performance in yields or high growth in export earnings that would support a surge in commercial imports. To the contrary, this growth will come from the prevalence of HIV/AIDS, which is expected to significantly reduce the country's population growth rate—from 2.6 percent per year in the historical period to a projected rate of about 1 percent. Therefore, the projected production growth of less than 3 percent per year will be sufficient to raise per capita consumption

Table 3—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
			---1,000 tons ---			
1992	57,345	37,090	7,747	4,932		121,387
1993	61,108	39,687	9,086	2,584		128,059
1994	64,401	40,074	8,991	3,160		133,155
1995	64,872	41,274	7,549	2,531		135,417
1996	69,804	41,424	7,606	2,073		139,203
1997	63,630	42,976	10,383	1,788		139,364
1998	69,592	45,272	12,425	2,546		148,260
1999	67,876	46,550	11,056	2,169		149,019
2000	66,821	46,506	12,683	2,855		152,452
Projections				Food gap SQ	Food gap NR	(w/o food aid)
2001	67,647	48,413	12,404	*6,227*	*12,914*	146,910
2006	84,524	53,086	12,918	*4,120*	*9,545*	172,933
2011	96,701	58,144	13,755	*6,870*	*11,332*	193,730

Sub-Saharan Africa

589 million people in 2001

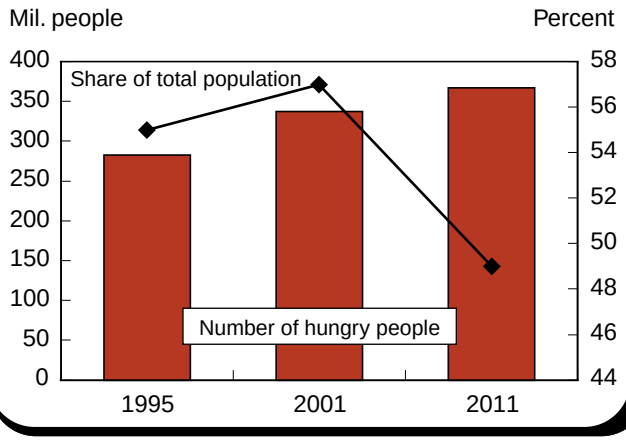
Growth in grain production will match that of population.

Imports will continue to play a minor role in total food supplies.

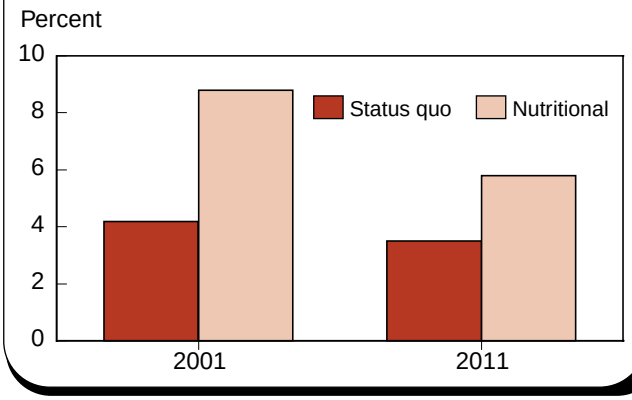
At the regional level, per capita consumption is projected to hold steady through the next decade; however, it will decline in 21 of the 37 countries.

The number of hungry people in the region is projected to rise from 337 million in 2001 to 367 million in 2011; roughly half the population is projected to be hungry in 2011.

Hunger in Sub-Saharan Africa



Food gaps as a share of food availability in Sub-Saharan Africa



Sub-Saharan Africa: Calorie consumption

	Calories per capita per day 1994-95	Calories per capita per day 1998-99	Per capita consumption growth 1980-99	Gini coefficient	GNP per capita
	Number		*Percent*		*U.S. dollars*
SSA	**2,135**	**2,193**	**-0.4**	**44.8**	**360**
Côte d'Ivoire	2,431	2,587	-1.4	36.7	710
Sengal	2,298	2,287	-0.4	41.3	510
Ethiopia	1,713	1,794	-0.3	40.0	100
Kenya	1,967	1,916	0.2	44.5	360
Zambia	1,947	1,939	-1.8	49.8	320
Zimbabwe	2,004	2,074	0.2	56.8	520

Source: FAO, 2001. World Development Indicators, 2000/1, World Bank.

levels. It should be noted, however, that this growth may be difficult to achieve with the decrease in labor availability and health issues related to HIV/AIDS. Relatively strong growth—greater than 1 percent per year—is projected for Ethiopia, Sudan, Mozambique, and Chad. Mozambique has experienced strong growth in output since the end of the war in 1995. This trend is projected to continue through the next decade with grain production rising at about 5 percent per year. There is potential for much higher yields for corn—the country's staple crop. Mozambique's corn yields were 30 percent below those of Zambia and 17 percent below those of Zimbabwe in the late 1990s.

To illustrate the impact of production variability, we examined the effect on the estimated food gaps when actual 2001 production data is compared with a hypothetical trend-level production forecast. With actual 2001 production levels, the status quo gap is estimated at 6.2 million tons. This gap declines 60 percent when projected trend levels are used. This means that production shortfalls from the trend in 2001 resulted in a more than doubling of expected food gaps. Similar—although not as extreme—results were found when nutrition gaps were estimated.

Historical gains in agricultural production in most countries in the region were largely due to area expansion. In many countries, population pressures and poor farming practices that have led to soil erosion and nutrient-deficient soils have pushed farmers onto marginal lands. These lands are less likely to be productive and are more easily degraded than existing cropland. Although such practices may support subsistence livelihoods for a time, they are likely to have significant negative implications for the welfare of rural and urban populations and the environment over the long term. Given these limitations, substantial increases in crop yields will be needed. Although several factors have a role, improved soil nutrients are identified as the most important component for sustained yield growth in the region. Without sufficient soil nutrients, crop yields cannot increase and respond to improved management practices or other inputs.

Changes in agricultural policies to enhance production incentives and prices received by farmers could affect fertilizer application rates that are crucial to improved productivity rates. Similarly, global trade liberalization is likely to affect fertilizer use as it will increase agricultural prices (in response to higher consumer demand as tariffs are reduced or removed) and enhance world market conditions. Improvements in agricultural education and extension would also assist in expanding the use of improved inputs and agricultural production practices. Improving the performance of extension services in rural areas would aid in education and also teach farmers about possible negative effects associated with the inappropriate use of inputs.

Access to markets has been a significant constraint for Sub-Saharan Africa's farmers. Rural infrastructure development is needed to facilitate transportation, improve seed, tool, and input distribution, and help farmers market output. However, improvements in infrastructure require investment, and the likelihood of a significant increase in investment in these countries is slim. The new Heavily Indebted Poor Countries (HIPC) initiative does provide some hope, however.

The HIPC initiative should have a positive impact on the economies of these countries and thereby improve the purchasing power of the people. This initiative represents a coordinated effort by the international financial community whose aim it is to reduce the debt burden to sustainable levels for 23 poor countries—most of which are in Sub-Saharan Africa. In order to participate in the program, countries must continue their efforts toward macroeconomic adjustments and structural policy reforms. This debt relief and forgiveness program is expected to reduce debt stock, lower debt service payments, and raise social spending—principally in the areas of education and health care. Uganda and Bolivia are the first two countries to reach the "completion point," meaning that they have implemented appropriate policies and are receiving the agreed-upon debt relief. The amount of debt service relief for each country is estimated at $2 billion. This debt relief should allow them to allocate additional funds toward investment in productive activities that will stimulate their economies, rather than constrain their focus to debt repayment.

Asia

Afghanistan experienced a second consecutive year of drought in 2001, which is compounded by ongoing conflict, leading to a food gap of 1.9 million tons to meet recent per capita consumption levels (excluding refugee considerations). North Korea also is experiencing a food supply shortfall this year, with a food gap of 1.7 million tons. Elsewhere, the number of hungry people in Asia appears to be on the decline. [Michael Trueblood]

There is a severe shortfall in food availability this year in Afghanistan. The country has experienced a second consecutive year of drought, leading to grain output that is estimated to be about 34 percent below the recent trend. Refugee movements related to the recent war have exacerbated these production shocks. In order to meet a target of the most recent per capita consumption levels (excluding refugee considerations), the food gap is estimated to be about 1.9 million tons, or 44 percent of the target level. To reach minimum nutritional levels, about 3 million tons of grain are required. The situation is projected to remain acute over the next decade, requiring perhaps as much as 3.3 million tons annually to meet nutritional needs.

North Korea also is experiencing a severe food supply shortfall this year, though not as intense as Afghanistan's deficit. North Korea's grain output is about 7 percent below trend, following last year's decline of 6 percent. To meet recent per capita consumption levels, about 1.7 million tons are required (about 26 percent of the overall food supply). Over the next decade, this food gap is estimated to decline, but still remain relatively high (about 1.2 million tons, or 17 percent below present food supply requirements). Food availability across all income groups presently is inadequate to meet minimum nutrition standards; the situation is not projected to change very much in the next decade, except for the top income quintile.

The number of hungry people in other countries in Asia appears to be on the decline. ERS estimates that in the mid-1990s about 510 million Asian people were hungry (that is, they did not meet minimum nutritional requirements). That number has declined to about 484 million people in 2001. By 2011, it is estimated that the number of hungry people will be about 328 million people.

Most of the decreases in the number of hungry people can be explained by increased purchasing power of the lowest income groups in Bangladesh and India. Today, only the bottom income quintile in Bangladesh fails to meet their nutritional requirements, compared with the bottom two quintiles in 1995. This is explained in part by three consecutive good food harvests as well as sustained real economic growth, which has averaged 3.7 percent per person per year over the last decade. Bangladesh's economy has been helped by the rapid growth in exports of textiles and clothing.

In India, food supplies have continued to increase. The country has become a significant grain exporter, while food stocks are at record levels. The challenge now is to improve access to food for the lowest income groups in that country. The bottom two income quintiles presently fail to meet nutritional requirements, but it is projected that only the bottom quintile will fail to do so by 2006. India has more than doubled its per capita GDP growth rate in the last decade compared with the previous decade (3.5 percent per annum versus 1.6 percent). Some of this economic growth is due to important policy changes and greater trade orientation. If sustained, the growth has the potential to lift millions of people out of poverty. India's longrun food supply situation also is helped by an easing of the population growth rate, which is expected to level out to 1.1 percent annually in the next decade from its present rate of 1.6 percent per year.

In Nepal, average per capita consumption levels are above nutritional requirements, but the country faces relatively minor food deficits to meet the present consumption levels. This problem may intensify in the next decade. Inadequate access to food for the lowest income groups is projected to increase in the future. Production largely accounts for the total food supply, but production is not projected to grow as fast as population, thereby putting pressure on future food supplies. Land expansion possibilities are limited, so yield growth rates will have to increase from the historical rates to eradicate the problem. Imports are not expected to grow very much, given the country's

landlocked and rugged geography that makes it expensive to transport food inland.

The other five countries in the Asian region that are included in this report (Indonesia, Pakistan, Philippines, Sri Lanka, and Vietnam) generally can be characterized as having adequate food supplies at the national level in the short and long run. All income groups also are projected to have adequate access to food to meet nutrition requirements, both now and over the next decade.

A common concern throughout the region is the limited opportunity to expand land area, compounded by yield growth rates that are starting to slow down. Increasingly, farmers in the region are bringing marginal land into production. Average yields continue to increase robustly in Bangladesh and Vietnam, but in the other countries, yields are starting to either plateau or decline. Environmental problems associated with irrigation also appear to be increasing.

Table 4—Food availability and food gaps for Asia

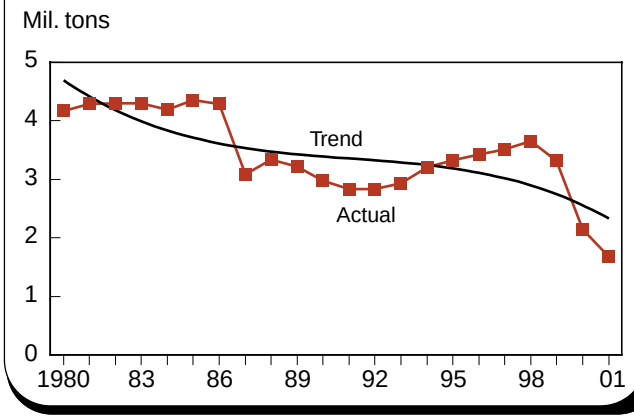
Year	Grain production	Root production	Commercial imports	Food aid receipts (grains)	Aggregate availability of all food
			---1,000 tons ---		
1992	280,809	15,792	11,590	1,769	401,645
1993	286,011	15,631	11,486	1,792	406,929
1994	289,925	15,690	10,893	1,942	417,722
1995	299,303	15,659	17,813	2,107	437,234
1996	303,206	16,382	17,116	1,686	445,134
1997	307,064	17,199	16,363	2,105	446,409
1998	316,716	16,790	17,908	4,553	456,803
1999	329,246	17,360	22,540	3,200	473,080
2000	330,645	17,383	21,012	3,145	479,877
Projections				**Food gap** SQ / NR	(w/o food aid)
2001	324,975	17,231	21,140	***3,772*** / ***3,878***	468,433
2006	366,717	18,604	24,420	***2,728*** / ***2,986***	530,243
2011	398,323	20,069	27,827	***3,513*** / ***3,716***	578,464

Asia
1,737 million people

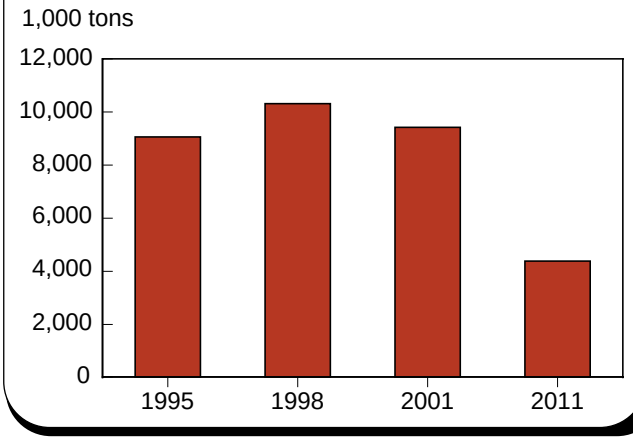
Afghanistan has experienced a second consecutive drought, which is compounded by ongoing conflict, leading to a food gap of 1.9 million tons to meet recent per capita consumption levels (excluding refugee considerations). North Korea also is experiencing a food supply shortfall this year, with a food gap of 1.7 million tons.

The number of hungry people in Asia is projected to decline from 484 million people in 2001 to 328 million people in 2011. Most of the decreases are projected to come from the lowest income groups in Bangladesh and India.

Afghanistan's grain production is down again in 2001



Distrbution gaps in Asia



Asia: Calorie consumption

	Calories per capita per day 1994-95	Calories per capita per day 1998-99	Per capita consumption growth 1980-99	Gini coefficient	GNP per capita
	Number		*Percent*		*U.S. dollars*
Asia	**2,276**	**2,331**	**1.6**	**36.6**	**506**
Afghanistan	1,557	1,799	--	--	--
Bangladesh	2,022	2,157	1.4	33.6	370
India	2,420	2,408	1.7	37.8	450
Indonesia	2,891	2,915	2.9	36.5	580
Korea, Dem. Rep.	2,180	2,106	--	--	--
Pakistan	2,397	2,459	1.4	31.2	470

-- = Not available.
Source: FAO, 2001. World Development Indicators, 2000/1, World Bank.

Latin America and the Caribbean (LAC)

Food security continues to improve in this region, reflected in the steady increase in calorie consumption. However, not all countries have benefited from this progress as Haiti, Honduras, and Nicaragua are projected to have large numbers of hungry people unless food production can be increased dramatically and export earnings can be increased to pay for commercial imports. A drought in Central America has reduced 2001 output by up to 20 percent. [Birgit Meade]

Food security has improved in lower income Latin America and the Caribbean in the last two decades, and this trend is expected to continue in the next decade. For the 11 countries covered in this report,[1] per capita food consumption as measured in daily calorie intake has increased steadily, exceeding 2,400 calories in 1999 (well above the FAO recommended level of 2,100 calories). The number of people consuming less than the nutritional requirement is estimated to decline from about 60 million in 1995 to 30 million in 2011. However, not all countries in the region have shared in this positive development. In fact, economic shocks stemming from natural events or policy continue to threaten food security, at least among the lowest income countries in the region.

At the regional level, the improvement in food consumption is largely driven by growth in food imports, while domestic food production lags demand growth. Commercial imports in the study countries comprised 44 percent of domestic food supplies in 1999, and this share is projected to rise to more than 50 percent by 2011. Thus, the dependability of sources for foreign exchange earnings will be key to ensuring food security. During the last decade, these countries have adopted policies to diversify exports, but agricultural products continue to predominate (on average, 30 percent in the 1990s).

Weather-related production instability characterizes the region. This, and the decline in international commodity prices such as coffee, could have serious financial implications. The current coffee price slump is a painful reminder that reliance on a few unprocessed agricultural export products exposes the whole economy to the volatility of price swings in the world market. Countries such as Guatemala and Honduras are relying on coffee for about 25 percent of their export earnings, and rural laborers need the income that the coffee harvest provides.

Another food security concern is poverty and income inequality, which limit food access and underlie food security problems in the region. Although Latin American countries have much higher incomes than many Sub-Saharan African or South Asian countries, their low-income populations are faced with similar food insecurity problems. For example, the distribution gap—the amount of food necessary to raise consumption in all income quintiles to the nutritional standard—showed that in 2001, in 10 of the 11 countries examined, 20 percent or more of the population did not have access to nutritionally adequate food. This distribution gap is estimated at close to 2 million tons in 2001, more than twice the national average nutrition gap. However, the situation is projected to improve in the next decade. By 2011, only six countries are estimated to have 20 percent or more people vulnerable to food insecurity, and the food gap is projected to decline by about 30 percent on account of income growth projections and improvements in agricultural performance.

This regional trend does not apply to Haiti, where food security continues to be precarious. Per capita consumption in 2000 was lower than in 1980. Both the status quo and the nutritional food gap are projected to more than double during the next decade and exceed 370,000 tons by 2011—almost 50 percent of their grain supply. Grain and tuber production grew very slowly in the 1990s, and commercial and food aid imports have become an increasingly important share of food supplies, growing from 27 percent in the 1980s to 41 percent in the 1990s. While the rest of the region experienced declining food aid levels, food aid to Haiti increased steadily in the 1990s to more than 180,000

[1] The countries studied here are four Central American countries: El Salvador, Guatemala, Honduras, and Nicaragua; three Caribbean countries: the Dominican Republic, Haiti, and Jamaica; and four South American countries: Bolivia, Colombia, Ecuador, and Peru.

Table 5—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
			---1,000 tons ---			
1992	10,494	2,376	6,339	1,324		29,433
1993	11,024	2,723	6,237	1,371		29,307
1994	10,095	2,802	8,007	1,002		30,757
1995	10,172	2,970	8,844	520		32,127
1996	9,912	3,040	9,481	556		32,617
1997	9,728	3,030	10,348	476		32,820
1998	10,127	2,946	10,843	912		34,562
1999	11,119	3,341	10,579	714		34,864
2000	10,725	3,544	10,774	555		35,655
Projections				**Food gap**		
				SQ	NR	(w/o food aid)
2001	11,103	3,399	11,620	***586***	***822***	35,773
2006	12,185	3,698	14,550	***387***	***635***	42,225
2011	13,138	4,018	18,399	***562***	***839***	50,087

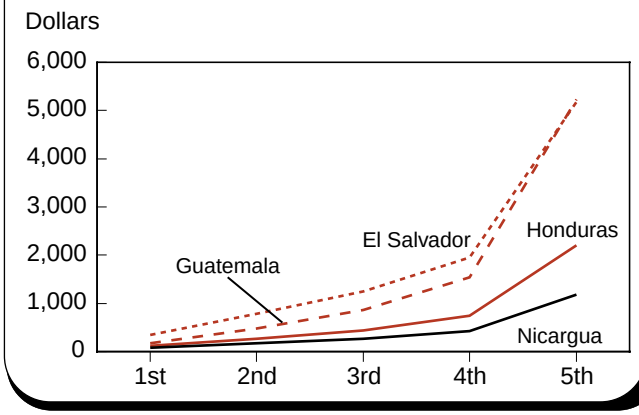
Latin America and the Caribbean

137 million people

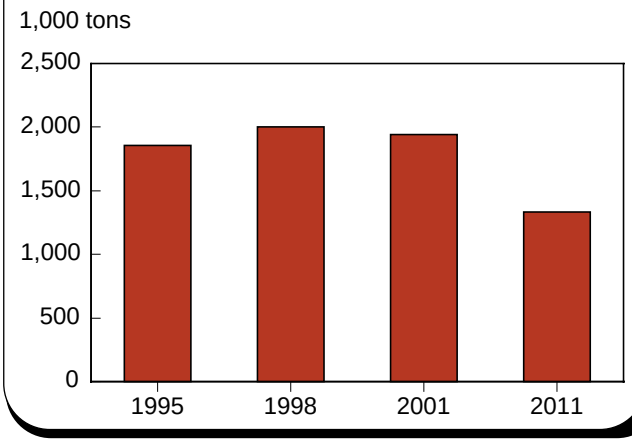
Food security in the region is projected to improve over the next 10 years. Despite recent economic difficulties in South America long term projections indicate rising per capita consumption for most countries.

Haiti and Nicaragua, however, the poorest countries in the region, don't share this optimistic outlook. Their situation is expected to worsen unless drastic political and infrastructural improvements can be achieved.

Annual per capita income by income quintile, 2000



Distrbution gaps in Latin America



Latin American and the Caribbean: Calorie consumption

	Calories per capita per day		Per capita consumption growth	Gini coefficient	GNP per capita
	1994-95	1998-99	1980-99		
	Number		*Percent*		*U.S. dollars*
LAC	**2,346**	**2,407**	**0.2**	**49.2**	**1,489**
Bolivia	2,209	2,228	0.1	42.0	1,010
El Salvador	2,534	2,453	1.4	52.3	1,900
Guatemala	2,356	2,261	0.1	59.6	1,660
Haiti	1,779	1,957	--	--	460
Honduras	2,346	2,377	-0.1	53.7	760
Nicaragua	2,147	2,278	-1.1	50.3	430

-- = Not available.
Source: FAO, 2001. World Development Indicators, 2000/1, World Bank.

tons in 2000, which would be enough to close estimated food gaps for 2001 if kept at the same level.

Honduras and Nicaragua experienced rising per capita consumption levels in the 1980s, before natural disasters caused setbacks in the 1990s. Honduras is still struggling to recover from the devastating destruction brought by Hurricane Mitch in 1998, and has since suffered from a drought that appears to have decreased the 2001 grain output by 20 percent compared to 2000. Status quo food gaps are therefore estimated at 287,000 tons in 2001, almost six times the level estimated for 2000. For the coming decade, however, production is expected to increase at an annual rate of 4 percent, which, combined with increased commercial imports, should allow status quo food gaps to decline to less than 80,000 tons by 2011. The nutritional food gap is estimated at close to 440,000 tons in 2001 and is projected to decline to 267,000 tons within 10 years. These large food gaps—measuring between 30 and 15 percent of the amount of food needed to meet average nutritional standards—suggests that undernutrition and hunger are widespread.

Nicaragua is suffering its second consecutive year of drought. Output in 2001 is estimated to be 8 percent below the pre-drought 3-year average. The status quo food gaps are thus estimated at 135,000 tons in 2001, about 15 percent higher than last year's food aid level. Nicaragua is mostly dependent on domestic food production as imports comprise less than one-third of domestic food supplies and are not expected to increase substantially. Yields are among the lowest in the region and are projected to grow at an annual rate of 1.3 percent, the same rate that area is expected to grow. Thus, production and import growth is projected to barely keep pace with population growth (estimated at 2.6 percent, the highest in the region), thereby failing to reduce the food gaps during the next 10 years.

New Independent States (NIS)

Tajikistan's harvest is down for the second year in a row, leading to an estimated food gap of about 300,000 tons to meet recent per capita consumption levels. ERS estimates that the number of hungry people in the region has declined from about 17 million people in 1995 to 10 million people today, mostly due to improvements in Azerbaijan. The remaining number of hungry people is projected to remain at similar levels in the next decade, primarily in Tajikistan and Armenia, due to a combination of both inadequate food supplies and access to food. [Michael Trueblood]

With the exception of Tajikistan, food production for the five NIS countries covered in this report (Armenia, Azerbaijan, Georgia, Kyrgyzstan, and Tajikistan) has recovered somewhat from last year's drought. Tajikistan's harvest is down again for the second year in a row. ERS estimates that about 300,000 tons of grain—about 24 percent of the overall food supply requirement—are needed to meet recent average per capita consumption levels. Meeting a nutritional standard would entail about 495,000 tons, or 34 percent of requirements. This analysis excludes considerations of refugee movements that may arise from political instability in the region.

ERS estimates that the number of people in the region who fail to meet nutritional requirements has been declining since the mid-1990s and will continue to do so over the next decade. The number has declined from about 17 million people in 1995 to 10 million people today. Most of that improvement occurred in Azerbaijan, which had about 6 million people with inadequate diets in 1995 compared with very few today. The total number of hungry people in the region is projected to decline further to about 8 million people by 2011, with most of the decreases coming in Armenia and Georgia.

For the most part, these positive trends reflect a continuation of political stability and economic recovery, which has helped attract foreign investment. All five countries have shown positive real per capita economic growth since 1996 after early contractions following the breakup of the Soviet Union. Armenia and Georgia have shown the highest growth rates at around 5 and 8 percent, respectively. Azerbaijan has been affected positively by a surge in its oil and gas exports, which has supported increased food imports and improved access to food for all income groups.

Tajikistan is projected to have longrun hunger problems related to both inadequate food supplies and access to food. Over the next decade, Tajikistan will face food supply deficits. To meet present per capita consumption levels, food supplies are estimated to be about 5 percent below requirements in 2001; to meet nutritional requirements, the deficit is about 18 percent. With very limited food supplies and low incomes, all segments of the Tajikistan population are estimated to consume nutritionally inadequate diets in 2001, accounting for about 5 million hungry people. That situation is expected to remain the same, and there are projected to be 6 million hungry people by the end of the next decade.

Although Armenia has shown robust economic growth, grain supplies in the country have continued to contract. Grain imports, which previously accounted for about 80 percent of total supplies, have been hurt by a trade embargo from neighboring countries and have recently averaged about 25 percent of total supplies. Grain production in the country has stagnated and therefore has not been able to make up the difference. ERS estimates that Armenia presently faces a food supply deficit of about 187,000 tons to meet nutritional requirements, but this deficit should fade away over the next decade. Most of the improvement is expected to come from other food sources as the country continues to diversify its diet. Like Tajikistan, it is estimated that all segments of the population consume inadequate diets, resulting in an estimated 3 million hungry people. However, over time it is projected that the top two income quintiles will be able to reach nutritional requirements, reducing the number of hungry people to 2 million people.

The longrun situation continues to be threatened by political and military instability in the region. The situation in Afghanistan could lead to large refugee move-

ments, which could spill over to other countries, including Tajikistan. Also, tensions have been rising recently between Georgia and Russia over the breakaway region of Abkhazian, which could lead to further problems for Georgia. However, on the positive side, recent peace negotiations between Armenia and Azerbaijan over Nagorno-Karabakh seem to be moving toward a lasting settlement.

Table 6—Food availability and food gaps for New Independent States (NIS)

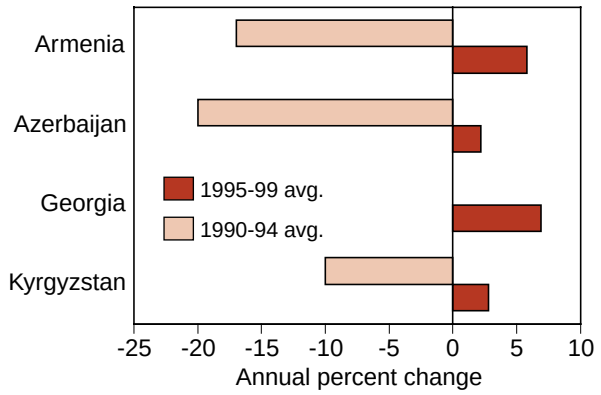
Year	Grain production	Root production	Commercial imports	Food aid receipts (grains)	Aggregate availability of all food
			---1,000 tons ---		
1992	2,539	---	---	---	---
1993	2,451	---	1,333	---	---
1994	1,913	224	846	1,102	4,567
1995	1,944	256	430	929	4,473
1996	2,895	266	772	347	4,533
1997	3,491	294	840	511	5,174
1998	3,127	336	845	148	4,870
1999	3,155	397	1,086	290	5,371
2000	2,349	403	968	245	4,770
Projections				**Food gap**	
				SQ / NR	(w/o food aid)
2001	2,869	398	967	***299*** / ***682***	4,587
2006	3,453	443	941	***44*** / ***279***	5,412
2011	3,713	492	976	***78*** / ***305***	5,817

NIS
27 million people

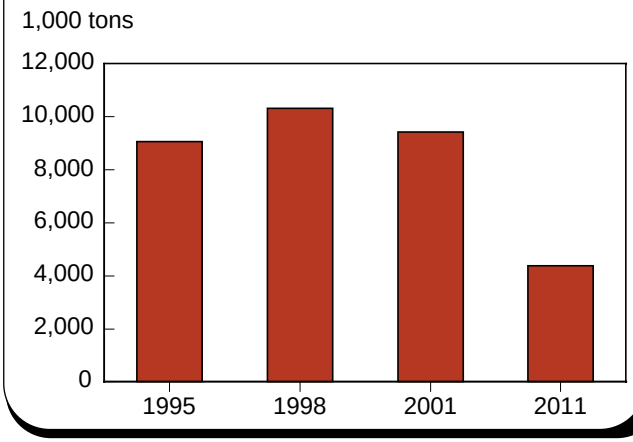
Tajikistan faces another food gap this year of about 300,000 tons. The country will continue to confront chronic food problems over the next decade, both in terms of food supply and economic access.

The number of hungry people in the region has been declining and will continue to do so over the next decade. Most of the improvements to date have occurred in Azerbaijan. Future decreases will come from Armenia and Georgia. These positive trends reflect a continuation of political stability and economic recovery in recent years.

Per capita incomes are rebounding



Distrbution gaps in NIS



NIS: Calorie consumption

	Calories per capita per day 1994-95	Calories per capita per day 1998-99	Per capita grain consumption growth 1990-2000	Gini coefficient	GNP per capita
	Number		*Percent*		*U.S. dollars*
NIS	**2,110**	**2,379**	**-0.7**	**40.5**	**490**
Armenia	2,004	2,171	-9.5	--	490
Azerbaijan	2,050	2,163	1.9	--	550
Georgia	2,140	2,381	-0.3	--	620
Kyrgyzstan	2,246	2,800	3.9	40.5	300
Tajikistan	2,288	1,939	-4.0	--	290

-- = Not available.
Source: FAO, 2001. World Development Indicators, 2000/1, World Bank.

Market Reforms and Policy Initiatives: Rapid Growth and Food Security in China

Bryan Lohmar[1]

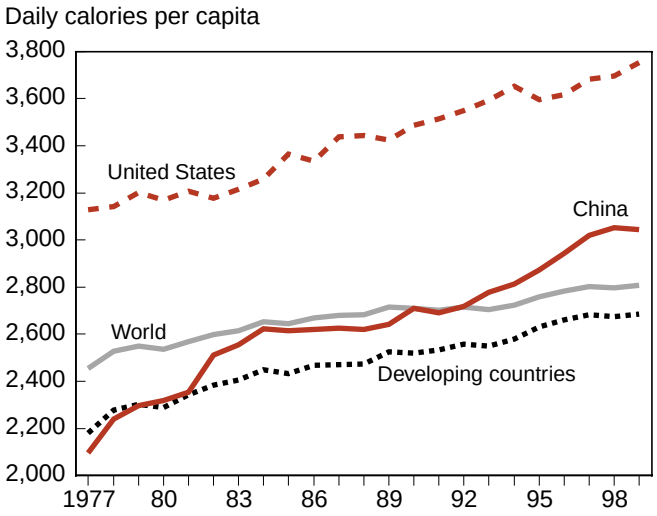
Abstract: China has made important gains in providing food security to its vast population, but over 100 million people still live on less than one dollar a day and over 40 million people live under China's poverty line standard (around 60 cents/day). The core policies China uses to promote food security—grain reserves, marketing and self-sufficiency policies—are expensive and do not effectively provide food security to poor rural households. Various policies implemented since the 1980s to bring the remaining people out of poverty have been marginally effective. Land tenure policies promote food security by providing all rural households access to land, but also have negative effects on the growth of rural incomes. The most effective policy that promotes development and food security to targeted poor areas are the food-for-work projects coordinated by the Poor Area Development Offices. Poverty alleviation is helped by rapidly growing nonagricultural rural incomes. Job growth in this sector is likely to be spurred with China's accession to the World Trade Organization. However, many workers may be laid off from the inefficient state-owned enterprises and could result in a new food security problem in China: unemployed urban workers.

Keywords: China, food security, land tenure, WTO, self-sufficiency, rural poverty.

Introduction

China has made enormous progress in providing food security for its people since economic reforms were introduced in the late 1970s. According to FAO statistics, average per capita food consumption in China was only 2,017 calories in 1977, well below the world average of 2,500 and below the average for other developing countries at that time (fig. A-1). By 1999, average per capita food consumption in China had increased by over 50 percent, to 3,045 calories, above the world average of 2,808 calories. Nutritional intake and food quality also have improved in China. Consumers now vary their diets with more meat and vegetables than before while per capita consumption of staple grains has hardly increased in the past decade.

Figure A-1
Average caloric intake in China and the rest of the world



Source: U.N., Food and Agriculture Organization, FAOSTAT databook.

[1]Agricultural economist with the Market and Trade Economics Division, Economic Research Service, USDA.

Despite the success indicated by these aggregate statistics, China still has pockets of poverty and seeks to provide greater food security for its large population, many of which are low-income farmers in areas with poor resource endowments and low levels of economic development. Household food insecurity is mostly a rural phenomenon in China. In the pre- and early reform periods (late 1950s to late 1980s), a wide variety of policies favored urban areas at the expense of rural areas, including urban food subsidies paid for by farmers through low prices received for their products. These policies kept urban food consumption at levels well above rural consumption. During the Great Leap Forward (1959-1961), urban residents, for the most part, were largely unaffected by food shortages while the world's worst famine devastated many rural areas (see box). By the 1990s, urban food subsidies were removed because urban residents had become wealthy enough to afford ample food without them.

To advance food security for both urban and rural households, China has established several programs and institutional arrangements. At the core of the policies to promote food security in China is a system of government-held stocks, state-owned grain marketing bureaus and local food self-sufficiency policies. These core policies, however, are generally intended to maintain grain supply to urban areas rather than poor rural areas. Other food security policies range from those that promote basic goals such as increasing rural incomes, targeted anti-poverty policies such as food-for-work programs, and idiosyncratic institutions such as the land tenure system which guarantees rural households access to land. These policies vary in effectiveness, but in many respects the latter set of policies have had a greater positive impact on the food security of rural households than the core grain storage and self-sufficiency policies.

Complex food security issues and policies in China must also be considered against the backdrop of an economy in transformation simultaneously undergoing both rapid development and transition from a planned to a market economy. Much of China's achievement in extending food security to millions of households has come about under the development "miracle" of the last 20 years. This miracle was the result of policies that weakened administrative control over economic decisions that characterized the collective era. Yet many of China's food security policies have their roots in these administrative controls, but have been hybridized to adapt to the new market environment.

This article provides an overview of China's success in providing food security and the policies used to achieve that goal. It will describe the core policies of China's grain reserve system, state-owned grain marketing, and policies to promote local self-sufficiency. In addition, it discusses China's anti-poverty policies and the problems and successes China has encountered in trying to bring development and food security to the remaining rural poor areas.

Food Availability and Self-Sufficiency Policies

The term "food security" does not always mean access to food for poor households in China. Often, food security policies are intended to promote local and national grain self-sufficiency, or to maintain food availability through government-held grain stocks. China's desire to control and maintain politically determined levels of grain stocks and grain self-sufficiency generates three sets of policies: grain reserve policies, grain marketing policies, and grain self-sufficiency policies. All three have roots in the period of collectivized agriculture and some, such as policies of state-held grain reserves, go back thousands of years in China. The reform of these policies, however, has lagged compared to the reform of marketing and trade in other products or the reform in agricultural production institutions overall. Many of the marketing, storage, and trade policies have been liberalized over the last 20 years, only to be "reformed" again by changes that bring back government control.

Grain marketing policies. China's leaders see the undisrupted supply of grain to urban areas and low grain price volatility as important political goals. To achieve these goals, the government maintains control over the marketing and distribution of staple grains. Private grain trade was pushed out with the establishment of collectivized agriculture in the late 1950s, and the loss of private traders is thought to be one of the causes of the famine in 1959-61 (see box). Rural markets were restored in the early 1980s, and farmers today sell nearly all their fruit and vegetable production on free markets. However, government control of grain marketing still prevails, and even increased in the late 1990s, but has liberalized in the last 2 years. At its most liberalized period in the early 1990s, nongovern-

China: The Great Leap Forward

The high level of concern among China's leaders over food security, however misplaced by emphasizing self-sufficiency, is becoming more understandable as the events around the Great Leap Forward period (1959-1961) become known. The Great Leap Forward began as a drive to harness the energies of China's enormous rural population to modernize the agricultural sector, rapidly increase industrial and agricultural production, and establish rural collective utopias (the People's Communes). All varieties of food and services were to be plentiful and free of charge after only a few years of hard work setting up these collective enterprises. It ended as a monumental failure that likely set back China's economic development by a generation or more. The policy of state grain procurement, combined with a dramatic fall in agricultural production, caused a devastating famine, the grisly details of which are only now beginning to be known.

Estimates of the number of deaths by famine during what are now called the "three lean years" (1959-1961) are in the neighborhood of 20-45 million, making it far and away the worst famine in the history of the world in terms of absolute number of victims. In addition, an untold number of births were aborted by malnourished mothers. A frequently cited early estimate by Judith Banister (1987), concluded that there were roughly 30 million excess deaths during the period. The central inland provinces of Anhui, Henan, and Sichuan bore the brunt of the famine. Some estimate that up to a quarter of the rural population of Anhui perished during those 3 years (Becker, 1997). The actual number of famine deaths will never be known, partly because of the inherent difficulty of determining "excess deaths" from famine. Other reasons include the loss of many records in the years since, the movement of millions who fled famine areas, and the secrecy surrounding the events that occurred, which extends down to sub-provincial levels since local leaders wanted their superiors to believe that no famine was occurring in their respective areas.

The famine was due to a combination of lower food availability as well as a state-controlled grain distribution system that gave urban residents entitlement to food at the expense of rural residents in order to support industrialization. Agricultural production clearly plummeted over the period (Crook, 1988). Bad weather is officially blamed for the fall in production and at least part of the famine, but this does not fit with meteorological evidence taken from nearby countries, which paints a picture of relatively good weather for agricultural production over those years. It is more likely that production fell due to poor incentives under the collectives, ill-suited farming practices that the collective leaders were implored to adopt, and bureaucratic allocation of labor, much of which was directed at the now notorious rural steel furnaces even while unharvested crops rotted in the fields. But despite the production fall, rural officials at the time reported production increases in order to show the success of their collective operations. Thus China increased its grain procurement from rural areas and even its grain exports to the Soviet Union during this time. Between 1958 and 1959, grain output fell from 200 to 170 million metric tons (mmt), but quota deliveries rose from 51.8 to 64.1 mmt and exports rose from 2.7 to 4.2 mmt (Lin and Yang, 2000). This left insufficient grain for many rural areas to survive the year. Although grain production did not recover until 1966, quota levels fell back to the 1958 level (as a percent of production) and imports began by 1961.

ment traders handled about one-third of China's domestic grain market.

To carry out government grain marketing and storage policy, China has established a system of government-owned Grain Bureaus and Grain Stations in counties and townships across the countryside. The primary responsibility of this system has been to collect mandatory grain quota deliveries from farmers and to store state-owned grain reserves. China's grain quota policy is linked with the land policy (see page 27).

Since reforms in the late 1970s, households receive land to farm in exchange for delivering a grain quota to the Grain Bureau for a fixed, below-market price determined in advance by the government. The Grain Bureaus then either store the collected grain as state grain reserves or market it as a state-owned commercial enterprise. Grain Bureaus also can buy grain beyond the quota amount at a "negotiated" price, which is also set in advance by the government but is closer to free market prices. Farmers generally are free

also to sell any remaining grain on the free market, but this outlet was restricted in the late 1990s.[2]

China's government-owned Grain Bureaus are often called upon to fulfill policy objectives, yet are also expected to be commercial, financially independent enterprises. The conflicts that are inherent to fulfilling both goals cause a variety of problems. As state-owned companies, they are often required to hire demobilized soldiers or follow other hiring requirements. As a result, they have far more employees than they need, are notoriously inefficient, and rely on large subsidies to stay solvent. Because they must also compete with the private sector, or because of underlying economic factors that distort the outcomes of policy directives, they often cannot fulfill their political objectives.

The use of the extensive but inefficient state grain system to further political goals not only draws from government revenues, but also may exacerbate food insecurity in rural China. The Grain Bureau subsidies are substantial. In 1997/98, losses by state-owned Grain Bureaus totaled over 100 billion yuan, or $12 billion (Crook, 1998). In addition, since the Grain Bureaus carry out politically motivated price policies that do not consider underlying economic trends, they may actually exacerbate price volatility. In some cases, the Grain Bureaus could not make money buying grain at the prices they were instructed to pay, so they stopped buying altogether, which hurt farmers. Finally, until recently the Grain Bureaus have not considered quality or paid a premium for it. Even today, the premium is probably not sufficient to make high-quality grain, which tends to be lower yielding, profitable enough for farmers.

Grain reserve policies. In addition to control over grain movement, China's national government also controls a large amount of reserve grain stocks. The actual size of the government held stocks is not publicly released and is considered a state secret. In addition to state stocks, private end users (such as millers) maintain stocks, the Grain Bureaus themselves hold commercial stocks, and farm households also hold stocks for their own food security and as a liquid asset in areas where there are few, if any, financial institutions. One of the few attempts to break down China's stocks concluded that roughly 70 percent were held on farms, 24 percent were state-owned, and 6 percent were commercial stocks held by the Grain Bureaus and private operators (Crook, 1996).

China's state-held stocks, however, are too bureaucratically constrained to effectively reduce price volatility. Their existence has more to do with grain security for urban consumers and the military than to promote food security for low-income farmers. The state stocks are managed by the State Administration for Grain Reserves (SAGR), but are held by the Grain Bureaus, which in turn report to the SAGR. The SAGR stocks may be sold if prices increase by more than 20 percent, but this requires a decision at the provincial level, which takes time. Often, the Grain Bureaus intermingle the SAGR stocks and their own commercial stocks and so may perceive state stocks as part of their commercial enterprise, which they may not want to sell when prices are rising. Grain Bureaus also collect fees from SAGR to store the stocks, which they will lose if they sell the stored grain.

China's policy of maintaining strategic stocks is also expensive and perhaps unnecessary for advancing food security for the most vulnerable households. Cost estimates for carrying over the excessively large strategic stocks are substantial. A recent estimate of the costs to carry over one ton of wheat, rice, and corn came to roughly $42, $56 and $39, respectively, over 20 percent of the price of each commodity on the world market (Nyberg and Rozelle, 1999). These amounts, when multiplied by the several million tons of carry-over stocks, translate into substantial maintenance costs. In addition, farmers likely will not rely on these stocks to protect them from food shortages, partly due to past experience, and may store sufficient grain to weather a bad crop year (or two) themselves.

Self-sufficiency policies. The political motivation for holding strategic stocks also motivates the desire to be self-sufficient in staple grains. As a remnant from the collective era, central planners have promoted self-sufficiency on a national, as well as local, scale. Emphasis on self-sufficiency began to wane in the early 1990s, only to become important again in 1995, presumably after Lester Brown predicted massive food imports in China by 2030 that would destabilize world markets and cause famine in poorer parts of the world (Brown, 1994).

[2] Grain markets are currently liberalizing restrictions placed on private traders in the 1990s and private trade is growing. In 2000 and 2001, several provinces also announced that they will no longer set and collect grain quotas from farmers, so more grain will be available for marketing through the private sector.

In 1995, China established the Governors Grain Bag Policy (GGBP), which charged governors with achieving provincial self-sufficiency (balancing local supply and demand) and for some grain pricing and marketing in their provinces. The GGBP did not make any fundamental changes to grain marketing or production policy other than turning over the responsibility for grain production, marketing, and quota fulfillment to governors. At the same time this policy was initiated, however, came an increase in quota levels indicating a clear emphasis on increasing grain sown area, yields, and ultimately grain production.

At the national level, China seeks to promote self-sufficiency through state control over grain imports and exports. This allows government policy to ensure that if the international price is below China's price, grain will not be imported and undermine local grain production. Alternatively, if prices are higher on the international market, China's domestically produced grain will not leave the country and undermine locally held grain reserves. This control is achieved through a complex system of state-owned marketing and trade companies that interact with officials from the national government and the provinces to determine annual import and export quotas. These quotas are then allocated to buyers and sellers who fulfill their quota through the state trading enterprises (WTO accession has changed the import mechanisms and borders will become more open to imports).

While self-sufficiency policies ensure that grain is produced for local consumption, they may well adversely affect rural household food security. The policies discourage areas from moving into crops or economic activities for which they have a comparative advantage, thus holding back potential income growth. Income, of course, is the most important determinant of household food security, so policies that discourage farmers' ability to increase their incomes have a distinct negative effect on farm household food security. In addition, by encouraging grain to be locally produced, rather than produced in the most suitable areas, food self-sufficiency policies also lower the demand for markets in rural areas and thus slow market development. Well-functioning markets increase the overall wealth of an economy and can assure that food supplies are available for households when they need them, so long as they have the income to purchase them.

Overall, the main problem with China's system of state controlled grain marketing, storage, and emphasis on self-sufficient production, all done in the name of advancing food security, is that they promote food availability in rural areas, but not entitlement or the right to food. Entitlement is often the more important component of food security. Many famines happen when food is available, but households do not have the means to access it. Indeed, during the famine of 1959-61, China was exporting grain to the Soviet Union. Although crop production fell dramatically, there was some stored grain available, but the grain was not made available to many poor farmers.

Poverty Reduction in China: The Success of Rural Reforms

China's enormous success at increasing the food security for hundreds of millions of rural residents is due more to rapid economic growth than policies specific to food security. In the late 1970s and early 1980s, China implemented a series of economic reforms. The result was one of the world's most spectacular reductions in poverty, increasing food security for hundreds of millions of rural residents. The gross value of agricultural output rose from 139.7 billion yuan to 321.4 billion yuan between 1978 and 1984, increasing 7.7 percent a year in real terms. Using China's own poverty lines, the number of rural poor fell by 132 million between 1978 and 1984, from 260 million to 128 million (table A-1). World Bank estimates suggest an even greater decline, from 260 to 89 million, indicating that 171 million rural residents came out of absolute poverty in China over the period of 1978-84 (table A-1).[3]

The economic reforms that generated the profound reduction in absolute poverty had three main features (table A-2). First, in 1978, the new leadership introduced a one-time, 20-percent increase in prices paid to agricultural producers to reverse the urban-biased policies that dominated the collective period. Second, the Household Responsibility System (HRS) broke up collectivized agriculture and restored the role of the farm household as the primary unit of production.

It is interesting to note that China's leaders did not encourage the adoption of HRS in the beginning. Initially, HRS was viewed as a local anti-poverty program. Cadres in poor areas were allowed to experi-

[3] The estimates of absolute poor take retail food prices into account. They estimate the number of people whose income is insufficient to purchase a food basket that achieves minimum caloric intake at current prices.

Table A-1--Poverty reduction in China: China and World Bank estimates

Year	China's official poverty lines			World Bank I		World Bank II	
	Poverty line	Number of rural poor	Share of rural population	Number of rural poor	Share of rural population	Number of rural poor	Share of rural population
	Current yuan	*Million*	*Percent*	*Million*	*Percent*	*Million*	*Percent*
1978	--	260	32.9	--	--	260	33.0
1980	--	218	27.6	--	--	218	27.6
1981	--	--	--	--	--	194	24.3
1982	--	140	17.5	--	--	140	17.4
1983	--	--	--	--	--	123	15.2
1984	200	128	15.1	--	--	89	11.0
1985	206	125	14.8	--	--	96	11.9
1986	213	131	15.5	--	--	97	11.9
1987	227	122	14.3	--	--	91	11.1
1988	236	96	11.1	--	--	86	10.4
1989	259	106	12.1	--	--	103	12.3
1990	300	85	9.5	280	31.3	97	11.5
1991	304	94	10.4	287	31.7	--	--
1992	317	80	8.8	274	30.1	--	--
1993	350	75	8.2	266	29.1	--	--
1994	440	70	7.6	237	25.9	--	--
1995	530	65	7.1	200	21.8	--	--
1996	580	58	6.3	138	15.0	--	--
1997	640	50	5.4	124	13.5	--	--
1998	635	42	4.6	106	11.5	--	--

-- = Not available.
Source: China's poverty estimates for 1978-82 and absolute poverty estimates for 1978-1990 are from World Bank I (1992).
International Poverty line estimates from 1984 to 1998 are from World Bank II (2001).

Table A-2--China: Rapid changes between 1978 and 1984

	Grain prices	HRS adoption	Rural markets	Grain production	Grain sown area	Grain yield
	1978=100	*Percent of villages*	*Number*	*Million tons*	*Hectares*	*Kg/ha*
1978	100.0	0	--	304.8	120.6	2,596
1980	141.8	14	37,890	320.6	117.2	2,735
1982	161.1	80	--	354.5	113.5	3,124
1984	199.4	99	50,356	407.3	112.9	3,608

-- = Not available.
Source: National Bureau of Statistics, Agricultural Statistical Yearbook, various years; Lin, 1992; Carter, Zhong and Cai, 1996.

ment with organizational forms that increased production and incomes. Thus, poor areas implemented the HRS reforms first, and were so successful that other areas soon adopted the system. By the time HRS was officially sanctioned in 1984, nearly all of China's countryside had already adopted the system.

The third feature was the establishment of rural markets for households to market their excess production (beyond their grain quota delivery obligation). These free markets gave households the opportunity to not only sell excess production, but also to earn income through production and sale of sideline goods. The real value of sideline production rose 15.5 percent annually over the 1978-84 period (Carter, Zhong and Cai, 1996).

Land tenure system under HRS. A unique land tenure system was established under HRS in order to both restore household farming and promote egalitarian access to land, and, indirectly, to food. Chinese households do not own their land outright. Instead, the *right to use* land and the *right to residual income* from the land are extended to the households in the collective. The guidelines for how these allocations are determined vary widely from village to village, but usually are based on the number of people in the household (to uphold the egalitarian ideals of the collective era). In return for these rights, farm households usually must deliver a mandatory grain quota to the state Grain Bureaus (as described above) and often must pay an agricultural tax that is based on the size of their land allocation.

The fundamental aspects of the land tenure system established under HRS still exist today, providing access to land for every rural household and serving an important food security function. Because of this system, China does not have a large population of landless workers as is found in most other low-income agrarian countries. Landless rural workers are usually the most food insecure because they rely on wages to buy food and therefore are more vulnerable to disruptions in employment or food price increases. Landed households are less vulnerable because they are more likely to store agricultural production that they can sell or consume later. Landed households can also use their land as collateral to borrow money or food. While farmers in China cannot use their land directly as collateral, they can use future production as collateral if in need. China's policy of providing every household with access to land makes an important contribution to furthering food security for rural residents.

Although growth in agricultural production was impressive under HRS, and its linkage to the new land tenure arrangements is clear, the land tenure system also has effects that hold back income growth and impede entitlement. Tenure rights in China depend on the household maintaining residency in the village. The nominal owners of land, usually a village collective, hold the right to reallocate land away from households, which they may do to maintain an egalitarian distribution or for other more capricious reasons, generating tenure insecurity. The implied mobility costs and lack of incentives to make long-term productivity increasing investments adversely affect farm incomes. The magnitude of these effects is unknown and debated among China's rural economy scholars. In addition, the tenure system is less effective at promoting old-age food security since households lose land as members move out, leaving the elderly more dependent on their children than if they had small land holdings generating rental income.

Anti-poverty policies. After the enormous and immediate success of the HRS and related reforms, the pace of poverty reduction waned by the mid-1980s. To reinvigorate the process, China's State Council established the Leading Group for Economic Development in Poor Areas (LGEDPA) in 1986. The LGEDPA was a task force charged with the task of identifying poor areas and coordinating policies to facilitate economic growth in those areas.

Under the LGEDPA, China initiated a campaign to eliminate poverty by identifying poor areas, then channeling various funds to these areas to facilitate economic development. The LGDPA ultimately identified a total of 698 counties, roughly one-third of all the counties in China. Seventy-eight percent of the designated counties were to the west of a north-south line drawn through the mountainous regions connecting Heilongjiang and Yunnan Provinces, a geographic pattern of poverty that remains today. Once identified, the LGEDPA established Poor Area Development Offices (PADOs) to administer funds from national and provincial budgets, and also directed banks to make loans to these offices from special funds set up for poverty reduction. Designated poor counties received three main types of aid: subsidized credit, food-for-work programs, and development grants. These aid programs are meant to provide the investment impetus to spur economic development.

Since the introduction of the anti-poverty programs in the late 1980s, the campaign has been re-organized, and while it has not achieved its original goals, there are some signs of success. While poor counties that were designated and assisted by the anti-poverty campaign did not grow faster than all other counties, they did grow as fast as the average, which was faster than the poor counties that were not included in the campaign (Rozelle, Zhang and Huang, 1998). Many of the original loans were actually consumption subsidies, rather than investments to promote economic growth. In the early 1990s, efforts were made to re-designate counties to reflect their actual poverty levels and to ensure that funds went into investments rather than consumption loans. The most successful elements in the campaign were investments to increase rural education and agricultural productivity. In particular, the food-for-work programs, especially when the work was directed at constructing irrigation systems or soil conservation projects, had the best record of achieving average growth rates, and also likely had the greatest direct impact on food security for rural households.

The role of nonfarm income growth. The fastest growing segment of rural incomes since the early 1980s has not been agriculture, but rather nonagricultural incomes. Rural industry was the most dynamic sector of the economy for many years during the mid-1980s through to the early 1990s. Since 1980, over 100 million rural residents have found nonfarm jobs in rural industry. In addition to jobs in the formal rural industrial sector, the number of self-employed farmers in nonagricultural trades increased even faster (Lohmar, Rozelle and Zhao, 2001). By the mid-1990s, when growth in the rural industrial sector began to slow,

rural-urban migration surged. While this component of rural nonfarm employment is less well documented, estimates of the number of rural-urban migrants range from between 40 to 100 million in the mid 1990s. Unlike many other developing countries, however, rural-urban migrants do not face high food insecurity because they are not landless laborers driven from the countryside by poverty. They are generally young adults who, on their own, leave rural households behind to seek employment opportunities in the cities. These migrants tend to come from relatively poor villages in generally well-off regions. If these migrants suffer wage or employment loss, they can generally return to their home village for access to food.

The explosion in rural nonfarm employment in China has brought increased income to hundreds of millions of rural residents, but it has also had some drawbacks. Rural industrial growth was largely a coastal phenomenon. Inland provinces do not have the same access to urban and overseas markets or investment funds enjoyed by the coastal provinces. Even within villages, households with nonfarm incomes are the wealthiest households. Income inequality has increased substantially since the early 1980s. The tax system, which has yet to be reformed to reflect new income sources, exacerbates this inequality. Households still pay most taxes according to land size or agricultural production, while nonfarm income is not subject to taxes. Although rural income inequality has increased and is a problem, it is far lower than the inequality between regions, particularly between urban and rural areas where the ratio of average income is nearly 3 to 1. Because of the differences between agriculture and nonagricultural incomes, policies that facilitate movement of labor out of agriculture and labor mobility, such as rural education programs, hold out the most promise for increasing rural incomes in the future.

The Effect of WTO on Food Security

China recently finished longstanding negotiations to enter the World Trade Organization (WTO). Implementing the commitments it made to join WTO will make China's agricultural economy more open. The commitments include: transparent and significant tariff-rate quotas for staple grains and other important commodities; limits on the levels of trade-distorting domestic support China can extend to farm commodities; and, measures that will undermine the monopoly power of state trading companies and will likely promote domestic market development.

It is difficult to assess the net effect of China's commitments to WTO on the nation's overall food security. In the agricultural sector, many outcomes will depend on whether prices are higher or lower in China than the rest of the world and how the state trading and marketing regimes manage price volatility. These points are currently debated among scholars of China's rural economy. If prices are lower and more volatile than international markets, then the integration with the outside world that will come as a result of WTO accession will have a clear positive impact on rural incomes and food security for households that produce more grain than they can consume. However, higher grain prices will adversely affect households that cannot produce enough grain for their own consumption. The greater integration of China's domestic economy is also expected to increase overall wealth and rural incomes, especially as more farmers are allowed to specialize in high-value cash crops.

The most important impact WTO accession will have on food security in China, however, will likely be through growth in the nonagricultural sector, rather than through changes in agriculture directly. WTO accession is expected to increase the nonagricultural component of rural incomes and will, in the long run, provide net income increases for farm households even if prices for agricultural products fall. These effects, coupled with increased migration opportunities as the domestic economy becomes more integrated, will serve to increase household income, even in poor and remote areas of China where most food insecurity exists.

There is a downside to WTO accession, however, that could exacerbate the emerging problem of food insecurity in urban areas as state-owned enterprises lay off workers that formerly enjoyed "iron rice bowls"—lifetime employment and food security. The number of employees laid off from overstaffed and inefficient state-owned enterprises has grown significantly in recent years as China's leaders push state enterprise reform to prepare the industrial sector for competition with foreign enterprises after WTO accession. These workers are often older and have less education than the workers with whom they must compete for available jobs. The plight of these workers is a major, and growing, concern for the leadership in China. Attempts at introducing a social security system to provide them with at least subsistence income have failed, largely due to fiscal constraints. WTO accession will increase the pressure on state-owned enterprises to become more efficient and this will certainly mean more layoffs.

Without a social security system in place to provide food security for former employees, WTO accession may hasten the growth of what has up to now been almost nonexistent in China: urban food insecurity.

Conclusions

China has made important gains in providing food security to its vast population, most of whom live in farm households with only small plots of land. Still, given the size of the population, there were over 100 million living on less than $1 a day in 1998 and over 40 million living under China's lower poverty line standard. Various policies to bring the remaining people out of poverty since the initial surge of poverty reduction in the early 1980s have been marginally effective, but those remaining will be more difficult to reach since they generally live in more remote areas.

The policies China uses to promote food security are expensive and do not effectively provide food security to poor rural households, and may even worsen their food security by discouraging growth and market development. Practically the only truly effective policy that promotes development and food security to targeted poor areas are the food-for-work projects coordinated by the PADOs. Grain reserves, marketing, and self-sufficiency policies often are not intended to provide food security for the rural poor and certainly do not promote entitlement to food. Land tenure policies do promote food security by providing all rural households with access to land, but also have negative effects on the growth of rural incomes.

The fastest growing and most promising component of rural incomes is nonagricultural income. Nonagricultural incomes are expected to continue growing, especially with China's accession to the WTO. But these nonagricultural jobs have been, and will continue to be, concentrated in the coastal provinces, so policies that encourage migration are the best way to help households in poor inland areas access these jobs. Education is repeatedly shown to be one of the biggest determinants of the decision to migrate, and public education will play a key role in China's future success at bringing more people out of poverty. While WTO accession is expected to spur job growth, it will also spur layoffs from inefficient state-owned enterprises. Urban workers laid off from these firms may begin to form a new food security problem in China—unemployed urban workers.

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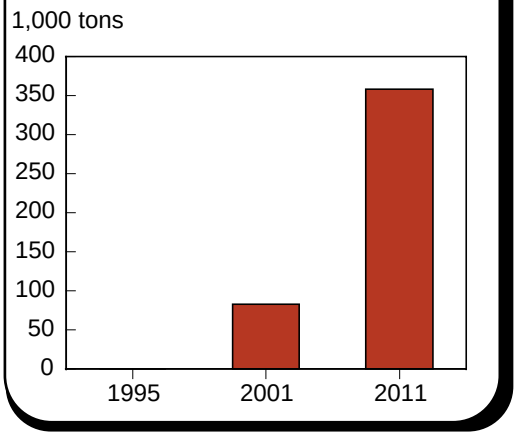
Statistical table 1--Algeria (North Africa)

Year	Grain production	Root production (grain equiv.)	Commercial imports (grains)	Food aid receipts (grains)	Aggregate availability of all food
			---1,000 tons ---		
1992	3,348	295	5,075	15	9,007
1993	1,563	272	5,854	18	8,742
1994	959	183	7,357	24	9,907
1995	2,137	306	6,096	13	11,940
1996	4,883	294	3,950	36	9,101
1997	883	242	6,170	13	9,621
1998	3,023	281	5,563	27	9,388
1999	2,052	254	5,828	15	9,450
2000	945	243	7,493	0	10,638
Projections				**Food gap** SQ	NR	(w/o food aid)
2001	1,602	280	6,790	***0***	***0***	9,781
2006	1,886	308	7,162	***0***	***0***	10,425
2011	1,970	339	7,735	***0***	***0***	11,147

Distribution gaps

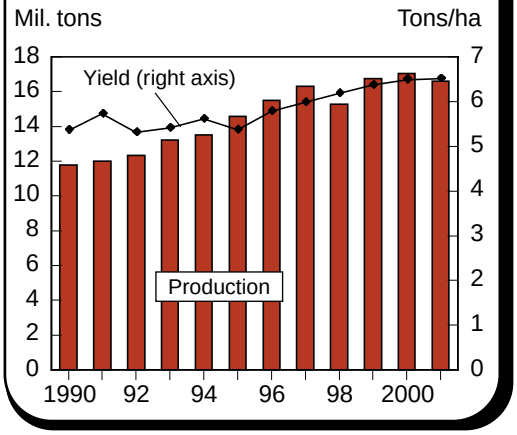


	1980-90	1990-2000
	Percent	
Export earnings growth	4.1	2.8
Consumption growth, p.c.	-1.7	0.4
Area growth	-2.2	-6.4
Yield growth	-0.4	2.2
Imports/Food supply ratio	66.5	69.8

Statistical table 2--Egypt (North Africa)

Year	Grain production	Root production (grain equiv.)	Commercial imports (grains)	Food aid receipts (grains)	Aggregate availability of all food
			---1,000 tons ---		
1992	12,329	460	6,635	482	17,595
1993	13,205	466	6,919	230	18,458
1994	13,510	398	8,974	180	20,356
1995	14,578	721	7,763	190	21,047
1996	15,485	731	8,521	145	21,325
1997	16,304	522	10,047	59	23,267
1998	15,289	572	10,495	13	22,949
1999	16,735	520	9,631	64	23,472
2000	17,034	518	9,593	64	23,067
Projections				**Food gap** SQ	NR	(w/o food aid)
2001	16,602	551	10,105	***0***	***0***	23,345
2006	17,907	589	10,514	***0***	***0***	24,579
2011	19,003	629	11,000	***0***	***0***	25,750

Grain production and yields

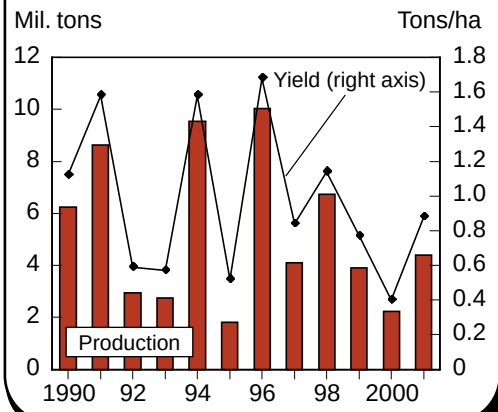


	1980-90	1990-2000
	Percent	
Export earnings growth	5.2	3.0
Consumption growth, p.c.	-1.5	2.0
Area growth	0.5	2.1
Yield growth	3.5	1.9
Imports/Food supply ratio	46.8	36.9

Statistical table 3--Morocco (North Africa)

Year	Grain production	Root production (grain equiv.)	Commercial imports (grains)	Food aid receipts (grains)	Aggregate availability of all food
			---1,000 tons ---		
1992	2,933	276	2,935	234	8,872
1993	2,753	265	3,597	124	9,889
1994	9,530	312	1,717	13	9,244
1995	1,800	267	3,628	0	9,910
1996	10,037	373	2,912	4	10,469
1997	4,101	357	2,782	10	10,039
1998	6,733	335	4,112	10	9,935
1999	3,913	341	4,392	19	10,592
2000	2,233	327	4,294	19	10,386
Projections				**Food gap** SQ	**Food gap** NR	(w/o food aid)
2001	4,385	351	4,375	***0***	***0***	10,249
2006	5,130	393	4,589	***0***	***0***	11,391
2011	6,048	439	4,824	***0***	***0***	12,803

Grain production and yields

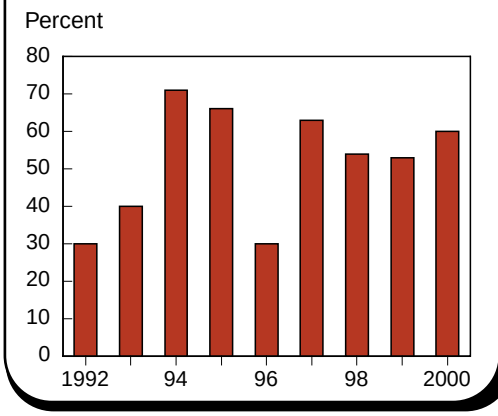


	1980-90	1990-2000
	Percent	
Export earnings growth	7.9	4.9
Consumption growth, p.c.	1.3	-0.7
Area growth	3.0	0.1
Yield growth	5.8	-4.6
Imports/Food supply ratio	29.2	39.3

Statistical table 4--Tunisia (North Africa)

Year	Grain production	Root production (grain equiv.)	Commercial imports (grains)	Food aid receipts (grains)	Aggregate availability of all food
			---1,000 tons ---		
1992	2,155	54	928	100	3,744
1993	1,561	49	1,020	46	3,267
1994	646	52	1,591	22	3,003
1995	1,366	58	2,702	18	4,377
1996	2,862	67	1,246	4	3,522
1997	1,151	72	1,979	12	3,740
1998	1,654	73	1,980	0	3,992
1999	1,806	79	2,039	4	4,128
2000	1,521	72	2,305	0	4,038
Projections				**Food gap** SQ	**Food gap** NR	(w/o food aid)
2001	1,551	78	2,203	***0***	***0***	3,970
2006	1,824	85	2,295	***0***	***0***	4,380
2011	1,980	93	2,434	***0***	***0***	4,699

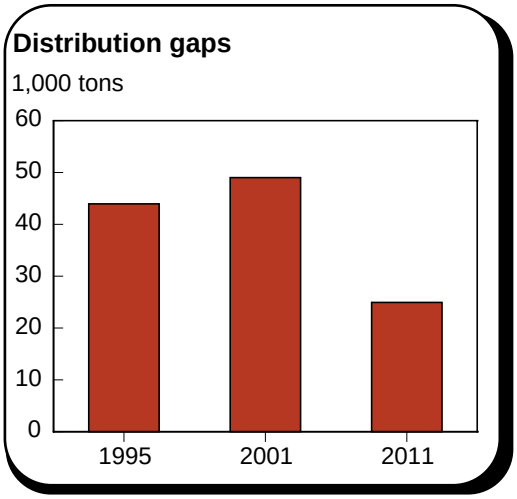
Commercial imports as share of supply



	1980-90	1990-2000
	Percent	
Export earnings growth	5.6	5.1
Consumption growth, p.c.	0.0	0.8
Area growth	-3.2	-1.6
Yield growth	-1.0	0.3
Imports/Food supply ratio	51.8	48.8

Statistical table 5--Cameroon (Central Africa)

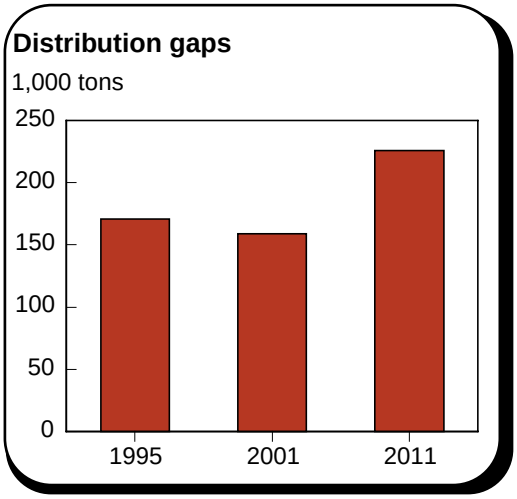
Year	Grain production	Root production (grain equiv.)	Commercial imports (grains)	Food aid receipts (grains)	Aggregate availability of all food
			---1,000 tons ---		
1992	868	828	509	1	3,246
1993	878	914	344	2	3,173
1994	892	962	475	2	3,381
1995	1,140	950	349	4	3,515
1996	1,240	967	145	0	3,487
1997	1,065	967	389	5	3,629
1998	1,155	970	451	11	3,770
1999	1,215	1,200	373	6	3,962
2000	1,215	1,145	290	3	3,886
Projections				**Food gap** SQ	**Food gap** NR	(w/o food aid)
2001	1,215	1,170	412	***50***	***0***	4,032
2006	1,475	1,275	512	***0***	***0***	4,661
2011	1,725	1,388	635	***0***	***0***	5,370



	1980-90	1990-2000
	Percent	
Export earnings growth	5.9	2.7
Consumption growth, p.c.	-0.3	0.3
Area growth	-0.2	-1.1
Yield growth	0.3	5.3
Imports/Food supply ratio	17.1	16.1

Statistical table 6--Central African Republic (Central Africa)

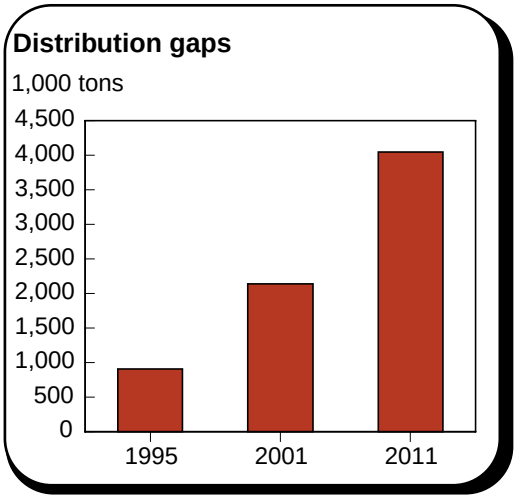
Year	Grain production	Root production (grain equiv.)	Commercial imports (grains)	Food aid receipts (grains)	Aggregate availability of all food
			---1,000 tons ---		
1992	93	281	35	5	684
1993	93	279	35	6	692
1994	85	271	58	1	724
1995	105	281	38	0	731
1996	110	298	18	0	751
1997	120	315	40	3	805
1998	120	333	35	10	833
1999	140	316	46	2	848
2000	140	300	37	3	834
Projections				**Food gap** SQ	**Food gap** NR	(w/o food aid)
2001	140	322	43	***11***	***26***	849
2006	141	340	52	***41***	***57***	900
2011	149	359	63	***67***	***85***	964



	1980-90	1990-2000
	Percent	
Export earnings growth	-1.2	14.3
Consumption growth, p.c.	-3.5	-0.3
Area growth	2.2	-2.2
Yield growth	2.1	4.6
Imports/Food supply ratio	7.3	9.2

Statistical table 7--Congo, Democratic Republic (Central Africa)

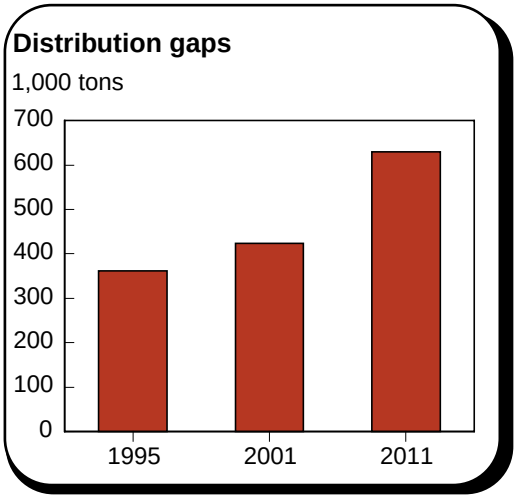
Year	Grain production	Root production (grain equiv.)	Commercial imports (grains)	Food aid receipts (grains)	Aggregate availability of all food
			---1,000 tons ---		
1992	1,408	6,968	320	27	9,633
1993	1,567	6,668	263	31	9,992
1994	1,545	6,744	231	91	9,937
1995	1,452	6,841	406	33	10,221
1996	1,465	6,032	283	24	9,521
1997	1,305	6,029	595	10	9,614
1998	1,585	6,046	572	14	9,975
1999	1,445	5,846	240	43	9,628
2000	1,470	5,664	221	38	9,569
Projections				**Food gap** SQ	**Food gap** NR	(w/o food aid)
2001	1,490	6,505	341	***223***	***1,824***	10,189
2006	1,857	7,130	318	***655***	***2,512***	11,424
2011	2,056	7,804	303	***1,512***	***3,664***	12,474



	1980-90	1990-2000
	Percent	
Export earnings growth	9.6	-5.5
Consumption growth, p.c.	-0.2	-2.6
Area growth	2.8	2.7
Yield growth	-0.7	-0.5
Imports/Food supply ratio	6.2	4.7

Statistical table 8--Burundi (East Africa)

Year	Grain production	Root production (grain equiv.)	Commercial imports (grains)	Food aid receipts (grains)	Aggregate availability of all food
			---1,000 tons ---		
1992	258	399	0	6	1,220
1993	249	389	0	59	1,197
1994	185	339	70	49	1,116
1995	225	356	55	5	1,150
1996	220	366	17	1	1,137
1997	225	389	24	0	1,160
1998	215	355	34	0	1,154
1999	220	397	18	5	1,213
2000	220	392	61	9	1,275
Projections				**Food gap** SQ	**Food gap** NR	(w/o food aid)
2001	220	390	39	***24***	***395***	1,218
2006	230	423	43	***105***	***526***	1,307
2011	272	457	47	***125***	***595***	1,451

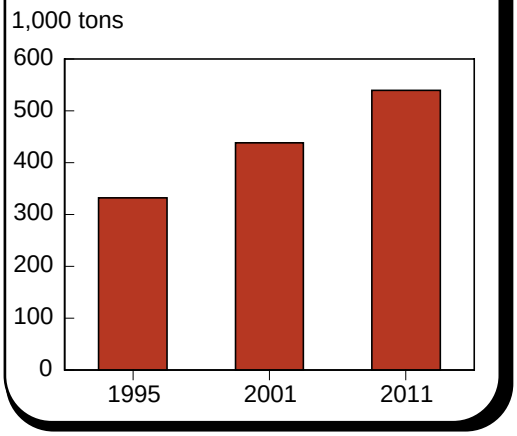


	1980-90	1990-2000
	Percent	
Export earnings growth	3.4	5.6
Consumption growth, p.c.	-1.8	-3.7
Area growth	-0.6	-4.0
Yield growth	0.2	-0.7
Imports/Food supply ratio	4.1	6.6

Statistical table 9--Eritrea (East Africa)

Year	Grain production	Root production (grain equiv.)	Commercial imports (grains)	Food aid receipts (grains)	Aggregate availability of all food
			---1,000 tons ---		
1992	198	0	0	0	198
1993	73	26	0	246	291
1994	298	26	111	153	685
1995	153	25	81	65	424
1996	84	25	237	9	452
1997	99	26	261	63	560
1998	458	27	205	103	897
1999	270	26	0	91	501
2000	182	25	84	212	635
Projections				**Food gap** SQ / NR	(w/o food aid)
2001	250	27	97	***229*** / ***420***	474
2006	354	30	91	***209*** / ***424***	589
2011	385	32	91	***272*** / ***514***	626

Distribution gaps

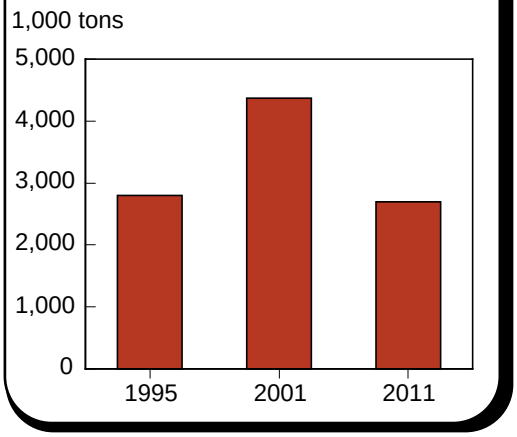


	1980-90	1990-2000
	Percent	
Export earnings growth	--	-4.8
Consumption growth, p.c.	-6.1	16.9
Area growth	-3.1	14.1
Yield growth	-1.2	-2.5
Imports/Food supply ratio	0.0	36.8

Statistical table 10--Ethiopia (East Africa)

Year	Grain production	Root production (grain equiv.)	Commercial imports (grains)	Food aid receipts (grains)	Aggregate availability of all food
			---1,000 tons ---		
1992	5,342	0	0	0	5,342
1993	5,276	1,354	456	0	8,663
1994	5,702	1,431	417	652	9,685
1995	6,922	1,510	0	787	10,764
1996	9,116	1,551	0	525	12,837
1997	6,901	1,587	0	297	10,419
1998	7,867	1,592	9	653	11,988
1999	7,655	1,615	51	610	11,904
2000	7,543	1,573	7	1215	12,440
Projections				**Food gap** SQ / NR	(w/o food aid)
2001	7,475	1,662	24	***1,750*** / ***3,949***	10,910
2006	10,573	1,839	25	***0*** / ***1,972***	14,767
2011	12,616	2,033	29	***0*** / ***1,586***	17,400

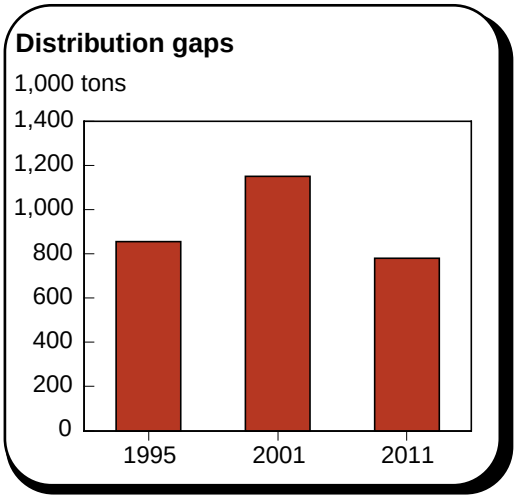
Distribution gaps



	1980-90	1990-2000
	Percent	
Export earnings growth	--	8.4
Consumption growth, p.c.	-1.0	4.8
Area growth	1.4	7.7
Yield growth	0.4	-1.9
Imports/Food supply ratio	0.0	5.3

Statistical table 11--Kenya (East Africa)

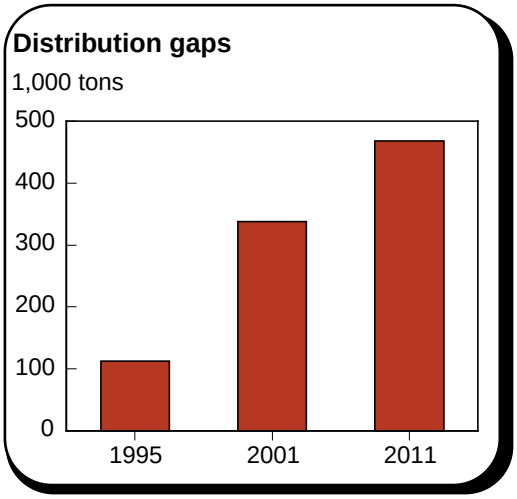
Year	Grain production	Root production (grain equiv.)	Commercial imports (grains)	Food aid receipts (grains)	Aggregate availability of all food
			---1,000 tons ---		
1992	3,085	500	371	288	6,037
1993	2,220	525	322	236	4,904
1994	3,554	520	1,014	111	6,876
1995	3,227	571	305	42	6,309
1996	2,778	606	367	59	5,422
1997	2,930	644	1,481	112	7,529
1998	3,030	651	865	80	6,885
1999	2,865	606	632	129	6,603
2000	2,315	595	1,772	117	7,428
Projections				**Food gap** SQ	**Food gap** NR	(w/o food aid)
2001	2,615	635	1,153	***0***	***792***	6,688
2006	3,180	694	1,252	***0***	***332***	7,784
2011	3,519	759	1,393	***0***	***143***	8,612



	1980-90	1990-2000
	Percent	
Export earnings growth	4.4	-0.1
Consumption growth, p.c.	-0.9	-0.2
Area growth	0.9	-1.5
Yield growth	1.4	0.8
Imports/Food supply ratio	7.6	18.3

Statistical table 12--Rwanda (East Africa)

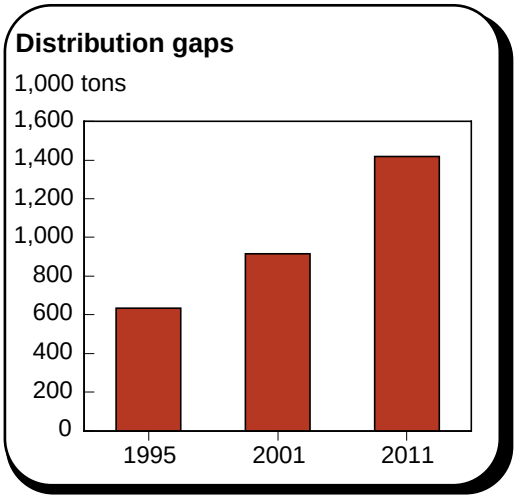
Year	Grain production	Root production (grain equiv.)	Commercial imports (grains)	Food aid receipts (grains)	Aggregate availability of all food
			---1,000 tons ---		
1992	267	695	0	90	1,632
1993	188	638	47	90	1,516
1994	149	452	0	282	1,230
1995	154	347	0	258	1,162
1996	174	450	0	349	1,342
1997	214	490	0	177	1,449
1998	214	474	55	160	1,558
1999	194	567	0	187	1,686
2000	214	833	55	169	2,075
Projections				**Food gap** SQ	**Food gap** NR	(w/o food aid)
2001	214	608	35	***483***	***310***	1,504
2006	249	671	34	***546***	***354***	1,662
2011	265	742	34	***648***	***435***	1,802



	1980-90	1990-2000
	Percent	
Export earnings growth	3.4	-6.0
Consumption growth, p.c.	-5.4	0.1
Area growth	-0.9	-2.9
Yield growth	0.1	0.7
Imports/Food supply ratio	3.2	16.3

Statistical table 13--Somalia (East Africa)

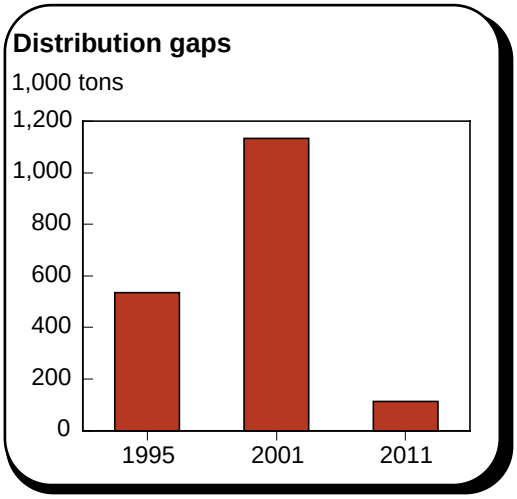
Year	Grain production	Root production (grain equiv.)	Commercial imports (grains)	Food aid receipts (grains)	Aggregate availability of all food
			---1,000 tons ---		
1992	202	14	52	312	1,193
1993	162	14	153	75	1,155
1994	228	13	138	13	1,209
1995	293	16	101	13	1,289
1996	313	18	126	3	1,373
1997	320	19	98	22	1,410
1998	254	21	182	34	1,498
1999	204	23	96	43	1,431
2000	229	24	275	35	1,684
Projections				**Food gap** SQ / NR	(w/o food aid)
2001	229	23	187	***167*** / ***860***	1,446
2006	304	26	183	***260*** / ***1,091***	1,670
2011	371	28	184	***375*** / ***1,345***	1,882



	1980-90	1990-2000
	Percent	
Export earnings growth	-14.0	2.2
Consumption growth, p.c.	-0.8	-4.7
Area growth	5.3	4.0
Yield growth	1.3	-5.9
Imports/Food supply ratio	35.7	41.0

Statistical table 14--Sudan (East Africa)

Year	Grain production	Root production (grain equiv.)	Commercial imports (grains)	Food aid receipts (grains)	Aggregate availability of all food
			---1,000 tons ---		
1992	5,307	49	351	286	7,818
1993	3,087	47	123	293	6,104
1994	5,152	50	726	138	8,225
1995	3,307	51	350	58	6,610
1996	5,207	52	309	120	8,464
1997	4,507	52	581	104	8,554
1998	5,842	53	469	293	9,087
1999	3,057	52	508	140	7,360
2000	3,332	53	1,166	144	8,076
Projections				**Food gap** SQ / NR	(w/o food aid)
2001	3,332	53	753	***1,362*** / ***936***	6,597
2006	5,122	56	711	***0*** / ***0***	9,402
2011	5,744	59	717	***0*** / ***0***	10,399

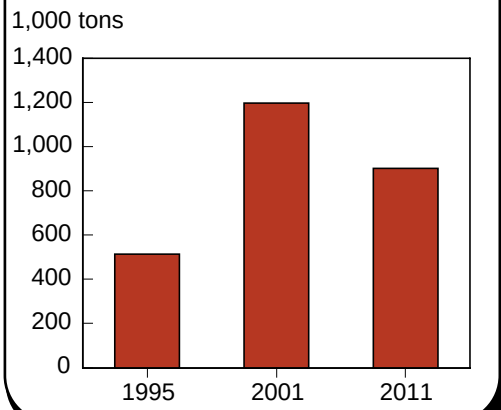


	1980-90	1990-2000
	Percent	
Export earnings growth	-1.5	6.1
Consumption growth, p.c.	1.5	0.0
Area growth	0.9	5.5
Yield growth	-1.5	-3.6
Imports/Food supply ratio	17.1	15.4

Statistical table 15--Tanzania (East Africa)

Year	Grain production	Root production (grain equiv.)	Commercial imports (grains)	Food aid receipts (grains)	Aggregate availability of all food
			---1,000 tons ---		
1992	3,390	1,648	173	36	6,515
1993	3,700	1,593	167	47	6,538
1994	3,305	1,671	232	114	6,480
1995	4,355	1,451	200	35	6,848
1996	4,180	1,450	157	20	6,814
1997	3,355	1,436	237	96	6,480
1998	3,905	1,477	347	42	6,892
1999	3,585	1,728	593	43	7,497
2000	3,050	1,413	655	70	6,811
Projections				**Food gap** SQ / NR	(w/o food aid)
2001	3,275	1,561	577	***72***	***962***	6,824
2006	4,296	1,685	649	***0***	***424***	8,318
2011	4,940	1,818	760	***0***	***386***	9,425

Distribution gaps

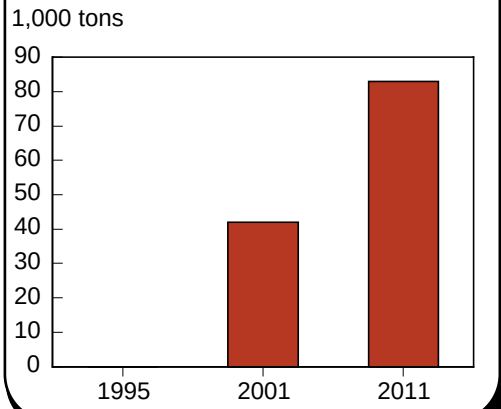


	1980-90	1990-2000
	Percent	
Export earnings growth	--	8.5
Consumption growth, p.c.	1.0	-3.0
Area growth	2.1	0.2
Yield growth	3.2	-0.4
Imports/Food supply ratio	4.9	5.8

Statistical table 16--Uganda (East Africa)

Year	Grain production	Root production (grain equiv.)	Commercial imports (grains)	Food aid receipts (grains)	Aggregate availability of all food
			---1,000 tons ---		
1992	1,666	1,765	0	40	5,425
1993	1,794	1,886	43	46	5,691
1994	1,900	1,593	0	63	5,626
1995	2,020	1,688	0	44	5,957
1996	1,750	1,431	0	49	5,505
1997	1,550	1,582	73	83	5,633
1998	1,680	2,007	180	53	6,283
1999	1,550	2,125	106	61	6,323
2000	1,670	2,730	0	61	7,023
Projections				**Food gap** SQ / NR	(w/o food aid)
2001	1,670	2,346	87	***312***	***0***	6,509
2006	2,166	2,607	98	***305***	***0***	7,702
2011	2,548	2,894	115	***580***	***0***	8,762

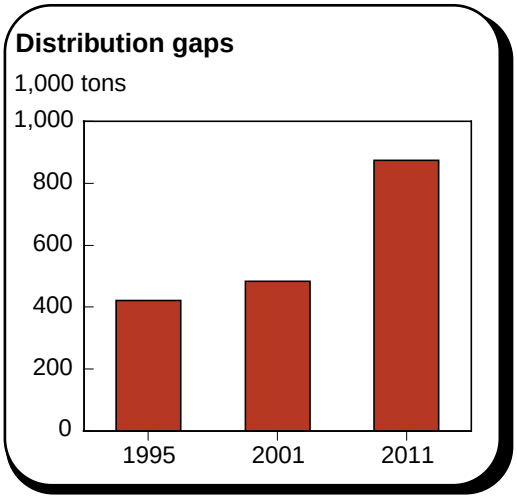
Distribution gaps



	1980-90	1990-2000
	Percent	
Export earnings growth	--	16.3
Consumption growth, p.c.	0.9	-0.9
Area growth	3.2	2.4
Yield growth	0.2	-2.1
Imports/Food supply ratio	1.1	2.2

Statistical table 17--Angola (Southern Africa)

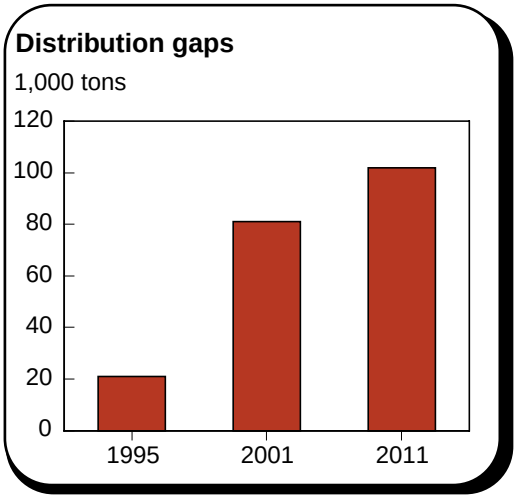
Year	Grain production	Root production (grain equiv.)	Commercial imports (grains)	Food aid receipts (grains)	Aggregate availability of all food
			---1,000 tons ---		
1992	452	714	235	116	2,219
1993	317	707	143	222	2,035
1994	261	887	217	229	2,254
1995	302	948	240	218	2,421
1996	473	932	378	190	2,677
1997	513	871	309	132	2,560
1998	443	1,175	348	146	2,816
1999	603	1,143	280	169	2,997
2000	538	1,143	394	141	3,061
Projections				**Food gap** SQ / NR	(w/o food aid)
2001	513	1,212	367	***248*** / ***280***	2,859
2006	643	1,301	412	***422*** / ***459***	3,202
2011	721	1,396	468	***653*** / ***695***	3,505



	1980-90	1990-2000
	Percent	
Export earnings growth	2.2	4.9
Consumption growth, p.c.	-2.9	2.8
Area growth	-3.3	4.5
Yield growth	-2.1	3.0
Imports/Food supply ratio	25.8	25.4

Statistical table 18--Lesotho (Southern Africa)

Year	Grain production	Root production (grain equiv.)	Commercial imports (grains)	Food aid receipts (grains)	Aggregate availability of all food
			---1,000 tons ---		
1992	75	16	197	45	393
1993	151	17	211	32	470
1994	243	20	194	15	469
1995	106	20	323	47	555
1996	261	20	319	15	578
1997	210	22	237	13	454
1998	180	23	283	7	558
1999	188	25	311	5	549
2000	173	26	237	3	469
Projections				**Food gap** SQ / NR	(w/o food aid)
2001	150	25	294	***35*** / ***32***	507
2006	213	27	293	***33*** / ***30***	564
2011	241	29	309	***48*** / ***44***	609

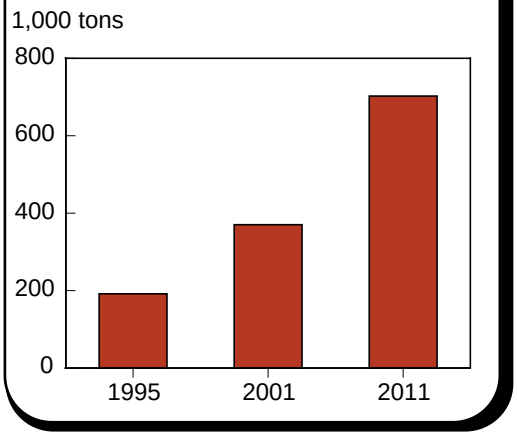


	1980-90	1990-2000
	Percent	
Export earnings growth	4.9	11.3
Consumption growth, p.c.	-4.2	-0.3
Area growth	1.3	1.9
Yield growth	-0.3	1.1
Imports/Food supply ratio	51.7	58.3

Statistical table 19--Madagascar (Southern Africa)

Year	Grain production	Root production (grain equiv.)	Commercial imports (grains)	Food aid receipts (grains)	Aggregate availability of all food
			---1,000 tons ---		
1992	1,715	916	79	59	3,063
1993	1,812	953	83	34	3,144
1994	1,670	972	125	20	3,059
1995	1,780	956	135	24	3,213
1996	1,830	962	53	43	3,242
1997	1,830	986	116	13	3,334
1998	1,700	983	133	24	3,284
1999	1,580	996	154	25	3,211
2000	1,860	923	214	16	3,512
Projections				**Food gap** SQ / NR	(w/o food aid)
2001	1,875	997	171	***0*** / ***117***	3,488
2006	2,036	1,080	188	***193*** / ***339***	3,785
2011	2,308	1,170	205	***296*** / ***461***	4,218

Distribution gaps

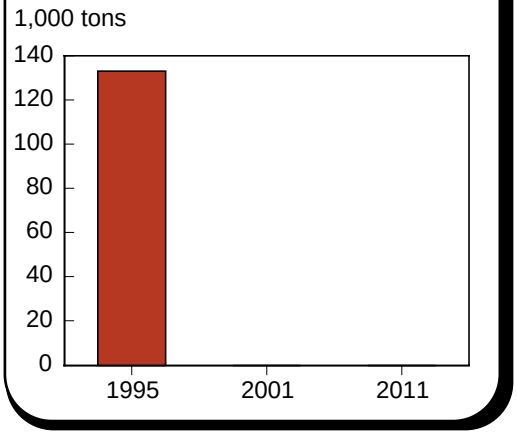


	1980-90	1990-2000
	Percent	
Export earnings growth	-1.7	3.5
Consumption growth, p.c.	-1.3	-2.2
Area growth	0.5	0.1
Yield growth	0.9	0.5
Imports/Food supply ratio	7.7	5.0

Statistical table 20--Malawi (Southern Africa)

Year	Grain production	Root production (grain equiv.)	Commercial imports (grains)	Food aid receipts (grains)	Aggregate availability of all food
			---1,000 tons ---		
1992	670	105	0	605	1,734
1993	2,016	128	519	62	2,528
1994	1,093	131	231	284	2,387
1995	1,628	154	189	117	2,322
1996	1,833	271	126	51	2,589
1997	1,270	370	146	27	2,347
1998	1,820	528	324	86	2,988
1999	2,525	557	221	42	3,038
2000	2,345	569	62	68	3,098
Projections				**Food gap** SQ / NR	(w/o food aid)
2001	2,195	577	208	***0*** / ***0***	3,149
2006	2,552	631	215	***0*** / ***0***	3,587
2011	2,876	691	224	***0*** / ***0***	3,999

Distribution gaps

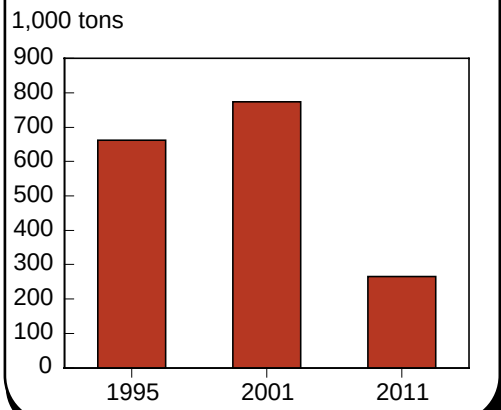


	1980-90	1990-2000
	Percent	
Export earnings growth	2.5	4.8
Consumption growth, p.c.	-1.5	3.7
Area growth	1.8	0.3
Yield growth	-0.5	6.3
Imports/Food supply ratio	4.6	15.3

Statistical table 21--Mozambique (Southern Africa)

Year	Grain production	Root production (grain equiv.)	Commercial imports (grains)	Food aid receipts (grains)	Aggregate availability of all food
			---1,000 tons ---		
1992	278	1,193	160	929	2,942
1993	715	1,292	340	351	3,222
1994	756	1,238	259	305	3,275
1995	1,080	1,528	298	266	3,820
1996	1,313	1,727	335	91	3,853
1997	1,453	1,941	215	183	4,239
1998	1,613	2,049	409	159	4,613
1999	1,758	1,948	308	100	4,595
2000	1,418	1,681	212	94	4,048
Projections				**Food gap** SQ	**Food gap** NR	(w/o food aid)
2001	1,568	1,964	319	***24***	***548***	4,291
2006	2,292	2,105	315	***0***	***35***	5,242
2011	2,853	2,255	324	***0***	***0***	6,054

Distribution gaps

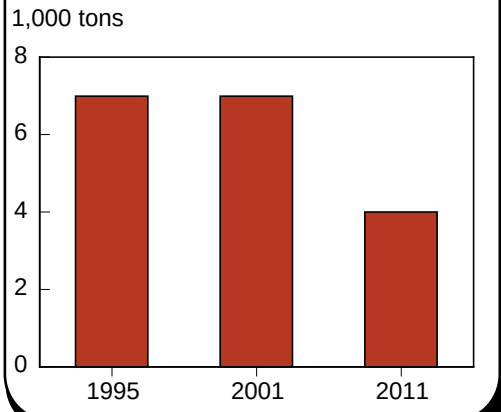


	1980-90	1990-2000
	Percent	
Export earnings growth	-6.8	14.5
Consumption growth, p.c.	0.2	1.1
Area growth	0.2	8.3
Yield growth	2.1	6.3
Imports/Food supply ratio	18.0	18.5

Statistical table 22--Swaziland (Southern Africa)

Year	Grain production	Root production (grain equiv.)	Commercial imports (grains)	Food aid receipts (grains)	Aggregate availability of all food
			---1,000 tons ---		
1992	59	2	79	40	260
1993	78	2	95	10	264
1994	104	2	121	1	308
1995	81	2	78	12	250
1996	140	2	77	0	297
1997	105	2	85	0	252
1998	114	2	70	10	243
1999	129	2	126	0	319
2000	119	2	79	0	272
Projections				**Food gap** SQ	**Food gap** NR	(w/o food aid)
2001	119	2	101	***7***	***0***	293
2006	138	2	123	***0***	***0***	350
2011	150	2	152	***0***	***0***	408

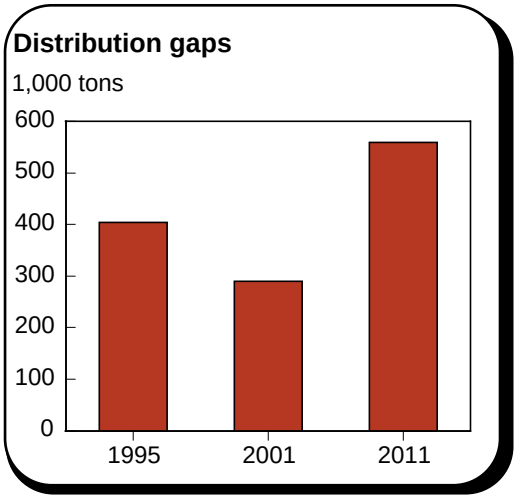
Distribution gaps



	1980-90	1990-2000
	Percent	
Export earnings growth	9.0	2.3
Consumption growth, p.c.	0.1	-5.2
Area growth	3.2	-2.5
Yield growth	0.4	6.1
Imports/Food supply ratio	48.0	48.6

Statistical table 23--Zambia (Southern Africa)

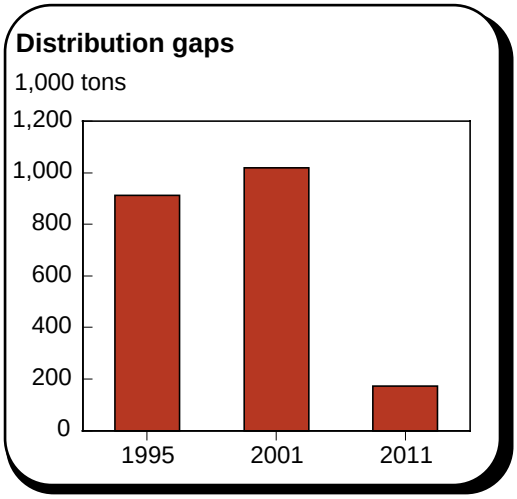
Year	Grain production	Root production (grain equiv.)	Commercial imports (grains)	Food aid receipts (grains)	Aggregate availability of all food
			---1,000 tons ---		
1992	597	272	191	535	1,897
1993	1,759	297	346	11	2,256
1994	1,195	296	61	12	1,965
1995	929	295	87	73	1,862
1996	1,563	297	145	8	1,944
1997	1,157	280	105	8	2,007
1998	807	322	489	40	2,031
1999	1,010	410	70	31	1,806
2000	1,452	398	413	7	2,576
Projections				**Food gap** SQ / NR	(w/o food aid)
2001	1,312	387	321	***0*** / ***78***	2,315
2006	1,261	423	346	***69*** / ***325***	2,325
2011	1,455	461	359	***92*** / ***380***	2,602



	1980-90	1990-2000
	Percent	
Export earnings growth	-3.3	3.5
Consumption growth, p.c.	1.8	-2.7
Area growth	-1.1	-0.6
Yield growth	7.7	0.8
Imports/Food supply ratio	13.9	14.7

Statistical table 24--Zimbabwe (Southern Africa)

Year	Grain production	Root production (grain equiv.)	Commercial imports (grains)	Food aid receipts (grains)	Aggregate availability of all food
			---1,000 tons ---		
1992	675	52	598	896	2,649
1993	2,249	57	589	16	2,564
1994	2,622	58	87	5	2,547
1995	1,225	64	119	3	2,109
1996	2,900	65	461	1	3,226
1997	2,435	68	218	0	2,671
1998	1,883	69	216	82	2,411
1999	2,016	72	243	5	2,796
2000	2,594	74	101	0	3,136
Projections				**Food gap** SQ / NR	(w/o food aid)
2001	1,818	75	191	***0*** / ***859***	2,222
2006	2,579	84	213	***0*** / ***0***	3,287
2011	2,952	94	247	***0*** / ***0***	3,832

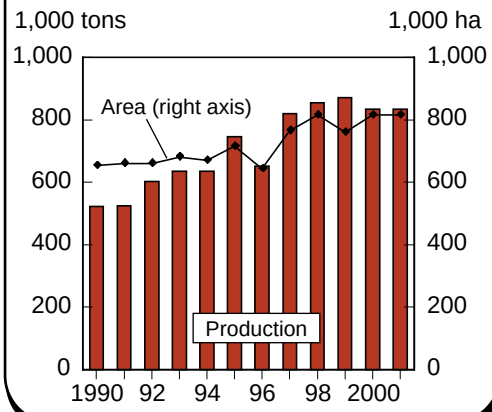


	1980-90	1990-2000
	Percent	
Export earnings growth	4.3	10.8
Consumption growth, p.c.	3.2	51.5
Area growth	-1.4	2.3
Yield growth	3.0	0.2
Imports/Food supply ratio	4.4	14.1

Statistical table 25--Benin (West Africa)

Year	Grain production	Root production (grain equiv.)	Commercial imports (grains)	Food aid receipts (grains)	Aggregate availability of all food
			---1,000 tons ---		
1992	602	782	406	19	1,619
1993	635	843	401	26	1,660
1994	635	868	241	15	1,686
1995	746	914	227	9	1,834
1996	651	1,018	146	12	1,730
1997	820	1,244	142	31	2,018
1998	855	1,284	106	11	1,966
1999	870	1,325	194	7	2,075
2000	835	1,367	94	6	1,999
Projections				**Food gap** SQ	NR (w/o food aid)
2001	835	1,397	140	***69***	***0*** 2,033
2006	1,082	1,551	155	***13***	***0*** 2,384
2011	1,259	1,720	178	***24***	***0*** 2,701

Grain production and area growth

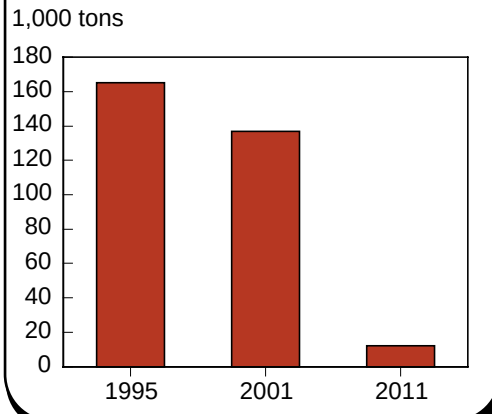


	1980-90	1990-2000
	Percent	
Export earnings growth	-4.3	3.7
Consumption growth, p.c.	2.4	0.9
Area growth	2.6	2.3
Yield growth	2.6	3.2
Imports/Food supply ratio	10.0	12.8

Statistical table 26--Burkina Faso (West Africa)

Year	Grain production	Root production (grain equiv.)	Commercial imports (grains)	Food aid receipts (grains)	Aggregate availability of all food
			---1,000 tons ---		
1992	2,438	31	137	31	2,877
1993	2,515	22	127	27	3,007
1994	2,453	19	117	19	2,889
1995	2,265	22	113	26	2,734
1996	2,425	24	117	31	2,907
1997	1,965	18	139	27	2,433
1998	2,640	20	230	63	3,180
1999	2,825	20	232	53	3,427
2000	2,800	20	123	35	3,334
Projections				**Food gap** SQ	NR (w/o food aid)
2001	2,805	20	195	***120***	***0*** 3,233
2006	3,598	21	187	***0***	***0*** 4,091
2011	4,300	22	183	***0***	***0*** 4,846

Distribution gaps



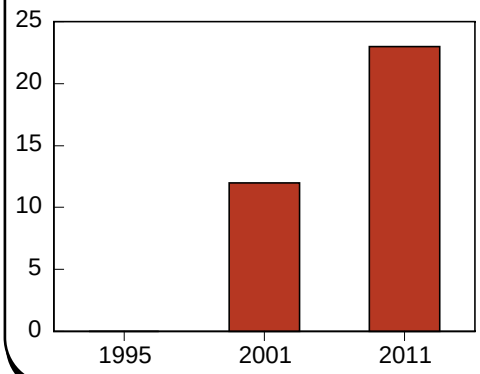
	1980-90	1990-2000
	Percent	
Export earnings growth	-0.4	0.1
Consumption growth, p.c.	3.5	0.6
Area growth	2.9	1.2
Yield growth	4.3	2.1
Imports/Food supply ratio	9.2	7.1

Statistical table 27--Cape Verde (West Africa)

Year	Grain production	Root production (grain equiv.)	Commercial imports (grains)	Food aid receipts (grains)	Aggregate availability of all food
			---1,000 tons ---		
1992	10	2	88	45	159
1993	12	4	13	58	142
1994	9	3	17	64	142
1995	10	2	35	50	158
1996	10	2	0	58	119
1997	10	2	62	50	175
1998	10	2	20	61	145
1999	10	2	27	54	146
2000	10	2	32	50	149
Projections				**Food gap**	
				SQ / NR	(w/o food aid)
2001	10	2	27	***60*** / ***9***	92
2006	14	2	29	***71*** / ***14***	99
2011	15	2	32	***83*** / ***20***	105

Distribution gaps

1,000 tons



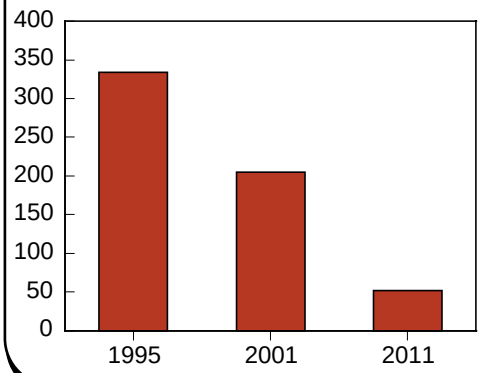
	1980-90	1990-2000
	Percent	
Export earnings growth	-5.4	15.7
Consumption growth, p.c.	0.9	-1.6
Area growth	26.4	4.4
Yield growth	-6.4	-1.2
Imports/Food supply ratio	86.6	86.7

Statistical table 28--Chad (West Africa)

Year	Grain production	Root production (grain equiv.)	Commercial imports (grains)	Food aid receipts (grains)	Aggregate availability of all food
			---1,000 tons ---		
1992	836	183	61	0	1,420
1993	671	176	70	17	1,295
1994	846	186	45	15	1,407
1995	779	215	35	8	1,479
1996	786	215	27	32	1,511
1997	916	220	32	28	1,704
1998	1,236	220	24	15	1,991
1999	1,166	208	33	20	1,947
2000	1,216	208	40	15	2,026
Projections				**Food gap**	
				SQ / NR	(w/o food aid)
2001	1,216	217	33	***97*** / ***37***	1,936
2006	1,607	239	32	***0*** / ***0***	2,484
2011	1,923	263	32	***0*** / 0	2,935

Distribution gaps

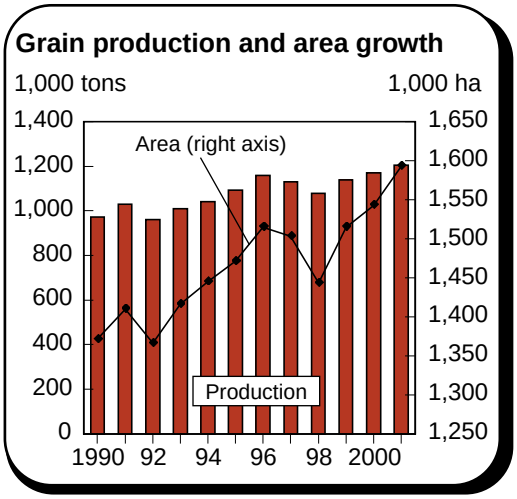
1,000 tons



	1980-90	1990-2000
	Percent	
Export earnings growth	6.5	5.0
Consumption growth, p.c.	-0.3	2.3
Area growth	2.1	5.9
Yield growth	0.9	1.0
Imports/Food supply ratio	9.5	5.0

Statistical table 29--Côte d'Ivoire (West Africa)

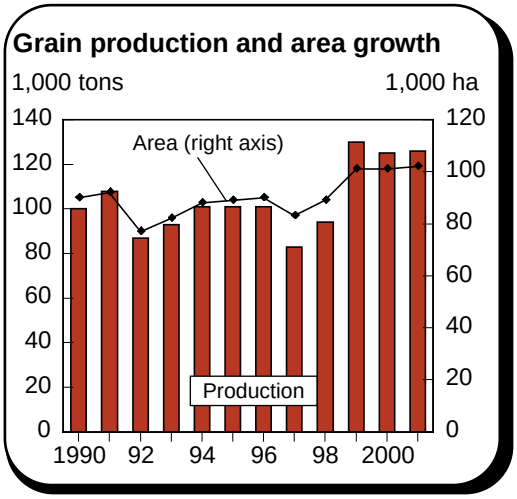
Year	Grain production	Root production (grain equiv.)	Commercial imports (grains)	Food aid receipts (grains)	Aggregate availability of all food
			---1,000 tons ---		
1992	962	1,619	607	41	3,925
1993	1,009	1,629	652	45	3,946
1994	1,042	1,669	479	56	3,868
1995	1,092	1,689	736	30	4,182
1996	1,160	1,744	569	45	4,132
1997	1,130	1,786	802	26	4,373
1998	1,078	1,759	860	34	4,487
1999	1,140	1,752	955	18	4,641
2000	1,170	1,752	1,183	17	5,009
Projections				**Food gap** SQ	**Food gap** NR	(w/o food aid)
2001	1,205	1,805	1,029	***0***	***0***	4,806
2006	1,407	1,982	1,102	***0***	***0***	5,334
2011	1,643	2,175	1,178	***0***	***0***	5,923



	1980-90	1990-2000
	Percent	
Export earnings growth	1.9	4.6
Consumption growth, p.c.	-1.0	0.2
Area growth	4.8	1.1
Yield growth	-0.9	0.8
Imports/Food supply ratio	22.7	21.5

Statistical table 30--Gambia (West Africa)

Year	Grain production	Root production (grain equiv.)	Commercial imports (grains)	Food aid receipts (grains)	Aggregate availability of all food
			---1,000 tons ---		
1992	87	2	92	6	274
1993	93	2	80	11	277
1994	101	2	99	2	288
1995	101	2	96	3	305
1996	101	2	122	6	335
1997	83	2	135	5	331
1998	94	2	149	6	352
1999	130	2	150	6	390
2000	125	2	112	5	352
Projections				**Food gap** SQ	**Food gap** NR	(w/o food aid)
2001	126	2	139	***13***	***0***	367
2006	150	2	145	***27***	***0***	403
2011	184	2	151	***30***	***0***	451

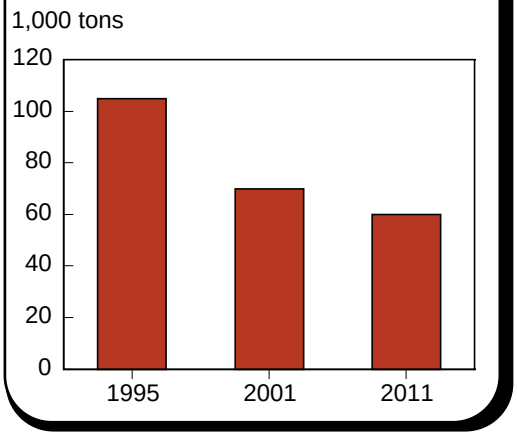


	1980-90	1990-2000
	Percent	
Export earnings growth	2.4	-1.1
Consumption growth, p.c.	2.3	-0.8
Area growth	-1.1	1.3
Yield growth	6.8	0.4
Imports/Food supply ratio	41.5	52.7

Statistical table 31--Ghana (West Africa)

Year	Grain production	Root production (grain equiv.)	Commercial imports (grains)	Food aid receipts (grains)	Aggregate availability of all food
			---1,000 tons ---		
1992	1,198	2,469	360	75	3,949
1993	1,582	2,665	273	126	4,330
1994	1,532	2,382	441	101	4,554
1995	1,737	2,717	237	43	4,606
1996	1,673	2,960	105	63	4,628
1997	1,578	2,954	194	69	4,890
1998	1,665	3,100	386	27	5,066
1999	1,550	3,461	287	53	5,180
2000	1,585	3,461	446	95	5,489
Projections				**Food gap** SQ	**Food gap** NR	(w/o food aid)
2001	1,585	3,567	403	***75***	***0***	5,417
2006	2,104	3,962	466	***0***	***0***	6,317
2011	2,481	4,393	560	***0***	***0***	7,207

Distribution gaps

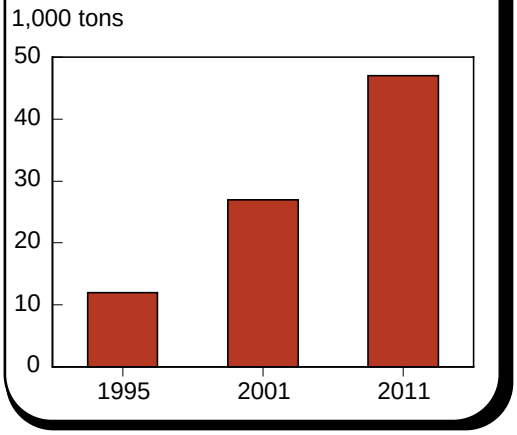


	1980-90	1990-2000
	Percent	
Export earnings growth	2.5	11.3
Consumption growth, p.c.	2.9	2.6
Area growth	1.4	2.8
Yield growth	5.9	1.7
Imports/Food supply ratio	11.0	8.6

Statistical table 32--Guinea (West Africa)

Year	Grain production	Root production (grain equiv.)	Commercial imports (grains)	Food aid receipts (grains)	Aggregate availability of all food
			---1,000 tons ---		
1992	505	255	311	30	1,602
1993	553	277	273	46	1,688
1994	574	284	363	29	1,764
1995	600	298	408	8	1,860
1996	610	319	301	6	1,804
1997	630	346	320	6	1,817
1998	630	372	271	21	1,806
1999	715	392	213	14	1,858
2000	665	392	264	1	1,860
Projections				**Food gap** SQ	**Food gap** NR	(w/o food aid)
2001	690	393	254	***0***	***0***	1,854
2006	825	428	259	***0***	***0***	2,088
2011	950	465	267	***28***	***0***	2,316

Distribution gaps



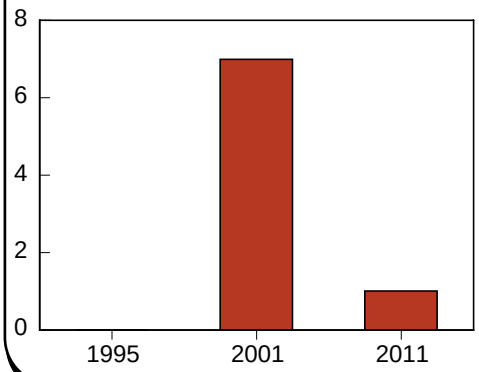
	1980-90	1990-2000
	Percent	
Export earnings growth	6.1	4.4
Consumption growth, p.c.	1.4	-0.1
Area growth	1.7	0.0
Yield growth	1.4	3.3
Imports/Food supply ratio	22.0	26.2

Statistical table 33--Guinea-Bissau (West Africa)

Year	Grain production	Root production (grain equiv.)	Commercial imports (grains)	Food aid receipts (grains)	Aggregate availability of all food
			---1,000 tons ---		
1992	125	24	73	9	278
1993	134	24	61	9	272
1994	154	24	66	2	296
1995	152	25	61	2	294
1996	150	26	68	6	304
1997	145	26	39	3	285
1998	125	27	19	21	265
1999	145	28	23	1	272
2000	145	28	62	10	324
Projections				**Food gap** SQ	**Food gap** NR	(w/o food aid)
2001	147	28	35	***10***	***0***	285
2006	177	29	37	***0***	***0***	329
2011	211	31	39	***0***	***0***	378

Distribution gaps

1,000 tons



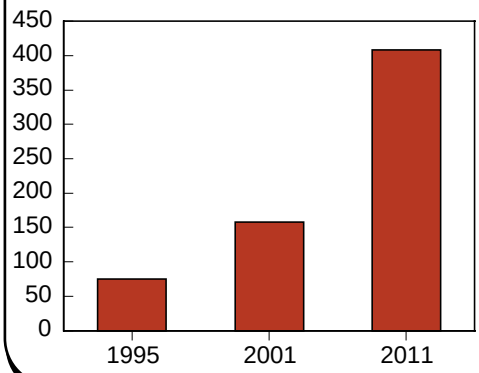
	1980-90	1990-2000
	Percent	
Export earnings growth	-1.7	13.2
Consumption growth, p.c.	8.4	-2.6
Area growth	8.2	-2.6
Yield growth	4.1	1.9
Imports/Food supply ratio	24.2	25.3

Statistical table 34--Liberia (West Africa)

Year	Grain production	Root production (grain equiv.)	Commercial imports (grains)	Food aid receipts (grains)	Aggregate availability of all food
			---1,000 tons ---		
1992	61	141	0	149	468
1993	39	127	0	146	407
1994	30	131	0	183	398
1995	35	99	0	132	428
1996	60	116	0	88	415
1997	100	146	0	45	479
1998	125	158	30	102	632
1999	160	158	0	76	627
2000	160	160	99	102	789
Projections				**Food gap** SQ	**Food gap** NR	(w/o food aid)
2001	160	162	39	***190***	***135***	585
2006	156	174	40	***329***	***263***	599
2011	166	186	40	***461***	***382***	632

Distribution gaps

1,000 tons



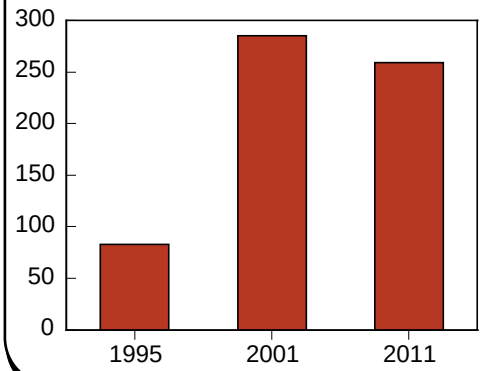
	1980-90	1990-2000
	Percent	
Export earnings growth	-3.1	0.0
Consumption growth, p.c.	-1.3	0.1
Area growth	0.2	2.0
Yield growth	-0.5	4.5
Imports/Food supply ratio	24.4	29.5

Statistical table 35--Mali (West Africa)

Year	Grain production	Root production (grain equiv.)	Commercial imports (grains)	Food aid receipts (grains)	Aggregate availability of all food
			---1,000 tons ---		
1992	1,714	6	63	35	2,295
1993	1,965	9	62	29	2,475
1994	2,234	7	26	16	2,785
1995	2,050	8	90	8	2,664
1996	2,075	9	54	29	2,649
1997	2,000	10	95	31	2,499
1998	2,275	12	123	9	2,724
1999	2,325	10	122	14	2,636
2000	2,325	10	105	3	2,660
Projections				**Food gap** SQ / NR	(w/o food aid)
2001	2,375	11	122	***0*** / ***107***	2,687
2006	2,816	13	134	***0*** / ***0***	3,179
2011	3,221	14	149	***0*** / ***0***	3,634

Distribution gaps

1,000 tons



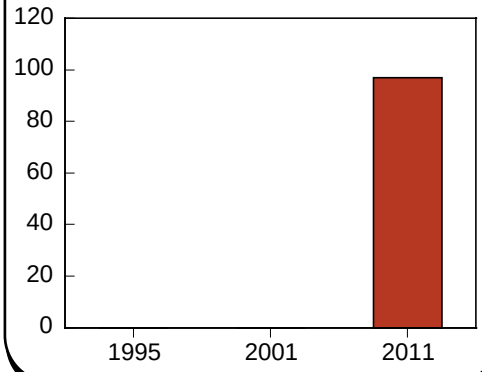
	1980-90	1990-2000
	Percent	
Export earnings growth	4.8	9.7
Consumption growth, p.c.	4.3	-1.1
Area growth	2.4	0.1
Yield growth	5.5	1.9
Imports/Food supply ratio	10.7	4.5

Statistical table 36--Mauritania (West Africa)

Year	Grain production	Root production (grain equiv.)	Commercial imports (grains)	Food aid receipts (grains)	Aggregate availability of all food
			---1,000 tons ---		
1992	103	1	184	45	591
1993	158	1	214	63	702
1994	204	1	192	22	692
1995	210	1	192	28	741
1996	195	1	250	24	774
1997	108	1	333	27	764
1998	158	1	762	24	869
1999	193	1	467	24	904
2000	193	1	274	17	717
Projections				**Food gap** SQ / NR	(w/o food aid)
2001	198	1	496	***72*** / ***0***	789
2006	232	2	488	***203*** / ***0***	781
2011	267	2	482	***339*** / ***65***	777

Distribution gaps

1,000 tons

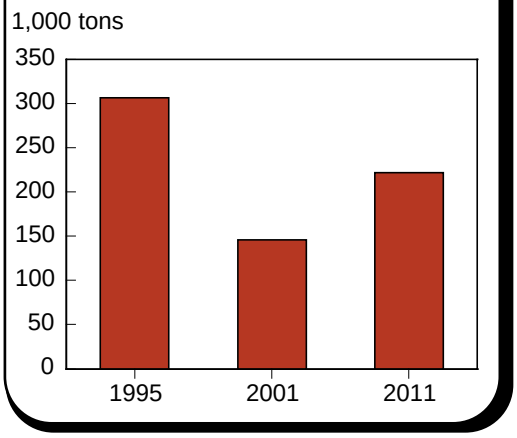


	1980-90	1990-2000
	Percent	
Export earnings growth	2.1	1.6
Consumption growth, p.c.	2.1	0.4
Area growth	2.8	4.6
Yield growth	12.4	2.3
Imports/Food supply ratio	72.3	66.5

Statistical table 37--Niger (West Africa)

Year	Grain production	Root production (grain equiv.)	Commercial imports (grains)	Food aid receipts (grains)	Aggregate availability of all food
			---1,000 tons ---		
1992	2,227	51	114	28	2,605
1993	2,119	70	109	33	2,516
1994	2,190	49	78	39	2,593
1995	2,153	56	54	19	2,569
1996	2,296	60	20	46	2,795
1997	2,195	70	29	45	2,887
1998	2,940	60	266	59	3,826
1999	2,795	68	262	19	3,707
2000	2,745	68	402	11	3,832
Projections				**Food gap** SQ	NR	(w/o food aid)
2001	2,745	66	323	***373***	***0***	3,508
2006	3,360	73	339	***285***	***0***	4,235
2011	3,699	81	363	***581***	***0***	4,658

Distribution gaps

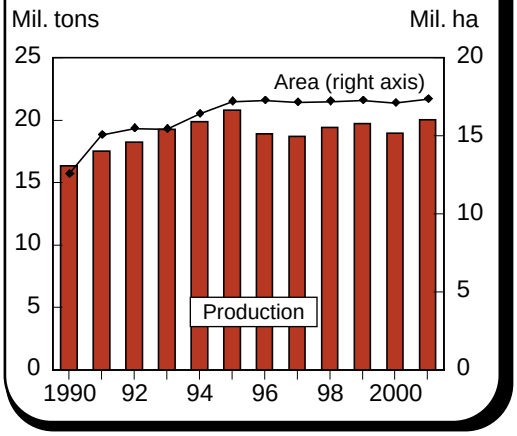


	1980-90	1990-2000
	Percent	
Export earnings growth	-2.9	3.1
Consumption growth, p.c.	-2.6	1.4
Area growth	1.8	3.2
Yield growth	-0.9	1.1
Imports/Food supply ratio	7.3	6.4

Statistical table 38--Nigeria (West Africa)

Year	Grain production	Root production (grain equiv.)	Commercial imports (grains)	Food aid receipts (grains)	Aggregate availability of all food
			---1,000 tons ---		
1992	18,248	14,736	1,105	0	31,369
1993	19,278	15,637	1,730	0	34,696
1994	19,897	16,347	1,191	0	34,512
1995	20,810	16,636	1,039	0	35,656
1996	18,885	16,849	1,276	0	34,905
1997	18,700	17,453	1,898	1	35,186
1998	19,390	18,482	2,170	0	36,433
1999	19,745	18,858	2,264	0	37,605
2000	18,945	18,858	2,217	0	37,017
Projections				**Food gap** SQ	NR	(w/o food aid)
2001	20,050	19,564	2,230	***0***	***0***	37,934
2006	23,230	21,475	2,230	***0***	***0***	42,709
2011	25,845	23,537	2,249	***0***	***0***	46,974

Grain production and area growth

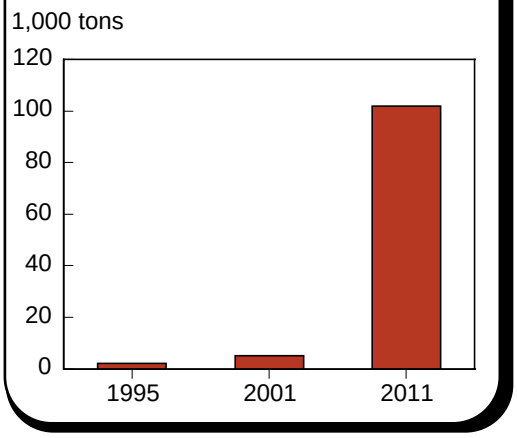


	1980-90	1990-2000
	Percent	
Export earnings growth	-0.3	5.1
Consumption growth, p.c.	-1.7	0.1
Area growth	-1.9	2.5
Yield growth	5.2	-1.3
Imports/Food supply ratio	9.1	3.9

Statistical table 39--Senegal (West Africa)

Year	Grain production	Root production (grain equiv.)	Commercial imports (grains)	Food aid receipts (grains)	Aggregate availability of all food
			---1,000 tons ---		
1992	817	20	521	71	2,211
1993	1,029	19	565	38	2,469
1994	886	31	570	18	2,341
1995	1,005	23	698	9	2,563
1996	917	16	777	6	2,616
1997	706	20	610	10	2,344
1998	686	25	868	14	2,715
1999	1,023	17	862	48	3,076
2000	948	17	727	37	2,923
Projections				**Food gap** SQ / NR	(w/o food aid)
2001	945	20	823	***0*** / ***0***	2,900
2006	1,027	21	849	***92*** / ***0***	3,070
2011	1,165	22	870	***255*** / ***0***	3,319

Distribution gaps

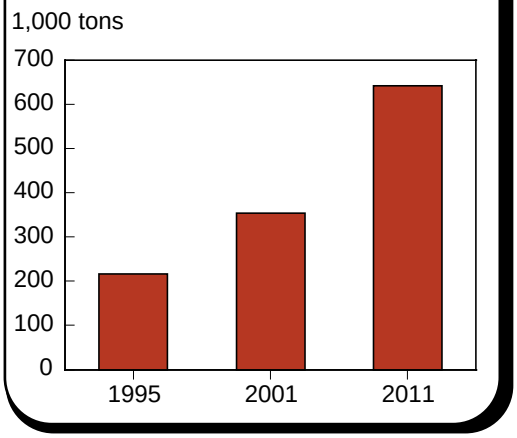


	1980-90	1990-2000
	Percent	
Export earnings growth	3.7	2.3
Consumption growth, p.c.	1.4	-1.3
Area growth	1.4	0.5
Yield growth	2.3	-1.0
Imports/Food supply ratio	40.5	43.6

Statistical table 40--Sierra Leone (West Africa)

Year	Grain production	Root production (grain equiv.)	Commercial imports (grains)	Food aid receipts (grains)	Aggregate availability of all food
			---1,000 tons ---		
1992	315	48	117	29	735
1993	321	44	120	29	777
1994	270	104	248	30	803
1995	193	95	243	48	874
1996	260	118	250	58	925
1997	275	129	272	32	831
1998	235	119	256	71	849
1999	255	93	274	17	853
2000	255	97	106	44	883
Projections				**Food gap** SQ / NR	(w/o food aid)
2001	250	108	192	***124*** / ***239***	844
2006	278	116	145	***260*** / ***389***	819
2011	304	124	111	***389*** / ***532***	811

Distribution gaps

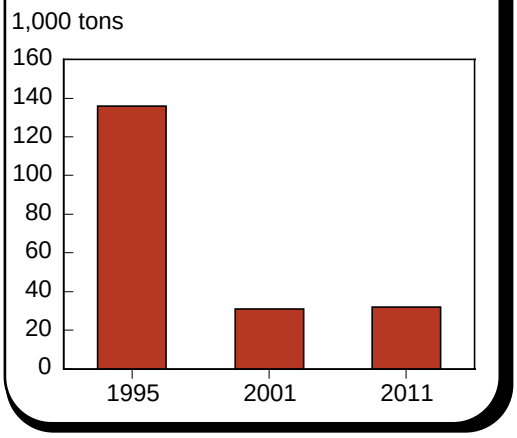


	1980-90	1990-2000
	Percent	
Export earnings growth	0.2	-12.5
Consumption growth, p.c.	-1.8	-0.5
Area growth	-2.1	-1.6
Yield growth	0.1	0.1
Imports/Food supply ratio	22.5	39.4

Statistical table 41--Togo (West Africa)

Year	Grain production	Root production (grain equiv.)	Commercial imports (grains)	Food aid receipts (grains)	Aggregate availability of all food
			---1,000 tons ---		
1992	492	302	160	4	910
1993	611	351	57	11	1,000
1994	405	289	51	8	702
1995	450	416	72	4	937
1996	600	423	93	5	1,145
1997	705	470	107	6	1,244
1998	565	469	211	4	1,191
1999	620	499	327	8	1,409
2000	620	499	64	4	1,179
Projections				**Food gap** SQ / NR	(w/o food aid)
2001	630	508	204	***29*** / ***0***	1,277
2006	797	568	207	***0*** / ***0***	1,486
2011	922	635	215	***12*** / ***0***	1,667

Distribution gaps

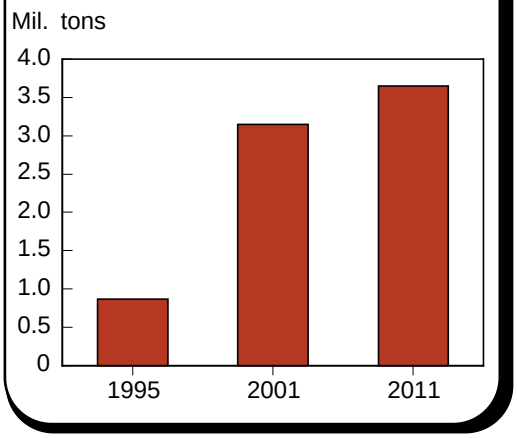


	1980-90	1990-2000
	Percent	
Export earnings growth	0.1	-0.5
Consumption growth, p.c.	-1.5	2.7
Area growth	4.5	7.5
Yield growth	1.1	-2.7
Imports/Food supply ratio	12.3	11.8

Statistical table 42--Afghanistan (Asia)

Year	Grain production	Root production (grain equiv.)	Commercial imports (grains)	Food aid receipts (grains)	Aggregate availability of all food
			---1,000 tons ---		
1992	2,830	86	42	108	3,521
1993	2,930	88	143	71	3,582
1994	3,210	88	0	151	3,744
1995	3,320	90	71	124	4,131
1996	3,420	90	6	174	4,141
1997	3,510	90	156	85	4,167
1998	3,654	90	82	76	3,744
1999	3,310	90	86	199	3,865
2000	2,144	90	1,157	114	4,025
Projections				**Food gap** SQ / NR	(w/o food aid)
2001	1,670	93	431	***1,880*** / ***3,030***	2,413
2006	3,342	100	387	***1,283*** / ***2,749***	4,189
2011	3,568	108	395	***1,763*** / ***3,428***	4,453

Distribution gaps

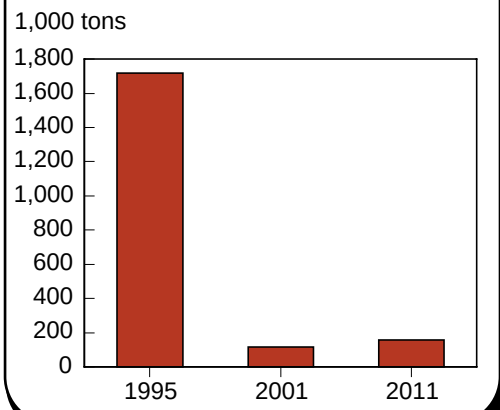


	1980-90	1990-2000
	Percent	
Export earnings growth	-9.9	0.0
Consumption growth, p.c.	-1.6	-3.2
Area growth	-3.2	1.0
Yield growth	-0.6	-0.8
Imports/Food supply ratio	3.7	8.5

Statistical table 43--Bangladesh (Asia)

Year	Grain production	Root production (grain equiv.)	Commercial imports (grains)	Food aid receipts (grains)	Aggregate availability of all food
			---1,000 tons ---		
1992	19,452	454	783	719	24,170
1993	19,264	446	333	745	23,642
1994	18,011	457	0	858	21,829
1995	18,979	467	1,637	755	24,967
1996	20,299	472	1,778	527	26,419
1997	20,365	469	1,097	531	25,821
1998	21,706	478	897	1,293	26,471
1999	25,104	511	3,865	908	33,898
2000	25,890	511	1,245	907	32,124
Projections				**Food gap** SQ	NR (w/o food aid)
2001	25,550	515	2,221	***0***	***0*** 31,543
2006	27,000	555	2,717	***0***	***0*** 33,777
2011	29,134	597	3,354	***0***	***0*** 36,939

Distribution gaps

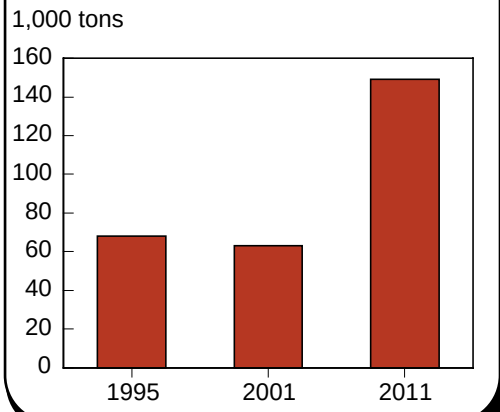


	1980-90	1990-2000
	Percent	
Export earnings growth	7.7	13.6
Consumption growth, p.c.	0.3	1.6
Area growth	0.0	0.5
Yield growth	2.3	2.5
Imports/Food supply ratio	10.4	8.3

Statistical table 44--India (Asia)

Year	Grain production	Root production (grain equiv.)	Commercial imports (grains)	Food aid receipts (grains)	Aggregate availability of all food
			---1,000 tons ---		
1992	165,337	5,597	1,280	261	236,812
1993	168,530	5,239	47	336	236,792
1994	170,844	5,906	0	271	247,080
1995	174,870	5,845	0	268	252,185
1996	177,758	6,102	380	275	258,394
1997	182,842	7,493	1,269	264	263,602
1998	184,020	7,355	1,549	323	265,002
1999	190,740	7,322	1,422	358	268,795
2000	192,514	7,322	1,849	259	271,664
Projections				**Food gap** SQ	NR (w/o food aid)
2001	188,500	7,117	1,735	***0***	***0*** 270,804
2006	212,567	7,793	2,040	***0***	***0*** 306,109
2011	230,507	8,524	2,439	***0***	***0*** 332,850

Distribution gaps

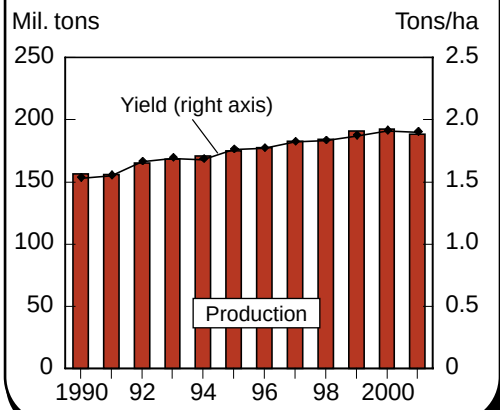


	1980-90	1990-2000
	Percent	
Export earnings growth	5.9	12.0
Consumption growth, p.c.	0.6	-0.2
Area growth	-0.2	0.0
Yield growth	3.3	2.2
Imports/Food supply ratio	0.8	0.5

Statistical table 45--Indonesia (Asia)

Year	Grain production	Root production (grain equiv.)	Commercial imports (grains)	Food aid receipts (grains)	Aggregate availability of all food
			---1,000 tons ---		
1992	36,968	5,977	3,378	41	55,688
1993	35,715	6,218	3,132	52	54,201
1994	38,433	5,695	5,419	15	55,044
1995	39,215	5,755	8,862	12	62,243
1996	38,034	6,204	7,088	0	60,968
1997	36,818	5,496	5,305	9	55,866
1998	38,353	5,452	5,571	1,374	59,071
1999	39,645	5,837	8,270	436	63,569
2000	37,500	5,837	8,049	508	65,426
Projections				**Food gap** SQ / NR	(w/o food aid)
2001	38,500	5,865	7,114	***0*** / ***0***	60,989
2006	43,089	6,251	8,545	***0*** / ***0***	68,892
2011	46,569	6,655	9,487	***0*** / ***0***	74,792

Grain production and yields

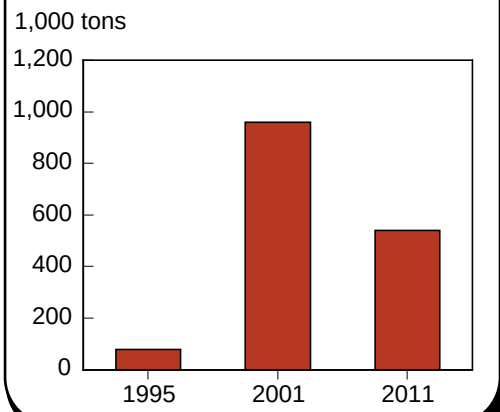


	1980-90	1990-2000
	Percent	
Export earnings growth	2.9	6.4
Consumption growth, p.c.	0.0	-1.0
Area growth	1.1	1.0
Yield growth	1.6	-0.1
Imports/Food supply ratio	5.8	11.3

Statistical table 46--Korea, Dem. Rep. (Asia)

Year	Grain production	Root production (grain equiv.)	Commercial imports (grains)	Food aid receipts (grains)	Aggregate availability of all food
			---1,000 tons ---		
1992	3,723	473	1,146	0	6,246
1993	3,423	496	1,576	0	6,116
1994	3,825	491	496	75	5,713
1995	3,375	539	244	736	5,811
1996	3,175	573	563	508	5,707
1997	3,075	608	595	833	6,065
1998	3,400	616	463	1,042	6,347
1999	3,450	573	379	824	6,341
2000	2,800	563	730	921	6,186
Projections				**Food gap** SQ / NR	(w/o food aid)
2001	2,700	597	517	***1,670*** / ***848***	4,760
2006	3,602	636	484	***1,113*** / ***238***	5,732
2011	3,795	676	475	***1,207*** / ***288***	5,980

Distribution gaps

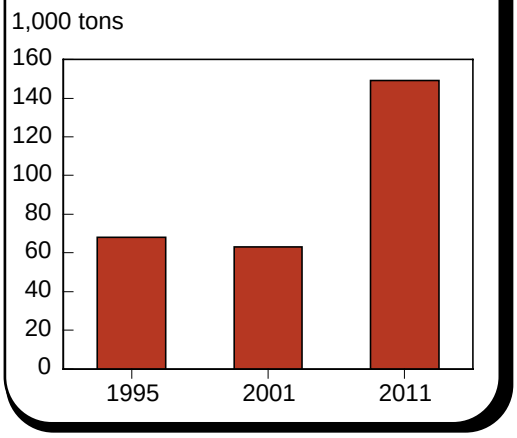


	1980-90	1990-2000
	Percent	
Export earnings growth	3.9	-16.6
Consumption growth, p.c.	-1.6	-2.0
Area growth	-2.5	-1.3
Yield growth	3.1	-1.7
Imports/Food supply ratio	8.9	23.0

Statistical table 47--Nepal (Asia)

Year	Grain production	Root production (grain equiv.)	Commercial imports (grains)	Food aid receipts (grains)	Aggregate availability of all food
			---1,000 tons ---		
1992	4,003	198	38	18	4,638
1993	4,075	199	9	44	4,768
1994	4,427	211	43	26	5,227
1995	4,585	223	6	42	5,428
1996	4,985	237	50	28	5,712
1997	5,110	259	5	33	5,814
1998	5,165	253	0	52	5,931
1999	5,308	280	12	34	6,138
2000	5,310	301	118	6	6,320
Projections				**Food gap** SQ	**Food gap** NR	(w/o food aid)
2001	5,340	288	37	***221***	***0***	6,100
2006	5,894	309	43	***332***	***0***	6,737
2011	6,388	332	50	***543***	***0***	7,307

Distribution gaps

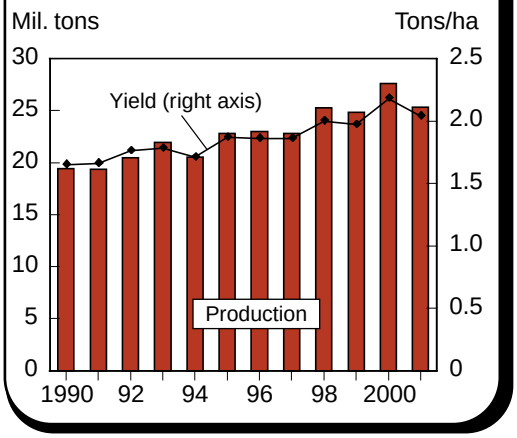


	1980-90	1990-2000
	Percent	
Export earnings growth	3.9	14.7
Consumption growth, p.c.	1.9	0.4
Area growth	3.1	1.6
Yield growth	1.7	0.8
Imports/Food supply ratio	1.4	1.0

Statistical table 48--Pakistan (Asia)

Year	Grain production	Root production (grain equiv.)	Commercial imports (grains)	Food aid receipts (grains)	Aggregate availability of all food
			---1,000 tons ---		
1992	20,458	279	1,813	236	32,248
1993	21,915	301	2,829	67	36,285
1994	20,537	331	1,824	93	36,125
1995	22,833	343	2,692	18	38,377
1996	23,013	336	1,938	48	38,868
1997	22,826	316	2,355	159	38,993
1998	25,285	425	2,231	300	41,215
1999	24,830	516	3,107	148	43,265
2000	27,599	529	2,060	267	44,645
Projections				**Food gap** SQ	**Food gap** NR	(w/o food aid)
2001	25,325	510	2,571	***0***	***0***	41,546
2006	30,417	562	2,719	***0***	***0***	49,461
2011	34,175	618	2,933	***0***	***0***	55,351

Grain production and yields

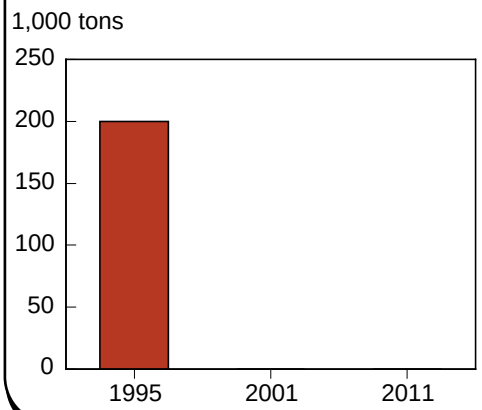


	1980-90	1990-2000
	Percent	
Export earnings growth	8.4	1.7
Consumption growth, p.c.	-0.1	0.2
Area growth	0.9	0.8
Yield growth	1.1	2.4
Imports/Food supply ratio	4.7	9.0

Statistical table 49--Philippines (Asia)

Year	Grain production	Root production (grain equiv.)	Commercial imports (grains)	Food aid receipts (grains)	Aggregate availability of all food
			---1,000 tons ---		
1992	11,000	934	2,076	53	16,801
1993	11,480	940	2,216	52	17,923
1994	11,343	972	2,462	44	18,770
1995	11,587	978	2,887	11	18,469
1996	11,480	984	3,535	40	20,297
1997	10,016	992	3,874	9	19,739
1998	11,568	893	5,100	15	21,184
1999	12,221	943	3,340	111	20,096
2000	12,603	902	3,919	110	21,123
Projections				**Food gap** SQ	NR	(w/o food aid)
2001	12,625	931	4,422	***0***	***0***	21,865
2006	13,808	978	5,082	***0***	***0***	24,216
2011	15,112	1,026	5,879	***0***	***0***	26,975

Distribution gaps

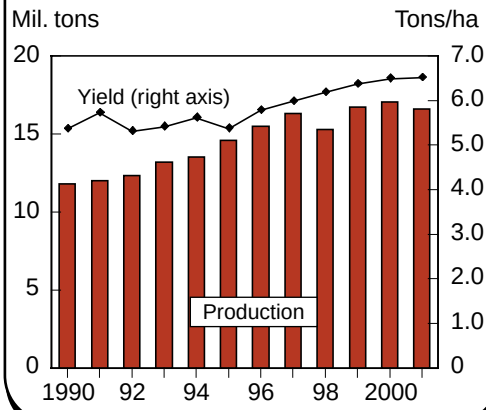


	1980-90	1990-2000
	Percent	
Export earnings growth	3.5	8.1
Consumption growth, p.c.	1.9	-2.1
Area growth	1.1	-0.9
Yield growth	2.3	1.8
Imports/Food supply ratio	12.8	20.0

Statistical table 50--Sri Lanka (Asia)

Year	Grain production	Root production (grain equiv.)	Commercial imports (grains)	Food aid receipts (grains)	Aggregate availability of all food
			---1,000 tons ---		
1992	1,649	140	810	249	4,411
1993	1,748	145	813	338	4,514
1994	1,905	140	595	346	4,834
1995	1,679	138	1,029	121	4,855
1996	1,502	137	1,267	21	4,740
1997	1,758	118	1,201	134	4,993
1998	1,845	107	1,221	27	5,247
1999	1,962	102	1,212	68	5,347
2000	1,955	105	1,041	53	5,200
Projections				**Food gap** SQ	NR	(w/o food aid)
2001	1,965	105	1,206	***0***	***0***	5,308
2006	2,002	109	1,304	***0***	***0***	5,535
2011	2,055	112	1,414	***0***	***0***	5,808

Grain production and yields

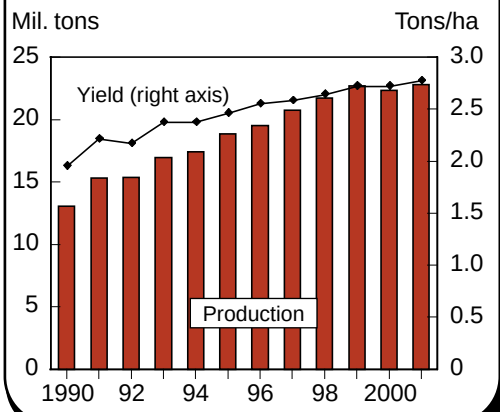


	1980-90	1990-2000
	Percent	
Export earnings growth	4.7	7.3
Consumption growth, p.c.	0.0	0.9
Area growth	-0.6	0.0
Yield growth	1.3	1.3
Imports/Food supply ratio	30.5	37.1

Statistical table 51--Vietnam (Asia)

Year	Grain production	Root production (grain equiv.)	Commercial imports (grains)	Food aid receipts (grains)	Aggregate availability of all food
			---1,000 tons ---		
1992	15,389	1,654	223	84	17,110
1993	16,931	1,561	389	87	19,107
1994	17,390	1,400	349	64	19,356
1995	18,860	1,281	586	20	20,768
1996	19,540	1,246	512	65	19,889
1997	20,744	1,356	506	49	21,349
1998	21,720	1,120	821	52	22,591
1999	22,676	1,185	848	115	21,768
2000	22,330	1,224	845	0	23,164
Projections				**Food gap** SQ / NR	(w/o food aid)
2001	22,800	1,211	886	***0*** / ***0***	23,105
2006	24,996	1,312	1,100	***0*** / ***0***	25,596
2011	27,020	1,420	1,401	***0*** / ***0***	28,009

Grain production and yields

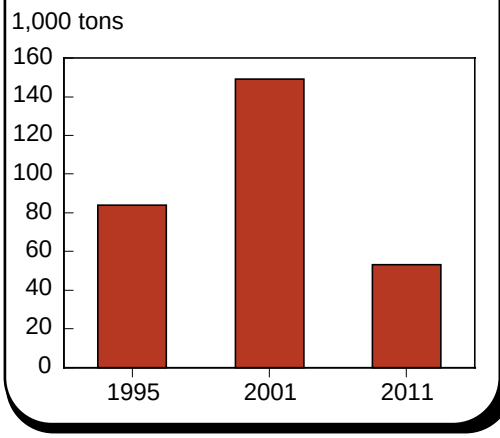


	1980-90	1990-2000
	Percent	
Export earnings growth	0.0	27.7
Consumption growth, p.c.	-0.5	1.6
Area growth	1.0	2.3
Yield growth	3.4	3.1
Imports/Food supply ratio	4.3	2.6

Statistical table 52--Bolivia (Latin America & Caribbean)

Year	Grain production	Root production (grain equiv.)	Commercial imports (grains)	Food aid receipts (grains)	Aggregate availability of all food
			---1,000 tons ---		
1992	780	291	175	243	1,729
1993	1,055	318	135	205	1,815
1994	875	268	204	176	1,677
1995	825	272	306	94	1,863
1996	965	296	110	143	1,806
1997	1,090	338	86	149	1,992
1998	1,015	250	105	144	1,960
1999	980	341	106	74	1,926
2000	590	408	152	54	1,979
Projections				**Food gap** SQ / NR	(w/o food aid)
2001	940	349	124	***0*** / ***18***	1,963
2006	1,137	392	134	***0*** / ***0***	2,329
2011	1,337	441	145	***0*** / ***0***	2,707

Distribution gaps

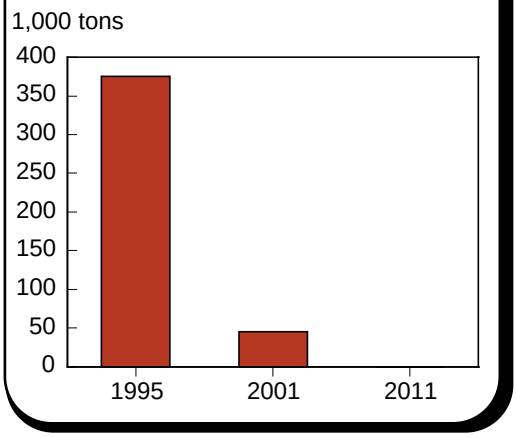


	1980-90	1990-2000
	Percent	
Export earnings growth	1.0	5.0
Consumption growth, p.c.	-1.3	-2.0
Area growth	1.4	-1.5
Yield growth	0.5	2.6
Imports/Food supply ratio	25.3	20.5

Statistical table 53--Colombia (Latin America & Caribbean)

Year	Grain production	Root production (grain equiv.)	Commercial imports (grains)	Food aid receipts (grains)	Aggregate availability of all food
			---1,000 tons ---		
1992	2,804	1,037	1,596	17	9,861
1993	2,777	1,250	1,700	31	9,763
1994	2,610	1,257	2,401	15	10,441
1995	2,469	1,247	2,600	0	10,573
1996	2,129	1,296	3,278	9	11,364
1997	1,834	1,172	3,292	7	10,898
1998	2,026	1,116	3,772	11	11,846
1999	2,583	1,256	3,222	10	11,713
2000	2,584	1,256	3,079	0	12,045
Projections				**Food gap** SQ	NR	(w/o food aid)
2001	2,614	1,248	3,595	***0***	***0***	12,584
2006	2,517	1,346	4,514	***0***	***0***	14,254
2011	2,622	1,449	5,621	***0***	***0***	16,697

Distribution gaps

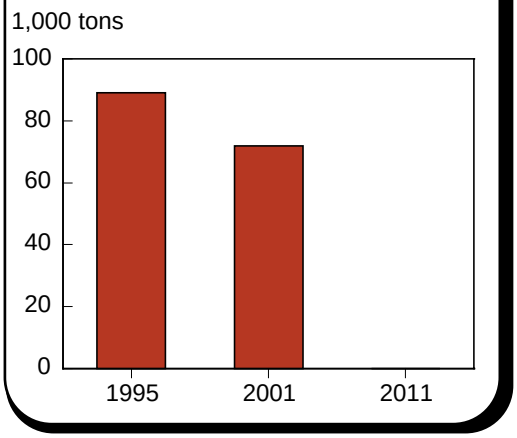


	1980-90	1990-2000
	Percent	
Export earnings growth	7.5	5.0
Consumption growth, p.c.	-0.1	1.2
Area growth	1.5	-4.2
Yield growth	0.2	1.4
Imports/Food supply ratio	18.8	38.3

Statistical table 54--Dominican Republic (Latin America & Caribbean)

Year	Grain production	Root production (grain equiv.)	Commercial imports (grains)	Food aid receipts (grains)	Aggregate availability of all food
			---1,000 tons ---		
1992	390	84	802	7	1,719
1993	350	57	992	7	1,968
1994	329	63	950	3	1,921
1995	316	85	1,045	1	2,015
1996	360	78	1,034	2	1,968
1997	301	64	1,185	5	2,163
1998	281	74	1,013	31	1,916
1999	311	73	1,324	85	2,104
2000	326	77	1,520	0	2,182
Projections				**Food gap** SQ	NR	(w/o food aid)
2001	346	78	1,325	***0***	***0***	2,158
2006	325	87	1,597	***0***	***0***	2,577
2011	344	96	1,889	***0***	***0***	3,100

Distribution gaps

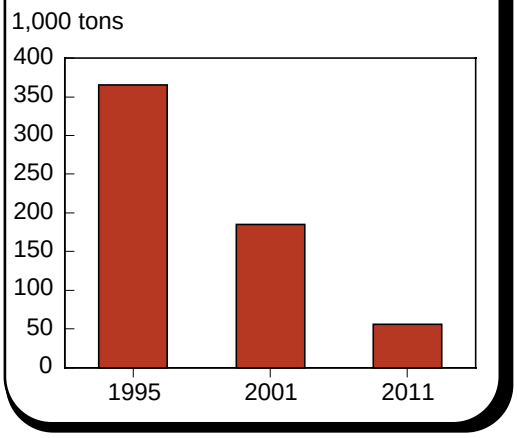


	1980-90	1990-2000
	Percent	
Export earnings growth	4.5	6.2
Consumption growth, p.c.	1.2	0.2
Area growth	-0.8	-1.8
Yield growth	0.8	0.4
Imports/Food supply ratio	52.7	71.3

Statistical table 55--Ecuador (Latin America & Caribbean)

Year	Grain production	Root production (grain equiv.)	Commercial imports (grains)	Food aid receipts (grains)	Aggregate availability of all food
			---1,000 tons ---		
1992	1,028	128	354	14	2,769
1993	1,104	113	275	12	2,585
1994	1,050	137	343	32	2,758
1995	1,009	123	383	1	2,796
1996	767	120	439	8	3,014
1997	831	164	655	20	2,763
1998	791	136	1,034	20	3,437
1999	901	153	770	20	3,260
2000	861	216	648	44	3,135
Projections				**Food gap** SQ / NR	(w/o food aid)
2001	858	173	899	***0*** / ***0***	3,300
2006	982	182	1,105	***0*** / ***0***	3,951
2011	1,025	191	1,376	***0*** / ***0***	4,593

Distribution gaps

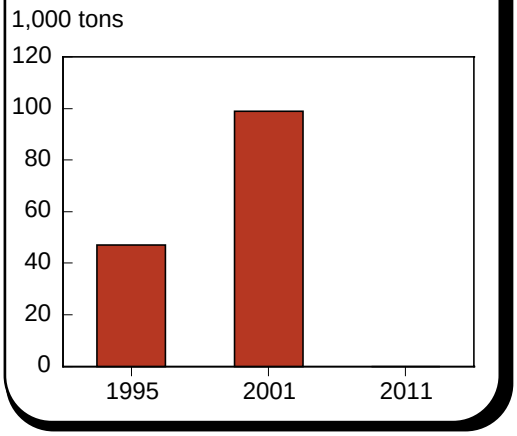


	1980-90	1990-2000
	Percent	
Export earnings growth	5.4	4.7
Consumption growth, p.c.	-0.8	-2.4
Area growth	4.1	-0.6
Yield growth	0.2	-1.2
Imports/Food supply ratio	35.3	33.1

Statistical table 56--El Salvador (Latin America & Caribbean)

Year	Grain production	Root production (grain equiv.)	Commercial imports (grains)	Food aid receipts (grains)	Aggregate availability of all food
			---1,000 tons ---		
1992	953	15	151	131	1,458
1993	858	14	214	79	1,355
1994	690	32	468	7	1,534
1995	873	27	417	14	1,443
1996	841	26	399	7	1,199
1997	860	26	566	8	1,692
1998	790	20	343	49	1,291
1999	855	26	189	7	1,112
2000	890	27	664	0	1,673
Projections				**Food gap** SQ / NR	(w/o food aid)
2001	890	25	435	***0*** / ***0***	1,422
2006	978	28	583	***0*** / ***0***	1,730
2011	1,071	30	798	***0*** / ***0***	2,154

Distribution gaps

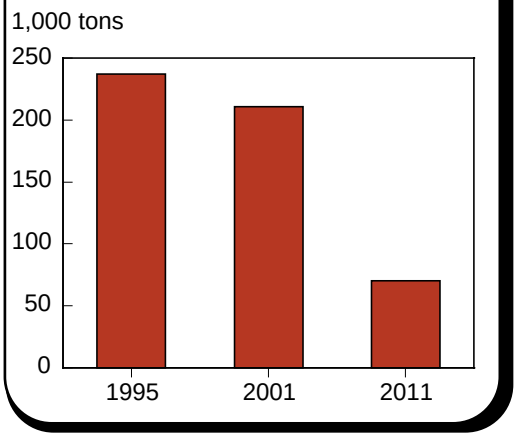


	1980-90	1990-2000
	Percent	
Export earnings growth	-3.4	12.6
Consumption growth, p.c.	2.1	-5.4
Area growth	0.6	0.1
Yield growth	1.6	0.8
Imports/Food supply ratio	23.4	30.9

Statistical table 57--Guatemala (Latin America & Caribbean)

Year	Grain production	Root production (grain equiv.)	Commercial imports (grains)	Food aid receipts (grains)	Aggregate availability of all food
			---1,000 tons ---		
1992	1,454	16	293	109	2,281
1993	1,400	17	285	151	2,235
1994	1,343	17	442	144	2,424
1995	1,423	17	476	35	2,380
1996	1,436	17	611	45	2,368
1997	1,258	17	599	18	2,296
1998	1,235	20	697	93	2,446
1999	1,285	21	951	65	2,609
2000	1,283	21	917	59	2,691
Projections				**Food gap** SQ / NR	(w/o food aid)
2001	1,282	23	978	***0*** / ***0***	2,655
2006	1,372	26	1,327	***0*** / ***0***	3,215
2011	1,443	30	1,843	***0*** / ***0***	3,996

Distribution gaps

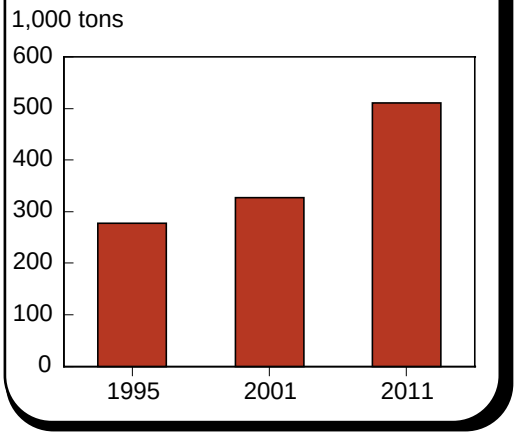


	1980-90	1990-2000
	Percent	
Export earnings growth	-1.8	6.3
Consumption growth, p.c.	0.0	-1.3
Area growth	0.6	0.3
Yield growth	1.9	-1.5
Imports/Food supply ratio	14.8	30.4

Statistical table 58--Haiti (Latin America & Caribbean)

Year	Grain production	Root production (grain equiv.)	Commercial imports (grains)	Food aid receipts (grains)	Aggregate availability of all food
			---1,000 tons ---		
1992	320	231	316	75	1,495
1993	340	223	268	114	1,462
1994	330	216	198	117	1,391
1995	345	219	339	126	1,639
1996	345	215	265	151	1,604
1997	405	211	267	146	1,723
1998	455	213	375	148	1,896
1999	455	217	349	180	1,944
2000	455	224	418	183	2,060
Projections				**Food gap** SQ / NR	(w/o food aid)
2001	455	222	379	***165*** / ***162***	1,775
2006	505	235	366	***254*** / ***252***	1,851
2011	537	250	357	***376*** / ***373***	1,905

Distribution gaps

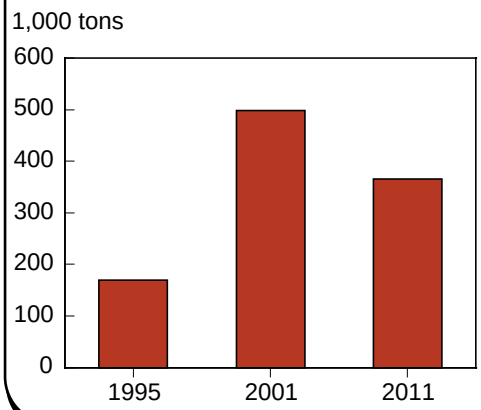


	1980-90	1990-2000
	Percent	
Export earnings growth	-0.9	-0.6
Consumption growth, p.c.	-1.2	2.4
Area growth	-2.2	4.7
Yield growth	-0.6	-0.9
Imports/Food supply ratio	27.1	41.1

Statistical table 59--Honduras (Latin America & Caribbean)

Year	Grain production	Root production (grain equiv.)	Commercial imports (grains)	Food aid receipts (grains)	Aggregate availability of all food
			---1,000 tons ---		
1992	710	8	77	64	1,060
1993	690	8	72	149	1,121
1994	617	7	260	73	1,195
1995	780	7	238	43	1,235
1996	679	8	217	36	1,089
1997	697	8	413	20	1,450
1998	560	9	185	94	1,195
1999	606	9	378	110	1,288
2000	615	8	327	110	1,281
Projections				**Food gap**	
				SQ NR	(w/o food aid)
2001	487	9	378	***287*** ***437***	1,022
2006	759	10	395	***66*** ***237***	1,416
2011	868	12	426	***77*** ***267***	1,579

Distribution gaps

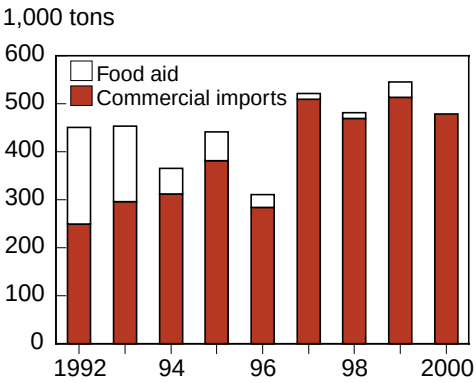


	1980-90	1990-2000
	Percent	
Export earnings growth	1.1	1.7
Consumption growth, p.c.	-2.2	-1.1
Area growth	0.8	-1.1
Yield growth	1.1	-0.4
Imports/Food supply ratio	20.1	30.3

Statistical table 60--Jamaica (Latin America & Caribbean)

Year	Grain production	Root production (grain equiv.)	Commercial imports (grains)	Food aid receipts (grains)	Aggregate availability of all food
			---1,000 tons ---		
1992	4	84	250	201	711
1993	5	92	296	157	790
1994	5	97	312	53	669
1995	5	102	381	60	721
1996	5	108	284	27	648
1997	5	90	509	13	846
1998	5	86	469	13	792
1999	5	85	513	33	835
2000	5	85	479	0	787
Projections				**Food gap**	
				SQ NR	(w/o food aid)
2001	5	90	519	***0*** ***0***	854
2006	5	97	620	***0*** ***0***	1,033
2011	6	105	744	***0*** ***0***	1,254

Commercial imports and food aid

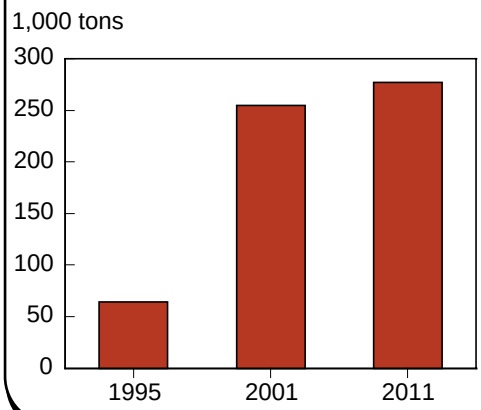


	1980-90	1990-2000
	Percent	
Export earnings growth	5.4	0.1
Consumption growth, p.c.	-3.7	1.6
Area growth	-12.0	4.0
Yield growth	4.7	2.7
Imports/Food supply ratio	84.6	82.2

Statistical table 61--Nicaragua (Latin America & Caribbean)

Year	Grain production	Root production (grain equiv.)	Commercial imports (grains)	Food aid receipts (grains)		Aggregate availability of all food
			---1,000 tons ---			
1992	382	20	81	86		929
1993	473	21	93	55		991
1994	425	21	164	34		997
1995	493	21	164	43		1,066
1996	558	21	201	33		1,078
1997	494	22	175	28		1,045
1998	537	21	68	160		1,073
1999	482	22	166	98		1,138
2000	414	22	202	105		1,168
Projections				**Food gap**		
				SQ	NR	(w/o food aid)
2001	441	22	154	***135***	***205***	937
2006	585	24	163	***66***	***146***	1,160
2011	647	26	180	***109***	***200***	1,270

Distribution gaps

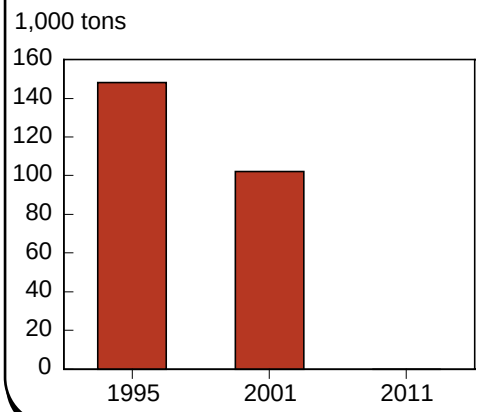


	1980-90	1990-2000
	Percent	
Export earnings growth	-3.9	8.1
Consumption growth, p.c.	-0.9	0.6
Area growth	-0.8	3.4
Yield growth	2.5	0.1
Imports/Food supply ratio	28.3	30.6

Statistical table 62--Peru (Latin America & Caribbean)

Year	Grain production	Root production (grain equiv.)	Commercial imports (grains)	Food aid receipts (grains)		Aggregate availability of all food
			---1,000 tons ---			
1992	1,669	462	2,244	377		5,423
1993	1,972	611	1,907	410		5,222
1994	1,821	686	2,266	348		5,750
1995	1,634	850	2,494	105		6,394
1996	1,827	857	2,643	95		6,480
1997	1,953	917	2,600	61		5,952
1998	2,432	1,001	2,781	149		6,711
1999	2,656	1,137	2,611	33		6,935
2000	2,702	1,198	2,369	0		6,653
Projections				**Food gap**		
				SQ	NR	(w/o food aid)
2001	2,785	1,160	2,833	***0***	***0***	7,102
2006	3,018	1,270	3,747	***0***	***0***	8,710
2011	3,239	1,388	5,018	***0***	***0***	10,832

Distribution gaps

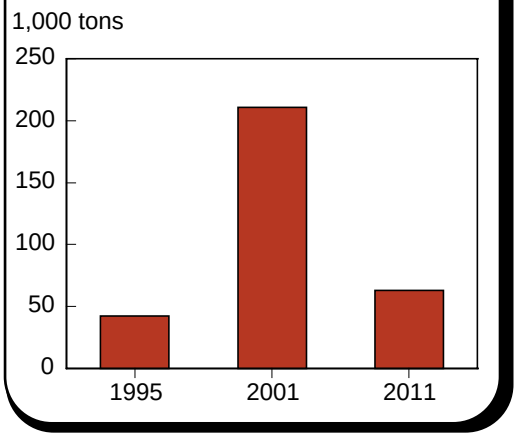


	1980-90	1990-2000
	Percent	
Export earnings growth	-0.9	8.5
Consumption growth, p.c.	-1.4	2.9
Area growth	1.9	4.3
Yield growth	2.1	2.6
Imports/Food supply ratio	42.6	47.6

Statistical table 63--Armenia (New Independent States)

Year	Grain production	Root production (grain equiv.)	Commercial imports (grains)	Food aid receipts (grains)	Aggregate availability of all food
			---1,000 tons ---		
1992	292	62	449	117	784
1993	301	80	119	277	723
1994	213	80	53	367	874
1995	236	82	0	267	876
1996	306	82	29	104	752
1997	290	69	74	158	837
1998	320	85	48	11	698
1999	290	80	79	22	727
2000	160	62	82	19	605
Projections				**Food gap** SQ / NR	(w/o food aid)
2001	250	77	68	***0*** / ***187***	644
2006	335	85	66	***0*** / ***27***	818
2011	360	94	68	***0*** / ***0***	881

Distribution gaps

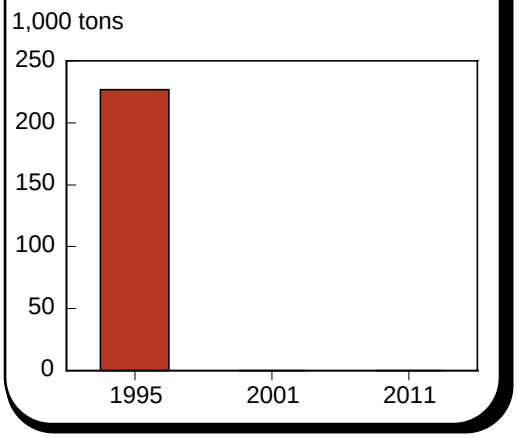


	1980-90	1990-2000
	Percent	
Export earnings growth	--	-18.2
Consumption growth, p.c.	--	-9.5
Area growth	--	1.4
Yield growth	--	-2.8
Imports/Food supply ratio	--	44.7

Statistical table 64--Azerbaijan (New Independent States)

Year	Grain production	Root production (grain equiv.)	Commercial imports (grains)	Food aid receipts (grains)	Aggregate availability of all food
			---1,000 tons ---		
1992	1,266	30	585	6	1,982
1993	1,084	29	557	58	1,790
1994	1,015	29	-2	424	1,710
1995	878	30	296	167	1,640
1996	1,000	41	327	34	1,696
1997	1,130	43	693	63	2,268
1998	1,020	60	798	15	2,282
1999	1,070	65	840	38	2,297
2000	1,470	87	594	33	2,381
Projections				**Food gap** SQ / NR	(w/o food aid)
2001	1,730	75	783	***0*** / ***0***	3,129
2006	1,349	83	865	***0*** / ***0***	2,736
2011	1,448	92	900	***0*** / ***0***	2,909

Distribution gaps



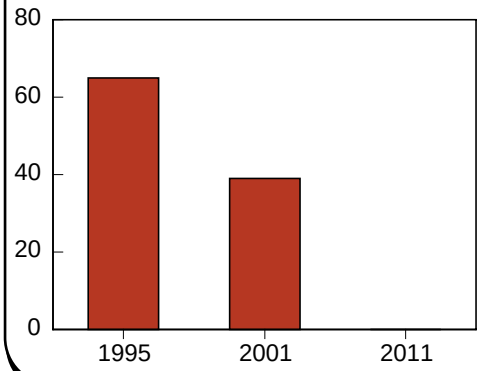
	1980-90	1990-2000
	Percent	
Export earnings growth	--	11.1
Consumption growth, p.c.	--	1.9
Area growth	--	0.4
Yield growth	--	-1.3
Imports/Food supply ratio	--	35.6

Statistical table 65--Georgia (New Independent States)

Year	Grain production	Root production (grain equiv.)	Commercial imports (grains)	Food aid receipts (grains)	Aggregate availability of all food
			---1,000 tons ---		
1992	496	41	394	194	1,370
1993	403	49	260	585	1,290
1994	470	58	166	569	1,269
1995	497	69	175	355	1,270
1996	658	56	523	97	1,410
1997	882	69	501	143	1,431
1998	588	68	411	95	1,417
1999	768	87	289	102	1,440
2000	330	94	430	70	1,341
Projections				**Food gap** SQ / NR	(w/o food aid)
2001	580	86	379	***0*** / ***0***	1,247
2006	707	92	383	***0*** / ***0***	1,441
2011	754	98	398	***0*** / ***0***	1,538

Distribution gaps

1,000 tons



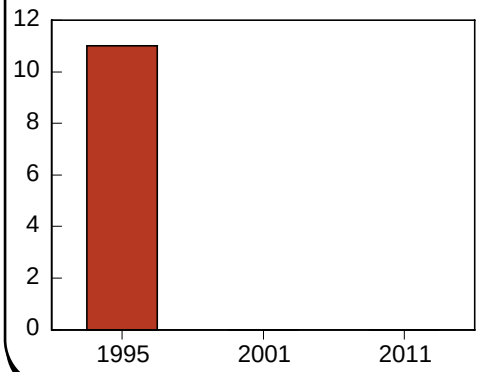
	1980-90	1990-2000
	Percent	
Export earnings growth	--	12.4
Consumption growth, p.c.	--	-0.3
Area growth	--	3.9
Yield growth	--	-3.6
Imports/Food supply ratio	--	51.8

Statistical table 66--Kyrgyzstan (New Independent States)

Year	Grain production	Root production (grain equiv.)	Commercial imports (grains)	Food aid receipts (grains)	Aggregate availability of all food
			---1,000 tons ---		
1992	1,510	70	332	91	1,323
1993	1,511	59	119	156	1,183
1994	993	60	140	61	1,118
1995	985	83	83	139	1,268
1996	1,415	108	78	31	1,295
1997	1,713	130	52	70	1,615
1998	1,713	149	105	1	1,577
1999	1,591	184	147	77	1,663
2000	1,503	199	123	79	1,669
Projections				**Food gap** SQ / NR	(w/o food aid)
2001	1,753	192	128	***0*** / ***0***	1,729
2006	1,846	218	137	***0*** / ***0***	1,847
2011	1,988	248	147	***0*** / ***0***	2,018

Distribution gaps

1,000 tons

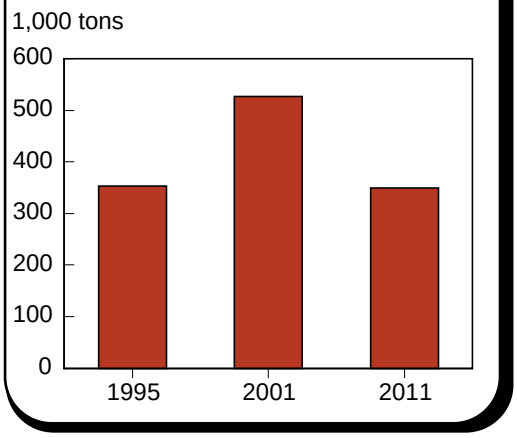


	1980-90	1990-2000
	Percent	
Export earnings growth	--	-2.2
Consumption growth, p.c.	--	3.9
Area growth	--	1.8
Yield growth	--	-0.5
Imports/Food supply ratio	--	17.0

Statistical table 67--Tajikistan (New Independent States)

Year	Grain production	Root production (grain equiv.)	Commercial imports (grains)	Food aid receipts (grains)		Aggregate availability of all food
			---1,000 tons ---			
1992	241	32	1,116	71		1,515
1993	236	28	834	82		1,570
1994	237	26	488	104		1,306
1995	226	22	191	168		1,059
1996	516	21	142	115		1,076
1997	606	25	212	141		1,290
1998	506	34	282	41		1,178
1999	506	46	571	89		1,541
2000	356	48	333	77		1,155
Projections				**Food gap**		
				SQ	NR	(w/o food aid)
2001	286	43	393	***299***	***495***	967
2006	565	48	355	***44***	***253***	1,305
2011	611	53	363	***78***	***305***	1,380

Distribution gaps



	1980-90	1990-2000
	Percent	
Export earnings growth	--	--
Consumption growth, p.c.	--	-4.0
Area growth	--	2.9
Yield growth	--	5.2
Imports/Food supply ratio	--	60.2

Appendix 1—Food Security Model: Definition and Methodology

The Food Security Assessment model used in this report was developed at ERS for use in projecting food consumption and access, and food gaps (previously called food needs) in 67 low-income countries through 2011. The reference to food includes 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.

The food security of a country is evaluated based on the gap between projected domestic food consumption (produced domestically plus imported commercially minus nonfood use) and a consumption requirement. Although food aid is expected to be available during the projection period, it is not included in the projection of food consumption. It should be noted that while projection results will provide a baseline for the food security situation of a country, they depend on assumptions and specifications of the model. Since the model is based on historical data, it implicitly assumes that the historical trend in key variables will continue in the future.

Food gaps are projected using two consumption criteria:

1) *Status quo target*, where the objective is to maintain average per capita consumption of the recent past. The most recent 3-year average (1998-2000) is used for the per capita consumption target in order to eliminate short-term fluctuations.

2) *Nutrition-based target*, where the objective is to maintain the daily caloric intake standards recommended by the UN's Food and Agriculture Organization (FAO). The caloric requirements (based on total share of grains, root crops, and "other") used in this assessment are those necessary to sustain life with minimum food-gathering activities. They are comparable to the activity level for a refugee—they do not allow for play, work, or any activity other than food gathering.

The status quo measure embodies a "safety-net" criterion by providing food consumption stability at recently achieved levels. The nutrition-based target assists in comparisons of relative well-being. Comparing the two consumption measures either for countries or regions provides an indicator of the need depending on whether the objectives are to achieve consumption stability and/or to meet a nutritional standard. Large nutrition-based needs relative to status quo needs, for example, mean additional food must be provided if improved nutrition levels are the main objective. In cases where nutrition-based requirements are below status quo consumption needs, food availability could decline without risking nutritional adequacy, on average. Both methods, however, fail to address inequalities of food distribution within a country.

Structural Framework for 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 67 lower 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 lag return (real price times yield), while yield responds to input use. Commercial imports are assumed to be a function of domestic price, world commodity price, and foreign exchange availability. 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 reserve is 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. The projections 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 assessments where the contribution to the diet of commodities such as meat and dairy products was overlooked. The plan is to enhance this aspect of the model in the future.

For the grains and root crops (*c*) commodity group, food consumption (*FC*) is defined as domestic supply (*DS*) minus nonfood use (*NF*). n is country index and t is 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*) and changes in stocks (*CSTK*).

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

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

$$PR_{cnt} = AR_{cnt} * YL_{cnt} \quad (4)$$
$$YL_{cnt} = f\,(LB_{cnt}, FR_{cn}, K_{cnt}, T_{cnt}) \quad (5)$$
$$RPY_{cnt} = YL_{cnt} * DP_{cnt} \quad (6)$$
$$RNPY_{cnt} = NYL_{cnt} * NDP_{cnt} \quad (7)$$
$$AR_{cnt} = f\,(AR_{cnt-1}, RPY_{cnt-1}, RNPY_{cnt-1}, Z_{cnt}) \quad (8)$$

where *AR* is area, *YL* is yield, *LB* is rural labor, *FR* is fertilizer use, *K* is the 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* is 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:

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

where *NDS* is supply of substitute commodity, *GD* is real income, and *EXR* is real exchange rate.

Projections of food consumption by income group—Inadequate economic access is the most important cause of chronic undernutrition among developing countries and is related to the level of income. 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 countries is the key factor preventing the 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.[1] It should be noted that this approach ignores the consumption substitution of different food groups by income class. The procedure uses the concept of the income/consumption relationship and allocates the total projected amount of available food among different income groups in each country (income distributions are assumed constant during the projection period).

Assuming a declining consumption and income relationship (semi log functional form):

$$C = a + b \ln Y \quad (11)$$
$$C = C_o/P \quad (12)$$
$$P = P_1 + \ldots\ldots + P_i \quad (13)$$
$$Y = Y_o/P \quad (14)$$
$$i = 1 \text{ to } 5$$

where *C* and *Y* are known average per capita food consumption (all commodities in grain equivalent) and per capita income (all quintiles), C_o is total food consumption, *P* is the total population, *i* is income quintile, *a* is the intercept, *b* is the consumption income propensity, and *b/C* is consumption income elasticity (point estimate elasticity is calculated for individual countries). To estimate per capita consumption by income group, the parameter *b* was estimated based on cross-country (67 low-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.

Historical Data

Historical supply and use data for 1980-2000 for most variables are from the USDA database. Data for grain production in 2001 for most countries are based on a USDA database as of October 2001. Food aid data are

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

from FAO, and financial data are from the International Monetary Fund and World Bank. Historical nonfood-use data, including seed, waste, processing use, and other use, are estimated from the FAO *Food Balance* series. The base year data used for projections are the average for 1998-2000, except export earnings that are 1997-99.

Endogenous variables:

Production, area, yield, commercial import, domestic producer price, and food consumption.

Exogenous variables:

Population—data are medium UN population projections as of 1998.

World prices—data are USDA/baseline projections. Stocks-USDA 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—USDA data, projections are either based on the population growth rate or extrapolation of historical trends.

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

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

Food aid—historical data from FAO, *no food aid* assumed during the projection period.

Gross Domestic Product—World Bank data.

Merchandise and service imports and exports—World Bank data.

Net foreign credit—World Bank data, 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.

(***Shahla Shapouri***)

Appendix table 2a--List of countries and their food gaps in 2001

	2001 food gaps				2001 food gaps		
	Status quo	Nutrition	Distribution		Status quo	Nutrition	Distribution
	1,000 tons				1,000 tons		
Angola	248	280	483	Algeria	0	0	83
Benin	69	0	0	Egypt	0	0	0
Burkina Faso	120	0	137	Morocco	0	0	0
Burundi	24	395	424	Tunisia	0	0	0
Cameroon	50	0	49	**North Africa**	**0**	**0**	**83**
Cape Verde	60	9	12				
Central African Rep.	11	26	159	Afghanistan	1,880	3,030	3,150
Chad	97	37	205	Bangladesh	0	0	115
Congo, Dem. Rep.	223	1,824	2,135	India	0	0	6,177
Côte d'Ivoire	0	0	0	Indonesia	0	0	0
Eritrea	229	420	438	Korea, Dem. Rep.	1,670	848	959
Ethiopia	1,750	3,949	4,369	Nepal	221	0	63
Gambia	13	0	0	Pakistan	0	0	0
Ghana	75	0	70	Philippines	0	0	0
Guinea	0	0	27	Sri Lanka	0	0	0
Guinea-Bissau	10	0	7	Vietnam	0	0	0
Kenya	0	792	1,151	**Asia**	**3,772**	**3,878**	**10,464**
Lesotho	35	32	81				
Liberia	190	135	158	Bolivia	0	18	149
Madagascar	0	117	370	Colombia	0	0	45
Malawi	0	0	0	Dominican Rep.	0	0	72
Mali	0	107	285	Ecuador	0	0	99
Mauritania	72	0	0	El Salvador	0	0	211
Mozambique	24	548	773	Guatemala	165	162	327
Niger	373	0	146	Haiti	287	437	498
Nigeria	0	0	0	Honduras	0	0	0
Rwanda	483	310	338	Jamaica	135	205	255
Senegal	0	0	5	Nicaragua	0	0	185
Sierra Leone	124	239	354	Peru	0	0	102
Somalia	167	860	916	**Latin America and**			
Sudan	1,362	936	1,133	**the Caribbean**	**586**	**822**	**1,944**
Swaziland	7	0	7				
Tanzania	72	962	1,199	Armenia	0	187	63
Togo	29	0	31	Azerbaijan	0	0	0
Uganda	312	0	42	Georgia	0	0	0
Zambia	0	78	290	Kyrgyzstan	0	0	0
Zimbabwe	0	859	1,018	Tajikistan	299	495	350
Sub-Saharan Africa	**6,227**	**12,914**	**16,813**	**New Independent States**	**299**	**682**	**414**
				Total	**10,883**	**18,296**	**29,718**

Appendix table 2b--List of countries and their food gaps in 2011

	2011 food gaps				2011 food gaps		
	SQ	Nutrition	Distribution		SQ	Nutrition	Distribution
		1,000 tons				1,000 tons	
Angola	653	695	874	Algeria	0	0	358
Benin	24	0	0	Egypt	0	0	0
Burkina Faso	0	0	12	Morocco	0	0	0
Burundi	125	595	630	Tunisia	0	0	1
Cameroon	0	0	25	**North Africa**	**0**	**0**	**359**
Cape Verde	83	20	23				
Central African Rep.	67	85	226	Afghanistan	1,763	3,428	3,650
Chad	0	0	52	Bangladesh	0	0	158
Congo, Dem. Rep.	1,512	3,664	4,044	India	0	0	655
Côte d'Ivoire	0	0	0	Indonesia	0	0	0
Eritrea	272	514	539	Korea, Dem. Rep.	1,207	288	540
Ethiopia	0	1,586	2,697	Nepal	543	0	149
Gambia	30	0	1	Pakistan	0	0	0
Ghana	0	0	60	Philippines	0	0	0
Guinea	28	0	47	Sri Lanka	0	0	0
Guinea-Bissau	0	0	1	Vietnam	0	0	0
Kenya	0	143	780	**Asia**	**3,513**	**3,716**	**5,152**
Lesotho	48	44	102				
Liberia	461	382	408	Bolivia	0	0	53
Madagascar	296	461	703	Colombia	0	0	0
Malawi	0	0	0	Dominican Rep.	0	0	0
Mali	0	0	259	Ecuador	0	0	0
Mauritania	339	65	97	El Salvador	0	0	70
Mozambique	0	0	266	Guatemala	376	373	511
Niger	581	0	222	Haiti	77	267	366
Nigeria	0	0	0	Honduras	0	0	0
Rwanda	648	435	468	Jamaica	109	200	277
Senegal	255	0	102	Nicaragua	0	0	56
Sierra Leone	389	532	642	Peru	0	0	0
Somalia	375	1,345	1,417	**Latin America and**			
Sudan	0	0	113	**the Caribbean**	**562**	**839**	**1,333**
Swaziland	0	0	4				
Tanzania	0	386	903	Armenia	0	0	63
Togo	12	0	32	Azerbaijan	0	0	0
Uganda	580	0	83	Georgia	0	0	0
Zambia	92	380	559	Kyrgyzstan	0	0	0
Zimbabwe	0	0	172	Tajikistan	78	305	350
Sub-Saharan Africa	**6,870**	**11,332**	**16,563**	**New Independent States**	**78**	**305**	**414**
				Total	**11,023**	**16,193**	**23,821**

Appendix table 3--Country indicators

Region and country	Population 2001	Population growth rate	Grain production: Growth 1980-2000	Grain production: Coefficient of variation 1980-2000	Root production growth 1980-2000	Projected annual growth in supply	Per capita GNP 1999	Macroeconomic indicators: Per capita GNP growth 1999	Macroeconomic indicators: GDP growth 1999	Export earnings growth 1998	Official development assistance as a share of GNP 1998	External debt (present value) as a share of GNP 1998
	1,000	Percent					U.S. dollars	Percent				
North Africa:												
Algeria	32,171	2.2	-1.0	47.9	4.0	1.4	1,550	3.6	3.3	3.5	0.9	66.0
Egypt	69,707	1.8	5.0	20.8	2.9	1.1	1,290	4.5	6.0	-7.7	2.3	29.0
Morocco	28,827	1.7	0.2	48.2	4.6	1.2	1,240	5.3	-0.7	3.3	1.5	54.0
Tunisia	9,715	1.3	2.5	45.4	4.9	1.4	2,060	4.1	6.2	3.7	0.8	56.0
Central Africa:				12.7								
Cameroon	15,481	2.6	2.0	13.8	3.4	2.8	610	3.8	4.4	4.7	5.0	98.0
Central African Rep.	3,681	1.8	1.5	14.3	0.1	1.3	300	2.6	3.4	0.6	11.6	55.0
Congo, Dem. Rep.	53,120	2.8	3.4	9.9	1.3	1.8	110	0.7	3.0	14.3	2.0	196.0
West Africa:				24.6								
Benin	6,260	2.7	4.9	14.4	6.1	2.5	380	1.9	5.0	-1.0	9.2	46.0
Burkina Faso	12,266	2.8	5.2	26.7	-5.2	3.4	240	3.8	5.8	10.5	15.5	32.0
Cape Verde	438	2.3	7.1	56.3	0.7	0.9	1,200	2.2	8.0	-3.9	--	--
Chad	7,851	2.6	4.5	20.1	0.9	3.4	230	5.5	-0.7	12.2	10.0	38.0
Côte d'Ivoire	15,077	2.0	2.6	15.2	2.2	2.2	700	3.9	2.8	0.9	7.6	122.0
Gambia	1,342	2.8	2.1	18.8	0.0	2.4	340	2.0	6.4	5.5		--
Ghana	20,766	2.7	6.6	33.0	8.3	2.7	390	1.9	4.4	14.4	9.6	55.0
Guinea	7,560	1.7	3.5	20.3	3.3	2.2	530	1.5	3.3	12.8	9.8	69.0
Guinea-Bissau	1,239	2.2	4.3	19.6	3.3	2.8	160	-30.4	7.8	-35.8	--	--
Liberia	3,325	5.4	-4.3	41.1	-0.3	1.0	--	--	--	--	--	--
Mali	11,517	2.8	4.5	11.9	1.7	2.7	250	1.3	5.5	1.3	13.5	84.0
Mauritania	2,743	2.7	8.8	29.6	-0.2	0.8	410	1.5	4.1	8.7	17.8	148.0
Niger	11,068	3.1	3.0	21.3	-2.8	1.9	200	4.8	-0.6	8.7	14.4	55.0
Nigeria	114,092	2.3	5.6	25.8	9.2	2.0	300	-1.5	1.0	-8.3	0.5	74.0
Senegal	9,728	2.6	1.2	19.5	1.2	1.6	520	3.8	5.1	5.2	10.8	58.0
Sierra Leone	4,977	2.5	-2.4	17.0	5.6	-0.1	140	-2.9	-8.1	--	16.2	126.0
Togo	4,748	2.6	4.5	26.9	2.6	2.5	330	-3.5	2.1	-0.3	8.6	68.0
East Africa:				25.6								
Burundi	6,852	2.3	-2.6	17.8	1.5	1.9	140	2.6	-1.0	-8.6	8.8	72.0
Eritrea	3,966	3.0	1.1	53.9	0.1	1.2	200	-6.7	0.8	-33.5	19.7	11.0
Ethiopia	64,063	2.4	4.0	21.7	2.2	3.4	100	-4.2	6.2	-9.4	10.0	135.0
Kenya	30,603	1.7	0.1	15.0	2.7	2.0	350	0.3	1.3	-5.8	4.2	45.0
Rwanda	8,063	4.3	-2.7	15.6	-1.6	1.6	230	7.1	6.1	-0.6	17.3	34.0
Somalia	10,506	4.0	-3.6	38.1	2.5	2.4	--	--	--	--	--	--
Sudan	30,113	2.1	2.9	37.3	-3.4	2.3	290	2.7	5.2	--	--	--
Tanzania	34,283	2.3	1.6	16.0	-0.2	2.6	220	3.8	4.7	-10.0	12.5	71.0
Uganda	22,464	3.1	1.9	14.9	1.4	2.8	310	2.8	7.4	-14.9	7.0	35.0

See footnotes at end of table.

continued--

Appendix table 3--Country indicators--Continued

Region and country	Population 2001	Population growth rate	Grain production: Growth 1980-2000	Grain production: Coefficient of variation 1980-2000	Root production growth 1980-2000	Projected annual growth in supply	Per capita GNP 1999	Macroeconomic indicators: Per capita GNP growth 1999	Macroeconomic indicators: GDP growth 1999	Export earnings growth 1998	Official development assistance as a share of GNP 1998	External debt (present value) as a share of GNP 1998
	1,000	Percent					U.S. dollars	Percent				
Southern Africa:												
Angola	13,291	3.2	1.8	28.7	5.1	1.8	380	16.3	2.7	-20.5	8.1	279.0
Lesotho	2,196	2.0	0.5	27.6	9.0	1.6	570	-5.3	2.5	15.8	5.7	42.0
Madagascar	16,391	2.8	1.1	6.4	1.6	2.2	260	1.7	4.7	1.1	13.5	89.0
Malawi	11,197	2.5	2.3	26.9	7.7	2.1	210	-1.0	4.0	3.8	24.4	77.0
Mozambique	20,065	2.0	6.4	55.6	1.8	2.9	210	9.7	7.3	6.5	28.2	74.0
Swaziland	1,037	2.8	1.6	25.6	-1.1	2.9	1,400	-1.3	2.0	3.0		
Zambia	9,359	2.1	0.0	29.3	6.0	2.2	330	-4.1	2.4	-7.5	11.4	181.0
Zimbabwe	11,797	1.1	-0.8	31.0	5.2	2.8	620	-1.4	0.1	25.2	4.7	69.0
Asia:				12.8								
Afghanistan	23,787	4.7	-2.1	13.0	-0.7	1.3	--	--	--	--	--	--
Bangladesh	131,394	1.7	2.4	12.8	0.8	1.7	350	4.2	4.9	14.3	2.7	22.0
India	1,029,033	1.5	2.7	12.4	3.2	1.7	440	4.3	6.5	4.2	0.4	20.0
Indonesia	214,889	1.3	1.9	4.1	1.2	1.7	640	-18.0	0.3	11.2	1.5	169.0
Korea, Dem. Rep.	25,853	1.4	-2.9	22.0	2.7	0.0	--	--	--	--	0.0	43.0
Nepal	24,483	2.3	3.0	12.1	6.8	1.6	210	0.3	3.9	-10.0	8.3	31.0
Pakistan	160,605	2.6	2.7	9.7	6.5	2.3	470	0.5	4.0	3.7	1.6	41.0
Philippines	77,479	2.0	2.0	9.2	0.5	2.1	1,050	-2.1	3.2	-10.4	0.9	66.0
Sri Lanka	19,018	1.0	0.9	9.7	-5.0	0.9	810	3.3	4.3	1.0	3.2	41.0
Vietnam	80,946	1.4	5.2	23.0	-2.0	1.7	350	4.3	4.8	--	4.3	76.0
Latin America and the Caribbean:				17.8								
Bolivia	8,517	2.3	2.2	17.2	1.0	2.9	1,010	2.7	0.6	2.7	7.5	59.0
Colombia	43,074	1.8	-1.1	12.1	1.4	2.9	2,470	-2.4	-4.3	8.8	0.2	32.0
Dominican Republic	8,624	1.5	-1.2	11.6	1.6	2.9	1,770	4.9	8.3	4.4	0.8	28.0
Ecuador	12,880	1.8	3.6	25.4	0.9	2.7	1,520	2.2	-7.3	-2.5	0.9	75.0
El Salvador	6,398	1.9	1.9	9.7	8.1	3.5	1,850	1.1	3.4	1.8	1.5	27.0
Guatemala	11,687	2.7	0.7	7.3	2.3	3.7	1,640	2.8	3.6	6.0	1.2	23.0
Haiti	8,359	1.7	0.3	15.2	0.1	0.6	410	1.1	2.2	21.8	10.5	16.0
Honduras	6,656	2.6	1.7	16.4	3.8	2.4	740	1.1	-1.9	1.8	6.3	64.0
Jamaica	2,605	0.9	-3.3	51.1	2.4	3.3	1,740	0.1	-0.4	-3.2	0.3	61.0
Nicaragua	5,215	2.8	1.6	15.0	3.0	1.9	370	3.3	7.0	-6.4	28.1	262.0
Peru	26,093	1.7	3.2	15.1	2.8	3.6	2,440	-3.3	1.4	3.3	0.8	55.0
New Independent States:				20.7								
Armenia	3,521	0.0	-0.2	17.0	-0.2	1.8	460	3.1	3.3	-0.1	7.1	29.0
Azerbaijan	7,781	0.6	0.0	15.3	15.1	1.2	480	8.9	7.4	-7.8	2.2	13.0
Georgia	4,947	-0.4	-0.4	22.5	9.3	1.4	970	2.5	3.3	3.5	4.6	36.0
Kyrgyzstan	4,734	0.7	-0.7	17.6	17.9	1.7	380	2.8	3.7	-3.5	60.5	3.1
Tajikistan	6,269	1.3	4.5	31.1	6.4	1.3	370	13.3	3.7	--	--	--

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

Source: Population=UN World Population Prospects, 1998; Macroeconomic indicators=World Bank.

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