

North Africa

Frequent droughts affect this region's economic performance but food security is usually not endangered. Food consumption is projected to increase in all countries except Egypt unless commercial imports grow enough to avoid a decline. [Michael Kurtzig]

The region's grain production dropped 33 percent in 1997 due to a severe drought in Algeria, Morocco, and Tunisia. Despite this shortfall, all countries in the region—with the exception of Morocco—will be able to maintain base per capita consumption levels with domestic supplies (production plus commercial imports). Morocco's food gap for 1997 is estimated at nearly 2 million tons. For the longer term, only Egypt shows a food gap near 600,000 tons in 2007. The region relies on imports for about 50 percent of its grain consumption needs, a figure likely to become larger as population and incomes rise and as the region becomes more urbanized. North Africa's reliance on food imports may further increase as the region's land and water resources are limited and future production increases will have to come primarily from increased input use and higher yields.

The region has frequent droughts, four in the last 7 years — Not only have these droughts caused wide fluctuations in production (18.5 million tons of grain in 1988 and 31.6 million in 1996), they have had major impacts on these countries' economic performance. As for the impact on local economies, the 1995 drought in Morocco caused a 7.6-percent drop in real GDP, a substantial widening of the fiscal deficit, and declining foreign exchange reserves. Conversely, the record agricultural output in 1996 generated GDP growth of nearly 12 percent, recovery in foreign exchange reserves, and a decline in inflation.

Income distribution is not a major threat to food security in the region — Income distribution in the region is less skewed than in others (see tables 4, 6, and 10). The region has the highest per capita consumption of grains in the world. In each country, base (1994-96) grain consumption far exceeds the nutritional requirement, even in the low-income groups. Egypt, with the lowest per capita income and more than half of the region's population, is the only country projected to be unable to maintain current consumption levels by 2007.

Egypt is dependent on imports for about two-fifths of its grain requirements. Dependency on imports to meet wheat requirements is even higher at 55 percent. Between 1988 and 1996, government programs raised procurement prices to stimulate production, and grain self-sufficiency rose from 53 to 62 percent. In the long run, however, total area planted to wheat is not expected to increase significantly due to the limited land and therefore, assuming no major change in technology, the country's import dependency will increase. While Egypt's current foreign exchange position is sufficient to cover its food imports, and exports are projected to grow strongly, foreign capital flows are less certain. In 1995, such

flows comprised 33 percent of the import budget. Egypt's ability to import is strongly linked to tourist earnings, oil exports, worker remittances, and Suez Canal rents.

Unlike Egypt, where all crops are produced on irrigated land, Morocco and Tunisia are faced with high production variability, which continues to threaten the food security of the lower income groups who are highly dependent on agriculture for both income and food. Moroccan grain output continues to depend heavily on rainfall. However, even with plentiful rainfall, wheat imports will be essential to meet increasing demand. Most grain producers are traditional farmers, with fields of less than 5 hectares. The annual variability in their production increases their vulnerability to food insecurity. While the private sector—thanks to trade liberalization—is playing an increasingly important role in the wheat import market, the government is still involved in the marketing and pricing of wheat, a staple in the diet, and continues to subsidize wheat flour at the retail level. Although the government pursues its stringent policy on budget deficit control, this subsidy is unlikely to be phased out in the near future because of social concerns.

Tunisia has phased out consumer and input subsidies on a wide range of items, most recently fertilizers and animal feed. Consumer subsidies remain only on certain basic food staples, such as cereals, edible oils, sugar, and milk. Efforts have been made to improve the targeting of subsidies by limiting them to products that are predominantly consumed by the poor. The government has pursued two principal goals in its food subsidy system: 1) to gradually reduce food subsidies and allow prices to more fully reflect market values, and 2) to ensure that food subsidies help only the most needy. As a result, the share of people living at the poverty level, with incomes of less than a dollar per day, averaged less than 4 percent over the last decade.

Algeria's future food security depends on political as well as economic factors. The country's economy grew at 4.6 percent in 1996, or 2.4 percent per capita. This followed 10 years of declining per capita incomes as the economy was adversely affected by weaker oil prices. Continued civil strife, now in its fifth year, portends a poor economic growth outlook. Algeria suffers from high unemployment, estimated at 28 percent, a decline in industrial output, and reduced foreign investment outside of the oil sector due to civil strife. In 1997, a devastating drought reduced grain yields 60 percent from last year. The resulting poor harvest signifies not only that farmers will earn far less income than they did last year, but also that political tension could escalate.

Table 3--Grain and Root Supply and Food Gaps for North Africa

Year	Grain Production	Root Production (grain equiv.)	Commercial Imports (grains)	Food aid receipts (grains)	Aggregate availability of food
			---1,000 tons---		
1988	18,478	1,019	14,743	2,118	20,679
1989	19,908	984	16,844	1,993	23,598
1990	21,261	984	13,277	2,604	21,234
1991	26,890	1,130	13,219	1,345	23,657
1992	20,765	998	15,013	831	22,712
1993	19,082	981	16,731	418	23,474
1994	24,680	993	19,073	239	25,775
1995	19,207	1,201	19,656	249	30,817
1996	31,599	1,002	19,946	204	32,129
Projections				Food gap	
				SQ	NR (w/o food aid)
1997	21,199	1,077	23,359	1,976	0
2002	25,975	1,109	24,399	566	0
2007	27,447	1,142	28,085	606	0

North Africa:

121.4 million people

Drought again devastates grain output in Algeria, Morocco, and Tunisia, but foreign exchange is sufficient for commercial grain imports to fill the gap.

Regional grain imports in 1997 are almost 50 percent higher than 10 years ago.

Regional grain import-dependency is increasing as land and water resources are limited and populations' incomes are rising.

Table 4--North Africa: Income Distribution in 1995

	Share of income owned by	
	poorest 10%	richest 10%
Algeria	2.8	31.5
Egypt	3.9	26.7
Morocco	2.8	30.5
Tunisia	2.3	30.7

Source: World Development Report 1997

Figure 4--North Africa: Grain Area and Yields

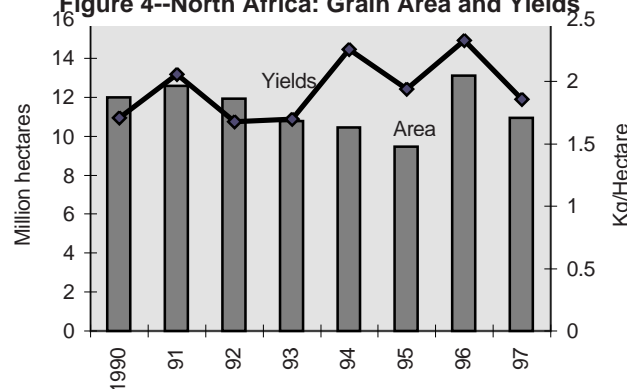
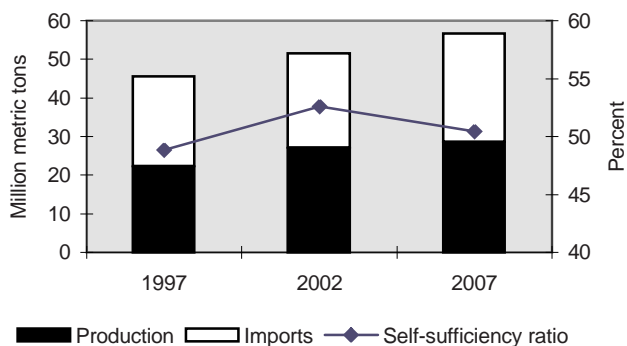


Figure 5--North Africa: Food Supply Sources



Sub-Saharan Africa

In the absence of food aid, average per capita food consumption is projected to decline throughout the next decade. To fill the gap, either annual production has to rise 10 percent more than projected rates or commercial imports have to double from projected levels. [Stacey Rosen]

Sub-Saharan Africa's food security position is highly vulnerable due to large variations in domestic food production, high population growth rates, and limited purchasing power of large segments of populations. This article examines factors affecting long-term food security and reviews results of the model for 37 Sub-Saharan countries, including projections of food gaps—to maintain per capita consumption and meet nutritional requirements—and distribution of food by income group.

Projections of per capita consumption are a direct reflection of the trends in domestic supply—production and commercial imports—and population growth. In the absence of food aid, per capita consumption is projected to decline an average of 0.4 percent per year throughout the projection period. The decline is steepest in Central Africa, at more than 0.6 percent, driven by trends in the Democratic Republic of Congo (formerly Zaire). The smallest decline is expected to be in East Africa. Caloric intake in Sub-Saharan Africa is currently the lowest in the world and any decline from this already low level can have severe implications for the health of the populations of these countries.

Sub-Saharan Africa's nutritional food gap is projected to be larger than the region's food gap to maintain consumption through the next decade (2007). The base (1994-96) consumption levels of these countries, at the aggregate level, are far below minimum nutritional requirements, and a much sharper increase in domestic supplies (from projected levels) is needed—either from production, commercial imports, or food aid imports—to improve the well-being of the populations. The countries where the nutritional gap far exceeds the gap to maintain consumption are Congo, Burundi, Ethiopia, Somalia, Zambia, and Chad.

No short-term food crisis is foreseen — Sub-Saharan Africa's gap between available food supplies and the amount needed to maintain base consumption levels is estimated at 3.7 million tons for 1997. This is about 60 percent higher than 1996 actual food aid receipts of 2.3 million tons. The gap is only 3 percent of regional production, but is about 40 percent of estimated commercial imports. Tanzania, Uganda, and Rwanda have the largest gaps. Together, these three countries account for more than a third of the region's status quo food gap in 1997. **Tanzania's** current gap is estimated at more than 500,000 tons. Grain output of less than 3.5 million tons in 1997 falls below the recent average of roughly 3.8 million tons. A late start to the rainy season and insufficient rains in some areas depressed

yields. **Uganda** depends on domestic production to supply nearly all of the country's food requirements. Therefore, with production estimated to fall more than 20 percent in 1997, an unusually large gap of 462,000 tons is the result. Rebel activity in the western and northern regions of the country has contributed to insecurity and displaced farmers. These problems and poorly distributed rainfall have adversely affected the 1997 harvest. In **Rwanda**, output for 1997 is estimated considerably higher than last year as the return of refugees resulted in increased area planted. However, output remains below pre-strife levels of the early 1990's. As a result, the food gap to maintain consumption is estimated at 352,000 tons—very close to last year's food aid receipts.

In the absence of food aid, a decline in per capita consumption is expected in the long term — The region's gap between domestic supplies and base consumption levels is projected to rise to 5.5 million tons in 5 years (2002) and to 8.9 million tons in 10 years. The largest gaps by the end of the projection period will be found in Nigeria, Rwanda, Congo, Angola, and Madagascar. These five countries account for more than a third of the region's food gap to maintain base consumption levels. The countries where the food gap to maintain consumption is projected to be zero or relatively small through the projection period are Central African Republic, Ethiopia, Swaziland, Cote d'Ivoire, Gambia, and Guinea-Bissau.

Sub-Saharan Africa's food gap to satisfy nutritional requirements is projected to rise from 9 million tons in 1997—two and a half times the status quo gap—to 12.6 million tons in 2002 and 15.7 million tons in 2007. Ethiopia, Congo, and Somalia account for more than 40 percent of the nutritional gap in 2007.

Several countries have been selected for discussion based on either the size of the food gaps, an unstable political environment, which is influencing the food situation, or a unique transition situation that makes projections difficult. These countries include Nigeria, Congo, Ethiopia, and Somalia.

While **Nigeria's** gap is large relative to other Sub-Saharan countries, it is very small relative to available food supplies in the country. In 2007, Nigeria's projected gap of 863,000 tons measures less than 3 percent of production. Historically, Nigeria, unlike most countries in the region, has not been a food aid recipient as domestic supplies have been adequate to meet consumption requirements. And, while Nigeria's gap to maintain consumption is the largest

in the region, the country's nutritional gap is projected to be zero through 2007. This means that Nigeria's domestic supplies will be adequate to meet minimum nutritional standards. Therefore, if meeting the nutritional target were used as a measure of food security, Nigeria would be considered one of the least vulnerable countries in the region.

For **Congo**, production growth needed to fill the gap to maintain base consumption is projected at nearly 2.6 percent per year—above the projected rate of 2 percent, but below historical growth. While grain yields are expected to improve upon historical rates, area growth is projected to slow considerably. Despite the increase projected for yields, they will remain among the lowest in Sub-Saharan Africa. Production growth required to fill the nutritional gap is projected at nearly 3.5 percent, well above the growth used in the model. Obviously, the political situation in Congo and the policies the new government puts in place will play a large part in influencing trends. If stability is achieved and incentives are provided to farmers, future growth may be able to match historical growth. If this scenario proves true, the gap to maintain base consumption levels would fall to zero and the nutritional gap would become negligible by 2007.

Ethiopia's nutritional gap is projected to be the largest in Sub-Saharan Africa, meaning that domestic supplies will fall well short—3 million tons—of meeting minimum nutritional requirements by 2007. To fill the nutritional gap, production will have to grow roughly 5 percent per year through the next decade. This is roughly one percentage point higher than the projected growth rate, and much higher than the historical growth rate of 2 percent. Filling the gap with commercial imports would require an unrealistic growth rate of more than 17 percent per year. While the nutritional gap will remain, the country is projected to make progress toward meeting its basic food needs, however. Projected growth rates in production and imports provide ample domestic supplies to maintain base consumption levels in 2007. This is a significant development for Ethiopia, which had relied on food aid throughout the 1980's and early 1990's to meet consumption requirements. The combined impact of people returning to their farms following the end of the war in 1991, favorable weather, and the implementation of policies designed to provide incentives to farmers stimulated output. The higher growth rates achieved in the 1990's are assumed to continue into the projection period. Area is projected to expand 2.3 percent per year through 2007, while yields are assumed to rise almost 2 percent per year. Both of these growth rates exceed those achieved during 1980-96. Import growth is projected at a modest annual rate of 1 percent.

Projections are difficult in **Somalia** given the precarious state of the country. Grain output declined between 1980-96. For the projection period, output is expected to rebound, although slowly, with grain area increasing only 0.35 percent per year and yields rising less than 1 percent. Root crop output is projected to increase 1.44 percent annually. This growth falls short of meeting both consumption targets—maintaining base levels and meeting nutritional requirements. The growth needed to fill the nutritional gap—11 percent per year—

appears particularly elusive. Similarly, the growth in imports needed to fill these gaps far exceeds projected growth of under 1 percent per year.

Yield growth is the key to larger domestic food supplies in the future

— Historically, most increases in production in Sub-Saharan Africa have stemmed from area expansion. The continuation of this trend is unlikely as the region faces many resource constraints to sustainable agricultural growth, despite its vast and diverse land area. Much of Sub-Saharan Africa's land with crop production potential has poor quality soil.

Long term regional production growth will depend on adoption of new technology to increase yields. Yields in most Sub-Saharan countries fall well below world averages and thus, there is room for improvement, provided there is investment in research and/or extension services. During 1980-96, grain yields declined or increased marginally in about half of the Sub-Saharan countries. For the projection period, yields are expected to rise in all countries and, in most countries, rise at rates exceeding historical levels under the assumption of increased fertilizer use and adoption of new technologies. Therefore, failure to move in this direction may translate into larger gaps than outlined in this article.

Because production is the principal source of domestic supplies in this region, food gaps and/or deficits will widen if production growth fails to keep pace with population growth. For the region as a whole, population growth is projected to outstrip production growth by 0.4 percentage points per year, on average, which is the primary factor accounting for the widening food gaps.

Imports are not likely to increase significantly. Many Sub-Saharan countries face severe financial constraints following years of excessive government expenditures and stagnating export earnings that have limited import capacity. Fiscal mismanagement led to large debt accumulation. For the region on aggregate, external debt as a percent of GNP rose from 31 to 81 percent during 1980-95. This debt as a percent of export earnings jumped from 92 to 242 percent during the same period. Exports of goods and services increased only 2.5 percent per year during 1990-95. This is quite low compared with other developing regions such as Latin America, 7 percent, and South Asia, 12 percent. Because of these developments, the region is highly dependent upon external financial assistance to support imports. In 1995, external financial flows accounted for 30 percent of the region's imports. In some countries such as Mozambique and Lesotho, 70 to 80 percent of the import bill is financed by external assistance. Hence, commercial imports in most countries in the region can expand only marginally and therefore are projected to contribute little to domestic supplies. For the region, the ratio of commercial imports to production is projected at less than 13 percent in 1997 and 11 percent in 2007. The ratio of commercial imports to aggregate food availability is estimated at less than 10 percent throughout the projection period.

Unequal food distribution within countries intensified food insecurity — The review of regional and country averages gives an incomplete picture of the food security situation. A review of income distribution provides an insight to the extent of food shortfalls within a country.

If consumption in all or nearly all income groups falls short of the minimum nutritional requirements, a country's food security position would be considered at risk. Unfortunately, this is the case for most countries in the region. At the aggregate level (all income groups), consumption in 2007 falls below the nutritional target in 27 of the 37 countries in the region. Consumption in 2007 is projected to equal 93 percent of the nutritional target.

In Sub-Saharan Africa, on average, consumption in only the top income group is projected to exceed minimum nutritional requirements in 2007 in the absence of food aid (see figure 6). Consumption in the lowest income group in 2007 is projected at 74 percent of nutritional targets (see table 2 on page 8). It is important to remember that this is a regional average and therefore, individual countries may vary considerably. For example, in Sudan, Uganda, Swaziland, Benin, Ghana, and Guinea-Bissau, consumption in all or nearly all of the income groups in 2007 is expected to exceed the nutritional target. On the other hand, in half of the countries

in the region, consumption in 2007 in all income groups falls short of the nutritional target.

These shortfalls can also be used to estimate the number of hungry people (defined as those who cannot meet minimum nutritional requirements). In 2007, the population of Sub-Saharan Africa is projected to be nearly 800 million. The results indicate that 526 million, or 66 percent, will be hungry. Not surprisingly, nearly a third of these people are in the lowest income groups in these countries.

Given that food aid from donors has fallen during the 1990's, these countries must find ways to raise their domestic supplies—principally domestic production—as a first step toward improving the nutritional status of their people. Some steps taken to achieve this goal have yielded positive results. Some countries have begun to realize positive effects of the liberalization policies undertaken in the mid-1980's. In addition, resolution of long-standing civil wars in Ethiopia and Mozambique—which had disrupted agricultural activities for decades—has resulted in increased output. To remove impediments to production and achieve long-term growth in agriculture that exceeds historical trends, significant investment is needed to improve infrastructure and extension services and encourage technology adoption.

El Nino and its impact on Sub-Saharan Food Security

The El Nino weather phenomenon is expected to affect agriculture throughout the world. According to recent satellite data, the El Nino of 1997/98 is likely to be the most severe ever. In Africa, the impact is expected to be greatest in the southern region (and could significantly alter the results included in this assessment). During the 1991/92 El Nino event, a severe drought hit the region, reducing grain output roughly 45 percent, placing millions of people at risk of starvation, increasing demand for food imports, and straining the already weak economies of the region.

El Nino's effects have already been felt strongly in Somalia (in East Africa). Heavy rains since mid-October led to flooding, deaths, destruction of infrastructure, displacement of people, and crop losses. Food prices have increased significantly in the affected areas. In response to the disaster, UN relief organizations air-dropped food.

The worst effects of El Nino are expected to be felt in early 1998, a critical growing stage for the coarse grain crop in southern Africa. Corn is a staple crop in this region. A sharp drop in grain output will generate strong demand for imports. During the 1991/92 drought, commercial grain imports more than doubled while food aid imports tripled from normal levels. Such an increase in demand may spur increased grain prices in 1998 as world coarse grain stocks are very low—about 13 percent below their 1991/92 level.

A positive note for the region is the large exportable surplus in South Africa. Because of a good 1997 harvest, the country has a surplus estimated at roughly 1 million tons. Due to market liberalization, private traders are now permitted to export any amount they desire. Therefore, South Africa may be in a position to supply some neighboring countries that have shortfalls.

Reforms in most countries in the region have liberalized transport sectors, which contributed to improved transport channels. Grain marketing boards have been privatized in many countries and international grain trading companies play a larger role than in the past. The marketing boards and trading companies should facilitate the flow of food within and between countries that is expected to increase as demand for imports grows.

Due to the advanced warning of the onset of this El Nino, many countries in the region have established plans of action. For example, in Zambia the government and private companies have mounted well-organized information campaigns that include brochures, televised discussions, and radio programs that deal with ways to cope with drought. In Zimbabwe, the Grain Marketing Board has set up strategic grain reserves to cover 5 months of consumption and has set up a cash reserve to allow for imports of 3 months of consumption.

Table 5--Grain and Root Supply and Food Gaps for Sub-Saharan Africa

Year	Grain Production	Root Production (grain equiv.)	Commercial Imports (grains)	Food aid receipts (grains)	Aggregate availability of food
---1,000 tons---					
1988	52,387	27,720	5,040	3,157	69,261
1989	49,376	29,385	3,922	3,351	69,733
1990	51,790	31,697	4,524	3,586	75,783
1991	57,850	35,384	5,071	4,756	82,098
1992	55,674	37,482	8,065	5,687	83,747
1993	59,449	38,833	8,146	3,485	88,459
1994	62,773	38,830	7,865	3,040	89,657
1995	62,026	39,586	7,140	2,091	87,040
1996	64,409	40,313	8,398	2,254	93,302
Projections					
				Food gap	
				SQ	NR (w/o food aid)
1997	66,305	41,004	8,568	3,677	9,009
2002	77,503	44,897	9,007	5,506	12,625
2007	88,581	49,549	9,826	8,884	15,712

Sub-Saharan Africa

568 million people in 1997.

The gap between available food supplies and the amount of food needed to meet nutritional targets jumps 74 percent during 1997-2007.

Twenty-six of the 37 countries face gaps to maintain consumption and meet nutritional targets.

While Sub-Saharan Africa will have only 25 percent of the population of the study countries, the region is projected to account for 66 percent of the total nutritional gap.

Sub-Saharan Africa is the only region where the nutritional situation has deteriorated in the last three decades and this trend is expected to continue during the next decade.

Table 6--Sub-Saharan Africa: Income Distribution in 1995

	Share of income owned by	
	poorest 10%	richest 10%
Guinea-Bissau	0.5	42.2
Kenya	1.2	47.7
Nigeria	1.3	31.3
Rwanda	4.2	24.2
Senegal	1.4	42.8
Tanzania	2.9	30.2
Uganda	3.0	33.4
Zambia	1.5	31.3
Zimbabwe	1.8	46.9

Source: World Development Report 1997

Figure 6--Consumption Distribution by Income Group in Sub-Saharan Africa

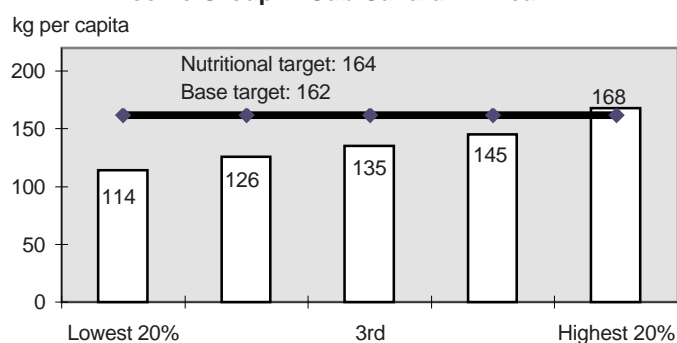
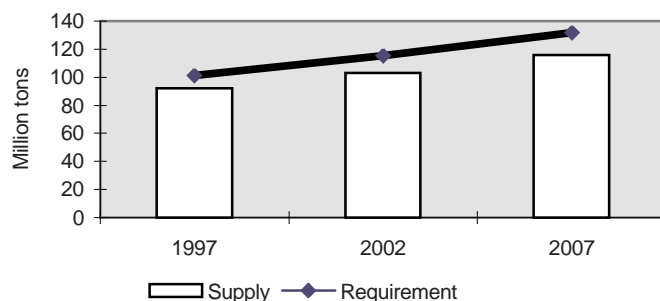


Figure 7--Sub-Saharan Africa: Grain and Root Supply vs Requirement



Asia

Asia has made considerable progress in improving food security. The impressive gains of the region's low-income countries, however, mask food problems in large segments of the population. For these groups, undernutrition is primarily the result of insufficient purchasing power to obtain nutritionally adequate diets. However, the incidence of undernutrition will decline over the next decade. [May Mercado Peters]

This article reports the results of the food security model for nine historically food aid receiving countries in Asia: Indonesia, Philippines, and Vietnam in Southeast Asia; Afghanistan, Bangladesh, India, Nepal, Pakistan, and Sri Lanka in South Asia. It also examines factors influencing estimated food gaps over the next decade.

Asia's per capita food availability has increased considerably since the advent of the Green Revolution. Grain production grew over 2 percent a year in six of the nine countries included in the study. As a result, most countries in the region sustained average annual growth rates in per capita food consumption (as measured by consumption of grains and root crops) of over 1 percent during 1980-96. Despite economic growth and food production gains, South and East Asia are still home to over half a billion chronically undernourished people — accounting for 63 percent of the total (66 country studies). Though projections indicate that the proportion of the population that is undernourished will be decreasing, the absolute number will remain high because of the heavy concentration of the population in this region.

Per capita food availability in the region is projected to stagnate over the next decade (increasing by less than a percent over the next decade), reflecting slower production growth than the historical trend. However, given the region's relatively fast consumption gains in the last three decades, the projected stagnation in per capita consumption, while disconcerting, does not pose an impending crisis. The largest increase in per capita availability is projected to occur in India, 7 percent, while the largest decline is projected to occur in Pakistan at 7.3 percent followed closely by Afghanistan at 7.1 percent. Nepal is also forecast to experience a large decline.

In the short run, the region is facing a serious food problem in North Korea where floods have destroyed the country's crops the last 2 years. While North Korea is not covered in the food security model of this report, information gathered about the country indicates that the situation has become chronic and life threatening. International food assistance is badly needed to avoid widespread famine and death due to starvation (see box 2).

For the region as a whole, the gap between available food supplies and the amount needed to maintain consumption is projected to be 2.1 million tons in 1997. The region's total food gap to maintain consumption is relatively small, less

than 1 percent of its domestic supply (commercial imports and production). This suggests that the short-term shortfall is not a major food security threat. Afghanistan, with a gap of 0.9 million tons, will account for about 41 percent of the shortfall. Bangladesh also has a large deficit, 0.5 million tons. These two countries combined account for over 60 percent of the region's projected deficit. India and Vietnam are the only countries in the region estimated to be able to maintain consumption from domestic supplies in 1997.

The current gap between the amount of food needed to meet nutritional requirements and domestic supplies is projected at 5.1 million tons in 1997, more than twice the amount needed to maintain current consumption. Bangladesh accounts for most of the gap (about 99 percent) in nutritional requirements, as the rest of the countries except Nepal and Sri Lanka are able to meet their targets from domestic supplies. The ability to meet nutritional targets from domestic supplies reflects the region's relatively high level of consumption.

Asia's long run food deficit is expected to increase, as the gap between domestic supplies (production plus commercial imports) and current consumption is projected to triple between 1997 and 2007. This trend holds for most countries in the region except India, which in the short and the long run is able to maintain consumption from domestic supplies. This trend is not alarming, however, because the food gap to maintain consumption will be a small proportion of domestic supply over the projection period (1.7 percent). Of the countries studied here, Afghanistan and Bangladesh will remain vulnerable to food insecurity. Per capita consumption in these two countries is projected to decline and their food gap to maintain current consumption is 2.6 million tons in 2007—about 40 percent of the region's needs. Meanwhile, per capita consumption in Pakistan is projected to decrease sharply as the deficit to maintain consumption increases from 50,000 tons in 1997 to 2.2 million tons by 2007.

The gap between available supply and amounts needed to meet nutritional requirements is also projected to continue to increase through 2007, although by a considerably smaller amount. Most countries in the region, despite their inability to maintain consumption levels, will be able to meet nutritional requirements from domestic supplies. The exceptions are Bangladesh, Nepal, Sri Lanka, and Afghanistan, with Bangladesh accounting for 90 percent of the region's nutritional needs in 2007.

Can food gaps be eliminated through increased production? — One way to eliminate the projected food gap in Asia by the end of the projection period is to increase domestic food production. Most countries would be able to eliminate the consumption deficit if they could maintain the same rate of growth in grain production over the projection period that they experienced during 1980-1996. For example, the Southeast Asian countries of Indonesia, Philippines, and Vietnam could maintain consumption if grain output during the projection period would grow at the same rate as during the preceding historical period. In India, if grain production grew at a rate of 2.05 percent per year throughout the projection period—slightly less than its 2.1 percent growth between 1980 and 1996—it would be able to maintain consumption from domestic supplies. The largest exception to this is Pakistan, which would have to increase its production 2.5 percent per year, nearly one percentage point more than during 1980-1996, to eliminate its food gap by the end of the projection period. Historical experience suggests this is not likely.

The main long-term regional concern is the sustainability of domestic production. The region as a whole is densely populated and continued population growth will put pressure on available cropland as urban areas expand. Expansion of cultivated land has stagnated, increasing by less than 1 percent since 1989. In South Asia, area under cultivation has actually declined. As a result, most of the increase in crop production will have to come through increased yields. Grain yields have grown substantially in the region in the past, primarily due to increased irrigation and widespread adoption of improved varieties made available through the Green Revolution. However, yield growth has been slowing recently, raising concerns that growth in grain production will not be able to be sustained at the previous rate. Environmental degradation caused by increased urbanization and industrialization will also make it difficult to maintain current rates of growth in crop yields. For the region to increase food availability, it will need to either accelerate its growth in exports to finance food imports or increase investment in its agricultural sector to increase agricultural production.

The possible exceptions to this are in Sri Lanka, Afghanistan, and Nepal. Nepal has yet to fully exploit all of its potential for expanding production through adoption of Green Revolution technologies. It has the lowest percentage of potentially irrigable land in irrigation and the lowest level of fertilizer use in the region. In Afghanistan and Sri Lanka, civil strife and political instability have led to disruptions in input supplies and cultivation, causing production to stagnate.

Can food gaps be eliminated through commercial imports? — There is a considerable degree of diversity among countries in terms of relying on food imports to increase consumption within the region. In Nepal, the food gap is over 150 percent larger than projected commercial imports, making it unlikely that Nepal will be able to maintain consumption without food aid. Other countries where the food deficit is high relative to commercial imports are

Afghanistan, 47 percent of imports, and Bangladesh, 33 percent of imports. Indonesia should be able to eliminate its deficit, which represents less than 1 percent of its projected commercial imports.

Increasing commercial imports to reduce food gaps would require most countries to more than double their food imports by 2007. It should be noted, however, that of the five regions studied here, Asia's projected food import dependency is the lowest, 6 percent compared to about 50 percent in North Africa in 2007. Nevertheless, for some countries increases in imports could create a significant budget pressure. In Pakistan, where per capita food availability is projected to decline 0.6 percent per year, growth in commercial imports would have to be 3.5 percentage points greater than projected. This would increase the country's import dependency to 12 percent by 2007 from 8 percent in 1996. Nepal would have to increase the growth of its food imports the most, an additional 14 percentage points.

In general, most countries in the region have restricted food imports as part of their policy of food self-sufficiency. As a result, they are not traditional food importers, but many, such as India and Pakistan, have the capacity to do so because the share of food imports in these countries' budgets is low. Whether these countries will be able to increase commercial imports will depend on whether a change in policy occurs.

Undernutrition continues in low-income groups — The food security situation in the region is generally favorable in that all countries in the region, except Bangladesh, Nepal, Afghanistan, and Sri Lanka, will be able to maintain consumption above levels needed to meet nutritional targets. However, the situation facing many households and specific segments of the population in the region is not as favorable.

If available food supplies were distributed evenly, nearly all households would be able to maintain nutritionally adequate diets. However, income is not distributed evenly. The poorest 20 percent of the region's population have control over only 8 percent of total income, while the richest 20 percent account for nearly 43 percent of income.¹

The inequality of income distribution is important to the extent that it affects the amount of resources people have available to obtain nutritionally adequate diets. To get a better understanding of the extent of the undernutrition problem in the region, the gap between per capita food consumption and nutritional requirements was estimated by income group for each country. The estimates indicate that by 2007, per capita food consumption of the poorest 20 percent of the population will fall below recommended nutritional standards in all countries except Indonesia. Individuals in the next income quintile are only slightly better off, with food consumption still below nutritional requirements in a majority of countries. This shows that even in countries where

¹It should be noted that this income distribution is not as skewed as that in many Sub-Saharan African and Latin American countries.

food availability is not a problem, 20 to 40 percent of the population will lack access to nutritionally adequate diets.

Because of the stagnation in per capita food availability and continued inequality in the distribution of incomes throughout the projection period, household access to food will continue to be a significant problem. By 2007, 570 million people, nearly 30 percent of the region's population, will still not be able to meet nutritional requirements. The undernutrition problem at the end of the projection period will be greatest in India and Bangladesh, which together could have more than 350 million undernourished people, or nearly

three-quarters of the people in the region who are unable to obtain nutritionally adequate diets.

Although pegged at 570 million people in 2007, the incidence of undernutrition in Asia will decline from 760 million in 1997. In contrast, the number of people undernourished in Sub-Saharan Africa is expected to increase from 303 million to 526 million in 2007. Nonetheless, the absolute number of undernourished people in low-income Asia will remain higher than in Sub-Saharan Africa at the end of the projection period.

Box 2

North Korea's Deteriorating Food Situation

The food security situation is grave throughout North Korea. The country's cereal deficit for the current marketing year is estimated by the Food and Agriculture Organization of the United Nations to be about 1.2 million tons. The state-run food distribution system (known as PDS) is unable to supply minimum amounts of grain to all of North Korea's population, forcing millions to seek other food sources and risk malnutrition. Estimates of what is being distributed through PDS since the beginning of 1997 range from 100-200 grams per person, substantially less than the recommended daily cereal requirement of about 450 grams. According to a government estimate, half of the country's 10 food distribution areas have ceased operation since June 1997. World Vision International estimates that about 5 million North Koreans, especially children less than 5 years old and adults older than 60 years, are facing possible starvation.

Political changes in the former USSR and in China during the past decade caused a sharp reduction in North Korea's ability to import fuel and food, causing its food supply to drop. Input supply has dropped sharply because the country's manufacturing sector does not have enough fuel to produce chemicals, farm machinery, and other inputs needed for North Korea's large-scale, chemical-intensive agriculture. This situation was exacerbated in the past 2 years by flooding that wiped out some corn and rice fields and also destroyed some farmers' household grain stocks. In 1997, a long summer drought has devastated the important corn crop. With very little grain stocks and a 1997 harvest that will be less than needed to keep the whole population alive, North Korea will need substantial assistance from the international community in the form of food aid to avoid disaster.

The short-run food crisis is indicative of the underlying problems in the country's agricultural sector. Failed farming policies have led to stagnant and declining yields, and

food production growth has lagged behind increases in population (see figure 8). The lack of essential inputs will continue to constrain food production. As a result, North Korea will not only need immediate food aid and assistance to cope with its current food crisis, but also solutions to its chronic food problems so that future crisis can be avoided. This means that in the medium to long term, the country will need to address the results of years of agricultural mismanagement as well as the economic problems that have led to faltering production. However, even more serious than North Korea's faltering agricultural production is its inability to buy food in the international market. Purchasing food imports and the materials needed for farm input supplies, require that North Korea develop a trading economy that exports nonagricultural goods for hard currency. To do this, North Korea will have to reduce geopolitical animosities that now form a barrier to its potential trade, restore its credit-worthiness so that normal commercial transactions become possible, and become more efficient in order to compete internationally. [May Mercado Peters and John Dyck]

Figure 8-- Grain Production and Total Imports, North Korea, 1980-97

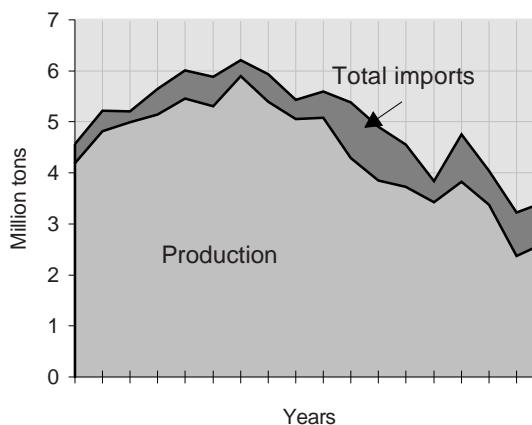


Table 7--Grain and Root Supply and Food Gaps for Asia

Year	Grain Production	Root Production (grain equiv.)	Commercial Imports (grains)	Food aid receipts (grains)	Aggregate availability of food	
			---1,000 tons---			
1988	249,043	14,093	9,965	3,378	249,107	
1989	268,008	14,555	9,582	2,756	263,842	
1990	263,185	14,080	8,505	2,522	263,438	
1991	266,168	14,429	6,648	2,721	264,433	
1992	277,257	15,248	10,942	1,859	272,891	
1993	282,451	15,075	10,449	1,792	276,091	
1994	285,906	15,011	11,790	1,877	275,204	
1995	294,835	15,157	19,664	1,495	291,439	
1996	298,494	15,231	17,055	1,328	297,862	
Projections						
				Food gap		
				SQ	NR	(w/o food aid)
1997	302,931	15,477	18,180	2,115	5,144	296,635
2002	331,774	16,361	19,942	5,582	6,079	321,628
2007	363,683	17,296	22,847	6,742	6,874	353,730

Asia

1,815 million people

By 2007, Asia's population--64 percent of the total--is projected to account for 29 percent of the nutritional food deficit.

Amidst prosperity and growth in the region, some countries such as Bangladesh and Afghanistan, remain food insecure. Current trends indicate a growing number of countries unable to maintain their recent consumption level.

Growing population, rapid urbanization, and industrialization continue to put pressure on the region's fragile resource base.

Table 8--Asia: Income Distribution in 1995

	Share of income owned by	
	poorest 10%	richest 10%
Bangladesh	4.1	23.7
India	3.7	28.4
Indonesia	3.9	25.6
Nepal	3.2	29.8
Pakistan	3.4	25.2
Philippines	2.8	32.1
Sri Lanka	3.8	25.2
Vietnam	3.5	29.0

Source: World Development Report 1997

Figure 9--Asia's Food Gap

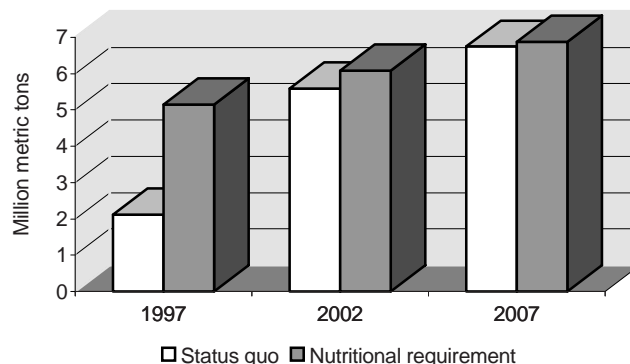
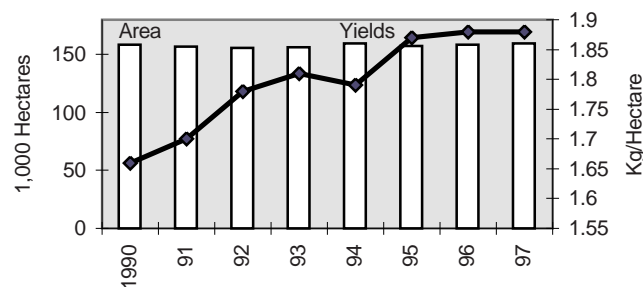


Figure 10--Asia: Grain Area and Yields



Latin America and the Caribbean

The total food gap to maintain per capita consumption for the region's lower income countries is projected to increase over the next decade. This could exacerbate the food security of the low-income population who face inadequate purchasing power. The projections show an increase in the number of people who will not be able to meet their nutritional requirement. [Birgit Meade]

The 11 countries covered in this article have the lowest per capita income among Latin American and Caribbean countries. They are: El Salvador, Guatemala, Honduras, and Nicaragua in Central America, the Dominican Republic, Haiti, and Jamaica in the Caribbean, and Bolivia, Colombia, Ecuador, and Peru in South America. Malnutrition and hunger are prevalent in a number of these countries and, if historical trends in food supply continue, average per capita food consumption is projected to decline about 6 percent in the next decade. The aggregate food gap to maintain per capita consumption is projected to more than double for the 11 countries as a whole by the next decade. For 1997, the food gap of 500,000 tons is about 4 percent of total regional production and 5 percent of commercial imports. By 2007, however, a gap of 1.4 million tons or 9 percent of production and 13 percent of commercial imports is projected.

The nutritional gap, 450,000 tons in 1997, is projected to reach more than 800,000 tons by 2007. Haiti, the poorest country in the Western Hemisphere, accounts for more than one-third of the region's 1997 nutritional gap, which is projected to widen and approach 300,000 tons by 2007.

Food production in the region is not keeping up with population growth. Latin America is a land-rich region, but good quality arable area is nevertheless threatened by rapid urbanization and environmental hazards such as soil erosion, salinity, and drainage, usually caused by poor cropping practices and intensive use. Under these circumstances, if per capita food availability is to be raised, long term increases in domestic supply will have to result from imports that are financed by export earnings.

Import dependency will increase—Import dependency (share of imports in total food supply) of the countries increased from 30 percent in the early 1980's to about 40 percent in 1995-96 and it is projected to continue to grow. This import trend, however, may not be sustainable. Foreign exchange earnings of the countries have improved significantly since 1990. In fact, with the exception of Haiti and Honduras, the range of growth in export earnings of the countries was from 4 to 12 percent annually, well above the 2.5 percent projected annual growth for food imports. However, debt service payments continue to be burdensome, particularly in Haiti, Honduras, Nicaragua, and Jamaica, where the value of debt exceeded the value of their GNP in 1995. In Haiti, the trade deficit reached 70 percent of the total value of imports and in Nicaragua the deficit is almost

50 percent. In 1995, almost half of Haiti's earnings from exports of goods and services had to be spent on debt service, while in Bolivia, Guatemala, and Nicaragua this figure was about one-third. To maintain per capita food consumption in the region, aggregate food imports will need to grow 3.3 percent per year in the next 10 years—almost 1 percentage point higher than projected.

Food security will worsen in lower income countries—Five countries—Bolivia, Guatemala, Haiti, Honduras, and Nicaragua, the lowest income countries of the 11 studied here—face gaps in maintaining consumption and are projected to experience a steady worsening of their food security situation. For Bolivia to maintain its consumption over the next decade, commercial imports have to triple. In Haiti, commercial imports would have to increase at an annual rate of 4 percent—almost 7 times its recent imports growth rate of 0.6 percent. Guatemala has been leading the group with import growth of 3 percent, but 5 percent are necessary to fill the food gap.

Within countries, food distribution remains a major problem—The more difficult dimension of food security in the region is the distribution of food within each country. Highly skewed distribution of income limits purchasing power and access to food for low-income households which, in turn, intensifies food security problems. Compared with other regions of the world, Latin American countries have the highest income inequality and widespread poverty.

This extremely unequal income distribution translates into an equally unequal distribution in access to food. In 1997, roughly 40 million people, or one-third of low-income Latin America and the Caribbean, are estimated to be unable to meet their nutritional requirements. Assuming no change in income distribution it is projected that over the next 10 years food insecurity will expand and threaten also middle income households in the five lowest income countries (Bolivia, Guatemala, Haiti, Honduras, and Nicaragua) and El Salvador.

In the long term, external assistance is not likely to be available. As food aid to the region has steadily declined over the last decade and is likely to continue to do so, further emphasis on increasing and stabilizing export earnings (for example by diversifying exports) will help to reduce food insecurity for a country as a whole. Food insecurity within a country will have to be addressed by targeted assistance and policies that benefit the income prospects of low-income households.

Table 9--Grain and Root Supply and Food Gaps for Latin America and the Caribbean

Year	Grain Production	Root Production (grain equiv.)	Commercial Imports (grains)	Food aid receipts (grains)	Aggregate availability of food	
			---1,000 tons---			
1988	10,181	2,643	3,802	1,611	13,178	
1989	10,410	2,623	3,365	1,320	12,208	
1990	10,102	2,521	4,005	1,423	12,551	
1991	9,725	2,474	4,413	1,817	12,115	
1992	10,505	2,372	5,609	1,335	12,776	
1993	10,970	2,730	5,727	1,371	12,817	
1994	10,579	2,817	7,560	1,002	13,584	
1995	10,538	2,970	8,474	434	14,668	
1996	10,685	2,902	9,233	294	14,500	
Projections						
			Food gap			
			SQ	NR	(w/o food aid)	
1997	10,674	2,941	9,301	502	446	14,285
2002	11,495	3,058	10,110	1,050	566	15,248
2007	12,344	3,177	11,336	1,440	827	16,660

Latin America and the Caribbean
142 million people

The current El Nino phenomenon is expected to have a strong negative impact on the agricultural sector in a number of countries in the region.

A very unequal income distribution continues to be the major threat to food security for low-income households.

Economic progress has not succeeded in significantly reducing the number of poor.

The number of people unable to maintain their consumption level by 2007 is projected to exceed 60 million.

Table 10--Latin America & Caribbean: Income Distribution in 1995

	Share of income owned by	
	poorest 10%	richest 10%
Bolivia	2.3	31.7
Colombia	1.3	39.5
Dominican R	1.6	39.6
Ecuador	2.3	37.6
Guatemala	0.6	46.6
Honduras	1.5	41.9
Jamaica	2.4	31.9
Nicaragua	1.6	39.8
Peru	1.9	34.3

Source: World Development Report 1997

Figure 11--Latin America's Food Gap

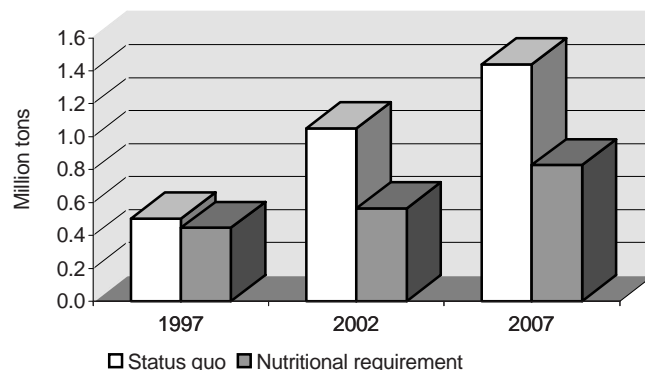
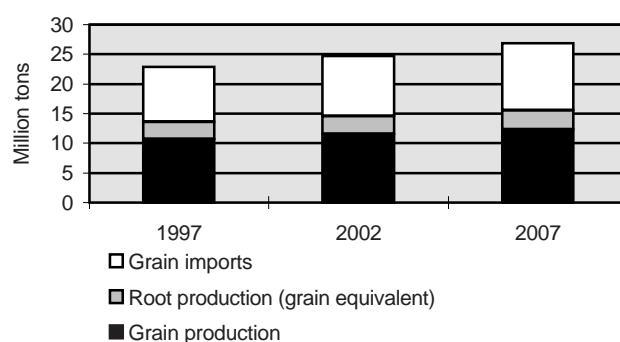


Figure 12--Grain and Root Supply in Latin America and the Caribbean



New Independent States (NIS)

Tajikistan's war-torn economy will likely keep it as the only NIS country with a significant food gap on a consistent basis. In other countries in the region, food consumption is projected to increase because of economic recovery, improved export performance, and higher grain output. [Jay Mitchell]

The aggregate food gap of the five NIS republics (Kyrgyzstan, Tajikistan, and the Caucasus nations of Armenia, Azerbaijan, and Georgia)² is forecast at 200,000 tons in 1997. The nutritional food gap is projected at 500,000 tons and is mainly accounted for by Tajikistan. The nutritional gap may be overstated because of the lack of reliable nutrition data, overestimating the contribution of grain and root crops in the diets of the countries. We assume that the composition of diets will remain unchanged over time. Other sources of nutrition, such as meat, dairy, fruits, and vegetables are very important in the diet of NIS countries. In particular, Armenia and Tajikistan, the two countries showing the largest nutritional gap for 1997, consume more fruits and vegetables per capita than most NIS countries, including Russia.

Financial improvement supports food security—

Commercial import capacity of the five NIS countries is expected to increase sharply to 2.2 million tons in 1997 due to positive economic growth and rising exports, direct budget support by donor nations and international organizations (such as the IMF and World Bank), and lower per unit costs of importing grain. Only Armenia and Tajikistan are expected to have a significant food gap in 1997, as Kyrgyzstan becomes self-sufficient in grain production and Azerbaijan and Georgia are able to meet any deficit largely through commercial imports.

Grain output for the five countries in this region is forecast to rise 9 percent to 4 million tons in 1997, following a 20-percent rise the previous year. Farmers have reacted to higher domestic grain prices and more attractive sales terms from a growing private grain market by expanding area sown, especially to wheat. Better moisture conditions from higher winter snowfall in the Caucasus nations should raise yields. Root production, less than 10 percent of grain output, is estimated up 17 percent to 300,000 tons (grain equivalent) in 1997.

Long-term food security is projected to improve—The Caucasus countries are likely to raise grain production moderately in the coming decade as area expands due to reduced hostilities, and yields increase as fertilizer and pesticide use rises. Total grain output in the region is projected to rise about 8 percent to 4.3 million tons in 2007, assuming slow progress on returning fallow fields to permanent cultivation in Nagorny-Karabakh (Azerbaijan) and Abkhazia (Georgia). More rapid return of these traditionally fertile lands could

contribute to steeper rises in grain output in the coming decade than are forecast here. At the same time, increased hard-currency export revenues, especially by Azerbaijan's growing oil exports, are projected to raise commercial grain imports nearly 30 percent to 2.8 million tons in 2007.

In graphic illustration of the benefits of macroeconomic and structural reform, Armenia and Georgia registered GDP growth in 1996 of 6 and 11 percent, respectively, ranking them at the top of NIS countries, ahead of even the radically-reforming Baltic nations. Both Caucasus nations are in their fourth year of positive economic growth, while Azerbaijan is in its second year of recovery. The food gap to maintain base consumption levels for Azerbaijan, never a large food aid recipient except for one particularly bad year in 1994, is forecast at only 20,000 tons in 1997. Georgia, a large food aid recipient for the past 5 years, is projected to have a negligible food gap for 1997 due to larger harvests and increased commercial import capacity. Armenia, still suffering from the effects of economic sanctions by Turkey and Azerbaijan due to political conflicts, is the only significant candidate for food aid among the Caucasus countries. Its food gap is estimated at about 100,000 tons for 1997, equivalent to about 45 percent of commercial imports and just over 30 percent of production.

Economic growth in the three Caucasus nations is expected to continue for at least 5 years, further boosting import capacity and thus improving the food supply situation. While population growth is forecast to accelerate from its current slow rate, it will likely average only about 0.5 percent annually in the coming decade. Future food gaps of the three Caucasus countries are expected to drop to negligible levels by 2007, as Georgia benefits from an end to its civil war, Armenia gains from a cessation of hostilities with Azerbaijan and relaxation of the trade blockade by Turkey, and Azerbaijan's oil export earnings soar. Azerbaijan's economy is benefiting from accelerating foreign investment, mostly in its oil sector, which is likely to total 5-10 percent of GDP annually in the next decade. While a renewed outbreak of violence in any of the Caucasus nations could raise the need for future food aid, such a scenario is becoming less likely as all three nations enter a period of economic recovery and increased regional integration.

Two consecutive bumper harvests have made Kyrgyzstan largely self-sufficient in food grains, eliminating the food gap for 1997. The Kyrgyz economy grew more than 5 percent in 1996 and similar growth is expected for 1997.

²These five countries are vulnerable to food insecurity and have received food aid in recent years.

Table 11--Grain and Root Supply and Food Gaps for New Independent States

Year	Grain Production	Root Production (grain equiv.)	Commercial Imports (grains)	Food aid receipts (grains)	Aggregate availability of food
			---1,000 tons ---		
1988	4,348	--	--	--	--
1989	3,318	--	--	--	--
1990	4,070	--	--	--	--
1991	3,827	--	--	--	--
1992	3,811	528	3,241	479	4,394
1993	3,694	458	2,211	1,159	4,321
1994	3,023	501	1,271	1,524	3,869
1995	3,077	647	1,346	1,119	3,917
1996	3,658	284	1,264	1,061	4,077
Projections					
				Food gap	
				SQ	NR (w/o food aid)
1997	3,989	338	2,187	201	519
2002	3,998	359	2,507	187	482
2007	4,293	381	2,824	204	529

NIS

27 million people

The food gap is projected to decline to negligible levels for all NIS countries, except Tajikistan, as higher grain production and greater commercial import capacity easily meet domestic food needs.

Tajikistan's war-torn economy will be slow to recover, however, as modest increases in both grain output and commercial imports fail to keep pace with a rapidly expanding population in the coming decade.

Table 12--NIS: Economic (GDP) Growth

	1996	1997-2002
	Percent	
Armenia	2.3	31.7
Azerbaijan	1.3	39.5
Georgia	1.6	39.6
Kyrgyzstan	2.3	37.6
Tajikistan	0.6	46.6

Source: Ecoplan

Figure 13--Tajikistan's Share in Total NIS Food Deficit

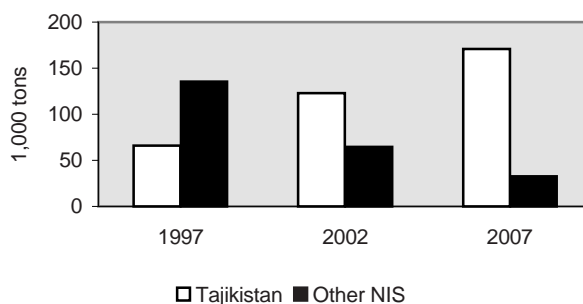
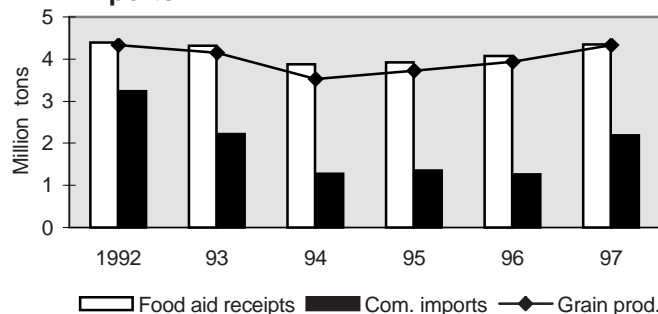


Figure 14--NIS(5) Grain Production and Imports



Kyrgyz grain output is forecast to increase at about 1 percent annually in the coming decade, which exceeds the projected rate of population increase. This should keep Kyrgyzstan largely self-sufficient in food grain supplies.

Tajikistan's food supply situation is projected to remain precarious—The only NIS country likely to consistently have a food gap is Tajikistan. The country's civil war, limited export earnings, and continued economic recession (GDP fell more than 10 percent in 1996 for the fifth straight year) have contributed to Tajikistan's food supply problems. The Food and Agriculture Organization (FAO) has identified more than 10 percent of the population (700,000 persons) as particularly vulnerable and in need of targeted humanitarian assistance for 1997, including food aid. While domestic policies promoting grain self-sufficiency have led to increased wheat area at the expense of cotton, the ability of Tajikistan to meet its food gap through increased production is limited. Multiple factors, including lack of adequate irrigation, insufficient land rotation, lack of land privatization, and low input use, will contribute to Tajikistan's food aid

dependency by keeping yields at barely 1 ton per hectare over the next 10 years. Rapid population growth of nearly 2 percent annually is likely to contribute to widening gaps between production and consumption in coming years, with commercial imports unlikely to match this gap.

Tajikistan's food gap to maintain base consumption levels is projected to almost triple to 170,000 tons by 2007; nutritional needs are forecast to reach about 500,000 tons the same year. While the absolute magnitude of future Tajik food gaps should not pose a problem based on past food aid levels (averaging nearly 200,000 tons over the past 2 years and probably higher once unofficial aid from Russia is included), the key concern is targeting food aid for the most vulnerable population. The current government's policies of distributing food aid mainly to cities has left rural regions to settle their own food supply situations despite a rising number of persons displaced by civil strife, orphans, and invalids. Thus, future food aid might be more effective in alleviating hunger if it is increasingly targeted at rural populations and away from the cities, where economic recovery is likely to begin.