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## **State of the World 2005 Trends and Facts — Cultivating Food Security**

*"At both the national and local level, the most important determinants of food security in the future may be quite different from those of the past."*

Despite technological advancements, the number of hungry people in developing countries increased by 18 million in the second half of the 1990s, to some 800 million today. Worldwide, nearly 2 billion people suffer from hunger and chronic nutrient deficiencies. Behind the tragic photographs of these desperate individuals, however, are the less visible problems that threaten the global food supply.

Diseases such as HIV/AIDS, water scarcity, soil degradation, and conflict still cause their share of food insecurity, but factory farming and climate change exacerbate these problems, and cause new ones. Diverse and indigenous breeds of plants and livestock are more able to resist disease and shocks, but these species are quickly being lost as commercial monoculture spreads around the globe. Meanwhile, subtle changes to climate will be a higher threat to agriculture than the occasional severe drought or heat wave, as these are most disruptive to plants bred for optimal climatic conditions.

Yet just as the threats—both new and old—to food security are numerous, so are the solutions. Our most important tool is not new chemicals or fertilizers or genetically engineered seeds, but a new approach to farming that depends on the knowledge of farmers and a sophisticated use of the environment around them.

### **Food Insecurity On the Rise**

For an increasing number of people in developing countries, food insecurity is a harsh reality. HIV/AIDS has become an accomplice of food insecurity, steadily stripping countries of their agricultural base. In Africa, for example, 7 million workers died between 1985 and 2000 in the 25 most AIDS-affected countries. Women, who comprise up to 80 percent of the farm workforce, now account for about 60 percent of people living with HIV in sub-Saharan Africa. Agricultural knowledge is being lost, as people die before they can pass it on to the next generation.

Environmental factors also play a role. Where people cannot afford to buy enough food, timeless problems like water shortages continue to be the main causes of hunger. Worldwide, 434 million people face water scarcity, and by 2025 between 2.6 billion and 3.1 billion people will be living in either water-stressed or water-scarce conditions. In addition, more than 80 percent of arable land worldwide has lost productivity because of soil degradation.

Conflict also threatens the ability of millions to get enough to eat by keeping farmers from their land. In Afghanistan, farmers were not able to get to their fields to plant crops in 2002; many were forced to kill their livestock in order to survive. And according to the U.N. Food and Agriculture Organization, the violence in Greater Darfur, Sudan, in 2004 forced 1.2 million people from their homes and fields.

## **New Threats to Food Security**

*"Among the threats on the horizon are the loss of diversity of plant and animal species, the emergence of new diseases and food-borne illnesses, and food bioterror."*

The world's plant and animal species are disappearing just as they are most needed to provide a buffer against rising threats such as climate change, food-borne illness, and bioterrorism. Since the beginning of the last century, 75 percent of the genetic diversity of agricultural crops has been lost. Thousands of breeds of plants and animals are being lost annually to wars, pests and diseases, climate change, urbanization, the global marketing of exotic breeding material, and large-scale industrial agriculture. Big, mechanized farms cannot manage a variety of crops, and giant food manufacturers require products of standard size and uniformity.

Yet food security depends on having a diverse genetic stock available. Farmers, herders, and fishers the world over depend on agro-biodiversity—the variety and variability of animals, plants, and microorganisms used directly and indirectly for food and agriculture—to feed themselves and their communities. Through selective breeding and seed saving, farmers have been able to adapt crops and animals to different climates and growing conditions.

Large-scale farming techniques are also contributing to food insecurity by increasing the likelihood of disease outbreaks such as avian flu and the Nipah virus. Huge factory farms crammed with animals and swollen with manure, monoculture crops replacing diverse cropping systems, recycling of animals and waste into livestock feed, growing concentration in the slaughtering and processing industry, the misuse of antibiotics—all of these hallmarks of industrial agriculture give pathogens greater opportunities to infect every layer of the food chain and, ultimately, to affect human health.

This type of farming also increases the risk of bioterrorism. In this era of "terror alerts," farms that forsake genetic diversity have in effect shed their battle armor. Despite their mammoth technological capabilities, huge sheds crammed with chickens or pigs are more vulnerable than smaller, more diverse farms to the unintended or malicious introduction of disease.

## **Institutional Solutions and Their Shortcomings**

*"While many agricultural officials, scientists, and agribusiness executives will continue to favor technological fixes, it is unlikely that this emphasis, which generated many of our current problems, will do the trick. Instead, policymakers and farmers are cultivating conceptual and political changes on the ground."*

In light of concerns about genetic diversity, governments and other stakeholders are making a greater effort to find institutional solutions, rather than technological fixes, to current agricultural challenges. Governments have met with non-governmental groups to negotiate treaties such as the 2004 International Treaty on Plant and Genetic Resources for Food and the 2003 Karen Commitment on livestock diversity. Such agreements indicate an increased understanding of the underlying issues and progress toward cooperation.

## **Farmers: A New, Old Solution**

*"While governments have been engaged in bureaucratic wrangling over agricultural resources, farmers have been quietly cultivating their own genetically diverse crops."*

Farmers, not surprisingly, know best how to grow diversity and protect crops and animals from disease and climate on the farm. Through seed saving and selective breeding, farmers are conserving genetic resources on the ground and sharing the fruits of their labor with other farmers at seed fairs and markets.

Planting a wider range of crops is perhaps the greatest hedge that farmers can take against increasingly erratic weather. More-diverse farms will cope better with drought, pests, and a range of other climate-related jolts. And they will tend to be less reliant on fossil fuels for fertilizer and pesticides. In northeastern Brazil, community seed banks (CSBs) are being built to help farmers get access to seeds and to train them to conserve agricultural biodiversity. In Kenya, seed fairs have become an effective and empowering way for women farmers to trade seeds, share knowledge, and improve genetic diversity and food security at the local level.

In parts of Africa, planting trees alongside crops—a system called agroforestry, which might include shade coffee and cocoa, or leguminous trees with corn—might be part of the answer. Trees send their roots deeper than crops do, making them more drought-resistant. They also pump water into the upper soil layers where crops can tap it. More-diverse crop mixes are all the more important since rising temperatures will eliminate much of the traditional coffee- and tea-growing areas in the Caribbean, Latin America, and Africa.

Efforts are also being made in developed countries. At the Land Institute in Salina, Kansas, the Institute's Sunshine Farm Project raises crops without fossil fuels, fertilizers, or pesticides as a way to reduce its contribution to climate change and to find an inherently local solution to a global problem.

### **How Consumers Can Help**

*"Farmers are not the only ones with a stake in a more secure food system, and they cannot shore up our fields and ranches by themselves."*

It is in the best interest of farmers to reduce their own energy use, simply to save money. But the long-term solution to rising greenhouse gas emissions and climate change will depend mostly on the choices that everyone else makes. Buying local ingredients can help. A meal using imported ingredients can easily generate four times the greenhouse gas emissions of a meal made from local ingredients.

Consumer can also make a difference in slowing the loss of agricultural diversity. Even if farmers decide that they want to start raising more diverse breeds of livestock and plants, the shift will ultimately depend on the willingness of shoppers to seek out these foods at the supermarket. Farmers need the support of a public committed to farms that can withstand climate change and new diseases, and also yield food that is safe to eat. Fortunately, this may not be a hard sell.

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### **Discussion Questions**

1. What are some of the ways the newest threats to food security, including climate change, the loss of agricultural diversity, and emerging diseases, affect the health and livelihoods of the urban and rural poor? What are some of the impacts of these threats on rich nations?
  2. Which regions of the world will feel the affects of climate change the most and why?
  3. What are some of the ways the loss of agricultural diversity threatens the future of global food security?
  4. What are some of the policy solutions for protecting agricultural diversity? What are some of the ways farmers are protecting crop and livestock diversity?
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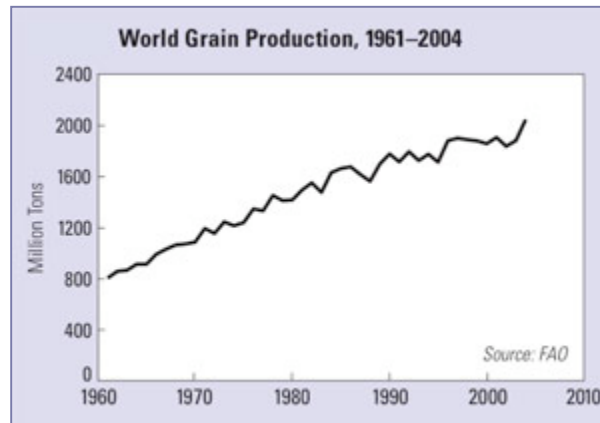
Source: <http://www.worldwatch.org/features/security/tf/10>

## Vital Signs Facts

### Grain Yields Rise, But No Respite for the Hungry

In 2004, global grain production broke 2 billion tons for the first time in history, marking a 9-percent increase from the 2003 level. Also in 2004, according to the U.N. Food and Agriculture Organization, the number of hungry people around the world increased for the first time since 1970. Starvation now kills more than 5 million children each year.

The biggest factor behind this record grain production in 2004 was an increase in average yields: with the same amount of hectares for planting, farmers were able to harvest more crops. However, most people go hungry not because of a global food shortage but because they are too poor to buy food or to obtain the land, water, and other resources needed to produce it.



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