

## PolicyPennings by Daryll E. Ray &amp; Harwood D. Schaffer

## National Geographic article addresses global food needs in 2050

The challenge of feeding an expected world population of over 9 billion in 2050—at least 2 billion more than today—has attracted considerable attention, resulting in a wide range of responses. A year and a half ago, the expectation was that the world's agricultural production would have to increase by 70 percent over the following 38 years. In our November 11, 2012 column (<http://agpolicy.org/weekcol/643.html>), we pointed out that using conventional technology we were able to move from feeding a world population of 4 billion in 1974 to feeding 7 billion in 2012—an increase of 75 percent over a 38-year period. The expected population increase between 2012 and 2050 was 28 percent.

But the challenge is not simply one of meeting the needs of more than 2 billion additional people—plus the 850+ million who currently are unable to meet their nutritional needs. With rising incomes in the major developing countries, the demand for animal-based protein also increases the need for the production of gains and oilseeds. Taken together—along with a slight increase in the projected population—it is now expected that crop production will need to double by 2050.

In an article in the May 2014 issue of *National Geographic*, titled “A Five Step Plan to Feed the World,” Jonathan Foley argues, “It doesn't have to be industrial farms versus small, organic ones. There's another way.” Foley directs the Institute on the Environment at the University of Chicago.

Foley begins his article by identifying the environmental problems created by current agricultural practices: the release of methane from “cattle and rice fields, nitrous oxide from fertilized fields, and carbon dioxide from the cutting of forests to grow crops or raise livestock.” He also says that agriculture is both a big consumer and polluter of water and it “accelerates the loss of biodiversity.” He makes it clear in his article that agriculture needs to both reduce its negative environmental impact and increase its effective agricultural output if agriculture is to feed the 2050 population in a more sustainable way.

He also identifies the all too familiar battle between those who believe that conventional agriculture is the only way to meet the coming challenge and “the proponents of local and organic farms.” He argues that elements of both arguments are part of the solution to meeting the needs of the increasing demand for agricultural production.

“I was,” Foley writes, “fortunate to lead a team of scientists who confronted this simple question: How can the world double the availability of food

while simultaneously cutting the environmental harm caused by agriculture? After analyzing reams of data on agriculture and the environment, we proposed five steps that could solve the world's food dilemma.”

The first step for Foley and his team is to “freeze agriculture's footprint.” In the past agriculture responded to the need for increased production by, in part, converting forests and grasslands to farm fields and pastures for livestock production. This expansion must stop, he argues.

Instead, and this is his second step, we need to “grow more on [the] farms we've got.” He sees the major gains coming from farmland “where there are ‘yield gaps’ between current production levels and those possible with improved farming practices.” Here he argues that both high-tech and organic techniques can contribute to increasing yields. He notes that “only 55 percent of food-crop calories directly nourish people. Meat, dairy, and eggs from animals raised on feed supply another 4 percent.”

“Use resources more efficiently” is Foley's third step. He takes one paragraph to identify the positive changes that conventional agriculture has made in this direction with the targeted use of fertilizers and pesticides through the use of GPS and soil testing. Foley also devotes a paragraph to the benefits that organics can bring “by incorporating cover crops, mulches, and compost to improve soil quality, conserve water, and build up nutrients.” Foley argues that “advances in both conventional and organic farming can give us more ‘crop per drop’ from our water and nutrients.”

The first 3 steps are ones that primarily depend upon the actions of farmers. The fourth step, “shift diets,” is in part targeted at consumers in the developed countries. In a call to change that certainly will draw the ire of the producers of animal protein, particularly beef, Foley calls for the adoption of a less meat-intensive diet. And then by calling for a reduction in the use of food crops and land for biofuels, he will incur the wrath of crop farmers. Both of these actions are aimed at increasing the percentage of crop production that goes to providing additional food without increasing the land area devoted to agriculture.

Fifth, Foley argues for reducing waste. When it comes to waste, we are all familiar with the need to improve harvest techniques and storage techniques in the developing world. In addition to talking about that, Foley points out that “in rich countries most of that waste occurs in homes, restaurants, or supermarkets.... Consumers in the developed world could reduce waste by taking such simple steps as serving

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smaller portions, eating leftovers, and encouraging cafeterias, restaurants, and supermarkets to develop waste-reducing measures.” He then points out that “of all of the options for boosting food availability, tackling waste would be one of the most effective.”

“Taken together, these five steps could more than double the world’s food supplies and dramatically cut the environmental impact of agriculture worldwide. But it won’t be easy. These solutions require a big shift in thinking. For most of our history we have been blinded by the overzealous imperative of more, more, more in agriculture—clearing more land, growing more crops, using more resources. We need to find a

balance between producing more food and sustaining the planet for future generations,” Foley writes.

In the next column we will look at the report, “Advancing Global Food Security in the Face of a Changing Climate,” recently released by the Chicago Council on Global Affairs.

Daryll E. Ray holds the Blasingame Chair of Excellence in Agricultural Policy, Institute of Agriculture, University of Tennessee, and is the Director of UT’s Agricultural Policy Analysis Center (APAC). Harwood D. Schaffer is a Research Assistant Professor at APAC. (865) 974-7407; Fax: (865) 974-7298; [dray@utk.edu](mailto:dray@utk.edu) and [hdschaffer@utk.edu](mailto:hdschaffer@utk.edu); <http://www.agpolicy.org>.