



## EXPERT BLOG

Scientists, agronomists, practitioners and political experts share their perspectives on current key issues or regional analyses.

### A more sustainable earth through productive agriculture

By IFA Editor on June 1, 2017



**IFA:** As the Executive Director of the Global Harvest Initiative, how do you see the agricultural sector evolving over the next few years?

**Dr. M. Zeigler:** On Earth Day in Washington, DC and in many cities around the world, people marched to advocate for science-based care of the planet and the natural resource base. Those of us who work in agriculture and food security have a special role to play to ensure we meet the goals of providing enough food for a growing population, while ensuring that our planet and resources remain sustainable for the next generation.



To satisfy a peak global population of 9.7 billion people in 2050, agricultural economists project that total agricultural demand (food, feed, fiber and fuels) will increase by 60% to 100% compared with 2005 levels.

Despite some recent calls to [re-examine the projected demand for food](#) in 2050, the organization I lead, [Global Harvest Initiative \(GHI\)](#) believes we must stay on track to nearly double agricultural output. But what matters is how we will actually grow the food, fiber and fuels we need!

**IFA:** How does climate change impact this mission?

**Dr. M. Zeigler:** First, we must work from realistic models that help us incorporate the climate impact on agriculture production. Climate change and the skyrocketing demand for livestock products must be considered when estimating future food production needs.

[The Agricultural Model Intercomparison and Improvement Project \(AgMIP\)](#) compared 10 of the leading models for projecting food demand and found that world agricultural

production of crops and livestock between 2005 and 2050 will need to rise by between 60% and 111%; demand growth will be particularly strong for ruminant products (cows, sheep) as well as for commodities used in the production of biofuels—sugar, coarse grains and oilseeds; and climate change will generate higher prices for agricultural commodities, especially crops.

**IFA: What other factors affect the future food production levels?**

**Dr. M. Zeigler:** We must reduce poverty, which comes about most effectively from higher levels of economic growth.

The United Nations Sustainable Development Goal 8 (SDG8) [lays out specific targets](#) for the economic growth required to end poverty and hunger: in the least developed countries, this must reach at least 7% annual GDP growth.

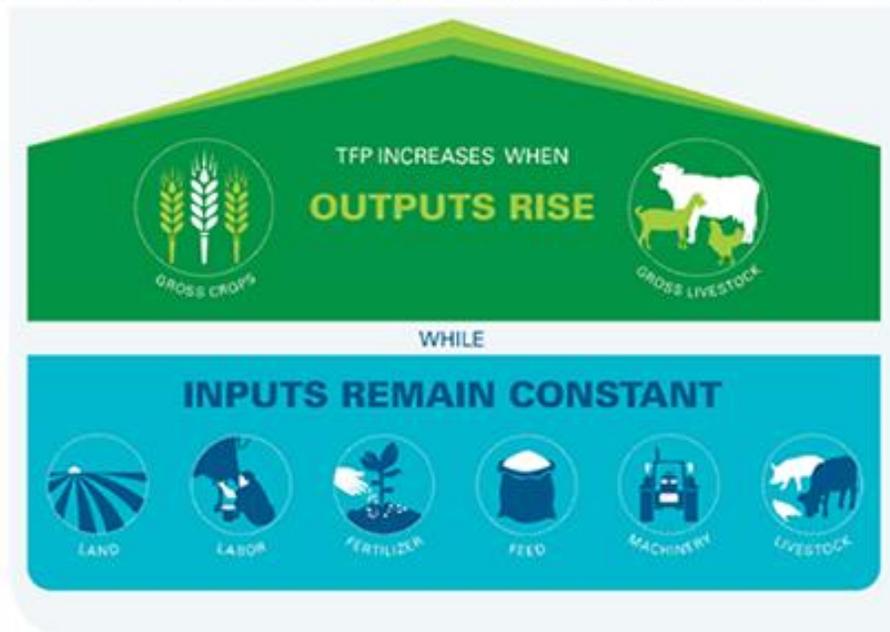
If we are to realize UN SDG 8 with higher economic growth, we will in turn see higher demand for agricultural output in the developing countries, where there is presently insufficient agriculture and food production. Balancing the required economic growth with ensuring food and agriculture prices are affordable, particularly for those in countries that are vulnerable to food price fluctuations, will be key as we move forward.

**IFA: What are the solutions to increase agricultural outputs in a sustainable way?**

**Dr. M. Zeigler:** By improving agricultural productivity, not just total agricultural output, and reducing post-harvest loss we can meet global food demand while conserving natural resources and shift to a more sustainable model of agricultural production. GHI believes that doubling agricultural productivity from 2005 to 2050 is the right goal and is aligned with the [UN SDG 2 target](#).

**Figure 1 – Total Factor Productivity**

Source: 2016 Global Agricultural Productivity Report®, Global Harvest Initiative

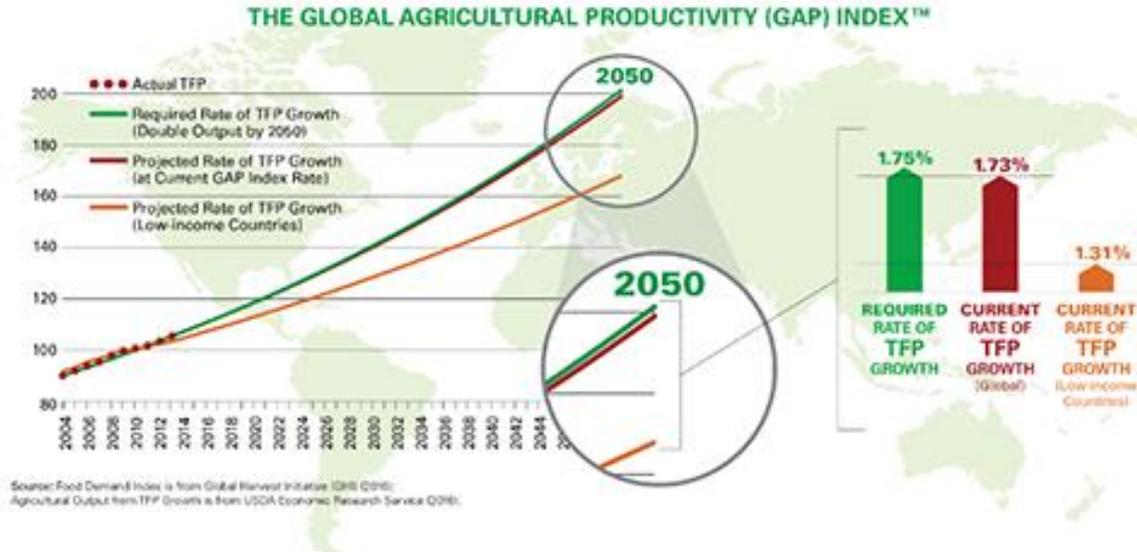


Productivity is not simply producing more food, or even achieving higher yields of crops. In agriculture, total factor productivity (TFP) is the ratio of agricultural outputs (gross crop and livestock output) to inputs (land, labor, fertilizer, feed, machinery and livestock) (Figure 1).

Revising the agricultural output goal downward may lead to decreasing investment in agricultural research and development, and may slow the pace of innovation reaching the field. These investments enable farmers to produce food more sustainably while conserving natural resources. Without these innovations, farmers, particularly in food-deficient countries, may [put more land into production](#) to increase output.

GHI has developed a benchmark tool, the GAP Index™ to track global progress toward doubling agricultural output from productivity (Figure 2).

**Figure 2 - Global Agricultural Productivity Index, 2016**  
 Source: 2016 Global Agricultural Productivity Report, Global Harvest Initiative



Our data show that for the third straight year, global TFP growth is not meeting the required rate of growth of 1.75%. Most concerning is that for low-income countries, productivity is only increasing 1.31%, well below the UN SDG 2 target of doubling productivity.

Accelerating agricultural productivity, particularly for the low-income countries and small-scale farmers, must be at the core of a comprehensive strategy to sustainably feed the world. With more than 75% of the world’s poor heavily dependent on agriculture as their primary source of food as well as for income, agricultural development through productivity is essential to improving their food security, nutrition and incomes.

To access the GAP Reports® and other information on agricultural productivity, visit [www.globalharvestinitiative.org](http://www.globalharvestinitiative.org)