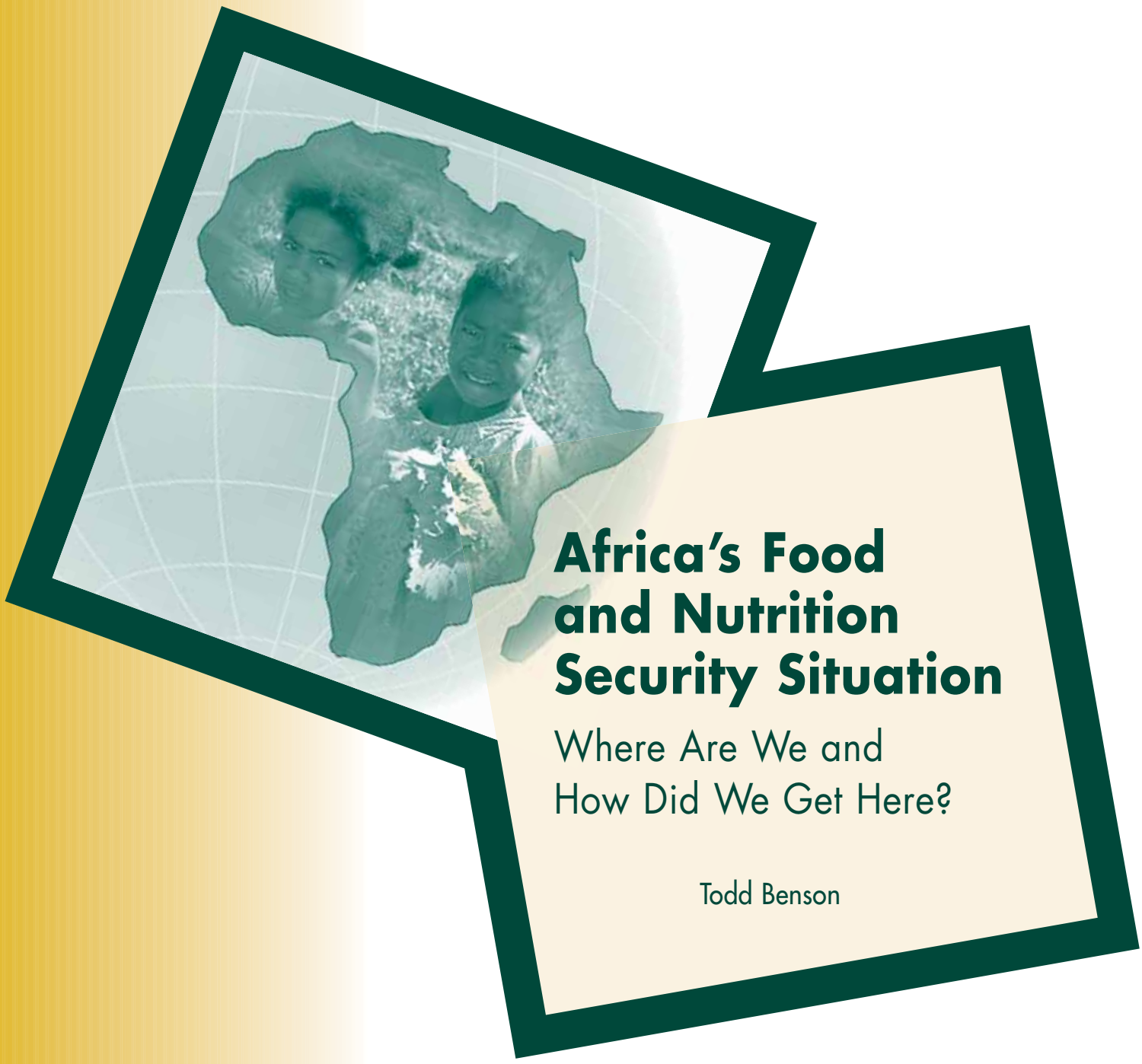
INTERNATIONAL FOOD
POLICY RESEARCH INSTITUTE

sustainable solutions for ending hunger and poverty

2020 Discussion Paper 37 • August 2004



Africa's Food and Nutrition Security Situation

Where Are We and How Did We Get Here?

Todd Benson

"A 2020 Vision for Food, Agriculture, and the Environment" is an initiative of the International Food Policy Research Institute (IFPRI) to develop a shared vision and consensus for action on how to meet future world food needs while reducing poverty and protecting the environment.

2020 Discussion papers present technical research results that encompass a wide range of subjects drawn from research on policy-relevant aspects of agriculture, poverty, nutrition, and the environment. They contain materials that IFPRI believes are of key interest to those involved in addressing emerging food and development problems.

This discussion paper has been prepared for the IFPRI 2020 conference "Assuring Food and Nutrition Security in Africa by 2020: Prioritizing Actions, Strengthening Actors, and Facilitating Partnerships," Kampala, Uganda, April 1–3, 2004. Designed in close consultation with a distinguished Advisory Committee, the conference is the centerpiece of a longer-term consultative process on implementing action for African food and nutrition security. This process is cosponsored by the European Commission (EC); Centre de coopération internationale en recherche agronomique pour le développement (CIRAD); Centre Technique de Coopération Agricole et Rurale (CTA); Deutsche Welthungerhilfe (German Agro Action); Development Cooperation Ireland; Federal Ministry for Economic Co-operation and Development, Germany, with Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) and Internationale Weiterbildung und Entwicklung (InWEnt); Ministère des Affaires étrangères, France; Regional Land Management Unit (RELMA); The Rockefeller Foundation; Sasakawa Africa Association; United States Agency for International Development (USAID); World Food Programme (WFP); and World Vision International. The 2020 Vision Initiative also gratefully acknowledges support from the following donors: Canadian International Development Agency (CIDA); Danish International Development Agency (Danida); and Swedish International Development Cooperation Agency (Sida).

Cover illustration: Joan K. Stephens
Cover Photo: © IFAD/R. Grossman

2020 Discussion Paper 37

Africa's Food and Nutrition Security Situation

Where Are We and How Did We Get Here?

Todd Benson

International Food Policy Research Institute
2033 K Street, NW
Washington, DC 20006–1002 USA
August 2004

ISBN 0-89629-649-0

Contents

Tables

Figures

Figures *(continued)*

Boxes

Foreword

Efforts and initiatives to combat hunger and malnutrition in Africa are gaining momentum at all levels—local, national, continental, and international. To design and implement effective strategies for action, it is vital that we have a clear understanding of the problems and options.

In this 2020 discussion paper, Todd Benson reviews the extent of food and nutrition insecurity across Africa. He assesses recent patterns and trends, exploring where significant progress has occurred, or not, and why. The differences between food and nutrition security, and how they are linked, are clarified. Benson examines the key direct and indirect determinants and consequences of food and nutrition insecurity in the African context and offers a menu of actions and strategies.

Lack of access to and availability of food—the key factors behind food insecurity—remain central concerns in Africa. When food insecurity interacts with health and care problems it translates into nutrition insecurity. HIV/AIDS is an important issue in that context. This comprehensive paper gives prominent attention to the oft-neglected issue of nutrition security. Reflecting emerging Africa-wide initiatives, the paper takes a continental perspective, which should be helpful for strategic consideration by the New Partnership for Africa's Development (NEPAD) and the African Union.

This paper was commissioned for the IFPRI 2020 Africa Conference on "Assuring Food and Nutrition Security in Africa by 2020: Prioritizing Actions, Strengthening Actors, and Facilitating Partnerships," held in Kampala, Uganda on April 1–3, 2004. There, it served to illuminate the discussions on why Africa has not yet achieved food and nutrition security and what needs to be done. I am sure this paper can influence the dialogues and indeed actions being undertaken to end hunger and malnutrition in Africa.

Joachim von Braun
Director General, IFPRI

Acknowledgments

I am particularly grateful for the insightful critiques of drafts provided by anonymous reviewers and Rajul Pandya-Lorch. Their input eased the process of revision considerably. I also owe thanks to Mary Arimond and Lisa Smith for the comments on nutrition security and the measurement of food and nutrition security each provided. Additionally, John Hoddinott, Don Doering, Lawrence Haddad, and Manohar Sharma directly and indirectly provided valuable concepts and information for use in this document. Finally, I am thankful for the efforts of Heidi Fritschel, Mary Jane Banks, Christina Lakatos, Uday Mohan, Joan Stephens, and Evelyn Banda in editing and otherwise finalizing this document.

Executive Summary

Food and nutrition security remain Africa's most fundamental challenges for human welfare and economic growth. Far too many people on the continent are unable to acquire and effectively utilize at all times the food they need for a healthy life. Because of low food availability and profound poverty, an estimated 200 million people on the continent are undernourished, and their numbers have increased by almost 20 percent since the early 1990s. The result is that more than a third of African children are stunted in their growth and must face a range of physical and cognitive challenges not faced by their better-fed peers. Undernutrition is the major risk factor underlying over 28 percent of all deaths in Africa (some 2.9 million deaths annually). The continuing human costs of inadequate food and nutrition are enormous, and the aggregate costs of food and nutrition insecurity at the national level impose a heavy burden on efforts to foster sustained economic growth and improved general welfare.

To be successful, new and innovative initiatives against poverty in Africa must sharply reduce hunger and malnutrition. The logic is as follows: Broad-based economic growth is necessary to increase incomes and consumption to reduce poverty. Economic growth can be achieved primarily through enhanced economic productivity, which in turn comes about through broad improvements in the intellectual and technical capacity of the population. The potential intellectual and technical capacity of the population is dependent on improved nutrition, particularly for young children and women in their childbearing years. Similarly, the effective utilization of such capacity is dependent on a properly nourished population, in which individuals are living healthy and active lives and are able to contribute creatively to their own and the nation's economic well-being. It is only when Africans have secured their basic food and nutritional needs that they will begin to experience sustained improvements in their broader welfare.

A household is *food secure* if it can reliably gain access to food in sufficient quantity and quality for all household members to enjoy a healthy and active life. It is possible, however, for individuals in food-secure households to have deficient or unbalanced diets. *Nutrition security* is achieved when secure access to food is coupled with a sanitary environment, adequate health services, and knowledgeable care to ensure a healthy and active life for all household members. The ability of an individual to fully reach his or her personal and economic potential, however defined, must depend to a large degree on his or her level of nutrition security. Moreover, the availability of nutrition resources and the degree to which an individual has access to such resources are a function of how society is organized in terms of economic structure, political and ideological expectations, and its institutions. Consequently, nutrition security must be a subject for political debate and an issue of immediate concern to any national development strategies.

What then is the level of access to the components of food and nutrition security that most Africans enjoy? For all Africans, such security is closely tied to agricultural productivity. Higher production from one's own farm or herds enhances household food security. For food purchasers, higher production generally means lower food prices and access to a greater quan-

tity of food in the market for a given income level. Many countries, however, particularly in Eastern and Central Africa, possess a combination of a moribund food crop sector and very low purchasing power. Stable access to food through the market requires that the food marketing system is effective in supplying food while also providing benefit to those who have food to sell. In most parts of Africa, the marketing system is not effective in this regard. People living on less than one dollar per day are unable to pay the prices they would need to pay to import all of the staple food they require.

In consequence, undernutrition in its various forms is primarily a chronic condition in Africa. Food crises emerge when broad negative shocks—drought, floods, economic downturns, conflict—affect chronically food-insecure populations. However, while not to discount the severity of acute hunger crises facing 30 to 40 million Africans annually, there are 160 million persons in Africa who are undernourished. Although they may not necessarily be facing an acute crisis in access to food, their access is not secure. If any of the 160 million were to be affected by one of these broad shocks or a range of other more individual shocks—death in the household, loss of an income source, chronic illness—most would face an acute hunger crisis relatively quickly. Because of this vulnerability, food aid and social safety net institutions remain an important component of the food security for many Africans.

Moreover, nutrition security requires several factors that are complementary to food security. Among these are a hygienic environment and access to health services. In these areas, the challenges are great, and important advances in nutrition security remain to be achieved through continued and increasing investment in these areas. There is also considerable evidence that the nutritional status of children varies directly with the educational level of their parents, and in particular their mothers. Mothers with more education are more knowledgeable about the care they need to provide their children. Although it is not an obvious element of strategies to enhance nutrition security, ensuring that girls are able to attain their full educational potential is a critical and currently deficient component of such efforts in Africa.

In a survey of the continent, the countries of North Africa are clearly among the most secure nutritionally. These countries are among the wealthiest in Africa, a fact that has implications for access to food through the market and for the basic requirements of good nutritional status. In contrast, those countries that are least nutritionally secure are not surprising. Those nations in Africa that have experienced conflict and the absence of an effective central government in recent years do not have in place the conditions that might assure broad nutrition security. Conflict exacerbates poverty and poor governance. These governments are unable to provide basic public goods, which results in a consequent lack of access to food, care, health services, and a healthy environment.

The more interesting and challenging cases are the broad range of countries that exhibit poor to fair progress in assuring the nutrition security of their citizens—countries where the majority of Africans live. Assessing what such nations might do differently to significantly improve nutrition security can only be done on a case-by-case basis. Where food availability is poor, food production must be enhanced at the same time as trade policies are reexamined to allow a more reliable supply of food from the global market. Other countries may be food secure but still have crippling rates of malnutrition. In these, attention should be directed to issues of household access to food and to the context within which the food is utilized—sanitation, health services, level of knowledgeable care, and a broad range of related issues. Moreover, the quality of policymaking and the effective and responsible implementation of those policies are important basic determinants of the degree to which food and nutrition security can be assured in any country in Africa.

Responsibility for assuring that individuals are able to attain food security ultimately lies with national governments. They have a duty to establish the conditions and institutions necessary to enable citizens to access the basic requirements of nutrition security—sufficient quantities of food necessary for a balanced diet; the means to acquire this food, whether through cash incomes or access to productive resources; education in order to provide proper nutritional care to one's dependents and oneself; clean water and adequate sanitation; and effective health services. It should not be expected that one detailed policy and action prescription will enable national governments to effectively address malnutrition in all countries. Because of historical factors, agroecological conditions, economic comparative advantage, or institutional structures, the basic determinants of food and nutrition security in any one African country will never be exactly the same as those of another. That said, there really are no exceptions—all African countries can attain nutrition security. What is needed is commitment to this goal; dedicated efforts to marshal the human, institutional, and material resources necessary for the task; followed by the application of the political will to undertake the actions necessary to achieve it.

National governments must lead several aspects of the effort to attain nutrition security, highlighted here:

- Sustained and broad-based economic growth is necessary. To end hunger in Sub-Saharan Africa by 2050, it is estimated that the region must attain a 3.5 percent annual average growth rate in per capita gross domestic product (GDP). In the past decade, however, only half a dozen countries had growth rates above 2.5 percent. The challenge is immense.
- Efforts must be made to open national markets to international trade, both within Africa and globally. National food availability should not necessarily or even primarily be dependent upon national food production alone. The nutrition security of the population of a country is enhanced to the degree that the nation invests in building the necessary institutional and legal frameworks and physical infrastructure to facilitate open, reciprocal trade, both with neighboring countries and with the globe as a whole.
- Agriculture cannot be ignored. The effectiveness of farmers in producing food is a critical factor in the level of access to food enjoyed by the farmers themselves and the much broader population with whom they are linked through the market. Growth in food supplies has the dual effect of increasing the income of the farming household and reducing the prices households must pay to acquire food in the marketplace, both of which enhance nutrition security. Moreover, increased production of food and nonfood crops provides an important input into the broader economy, both in rural areas and in urban manufacturing centers.
- Education is a critical input to good nutritional status, particularly for girls.
- Direct nutrition interventions are a necessary component of any effort to build the quality of human capital for economic growth and improved standards of living.
- A close link exists between successful improvements in child nutrition and increasing women's social access to resources they can use to improve care and increase the diversity and quantity of food provided the children under their care. Consequently, improving the level of equity between men and women is good for nutrition security.
- Locally conceived and implemented action has been shown to be the most effective way to improve food and nutrition security. Central government's role should consist of giving broad direction to local efforts and facilitating those efforts through resource allocation, provision of needed expertise, and institutional support.
- Budgetary allocations by central governments should reflect the central importance that

food and nutrition security has for the welfare of all people and the immense economic benefits it provides for relatively little cost. In this regard, donor funding should be viewed as a secondary resource to complement government's own.

- Without dedicated advocacy to inform policy makers at all levels of the critical role improved nutrition plays in development and poverty alleviation, it is unlikely that emerging democratic, decentralized, bottom-up political systems across Africa will allow the voices of the malnourished to be any better heard in planning and resource allocation decisions. The issue must be communicated effectively and understood widely, its significance for the welfare of all members of society recognized, and action catalyzed around proposed solutions. Ultimately, advocacy seeks to ensure that the political will is established so that the necessary resources are provided to aid individuals and households in attaining food and nutrition security.

Responsibility for assuring food and nutrition security must ultimately lie with national governments. Consequently, the master development plans of government should reflect the importance of such security to the welfare of its citizens. Thus it is critical that the poverty reduction strategy papers (PRSPs) that many African nations have developed in the past five years and that serve as master development plans for many are explicit on the importance of investing in food and nutrition security to reduce poverty and generate sustained economic growth. Similarly, sectoral plans and strategies, most notably agricultural sector strategies, should be oriented toward food and nutrition security objectives, along with their other long-standing objectives. Advocates for full food and nutrition security must engage in the higher-level policy processes guiding the revisions of the PRSPs and sectoral strategy documents. The key message should be that the arrow of cause and effect between nutrition security and income and broader economic growth runs both ways. Just as income growth enhances nutrition security, healthy, active, well-nourished citizens are an important precondition for sustained growth in income. Nutrition and food security concerns must be among the primary components of such strategies.

It is at the local government level, however, that direct actions must be taken to facilitate improved access to nutrition security for individuals and households. Global and national policies are meaningless if they do not cascade into action at the local level that improves the nutrition security of individuals resident there in real, measurable ways. Policy processes, capacity, and resource allocations at the local level all pose important challenges that must be successfully addressed to enable local residents to attain food and nutrition security.

The costs of attaining food and nutrition security in Africa are high. The benefits of such security, however, can easily be shown to outweigh these costs. Moreover, there is a moral obligation to address hunger and nutrition insecurity. This being the case, it is important to recognize the power of political will and effective leadership to overcome such constraints. Where development issues such as food and nutrition security arise through broad, participatory policy processes, political will is built. When effective leadership is brought to bear on such issues, any resource voids that hamper action can be quickly filled.

Food and nutrition insecurity is a critical constraint to economic growth in Africa and an immediate cause of widespread suffering. Millions of Africans seek enhanced food and nutrition security. National governments and their development partners can do a great deal on many different scales to facilitate and ensure their citizens' access to the tools that will allow them to meet their food and nutrition requirements. The solutions are known. Now we must build the broad political will to address this issue and to foster the leadership necessary to effectively implement the solutions.

1. Introduction

Food and nutrition security remain Africa's most fundamental challenges for human welfare and for economic growth. Far too many people on the continent are unable to acquire and effectively utilize at all times the food they need for a healthy life. In many countries, sufficient food to meet the needs of all citizens is not even available at a national level. In one-third of African countries the mean daily calorie availability per capita is below the recommended intake level of 2,100, and in DR Congo, Burundi, Eritrea, and Somalia calorie availability is below the minimum intake level of 1,800 (Table 1).[1] As a consequence of low food availability and profound poverty, an estimated 200 million people on the continent are undernourished or unable to meet their dietary energy requirements. Their numbers have increased by almost 20 percent since the early 1990s and doubled since the late 1960s.

In many African countries, food and nutrition security at both the national and the household level is dismal. Although there are more undernourished individuals in India alone than in Africa, it is in Africa that one finds the highest prevalence of undernourishment. Whereas 14 percent of the global population is undernourished, in Africa this prevalence is double: 27.4 percent of the population of Africa as a whole, and just under 33 percent of Sub-Saharan Africans, are undernourished (FAO 2003).[2] In more than a dozen countries, the rate of undernourishment is above 40 percent—in those countries experiencing or emerging from armed conflict, rates exceed 50 percent. The result is that more than a third of African children are stunted in their growth and must face a range of physical and cognitive challenges not faced by their better-fed peers.

Moreover, this focus on caloric availability and access does not necessarily capture the condition of the millions of Africans who, although consuming sufficient food to meet their energy requirements, have poor-quality diets with insufficient or unbalanced levels of minerals and vitamins to assure healthy, productive lives. Recently published research estimates that undernutrition of various sorts is the major risk factor underlying more than 28 percent of all deaths in Africa (some 2.9 million deaths annually).[3] For Africa the continuing human costs of inadequate food and nutrition are enormous.

---

[1]Although energy requirements vary according to age, sex, and activity levels, the U.S. Department of Agriculture uses 2,100 kilocalorie (kcal)/person/day as a recommended mean energy intake (Naiken 2002). A minimum energy intake level is about 300 kcal per day less.

[2]These estimates of undernourishment are based on calculations of the amount of food available in each country (national dietary energy supply), a measure of inequality in the distribution of consumption derived from household surveys, and a minimum energy requirement.

Note the distinction between undernourishment, which is a measure of the proportion of the population with inadequate access to sufficient calories to meet minimum calorie requirements, and undernutrition, which is a technical term signifying malnutrition due to inadequate food consumption. Both of these terms are defined in greater detail in the following chapter.

[3]Computed from data presented in Ezzati et al. 2003.

Table 1—Selected national and regional indicators of food and nutrition security for Africa

Region/country	Undernourished				Dietary energy supply	Stunted	Underweight	Under-5 mortality	Life expectancy	GDP per capita	GDP per avg. growth
	1999–2001		1990–1992		1999–2001	1995–2002	1995–2002	2002	2002	2002	1990–2002
	Number (millions)	Prevalence (%)	Number (millions)	Prevalence (%)	Kcal per person per day	% children 6–60 mo.	% children 6–60 mo.	Deaths per 1,000 births	Years, at birth	US$	Annual %
AFRICA	**204.5**	**27.4**	**171.2**	**28.8**	**2,370**	**36**	**27**	**154**	**48**	**650**	**0.5**
North Africa	**6.1**	**4.3**	**5.7**	**4.7**	**3,210**	**20**	**9**	**42**	**69**	**1,650**	**1.7**
Algeria	1.7	5.6	1.3	5.1	2,970	18	6	49	70	1,720	0.3
Egypt	2.3	3.4	2.7	4.7	3,370	21	11	41	69	1,470	2.5
Libya	0.0	0.0	0.0	0.0	3,320	15	5	19	73	5,540	–
Morocco	2.1	7.0	1.5	6.0	3,000	24	9	43	68	1,190	0.9
Tunisia	0.1	1.1	0.1	1.2	3,340	12	4	26	73	2,000	3.1
Sub-Saharan Africa	**198.4**	**32.9**	**165.5**	**34.9**	**2,180**	**39**	**29**	**168**	**46**	**440**	**0.2**
Central Africa	**47.6**	**58.3**	**22.0**	**35.0**	**1,810**	**36**	**28**	**193**	**43**	**270**	**–4.4**
Cameroon	4.0	26.8	3.9	32.8	2,240	35	21	166	47	560	0.0
CAR	1.6	43.2	1.5	50.0	1,960	39	24	180	40	260	–0.1
Chad	2.7	34.2	3.5	58.3	2,150	29	28	200	45	220	–0.1
Congo	0.9	30.0	0.9	39.1	2,210	19	14	108	48	700	–1.4
Congo, Dem. Rep.	38.3	75.1	12.1	31.4	1,570	38	31	205	41	90	–7.3
Equatorial Guinea	na	na	na	na	na	39	19	152	49	700	18.0
Gabon	0.1	8.3	0.1	10.0	2,580	21	12	91	57	3,120	–0.2
East Africa	**81.3**	**38.8**	**73.2**	**44.1**	**2,020**	**44**	**32**	**154**	**47**	**230**	**1.7**
Burundi	4.5	70.3	2.8	49.1	1,610	57	45	190	41	100	–3.9
Djibouti	na	na	na	na	na	26	18	143	46	900	–3.2
Eritrea	2.2	59.5	na	na	1,670	38	44	89	53	160	2.2
Ethiopia	26.4	42.0	na	na	1,910	52	47	171	46	100	2.5
Kenya	11.5	37.5	10.6	43.6	2,040	35	21	122	45	360	–0.6
Rwanda	3.1	41.3	2.8	43.8	2,000	41	27	183	39	230	0.3
Somalia	6.2	70.5	4.9	68.1	1,600	23	26	225	48	130	na
Sudan	7.7	24.8	7.9	31.1	2,290	na	17	94	56	350	3.4
Tanzania	15.2	43.3	9.5	35.2	1,970	44	29	165	44	280	0.6
Uganda	4.5	19.3	4.1	23.0	2,370	39	23	141	46	250	3.5
Southern Africa	**36.8**	**41.3**	**34.2**	**48.2**	**2,050**	**39**	**23**	**156**	**42**	**1,150**	**0.6**
Angola	6.4	48.9	6.1	61.6	1,900	45	31	260	40	660	–0.4
Botswana	0.4	26.7	0.2	15.4	2,270	23	13	110	41	2,980	2.7
Lesotho	0.5	25.0	0.5	29.4	2,310	46	18	87	36	470	2.0
Madagascar	5.7	35.6	4.3	35.0	2,070	49	33	136	53	240	–0.9
Malawi	3.7	32.7	4.7	49.0	2,170	49	25	183	38	160	1.3
Mozambique	9.7	53.0	9.7	68.8	1,950	44	26	197	38	210	4.6
Namibia	0.1	5.6	0.3	21.4	2,700	24	24	67	45	1,780	2.1
South Africa	na	na	na	na	na	25	12	65	49	2,600	0.4
Swaziland	0.1	11.1	0.1	12.5	2,570	30	10	149	36	1,180	0.1
Zambia	5.2	50.0	3.7	44.6	1,900	47	28	192	33	330	–1.4
Zimbabwe	4.9	38.9	4.5	42.9	2,100	27	13	123	34	470	–0.8
West Africa	**32.7**	**14.7**	**36.2**	**20.7**	**2,590**	**37**	**32**	**186**	**50**	**310**	**0.3**
Benin	1.0	15.9	1.0	20.8	2,480	31	23	156	51	380	2.0
Burkina Faso	1.9	16.5	2.0	21.5	2,460	37	34	207	46	220	2.0
Côte d'Ivoire	2.4	15.0	2.4	18.5	2,590	25	21	176	41	610	0.1
Gambia	0.4	30.8	0.2	20.0	2,280	19	17	126	54	280	0.1
Ghana	2.4	12.4	5.5	35.3	2,620	26	25	100	58	270	1.9
Guinea	2.3	28.4	2.5	39.1	2,330	26	23	169	49	410	1.6
Guinea-Bissau	na	na	na	na	na	30	25	211	45	150	–1.5
Liberia	1.2	41.4	0.7	33.3	2,080	39	26	235	41	150	4.8
Mali	2.4	21.1	2.2	24.4	2,370	38	33	222	49	240	1.8
Mauritania	0.3	11.1	0.3	15.0	2,730	35	32	183	52	410	1.2
Niger	3.7	34.3	3.3	41.3	2,130	40	40	265	46	170	–0.8
Nigeria	9.1	8.0	11.2	12.7	2,770	43	36	183	52	290	–0.3
Senegal	2.3	24.5	1.7	22.7	2,280	25	23	138	53	470	1.2
Sierra Leone	2.2	50.0	1.9	46.3	1,930	34	27	284	34	140	–5.9
Togo	1.1	24.4	1.2	34.3	2,310	22	25	141	50	270	–0.6
China	*135.3*	*10.6*	*193.0*	*16.5*	*2,970*	*16*	*11*	*39*	*71*	*940*	*8.6*
India	*213.7*	*21.2*	*214.5*	*24.9*	*2,490*	*46*	*47*	*93*	*64*	*480*	*4.0*
Developing world	**797.9**	**16.9**	**816.6**	**20.2**	**na**	**na**	**na**	**na**	**na**	**na**	**na**

Sources: The first five columns of data are taken from FAO 2003. The remaining data are taken from UNICEF 2003.

Notes: Regional summary statistics are computed on a population-weighted basis, excluding countries for which data are missing. na indicates not available or not applicable.

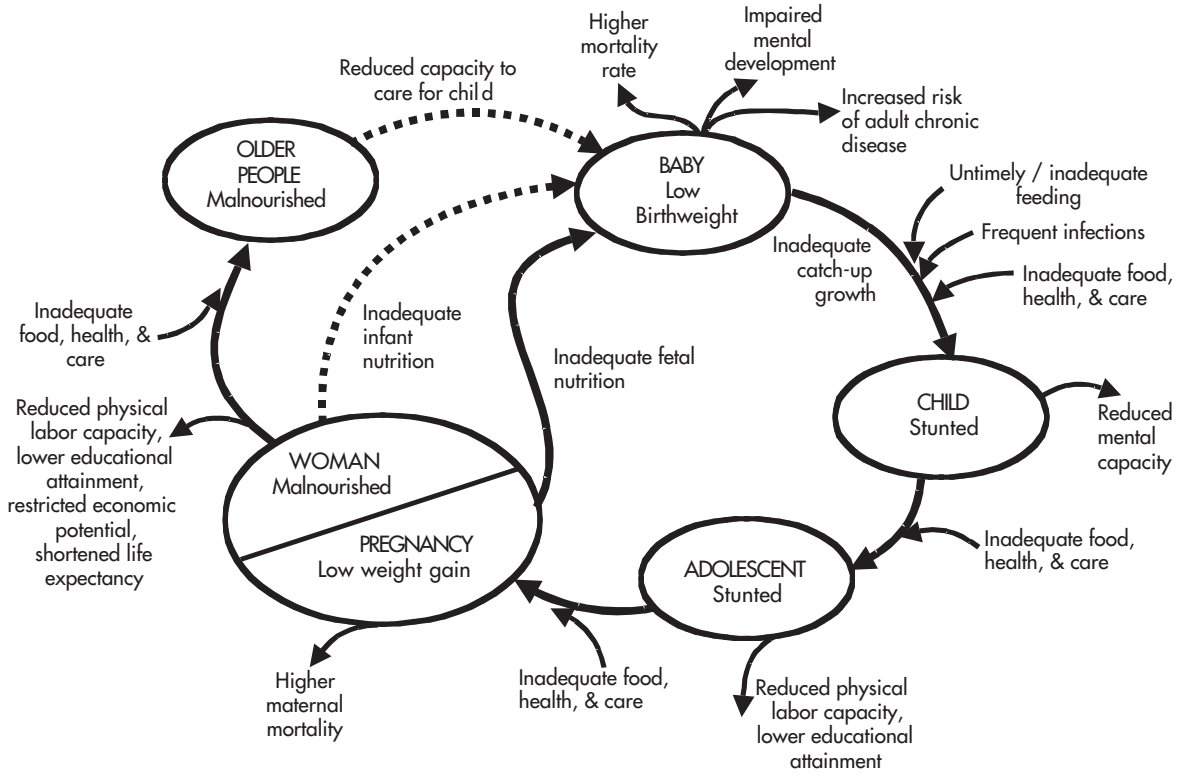
Box 1—Nutrition (and malnutrition) through the life cycle

Figure 1 shows how malnutrition can be perpetuated across generations in a cycle or, worse, a spiral of poverty and despair. The processes through which it functions can be described as follows:

> "[A girl] born to a mother that is undernourished will likely be born stunted in height and low in weight, even at full term. If the infant survives, her growth will be more likely to falter. Her ability to learn will be, to a large extent, irreversibly damaged as will her ability to develop other skills that pay off in the labor market, in the home, and in the community. She will be more susceptible to infectious diseases and to noncommunicable diseases in later life. Throughout her life, her options and her power to make choices about those options will be as stunted as her growth will be. Society will be worse off in a social and economic sense. During her childbearing years, she will bear low birth-weight babies of her own. And so the cycle of intergenerational poverty and ill-health continues." (IFPRI 2004, 1)

With interventions to enable individuals to break out of the bonds imposed by malnutrition, this same cycle can become a spiral of hope, where nutritional improvements are reinforced through the life cycle and each succeeding generation can aspire to an increasingly healthy and prosperous life.

Figure 1—The burden of malnutrition through the life cycle and across generations



Source: Modified from ACC/SCN 2000.

In addition to the cost of human suffering, food and nutrition insecurity in Africa has economic costs. These costs are those of dealing with disease and other problems related to malnutrition, as well as the enormous reductions in human potential and economic productivity brought about by hunger and malnutrition. As shown in Figure 1 and described in Box 1, malnourished children suffer from intellectual impairment. Hungry children make poor students and are prone to drop out of the educational system. Hungry and malnourished adults are unable to be fully productive workers and are more likely to be ill, increasing the burden on often overstretched health systems. Undernourished mothers give birth to low birthweight babies, transferring the broad economic disadvantages of malnutrition in their own lives to the next generation. The aggregate costs of food and nutrition insecurity at the national level impose a heavy burden on efforts to foster sustained economic growth and improve general welfare.

The precarious state with regard to their access

Box 2—International commitments to the right to food

Universal Declaration of Human Rights (1948), Article 25

"Everyone has the right to a standard of living adequate for the health and well-being of himself and his family, including food, clothing, housing and medical care and necessary social services, and the right to security in the event of unemployment, sickness, disability, widowhood, old age or other lack of livelihood in circumstances beyond his control."

International Covenant of Economic, Social, and Cultural Rights (1966), Article 11:

"The States Parties to the present Covenant recognize the right of everyone to an adequate standard of living for himself and his family, including adequate food, clothing and housing, and to the continuous improvement of living conditions. . . . The States Parties . . . shall take, individually and through international co-operation, the measures, including specific programmes, which are needed:

(a) To improve methods of production, conservation and distribution of food by making full use of technical and scientific knowledge, by disseminating knowledge of the principles of nutrition, and by developing or reforming agrarian systems in such a way as to achieve the most efficient development and utilization of natural resources;

(b) Taking into account the problems of both food-importing and food-exporting countries, to ensure an equitable distribution of world food supplies in relation to need."

Rome Declaration on World Food Security (1996)

"We, the Heads of State and Government . . . reaffirm the right of everyone to have access to safe and nutritious food, consistent with the right to adequate food and the fundamental right of everyone to be free from hunger. We pledge our political will and our common and national commitment to achieving food security for all and to an ongoing effort to eradicate hunger in all countries, with an immediate view to reducing the number of undernourished people to half their present level no later than 2015."

United Nations Millennium Declaration (2000)

"Men and women have the right to live their lives and raise their children in dignity, free from hunger and from the fear of violence, oppression or injustice."

to adequate food that so many Africans endure stands in stark contrast to the broad range of international commitments asserting that access to adequate food is a fundamental human right. Several of these commitments are noted in Box 2. By their agreement to these global commitments, African governments and their development partners have recognized that they have a duty to respect, protect, facilitate, and, if necessary, provide for the food and nutrition needs of all of the hungry and malnourished in Africa, as elsewhere, both by direct action and by creating a global economic and political environment in which food and nutrition security can be assured and sustained. Clearly many governments in Africa and their partners are not upholding their duty in this regard. Before holding governments accountable for this, however, one must assess whether these governments actually have the physical and human resources needed to carry out these obligations to their citizens (Gillespie 2001, 10). If not, it is essential to investigate why, and African governments, with their partners, must take action to improve the capabilities they require to comply with these commitments.

Encouragingly, against this alarming and pessimistic backdrop of human suffering in Africa and the shame of the world's shared inability to meet these moral commitments, Africa has reasserted itself on the international human development agenda. Innovative and energetic political and economic initiatives are gaining momentum both inside and outside the continent to effectively address poverty in Africa.

To be successful, these initiatives against poverty must sharply reduce hunger and malnutrition. The logic is as follows: Broad-based economic growth is necessary to increase household and individual incomes and consumption to reduce poverty. Economic growth can be achieved primarily through enhanced economic productivity. Enhanced productivity comes about through broad improvements in the intellectual and technical capacity of the population. The potential intellectual and technical capacity of the population is dependent on improved nutrition, particularly for young children and women in their childbearing years. Similarly, the effective utilization of such capacity is dependent on a properly nourished population, in which individuals are living healthy and active lives and are able to contribute creatively to their own and the nation's economic well-being.

To eliminate poverty attention must be paid both to formulating broad economic growth strategies and, in a focused manner, to directly enhancing the nutritional status of the population. Food and nutrition security must be a primary focus of the political and economic initiatives to address poverty that are now underway in Africa. Sufficient political will must be built to foster the action required to assure such security for all Africans. It is a question of first things first: only when Africans have secured their basic food and nutritional needs will they begin to experience sustained improvements in their broader welfare.

This paper aims to provide a reasonably comprehensive assessment of the multiple facets of food and nutrition security in Africa. To develop strategies for effectively reducing food and nutrition insecurity in Africa, policymakers and others need an understanding of the broad, multisectoral nature of the problem. This is the content of Chapter 2, which defines food and nutrition security more closely and contrasts the two terms "food security" and "nutrition security." The chapter also identifies the key conceptual determinants of food and nutrition insecurity in Africa and discusses key indicators for the measurement of food and nutrition security. In particular, by coupling consideration of a hygienic environment, adequate health services, and knowledgeable care with existing understanding of food security, a broader concept of nutrition security and a better practical understanding of why so many Africans are not adequately nourished is developed.

Chapter 3 builds on this discussion to provide an overview of the levels of and trends in food and nutrition security across the continent. The data are presented primarily at the national level but from a range of different perspectives—food production and consumption, calorie and micronutrient availability, health and care. A broad analysis identifies where significant progress in reducing food and nutrition insecurity has occurred, as well as where significant backsliding is taking place. As data

allow, the current dimensions of food and nutrition insecurity in Africa are assessed to provide a clearer understanding of how many are affected, where they live, and who they are.

Making sense of the food and nutrition security situation across the continent is the objective of Chapter 4. First it provides a conceptual framework for action to improve the access of African individuals and households to the various dimensions of nutrition security they require. The chapter then examines a broad range of driving forces, operating from the individual and household to the regional and international scales, that have shaped recent trends and will continue to be important in the future. Here the conceptual overview and empirical evidence of the previous two chapters are brought together in an assessment of how effective action may be taken to address the causes of malnutrition and food insecurity in order to effectively and sustainably eliminate them.

Chapter 4 also gives considerable attention to the actions that the various sectors of government and the economy can contribute to this effort. Building food and nutrition security, however, requires the concerted and coordinated action of a wide range of institutions and individuals. Consequently, sectoral policies alone are unlikely to assure food and nutrition security. They must be complemented by cross-sectoral and multi-scale perspectives. For example, gender analysis is an explicitly cross-sectoral perspective that is critical to making sure that Africa's women and children are well nourished and able to meet their full potential. Similarly, the manner in which central government contributes to assuring the food and nutrition security of its citizens will be different from but must be coordinated and mesh with the manner in which local government agencies, community organizations, or nongovernmental organizations operate in this regard.

The final chapter places this assessment within the frameworks for action presented by a set of initiatives to address poverty and food and nutrition insecurity in Africa. These include the various national poverty reduction strategies and related plans, the New Partnership for Africa's Development (NEPAD), the international Millennium Development Goals that emerged from the Millennium Declaration of 2000, and an assortment of other commitments that national governments and international partners have made to these issues in recent years. The financing of efforts to address food and nutrition insecurity is a particular concern here; this paper argues that African governments themselves should take the lead in making the necessary investments to assure the food and nutrition needs of their citizens. Not only is this necessary from the standpoint of the moral responsibilities of any government, it is also a critical investment in assuring the long-term economic prosperity of the country concerned and sustained improvement in its citizens' quality of life.

2. Food and Nutrition Security

To establish a common understanding of food and nutrition security and a better practical understanding of why so many Africans are not adequately nourished, this chapter will develop working definitions for these and related terms. Humanitarian concerns about hunger are sufficiently engaging that broad and loose definitions of hunger or, alternatively, food insecurity are usually adequate to mobilize political attention and concern (Mason 2002). We recognize that a hungry person, however "hungry" might be defined, should be a concern of us all. In taking action on that concern, however, one needs a closer understanding of what is meant when an individual is described as hungry, or an area as food insecure, or children as malnourished. Clarity in terminology allows us to better define and appreciate the challenges faced, to determine more readily the actions needed to address them, and to evaluate the impact of the actions undertaken in consequence.

This chapter argues that food security goes beyond food production and distribution and that nutrition security is not a necessary outcome of successfully achieving food security, but rather an issue that must be explicitly addressed in its own right. To make this argument, the chapter will present conceptual frameworks of the determinants of food and nutrition security and the links between food and nutrition security and human welfare. These frameworks will be used in Chapter 4 to guide the discussion on what actions must be taken to address the causes of food and nutrition insecurity. This chapter ends with a discussion of a range of key indicators that are used to measure food and nutrition security. Some of these indicators will be used in Chapter 3 to provide a situation analysis of food and nutrition security in Africa.

Defining the Issues

Food Security

A household is food secure if it can reliably gain access to food in sufficient quantity and quality for all household members to enjoy a healthy and active life (Gillespie and Haddad 2001, 40). Although this definition of food security is currently widely accepted, it represents the outcome of several decades of evolution in thinking on food security. It is useful to highlight several aspects of this definition.[4]

First, the scale of the definition is at the level of the household and the individual within the household. This level of analysis is quite different from the national level of analysis most commonly encountered in discussions of hunger and malnutrition in Africa, and which, for that matter, was used in the introductory chapter of this paper and will be used extensively in the next chapter. Undertaking analysis of food security at the household level allows us to determine how much actual access individuals have to available food, what causes their food insecurity, what sort of

[4] For a detailed discussion of food security, from which much of the following discussion is drawn, see Maxwell and Frankenberger 1992.

action needs to be taken, and where it should be taken to reduce household-level food insecurity. While one can talk of food-secure and food-insecure countries, doing so requires a coarse aggregation that does not reflect the considerable variation in the food-security condition of households within a particular country. Moreover, within the households themselves, the degree to which individuals have access to sufficient food may vary systematically owing to sex, age, or labor contribution criteria.

This situation points to a critical feature of the definition—food security is concerned with access to food. Food production does not equal food security. If food is in fields or in the markets, but families cannot afford to acquire it, then they are food insecure. We have all seen hungry people in the midst of supermarkets and filled granaries. Food availability is a necessary but not a sufficient condition to assure food security for a household. Households must have the resources necessary to acquire the food they need for consumption. For urban households, sufficient income is typically required to acquire food in the market. For rural African households, productive resources are required—cropland or livestock, together with sufficient labor and tools—as well as income to acquire that food they are unable to produce themselves. This aspect of the definition draws strongly from the simple, powerful observations of Amartya Sen (1981) on the critical importance of entitlements to food to assure food security, rather than food availability alone.

Additionally, food security has a temporal aspect. Food-secure households *reliably* gain access to food. A common temporal pattern in food consumption among smallholder farming households in Africa, particularly in those cropping areas receiving only a single rainy season annually, is to enjoy sufficient levels of food consumption, at least in caloric terms, in the months following the harvest. With the drawing down of stocks of own-produced food and limited income from other sources, however, frequently these households have insufficient food to meet their food needs in the demanding months just before the following harvest. Such households cannot be considered food secure.

Reliable access to food is also closely linked to notions of sustainability and vulnerability. When households are unable to acquire sufficient food using their regular means of access to food—for example, because of poor crop production or a loss of a source of income—they will employ a sequence of coping strategies to meet their food needs (Corbett 1988). With an extended shortfall in access, the nature of the coping strategies employed shifts from those that will have a relatively short-term impact on the future welfare and access to food of the household—reduction in food consumption levels, seeking piece work, and the like—to those that compromise the household's ability to regain the standard of living it had before the crisis. These coping strategies might include sale of land or other productive assets or withdrawing children from school to work. Food security, then, incorporates the notion that a household must not have to sacrifice the long-term ability of its members to acquire sufficient food in order to meet current, short-term food needs.

Finally, this definition extends our assessment of food security to consider the *health* of those eating the food—the objective is a healthy and active life. Here nutritional considerations begin to come to the fore. The quality of the food to which an individual or household has access must be considered. To enjoy a productive, healthy, and active life, all people require sufficient and balanced levels of carbohydrate, protein, fat, vitamins, and minerals in their diets. Households or individuals facing deficiencies or other imbalances in diet because they lack access to the necessary food for a balanced diet are not food secure. Similarly, the health status of the individuals consuming the food must be considered. Notably, adults who are infected with HIV have energy requirements that are 10 to 30 percent higher than individuals who are not infected (FANTA 2004). Consequently, HIV poses a double nutritional burden: as the infection progresses the infected individual is unable to produce or earn income to reliably get access to the food required, while at the same time his or her nutritional requirements have increased.

It is possible for households and individuals to have deficient or unbalanced diets without being food insecure. The definition of food security used here is concerned with physical and economic access to food of sufficient quality and quantity. If access to the components of a nutritious diet in sufficient quantities is reliably assured for a household, it is considered food secure, regardless of the nutritional outcome of the consumption of that food. A person may have reliable access to the components of a healthy diet, but because of poor health or care, ignorance, or personal preferences with negative nutritional implications, he or she may not be able to or choose not to use the food in a nutritionally sound manner. Just as food production and availability are necessary but not sufficient conditions for food security, food security itself is a necessary but not sufficient condition for nutrition security and a healthy and active life.[5]

Nutrition Security

A household achieves nutrition security when it has secure access to food coupled with a sanitary environment, adequate health services, and knowledgeable care to ensure a healthy life for all household members. Nutrition security is as concerned with the utilization of the food obtained by a household as it is with *access* to this food.[6] Although the notion of nutrition security has received far less attention in the literature on hunger and economic development than has food security, it constitutes a critical component in any discussion about how renewed dynamism in African economies can be translated into general welfare improvements for the poor and undernourished. Improved food security at the household or individual levels that results from more productive and profitable agriculture or from enhanced growth in the broader economy is merely an input to a better quality of life. An individual's ability to reach his or her full personal and economic potential, however defined, depends to a large degree on his or her level of nutrition security. If we accept that a central objective of poverty reduction is to enable individuals to maximize their potential, it follows that nutrition security must be a central component in the many poverty eradication efforts gaining momentum around the continent today.

The UNICEF conceptual framework of the determinants of nutritional status of children provides a succinct and useful way to understand nutrition security (Figure 2). The framework presents a generalized understanding of how proper nutrition or, similarly, malnutrition is the outcome of specific development problems related directly to the level of dietary intake and the health status of the individual. The quality of these immediate determinants, in turn, is determined by the underlying food security status of the household in which the individual resides. Of equal importance to nutrition security, however, is the availability of health services and a healthy environment and the quality of care the individual receives—that is, whether the available resources for good nutrition are used effectively. A sustained healthy and active life is possible only when these underlying determinants of the nutritional status of household members are of a sufficiently beneficial character.

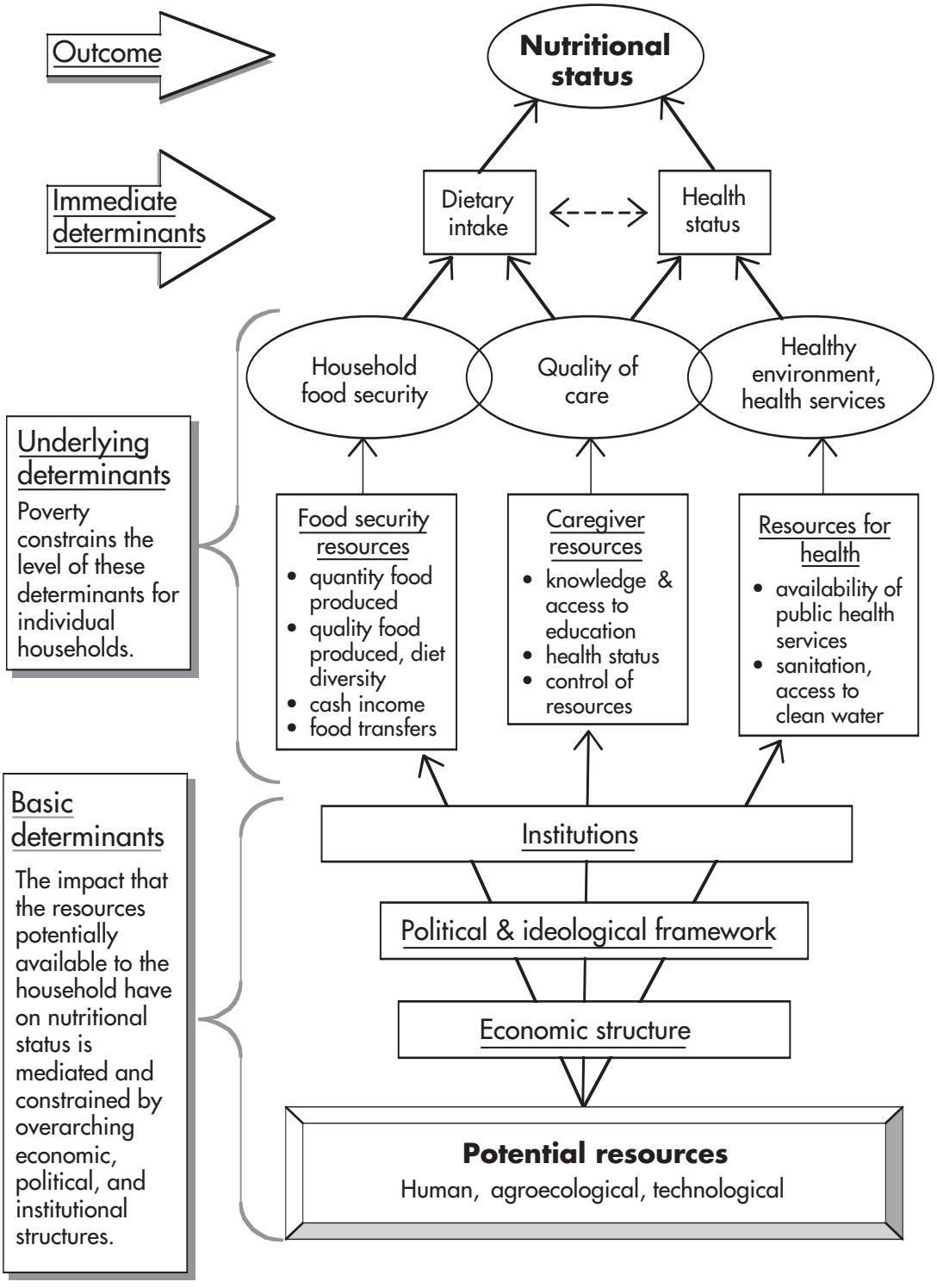
The degree to which these three underlying determinants are expressed, positively or negatively, is a question of resources. These resources

---

[5] The discussion here draws strongly from the U.S. Agency for International Development (USAID) definition of food security, in which three distinct variables are central to attaining food security: availability, access, and utilization (USAID 1992). In the definitions presented in this paper, however, food security is defined principally as assured availability and access to food. As utilization invokes a much broader range of activity and actors than the food production and distribution inherent in the concepts of availability and access, this paper associates utilization with nutrition security rather than food security.

[6] Proper utilization is, however, itself a function of access—the access that households and individuals have to a range of physical and social resources that determines the nutritional outcome of the use of the food. The conceptual framework of nutrition of the United Nations Children's Fund (UNICEF) discussed later can be interpreted in this light. This point is discussed further in Chapter 4.

Figure 2—The UNICEF conceptual framework of the determinants of nutritional status



Sources: Adapted from UNICEF 1990; Jonsson 1993; and Smith and Haddad 2000.

include the availability of food but extend much farther to include the physical and economic access that an individual or his or her caregiver has to that food, the caregiver's knowledge of how to utilize available food and properly care for the individual, the caregiver's own health status, and the control the caregiver has over resources within the household that might be used to nourish the individual. Finally, the level of access to information on and services for maintaining health; the availability of curative services; and the presence or absence of a healthy environment with clean water, adequate sanitation, and proper shelter all contribute to determining the nutritional status of an individual.

When the distribution of resources within society is the central point of discussion in accounting for why some are malnourished and others are not, the framework moves from the realm of the individual and household to the political. The UNICEF framework links the availability of nutrition resources to a set of basic determinants, which are themselves a function of how society is organized in terms of economic structure, political and ideological expectations, and the institutions through which activities within society are regulated, social values are met, and potential resources are converted into actual resources. Consequently, nutrition security is identified as a subject for political debate and an issue of immediate concern to any national development strategies.

Although nutrition security is principally defined at the household and the individual levels, as with food security, the determinants of nutrition security extend far beyond the control of the household itself. Unlike food security, however, nutrition security is the concern of many more institutions, sectors, and other actors than those typically found in the food sector (within which, in most African countries, the agriculture sector is the most prominent participant). If sustained improvements in the quality of life of African citizens are among the desired fruits of an energetic and dynamic agricultural sector in Africa, then broad nutrition security must be assured. It is unlikely that a food or agricultural strategy alone will bring about the desired ends. Resources must be provided to and coordinated action must be taken by a range of actors that extends considerably beyond the food sector alone.

Hunger and Malnutrition

Although this paper uses the framework of food security and nutrition security, these terms alone are insufficient to fully consider the multiple facets of the food and nutrition challenges that must be addressed in Africa. Earlier discussions have used several additional terms, in particular hunger and malnutrition. Definitions of these terms appear in Box 3. The various indicators that can be used to evaluate levels of hunger, malnutrition, or food and nutrition security in general will be described later in this chapter.

Figure 3 provides another vantage point for understanding this range of terms. The outer oval of the figure represents a nutrition-insecure population. The various shapes within the oval and their overlaps represent members of that population—whether households or individuals—who are suffering from various forms of nutrition insecurity, particularly as related to food insecurity. In the discussion that follows, for the sake of clarity and precision, use will be made of these terms based on the definitions provided in the text box and in Figure 3, insofar as possible.

Measuring Food and Nutrition Security

The development of this typology of the nutrition insecure is a necessary step in designing the sorts of actions and interventions needed to enable the individuals who fit into these various categories to attain nutrition security. The needs of people who are food insecure because of micronutrient malnutrition and the actions they must take to become nutrition secure, for example, will differ in important respects from those who are hungry but are not yet suffering from undernutrition. It follows, then, that to properly allocate resources to facilitate the access of the nutrition insecure to what they require to attain security, public, nongovernmental, and private voluntary agencies need a reasonable

Box 3—Definitions of terms related to food and nutrition security

Nutritional status: The physiological condition of an individual that results from the balance between nutrient requirements and intake and the ability of the body to use these nutrients.

Hunger: People experience the sensation of hunger when they lack the basic food intake necessary to provide them with the energy and nutrients for fully productive and active lives. Hunger principally refers to inadequate consumption of the macronutrients, carbohydrates in particular, and is an outcome of food insecurity. All hungry people are food insecure, but not all food-insecure people are hungry.

Malnutrition: A physical condition or process that results from the interaction of inadequate diet and infection and is most commonly reflected in poor infant growth; reduced cognitive development, anemia, and blindness in those suffering severe micronutrient deficiency; and excess morbidity and mortality in adults and children alike. Undernutrition and overnutrition are two forms of malnutrition.

Undernutrition: Malnutrition due to inadequate food consumption or poor absorption or biological use of nutrients consumed due to illness, disease, or nutrient imbalance. In addition to absolute deficit in food consumption, undernutrition frequently results from imbalanced diets in which sufficient macronutrients (carbohydrates, fat, protein) but insufficient vitamins and minerals (in particular the micronutrients iron, iodine, zinc, and vitamin A) are consumed, resulting in various physiological disorders and increased susceptibility to disease.

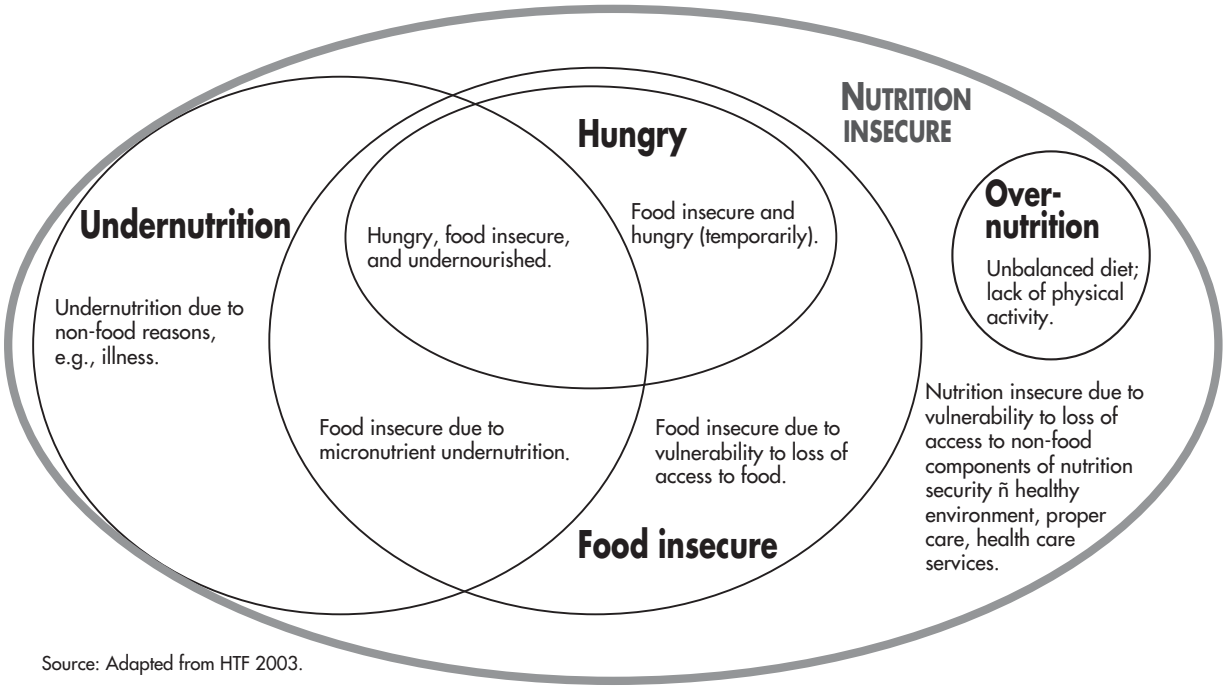
Moreover, although most individuals suffering from undernutrition are food insecure, an individual or household can be food secure but undernourished. For example, an individual who is food secure but suffers from frequent and severe bouts of diarrhea will not be able to use the food for growth and development and will experience undernutrition. Conversely, a hungry person may not necessarily be undernourished if the hunger is only of a temporary nature, having only been experienced for a few days.

Overnutrition: Malnutrition due to an excess of certain nutrients such as saturated fats and added sugars in combination with low levels of physical activity that may result in obesity, heart disease and other circulatory disorders, diabetes, and similar diseases. While individuals suffering from overnutrition are food secure, they do not enjoy nutrition security, and although the majority of malnourished individuals in Africa are undernourished, problems of overnutrition are also present.

Vulnerability: The presence of factors that place people at risk of becoming food insecure or malnourished, whether due to loss of access to food, proper nutritional care, or an inability to physiologically utilize available food because of infection or other disease.

Sources: HTF 2003; FIVIMS/FAO 2002.

Figure 3—Overlapping concepts within the context of nutrition insecurity



Source: Adapted from HTF 2003.

understanding of the size of the population suffering from the various forms of nutrition insecurity. To assess the scope of the various nutrition security problems, the progress being made in addressing them, and what more can be done, researchers must measure hunger and malnutrition and undertake sound analysis on the measurements.

This is not a simple task. Reflecting on the definition of nutrition security and the range of categories of food-insecure people reveals why. Nutrition security is a multidimensional phenomenon, requiring secure physical, economic, social, and physiological access to adequate food, a sanitary environment, adequate health services, and knowledgeable care. This complexity of what constitutes nutrition security makes it difficult to measure in precise terms. For the most part, it is possible to precisely measure only single dimensions of nutrition security and then to use a variety of such measures in combination to assess nutrition security in a relatively qualitative manner overall. Alternatively, it is possible to use proxy indicators of nutrition security, such as child mortality, and impute what the level of the proxy indicator implies for nutrition security. There is no single measure of nutrition security or, for that matter, food security.[7]

Several of the most frequently encountered measures related to nutrition security and its components are described in Table 2. Only those most commonly found in the literature on food and nutrition security are presented. The conceptual frameworks for food and nutrition security discussed earlier indicate that many other useful measures could be collected. Basic income, asset, or poverty-related information at the household or at aggregated levels is an important indicator of access to food. A broad range of information also can be collected on nutritional care practices—breastfeeding patterns, feeding patterns for young children, numbers of dependent children in a house-

[7] The outcome of nutrition security should be an individual with a healthy, active life. However, nutrition security is a necessary but not sufficient condition for such an outcome. Consequently, one cannot simply measure the number of people living such lives, even if one could develop such a measure, to assess levels of nutrition security. Moreover, such a measure would not provide any information to assess just where an insecure individual is along a nutrition insecurity continuum that runs from starvation to full nutrition security.

hold or population, and so on. Basic health and sanitation information similarly can be used—disease incidence, source of water, waste disposal practices, availability and quality of health care services, and patterns of use of health services, among others. A broad knowledge of the basic determinants of nutritional status operating at broader scales—economic, political, and institutional structures—is also necessary to acquire a comprehensive understanding. Poverty and welfare inequality measures, indicators of various aspects of human capital, gender assessments, and the like are all valuable metrics in this regard.

Moreover, the context of the particular nutrition security analysis will determine the sorts of information required. The measures already noted are primarily of use for longer-term monitoring and planning purposes. In the case of a food emergency, however, other measures also will be of value—market prices and commodity price ratios, wage rates, prevalence of consumption of nontraditional staples (famine foods), assessment of the degree to which households are relying on atypical coping strategies (productive asset sales, migration). Of course, to be used effectively, each must be calibrated to long-term baseline information.

Table 2—Selected indicators of food and nutrition security

Indicator	How collected	Comments
Dietary energy supply (national level)	Computed from national agricultural production, existing food stocks, and food import/export statistics.	Points to availability problems, in particular. However, high dietary energy supply values may well mask considerable variation in access to food within a population.
Undernourishment (using national-level data)	Computed from dietary energy supply, taking into account how consumption levels are distributed across the population. Undernourishment is then computed using a population-specific minimum daily energy supply requirement. Computed by the FAO.	Assesses what proportion of the population has access to sufficient calories to meet their daily caloric requirements. Measures access to sufficient food at broad, aggregated level of the nation. Only measure related to nutrition security that is available for all nations annually. Energy focus. Provides limited information on quality of food.
Undernourishment (using household-level data)	Household consumption and expenditure surveys.	Based on actual food consumption or acquisition of food by a representative sample of the population. Better correlated with other measures of nutritional status than is the undernourishment measure based on dietary energy supply (Smith and Aduayom 2004). Enables food quality assessment.
Low height-for-age (stunting)	Height (or length) measurements of children 6 to 60 months or 6 to 36 months in age. Children with abnormally low growth are identified by comparison with physical characteristics of similarly aged children, disaggregated by sex, in a standard, nutritionally secure population.	Indicative of long-term nutritional status of children. Best measure of cumulative growth retardation.
Low weight-for-age (underweight)	Weight measurements of children 6 to 60 months in age. Similar analysis as above.	Nonspecific indicator of overall malnutrition. Measures a combination of chronic and acute malnutrition.

Table 2—Continued

Indicator	How collected	Comments
Low weight-for-height (wasting)	Weight and height measurements of children 6 to 60 months in age. Similar analysis as above.	Measures acute child malnutrition. Indicative of sharp short-term fluctuations in nutritional status. Most useful in emergencies where severity of the nutritional crisis is being assessed or short-term progress in nutritional status is being monitored.
High weight-for-height (overweight)	Weight and height measurements of children 6 to 60 months in age. Similar analysis as above; however, interest is in those with abnormally high weight-for-height.	Measures the prevalence of overweight children in the population.
Mid-upper arm circumference	Distance around the mid-upper arm. Standard threshold values used to determine whether a child is at risk.	Used in emergencies in similar contexts to use of the wasting measure.
Body mass index	Computed as weight (in kg) divided by height (in meters) squared. Standard threshold values used to determine whether an individual is underweight or overweight.	Indicator of nutritional status in adults and older children. Only indicator commonly used to assess both short- and long-term nutritional status of adults, usually women of childbearing age. Commonly used for assessing the prevalence of both underweight and overweight individuals in a population.
Qualitative indicators of food security	Individual and household surveys, community focus group discussions. These take into account the broader food economy of which an individual, household, or community is a part. However, they can be quite narrowly focused on key proxy indicators of food and nutrition security.	Relies on subjective assessment of aspects of local and household food security by respondents. Can be quite easy to administer and analyze. However, comparability of measures drawn from different populations and cultures is often problematic. Frequently used in emergencies to assess severity of the nutritional crisis. Also for establishing baseline nutrition security conditions in an area at risk of food insecurity.
Dietary diversity	At individual level, collected through detailed nutrition surveys; household level, from consumption and expenditure surveys; national level, using agricultural production and food import/export statistics.	Proxy measure for quality of diet. The more diverse a diet, the less likely are micronutrient imbalances. Measures include proportion of calories acquired from nonstaple foods and number of different food items or food groups consumed (individual or household).
Micronutrient deficiency	Based on biochemical analysis (laboratory, some field tests) or symptomatic diagnosis of deficiency-related disease: night blindness (vitamin A), goiter (iodine), anemia (iron).	Difficult to collect on a large scale. Biochemical measures require access to analytical laboratory facilities.
Infant mortality (under one year) and child mortality (under five years) rates	Census, demographic, and health surveys.	Proxy measures of nutrition security. Integrated measure of risks to child survival, among which poor nutritional status is a major factor.
Low birth weight prevalence	Proportion of babies born weighing less than 2500 g. Collected from health statistics.	Integrated proxy measure of nutrition security. As an outcome indicator, low birth weight reflects fetal growth retardation due to the poor health and nutrition of the mother. However, also serves as an indicator of risk of infant mortality and future poor health. Predicts, less precisely, economic and broad human potential of the child. From a life cycle perspective on nutrition and the intergenerational transmission of poverty within society (see Figure 1), low birth weight is a critical measure.

Source: Compiled by author.

3. Food and Nutrition Security in Africa: Current Status and Trends

In this chapter, a broad overview is given of the current nutritional and food security status of Africans. A range of information is presented to provide different perspectives on food and nutrition security. In line with the conceptual model of the determinants of nutritional status, information is provided on availability of and access to food, indicators of a sanitary environment, the efficacy of available health care, and whether children are likely to receive knowledgeable care within their homes. Most of the information is presented at a national level of analysis. The chapter starts by considering broad indicators of nutritional status.

Nutritional Status and Malnutrition

Globally, progress is being made in reducing nutrition insecurity. The prevalence of child malnutrition has declined significantly over the past 25 years. Rates of stunting (low height-for-age) among children aged 6 months to 5 years in all developing countries dropped almost 20 percentage points, from 49 to 30 percent, between 1980 and 2000, while underweight (low weight-for-age) rates dropped from 38 to 25 percent (de Onis et al. 2004). Taken as a whole, however, Africa is an unfortunate exception to these trends. As shown in Table 3, estimates of reductions in malnutrition are much lower in Africa than elsewhere. Over the period 1980 to 2000, stunting rates declined by less than 4 percentage points, so that, with population growth, the actual number of stunted children actually increased by more than 12 million. Both relative and absolute numbers of underweight children in Africa increased over the same period.

Moreover, as shown in Figure 4a, inconsistent trends are seen in the prevalence of malnutrition across the seven African countries for which three data points are available.[8] While Table 3 shows that the broad trends in the prevalence of stunting are slightly downward, the aggregate continental trend is not reflected consistently at the individual country level as economic, food, and social sector policies change (or are not given consistent support), conflict shatters any progress that has been made, or emergency food crises are not effectively managed. The patterns in Figure 4a show that several of the nations in Africa that have had good economic performance over the past decade—Egypt, Ghana, and Uganda—were able to reduce malnutrition further. Such performance is not sufficient, however, as evidenced by Mali, which is frequently noted alongside Ghana and Uganda as being among those African countries that have made important gains in economic development over this period. The prevalence of stunted children in Mali has increased even as the Malian economy has been growing. Moreover, downward trends cannot necessarily be sustained. Zimbabwe shows a reversal in its fight against child malnutrition, a reversal that likely has been exacerbated by the economic challenges this nation has faced more recently.

[8] Trends over the past two decades based on two data points can be determined for 11 additional countries in Africa. For 6 of these (Benin, Burkina Faso, Cameroon, Kenya, Niger, Nigeria), malnutrition is increasing. In 2 (Madagascar, Malawi), little change is seen. And in 3 (Côte d'Ivoire, Rwanda, Togo), the prevalence of stunting is declining.

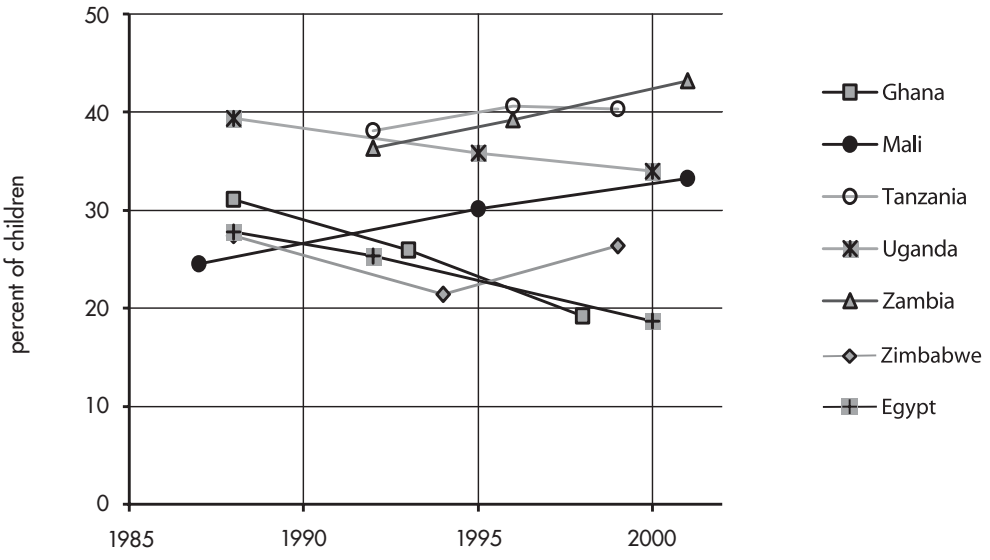
Table 3—Estimated prevalence and numbers of underweight and stunted children 0–5 years old in Africa, 1980 to 2005 (projected), by subregion

	Prevalence (%)				Numbers (millions)			
	1980	1990	2000	2005	1990	1995	2000	2005
Stunted								
Africa	**39.0**	**36.9**	**35.2**	**34.5**	**32.8**	**39.6**	**45.1**	**48.5**
Eastern	44.4	44.4	44.4	44.4	12.0	15.8	19.4	21.6
Middle	46.6	42.2	37.8	35.8	4.5	5.6	6.8	7.4
Northern	34.0	27.4	21.7	19.1	6.2	5.8	4.6	4.2
Southern	26.2	25.4	24.6	24.3	1.3	1.5	1.5	1.4
Western	36.5	34.7	32.9	32.0	8.8	10.9	12.7	13.9
All developing countries	*48.6*	*37.9*	*29.6*	*26.5*	*222.6*	*204.3*	*162.1*	*147.5*
Underweight								
Africa	**23.5**	**23.6**	**24.2**	**24.5**	**19.8**	**25.3**	**30.9**	**34.5**
Eastern	24.3	26.7	29.2	30.6	6.6	9.5	12.8	14.8
Middle	29.6	27.8	26.1	25.3	2.9	3.7	4.7	5.3
Northern	15.4	12.3	9.7	8.6	2.8	2.6	2.1	1.9
Southern	14.3	14.0	13.7	13.6	0.7	0.8	0.8	0.8
Western	28.4	27.8	27.1	26.8	6.9	8.8	10.5	11.7
All developing countries	*37.6*	*30.1*	*24.8*	*22.7*	*172.1*	*162.2*	*135.5*	*126.5*

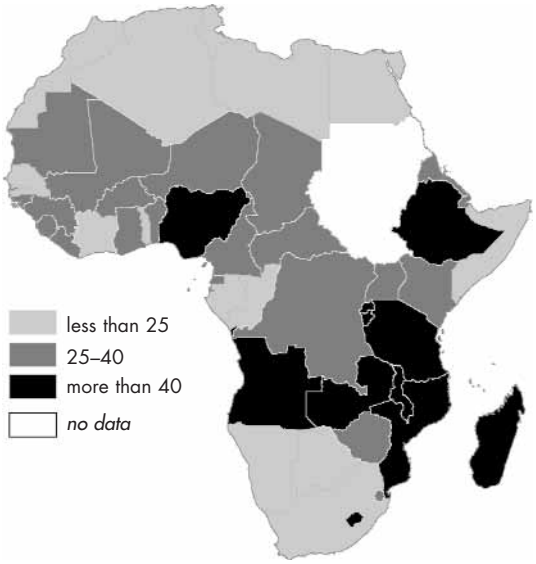
Source: de Onis et al. 2004, using data from WHO 2003.

Figure 4—Changes in stunting (low height-for-age) for children aged 6 to 36 months in recent years for countries in Africa for which three data points are available, and prevalence of stunting in preschoolers, by country in Africa, latest survey

4a. Stunting trends, children 6 to 36 months, selected African countries



4b. Stunting trends—Percentage of preschool children (aged 6-60 months) with low height-for-age, latest survey



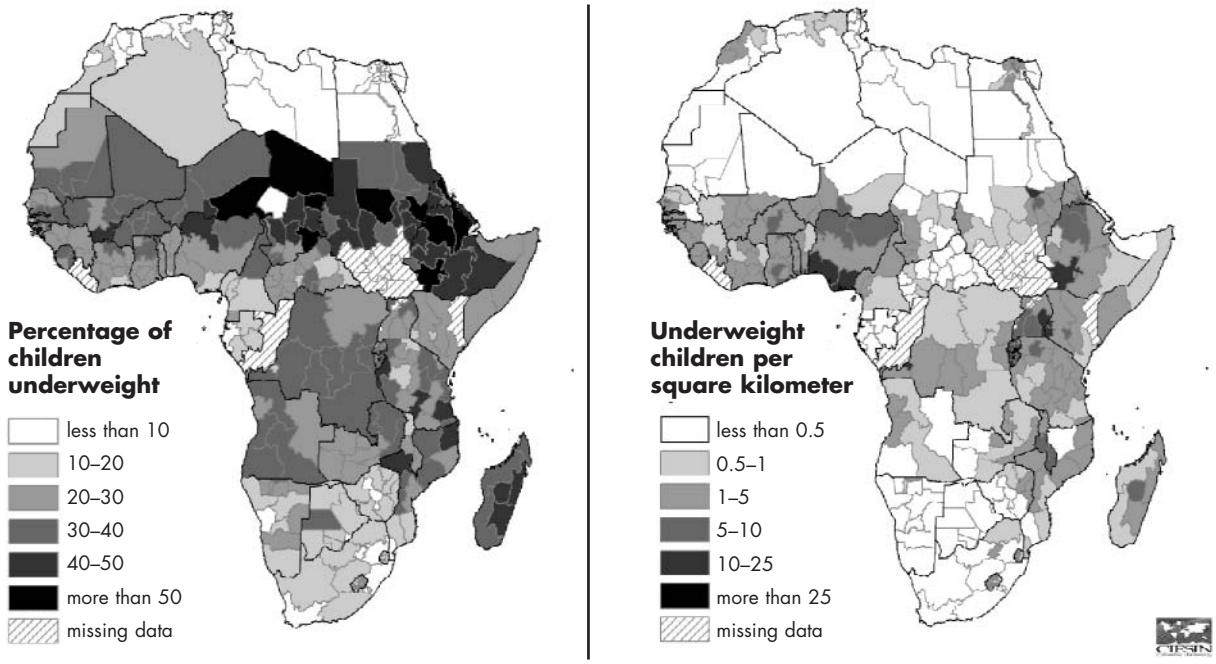
Sources: ORC Macro 2004; MEASURE DHS+ STATcompiler.
Note: In the chart, the stunting prevalence values are based on those for children aged 6 to 36 months. The values portrayed in the map are based on children aged 6 to 60 months. For the 44 DHS surveys in Africa for which stunting rates are provided for both age ranges, the average stunting rate for children aged 6 to 60 months is 3.3 percent higher than for those aged 6 to 36 months.

National and broader regional patterns can be seen in the data presented on stunting and underweight in Table 1 and in the map portraying the national prevalence of stunting in Figure 4b. North Africa stands out as an area in which child malnutrition is being addressed quite effectively. In Sub-Saharan Africa, the pattern is less encouraging and somewhat more complex. Coastal West and Central Africa and far Southern Africa, excepting Lesotho, have lower rates of child malnutrition. Landlocked countries and others with a large proportion of their population in the interior tend to have higher rates. Mental maps imprinted in the early 1980s of poorly nourished populations in the Sahel and Ethiopia remain relatively accurate today. The grouping of countries with the highest prevalence of stunting, however, is found in Southern and Eastern Africa, reflecting a complex set of challenges that include civil conflict, economic downturns due to macroeconomic mismanagement or commodity price shocks, and droughts and floods, or the legacies of such events. Finally, any effort to reduce the level of malnutrition in Africa must target Nigeria and DR Congo. Large populations coupled with high levels of malnutrition mean that 19 percent of the almost 47 million stunted preschoolers in Africa are found in Nigeria, while 8 percent are found in DR Congo.[9]

The prevalence of malnutrition can also be assessed at a subnational level. Using data from a range of demographic and health surveys, the Center for International Earth Science Information Network (CIESIN) of the Earth Institute at Columbia University (USA) recently developed a series of maps describing the incidence of malnutrition across the continent (HTF 2003). Two of these are shown in Figure 5. The map on the left is comparable in form to the map shown in Figure 4b but

[9] With Ethiopia, 40 percent of all stunted preschoolers on the continent are found in these three countries. Almost 14 percent of Africa's stunted children aged 6 to 60 months are Ethiopians.

Figure 5—Subnational estimates of the prevalence of underweight preschool children and area density of underweight children in Africa, latest available surveys

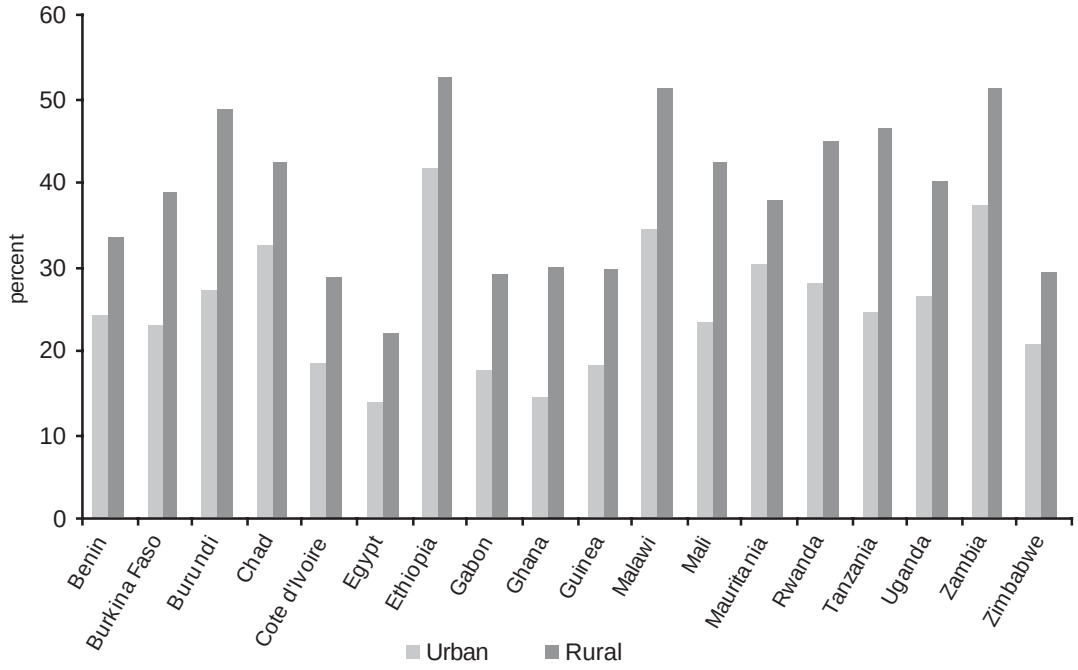


Source: HTF 2003.

uses underweight prevalence, instead of stunting, and subnational spatial units. The map on the right provides a different perspective on malnutrition. By taking into account the area density of the population from which the estimates of underweight are being made, the map provides an indication of the spatial intensity of the problem of underweight. These maps were used as part of an analysis of hunger hot spots in Africa. In this light, although problematic across much of subtropical Africa, Figure 5 shows quite clearly that malnutrition is most dense in a select handful of areas—in both southern and northern Nigeria; in the Ethiopian highlands; in Burundi, Rwanda, and southern Uganda; and in southern and central Malawi. It is in these areas that large numbers of malnourished children are concentrated.

Another important evaluation of nutrition security in Africa can be made by considering place of residence—rural or urban. Using data from Demographic and Health Surveys (DHS) carried out over the past seven years, Figure 6 shows stunting prevalence for under-fives, disaggregated by urban or rural residence. In all 18 countries, malnutrition as measured by stunting is more prevalent in rural areas than in urban centers. Although food is produced on farms in rural areas, this does not mean that the quality of rural diets is good. Figure 7 compares the diets of young children in rural and urban areas in six African countries. Across all of the countries, urban children are more likely to eat a broader range of foods and more nutrient-dense foods. In general, urban children in Africa have access to greater amounts of micronutrients than do rural children. Consequently, one should expect that, all things otherwise being equal, the nutritional status of children in rural areas will be worse than in urban centers.

Figure 6—Stunting prevalence among preschoolers by urban or rural residence, selected African countries



Sources: ORC Macro 2004; MEASURE DHS+ STATcompiler, most recent DHS survey.

Equally important, safe water and adequate sanitation, health services, and the knowledge needed by mothers or other caregivers to provide effective care to children are relatively less accessible in rural areas. Moreover, many farmers in Africa are net purchasers of food, for which nonfarm income sources may be required. Often such income-earning opportunities are not readily available in rural areas. Consequently, when coupled with markets that are unable to reliably provide food, many rural households are unable to access from the market the food they require beyond that available from their own production.

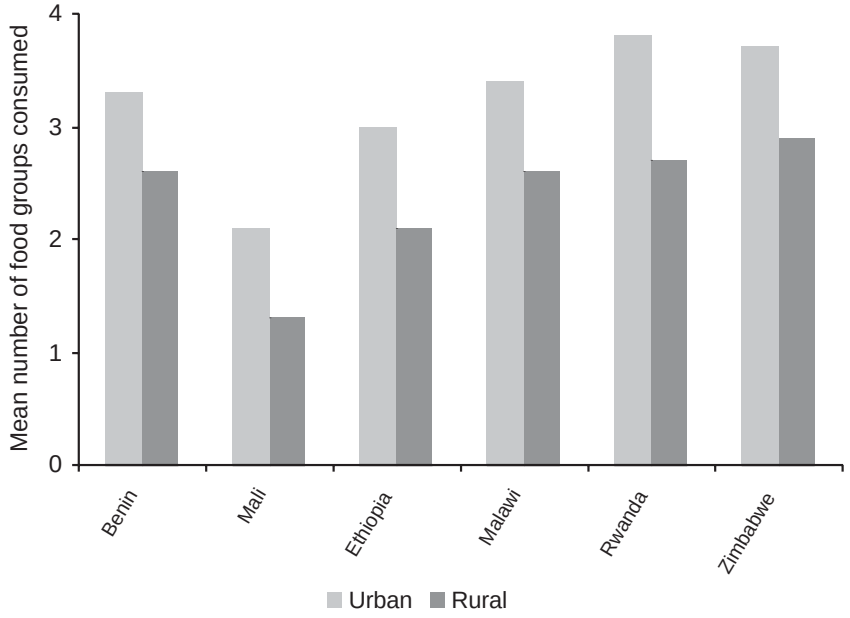
It is not correct, however, to argue that nutrition insecurity is primarily a rural phenomenon. In most of the countries examined in Figure 6, at least one out of five urban preschoolers is stunted. Poorer sections of African cities commonly have a less hygienic environment than is found in rural areas. Regular wage employment is often difficult to find in cities, reducing access to food. Moreover, the proportion of the population living in urban areas in several of these countries is greater than one third. Consequently, even though stunting prevalence is lower in urban areas than in rural zones, the absolute numbers of stunted preschoolers living in urban areas in Africa is significant.

The results shown in Figure 7 point in particular to differences in micronutrient intake levels. The burden of disease attributed to micronutrient deficiencies is often referred to as "hidden hunger": The clear link between a poor physical state and a lack of carbohydrate, protein, and fat in the diet is not as readily seen when considering micronutrient deficiency.[10] There is a clear lack of certain kinds of foods, but it is a question of quality rather than

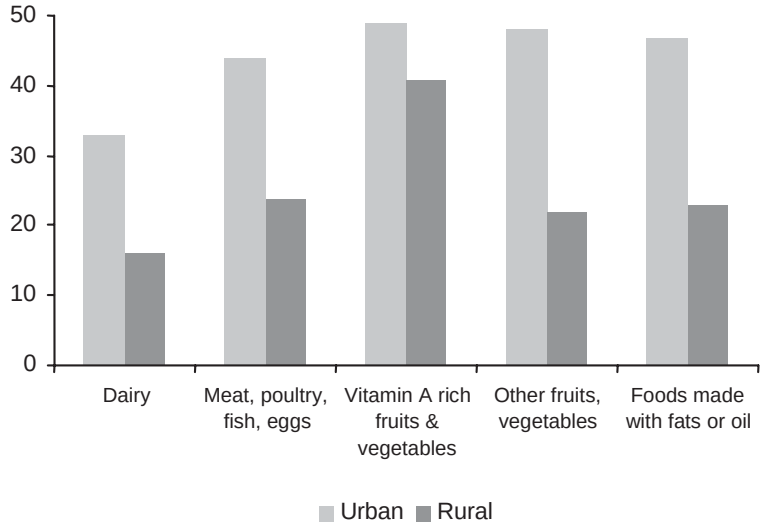
[10] Micronutrient deficiencies and hunger—as defined in Box 3 as an outcome of inadequate consumption of macronutrients—are not mutually exclusive. Indeed, micronutrient deficiencies should be expected where people are unable to consume sufficient carbohydrate, protein, or fat. Such deficiencies can also be significant health problems in populations that are generally not hungry but have relatively poor-quality diets. Hence, the term "hidden hunger" is used to characterize micronutrient deficiencies.

Figure 7—Diet quality comparisons for rural and urban areas, children aged 6 to 23 months, select African countries

7a. Dietary diversity: Mean number of food groups from which food was consumed yesterday



7b. Percent of children who ate foods from given food group yesterday (Benin, Mali, Ethiopia, Malawi, Rwanda, Zimbabwe)



Source: Ruel and Arimond 2003, computed from data collected in latest DHS surveys.

quantity. Moreover, subclinical levels of deficiency can have serious and irreparable health consequences. As noted earlier, micronutrient deficiencies are most common in areas where diets lack variety. Such diets are common in many farming zones of Africa or in poorer urban households that cannot afford to purchase fruits, vegetables, or animal-source foods. Four principal micronutrient deficiencies are of public health concern in Africa—vitamin A, iron, zinc, and iodine. Table 4 shows the principal sources of the micronutrients and the health effects of deficiency. Figure 8 presents maps on several of the health effects of deficiencies in vitamin A, iodine, and iron across the continent. [11]

Table 4—Micronutrients: Principal dietary sources and health effects of deficiency

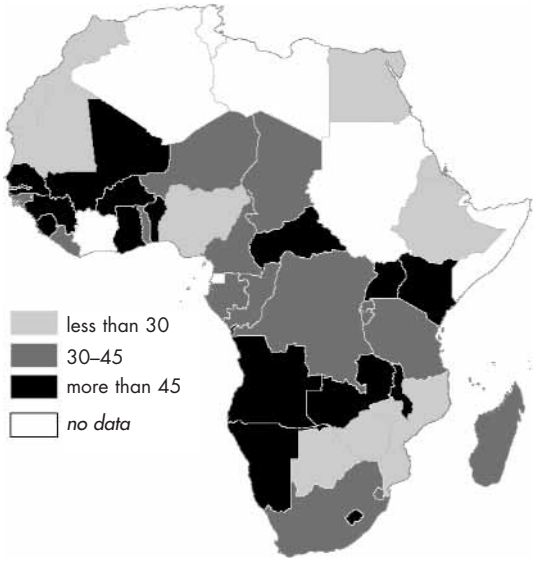
Micronutrient	Principal dietary sources	Health effects of deficiency
Vitamin A	Liver, egg yolk, milk and dairy products, green leafy vegetables (especially kale, amaranth, sweet potato, cowpea, and cassava leaves), yellow- and orange-colored fruits and vegetables (carrots, pumpkin, mango, papaya, oranges), orange-fleshed sweet potato, red palm oil.	Night blindness as the first stage in a set of increasingly severe eye problems (xerophthalmia) that lead to corneal ulcers and blindness. Impaired resistance to infection.
Iron	Liver, meat, poultry, fish, cereals (especially whole grain), nuts, beans, and green leafy vegetables. Also commercially produced iron-fortified foods.	Anemia, especially in women and children. Fatigue, with adverse effects on learning, productivity, and earnings. Pregnancy complications, maternal mortality, premature birth, and low birthweight. In children, significant loss of cognitive abilities as well as decreased physical activity and reduced resistance to disease.
Zinc	Animal and fish products, beans, and other legumes.	Poor growth, reduced resistance to infectious diseases, increased incidence of stillbirths, and possibly impaired cognitive development.
Iodine	Underlying cause of iodine deficiency is a deficiency of iodine in the local soil on which vegetation grows, animals graze, and crops are cultivated. This results in a shortage of iodine in local foodstuffs. Iodine fortification is the principal source of iodine, usually through iodized salt.	Mental retardation and stunted growth among children—"cretinism." Goiter is a symptom of iodine deficiency, which in itself may pose social, economic, and physiological burdens on the individual.

Source: FAO 1997.
Note: Humans are generally less able to absorb and utilize the vitamin A, iron, and zinc that come from plant foods than those that come from animal and fish sources.

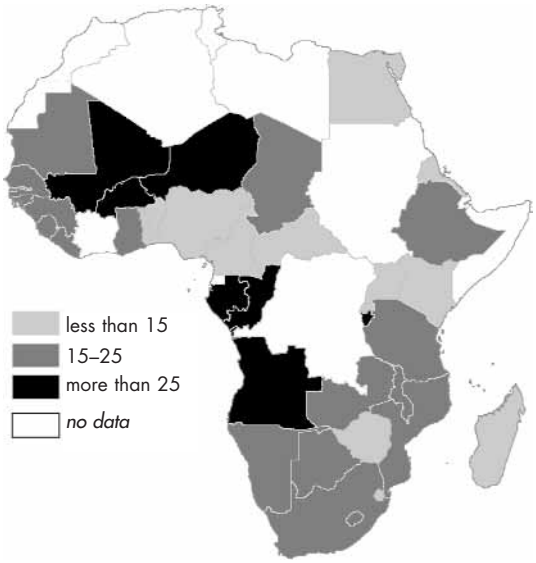
[11] Although zinc deficiency is recognized as a common and important public health problem, much less is known about the health effects of zinc deficiency than about the specific health impacts of deficiency of the other three critical micronutrients. Moreover, no reliable measures of milder zinc deficiency have yet been found. Consequently, estimates of the health burden imposed by zinc deficiency are much coarser than those for deficiencies of vitamin A, iron, and iodine.

Figure 8—Manifestations of micronutrient deficiencies in Africa: Vitamin A deficiency in children, goiter rate in children (lack of iodine), and iron deficiency anemia in women

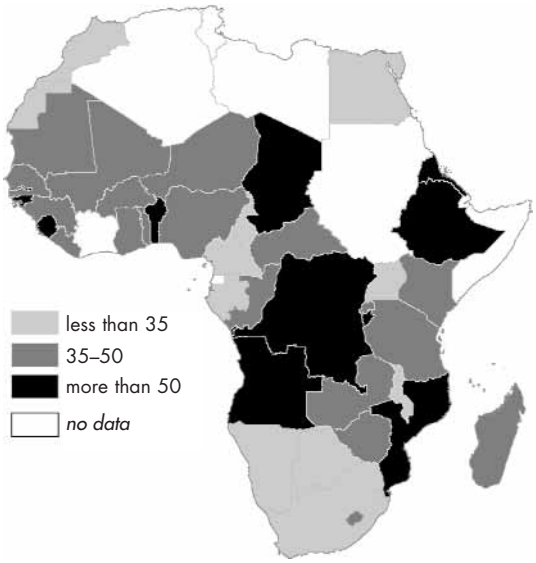
8a. Vitamin A deficiency in children
Estimated percentage of children under 6 with subclinical Vitamin A deficiency



8b. Total goiter rate in school age children
Percentage of children with any grade of goiter detected by palpitation



8c. Iron deficiency anemia in women
Estimated prevalence in women aged 15 to 45 years, percent



Source: UNICEF and MI 2004.

Table 5—Proportion of total estimated annual burden of disease in Africa attributed to major risk factors

Risk factor	% of disease burden	Risk factor	% of disease burden
Childhood and maternal undernutrition	*29.5*	*Sexual and reproductive health risks*	*20.1*
Underweight	18.0	Unsafe sex	19.4
Iron deficiency	2.9	Lack of contraception	0.8
Vitamin A deficiency	4.7	*Environmental risks*	*10.1*
Zinc deficiency	3.9	Unsafe water, sanitation, and hygiene	5.3
Other nutrition-related risks	*3.0*	Indoor smoke from solid fuels	3.5
High blood pressure	1.3	Other	1.1
High cholesterol	0.6	*Occupational risks*	*0.7*
High BMI	0.4	*Addictive substances*	*2.9*
Low fruit and vegetable intake	0.4		
Physical inactivity	0.3		

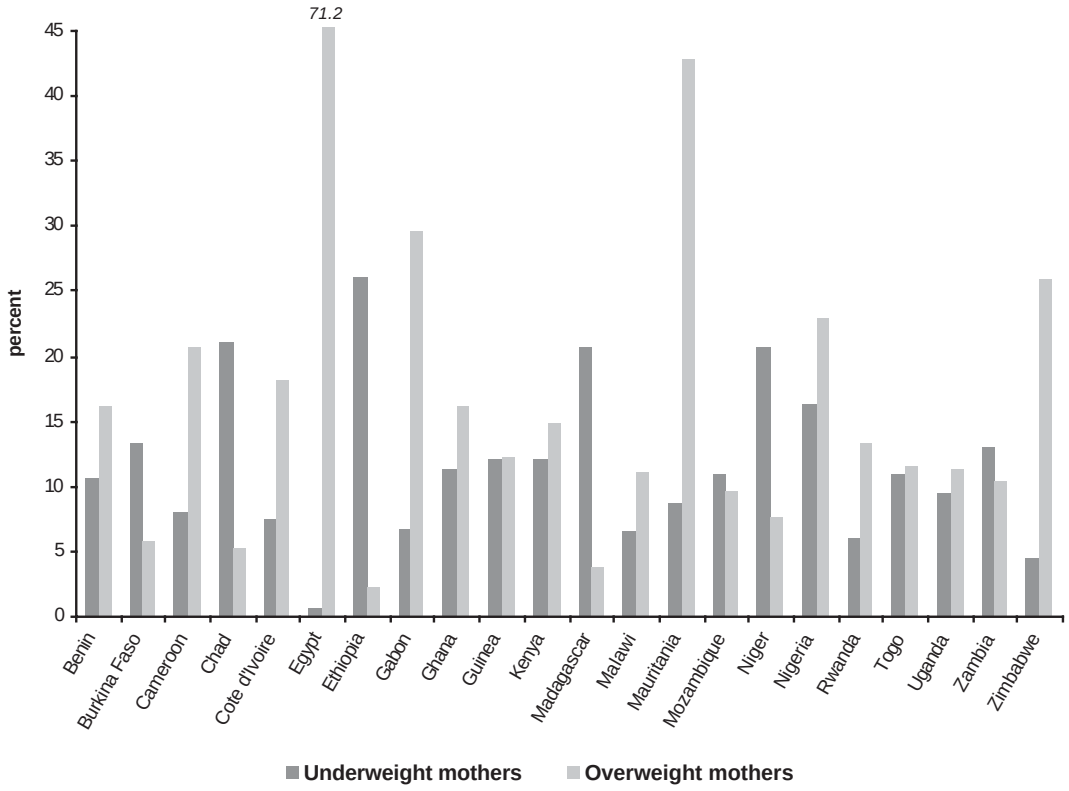
Source: Ezzati et al. 2003.
Note: Proportion of total estimated annual burden of disease is the share of disability-adjusted life years (DALYs) attributed to major risk factors. Total estimated DALYs lost annually in Africa is 349,513,000.

Table 5 shows the estimated burden of disease across the continent that can be attributed to a range of major risk factors. The burden of disease is calculated by estimating the number of active and healthy years of life across the population that is lost to these major risks—disability-adjusted life years (DALYs). Among the major risk factors listed are those due to several micronutrient deficiencies—iron, vitamin A, and zinc. One-third of the disease burden attributable to childhood and maternal undernutrition in Africa is due not to an absolute lack of food but to deficiencies in the quality of that food.

Considerable progress has been made both globally and in Africa over the past 15 years in addressing such micronutrient deficiency diseases. This progress has come in part because, although these problems are extremely serious, their solutions are relatively inexpensive to implement—they include salt iodization, fortification of commonly consumed commercial foods, and supplemental doses of vitamin A and iron for women and children. The simplest and most sustainable way to eliminate micronutrient deficiencies is by making sure that individuals and households know the importance of a balanced diet and have access to what is required to consume such diets. As a result of efforts such as these, globally, the prevalence of iodine deficiency has been cut in half since 1990 and many countries are now providing more than 70 percent of their children with at least one vitamin A capsule a year (UNICEF and MI 2004). Although it is difficult to quantify the progress made in reducing micronutrient deficiencies in Africa, in line with global efforts, headway has been made on the continent.

As seen in the maps in Figure 8, however, many Africans still consume insufficient amounts of the relatively small quantities of these nutrients that they require. High levels of anemia reduce the ability of women to work and provide adequate care for their children and make pregnancy and childbirth much more risky for them than would otherwise be the case. Between 15,000 and 20,000 African women die each year owing to severe iron-deficiency anemia. The pattern of the prevalence of goiter shown in Figure 8b points to hundreds of thousands of children in Africa who have lowered intellectual capacity due to iodine deficiency. Vitamin A deficiencies in children are common across the continent, reducing their ability to resist infection and contributing to the deaths of more than half a million African children annually (UNICEF and MI 2004).

Figure 9—Proportion of recent mothers who are underweight (BMI<18.5) or overweight (BMI>25.0), selected African countries



Sources: ORC Macro 2004; MEASURE DHS+ STATcompiler, most recent DHS survey.

Policymakers need to be as concerned with micronutrient deficiencies and the quality of food consumed as they are with broad hunger and the quantity of food consumed. Micronutrient deficiencies remain a major source of suffering across Africa, forcing people to live unhealthy, short lives, unable to reach their full mental and physical potential. By reducing the productivity and the potential of the workforce, micronutrient deficiencies are a critically important barrier to attaining economic growth and realizing a better future throughout Africa.

Finally, nutritional insecurity can also arise from overnutrition. Compared with the developed world and particularly among children, this is not yet a significant problem in Africa. De Onis and Blössner (2003) provide information on overweight (high weight-for-height) prevalence among children for those countries with recent data, including 32 countries from Africa. Overall, on a population-weighted basis, 3.9 percent of preschoolers in these African countries are overweight. The highest prevalence rates are found in the North African countries, as well as South Africa and Zimbabwe. Prevalence levels in these countries range from 6.7 to 10.1 percent.

Disease due to overnutrition is present in Africa, however, and it does contribute to the burden of disease on the continent, as shown in the "Other nutrition-related risks" category in Table 5. The DHSs collect body mass index (BMI) data on women who have given birth in the previous three or five years. Contrary to common perceptions, the most recent surveys from 22 countries across the continent show that the prevalence of overweight in mothers (BMI > 25.0) exceeds that of underweight (BMI < 18.5) in the majority of the countries surveyed (Figure 9). Although the majority of

Africans face real threats to their physical well-being owing to a lack of the nutrients they require, clearly in many parts of Africa—particularly, though not exclusively, in urban centers in better-off countries—segments of the population are undergoing a nutrition transition toward diets containing more sugar, fats, and preprocessed foods at the same time as their activity levels are reduced. The consequent levels of overweight and obesity will lead to increases in diet-related chronic diseases, including heart disease, diabetes, high blood pressure, and stroke (Popkin et al. 2001). As in Latin America and some parts of Asia, African countries experiencing economic growth will increasingly bear two nutritional burdens—the costs associated with millions of undernourished children and the costs of caring for adults suffering from these overnutrition-induced chronic diseases.[12]

Availability of and Access to Food

In terms of availability of and access to food, food security is also improving globally, if less dramatically than nutritional status. Undernourishment, as computed by the Food and Agriculture Organization of the United Nations (FAO), is a measure that combines an estimate of the availability of calories at the national level with some assessment of the distribution of those calories across the population. The proportion of the population that is unable to meet their recommended daily energy supply can then be estimated. As shown at the bottom of Table 1, the proportion of the undernourished in the population of the developing world dropped from 20 percent in 1990–92 to 17 percent in 1999–2001 (FAO 2003).[13]

The level of undernourishment in Africa, however, is significantly higher than the current global level, and progress in reducing the numbers of undernourished is not quite as strong as the global trends. The proportion of the undernourished in the population of Africa only dropped from 29 percent in 1990–92 to 27.5 percent in 1999–2001. Although progress is being made over wide areas of the continent, it often occurs in areas with crushing levels of undernourishment, so that many remain undernourished (Figure 10). Indeed, with population growth and the poor progress being made in many countries, the overall size of Africa's population estimated to be undernourished has actually risen over the past several decades, from 111 million in 1969–71 to 171 million in 1990–92 to 204 million in 1999–2001. Several countries saw large increases in the number of undernourished between 1990–92 and 1999–2001. Conflict in DR Congo contributed to an increase of more than 25 million. In Tanzania dislocations associated with economic restructuring efforts coincided with poor cropping conditions, leading to 5.7 million more undernourished. Burundi, Madagascar, Somalia, and Zambia each experienced an increase of more than 1 million undernourished. In contrast, reductions in the number of undernourished nationally were found in only a handful of countries, and these reductions were relatively small. Only three countries decreased the number of undernourished by 1 million or more—Ghana (3.1 million), Nigeria (2.1 million), and Malawi (1.0 million).

---

12 The life cycle perspective on the intergenerational transmission of malnutrition presented in Figure 1 applies to many overweight mothers, just as it applies to undernourished women. Although inadequate access to food may not be the principal significant underlying determinant of malnutrition within the household of an overweight mother, poor knowledge of proper care and feeding practices and the way in which decisions that affect individual diet and care within the household are made may contribute both to the woman's own poor nutritional status and to her children's malnutrition (Garrett and Ruel 2003).

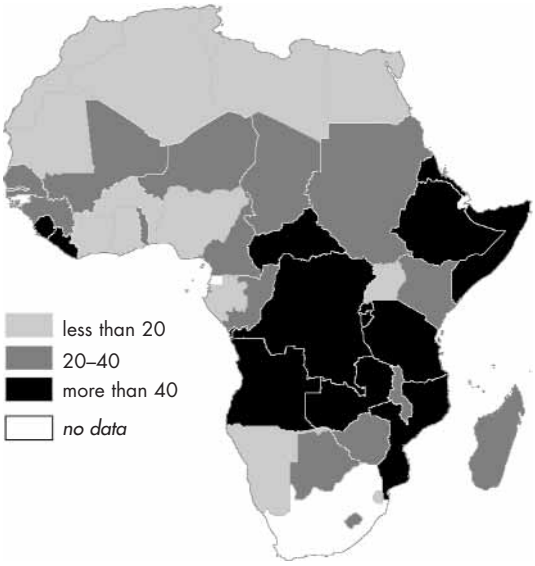
Second, in Figure 9, the lower than might be expected incidence of underweight relative to overweight women partly reflects the poor survival of undernourished children—one of every six Sub-Saharan African girls dies before her fifth birthday, in large part because of undernutrition.

13 Much of the global progress in reducing undernutrition over this period, however, can be attributed to the significant progress made in China alone, where the number of malnourished declined by almost 60 million. Elsewhere, progress was mixed, if not negative.

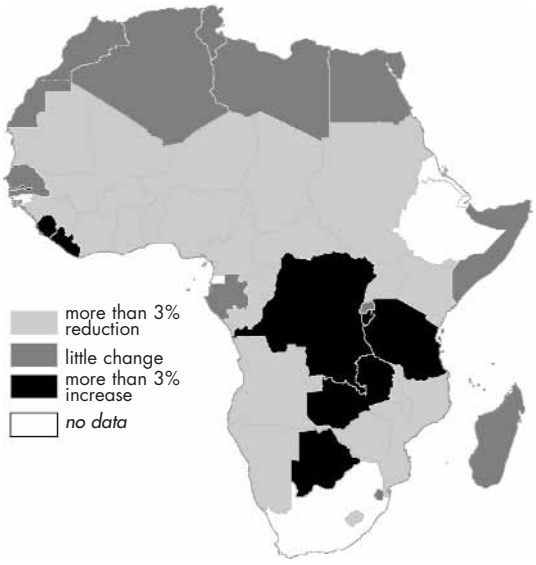
Figure 10—Prevalence of undernourishment by country in Africa and changes in undernourishment

10a. Population undernourished, 1999–2001

Percentage of population unable to meet minimum required dietary energy supply



10b. Percentage change in undernourished population, 1990–92 to 1999–2001



Source: FAO 2003.

Moreover, food emergencies so severe that they require an international response remain an important feature in Africa. The World Food Programme estimated that 38 million persons in Africa in 2003 were facing serious food shortages due to drought and floods, civil strife and consequent refugees and internally displaced people, or land disputes (WFP 2004). Civil conflict created food emergencies in Angola, Burundi, Congo, Côte d'Ivoire, DR Congo, Guinea, Liberia, Sierra Leone, Sudan, and Uganda. Drought and, in some countries, floods affected Eritrea, Ethiopia, Sudan, much of Southern Africa, and the western Sahel. Frequently the food insecurity caused by these primary factors is exacerbated by economic crises, HIV/AIDS, or political disputes that further reduce the ability of households and governments to effectively cope with these emergencies, with the result that more people go hungry. Although the countries affected by food emergencies might change from year to year, little progress is seen in reducing the incidence of such emergencies across the continent.

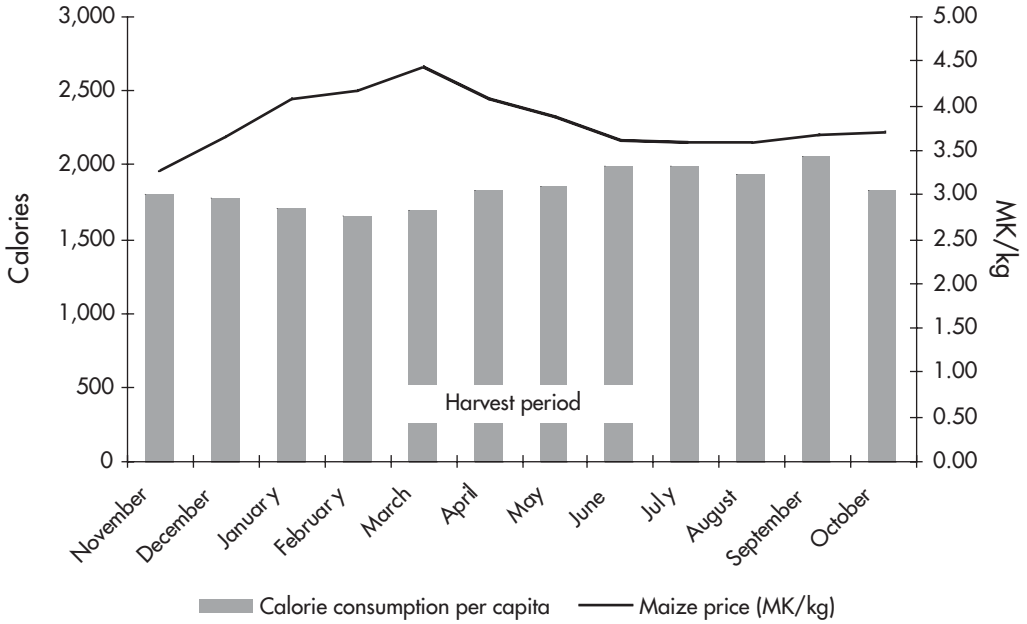
Although international media portray food insecurity in Africa mainly as the result of disconnected crises requiring immediate food aid to avert starvation, the hunger crises seen in Africa are primarily a manifestation of much broader chronic food insecurity. Undernutrition in its various forms in Africa is primarily a chronic condition. The food crises emerge when broad negative shocks—whether due to drought, floods, or other natural disasters; economic downturns; or conflict, and often in combination or in sequence—affect chronically food-insecure populations. Those suffering in these acute food insecurity incidents were food insecure or vulnerable to begin with. However, while not to discount the severity of acute hunger crises in Africa, there are an additional 160 million persons in Africa who are undernourished. Although they may not necessarily face an acute crisis in access to food, their access is not secure. They are vulnerable. Indeed, if any of the 160 million were to be

affected by one of these broad shocks or a range of other more individual shocks—death in the household, loss of an income source, chronic illness, and so on—most would soon face an acute hunger crisis.

Although the frequent food crises in Africa require rapid emergency food relief programs to meet the needs of the 30 to 40 million people affected annually, the chronic nature of food insecurity in Africa suggests that all African countries should consider putting in place formal social safety net programs that provide direct transfers of cash, food, agricultural inputs, or other goods to those vulnerable to food crises. If governments are unable to fiscally sustain such formal programs, at a minimum they should support existing, traditional safety net institutions, such as the informal transfers of cash, assets, or dependents between related households, savings clubs, and group labor organizations. Such safety nets strengthen the tenuous access to food of these needy households and individuals. Moreover, such programs can have a developmental aspect, whereby they not only protect access to food but also promote increased access to food for those in need. Public works programs, in particular, can provide needed public investments, particularly in social, transport, and market infrastructure, that will provide medium- to longer-term economic and nutritional benefits to local residents, while helping participant households access the immediate food they require through the wages paid (Smith and Subbarao 2003).

This chronic food insecurity has an important temporal dimension. Because most crops in Africa are rainfed, food availability follows a strongly seasonal pattern. Relatively high levels of food are available in the immediate postharvest season, with levels declining to the period of the hungry season, or soudure, just before the next harvest. Food price patterns mirror food availability, rising as food supplies decline through the postharvest period. As shown in Figure 11, rural Malawi provides an example of the pattern seen in many areas of Africa that receive a single rainy season. For most households in such areas, access to food is critically dependent on the level of agricultural production achieved. Several other features, however, are important to consider. First, this seasonality in

Figure 11—Mean rural per capita daily calorie consumption and average rural maize prices, by month, Malawi, 1997–98



Source: Poverty Monitoring System 2000.

access to food is also due to inefficient market systems that are unable to supply sufficient quantities of food in response to growing demand through the year, thereby exacerbating food price swings. Second, irrigation and agricultural water management is an important technical solution to such seasonality in production and consumption, as well as a means to guarantee reliability in the levels of production from year to year. Only 4 percent of cropland in Sub-Saharan Africa is irrigated, compared with a global level of almost 20 percent (World Bank 2003). Finally, better food storage and preservation can help ensure that all of the food harvested is retained for consumption or other productive use, either directly or through sale on the market. For all three factors, increasing investment and, where necessary, research can mitigate the effects of seasonality on food availability and access.

What level of access to food do most Africans enjoy? This section considers several dimensions. Two-thirds of Africans reside in rural areas, with the majority engaged in crop and livestock production for both their own use and market sale. For all Africans, but rural African households in particular, food and nutrition security is closely tied to agricultural productivity. Higher production on one's own farm or from one's own herds enhances household food security. For food purchasers, higher production generally means lower food prices and access to a greater quantity of food in the market for a given income level. Elsewhere around the globe other underlying determinants of nutritional status, such as women's education and its impact on the quality of care provided or the availability of health resources, are of greater importance, but in Africa the relatively low food availability is the most important underlying determinant of the high levels of child malnutrition observed.[14] Although other determinants of child nutritional status in Africa also exhibit important deficiencies, the most potent force for reducing malnutrition in Africa is raising food availability through increased agricultural productivity and trade (Smith and Haddad 2000, 84).

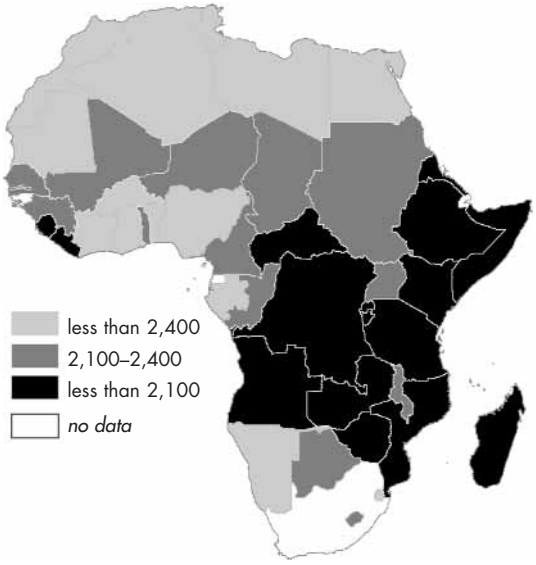
The four maps in Figure 12 provide some indication of the current availability and access to food in Africa. Availability of food is assessed based on total dietary supply (from food balance sheet data) and an index of food production, while access to available food uses of purchasing power per capita GDP and poverty headcount (proportion of the population living on less than US$1 per day) as proxy measures. The trends are not encouraging. Although the measures should be interpreted cautiously, a moribund food crop sector and very low purchasing power is found in combination in quite a few countries, particularly in Eastern and Central Africa. In such countries, it is likely that many rural households are unable to produce as much food as they require from their own land and cannot afford to go to the market to make up any deficiencies. Chronic food insecurity results. Any future negative shock to household well-being likely will propel them into deepening malnutrition and ill health.

Food crop production is not increasing at a rate necessary to meet population growth, currently averaging 2.4 percent annually across Africa. To meet the needs of this growing population through food crop production, food production indexes of around 140 should be seen in Figure 12b. Although good performance is seen in West Africa and, in particular, the Sahel, many African countries have been unable to raise their food crop production at this required rate. The reasons for poor performance in agricultural production in Africa, both for food crops and for cash crops, are well known. Poverty constrains the ability of farming households to invest in productive assets and agricultural technologies. Poor market systems result in high costs of inputs and low prices for farm outputs, providing poor economic incentives for farmers to invest in yield-enhancing, sustainable agricultural production systems. While farmers elsewhere in the world in 2000 used an average of 111.5 kilograms (kg) of fertilizer per hectare (ha) of arable land, farmers in Sub-Saharan Africa used almost 100 kg/ha less, or 12.7 kg/ha (World Bank 2003). State policies often result in inordinate levels of indirect taxation of farmers, further restricting the ability of farmers to profitably work their land. With increasing population and rising pressure on limited arable land, continual mining of existing natural resources, particularly of soil fertility, results in declining yields through time.

[14] On the underlying determinants of nutritional status, see Figure 2.

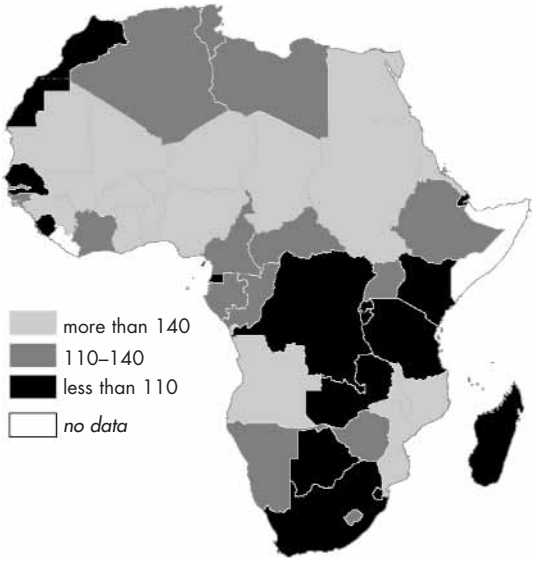
Figure 12—Daily dietary energy supply available, food production index, GDP per capita, and percentage of population living on less than US$1 per day in Africa, by country

12a. Dietary energy supply, 1999–2001
kcal/capita/day
Computed from total food production and food imports and exports



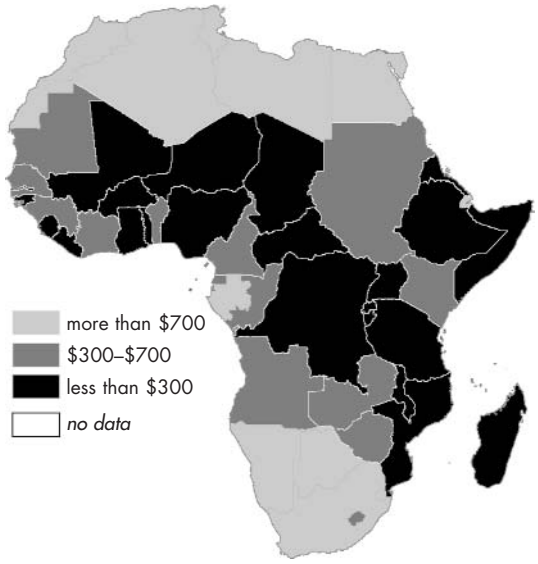
Source: FAO 2003.

12b. Food production index, 1998–2000
100 = aggregate value of national food crop production in 1989–91



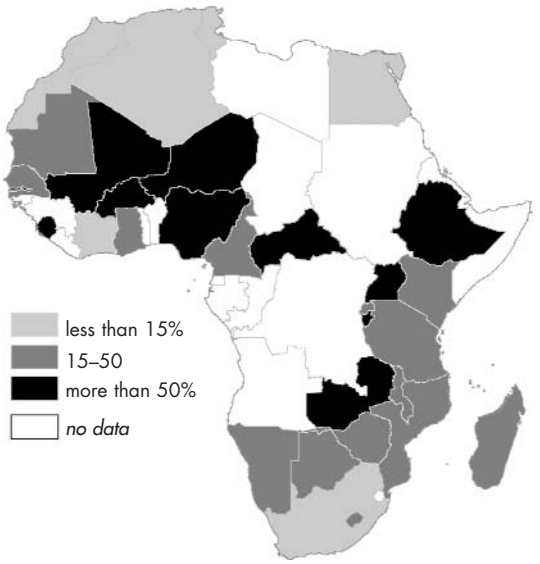
Source: World Bank 2003.

12c. GDP per capita (US$) 2002
Gross Domestic Product



Source: UNICEF 2003.

12d. Population living on less than US$1 per day
PPP adjusted US$, latest data available



Source: UNDP 2003.

Although signs are promising for a turnaround, throughout the 1990s governments across the continent sharply reduced their investments in public goods in the agricultural sector—primarily extension services and research. The share of agriculture in total government spending in Sub-Saharan Africa declined from 6.5 percent in 1992 to 4.2 percent in 1998 (FAO 2001). In most countries in Africa, food crop production, relative to cash crops, is frequently the most disadvantaged by government policies and spending decisions.

Although agricultural productivity trends are not good and overall access to sufficient food is poor across the continent, farming systems differ in the degree to which they are associated with high levels of malnutrition. Consequently, the dietary energy supply and the food production index at the continental and national levels may not be the most appropriate manner to assess the interaction between agricultural productivity and food and nutrition security.

Table 6 assesses the degree to which child malnutrition is associated with particular farming systems in Sub-Saharan Africa. The results are not clear. Whereas drier farming systems have somewhat higher levels of malnourished children, as might be expected, the highest prevalence is found in what most might consider a relatively productive and stable farming system, that of mixed cropping in the temperate highlands. Consequently, one should not assume too much causality. Agroecological resources and the other defining characteristics of a cropping system alone are unable to fully explain the patterns of malnutrition observed. Other basic determinants of nutritional status must also be examined.

As noted in the previous chapter, the availability of food through agricultural productivity or trade alone does not provide food security. Individuals and households must also have access to the food available. In parallel to Figure 12c, Table 1 includes a column on growth in GDP over the past decade. Here also the trends imply that most Africans are not seeing any improvements in their level of access to food. With little additional wealth being generated by the various African economies, income levels will remain stagnant and purchasing power will likely even decline through time. Gains in economic expansion have been modest overall. Across regions, the North African countries all saw

Table 6—Preschool underweight prevalence by Sub-Saharan African farming system

Farming system[a]	Underweight prevalence (%)	% of underweight children in all farming systems	Description
Large commercial and smallholder	8.4	1	Dualistic: smallholder and commercial
Coastal artisanal fishing	22.1	5	Coastal artisanal fishing
Tree crop	22.2	5	Dualistic: smallholder and commercial
Maize mixed	25.0	13	Smallholder rain-fed humid
Root crops	26.2	10	Smallholder rain-fed humid
Forest based	29.3	7	Smallholder rain-fed humid
Highland perennial	31.2	8	Smallholder rain-fed highland
Cereal–root crops mixed	31.9	15	Smallholder rain-fed humid
Sparse (arid)	33.5	2	Smallholder rain-fed dry/cold
Agropastoral millet/sorghum	34.1	10	Smallholder rain-fed dry/cold
Irrigated	34.6	3	Smallholder irrigated
Pastoral	40.2	8	Smallholder rain-fed dry/cold
Rice-tree crop	41.6	3	Smallholder rain-fed humid
Highland temperate mixed	42.9	10	Smallholder rain-fed highland
Total	**29.5**	**100**	

Source: HTF 2003.

[a]As defined by Dixon et al. 2001.

economic growth over the decade. Elsewhere, countries that saw gains in the size of their economies are adjacent to countries whose economies contracted, at least on a per capita basis. Moreover, countries that saw noteworthy economic gains often experienced them after years of misrule or civil conflict as, in part, a dividend of attaining peace—most notably Mozambique and Uganda. Likewise, the greatest contractions are seen where such conflict was occurring in the latter part of the decade. The reasons for these patterns and the necessary steps for improving economic performance are much studied, are not without controversy, and are much better summarized elsewhere. Most analysts will agree, however, that the needed economic transformations will occur only over the medium to long term. The low GDP per capita and the meager existence experienced by significant segments of the population in the intertropical area of Africa, as shown in Figure 12c and d, are unlikely to change for some time to come. Mechanisms put in place now to bring about strong and sustained economic growth may only come to fruition when members of the next generation are adults. This aspect of economic development provides additional support for investment in the food and nutrition security of Africa's children

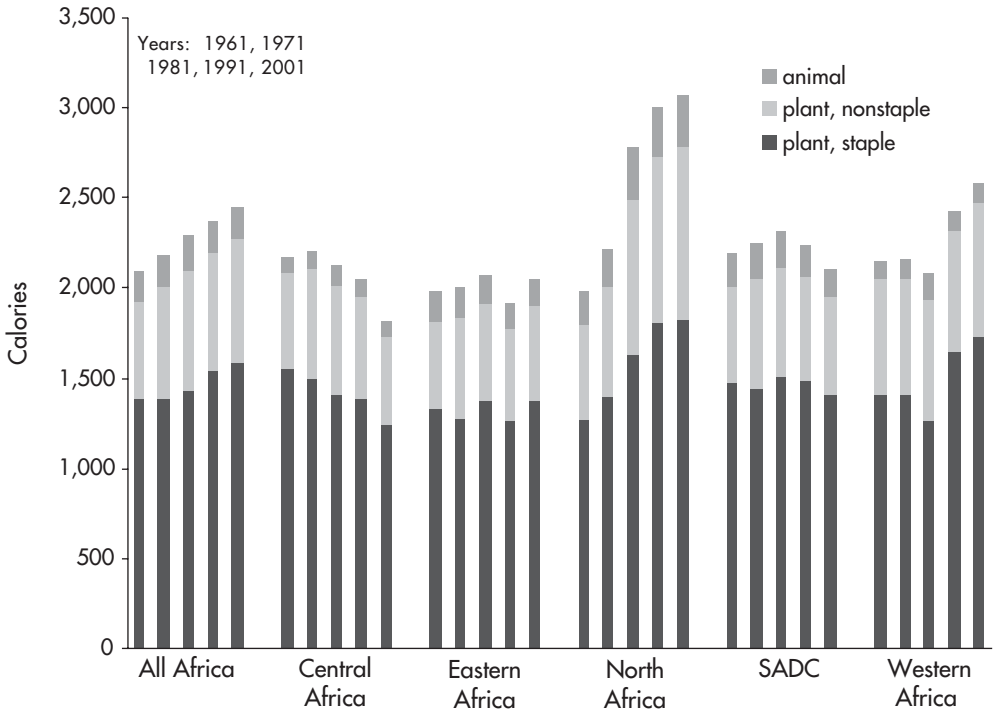
Masked in the information on per capita GDP and poverty headcount levels is the issue of whether markets throughout a country will actually be able to provide food to all who require it. Stable access to food through the market requires that the food marketing system is effective in supplying food, while also providing benefit to those who have food to sell. While over time markets are likely to emerge where there is effective demand, a broad range of physical and institutional factors are required for markets to operative effectively and reliably—for example, physical and market infrastructure, well-established and well-enforced commercial laws, and systems for generating and communicating commodity and market information. In most countries the degree to which these factors are in place will vary considerably across the country, with consequent variation in local food and nutrition security. As shown in Figure 12a, however, the fact that in so many countries in Africa the mean level of calories available is below the recommended intake level of around 2,100 kcal/person/day is testament to the poverty in these countries and the consequent inability to effectively express demand for needed food through markets. Although globally there is adequate food for the world's population, in Africa importers are unable to profitably bring in the food needed to make up national food deficits simply because poverty is so great that insufficient demand is expressed through the market system. People living on less than US$1 per day are unable to pay the prices they would need to pay to import all of the staple food they require. In consequence, food aid and social safety net institutions, whether formal or informal, must remain an important component of the food security of many African countries.

Pulling together information on agricultural production and trade in food, Figure 13 combines information on the quantity and quality of food available in Africa.[15] Trends in total per capita daily calorie availability are presented, disaggregated by broad food groups for Africa as a whole and by region at 10-year intervals between 1961 and 2001. The patterns of overall calorie availability confirm those seen in previous figures. If one uses a recommended average energy requirement of 2,100 kcal/person/day, sufficient food is available to meet recommended energy intake levels for Africa as a whole. Regions vary considerably, however, particularly with regard to this cut-off value—the food available in the central, eastern, and southern parts of the continent is less than or only meets recommended intake levels for the populations as a whole.[16] In contrast, the North African countries clearly perform well in assuring that sufficient food is available to their populations. An upturn in food availability is also seen in Western Africa over the past 20 years.

Although the quantity of food—particularly the amount of calories—to which individuals and households have access is the most commonly used indicator of food security, the quality of the food is also of concern. As noted, one-third of the burden of disease in Africa that can be attributed to undernutrition is due not to insufficient calories or protein, but to

[15] This information is derived from national food balance sheets and so reflects food availability rather than access or consumption of food.

Figure 13—Trends in total calories per capita per day available for consumption in Africa, by source and year



Source: FAO 2004.

deficiencies in micronutrients—iron, iodine, zinc, and vitamin A. In accounting for these deficiencies, the quality and composition of the diet is important.

Information in Figure 13 on the broad sources of calories provides a crude indicator of dietary quality. Staple foods tend to contain very low levels of the key micronutrients. In contrast, animal and fish products are the best sources, with nonstaple plant food providing intermediate amounts. Over the past 40 years in all regions of Africa, very little change has occurred in the broad composition of available foods and, hence, the quality of diets derived from them. Staple grains, roots, and tubers are the source of about 65 percent of all available calories over this period—slightly higher in Central Africa (68 percent), somewhat lower in North Africa (61 percent). Moreover, very little shift has occurred in the share of calories coming from staples over these 40 years—only Central and North Africa show a slight decline in the share of calories from staples, made up for by increases in the share from nonstaple plant food. The share of calories coming from animal and fish products is about 5 percent in Western and Central Africa and 8 to 9 percent elsewhere, with little change across the period in any region. The balance of calories available is derived from nonstaple plant sources—between 26 and 30 percent share across the regions.

---

16 The regions in Figure 12 are not mutually exclusive and are defined as follows:
Central Africa—Angola, Cameroon, Central African Republic, Chad, Congo, DR Congo, Equatorial Guinea, Gabon, Sao Tome, and Principe.
Eastern Africa—Burundi, Comoros, Djibouti, Eritrea, Ethiopia, Ethiopia, Kenya, Madagascar, Malawi, Mauritius, Mozambique, Reunion, Rwanda, Seychelles, Somalia, Tanzania, Uganda, Zambia, and Zimbabwe.
North Africa—Algeria, Libya, Mauritania, Morocco, and Tunisia.
Southern African Development Community (SADC)—Angola, Botswana, DR Congo, Lesotho, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, Tanzania, Zambia, and Zimbabwe.
Western Africa—Benin, Burkina Faso, Cape Verde, Côte d'Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Mauritania, Niger, Nigeria, Senegal, Sierra Leone, and Togo.

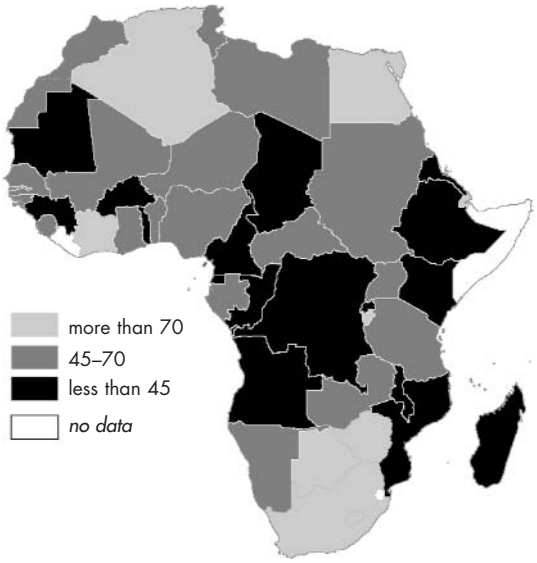
Given the poor economic progress being made in most parts of Africa, the patterns shown in Figure 13, both in aggregate and across categories of food, are not surprising. The continued reliance on staple grains, roots, and tubers for the bulk of calories is principally an economic issue. Meat and fish consumption for the many poor Africans is a luxury, and, moreover, these foods may not always go to those who require them most, both within individual households and within society as a whole. Consequently, the nutritional benefits of increasing consumption of such foods cannot be realized. Unless dynamic, poverty-reducing economic growth is achieved in Sub-Saharan Africa in the short term, one should expect that the shares of total calories available across food types will remain as shown in Figure 13 for the near future. With a sustained generally higher standard of living in North Africa, the shares of calories available should shift somewhat from staples to nonstaples and animal and fish products. Such a pattern would mimic that seen in recent years in the growing economies of East Asia, particularly China (Bouis and Hunt 1999).

Access to a Healthy Environment, Health Services, and Knowledgeable Care

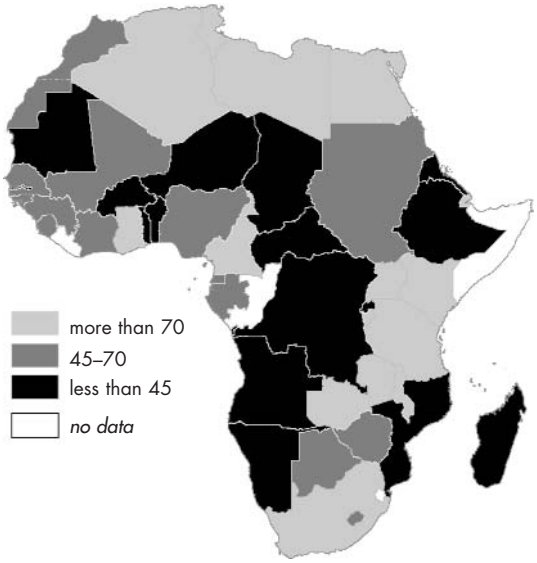
As noted in the previous chapter, food availability and access to that food alone are insufficient to assure nutrition security. Several complementary factors relating to how the food is utilized must also be in place if all are to enjoy a healthy and active life resulting from proper nutrition. Among these is a hygienic environment and access to health services. Individuals suffering from illness are unable to properly utilize the nutrients in the food to which they have access. Globally, considerable effort has gone into improving public health by providing clean water and adequate sanitation. Figure 14 shows current progress in Africa in this regard. Although several countries have made admirable strides in assuring that their citizens live in a hygienic environment, in most countries continued efforts are needed. By comparing these maps with those in Figure 12, one can identify several countries—Benin, Morocco, and Namibia, among others—where one should find reasonable access to food but where improved water and sanitation is clearly needed if they are to achieve nutrition security.

Figure 14—Access to safe water (rural) and adequate sanitation (all) in Africa, by country

14a. Rural population with access to safe drinking water, 2000
percent



14b. Population with adequate sanitation, 2000
percent



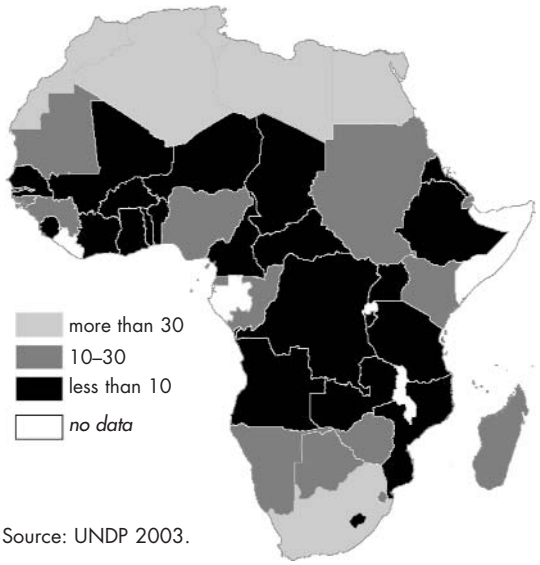
Source: UNDP 2003.

Closely linked to a hygienic environment is the health status of the population more generally. Access to health services—both preventative and curative—is a central component of attaining nutrition security. A broad range of indicators can be used to assess this factor in Africa. Here, two indicators of access to health care—number of doctors per 100,000 people and percentage of pregnant women receiving prenatal care—are considered, together with a map on HIV infection, and important challenge for African health care systems. The patterns and levels of these indicators are discussed, after which two health outcome indicators—child mortalilty and life expectancy at birth—are examined. The levels of these outcomes are significantly determined by the degree of nutrition security achieved by individuals and households.

The map in Figure 15a showing the number of

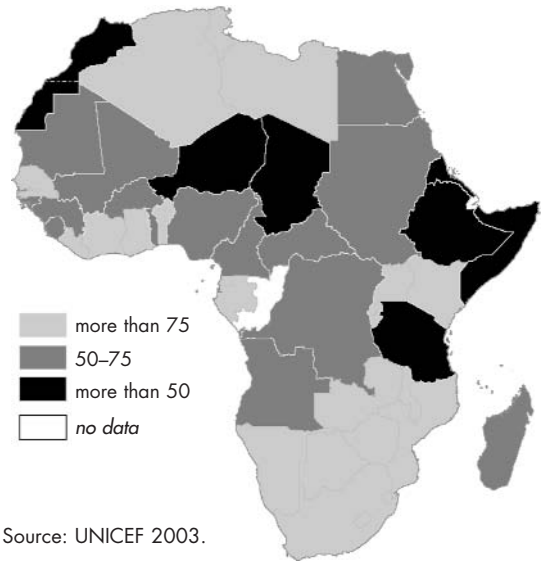
Figure 15—Access to health services in Africa: Number of medical doctors per 100,000 persons, percent of pregnant mothers receiving prenatal health care, and HIV infected adults, by country

15a. Medical doctors per 100,000 persons
Latest data



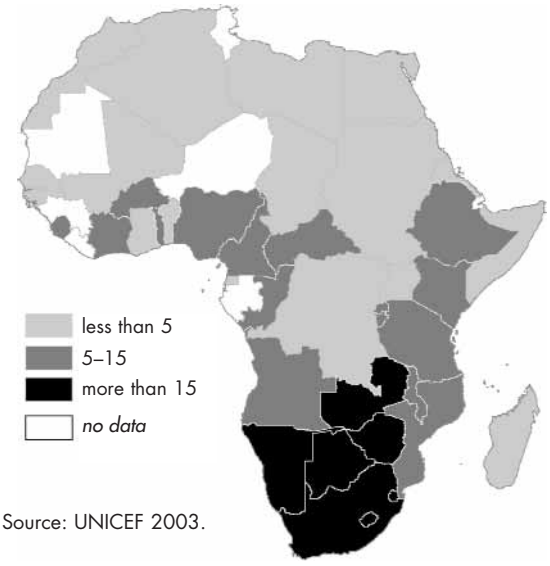
Source: UNDP 2003.

15b. Prenatal care, mothers receiving, percent
Latest data



Source: UNICEF 2003.

15c. HIV infected adults, prevalence end–2001
Percent, age 15 to 49 years



Source: UNICEF 2003.

medical doctors per 100,000 persons largely reflects the pattern of GDP per capita and poverty prevalence presented in Figure 12. Access to doctors and secondary and tertiary medical care facilities is as much a question of resources as it is of medical need. Poorer countries tend to have fewer doctors per capita. Figure 15b, however, is arguably the more useful for our purposes here. Prenatal care services are primarily provided as a component of primary health care programs. These programs are also a primary means of providing direct nutrition services to the population. Indeed, an important component of prenatal care is proper nutrition to prevent low birth weight. Overall, the picture across Africa concerning the provision of these health care services is encouraging. There is room for expansion—large numbers of pregnant women still are receiving no attention—and likely the quality of the care provided can be enhanced. If the health care component of nutrition security is to be reliably and effectively available, the primary health sector requires more resources. These data on prenatal care provision, however, indicate that a foundation upon which to build is in place in many countries.

The challenges facing Africa's health care services are great. Africa is relatively less healthy than most other continents, with fewer public health services in place to control disease. Over the past two decades, HIV infection has added an almost overwhelming additional burden to what already was a daunting set of challenges. As shown in Figure 15c, the countries in Southern and Eastern Africa are currently facing the most severe levels of infection, but all countries in Africa must put in place the mechanisms to effectively control the disease and care for those infected. Existing health services will be extremely stretched, and the overall quality of service provision, including nutrition-oriented services, may suffer without significant additional resources. Moreover, HIV has effects on food and nutrition security far beyond its impact on health services. HIV infection and AIDS reduce household food production both now and in the future, hinder access to available food and necessary health care that the household had before a member or members became infected with HIV, and lower the quality of nutritional care received by those dependent on individuals infected with the virus.

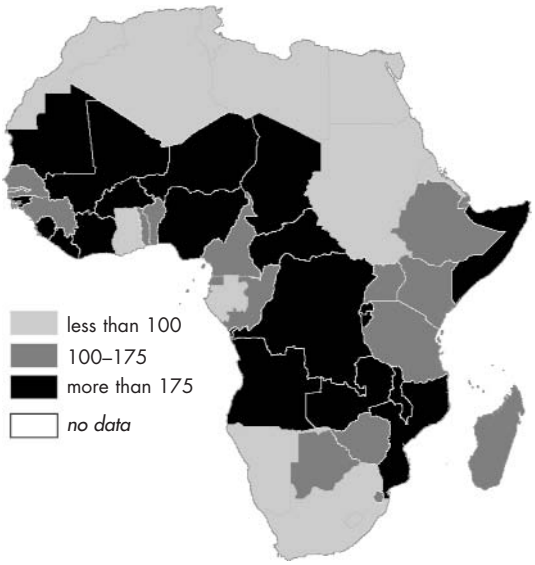
With regard to health outcome indicators, malnutrition levels and nutrition security in general are closely linked with child (under-five) mortality rates. Figure 16 provides several perspectives on the provision of adequate health care across the continent as evidenced by levels of child mortality. Levels remain high in Africa. For the countries south of the Sahara as a whole, the most recent estimates of child mortality are about 170 deaths in the first five years of life for every 1,000 live births (UNICEF 2003). While many countries are making progress in reducing child deaths, a number of countries are failing to maintain effective past efforts and are experiencing a decline in the rate of progress against child mortality. In spite of the high levels of child mortality in Africa, only a handful of African countries show accelerating declines in levels of child mortality.

The scatter plot in Figure 16c provides a useful example of the necessary intertwining of nutritional and health concerns. It is estimated that approximately 55 percent of all child deaths are due to malnutrition that exacerbates the negative effects of disease on a child's health (Pelletier et al. 1994). The scatter plot shows that at the national scale the correlation between malnutrition and child mortality (or, alternatively, between good nutrition and child survival) is relatively strong. Effective health service delivery necessary for child survival will also contribute to nutrition security. Effectively addressing child mortality will require actions in the field of health and in other sectors well beyond the realm of food and nutrition security concerns. Similarly, nutritional considerations are critical for child survival. In a circular fashion, proper nutrition, in a technical sense, can be seen as a necessary input to improved child survival and the broader health of the population, which, if achieved in concert with the provision of a range of other key health services, is itself a necessary component of broader nutrition security.

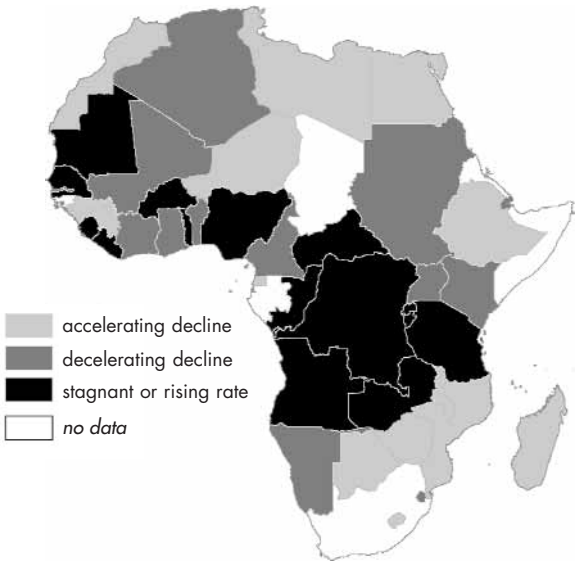
Life expectancy at birth is another health outcome variable within the context of nutrition security. This measure aggregates the range of threats to health over a lifetime and provides an indication of

Figure 16—Child mortality rates by country in Africa, progress being made in reducing child mortality, and scatter plot of national rates of stunting with child mortality

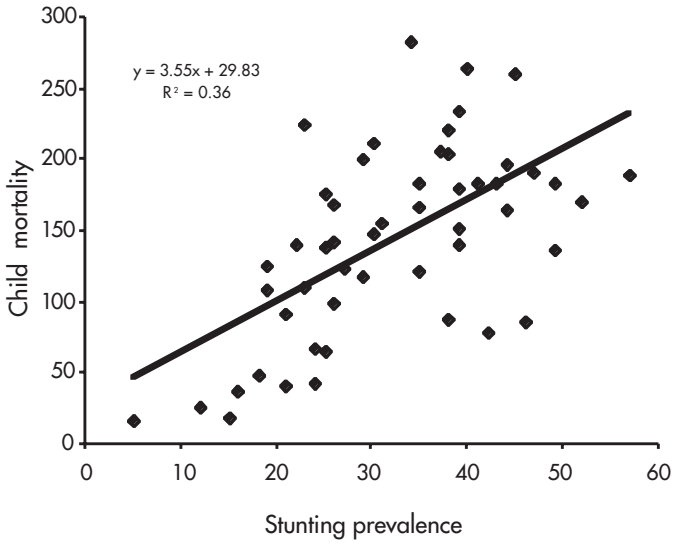
16a. Under-5 mortality, 2002
No. of deaths in first five years of life per 1,000 live births



16b. Progress in reducing under-5 mortality
Comparison of annual rate of reduction in under-5 mortality of 1990–2002 with that of 1960–90



16c. Stunting and child mortality rates, countries of Africa, 2002



Source: UNICEF 2003.

the burden of disease individuals face, the degree of access that individuals have to health care, and the quality of that care. Figure 17 portrays this information, as well as information on how life expectancy has been changing across the countries of Africa since 1970. In the southern and eastern parts of the continent, in particular, the picture is bleak. With only a couple of exceptions, the probability that Africans born today south of the Sahara will live to see their 55th birthday is below 50 percent. Only for infants born in North Africa can one be quite confident that they will live out long and, hopefully, full lives. Elsewhere the health risks are great, the facilities in place to manage the health risks are insufficient, or both.

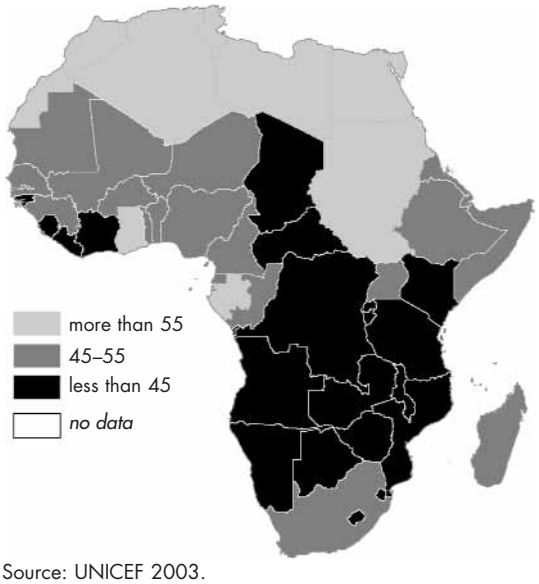
HIV infection is an important part of the explanation of the spatial patterns revealed in these maps. A majority of those countries that have seen reductions in life expectancy since 1970 are also those that have HIV infection rates among adults of greater than 5 percent. The sharpest drops in life expectancy are in the countries with the highest infection rates.

The maps on life expectancy are also useful in describing an additional dimension of nutrition security—access to knowledgeable care. The likelihood that infants and children will enjoy healthy and active lives is closely linked to the quality of care they receive. As is common with HIV/AIDS, high levels of mortality among parents of young children render these children nutritionally insecure. In addition to the economic shock resulting from the death of a parent and the resulting impact on the access a child has to sufficient food of adequate quality, the death will also reduce the quality of care the child receives. Care refers to the use made of available resources to enhance the nutritional status of the child. It is likely that the nutrition security of an orphaned child will be reduced due both to an absolute reduction in the nutritional resources—food, health services, and so on—and to less effective use of the resources that are available to sustain or enhance the child's nutritional status.

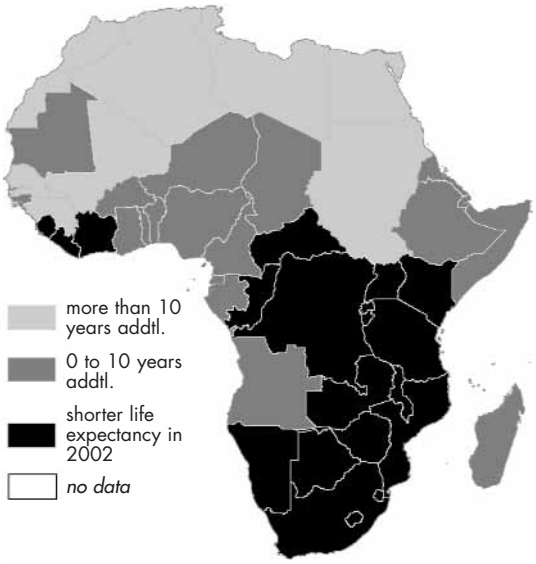
More broadly concerning nutritional care, there is considerable evidence across countries that the nutritional status of children varies directly with the level of education of their parents, and in particular,

Figure 17—Life expectancy at birth and changes in life expectancy since 1970 in Africa, by country

17a. Life expectancy at birth, years, 2002



17b. Change in life expectancy at birth, years, 1970–2002



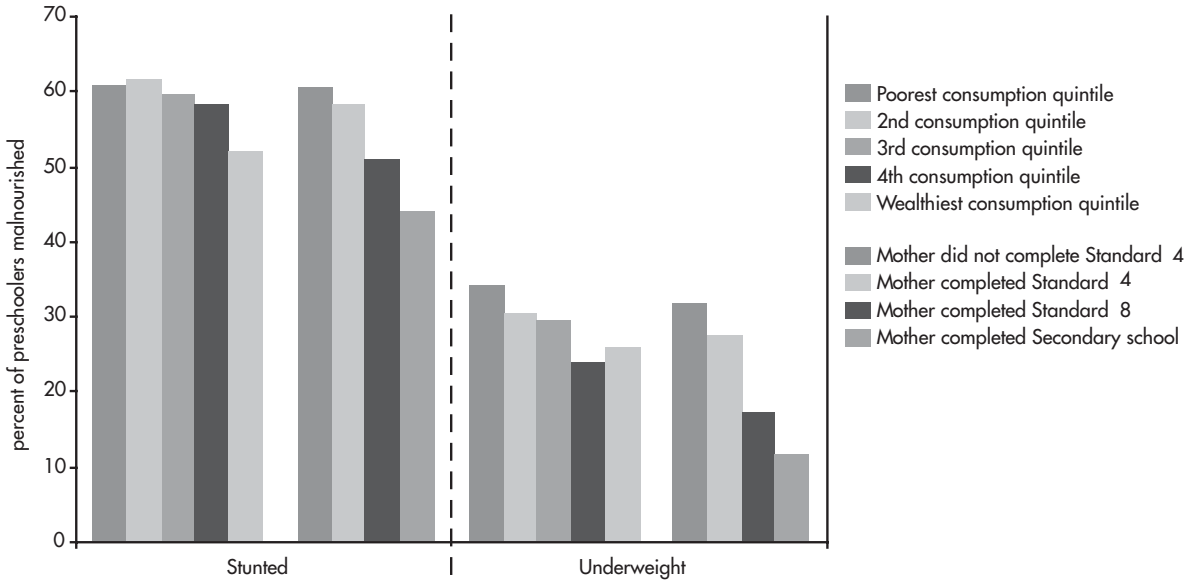
Source: UNICEF 2003.

their mothers. Mothers with more education are more knowledgeable about the care that they need to provide their children, both in the context of nutrition and in more general health care. Indeed, a commonly seen pattern around the world is that the nutritional status of preschoolers is more closely correlated with the educational level of their mother than it is with the per capita consumption and expenditure levels of the household. Figure 18 shows such results from a recent survey in Malawi. Although preschooler stunting and underweight rates do decline with increased household consumption levels, the relationship is not as strong as the declines seen in these rates with increasing levels of educational attainment by the children's mothers. Although it is not an obvious element of nutrition strategies, ensuring that girls are able to go to school and attain their full educational potential is a critical component of any sustainable effort to enhance nutrition security in Africa.

To assess the degree to which nutrition security in aggregate is assured in Africa through the provision of knowledgeable care, Figure 19 provides two measures. The first, female adult literacy, reflects past broad knowledge building. The second, the net enrollment rate for girls in primary school, reflects the degree to which knowledge, both general and more nutrition-focused, is being built to enhance the nutrition security of future generations. Where one finds low literacy and low enrollment of girls in school, one should also expect relatively lower nutrition security now and in the future, all things being equal.

The patterns seen across the countries of Africa are mixed. Encouraging levels of both female literacy and the enrollment of girls in school are seen in many countries of Eastern and Central Africa. If the educational curriculum in these countries provides knowledge of basic nutritional and childcare principles, we should expect that poor-quality care will not be a critical factor contributing to malnutrition. Many children in the Sahelian countries in particular, however, cannot be expected to enjoy nutrition security now and in the future in part because of the lower-quality care they receive from their relatively less well-educated mothers. In spite of the increases in food production shown previously for the countries of the Sahel in Figure 12b, without knowledgeable care, nutrition security there cannot be assured.

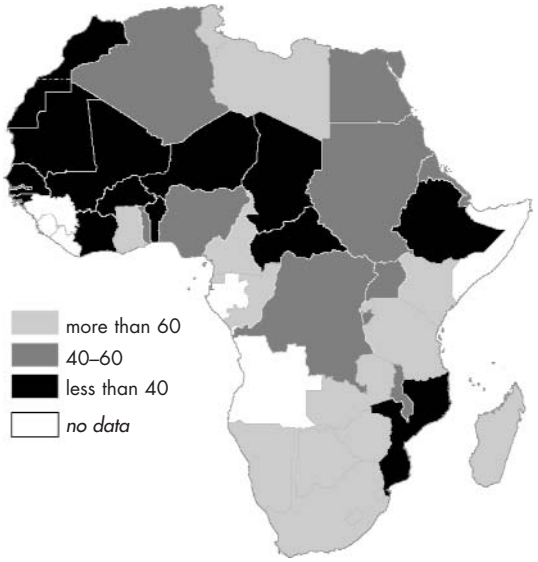
Figure 18—Prevalence of preschooler undernutrition in Malawi, by consumption quintile and mother's educational attainment



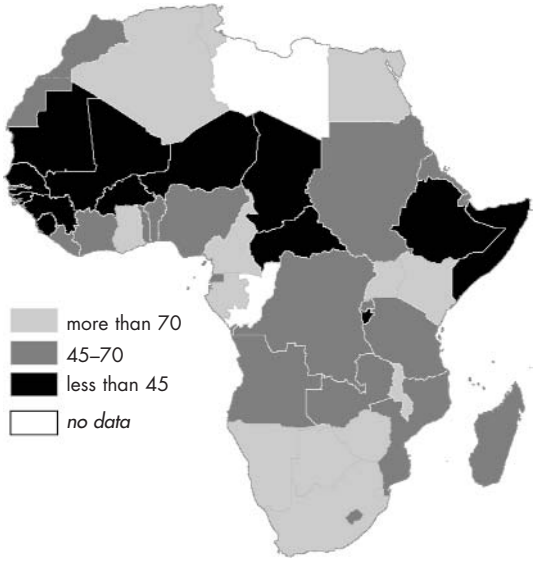
Source: Poverty Monitoring System 2001.
Note: "Standard" refers to grade.

Figure 19—Female adult literacy rates and girls' net primary enrollment rates in Africa, by country

19a. Female literacy, adult, 2001
Percentage of women age 15 years and older



19b. Girls' net primary enrollment rate
Percentage of girls who are of primary school age attending primary school, latest data



Source: UNDP 2003.

Trends and Expectations

It would be extremely useful to policymakers and development planners if the information presented in this chapter could be used to identify which countries in Africa are following sustained paths of increasing nutrition security. Many countries doing less well in this regard would stand to benefit from replicating the mix of policy and action employed by these successful countries.

The earlier discussion on measuring food and nutrition security highlighted, however, that it is difficult to rigorously assess the food security and especially the nutrition security of an individual, household, community, or nation. These concepts are complex. The measures available are typically one dimensional or are proxy measures that, if not so limited in the dimensions of food and nutrition security that they cover, do not map directly with food security or nutrition security. Moreover, as highlighted for child mortality and nutrition security, the levels of these measures are often outcomes of improved nutrition security, as well as factors contributing to such security. No attempt is made here, therefore, to develop a single index of national food and nutrition security.

Nevertheless, it is possible to gain some insights into where progress is being made in enhancing overall nutrition security and what might account for this. A simple way of doing so is to undertake a simple relative ranking analysis of the various factors and dimensions of nutrition security that were presented earlier in this chapter and assess performance on each individually and across factors.

On this basis, the countries of North Africa stand out clearly as the most secure nutritionally. These countries are among the wealthiest on the continent, a fact that has implications for access to food through the market and for the provision of health care services and the requirements of a hygienic environment. These countries rank high on all of these factors. Although agricultural productivity gains in these countries are not among the most

dramatic on the continent, gains are being made. Finally, the indicators of the quality of nutritional care are relatively good. Female adult literacy rates across these countries, if somewhat uneven, are relatively high, and girls are going to school. Most of the pieces are in place for broad nutrition security. The low preschooler stunting rates seen in these countries relative to the rest of Africa is evidence of success in this regard.

In contrast, those countries that are least nutritionally secure are not surprising. Countries that have experienced conflict and the absence of an effective central government in recent years do not have in place the conditions to assure broad nutrition security. Burundi, DR Congo, Liberia, Sierra Leone, and Somalia, when assessed based on those nutrition security factors for which data exist, are consistently ranked among the worst on the continent. Conflict exacerbates poverty and poor governance. These governments are unable to provide basic public goods, which results in a lack of access to food, care, health services, and a healthy environment. Although encouraging signs have been seen in several of these countries in the past year, it will take several years of such trends before children in these countries can be brought up in conditions that will result in their enjoying a healthy and active life with nutrition security.

The more interesting and challenging cases, for better or for worse, are the broad range of countries that are exhibiting only poor to fair progress in assuring the nutrition security of their citizens. These countries are home to the majority of Africans. Assessing the performance of the various factors and dimensions of nutrition security to judge what they might do differently can likely only be done on a case-by-case basis. Such an assessment is shown for several African countries in Box 4. In those countries in which food availability is deficient, such as Malawi and Mozambique, food production must be enhanced at the same time that trade policies are reexamined to allow a more reliable supply of food from the global market. Other countries may exhibit high levels of available food but still have crippling rates of malnutrition. In these countries, attention should be directed to issues of household access to food—a broad consumption-based poverty perspective that pays explicit attention to the distribution of resources and consumption levels across society—and to the context within which the food is utilized, including sanitation, health services, level of knowledgeable care, and a broad range of related issues. Moreover, the quality of policymaking and the effective and responsible implementation of those policies are important basic determinants of the degree to which food and nutrition security can be assured in any country in Africa and elsewhere.

Overall, this chapter shows that a large proportion of the population of Africa does not enjoy food security. Moreover, many of those who have good access to sufficient food for their caloric needs nonetheless suffer from nutrition insecurity. Many households consume a monotonous, unvaried diet and so suffer from micronutrient deficiencies. Unhygienic environments coupled with poor access to health services impose a heavy burden of disease that makes it difficult for individuals to properly utilize and absorb the nutrients they consume. Young children in Africa too often receive suboptimal care from their mothers or other caregivers, resulting in poor child growth. Such poor care, whether in terms of feeding practices, diet choices, or other caring practices, is due as much to a lack of knowledge on the part of the caregivers as to a lack of material resources. Consequently, although there is considerable variation across the continent in the degree to which these various determinants of malnutrition operate, the high prevalence of malnourished children is not surprising.

Box 4—Country-level situation analysis of nutrition security in select African countries

Malawi: Sustained economic growth proving elusive. High proportion of population unable to meet basic needs. High levels of child malnutrition. Very low purchasing power results in a poor, unreliable market system. Potentially productive agricultural sector, but subject to floods and drought, so aggregate food availability not assured. Landlocked country, so costs of imports, including agricultural inputs, are high, and exports may be uncompetitive globally owing to high transport costs. Difficult to make profitable use of high-yielding agricultural technologies, resulting in unsustainable mining of natural resources. Emergency food management system proved deficient in last emergency (2002–03). HIV infection relatively high.

Mozambique: Encouraging signs for sustained economic growth, but high proportion of population unable to meet basic needs. Potentially productive agricultural sector but subject to cyclones, floods, and drought. Considered relatively food insecure. Poor marketing and transport systems. Sparse health infrastructure in rural areas, with high levels of child mortality. HIV infection relatively high. Low female literacy, but girls increasingly are going to school. Limited numbers of trained professionals in agriculture and nutrition sectors, particularly outside the capital. Reliant on international NGOs to deliver many social services in rural areas. Potentially good access to global trade. Food security and nutrition relatively important policy issues.

Nigeria: Major global oil producer. Economic diversification away from oil not yet successful. Oil benefits not equitably distributed across population. Sustainable, broad-based economic development proving difficult to achieve. Diverse and potentially productive agricultural sector. High proportion of population reliant on agriculture. Food secure in terms of aggregate food availability. However, many unable to meet basic needs, including in food. High levels of malnutrition in spite of availability of food. Dynamic but crumbling market system. Good linkages to global market systems. Policy processes are disordered, unpredictable, and not transparent, with little effective master development planning. However, recently passed a national policy on food and nutrition. Large numbers of trained professionals in agriculture and nutrition, but ineffectively utilized. Health and educational systems in place, but quality of performance is quite varied. Sharp contrasts in educational attainment levels across the country for both men and women. In contrast to the other countries, level of donor support quite low on a per capita basis.

Uganda: Encouraging economic growth and poverty reduction over the past decade. Relatively effective and transparent policy processes. Strong emphasis on decentralized, democratic decisionmaking, although central government remains dominant in policymaking and resource allocations. Nevertheless, armed conflict in the north and northeast is causing significant food insecurity. Agriculture is focus of economic growth strategies. Relatively productive agriculture, with sufficient food available in aggregate. Landlocked nation, so comparative economic advantage within global markets is problematic. Education and health systems are in place, if somewhat overstretched. Limited numbers of professionals, but used relatively effectively.

Sources: Benson et al. 2003; Devereux 2002.

4. Action to Address Food and Nutrition Insecurity

This chapter discusses what actions need to be taken to improve or strengthen the access of individuals and households to those dimensions of food and nutrition security to which they currently have poor or unreliable access. This is not a comprehensive overview. Rather, the aim is selective, addressing leadership issues, components of broader economic objectives, some sectoral issues, and several issues within the social and political realms of a society. Some guidance is given on the sorts of actions that are likely to provide the greatest advances in enabling individuals and households to secure all of their food and nutrition needs. An access-based framework is developed to better understand the pattern of actions necessary and the sorts of effects we might anticipate.

Building Access to Nutrition Security

The discussion in Chapter 2 focused on defining the various terms used in considering food and nutrition security. These definitions facilitated the presentation in Chapter 3 on the current status of nutrition security across Africa. Yet although the definitions and conceptual frameworks (both implicit and explicit) presented do provide a better understanding of exactly what is under discussion, they give only general insights into who should act and how they should act to improve the food and nutrition security of insecure households and individuals. In this section, an access-based perspective on nutrition security is presented to better offer such guidance.[17]

This framework is presented in diagram form in Figure 20. Nutrition security is a multidimensional phenomenon, requiring secure access to adequate food, a sanitary environment, adequate health services, and knowledgeable care to ensure that individuals and households can make or find food available, have access to it, and can properly utilize it. Second, this access is subdivided into four dimensions—physical, economic, social, and physiological. This framework focuses on the individual. Drawing on the UNICEF understanding of the determinants of malnutrition presented in Figure 2, however, it allows one to consider important questions about the sorts of actions that should be taken at a range of broader scales—household, community, district, nation, and globe—so that the individual enjoys secure access to the determinants of nutrition security. Access to the components of nutrition security across the various dimensions is a relevant concept for guiding action whether one is a policymaker at the national level or a program implementer at the community level.

Moreover, action is needed by a broad range of actors in order for individuals to have such security. The dimensions of access can similarly be examined to assess who is responsible for or has competence in facilitating the various dimensions of access individuals require to assure their nutrition security. Table 7 provides a broad overview of the issues and the public sector actors concerned with each dimension. Several of these will be examined in more detail later in this chapter. The actions assigned to each of the dimensions of access are not one-to-one matches. Although one can assign,

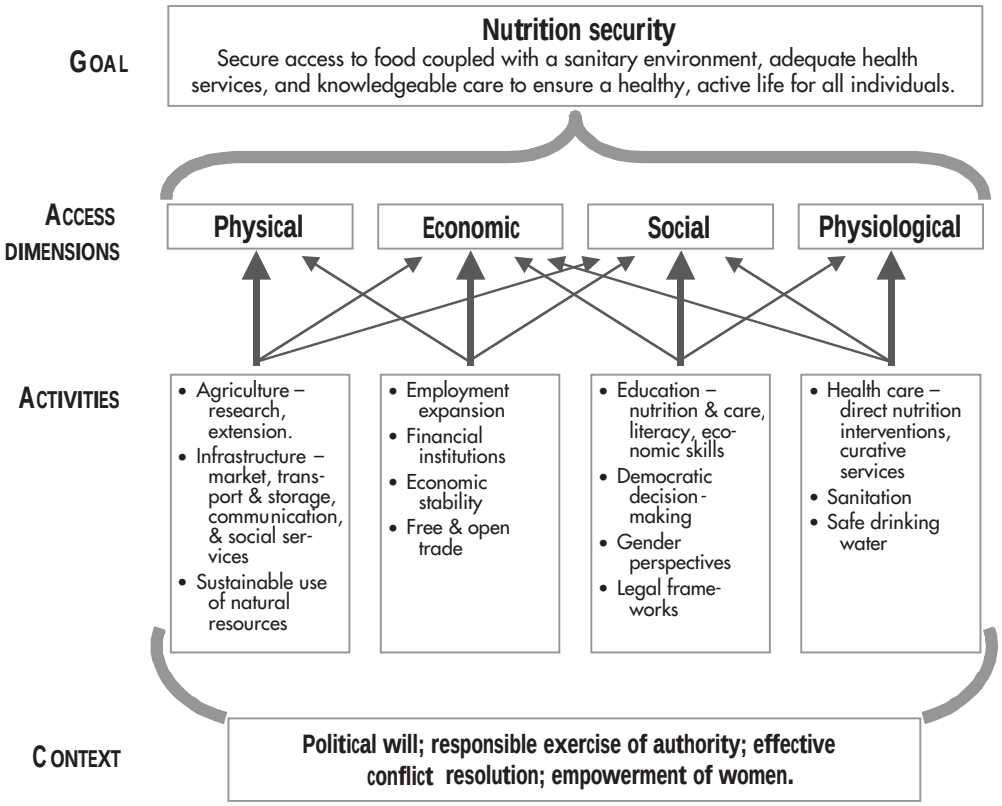
[17]The conceptual framework and discussion are adaptations and extensions of those in HTF (2003, 50ff.). The framework is based on the food availability-access-utilization model of food security that was highlighted in footnote 5 (USAID 1992) and the UNICEF conceptual model of the determinants of nutritional status of children presented in Figure 2.

for example, activities related to health care primarily to the physiological dimension, health activities will have implications for all dimensions: population services will ease land pressure (a physical dimension); primary and curative health services will result in improved human capabilities and greater economic access; and direct nutrition interventions to women will advance their nutrition security and, within the social dimension, contribute to their empowerment. The schematic web of arrows linking activities to access dimensions in Figure 20 highlights the broad effects of the actions that can be taken to improve nutrition security.

It is important to note that action that appears to enhance nutrition security when narrowly considered within one dimension of access may have no effect on nutrition security in aggregate because of a lack of complementary investments in other dimensions of nutrition security. For example, investments in irrigation should lead to increased physical access to food locally. With the changed physical environment resulting from irrigation, however, a new disease environment is created that will require investments in health services, both public and curative, to properly manage it. If these health issues that affect physiological access to nutrition security are not addressed, it is possible that irrigation will result in no net improvement in nutrition security.

Policy analysis within a transparent policy process is needed to understand such links and to guide the appropriate mix of action across all four dimensions. Choices made at the policy level and the way in which those choices are carried out affects the prevalence of malnutrition and food insecurity in Africa. Improving access to the various components of nutrition security must be seen in the first instance as a policy issue, and only secondarily as a technical issue.

Figure 20—Access-based conceptual framework of nutrition security



Source: Adapted from HTF 2003.

Table 7—Dimensions of access to nutrition security

Dimension of access	Issues and concerns	Sectoral actors (government and private)
Physical	Sustainable agricultural production, adequate storage. Ability of markets to deliver food to consumers and inputs to farmers. Stability of food supply. Food emergency warning and response system. Presence of social service facilities—schools, health facilities. Sustainable use of communal and private physical resources. Equitable intrahousehold food distribution.	Agriculture, local government, education, health, environment, public works.
Economic	Employment expansion to assure broad economic access—requires sustained and equitable economic growth. Efficiency of markets—wage and price levels, effective economic incentive structures. Access to information for confident investment. Stable and rational economic policies. Open trade policies. Free movement of food from areas of surplus and low prices to deficit areas with high prices. Sustainable access to credit.	Finance, economic planning, information and communication, foreign affairs, labor, trade.
Social	Decision making—transparent, democratic, locally responsive, providing a forum for the voice of the malnourished and nutritionally insecure to be heard. Consideration of nutritional implications of normative social roles—women's time burdens and restricted access to economic resources. Attention to socially or economically marginalized groups, facilitation of their access to all dimensions of nutrition security. Knowledge. Effective educational institutions. Understanding of the components of a proper diet. Instruction in proper feeding and care of infants and children. Enhancement of general human capital. Legal frameworks in place to facilitate food production or market acquisition—appropriate, fair tenure systems; clear, enforced contract law.	Justice, local government, health, education, social safety net programs, information and communication.
Physiological	Health services available, including direct nutrition interventions, population services, among other primary health care services; effective curative services. Requirements for a healthy environment—clean water, proper sanitation, food safety knowledge. Nutritionally sound food preparation.	Health, water and sanitation, education.

Finally, underpinning the entire framework is a set of foundational conditions without which broad and sustained nutrition security cannot be assured. Commonplace throughout the literature on social and economic development, these issues must not be ignored. Moreover, it is not enough to meet only some of these foundational conditions. Political will does little to assure nutrition security when conflict makes the entire population vulnerable. Similarly, responsible exercise of authority, or good governance, will not help the malnourished without the political will to do so. Lastly, given that the human

potential of members of the next generation is directly related to the physical well-being of mothers during the perinatal period (pregnancy, birth, and lactation) and beyond, and that throughout the world mothers and other women are the principal food preparers and caregivers for children, the social and economic empowerment of women is necessary so that they can undertake these roles effectively, with dignity, and in good health.

Taking Responsibility for Food and Nutrition Security

The individual is ultimately responsible for assuring his or her own nutritional status (or, in the case of children and other dependents, the caregiver is responsible). A wide range of barriers and constraints, however, prevent individuals from taking the actions needed to lead them and their dependents to good nutritional status and a healthy and active life. Resource constraints leave individuals with too little income, time, land, or capital to purchase or produce the food they need or to process and prepare it in a nutritious manner. Informational constraints result in poor care or the poor allocation of available resources for proper nutrition. The local environment may impose barriers to good nutrition because of poor health conditions or highly variable food availability. Ultimately the individual will need to overcome these barriers if he or she is to enjoy a healthy life.

Salient Role for National Governments

Although individuals are ultimately responsible for their own nutrition security, improved nutrition is a public good. The good nutritional status of my neighbor will be advantageous to me as well. Government at its various levels—community, district, and national—can justifiably be expected to have a duty to assist citizens in removing or mitigating the various constraints and barriers they face to achieving good nutritional status. Many dimensions of nutrition security that individuals require cannot be readily supplied through the market (Gillespie and Haddad 2001, 112). Market processes alone will not assure adequate food and nutrition security for all citizens. Consequently, government must take responsibility for assuring that all citizens enjoy nutrition security. The state cannot be complacent. In a similar fashion, the development partners of national governments within the global community should support government efforts to facilitate individuals' access to what they require to attain nutrition security.

If assuring nutrition security is essentially the concern of all—the individual, government, donors, as well as a broad range of civil society organizations—there is a very real risk that it becomes the responsibility of none. Paarlberg (2002) demonstrates that responsibility for assuring that individuals are able to attain food security must ultimately lie with national governments, despite strong globalization trends, on the one hand, and decentralization efforts, on the other. Many national governments in Africa, however, are not meeting this responsibility. "Significant hunger persists . . . largely because of governance deficits and failures at the national, not the global, level. Too many national governments in the developing world fail to provide the essential domestic public goods—such as peace, rule of law, public research, and rural transport infrastructure. . . . The governance challenge for food security is to . . . persuade existing sovereign governments to deliver the minimal public goods needed at the national level" (Paarlberg 2002, 1).

The same argument applies to nutrition security. National governments have a duty to establish the conditions and institutions necessary to enable citizens to attain nutrition security—sufficient quantities of food necessary for a balanced diet; the means to acquire this food, whether through cash incomes or access to productive resources; education about providing proper nutritional care to one's dependents and oneself; clean water and adequate sanitation; and effective health services. If the national government does not provide these public goods, it is unlikely that nutrition security can ever be achieved. Responsibility in the public sphere for building nutrition security lies foremost in the hands of the leaders of the national government. They must foster the political will, make the decisions, and facilitate the action necessary to remove or mitigate the constraints to good nutritional status that so many Africans face.

Technical Sectoral Responsibility and Cross-Sector Coordination

To build nutrition security, it is important to consider the particular characteristics of nutrition as a subject for policymaking and program implementation by national government institutions.[18] Nutrition is usually neglected in the formulation of government and sectoral policies and strategies, in the definition of government and sectoral programs, and in the allocation of government resources. As already emphasized and apparent from Figure 20, nutrition security is a cross-cutting issue. With no strong sectoral advocates responsible for seeing that attention is paid to nutrition security, it can easily be ignored or addressed in an uncoordinated, piecemeal fashion.

Agriculture and nutrition typically are viewed as the technical sectors preeminently concerned with nutrition security, with nutrition usually acting as a subsector of the health sector. Food constitutes a principal focus in the work of both. Food availability in Africa is heavily dependent on food production, which is the particular, but not exclusive, interest of agriculturalists. Food utilization is often seen as a health issue to which, it is assumed, agriculturalists and others have very little to contribute. Given that resources for development are scarce and have alternative uses, this segmented view of agriculture, food, and nutrition inevitably positions the agriculture and nutrition communities as competitors for resources that can be used to enhance nutrition security rather than as partners in action. Consequently, the agriculture and nutrition communities frequently miss important opportunities to collaborate with each other and, equally important, with other sectors and agencies—in education, trade, public works, and so on—to effectively address the constraints to improved nutrition security. Sectoral action taken to address malnutrition is often much less effective than coordinated action could be.

The sectoral organization of government underlying this problem is not necessarily perverse. Although government organization could be improved, sectoral organization is a proven system that allows the state to fulfill many of its duties. As a consequence, however, it is inherently difficult to effectively undertake the cross-sectoral action necessary to enhance nutrition. But the issue of nutrition security is not unique in this regard. Although the cross-sectoral barriers to effectively addressing malnutrition may be particularly salient, most development issues ultimately require coordinated cross-sectoral action. Such coordination is fostered by political leaders exercising political will.

Nutrition insecurity is a high-priority development challenge in most African countries. Technical responsibility for action to effectively address the issue does lie with the various sectors noted in Table 7. The individual sectors can make important contributions to facilitating the access of individuals and households to what they require to assure their own nutrition security. Ultimately, however, the responsibility for implementing activities across sectors lies with the political leaders. These leaders must be champions for improving nutrition within their countries. They are the ones in the position to effectively direct action across sectors. They must assume the responsibilities for coordinating necessary action against malnutrition, allocating the necessary resources to the various technical sectors concerned, and holding those sectors accountable for the use of their resources. They confront a broad range of competing demands, however, and do not necessarily understand the important constraints on economic and social development imposed by malnutrition. Advocates for improved nutrition in Africa must make sure that such political leaders hear about and respond to the needs of their malnourished constituents and that there are political consequences for inaction in this regard.

Economic Growth and Nutrition Security

Underlying this discussion is the critical need for broad-based, rapid economic growth to sustainably address food and nutrition insecurity. Economic growth creates additional wealth. This additional wealth provides added resources to contribute to the broad range of activities that can enhance access to the components of nutrition security across all dimensions. As noted earlier, what must be done to improve economic performance is among the most studied and debated areas of economic research and goes far beyond the purposes of this paper. Nevertheless, there is considerable, though

[18] The discussion in this section is drawn from Benson, Palmer, and Johnson–Welch 2003.

not unanimous, agreement that many of the key contextual elements of nutrition security noted in Figure 20 are also necessary preconditions for economic growth. Political will and the responsible exercise of authority, together with sound economic policies, are necessary foundations.

In a cross-country assessment of income growth and malnutrition in a dozen developing countries, Haddad et al. (2003) show that increases in per capita income at the national level imply similar reductions in the prevalence of underweight preschoolers: in their 12 study countries, malnutrition should decline by 27 percent by 2015 if per capita income growth is sustained at about 2.5 percent per year. To end hunger in Sub-Saharan Africa, Runge et al. (2003) estimate that a regional annual average per capita GDP growth rate of 6.3 percent is needed to meet a target date of 2025, and 3.5 percent if the target date is 2050. In the past decade, however, only half a dozen countries have had average per capita growth rates above 2.5 percent. The challenge is immense.

Food and nutrition insecurity is a facet of poverty. Broad-based economic growth will increase the income and the asset base of African households, providing them with increased access through the market to a broad range of nutrition related goods and services—increased food consumption and dietary diversity, better access to clean water and sanitation, a broader range of health care, and increased educational opportunities. Moreover, economic growth will also enable government to better provide the services critical for improved nutrition—public goods ranging from improved physical infrastructure to effective market institutions to public health investments, social safety net programs, and direct nutrition interventions. Although increased income and assets and broad economic growth are not all that is needed to improve nutrition security, many of the actions necessary to foster economic growth in the countries of Africa in themselves will also significantly improve nutrition security.

Moreover, to restate a point made earlier in several forms, the arrow of cause and effect between nutrition security and economic growth runs both ways. Just as economic growth enhances nutrition security, healthy, active, well-nourished citizens are an important precondition for sustained economic growth.

Action to Build Access

Although individual sectors acting alone cannot effectively remove all of the barriers and constraints individuals and household face as they seek to ensure their nutrition security, there are particular contributions that several sectors can make. If undertaken in a coordinated fashion, these actions in aggregate will significantly improve the access of malnourished people to that which they require to attain nutrition security. The following sections of this paper highlight several key contributions that can be made by individual sectors and then consider some critical cross-sectoral issues.

Markets and Trade

Pro-poor economic growth and sustainable nutrition security require that poor people have access to productive resources and employment. As two-thirds of Africans live in rural areas, productivity gains in agriculture, which will boost rural incomes on and off the farm, are critical to the improved welfare of Africans. Considerable evidence shows that increases in farm income in developing countries promote strong income increases in the rest of the economy, enhancing the nutrition security of society as a whole. To the extent that agricultural productivity gains lead to lower food prices, they also will benefit nonfarm consumers, as well as poorer farmers who are net food purchasers.

Farmers need access to adapted crop varieties, improved livestock, appropriate tools, fertilizer, pest management, and other yield-increasing and environment-friendly technology. Producing higher-value cash and export crops can help increase the incomes of poor rural households and, therefore, food and nutrition security. Moreover, many rural Africans also work in small-scale rural enterprises providing goods and services for other rural households or in agro-industries that add value to agricultural produce. In order for these rural activities to realize welfare and nutritional benefits, effective markets need to be in place (IFPRI 2002). Without access to well-functioning markets for outputs,

inputs, consumption goods, capital, and labor, nutrition-insecure people cannot fully capture the potential benefits their livelihoods might offer them, nor can they expand their employment options. The use of improved agricultural technologies requires that the technologies be profitably employed. Dramatic maize yield response to the application of nitrogenous fertilizer, for example, is meaningless if the farmer is unable to cover the costs of the fertilizer through the sale of the additional maize produced through its use (MPTF 1999). Such a situation is a problem of markets, rather than of agronomy. Without adequate markets, improved crop production cannot be sustained, and the rural economy stagnates. Rural poor people, whether farmers or not, will not benefit if they are excluded from participating and profitably competing in the mainstream market economy.

The welfare and nutrition security of rural Africans is no longer, and likely never was, assured by a self-contained, subsistence economic orientation. In spite of the long-standing market systems on the continent, there is considerable room for developing and enhancing new and existing private competitive markets. How can the hungry and malnourished improve their access to adequate, nourishing food through the market? Alternatively, what institutions and physical infrastructure need to be in place before a country can securely place its faith in the market as a strategic food reserve to deal with production-induced food insecurity crises?

The primary function of markets is the distribution of goods and services. For such distribution to take place efficiently, information on the demand for and supply of various commodities must be available to market participants, transportation needs to be in place to effectively move physical goods, and locations for market transactions to take place need to be established—for most Africans, this means physical marketplaces. Consequently, effective markets will require putting in place across the continent a broad range of physical infrastructure—roads, marketplaces, and communication networks. These efforts must proceed hand-in-hand with the development of requisite supporting institutions for effective private markets. Governments in Africa must continue to judiciously reduce their role in markets and trade. Nevertheless, competent public administration and investment in public goods will remain essential to ensure that contracts are enforced and commodity quality control standards are maintained. Efficient, responsive, and fair markets are necessary if individuals seeking to improve their welfare and nutrition security are to derive maximum benefit from them. Moreover, although the focus here has been on helping rural Africans derive greater benefit from their livelihoods through increased commercialization, a more efficient and broader market system will also benefit the many urban poor and malnourished through increased supply and likely lower prices of food and other rural products.

This discussion should not be limited to the national market system. Rather, efforts must be made to open national markets to international trade, both within Africa and globally, so that maximum benefits from the broader supply and demand offered by the world as a whole accrue to the poor and the malnourished. National food availability should not necessarily or even primarily be dependent upon national food production alone. Alexandratos (1995) assessed the correlates of success for those countries that showed marked improvement in food security between 1960 and 1990. The study found a mixed picture concerning the role of domestic agricultural growth in assuring food security. In most of the countries, however, there was a spurt of growth in food imports over this period and consequent rapid declines in national food self-sufficiency. Although the author clearly states that, particularly for countries with a large agricultural sector—as in most African countries—agricultural growth must be a critical component of continued food security, the importance of utilizing the global market to meet national food needs, insofar as possible, is unambiguous. If countries seek a reliable food supply, open trade, rather than self-sufficiency, is the most effective way to achieve it. The nutrition security of a country's population is enhanced to the degree that the nation invests in building the necessary institutional and legal frameworks and physical infrastructure to facilitate open, reciprocal trade with both neighboring countries and the globe as a whole.

There also should be no ambiguity, however, about the terms upon which African countries should participate in such trade. Although they must not let themselves be sidelined from participating in the global economy, African countries should not accept a playing field for participation in regional and global trade that is not level. The restrictions and other unfair trading practices of trade partners both in the developed world and in Africa prove an important barrier to achieving improved economic welfare and, ultimately, nutrition security for most Africans. African nations stand to realize the greatest relative gains of any producing regions from the liberalization of agricultural trade (Runge et al. 2003, 63). Particularly if requisite complementary investments are made in transport and marketing infrastructure, African nations and farmers can be strong participants in such open markets. Consequently, they must remain fully engaged in negotiations within the World Trade Organization and in other international and regional bodies. Doing so will require strong, confident leadership. African smallholders are in a disadvantageous position relative to the large, integrated agribusinesses that dominate global trade. Likely modifications to current forms of agricultural production will be needed if Africa is to compete effectively in broad global markets. Not competing, however, is no option. The costs of withdrawal are too great—costs that are most sharply felt by poor and malnourished Africans.

Agriculture

In any effort to improve food and nutrition security in Africa, agriculture must receive attention. As noted earlier, raising agricultural productivity remains the most potent force for reducing malnutrition in Africa (Smith and Haddad 2000). In many ways, the agricultural sector is the first among equals in addressing the problems of food and nutrition insecurity on the continent. Yet it must be reemphasized that efforts within agriculture alone, if conducted in isolation from activities in other sectors, will not bring food and nutrition security to the many undernourished Africans.

In this section, some of the direct links between agriculture and nutrition security will be highlighted. These links are relatively self-evident. Food is the most important physical input to improved nutritional status. A dynamic and expanding agricultural sector provides immediate and far-reaching nutritional benefits. Although agriculture is concerned with much more than food, the effectiveness of farmers in producing food is a critical factor in the level of access to food enjoyed by the farmers themselves, their households, their communities, and the much broader population with whom they are linked through the market. Growth in food supplies has the dual effect of increasing the income of farming households and reducing the prices all households must pay to acquire food in the marketplace, thereby increasing food access and enhancing nutrition security for both types of household (Bouis and Hunt 1999). Moreover, increased production of food and nonfood crops is an important input into the off-farm economy, both in rural areas and in urban manufacturing centers. High levels of agricultural productivity stimulate these sectors of the economy, while also expanding employment opportunities and raising incomes. In rural areas, increased incomes in the farming sector will increase demand for the goods and services of the local rural nonfarm sector, increasing incomes and the nutrition security of those working in that sector. Moreover, increased income should lead to investments in a wide range of assets. Such assets, particularly if they are productive in nature, should enhance the overall productivity of the rural economy, while also providing a resource to safeguard food and nutrition security in the face of negative shocks to agricultural production or other income sources. These assets are a form of savings that ideally can be sold in the face of such shocks, enabling households continued access to the various dimensions of nutrition security.

In the majority of African countries where the bulk of the population is employed in agriculture and allied industries, putting in place the conditions to bring about agricultural growth should produce direct nutritional benefits. The components of agricultural development are quite well known—it is in the effective establishment of these building blocks where the problems most often lie:

- establishing reliable access to new, profitable, and properly adapted agricultural technologies, particularly those for nonstaple crops that are rich in micronutrients;
- putting in place appropriate agricultural communication and extension systems so that farmers are informed users of new technologies and can make knowledgeable choices among production options—choices, particularly for subsistence-oriented farmers, that will in part be based on nutritional considerations;
- establishing rural financial markets and institutions to enable farmers to reliably acquire the financial capital they need to access productive technologies; and
- building responsive, competitive rural markets and trade networks in which farmers are able to participate with as close to full information on market conditions as possible.

Agriculture has its principal direct effects on nutrition security, first, through supplying sufficient quantities of food for consumption needs, either within the farming household or through the market, and, second, through providing inputs into a broad range of economic sectors in which large segments of the population are employed. For the most part, the quality of the food produced by farmers is assumed to be irrelevant to the degree to which agricultural activities affect broad nutrition security. This does not necessarily need to be the case. A large international, interdisciplinary research program being led by the Consultative Group for International Agricultural Research (CGIAR)—the HarvestPlus program[19]—seeks to increase the nutrient density of many global staple food crops, particularly by increasing the levels of bioavailable iron, zinc, and vitamin A that they contain (Graham et al. 2001). This research effort is just beginning, having started in 2003. If such traits can be bred into high-yielding varieties that enjoy wide consumer acceptability—if biofortification can be achieved for a range of staple crops—farmers would be able to offer a direct, low-cost, and sustainable way to improve the nutritional status of millions of people around the world.

Even if one assumes that agriculture is principally about access to the physical and economic dimensions of nutrition security, a full range of complementary investments in education, health, infrastructure, and governance and administration are needed for agricultural livelihoods to provide individuals and households with food and nutrition security. Stimulating the agricultural sector to improve food and nutrition security requires action in areas far removed from the areas of competence of agriculturalists—markets, education, and primary health care, among others—as much as it requires attention to classic agronomy and livestock husbandry issues. Although the agricultural sector is where the greatest progress is required for broad food and nutrition security to be assured in Africa, it bears repeating that isolated efforts within the agricultural sector alone will not achieve such security. Coordinated action with other sectors is needed.

Education and Nutrition Communication

Individual economic advancement is most commonly founded upon an appropriate and adequate education. Similarly, improved nutrition requires access to knowledge on how to eat a proper, balanced diet and how to provide proper feeding, care, and medical attention to children and other dependents. Having sufficient economic resources to be properly fed is not enough. One must also know how to make use of available resources to achieve a good nutrition status and a healthy, active life. Increased knowledge, whether gained through formal or informal means, will result in better nutritional status both by enhancing the income-earning opportunities for the household and by increasing the quality of care, nutritional and otherwise, that can be offered dependents within the household. Evidence of this relationship for Malawi was presented earlier in Figure 18.

Consequently, it is critical that the primary education curricula in all African countries pay particular attention to nutrition. Where educational attainment levels for girls remain low, such information should be introduced as soon as possible. Of course, formal education is not the only way to com-

[19] See http://www.harvestplus.org.

municate information on good nutrition. Adult education programs, such as adult literacy campaigns, and regular primary health care programs that include training modules are also important means for offering information on good diets and proper nutritional care. Agricultural extension agents should also be encouraged to build their knowledge on proper nutrition and convey that knowledge to farmers. The media must also be exploited in this manner—radio in particular, as it is the most far-reaching form of mass media on the continent.

The nutrition education messages that need to be learned are relatively simple—the components of a balanced diet and information on how locally available foods can be used to build balanced diets, the value of exclusive breastfeeding, the importance of prenatal care and regular child growth monitoring, maintaining sanitation and a healthy environment, and the control of infant and childhood illnesses, in particular. The messages should be adapted to directly address important local barriers to good nutrition. Such messages need to be heard by all using all possible methods.

Health

Problems of food and nutrition security account for a considerable amount of the physical suffering and shortened lives of Africans. As noted in the introduction, recent research shows undernutrition to be the major risk factor underlying more than 28 percent of all deaths in Africa. The same research also evaluated the factors that chiefly account for the burden of disease that the African population endures (Table 5). Factors contributing to nutrition insecurity feature prominently in this list, particularly lack of food and a healthy environment. Absolute deficiency in food consumption that results in underweight persons is the most important direct nutritional factor accounting for the aggregate burden of disease in Africa, but the impact of micronutrient deficiencies is also of much greater significance than most might expect. The absence of a healthy environment—lack of sanitation and no access to clean water—also contributes to the disease burden of Africans.

It is no surprise that Africa is relatively less healthy than the rest of the world. The burden of disease in Africa on a per capita basis amounts to 0.55 DALYs lost annually. By contrast, the global rate is about half of this value: 0.24 (computed from Ezzati et al. 2003). The most important single health risk is unsafe sex, reflecting the decimation being caused by HIV infection, particularly in Southern and Eastern Africa. As highlighted in Chapter 3, the nutritional status of many children cannot but be poor with the disability or death of their primary caregiver due to AIDS. Moreover, the broad range of other diseases—malaria, diarrhea, pneumonia, measles, and so on—that Africans have suffered for many generations continues to make the lives of many painful and short. Indeed, the great overall burden of disease in Africa, particularly as it affects adults, will necessarily reduce the quality and quantity of nutritional care that they are able to provide their dependents. The need for strong health services on the continent has never been greater.

The health sector also has an important technical responsibility in assuring that food and nutrition security is attained in Africa. The bulk of nutrition professionals, both public and clinical nutritionists, are usually found within the health sector. The responsibility, however, extends far beyond these experts in nutrition. As already highlighted, proper food intake in the absence of health will not assure nutrition security. Curative health professionals have a critical role to play.

The health sector is usually responsible for coordinating and leading direct nutritional intervention programs. Direct nutritional interventions, particularly those that address micronutrient malnutrition and broad child survival concerns, have proven effective and efficient in improving the nutritional status of, in particular, preschool children and women of childbearing age. Several broad categories of such interventions are noted in Box 5.

In assessing how best to address nutrition insecurity to establish a sustainable basis for economic growth, it is crucial not to underestimate the impact of direct nutritional interventions. These programs are important investments in human welfare and economic productivity. Their benefits can be seen most dramatically in efforts to reduce the prevalence of low birthweight babies. Behrman and Alderman (2003, cited in Behrman et al. 2004) undertook a cost–benefit analysis of programs of

Box 5—Direct interventions for nutrition security

A broad range of direct nutrition interventions can be employed to improve nutrition. Among those most commonly used are

- providing education about the kinds of foods that can increase the intake and absorption of vitamins and minerals;
- preventing low birthweight through prenatal food and micronutrient supplementation;
- improving child growth by encouraging exclusive breastfeeding for the first six months of life, the appropriate use of fortified complementary foods as the child grows, and control of diarrhea and acute respiratory diseases;
- preventing and treating anemia among women and children through iron supplementation and food fortification;
- eliminating iodine deficiency disorders through iodine supplementation, particularly using iodized salt;
- preventing and treating vitamin A deficiency through facilitating dietary change to vitamin A–rich foods and through supplementation; and
- undertaking interventions to prevent diseases and reduce parasite loads—such as malaria, hookworm, guinea worm, bilharzia (schistosomiasis), and intestinal parasites—that reduce the body's ability to absorb and retain nutrients consumed.

Sources: Allen and Gillespie 2001; UNICEF and MI 2004.

various sorts that seek to improve fetal nutrition and increase infant birthweight—prenatal care, in the broadest sense. The direct costs of the programs that they examined ranged from US$14 to US$100 per low birthweight birth averted.[20] They calculated the present discounted value of the benefits that accrue from averting a low birthweight birth to amount to more than US$550. The benefits from improved fetal nutrition accrue from a range of sources, including reduced costs of health care and productivity gains from the increased physical and mental abilities of the child through his or her life. Estimates of the value of these benefits are detailed in Table 8. The most important of these benefits is simply the increased economic productivity potential of the child.[21] Most of the other direct nutrition interventions considered by the researchers show similar strong rates of return. Direct nutrition interventions must be seen as a critical component of any effort to build the quality of human capital for economic growth and improved standards of living. Nutrition activities are typically part of a broader range of primary health care activities. The objective of primary health care is to ensure that all people enjoy a healthy and active life. Ensuring that individuals attain a relatively high level of nutrition secu-

[20] Costs came from programs in Kenya and Uganda and from a broad overview study of prenatal nutrition interventions in developing countries.

[21] This analysis requires a wide set of assumptions. The researchers undertook a range of sensitivity analyses in calculating the benefits of reducing low birthweight. Benefit-to-cost ratios under virtually all scenarios exceeded 1.0—in several cases, by an order of magnitude. The benefit value noted here is a reasonable expectation. See Behrman et al. 2004 for additional detail.

Table 8—Shifting an infant from a low to a nonlow birthweight status, estimate of present discounted values of seven major classes of benefits that accrue

Benefit class	Value of benefits (discounted)	% of total benefits
Reduced infant mortality	$93	16
Reduced neonatal care	$42	7
Reduced costs of infant/child illness	$38	7
Productivity gain from reduced stunting	$99	17
Productivity gain from increased ability	$239	41
Reduction in costs of chronic diseases	$23	4
Intergenerational benefits	$45	8
Total value of benefits	$580	100

Source: Alderman and Behrman 2003, cited in Behrman, Alderman, and Hoddinott 2004.
Note: Annual discount rate of 5 percent used to adjust the value of future benefits. Costs of programs examined in study ranged from $14 to $100 per low birthweight birth averted.

rity is but one of a range of actions needed to attain this end. The Declaration of Alma-Ata on the contribution that primary health care can make to protect and promote the health of all the people, excerpted in Box 6, remains as valid today in this regard as it was in 1978. Broad, cross-sectoral action that focuses on nutrition with the clear involvement, if not leadership, of local communities is required to effectively ensure people's nutrition security and potential for living healthy and active lives.

Unfortunately, it is quite common for primary health care activities to be given secondary importance within the health sector. In the resource allocations made by central government to health, curative services commonly receive the bulk of resources. The primary health care services then must divide a relatively restricted pot of funds among them, with no guarantee that nutritional programming will receive sufficient funds. In consequence, in Africa donor funding is often used to meet the costs of such nutrition programs. While it is important that the resources come from somewhere, this fact reflects a degree of misplaced priorities by national leaders in Africa. The central importance of food and nutrition security for the welfare of all people and the immense economic benefits provided for relatively little cost should be better reflected in the patterns of budgetary allocation by central government.

Gender Issues in Assuring Food and Nutrition Security

Improvements in child nutrition are closely linked to increased social access of women to the resources they can use to improve care for children and increase the diversity and quantity of food provided the children under their care. As noted earlier, nutrition-related activities have an important gender dimension. If we define gender concerns as based on widely shared norms and expectations about the roles, rights, and responsibilities of men and women, much of what we do to assure the good nutrition of our own households and ourselves has a strong gender content. A key question in this regard is, "Who does these nutrition-related tasks?" To a large degree, it is women who are directly involved in the processing and preparation of food and the care and feeding of dependents within the households. Beyond breastfeeding, there is really no biological reason for women alone to assume these roles and for men to shun them. These gender roles and responsibilities can vary by

Box 6—The Declaration of Alma-Ata

The Declaration of Alma-Ata on primary health care, made in 1978, highlighted several actions and processes necessary to protect and promote the health of all people:

- education concerning prevailing health problems and the methods of preventing and controlling them;
- promotion of food supply and proper nutrition;
- an adequate supply of safe water and basic sanitation;
- maternal and child health care, including family planning;
- immunization against the major infectious diseases;
- prevention and control of locally endemic diseases;
- appropriate treatment of common diseases and injuries; and
- provision of essential drugs.

[Moreover,] primary health care involves, in addition to the health sector, all related sectors and aspects of national and community development, in particular agriculture, animal husbandry, food, industry, education, housing, public works, communications and other sectors; and demands the coordinated efforts of all those sectors.

[And it] requires and promotes maximum community and individual self-reliance and participation in the planning, organization, operation and control of primary health care, making fullest use of local, national and other available resources; and to this end develops through appropriate education the ability of communities to participate.

Source: WHO 1978.

setting and change over time (Agriculture–Nutrition Advantage Project 2003). Consequently, an analysis of food and nutrition security with particular attention to gender is particularly appropriate in assessing how the nutrition security of children, in particular, and all of society can be improved. If the gendered ordering of society leads to malnutrition and consequent suffering, then certainly there should be scope for change.

It is clear that gender bias and discrimination constrain and limit women's rights, choices, capabilities, and opportunities. Poor women have fewer employment opportunities than men, their wages frequently are significantly lower than men's, they have less access to resources and information, and they are less involved in household decisionmaking processes. Girls are less likely to be enrolled in school and drop out earlier than boys. Domestic time demands on women are greater than those on men. In rural Africa women are usually responsible for a considerable portion of household food production, all food processing and preparation and fuel and water collection, while also being responsible for childcare and, when household members are ill, caring for the sick. The time and resource demands on urban women are not necessarily any less all-consuming. Taken together, this broad range of activities limits women's abilities to improve their own nutritional status and that of their children. Competing demands for time and

resources frequently require something to be sacrificed. All too often, what is sacrificed is the nutritional well-being of the woman herself and, if additional sacrifices need to be made, the nutritional well-being of her children and household.

Improving the level of equity between men and women is good for nutrition security (Oniang'o and Mukudi 2002). In the absence of such equity, women have poorer nutritional status, have less access to health care and education, are unable to provide high-quality, knowledgeable care to their children and dependents, and face greater household food insecurity whether through reduced production on their own fields or lower income-earning potential in the labor market (ACC/SCN 2004). In a broad cross-country quantitative analysis, Smith et al. (2003) found that women's decisionmaking power relative to men's was significantly associated with improved nutritional status in their children. They conclude that sustainably improving nutritional status requires proactive efforts to improve the status of women. They suggest programs that will enable women to gain access to new resources and promote girls' education and health care, introduce technologies that save household labor, subsidize childcare for working parents, and improve the nutritional status of adolescent girls and young women. While laudable in themselves from an equity and human rights standpoint, these efforts will also improve the nutrition security of a much larger group than just the women alone. Their children and their households as a whole will also benefit.

Finally, while gender concerns are most easily recognized at the household decisionmaking level, they are also important within the policymaking arena. Women's participation in democratic decisionmaking bodies must be encouraged. If decisionmaking is left to men alone, the political priorities that emerge may pay little attention to improving food and nutrition security.

Food and Nutrition Security, Scale, and Policy Processes

Ultimately, the outcome of all efforts to improve such security must be realized at the level of the individual. As is clear from the UNICEF framework on the determinants of nutritional status, however, many, if not most, of the determinants of nutritional status operate on much broader geographic scales than that of the individual. What does this imply for policymaking and planning, resource allocation, and program implementation to reduce food and nutrition insecurity?

Several issues must be kept in mind. First, at the broader scales, heterogeneity exists within the areas of analysis. Agroecological variation and differences in the degree to which smaller areas are integrated into broad systems of markets and trade mean that both availability and access to food will vary from place to place within a region or nation. Sociocultural barriers to various components of food and nutrition security will differ from group to group across the landscape. Consequently, although broad strategies to enhance food and nutrition security can be developed, these strategies must be context specific in their implementation.

Second, and emerging in part from the first point, efforts aimed at improving food and nutrition security that involve strong central government planning and control are unlikely to succeed. Locally conceived and implemented action is the primary manner in which the barriers and constraints to such security can be removed. For the central government and others in the system as a whole, the transaction costs—the costs of acquiring the needed information and of coordinating the various agents involved—are too great. The role of the central government should be much broader and looser, consisting of giving broad general direction to local efforts and facilitating those efforts by allocating resources, providing needed expertise, offering institutional support, and the like. Indeed, evidence from Asia suggests that where sustained improvements in the nutrition security of the population are desired, responsibility for undertaking the actions needed to attain that aim must be placed within the communities concerned (Mason et al. 2001). The role of government-provided services is to provide necessary technical inputs to the efforts within the communities but not to lead those efforts. Although many African countries face severe capacity constraints that will prevent them from being able to fully follow such a

model in addressing food and nutrition insecurity, it should serve as a vision for the future.

Finally, policymaking and program planning have always been guided by those whose voices are heard within the policymaking arena across a range of levels. Over the past 10 years, democratic political frameworks have increased in number across Africa. The possible increase in attention paid to the "will of the people" and the new political calculations required of politicians within these new competitive systems may either improve the attention given to or draw attention away from nutritional considerations in policymaking. Similarly, decisionmaking and provision of government services are becoming increasingly decentralized in Africa, paralleling and supporting democratization efforts. Where these twin efforts have met with some success, the policymaking process is considerably more noisy, with a broader range of priorities (or definitions of those priorities) demanding attention.

Consequently, community-level political leaders and others who seek government support for nutrition-related interventions are unlikely to succeed without strategically engaging in the political processes of which they are a part. Government structures all the way up to central government face many competing demands. Moreover, from a political standpoint, nutrition security has a somewhat problematic nature, primarily due to a simple lack of knowledge of all of the dimensions of nutrition security. An informed public is critical to democratic decisionmaking, as people cannot demand things they know nothing about. If people are not aware of the causes and the full magnitude of the costs of their malnutrition, it is unlikely that a democratic, decentralized system will facilitate solutions (Benson et al. 2003).

Consequently, nutrition security requires dedicated advocacy to gain more attention at all policy levels—decentralized, national, and global—and as an issue of broad public concern. To compete successfully within a democratic political arena, the issue must be communicated effectively and understood widely, its significance for the welfare of all members of society recognized, and action catalyzed around proposed solutions. Advocacy seeks to do this. A broad range of advocacy activities should be pursued: charismatic political champions for nutrition and food security can be cultivated to build high-level commitments to the issue; advocacy groups can be created to educate and mobilize people to address the issues; innovative solutions to specific constraints need to be evaluated and communicated. Ultimately, advocacy seeks to establish the political will to devote the necessary resources to aid individuals and households in attaining food and nutrition security. While such security is an issue of basic human rights, efforts to attain such security must still be evaluated and find support within the arena of politics.

5. Advancing Food and Nutrition Security

How can action be mobilized in the short term to address food and nutrition insecurity in Africa? To answer this question, this chapter examines a range of policy statements on this issue from the global to the local government level, considering how these statements may be implemented in a manner that will make a difference in the quality of lives of those who are insecure.

Why focus on policies? Why are policies important? In the face of stagnant and declining economies and standards of living in most areas of the continent, considerable cynicism is heard about policy drafting and policymaking in or for Africa. The policies developed and, to some degree, implemented in the past so far have not led to a brighter future for many Africans. Can anything new be said? Why do we need policies when the fate of so many is to simply gather dust while people are no better off?

Policies prioritize. They provide statements of intent by government as it works in the interests of society as a whole and individuals within society. Particularly when formulated with close attention to strategic action, rather than simply documenting where action is needed, they provide useful guidance to decisionmakers at all levels in judging how best to allocate resources—they delimit the range of options to which public resources should be applied. Policies are critical to making sure that capacity is in place to implement such strategic action and that sufficient resources are allocated to successfully attain the goals set out in the policies. When developed in a democratic and transparent manner, policies can be said to reflect the aspirations of the people. Although much of the cynicism that greets new policies may be justified, they are a necessary component of undertaking coordinated, effective action on a large scale, such as that needed to ensure food and nutrition security for all Africans.[22]

Policies principally involve agents of the state, yet there are a wide range of actors involved, in this case, in assuring individuals the access they need to the various dimensions of food and nutrition security. These include the private sector, local NGOs across the spectrum of civil society, and international development partners—multilateral and bilateral donors and international NGOs. Should policy matter for these individuals and institutions? They are not as constrained by the dictates of policy as is government. Indeed, in many cases NGOs in particular have been effective agents for human and economic development, arguably because they have enjoyed more flexibility in action, unencumbered by the dictates of policy.

Strong arguments can be made, however, that such policy applies almost as strongly to the nonstate actors. Ideally, the state will put in place a range of incentives and disincentives to guide the somewhat independent activities of the private sector and NGOs toward the objectives laid out in policy. This policy, therefore, should be an important component of the information they use to guide their activities. International donors and NGOs all require some means to prioritize their actions within a country or region. Policy provides this. These are pragmatic reasons for nonstate actors to bring

[22] Moreover, as Chabal and Daloz (1999) point out, political actors can derive considerable personal and public (for their narrowly defined constituencies) benefit from a government that lacks defined and transparent policymaking processes and priorities, concrete development objectives, and explicit strategies to attain those objectives. In the absence of policy, greater abuse of power is likely.

policy into their strategic planning. In a more ideal sense, however, policy should represent the broad aspirations of a nation's citizens. Particularly if derived in a transparent and participatory manner, it can do this. In such cases, any agent that goes counter to established policy should provide strong and sound justification for its action. Policy is an important mechanism by which to hold nonstate actors accountable.

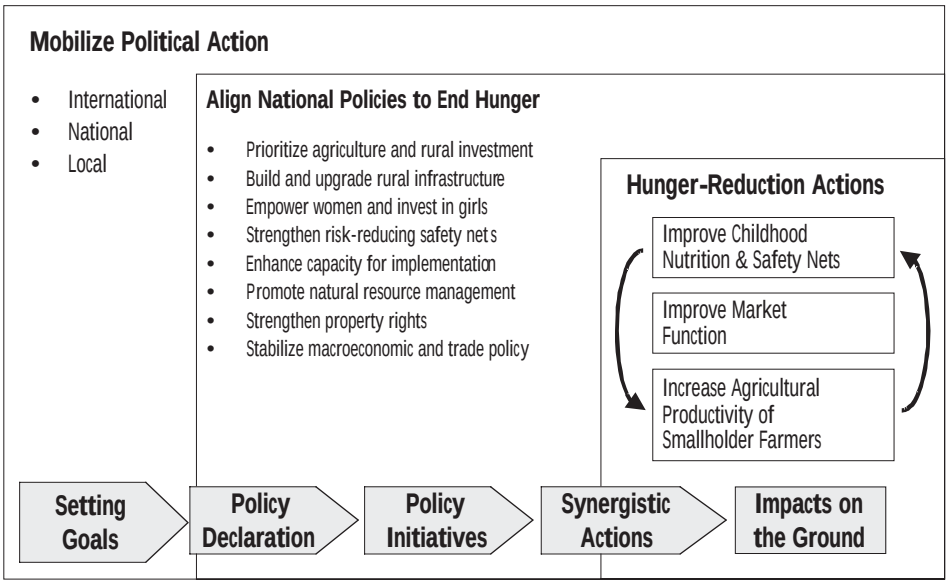
A Hierarchy of Policies to Improve Food and Nutrition Security

The policies formulated at different geographic scales ideally should foster a cascade of action to attain the aim of improved food and nutrition security. To demonstrate, Figure 21 shows a conceptual framework established by the Millennium Project Hunger Task Force to attain their goal of cutting global hunger by half by 2015. Political action is mobilized initially through international policy formulation. The advocacy actions associated with these international goals are to be translated into national and local political action to formulate contextually appropriate policy at those levels. The goals of these national and local policies, in turn, are to be attained by undertaking action initiatives. These initiatives will result in specific, well-defined sectoral and cross-sectoral actions and investments to remove constraints and facilitate access to the components of nutrition security for individuals and households. In this case, the actions being advocated are those aimed at increasing agricultural productivity, improving markets, and providing direct nutrition interventions to those in need. The outcome of this cascade of policy formulation, advocacy, planning, and sectoral and cross-sectoral actions will be impact. If the policies are right and the strategic planning is sound, that impact should be improved nutrition security for a much larger group of people than those who enjoy such security now.

Global Policies

One could point to any of several global policy statements on food and nutrition security. Most of

Figure 21—A cascade of action: The strategy to end global hunger proposed by Millennium Project Hunger Task Force



Source: HTF 2003.

them exhibit considerable overlap, as they are usually developed through broad consultation under the leadership of the United Nations or its constituent agencies (see HTF 2003, Annex 1). Arguably, the most prominent such policy statement at present is the United Nations Millennium Declaration of 2000. Emerging from the Millennium Summit, the declaration recommits the community of nations to a broad range of steps to lead to a "more peaceful, prosperous and just world." In contrast to previous policy statements, however, the Millennium Declaration also establishes eight goals—the Millennium Development Goals (MDGs)—each with quantified targets, to motivate the international community to action. Within the context of food and nutrition security, the community of nations committed itself "to halve, by the year 2015, . . . the proportion of people who suffer from hunger" (Millennium Declaration, para. 19).

Recognizing the need to put in place a broad action plan to achieve these goals, the secretary-general of the United Nations, with the UN Development Programme, launched the Millennium Project to formulate strategies. Within the project are 10 task forces that are to devise implementation plans over three years to allow all developing countries to meet the MDGs. Among these is the Hunger Task Force, referred to earlier, which is fleshing out and extending the Millennium Declaration by prioritizing the sorts of actions that can be taken to address food and nutrition insecurity. This work is now in progress, with an interim strategic document published in late 2003. Although this document puts forward specific technical actions, delineating some roles and responsibilities, the Hunger Task Force recognizes that its principal role is to mobilize the political commitment to end hunger, at the global scale as well as at the national and local scales, in rich and in poor countries (HTF 2003, 11). This goal is appropriate, given the task force's global mandate.

Continental Policies

The policy declarations at the global level begin to find greater substance as the scale moves toward the local. The continent of Africa is large and diverse. Consequently, continental policies are still relatively abstract, serving more for advocacy than to provide concrete input into action to address food and nutrition security. As noted in Chapter 1, however, because of the backdrop of human suffering in Africa, Africa has reasserted itself on the international human development agenda. A key actor in this renewed effort is NEPAD, the New Partnership for Africa's Development, an organization developed by African heads of state to set the continent on the path to irreversible and sustainable development.

NEPAD, with the assistance of the FAO, has developed a detailed Comprehensive Africa Agriculture Development Programme (CAADP) strategy document that proposes a broad range of interventions to guarantee sustainable food security and ensure economic prosperity for all Africans (NEPAD 2002). The CAADP was accepted by African heads of state at the African Union summit in Maputo in July 2003, at which time these leaders committed themselves to allocating at least 10 percent of their national budgetary resources to the implementation of action plans emerging from the CAADP, up from average current allocations of just above 4 percent. Such policy statements, like global statements, are far removed from where concrete action must take place and give little if any attention to nutrition security. Nevertheless, they are important to galvanize initiatives at the national and local levels toward action that will affect the food and nutrition security of individuals and households, as well as in guiding resource allocations to such ends. Moreover, such continental and regional policy statements can provide useful frameworks for enhancing trade, which earlier was shown to be an important factor in promoting food and nutrition security. The CAADP is as useful for the overall direction it provides and the priorities it establishes for African nations as for the particular details of the strategy.

National Policies

Responsibility for assuring food security ultimately lies with national governments. At the national level the cascade of policies on food and nutrition security must move from a focus on advocacy and building political will, which characterizes their nature at the global and continental levels, to actually building initiatives for action on the policy issues.

In this section two sorts of national policies are considered in light of attaining food and nutrition security for all. The first is the broad master development policy for the country. Although not all

African countries have formulated such a policy, poverty reduction strategy papers (PRSPs) are serving as master development policies for a majority of nations across Africa today (in some African countries such policies take other forms). Second, because in Africa agriculture is the critical sector whose dynamism determines the food and nutrition security of most Africans, agricultural sector investment plans also will be discussed.

Since 1999 at least 28 African countries have written or are developing PRSPs under the debt-relief initiative for heavily indebted poor countries (HIPCs) of the World Bank and the International Monetary Fund (IMF). In addition, several countries that do not qualify for inclusion in the HIPC program are also formulating PRSPs in order to receive concessional lending for poverty reduction activities. The PRSPs describe the macroeconomic, structural, and social policies and programs that a country has or will put in place to promote growth and reduce poverty, together with the associated external financing needs required. They are prepared by governments using a participatory process that involves civil society, as well as donor agencies. Although the PRSPs were initially motivated by the HIPC debt-relief initiative, in time they have come to have broader significance. Many international donors other than the World Bank and the IMF use the PRSP for a given country to guide their own programs with and in that country. For this reason and, more important, for the greater rigor it provides in prioritizing government action and allocating resources, most countries that have developed a PRSP are now using it as their master development policy.

Although economic growth strategies lie at the core of most PRSPs, food and nutrition security are virtually absent in their initial formulations. A recent study reviewed 25 PRSPs from around the globe from a food security perspective and observed that in virtually all cases no integrated framework was used that links food and nutrition insecurity with poverty (Bindraban et al. 2003). Nutritional considerations are not included as part of the definition of "poverty" adopted by most PRSPs. Among the poverty reduction indicators specified for the purposes of monitoring PRSP progress, malnutrition measures are typically absent. Income growth is the principal orientation of the strategies, and rightly so. However, there is little balance seen with regard to other fundamental problems of welfare or, alternatively, poverty, including food and nutrition security issues. Yet the dominant, if unstated, assumption seems to be that if income growth is achieved, these other problems will take care of themselves. The argument in this paper, particularly concerning nutrition security, is that, just as increased agricultural productivity alone will not lead to nutrition security, neither will income growth alone.

Fortunately, the PRSPs are not written in stone. They are living documents that need to be evaluated and redrafted on a regular basis to reflect changing priorities and changed understanding of how to effectively reduce poverty. The unbalanced and exclusive orientation toward income growth of the first PRSPs in most African countries need not remain. Advocates for full food and nutrition security in Africa must engage in the higher-level policy processes guiding the revisions of the PRSPs, either directly or through nutrition champions. The key message should be that just as income growth enhances nutrition security, healthy, active, well-nourished citizens are an important precondition for sustained growth in income. Nutrition and food security concerns must be among the primary components of such strategies.

The PRSPs are intended to guide the development of sector plans, but not serve as blueprints. The PRSP provides broad policy context, while the sectoral plans develop initiatives to undertake action on the ground to meet the broader policy aims. The sectoral plans are a step down from the PRSPs in the hierarchy of policies alluded to earlier, a hierarchy that must cascade into action. In particular, it is through agricultural sector investment plans that food and nutrition security issues can move from the rhetoric to concrete initiatives. Indeed, in several countries, the agricultural sector plan is seen as the principal plan of action for the PRSP, reflecting the dominance of agriculturally oriented livelihoods in such countries. Consequently, in their implementation, these agricultural sector plans potentially can have sustainable positive impact on food and nutrition security within the country.

As already noted, however, nutrition concerns in particular are poorly served by the sectoral organization of government—"Improved nutrition is the concern of all, but the responsibility of none." If nutrition insecurity is to be addressed, ownership of

Box 7—Uganda's Plan for the Modernization of Agriculture

The Plan for the Modernization of Agriculture (PMA) is a cross-sectoral but agriculture-led action plan for eradicating poverty that emerged from the Poverty Eradication Action Plan of Uganda, its PRSP. Shortly after the PMA was launched, food and nutrition security advocates interacted with the steering committee of the PMA, engaging the members in discussions about how the PMA might contribute to enhancing food and nutrition security in the country. As a result of these discussions, when the cabinet approved the Uganda Food and Nutrition Policy shortly thereafter, it assigned responsibility for implementing the policy to the PMA (Tumusiime 2003). The overall goal of the policy is "to ensure food security for and adequate nutrition of all the people of Uganda for their health as well as their social and economic well being" (NFNC 2002). It still is too early to tell whether nutrition has become an explicit component of the developmental scope of the PMA with significant resource allocations and to judge how well the cross-sectoral requirements for effectively addressing nutrition insecurity are being met. Nevertheless, this example from Uganda demonstrates that engaging with the sectors concerned is one way in which nutrition security can become a formal part of the political process.

the issue must be built. The leaders of the agricultural sector must be educated about the clear contribution that agriculture can make to nutrition security. While the agricultural sector readily accepts its role in assuring food security, food security will only have welfare impact though cross-sectoral action that pays closer attention to the various dimensions of nutrition security. Agriculture and health, in particular, together with other sectors, need to act in a coordinated fashion to enable the population to achieve nutrition security and the healthy and active lives this brings. There is scope for inserting nutrition into the sectoral policies and action plans of agriculture, extending the vision of the sector beyond food security to broader nutrition security. Again, advocacy is the key—advocacy to build the political will within the agricultural sector to undertake the actions necessary to achieve nutrition security. As shown in Box 7, Uganda provides a useful example of how this might be done.

Local Government Policies

It is at the local government level that direct actions must be taken to facilitate improved access for individuals and households to nutrition security. The hierarchy of policies in place at much broader scales are meaningless if they do not cascade into some form of action at the local level that has real, measurable impact in improving the nutrition security of individuals resident there.

The barriers to effective action at this level, however, are substantial. An important initial barrier is linked to the policy processes operating at local levels. As described earlier, where local priorities are developed within a democratic decisionmaking system, ignorance of the importance of good nutrition may lead to misplaced priorities. Without an informed electoral constituency, politicians may find it difficult to justify a nutrition project rather than a health facility, for example. It is easier for the local politician to point to the health facility when seeking votes at next election than to point to a nutrition program that may actually be more significant for the well-being of local residents. For locally led food and nutrition security programs to be implemented, local knowledge of how good nutrition improves lives needs to be built, followed by advocacy at the appropriate political levels to see that nutrition security becomes a local political priority.

The level of expertise in nutrition at the local government level in most African countries is quite low, and building broad nutrition knowledge is a

challenge. This challenge is not fatal in itself, however. As noted in the previous chapter, with an effective primary health care system, a well-conceived nutrition education program, and nutritional expertise available within the country, substantial improvements in nutrition security can be achieved. Such expertise is a critical input that central government can provide to communities and local governments as they undertake action to enhance the food and nutrition security of local residents. Careful and strategic planning is necessary. Of course, building up the cadre of trained nutritionists should be a priority in all countries suffering from nutrition insecurity.

Finally, local financing of any development programs in Africa, food and nutrition security programs or others, can be problematic. In most countries, there is limited scope for local revenue generation, although this assumption should be tested on a case-by-case basis. Consequently, central government grant-based funding is necessary for local governments to effectively provide the services they are expected to provide to local residents. This situation opens the door for conditional grants based on food and nutrition security provisions to serve as incentives to local governments to undertake activities with a nutrition security objective. Although this sort of funding mechanism should be encouraged, it is not wholly benign. Conditional grants, by their nature, reduce the local responsiveness of local government, making local political leaders responsive more to the dictates of central government than to their constituents. If conditional grants to enhance food and nutrition security are used, they must be coupled with local advocacy work and knowledge building on these issues. Doing so should build demand for continued local attention to the issues even in the absence of the grant mechanisms.

The description of the hierarchy of policies and related action to build food and nutrition security can logically go beyond the local government to the level of the community, the household, and within the household. Some issues of distribution and exclusion of nutritional resources are best examined and addressed at those levels. Indeed, arguably all of the barriers and constraints to achieving food and nutrition security that are addressed in the higher-level policies will have locally specific manifestations with which individuals are confronted on a daily basis. To be successful, efforts to enhance food and nutrition security in Africa must contribute to removing such local barriers and constraints. All policies at higher levels must be clear about how they link to action at these levels.

Financing Efforts to Assure Food and Nutrition Security

Resource constraints dominate the day-to-day activities of most African governments, hindering their ability to effectively provide public services and constraining their contributions to fostering sustained, broad-based economic growth and poverty reduction. Consequently, resource constraints are an important concern in building food and nutrition security in Africa.

The costs of attaining food and nutrition security in Africa are high. NEPAD's Comprehensive Africa Agriculture Development Programme (CAADP) strategy proposes investments of US$251 billion over the period 2002 to 2015, or just under US$18 billion per year, to reduce the incidence of hunger and raise farm output (NEPAD 2002). Of this investment, US$7 billion annually, or 39 percent, is to come from public domestic sources in Africa, US$6.3 billion, or 35 percent, from concessional assistance from donors, with the balance from private investment and commercial loans. Such a budget faces some stark constraints. Notably, estimated total annual government expenditures on agriculture in Africa in the late 1990s were roughly US$6.2 billion (World Bank 2003; FAO 2001). Moreover, through the 1990s the major bilateral and multilateral donors annually committed globally only about US$8 billion to agriculture, broadly defined (FAO/IFAD/WFP 2002). Moreover, these CAADP costs are primarily focused on attaining food security and not broader nutrition security.

Yet the benefits of attaining food and, more important, nutrition security exceed these costs. This can be demonstrated by calculating the aggregate benefits that accrue through addressing a single nutrition problem, that of low birthweight. As discussed in Chapter 4, the present discounted value of the benefits that accrue from averting a low birthweight birth amount to over $550, with net benefits conservatively estimated at over $450 (Behrman et al. 2004). UNICEF (2003) estimates

that 14 percent of the 28 million babies born annually in Sub-Saharan Africa have a low birthweight of below 2.5 kg. Based on these values, reducing the incidence of low birthweight births in Sub-Saharan Africa by half by itself should provide aggregate net benefits of almost $900 million annually. Much larger benefits should be achieved as additional nutritional problems—iodine deficiency-linked mental retardation, iron deficiency anemia in women, poor nutritional care, and so on—and components of food insecurity, especially increasing agricultural productivity and profitability, are effectively addressed.

Moreover, while acknowledging the potential severity of the problem of limited resources, it is important to recognize the power of political will and effective leadership to overcome such constraints. Where development issues such as the need to assure that all enjoy food and nutrition security arise through broad, participatory policy processes, political will is built. Sustained strategic advocacy efforts at local, national, and global levels can accelerate the building of political will. With continued advocacy, any resource voids that may hamper action on the issue will quickly be recognized. When effective leadership is brought to bear on such issues, such resource voids can be quickly filled.

Clearly, donors to African governments are an important source of these resources. Donors have shown themselves to be willing to make important commitments to development issues in Africa when there is broad political will to see that such issues be addressed, together with strong leadership. By the same token, international donors, particularly bilateral donors, have also shown themselves willing to walk away from even morally compelling issues for which governments provide no leadership. Among the important tasks of advocates for food and nutrition security is to establish leaders on the issue, particularly leaders of such a stature that through their actions they can reassure foreign donors of the seriousness of a nation's commitment to building food and nutrition security. With effective leaders guiding the implementation of well-conceived plans for addressing this issue in a transparent fashion, African governments should expect that their international development partners will meet all resource gaps that they face for such programs.

Nonetheless, while donors may be willing, insofar as possible African governments themselves should be the principal source of funds to support programs to eliminate food and nutrition insecurity.[23] Nutrition security is a critical investment for economic growth. More important, there is a considerable moral obligation to do so. Without such security, individuals are unable to fully exploit their full human potential and enjoy healthy and active lives. Certainly, donor funds will be made available, but it is important to ask whether donors are too willing to fill the gap in this area, allowing governments to neglect those important responsibilities they have for assuring the nutrition security of their citizens. Currently, most African governments direct very small amounts of central government funding to direct nutrition activities. Although nutrition security involves much more than these activities, government's commitment to assuring nutrition security can be assessed, in part, through the degree of their commitment to such programs. National government must exercise leadership to build food and nutrition security, both in moral and in material terms.

Food and nutrition insecurity is a critical constraint to economic growth in Africa and an immediate cause of widespread suffering. Millions of Africans seek enhanced food and nutrition security. There is much that national governments can do with their development partners, both in-country and globally, to facilitate such access. The solutions are known. Now we must build the broad political will to address this issue and to foster the leadership necessary to effectively implement the solutions.

---

[23] Some African countries are clearly dependent upon donor resources to such an extent that prospects for government's undertaking significant investment in efforts to attain food and nutrition security are poor. In 2001 Burkina Faso, Burundi, Eritrea, Ethiopia, Guinea-Bissau, Malawi, Mauritania, Mozambique, Rwanda, and Sierra Leone all received levels of aid that exceeded 15 percent of their GDP (World Bank 2003). Most of these countries are also participants, however, in the HIPC process and have written poverty reduction strategies. As the PRSPs are reworked in the future, advocates for food and nutrition security in these countries should endeavor to see that each pays closer attention to these issues so that, thereafter, a substantial portion of any HIPC funds made available to these countries will be allocated to food and nutrition security-oriented activities.

References

ACC/SCN (United Nations Administrative Committee on Coordination/Standing Committee on Nutrition). 2004. *Fifth report on the world nutrition situation*: *Nutrition for improved development outcomes*. Geneva.

———. 2000. *Fourth report on the world nutrition situation*. Geneva: ACC/SCN in collaboration with IFPRI.

Agriculture–Nutrition Advantage Project. 2003. Gender terms and definitions. Project document. International Center for Research on Women (ICRW) and International Food Policy Research Institute (IFPRI), Washington, DC. Photocopy.

Alexandratos, N., ed. 1995. *World agriculture: Towards 2010*. Rome: Food and Agriculture Organization of the United Nations (FAO).

Allen, L., and S. Gillespie. 2001. What works? A review of the efficacy and effectiveness of nutrition interventions. *ADB Nutrition and Development Series No. 5* and *ACC/SCN Nutrition Policy Paper No. 19*. Manila and Geneva: Asian Development Bank (ADB) and United Nations Administrative Committee on Coordination/Standing Committee on Nutrition (ACC/SCN).

Behrman, J. R., H. Alderman, and J. Hoddinott. 2004. Hunger and malnutrition. Copenhagen Consensus Challenge Paper. Copenhagen Consensus 2004. Photocopy.

Benson, T., T. Palmer, and C. Johnson-Welch. 2003. Crossing boundaries to reduce malnutrition? An institutional study of agriculture and nutrition in Uganda, Mozambique, and Nigeria. Agriculture-Nutrition Advantage project document. International Food Policy Research Institute (IFPRI), Washington, DC. Photocopy.

Bindraban, P. S., and others from the Wageningen University and Research Centre. 2003. Focus on food insecurity and vulnerability: A review of the UN system Common Country Assessments and World Bank Poverty Reduction Strategy Papers. A report for the Food Insecurity and Vulnerability Information and Mapping System (FIVIMS) of the Food and Agriculture Organization of the United Nations (FAO). Wageningen University and Research Centre, Wageningen, the Netherlands. Photocopy.

Bouis, H., and J. Hunt. 1999. Linking food and nutrition security: Past lessons and future opportunities. *Asian Development Review* 17: 168–213.

Chabal, P., and J.-P. Daloz. 1999. *Africa works: Disorder as political instrument*. Oxford: James Currey.

Corbett, J. E. M. 1988. Famine and household coping strategies. *World Development* 16 (9): 1099–1112.

De Onis, M., and M. Blössner. 2003. The World Health Organization Global Database on Child Growth and Malnutrition: Methodology and applications. *International Journal of Epidemiology* 32: 518–526.

De Onis, M., M. Blössner, E. Borghi, R. Morris, and E. A. Frongillo. 2004. Methodology for estimating regional and global trends of child malnutrition. *International Journal of Epidemiology* (submitted).

Devereux, S. 2002. State of disaster: Causes, consequences, and policy lessons from Malawi. An ActionAid report commissioned by ActionAid-Malawi.

Dixon, J., and A. Gulliver with D. Gibbon. 2001. *Farming systems and poverty: Improving farmers' livelihoods in a changing world*. Rome and Washington, DC: Food and Agriculture Organization of the United Nations (FAO) and World Bank.

Ezzati, M., A. D. Lopez, A. Rodgers, S. Vander Hoorn, C. J. L. Murray; and the Comparative Risk Assessment Collaborating Group. 2003. Selected major risk factors and global and regional burden of disease. *Lancet* 360: 1347–1360.

FAO (Food and Agriculture Organization of the United Nations). 1997. *Agriculture, food, and nutrition for Africa: A resource book for teachers of agriculture*. Rome.

———. 2001. *Mobilizing the political will and resources to banish world hunger*. Rome.

———. 2003. *The state of food insecurity in the world, 2003*. Rome.

———. 2004. FAOStat: FAO statistical databases. Online agricultural and food databases and extraction tool. http://apps.fao.org/.

FAO/IFAD/WFP (Food and Agriculture Organization of the United Nations, International Fund for Agricultural Development, and World Food Programme). 2002. Reducing poverty and hunger: The critical role of financing for food, agriculture, and rural development. Paper prepared for the International Conference on Financing for Development, Monterrey, Mexico, March 18–22.

FANTA (Food and Nutrition Technical Assistance Project). 2004. Recommendation for the nutrient requirements for people living with HIV/AIDS. Project brief. Washington, DC: FANTA. Photocopy.

FIVIMS/FAO (Food Insecurity and Vulnerability Information and Mapping System/Food and Agriculture Organization of the United Nations). 2002. Measurement and assessment of food deprivation and undernutrition. Summary of proceedings of an international scientific symposium convened by the Agriculture and Economic Development Analysis Division, Food and Agriculture Organization of the United Nations, June 26–28. Rome.

Garrett, J. L., and M. T. Ruel. 2003. Stunted child–overweight mother pairs: An emerging policy concern? *Food Consumption and Nutrition Division Discussion Paper No. 148*. Washington, DC: International Food Policy Research Institute.

Gillespie, S. 2001. Strengthening capacity to improve nutrition. *Food Consumption and Nutrition Division Discussion Paper No. 106*. Washington, DC: International Food Policy Research Institute.

Gillespie, S., and L. Haddad. 2001. Attacking the double burden of malnutrition in Asia and the Pacific. *ADB Nutrition and Development Series No. 4*. Manila and Washington, DC: Asian Development Bank (ADB) and International Food Policy Research Institute (IFPRI).

Graham, R. D., R. M. Welch, and H. E. Bouis. 2001. Addressing micronutrient malnutrition through enhancing the nutritional quality of staple foods: Principles, perspectives, and knowledge gaps. *Advances in Agronomy* 70: 77–142.

Haddad, L., H. Alderman, S. Appleton, L. Song, and Y. Yohannes. 2003. Reducing child malnutrition: How far does income growth take us? *World Bank Economic Review* 17 (1): 107–131.

HTF (Hunger Task Force). 2003. *Halving hunger by 2015: A framework for action*. Interim report of the Millennium Project. New York: United Nations Development Programme (UNDP).

IFPRI (International Food Policy Research Institute). 2002. *Reaching sustainable food security for all by 2020: Getting the priorities and responsibilities right*. Washington, DC.

———. 2004. *Accelerating malnutrition reduction in Bangladesh: The potential role of DfID-Bangladesh to add value*. A Nutrition Interventions Scoping Study. Report of an IFPRI-led team. Washington, DC.

Jonsson, U. 1993. Integrating political and economic factors within nutrition-related policy research: An economic perspective. In *The political economy of food and nutrition policies*, edited by P. Pinstrup-Andersen. Baltimore, MD, USA: Johns Hopkins University Press.

MPTF (Maize Productivity Task Force), Action Group I. 1999. Validating and strengthening the area-specific fertilizer recommendations for hybrid maize grown by Malawian smallholders. A research report of the results of the nationwide 1997/98 Maize Fertilizer Recommendations Demonstration. Ministry of Agriculture and Irrigation, Lilongwe, Malawi. Photocopy.

Mason, J. B. 2002. Measuring hunger and malnutrition. In *Measurement and assessment of food deprivation and undernutrition*. Proceedings of an international scientific symposium convened by the Agriculture and Economic Development Analysis Division, Food and Agriculture Organization of the United Nations (FAO), June 26–28. Rome: FAO.

Mason, J. B., J. Hunt, D. Parker, and U. Jonsson. 2001. Improving child nutrition in Asia. *ADB Nutrition and Development Series No. 3*. Manila and New York: Asian Development Bank (ADB) and United Nations Children's Fund (UNICEF).

Maxwell, S., and T. Frankenberger. 1992. *Household food security: Concepts, indicators, and measurements: A technical review*. New York and Rome: United Nation's Children Fund (UNICEF) and International Fund for Agricultural Development (IFAD).

Naiken, L. 2002. FAO methodology for estimating the prevalence of undernourishment. In *Measurement and assessment of food deprivation and undernutrition*. Proceedings of an international scientific symposium convened by the Agriculture and Economic Development Analysis Division, Food and Agriculture Organization of the United Nations (FAO), June 26–28. Rome: FAO.

NFNC (National Food and Nutrition Council). 2002. *Uganda food and nutrition policy*. Kampala.

NEPAD (New Partnership for Africa's Development). 2002. *Comprehensive Africa Agriculture Development Programme*. Rome: Food and Agriculture Organization of the United Nations (FAO).

Oniang'o, R., and E. Mukudi. 2002. Nutrition and gender. In *Nutrition: A foundation for development policy briefs series*. Geneva: ACC/SCN.

ORC/Macro. 2004. Demographic and Health Surveys STATcompiler. Online DHS survey data extraction tool. http://www.measuredhs.com/start.cfm.

Paarlberg, R. 2002. Governance and food security in an age of globalization. *2020 Vision for Food, Agriculture, and the Environment Discussion Paper 36*. Washington, DC: International Food Policy Research Institute (IFPRI).

Pelletier, D. L., E. A. Frongillo Jr., D. G. Schroeder, and J.-P. Habicht. 1994. A methodology for estimating the contribution of malnutrition to child mortality in developing countries. *Journal of Nutrition* 124 (10 suppl.): 2106S–2122S.

Popkin, B. M., S. H. Horton, and S. Kim. 2001. The nutrition transition and prevention of diet-related diseases in Asia and the Pacific. *ADB Nutrition and Development Series No. 6.* Manila: Asian Development Bank (ADB).

Poverty Monitoring System. 2000. *Detailed tables for a poverty profile of Malawi, 1998.* Lilongwe: Government of Malawi.

——. 2001. *A relative profile of poverty in Malawi, 1998: A quintile-based poverty analysis of the Malawi Integrated Household Survey, 1997–98.* Lilongwe: Government of Malawi.

Ruel, M. T., and M. Arimond. 2003. Dietary diversity, nutrient adequacy, and children's growth: Current knowledge and new evidence. Presentation made at "Food-based approaches for healthy nutrition in West Africa" workshop, Ouagadougou, Burkina Faso, November.

Runge, C. F., B. Senauer, P. G. Pardey, and M. W. Rosegrant. 2003. *Ending hunger in our lifetime: Food security and globalization*. Baltimore, MD, USA: Johns Hopkins University Press.

Sen, A. 1981. *Poverty and famines: An essay on entitlement and deprivation*. London: Clarendon.

Smith, L. C., and D. Aduayom. 2004. Measuring food insecurity using household expenditure surveys: New estimates from Sub-Saharan Africa. *Food Consumption and Nutrition Division Discussion Paper*. Washington, DC: International Food Policy Research Institute. Forthcoming.

Smith, L. C., and L. Haddad. 2000. Explaining child malnutrition in developing countries: A cross-country analysis. *IFPRI Research Report 111*. Washington, DC: International Food Policy Research Institute (IFPRI).

Smith, L. C., U. Ramakrishnan, A. Ndiaye, L. Haddad, and R. Martorell. 2003. The importance of women's status for child nutrition in developing countries. *IFPRI Research Report 131*. Washington, DC: International Food Policy Research Institute (IFPRI).

Smith, W. J., and K. Subbarao. 2003. What role for safety net transfers in very low income countries? *Social Protection Discussion Paper Series No. 301*. Washington, DC: World Bank.

Tumusiime, R. P. 2003. Implementation of the food and nutrition policy of Uganda. Ministry of Agriculture, Animal Industry, and Fisheries, Entebbe, Uganda. Photocopy.

UNICEF (United Nations Children's Fund). 1990. *Strategy for improved nutrition of children and women in developing countries*. A UNICEF policy review. New York.

——. 2003. The state of the world's children 2003. Online database. New York. http//www.unicef.org/sowc03.

UNICEF and MI (United Nations Children's Fund and the Micronutrient Initiative). 2004. Vitamin and mineral deficiency: A global damage assessment report. New York and Ottawa. http//www.micronutrient.org.

UNDP (United Nations Development Programme). 2003. Human development indicators 2003. Online database. New York. http://hdr.undp.org/.

USAID (United States Agency for International Development). 1992. Definition of food security. *USAID Policy Determination 19*. Washington, DC. Photocopy.

World Bank. 2003. *World development indicators 2003*. CD-ROM. Washington DC: Development Data Group, World Bank.

WFP (World Food Programme). 2004. Africa hunger alert. http://www.wfp.org/appeals/africahungeralert/ (accessed January 21).

WHO (World Health Organization). 1978. *Declaration of Alma-Ata*. International Conference on Primary Health Care, Alma-Ata, USSR, September 6–12, 1978.

——. 2003. Global database on child growth and malnutrition. Online database. Geneva. http://www.who.int/nutgrowthdb.

Todd Benson is a research fellow in IFPRI's Food Consumption and Nutrition Division. He conducts research on poverty, poverty mitigation, and household economic vulnerability, primarily in Malawi where he was out-posted until mid-2001. Before coming to IFPRI, Benson was a geographer/socioeconomist in agricultural research with the Government of Malawi. He holds a B.A. in environmental studies and water resources from Cook College, Rutgers University, and an M.A. and Ph.D. in geography from the University of Minnesota.

Notes

2020 Advisory Council

H.E.Yoweri K. Museveni (Chairman), President, Republic of Uganda

H.E. Olusegun Obasanjo, President, Federal Republic of Nigeria

H.E. Abdoulaye Wade, President, Republic of Senegal

Mr. Sartaj Aziz, Former Finance Minister and Foreign Minister, Government of Pakistan

Lennart Båge, President, International Fund for Agricultural Development (IFAD), Italy

Rev. David Beckmann, Director, Bread for the World, USA

Ms. Catherine Bertini, Chair, United Nations System Standing Committee on Nutrition, USA

Dr. Keith A. Bezanson, Former Director, Institute of Development Studies, United Kingdom

Dr. Norman E. Borlaug, Nobel Laureate and Distinguished Professor of International Agriculture, Texas A&M University, USA

Dr. Lester Brown, President, Earth Policy Institute, USA

Dr. Margaret Catley-Carlson, Chairperson, Global Water Partnership, USA

Prof. Chen Chunming, Senior Advisor and President, Chinese Academy of Preventive Medicine, China

Dr. Gordon R. Conway, President, The Rockefeller Foundation, USA

Dr. Bernd Eisenblätter, Managing Director, Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ), Germany

Dr. Leonard Good, CEO & Chairman, Global Environment Facility, USA

Mr. Michel Griffon, Scientific Director, Centre de Coopération Internationale en Recherche Agronomique pour le Développement (CIRAD), France

Mr. Robert Havener, President Emeritus, Winrock International, USA

Dr. Dean R. Hirsch, President and CEO, World Vision International, USA

Mr. Johan Holmberg, Former Ambassador of Sweden to Mozambique

Mr. Ian Johnson, Chairman of the CGIAR and Vice President, Environmentally and Socially Sustainable Development Network, The World Bank, USA

H.E. Speciosa Wandira Kazibwe, Former Vice President, Republic of Uganda

Dr. Mark Malloch Brown, Administrator, UNDP, USA

Sra. Margarita Marino de Botero, Corporacion El Colegio Verde, Colombia

Prof. Alexander F. McCalla, Professor Emeritus, University of California at Davis, USA

Mr. Robert S. McNamara, Former President, The World Bank, USA

Dr. Peter McPherson, President, Michigan State University, USA

Dr. Moïse Mensah, Former Minister of Finance, Government of Benin

Mr. James Morris, Executive Director, World Food Programme, Italy

Mr. Harris Mutio Mule, Executive Director, Top Investment and Management Services (TIMS), Limited, Kenya

Dr. Maureen O'Neil, President, International Development Research Centre (IDRC), Canada

Dr. Per Pinstrup-Andersen, H.E. Babcock Professor of Food and Nutrition Policy, Cornell University, USA

Mrs. Mary Robinson, Director, Ethical Globalization Initiative, USA

Dr. Jeffrey Sachs, Director, The Earth Institute at Columbia University, USA

Dr. Pedro Sanchez, Director of Tropical Agriculture, The Earth Institute at Columbia University, USA

Mrs. Victoria Sekitoleko, Subregional Representative, Food and Agriculture Organization of the United Nations (FAO), Zimbabwe

Prof. Amartya Sen, Nobel Laureate and Master of Trinity College, United Kingdom

Dr. Ismail Serageldin, Director, Library of Alexandria, Egypt

Dr. Ammar Siamwalla, Former President, Thailand Development Research Institute Foundation, Thailand

Dr. M. S. Swaminathan, Chairman, M. S. Swaminathan Research Foundation, India

Mr. M. Syeduzzaman, Former Minister of Finance, Bangladesh

Mr. Paul Thibault, President, Canadian International Development Agency (CIDA), Canada

Dr. Bamanga Mohammed Tukur, Executive President, African Business Roundtable and Chairperson, NEPAD Business Group, Nigeria

Prof. Joachim von Braun (Ex-Officio), Director General, IFPRI, USA

The Honorable Youssef Wally, Deputy Prime Minister and Minister of Agriculture, Egypt

Dr. Vo-Tong Xuan, Rector, Angiang University, Vietnam

Prof. Muhammad Yunus, Founder, Grameen Bank, Bangladesh

Recent 2020 Discussion Papers

36. *Governance and Food Security in an Age of Globalization*, by Robert L. Paarlberg, 2002
35. *Prospects for Global Food Security: A Critical Appraisal of Past Projections and Predictions*, by Alex F. McCalla and Cesar L. Revoredo, 2001
34. *Agricultural Research and Poverty Reduction*, by Peter Hazell and Lawrence Haddad, 2001
33. *Governing the GM Crop Revolution: Policy Choices for Developing Countries*, by Robert L. Paarlberg, 2000
32. *Integrated Nutrient Management, Soil Fertility, and Sustainable Agriculture: Current Issues and Future Challenges*, by Peter Gruhn, Francesco Goletti, and Montague Yudelman, 2000
31. *Roots and Tubers for the 21st Century: Trends, Projections, and Policy Options*, by Gregory J. Scott, Mark W. Rosegrant, and Claudia Ringler, 2000
30. *Overcoming Child Malnutrition in Developing Countries: Past Achievements and Future Choices*, by Lisa C. Smith and Lawrence Haddad, 2000
29. *Prospects for India's Cereal Supply and Demand to 2020*, by G. S. Bhalla, Peter Hazell, and John Kerr, 1999
28. *Livestock to 2020: the Next Food Revolution*, by Christopher Delgado, Mark Rosegrant, Henning Steinfeld, Simeon Ehui, and Claude Courbois, 1999
27. *Soil Degradation: A Threat to Developing-Country Food Security by 2020?*, by Sara J. Scherr, 1999
26. *Fostering Global Well-Being: A New Paradigm to Revitalize Agricultural and Rural Development*, by David D. Bathrick, 1998
25. *Pest Management and Food Production: Looking to the Future*, by Montague Yudelman, Annu Ratta, and David Nygaard, 1998
24. *Food from Peace: Breaking the Links between Conflict and Hunger*, by Ellen Messer, Marc J. Cohen, and Jashinta D'Costa, 1998

To download or order 2020 discussion papers online, go to: http://www.ifpri.org/pubs/catalog.htm#dp

ISBN 0-89629-649-0

INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE
2033 K Street, NW, Washington, DC 20006-1002 USA
TEL: +1-202/862-5600 • FAX: +1-202/467-4439
EMAIL: ifpri@cgiar.org • WEB: www.ifpri.org

www.ifpri.org/2020Africaconference