focus C

What are the links between agricultural production and food security?

Today, the world has more than enough food to feed everyone, yet 850 million are food insecure. Achieving food security requires adequate food availability, access, and use. Agriculture plays a key role in providing (1) food availability globally (and nationally and locally in some agriculture-based countries); (2) an important source of income to purchase food; and (3) foods with high nutritional status.

In the mid-1970s, as rapidly increasing prices caused a global food crisis, food security emerged as a concept. Attention focused first on food's availability but then quickly moved to food access and food use—and, most recently, to the human right to adequate food. The International Covenant on Economic, Social, and Cultural Rights, ratified by 153 states, obligates these states to progressively realize the right to food.

The commonly accepted definition of food security is—

> when all people, at all times, have physical, social, and economic access to sufficient, safe, and nutritious food to meet their dietary needs and food preferences for an active and healthy life.[1]

The chronically food insecure never have enough to eat. The seasonally food insecure fall below adequate consumption levels in the lean season. And the transitory food insecure fall below the food consumption threshold as a result of an economic or natural shock such as a drought, sometimes with long-lasting consequences.

Investments in agriculture are important to increase food security. The channels are complex and multiple. Rising productivity increases rural incomes and lowers food prices, making food more accessible to the poor. Other investments—such as improved irrigation and drought-tolerant crops—reduce price and income variability by mitigating the impact of a drought. Productivity gains are key to food security in countries with foreign exchange shortage or limited infrastructure to import food. The same applies to households with poor access to food markets. Nutritionally improved crops give access to better diets, in particular through biofortification that improves crop nutrient content. The contributions that agriculture makes to food security need to be complemented by medium-term programs to raise incomes of the poor, as well as insurance and safety nets, including food aid, to protect the chronic and transitory poor (chapter 9).

Secure world, insecure households

The world is generally food secure, producing enough food to meet the dietary needs of today's global population—although future global food security should not be taken for granted because of uncertainties from growing resource scarcity and climate change (chapter 2). Yet 850 million people remain undernourished.[2] Accordingly, the first Millennium Development Goal includes the target of halving hunger as tracked by the measure of undernourishment given by the Food and Agriculture Organization of the UN (FAO) .[3]

The highest incidence of undernourishment is in Sub-Saharan Africa, where one in every three persons suffers from chronic hunger (figure C.1). The greatest number of undernourished is in South Asia (299 million), closely followed by East Asia (225 million).

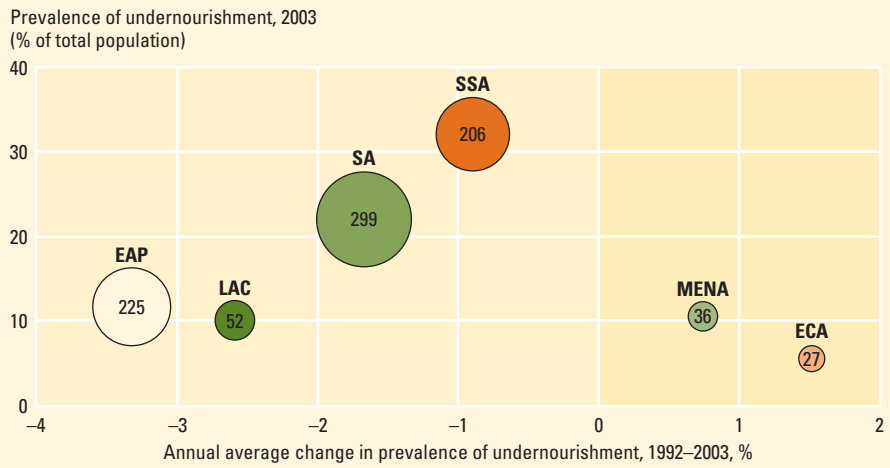
East Asia has reduced the prevalence of undernourishment in the past decade by more than 3 percent a year and South Asia by 1.7 percent a year, but the failure to reduce the absolute number of undernourished remains a cause for concern. In the 1970s, 37 million people were removed from the ranks of the undernourished, and 100 million in the 1980s, but in the 1990s, only 3 million were removed.

What accounts for these millions of food-insecure individuals? Food security depends on adequate and stable food availability, access to adequate and appropriate food, and proper use and good health to ensure that individual consumers enjoy the full nutritional benefits of available, accessible food. Availability is necessary but not enough to ensure access, which is necessary but not enough for effective use.

Food availability—producing enough to eat

The price increases in the mid-1970s world food crisis were exacerbated by low foreign exchange reserves, limiting food imports in many food-deficit countries. This rise in prices prompted some countries to look inward, striving for food self-sufficiency through domestic production. But today with deeper international markets, lower real prices, and more countries with convertible exchange rates, trade can stabilize

Figure C.1 Undernourishment is highest in Sub-Saharan Africa



Sources: http://faostat.fao.org; FAO 2006c.
Note: The size of bubbles represents millions of undernourished people. EAP—East Asia and Pacific, LAC—Latin America and Caribbean, SA—South Asia, SSA—Sub-Saharan Africa, MENA—Middle East and North Africa, ECA—Europe and Central Asia.

Embargoed: not for broadcast or transmission until October 19, 2007 at 12:00 noon in Washington, DC (16:00 GMT)

food availability and prices for most countries (chapter 5). And most countries have diversified their export base, increasing their capacity to import.

However, food availability is still a concern in some agriculture-based countries. Many countries have declining domestic production per capita of food staples.[4] Burundi, Ethiopia, Kenya, Madagascar, Nigeria, Sudan, Tanzania, and Zambia all had negative per capita annual growth rates in staple food of –1.0 to –1.7 percent from 1995–2004. In addition, staple food production in many agriculture-based countries is largely rain fed and experiences large fluctuations caused by climatic variability. In Sudan, for example, the coefficient of variation of domestic staple food production is 25 percent. This means that a shortfall of at least 25 percent of average production occurs every six years. And many other countries have similarly high coefficients: Niger and Malawi at 18 percent; Rwanda at 15 percent; and Burkina Faso, Chad, Kenya, Uganda, and the Republic of Yemen above 10 percent.

Stagnation or decline in domestic production and large fluctuations clearly raise a potential problem of food availability at the national level. Can this problem be addressed through imports? In many countries the answer is yes. In other countries, however, the main staples consumed have a low degree of tradability and are hardly traded internationally (chapter 1). Poor infrastructure imposes high costs for food to reach isolated areas, even when the capital city and coastal cities are well served by international markets.

Beyond tradeability issues—with adequate infrastructure and internationally traded staples—low foreign exchange availability often limits the capacity to import. Consider the case of Ethiopia that would import on average 8 percent of its staple food consumption (assuming no food aid) to maintain current levels. Additionally, a 9 percent shortfall in production, which occurs on average every six years, could only be compensated by a doubling of imports. But in the absence of food aid, Ethiopia would already be spending 16 percent of its foreign exchange earning on food imports, leaving little scope for the necessary increases in imports.

Almost all the agriculture-based countries are net importers of food staples, importing on average 14 percent of their total consumption over the past 10 years, but reaching high dependency levels of more than 40 percent in Guinea-Bissau, Haiti, and the Republic of Yemen. With such levels of dependency and food imports often representing more than 20 percent of the available foreign exchange, world price fluctuations place additional strain on import capacity and therefore domestic food availability. World price variability remains high, with a coefficient of variation of around 20 percent.

Because of the low price elasticity of demand for food staples and the thinness of markets, problems in food availability (from low domestic production or lack of imports) translate into large spikes in domestic prices and reductions in real incomes of poor consumers (many of whom are farmers). Even in countries that engage in trade, transportation and marketing costs result in a large wedge between import and export parity within which domestic prices can fluctuate without triggering trade. Price variability, which is already high even in capital cities with mostly liberalized markets, is exacerbated in inland and more remote regions.

Food access—having enough to eat

But for most of the malnourished, the lack of access to food is a greater problem than food availability. Nobel Laureate Amartya Sen famously wrote that "starvation is a matter of some people not *having* enough food to eat, and not a matter of there *being* not enough food to eat."[5] The irony is that most of the food insecure live in rural areas where food is produced, yet they are net food buyers rather than sellers (chapter 4). Poverty constrains their access to food in the marketplace. According to the UN Hunger Task Force, about half of the hungry are smallholders; a fifth are landless; and a tenth are agropastoralists, fisherfolk, and forest users; the remaining fifth live in urban areas.[6] *Today, agriculture's ability to generate income for the poor, particularly women, is more important for food security than its ability to increase local food supplies.* Women, more than men, spend their income on food. In Guatemala, the amount spent on food in households whose profits from nontraditional agricultural exports were controlled by women was double that of households whose men controlled the profits.[7]

India has moved from food deficits to food surpluses, reducing poverty significantly and reaching a per capita income higher than that in most parts of Sub-Saharan Africa. Yet it remains home to 210 million undernourished people and 39 percent of the world's underweight children.[8] Bangladesh, India, and Nepal occupy three of the top four positions in the global ranking of underweight children. Ethiopia is the fourth, with the same incidence of underweight children as India. Many believe that the inferior status of women in South Asia has to some extent offset the food security benefits of agriculture-led poverty reduction.

Food use—ending hidden hunger

Food use translates food security into nutrition security. Malnutrition has significant economic consequences, leading to estimated individual productivity losses equivalent to 10 percent of lifetime earnings and gross domestic product (GDP) losses of 2 to 3 percent in the worst-affected countries.[9] But malnutrition is not merely a consequence of limited access to calories. Food must not only be available and accessible, but also be of the right quality and diversity (in terms of energy and micronutrients), be safely prepared, and be consumed by a healthy body, as disease hinders the body's ability to turn food consumption into adequate nutrition.

Lack of dietary diversity and poor diet quality lead to micronutrient malnutrition or hidden hunger,[10] even when energy intakes are sufficient. Hidden hunger can cause illness, blindness, and premature death as well as impair the cognitive development of survivors. In the next 12 months, malnutrition will kill 1 million children before the age of five.[11] Iron deficiency among female agricultural workers in Sierra Leone will cost the economy $100 million in the next five years.[12]

Although increased production of horticulture products and livestock has been agriculture's main avenue to improve diet quality, agriculture now offers an additional pathway to address hidden hunger. Biofortification is enhancing staple crop varieties and improving diet quality with higher levels of vitamins and minerals through conventional crop-breeding and biotechnology.

In the future, agriculture will continue to play a central role in tackling the problem of food insecurity. It can maintain and increase global food production, ensuring food availability. It can be the primary means to generate income for the poor, securing their access to food. And through new and improved crop varieties, it can improve diet quality and diversity and foster the link between food security and nutrition security.

Embargoed: not for broadcast or transmission until October 19, 2007 at 12:00 noon in Washington, DC (16:00 GMT)