

The cup half empty

One-sixth of the world's population does not have enough food to sustain life, and the world's food supply needs to double by 2050 without increasing demand for water or fuel. Agricultural genetics is one of the easier parts of the solution.

Translation of genetics research is more straightforward in agriculture than in medicine and adequate nutrition has a much larger impact on global health outcomes than any medical intervention. Consequently, one of the most constructive sessions at this year's Milken Institute Global Conference drew attention to the causes of—and solutions to—world hunger.

Hunger is the top global issue that is not on the G8 or G20 agenda. US and EU farm subsidies—and decisions taken for reasons of investment hedging and protectionism—can all cause destabilizing distortions of food prices in local markets across the planet, most notably by multiplying food transport costs. Decreased commitment from Western countries to food aid and diversion of crops to biofuel initiatives are other recent causes of hunger. However, consequences of these decisions may not only work in one direction, as the world's food web is interconnected and decisions made by the West can lead to negative repercussions on its own food security.

A number of organizations make it their duty to keep world hunger fresh in the minds of decision makers. The International Food Policy Research Institute (<http://www.ifpri.org/>) highlights changes in their Global Hunger Index, which tracks self-sufficient nations and success stories such as Brazil's food safety net program that buffers the country against unexpected collapse of access to food. The IFPRI also records trouble spots of hunger due to conflict and climate change, bringing attention to protests and riots in dozens of countries in response to spiking food prices in 2008.

The United Nations World Food Program (<http://www.wfp.org/>) is in a good position to advise on what works and what does not in world agriculture, as it acts as a food bank of last

resort, buying from farmers in developing nations, brokering solutions to logistic problems and distributing food aid to head off crisis. Organizations such as the African Agricultural Technology Foundation (<http://www.aatf-africa.org/>) and the International Maize and Wheat Improvement Center (<http://www.cimmyt.org/>) are developing and promoting well-tested, locally appropriate seed, such as water-efficient maize, helping to decrease the risk of growing more maize.

Where does genetics research fit in? It has sometimes been said that the continuation of the Green Revolution need not entail new knowledge since changes in climate and land use are occurring quickly, requiring rapid anticipation of future needs such as dealing with increasing incidence of drought and saline soils. Rational breeding schemes, shortcuts utilizing molecular markers, transgenic technology and recognition of the genetic resources of locally adapted heritage strains may all be used in the effort to put well-tested and robust crop lines in the hands of local growers. New discoveries from the crop Genome Revolution exert their own pressure by turning foodstuffs in danger of being taken for granted into treasure troves, thus guiding our common story of adaptive coevolution.

The big problems are economic, social and political. In particular, there is a growing awareness that US leadership in global agricultural research as it has been practiced by the Ford and Rockefeller Foundations and USAID needs to be renewed without the hobbles of counterproductive legislation that regards overseas farmers as competitors. Our relationships are more complex and fragile than that. Famine, crisis and disease can now spread globally with remarkable speed. Fortunately, information can too. ■