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INTERNATIONAL AGRICULTURE AND TRADE REPORTS

FOOD SECURITY ASSESSMENT

Situation and Outlook Series



**Two-thirds of Sub-Saharan Africa's population
is projected to be undernourished in 2007.**



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FOOD SECURITY ASSESSMENT

Situation and Outlook Series

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Preface

This report continues the series of food assessments begun in the late 1970's. *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. This year 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 .

This report projects food availability for 66 countries during the next decade. The results are also used to project consumption by income group to analyze the severity of nutritional problems within the countries. The report includes an overview section that provides a global outlook of food security. That section is followed by five regional writeups (North Africa, Sub-Saharan Africa, Asia, Latin America, and New Independent States (NIS) of the former Soviet Union). The report concludes with four research papers related to food security. The topics include the institution of outward-oriented policies to achieve efficiency in resource allocation, regional policy initiatives in Southern Africa, resource use and implications on the environment, and factors to reduce income inequality. The articles review the linkages between these issues and achieving food security.

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Summary

The Food Gap Is Projected To Widen Over the Next 10 Years

The food gap to maintain consumption is projected to increase from 8.5 million tons in 1997 to 18 million tons by 2007 for the 66 countries studied here. Many low-income countries are unable to meet minimum nutritional requirements of their people, and this nutritional food gap is projected to grow from 15 million tons in 1997 to 24 million tons by 2007. But even within countries that have enough food available, low-income households often do not have the means to purchase their minimum requirements.

Since 1995, global food security has become a high profile issue as a result of concerns stemming from a spike in grain prices in 1995 and a decline in world grain stocks. The trends in policies of major agricultural producers are toward market orientation and greater awareness of environmental concerns. The expected implications of these trends together with strengthening economic growth in many developing countries are lower stockholdings, primarily in the United States, and a slowdown in the long-term decline in real commodity prices. Some are also concerned with the potential for increased price variability. Food import-dependent developing countries view the strengthened food import prices and the possibility of reduced food aid availability as a major threat to their food security. Responding to these concerns at the declaration of the World Food Summit in November 1996, participants pledged “to reduce the number of undernourished people to half their present level no later than 2015.”

The question that arises from these issues is, are these low-income countries moving along the necessary path to improve their nutritional situations in the long term? The evaluation of future food availability of low-income developing countries, although extended only through 2007, indicates that per capita food consumption in many countries will decline, leading to growing gaps.

When the total amount of the projected food availability is allocated among different income groups in each country, the result shows a slight increase in the number of people who cannot meet their nutritional requirements—from 1.1 billion in the base year to 1.2 billion by 2007.

Regional comparisons of projections of food gaps place Sub-Saharan Africa as the most vulnerable region with respect to food security. By 2007, this region is projected to account for about half of the total gap (66 countries) to maintain consumption and 66 percent of the gap to meet its nutritional needs while its population comprises only 25 percent of the total. The main problem in the region is high population growth, which puts pressure on food supplies.

In addition to inadequate food availability, skewed distribution of purchasing power amplifies the nutritional problem in the region. The number of people who cannot meet their nutritional requirements is projected to increase from 303 million in the base year to 526 million by 2007. This means the region, projected to account for 25 percent of the population of the study countries, will have about 44 percent of the undernourished people.

Low-income Asian countries, with the second largest food gap, have made significant gains in increasing food availability over the past three decades. Most Asian countries may be able to close their food gaps by increasing imports. The region’s impressive gains, however, mask food problems in large segments of the population, where purchasing power is insufficient. Although the number of people who cannot meet their nutritional requirements is projected to decline 25 percent over the next decade, the region is projected to account for about half of the undernourished people in the study countries.

In Latin America and the Caribbean, the most difficult dimension of food security is the distribution of food within each country. The number of people who cannot meet their nutritional requirements is projected to increase 55 percent between the base period and 2007. Highly skewed distribution of income limits purchasing power and access to food for low-income households which, in turn, intensifies food security problems.

North Africa is the only region with adequate resources to meet its nutritional needs. However, frequent droughts often affect each country’s economic growth and welfare. The current level of food consumption is among the highest in the world and is projected to increase in all countries except Egypt. Political instability would be the only threat to food security in the region and could cause serious problems in a country such as Algeria.

Food consumption in the New Independent States (formerly referred to as the former Soviet Union) is projected to increase because of economic recovery, improved export performance, and higher food production. Only the war-torn economy of Tajikistan will likely remain vulnerable to food insecurity and is projected to have a significant food gap on a consistent basis.

The second part of *Food Security Assessment* consists of four research papers that discuss topics related to food security. The topics include the institution of outward-oriented policies to achieve efficiency in resource allocation, regional policy initiatives in Southern Africa, resource use and implications on the environment, and factors to reduce income inequality. Statistical tables for each of the countries included in the model are also provided.

Global Food Security: Overview

The food security position of many developing countries is expected to remain precarious unless special attention is focused on the low-income households in the economic growth process. For the resource-poor countries, many in Sub-Saharan Africa, but also those countries such as Haiti and Bangladesh, where poverty and agricultural resource degradation are intensifying, the situation is projected to deteriorate. [Shahla Shapouri and Stacey Rosen]

Global Food Supply

The world's resources are adequate to produce enough food for its population for at least the next few decades. Global production capacity is important for many developing countries because of their growing dependence on food imports. Even in low-income countries where foreign exchange is limited, grain import dependency increased from 8 percent of consumption in 1980 to 12 percent in 1996. In North African countries, imports contribute as much as 50 percent of food consumption and have improved the nutritional status of the region.

Since 1995, global food security has become a high profile issue because of concerns stemming from a spike in grain prices in 1995 and a decline in world grain stocks. The trends in policies of major agricultural producers are toward market orientation and greater awareness of environmental concerns. The expected implications of these trends together with strengthening economic growth in many developing countries are lower stockholding, primarily in the United States, and a slowdown in the long-term decline in real commodity prices. Some analysts are also concerned with the potential for increased price variability. Food import-dependent developing countries view the strengthened food import prices and the possibility of reduced food aid availability as a major threat to their food security. Participants at the World Food Summit in November 1996 pledged "to reduce the number of undernourished people to half their present level no later than 2015."

To evaluate the future food security situation of low-income developing countries, this report focuses on 66 countries that have been or are potential food aid recipients. Food availability is projected through the next decade (see box 1). Since aggregate measures do not include food consumption problems within a country, an attempt was made to use a consumption-income relationship (based on projected food availability) to estimate food consumption by different income groups. (It should be noted that consumption distribution results are a rough estimate of reality because of the lack of data.)

Food Insecurity Would Remain a Problem...

Although food supplies are projected to increase faster than population growth in higher income developing countries,

many lower income countries remain vulnerable to food insecurity. A country will be faced with growing food insecurity when food supplies do not keep pace with population growth. Many factors adversely affect a country's food security position, including: low and variable food production, high population growth, low income and skewed income distribution, and limited foreign exchange to import food. Performance of these factors, in turn, depends on the natural resource endowment of a country, use of technology, domestic policies, employment, export earnings, import prices, political stability, and the state of the global economy.

The projected food gaps to maintain per capita consumption at the base level (1994-96) and to meet minimum nutritional requirements showed growing needs at the aggregate level (food is measured as the sum of grains and root crops converted to grain equivalent) (see table 1 and figure 1). The additional food needed to maintain per capita consumption is estimated at 8.5 million tons for 1997, growing to 18 million tons by 2007—more than a twofold increase. Forty-three countries cannot maintain consumption by 2007. The food needed to provide minimum per capita caloric requirements is 15 million tons in 1997, increasing to 24 million tons by 2007. This is significantly larger than the food gap to maintain current consumption, but the nutritional gap increases at a slower rate. By 2007, 39 countries are projected to be unable to meet their nutritional requirement. Some of the study countries are projected to be able to meet nutritional consumption targets, but their domestic supplies (production plus commercial imports) would fall short of maintaining base consumption levels. In these cases, even if per capita consumption were to fall, their diets would most likely remain nutritionally adequate due to their historically high consumption levels. Egypt, Indonesia, Pakistan, Uganda, and Cote d'Ivoire are among them. Egypt, for example, is one of the largest per capita grain consumers in the world. With market liberalization and reductions in consumer subsidies, consumption is projected to decline in this country, but would remain higher than the minimum nutritional requirement.

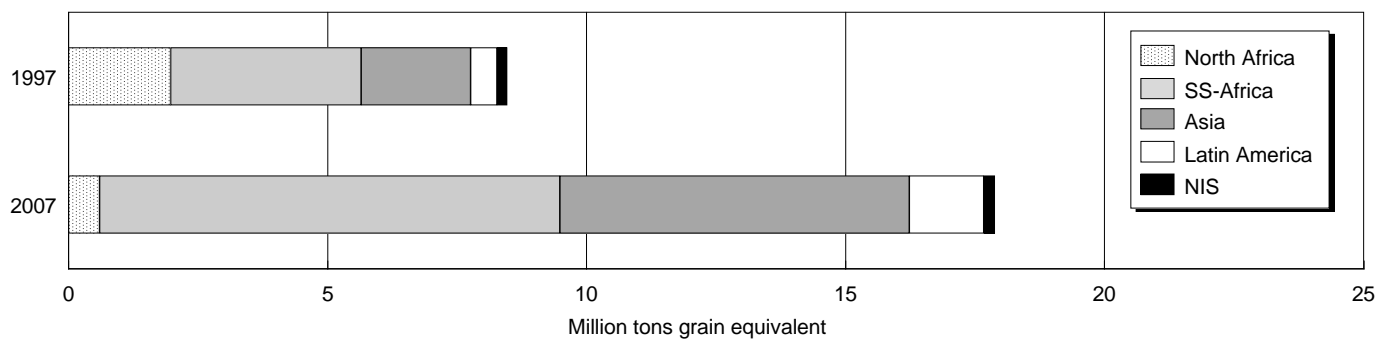
When the total amount of the projected food availability is allocated among different income groups in each country, the results show a slight increase in the number of people who cannot meet their nutritional requirement—from 1.1 billion in the base year to 1.2 billion by 2007. Given the high aggregate growth of needs to meet nutritional require-

Table 1--Grain and Root Supply and Food Gaps for 66 Countries

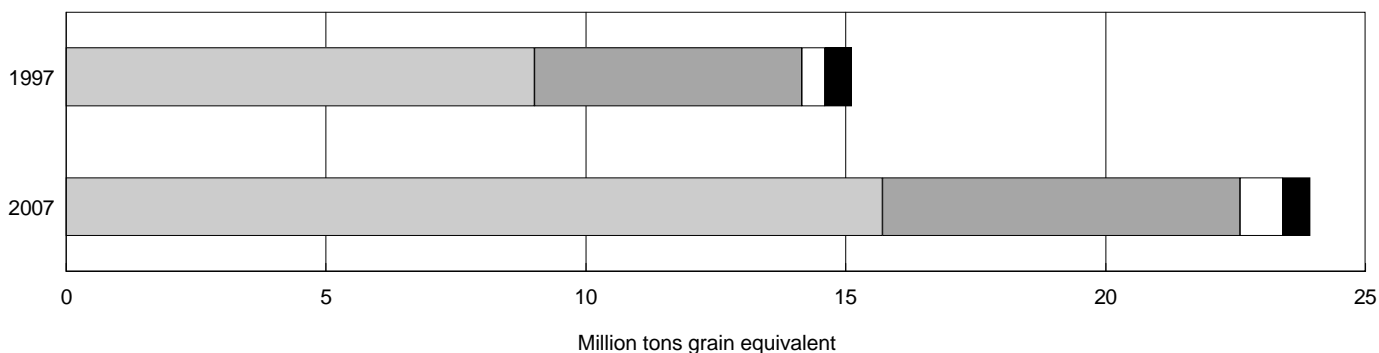
Year	Grain Production	Root Production (grain equiv.)	Commercial Imports (grains)	Food aid receipts (grains)	Aggregate availability of food	Population
			---1,000 tons ---			Million
1988	334,437	45,475	33,549	10,263	352,225	1,952
1989	351,020	47,547	33,713	9,420	369,381	1,997
1990	350,408	49,282	30,312	10,136	373,006	2,041
1991	364,460	53,417	29,352	10,638	382,303	2,086
1992	368,012	56,627	42,870	10,189	396,520	2,130
1993	375,646	58,077	43,263	8,224	405,162	2,175
1994	386,961	58,152	47,559	7,682	408,089	2,220
1995	389,683	59,560	56,281	5,388	427,881	2,267
1996	408,845	59,732	55,896	5,140	441,871	2,314
Projections				Food gap*		
				SQ	NR	(w/o food aid)
1997	404,886	60,838	61,594	8,471	15,117	434,772
2002	450,702	65,784	65,964	12,891	19,752	478,609
2007	496,301	71,546	74,917	17,875	23,941	529,566

*SQ stands for status quo and describes the amount of grain and root crops needed to support 1994-96 levels per capita consumption and NR stands for nutritional requirements and describes the amount needed to support minimum nutritional standards (see box 1).

**Figure 1--Food Gaps:
Gap to Maintain Consumption Levels in 1997 and 2007**



Nutritional Gap in 1997 and 2007



How Food Security Is Assessed

The goal of this report is to project food availability and access in 66 lower income developing countries—37 in Sub-Saharan Africa, 4 in North Africa, 11 in Latin America and the Caribbean, 9 in Asia, and 5 in the NIS (see appendix table 1 for a list of countries and appendix 2 for a detailed description of the methodology). The period covered is 1997 (current), 2002 (5 years out), and 2007 (10 years out). Projections of food gaps for the countries through 2007 are based on differences between consumption targets and estimates of food availability, which is domestic supplies (production plus commercial imports) minus nonfood 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 grain and root crops needed to support 1994-96 levels per capita consumption, and 2) meeting nutritional requirements (NR), which is the gap between available food and food needed to support minimum per capita nutritional standards (for definitions of terms used see the 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 fail to 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.

Finally, based on the projected population, **the number of people who cannot meet their nutritional requirements** is projected. The reference to food includes grains and root crops (converted to grain equivalent) which, in most countries, account for as much as 80 percent of all calories consumed.

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.

ments, this implies that nutritional problems will intensify (see table 2). In other words, according to these estimates, the nutritional problems will not spread in terms of the number of people, but the problem will become more severe.

...Especially in Many African Countries

Regional comparisons of projections of food gaps by 2007 place Sub-Saharan Africa (37 countries) as the most vulnerable region with respect to food security. By 2007, this region is projected to have about 50 percent of the total gap (for 66 study countries) or—8.9 million tons—to maintain consumption. The region is also expected to have 66 percent of the total gap—or 15.7 million tons—to meet its nutritional needs. Meanwhile, Sub-Saharan Africa's population is only 25 percent of the total of the study countries (see figures 2 and 3). The projected food needs to maintain consumption for the region as a whole are significantly larger than current total food aid availability for all countries. The main contributing factor to the food gap in Sub-Saharan Africa is high population growth, which puts pressure on food supplies. In fact, production growth is projected to be greater in Sub-Saharan Africa than in other regions (2.4 percent per year compared with less than 2 percent in other regions), but because of high population growth, there is a declining per capita production trend.

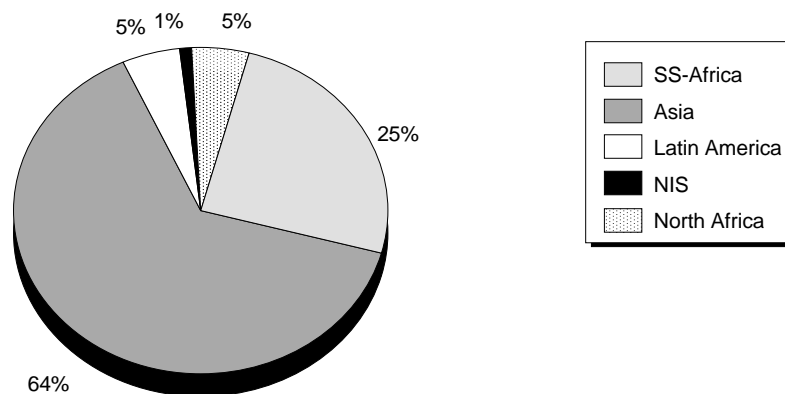
Another contributor to the food gap is the financial constraints that limit Sub-Saharan Africa's food imports. Commercial food imports grew 2.3 percent per year during 1980-96, or less than half the rate of other regions. The lack of adequate foreign exchange to support food imports is the reason for the region's growing reliance on food aid. The region's share of global food aid receipts has increased during the last two decades. Food aid's share of total food imports ranged from 20 to 50 percent during 1980-96, but there clearly has been an upward trend.

In addition to inadequate food availability, skewed distribution of purchasing power amplifies the nutritional problem in the region as scarce food supplies end up being distributed very unevenly among populations. The number of people who cannot meet their nutritional requirement is projected to increase from 303 million in the base year to 526 million by 2007. This means that Sub-Saharan Africa, projected to account for 25 percent of the population of the study countries, will have about 44 percent of the undernourished people.

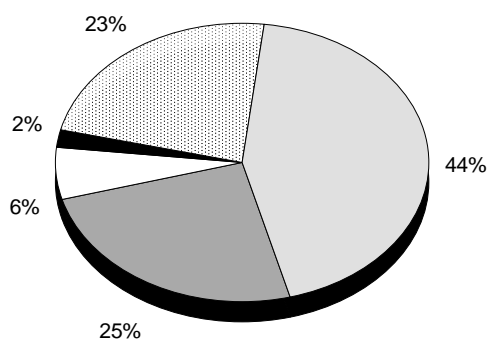
Low-income Asian countries, with the second largest food gap, have made significant gains in increasing food availability over the past three decades. Most Asian countries may be able to close their food gaps by increasing imports. Import dependency has averaged less than 5 percent since 1990. Countries such as India and Pakistan have restricted imports of food as part of their policy of food self-sufficiency, but have the capacity to increase their imports. The region's impressive gains, however, mask food problems in large segments of the population, where purchasing power is insufficient. Although the number of people who cannot meet their

Figure 2--Distribution of Population and Food Gaps

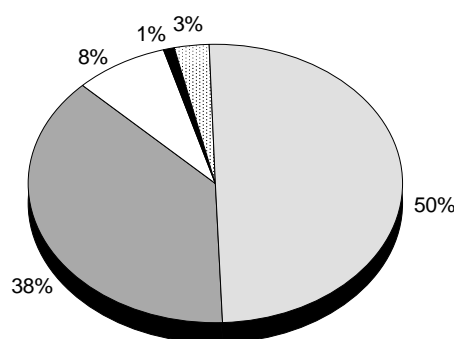
Population in 2007



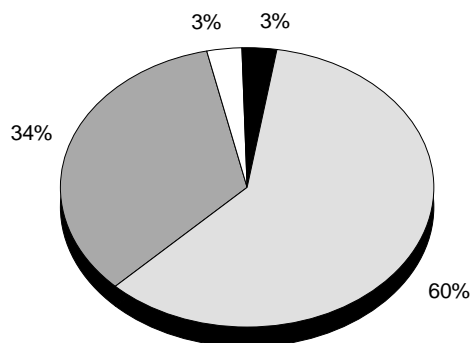
1997--Status Quo Gap



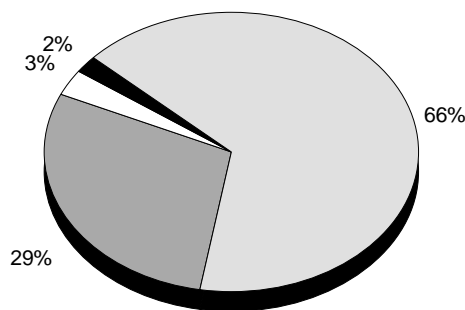
2007--Status Quo Gap



1997--Nutritional Gap



2007--Nutritional Gap



nutritional requirement is projected to decline by 25 percent over the next decade, the region is projected to account for half of the undernourished people in the study countries.

Latin America's food import dependency is growing—increasing from 30 percent in the early 1980's to about 40 percent in 1995-96. This trend is expected to continue, and while not alarming, the region's food import dependency may not be sustainable over the long term. Foreign exchange earnings of the countries have improved significantly, but debt service payments continue to be burdensome, particularly in lower income countries such as Haiti, Honduras, and Nicaragua, where the value of debt exceeded the value of GNP in 1995. The more difficult dimension of food security in the region is the distribution of food within each country. The number of people who cannot meet their

nutritional requirement is projected to increase. Highly skewed distribution of income limits purchasing power and access to food for low-income households which, in turn, intensifies food security problems.

North Africa is the only region with adequate resources to meet its nutritional needs. However, frequent droughts often affect this region's economic performance. The current level of food consumption is among the highest in the world and is projected to increase in all countries except Egypt. Political instability would be the only foreseeable threat to the food security of the region and could cause serious problems in a country such as Algeria.

In the New Independent States (NIS) of the former Soviet Union, food consumption is projected to increase because of

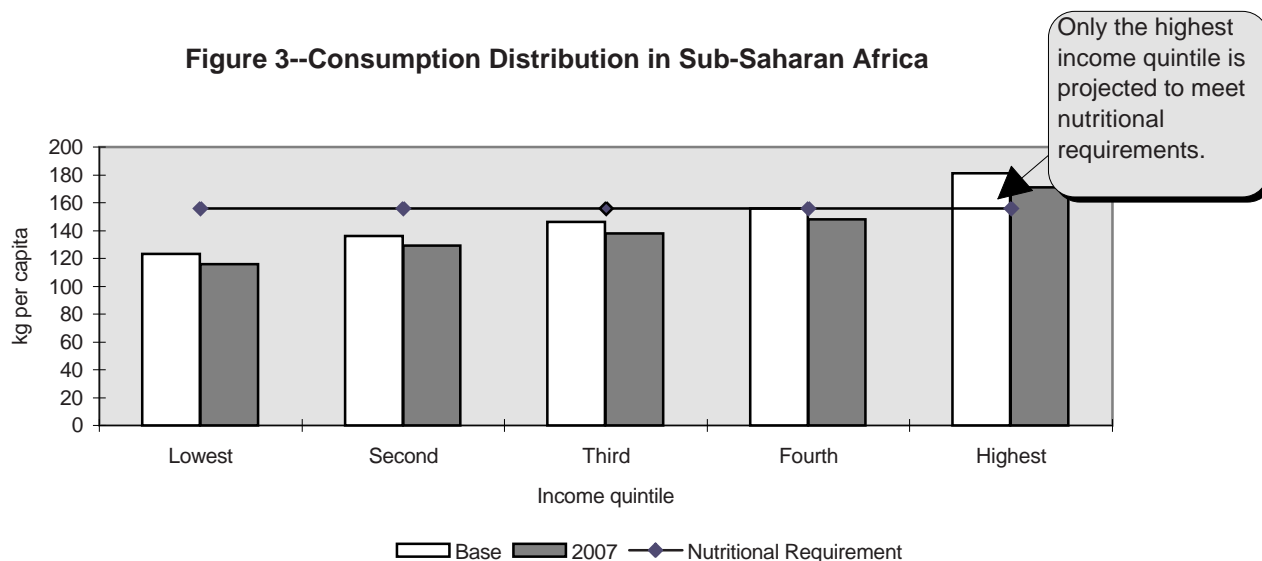
Table 2--Ratio of Food Consumption to Nutritional Requirements

Region	Year 1/	Income quintiles				
		Lowest	Second	Third	Fourth	Highest
North Africa	Base	1.22	1.28	1.33	1.38	1.50
	2007	1.24	1.31	1.36	1.41	1.53
Sub-S. Africa	Base	0.74	0.82	0.88	0.94	1.08
	2007	0.70	0.77	0.83	0.88	1.02
Asia	Base	0.92	0.98	1.02	1.06	1.18
	2007	0.94	1.00	1.04	1.09	1.20
Latin America	Base	0.96	1.06	1.13	1.21	1.41
	2007	0.93	1.03	1.10	1.17	1.36
NIS 2/	Base	0.91	0.99	1.04	1.09	1.20
	2007	0.99	1.07	1.12	1.18	1.29

1/ 1994-1996 average.

2/ Based on average regional income distribution.

Figure 3--Consumption Distribution in Sub-Saharan Africa



economic recovery, improved export performance, and higher food production. Only the war-torn economy of Tajikistan will likely remain vulnerable to food insecurity and is projected to have a significant food gap on a consistent basis.

Food Aid Remains Vital to Many Countries

Food aid, which was introduced because of high production surpluses in donor countries, has become a crucial resource for the poor countries and countries in need of emergency support. The decline in grain stocks of major donors, such as the United States, means that food aid is no longer a relatively “free good” since commodity aid must be purchased from the open market. The United States and the European Union (EU) have historically supplied about 75-85 percent of the world’s grain food aid. However, with growing market liberalization in these countries, falling global stocks, and shrinking food aid budgets of the major donor countries,

food aid availabilities have declined considerably. Food aid shipments for 1996/97 are estimated at roughly 7.5-million tons, the same as the previous year. Food aid donations have not been this small since the mid-1970’s. The 7.5 million tons, if not increased, will cover 42 percent of the needs to maintain consumption and only 31 percent of the nutritional gap by the year 2007.

This trend in donations is mirrored in the trend of receipts by the low-income food-deficit countries. In 1992/93, food aid donations to this group of countries were more than 10 million tons, or about 15 percent of their total grain imports. In 1996/97, these donations are estimated to drop to 6.5 million tons, or 10.4 percent of their grain imports. This decline implies that these countries, already facing severe financial constraints, must allocate more of their foreign exchange to food imports, thereby squeezing out imports of other essential goods.

As food aid donations have been declining, the type of food aid being supplied has also changed. Early on, most food aid was program food aid, which is non-targeted food assistance. This type of aid is provided on a bilateral basis to support recipient governments' budgets or reduce balance of payments deficits. More recently, donors have moved toward relief and project aid, which is targeted to specific groups of nutritionally vulnerable people. This trend toward a more humanitarian approach to food aid is clearly evident in the appropriations for the U.S. Public Law (PL) 480 program. PL 480's Title I program provides government-to-government sales of agricultural commodities to developing countries under long term credit arrangements. This program was cut roughly 25 percent between fiscal years (FY)1995 and 1998. Conversely, funding for Title II, the program under which the United States delivers emergency food and World Food Program shipments, has remained relatively stable. FY 1998 funding for Title II, \$837 million, is roughly three and a half times larger than Title I.

Food Security of Lower Income Countries: Opportunities and Obstacles

Global market liberalization of agriculture should increase market access for exports from food importing countries and generally enhance market efficiency. Clearly, the trade gains will vary by country. Larger countries with diversified exports are in a better position to benefit than the small countries who are dependent on a few export commodities.

Domestic policies of the countries should play a crucial role in increasing participation in the international market. The paper entitled "World Food Insecurity: A Policy Dilemma" in the Special Articles section argues that outward-oriented policies that allow an economy to be open to world goods and capital markets will achieve efficiency in allocation of resources and could improve global food security. Market liberalization, however, can confront countries with new challenges. Given that many countries are reducing the role of government in the agricultural sector, the management of risk resulting from production shortfalls and import price hikes will become essential to ensuring food security. Regional policy initiative proposals (as opposed to national level proposals) can reduce the impact of supply variability on food security of the countries. The next paper, entitled "Can Regional Policy Initiatives Help Achieve Food Security in Southern Africa?" examines the options that could be considered in this area such as establishing a regional strategic grain reserve, implementing an international food import insurance program, and establishing a free trade zone. The costs and benefits of different options will vary, but these regional policy initiatives will result in a food security gain for small countries with limited resources to cope with high food supply variability.

Even for the countries with adequate food supplies to meet their consumption requirement, the future food security challenge depends on the way resources are used and their linkages to environment and sustainability. As the paper "Resources, Sustainability, and Food Security" indicates, the quality and quantity of natural and other resources should be taken into account for improved analysis of sustainable resource use and food security.

The resource-poor countries, however, are expected to remain vulnerable to food insecurity. In these countries, the problems arising from inadequate food supplies are exacerbated by inadequate purchasing power resulting from skewed income distribution. In countries such as Tanzania or Ethiopia, large segments of the population are undernourished. In these countries, reducing income inequality in addition to adopting policies to increase income growth, can reduce food insecurity. With increases in income, lower income groups tend to increase their food consumption more than high income groups. Even in countries with adequate aggregate food supplies, skewed income distribution limits access of low income groups to sufficient amounts of food. For example, if available food were distributed equally in the countries of India, Pakistan, the Dominican Republic, El Salvador, Sudan, Cote d'Ivoire, and Nigeria, all residents would have been able to meet their nutritional requirement. The last paper on "Income Distribution and Food Security" examines the impact of factors that can reduce income inequality and improve food security of the countries. Level of income, increased agricultural investment, investment in education to reduce fertility rates, and political freedom are found to be important contributing factors to reductions in income inequality.

To summarize, food insecurity among many countries is expected to continue unless special attention is focused on low-income households in the economic growth process. A decline in per capita food consumption is projected for most Sub-Saharan African countries, as well as some in Latin America and Asia. If this trend continues, the pledge of the participants in the World Food Summit cannot be met. For Sub-Saharan Africa in particular, accepting a decline in per capita consumption from already low levels could have severe nutritional consequences. For the resource-poor countries, many in Sub-Saharan Africa, but also countries such as Haiti and Bangladesh, where poverty and agricultural resource degradation are growing, the situation is expected to deteriorate. To reverse this trend, both internal and external political and policy commitments are required. Historically, increased investment and policy adjustment have increased purchasing power and food security of many developing countries. There is no reason to believe that the historical achievements cannot be repeated in the future.