



RISK & INNOVATION

Is There A Simple Solution To The Coming Food Crisis?

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OVERVIEW

With the world's population expected to reach almost 10 billion by 2050, demand for food is set to increase by 70 percent over the coming decades, according to the United Nations Food and Agriculture Organization.

At the same time, climate change is set to hit agriculture hard, according to a recent study in PLOS Biology. The number of plant growing days is projected to decrease by 11 percent by 2100, with tropical regions losing as many as 200 growing days each year; as many as 3.4 billion people will be living in countries that will lose a third of their agricultural production. All this as bees – vital for agricultural pollination – continue to mysteriously die out, with the U.S. alone losing 40 percent of its colonies over the past year

Regular famines in the developing world already cause huge humanitarian crises; and as more refugees seek protection, the developed world will come under increasing social and infrastructure pressure. Markets and supply chains affecting multiple industries can be hit hard, as witnessed by Europe's existing migrant challenge, which has seen trucks travelling to and from the U.K. held back for days due to migrant security concerns. This is not just a developing world problem, or simply a challenge for the food industry, governments or aid agencies – it is in everyone's best interest to find a solution.



IN DEPTH

Food shortages are increasingly likely as the world's population continues to grow, and this will only be compounded by disruption from climate change. Yet simply increasing the amount of agricultural land is no solution. Two thirds of tropical deforestation is caused by the demand for farm land, while farming emits more greenhouse gasses than transportation. Increasing the amount of land farmed could simply worsen the problem.

With a third of the world's population employed in agriculture, according to the UN Food and Agriculture Organization, even without the likely chaos of food shortages the impact on employment and the global economy could be profound. California's on-going drought is just one example – it is expected to cost the local economy \$2.4 billion this year, with the loss of as many as 18,600 jobs.

Increase farming efficiency, and unemployment is also likely to increase significantly. In the developed world, more efficient farming techniques have led to agricultural sector employment typically below five percent of the population, versus well over 60 percent working on farms in many developing markets.

A failure to address the coming food crisis – including the employment challenge – will not simply result in increased hunger and famine in poorer parts of the world, but significant infrastructure, supply and security challenges for the developed world. This is why making agriculture more productive is only part of the challenge.

Give a man a fish – or teach a man to fish?

As much as a third of the food produced globally is wasted, according to the U.N. Food and Agriculture Organization. If just half of that waste could be reduced – and the savings effectively distributed – the one billion people currently going hungry in the world could be fed.

While much waste can be reduced by modern smart farming techniques, introducing genetically-modified crops engineered to be more hardy, and data analytics of supply chains to reduce spoilage in transit through monitoring shipping conditions, a sizeable proportion of food is lost through inefficiencies of production.

This is why sometimes it can be best to start with fixing the basics. The majority of the developing world's farmers are poorly educated, and rely on inefficient farming knowledge passed down through the generations.

The Egyptian Ministry of Agriculture has been experimenting with improving crop yields for years. One simple initiative to introduce simple, low-tech yet more efficient farming techniques has already seen wheat yields increase by 10 percent, while reducing the use of seeds by 60 percent and water by 30 percent, feeding savings back into the system for further investment.

In Cambodia, the System of Rice Intensification has seen crop yields increase by up to 50 percent while reducing seed consumption by 90 percent, water use by up to 50 percent, and chemical fertilizer by up to 100 percent, according to Cornell University.

By investing in training and education programs in modern farming techniques, farm efficiency can be greatly increased with minimal investment, without the need to turn to more controversial techniques that can damage the local (and global) ecosystem. By fixing productivity issues locally, distribution also becomes far less of a challenge – as local farmers can then supply their local communities, while also helping boost their local economies.

Returning to agriculture's roots

The desire for sustainable agricultural solutions is also helping drive the increase in organic agriculture over recent decades. By avoiding artificial fertilizers and pesticides, organic farming's advocates say, it can be much better for the environment. As organic food continues to increase in popularity in developed world markets, it can also make good business sense – one recent study suggesting organic produce being as much as 35 percent more profitable than conventional farming, despite typically requiring more labour, which also means more jobs.

Organic is not simply a return to the old days before artificial fertilisers and pesticides, however. Recent improvements in organic techniques have also boosted organic farming's productivity by as much as 36 percent over the last 30 years. But the picture isn't entirely positive – a 2014 metastudy by U.C. Berkeley found that organic yields are still on average 19.2 percent lower than conventional farming.

Even this doesn't give the full picture, however – certain crops, such as leguminous vegetables, see similar yields from organic as from conventional techniques. The key is to pick the right method of farming for the right crop, livestock, and local geological and climate conditions.

With organic agriculture often labour-intensive, highly profitable and requiring little investment in fertilizers, it could yet prove a promising solution to the developing world's twin challenges of improving farming efficiency and maintaining rural employment.

A role for business?

This is where business can both help – and, in the long-run, profit: by promoting solutions that are sustainable for both communities and the environment.

"Businesses... have the greatest stake in achieving a food-secure future," says former U.S. Secretary of State Madeleine Albright. "Businesses, including large multinational agriculture companies, stand to gain a great deal in the markets that now exemplify the most endemic and vexing challenges of food insecurity."

Rather than try to bring food to areas with food shortages, with all the logistical challenges that includes, working on prevention by ensuring local communities have the skills and training needed to make the most of their resources can reduce hunger through minimizing waste and boost local economies. In the long run, this is good for people, the planet, the global economy, and for business. If we fail to address the challenge, however, the problem is set to shake society to its core – no matter where in the world you are based.



TALKING POINTS



"Put simply, we need to produce more and impact less... we have just 13 harvests before we have 500 million more people needing food in Africa alone. These are the challenges; working together is the solution... The UK's Cross-Government Food Research and Innovation Strategy quotes lag periods of 15 to 25 years between research expenditures and widespread implementation at farm level. We must not underestimate that task. The time for just talking has run out." – Peter Kendall, President, U.K. National Farmers Union



"The global food system is under chronic pressure to meet an ever-rising demand... A global production shock... would be expected to generate major economic and political impacts that could affect clients across a very wide spectrum of insurance classes." – Food System Shock: The insurance impact of acute disruption to global food supply, Lloyd's of London



"Food production takes a toll, and neither maximizing the food nor minimizing the toll is a workable response. No one principle can reliably tell us how to make those trade-offs, because every situation is different." – The Washington Post



"It's important to remember that our current agricultural system produces far more food than is needed to provide for everyone on the planet. Eradicating world hunger requires increasing the access to food, not simply the production." – Professor Claire Klemen, Co-Director, U.C. Berkeley Food Institute

FURTHER READING

- How Will We Fill 9 Billion Bowls by 2050? – Thomson Reuters, August 11, 2015
- New Research Warns Of Catastrophic Food Shortages Due To Unchecked Climate Change – Think Progress, June 23, 2015
- Inside the Looming Food Crisis – National Geographic, May 24, 2015
- Can Our Food Systems Adapt to Rapid Urbanisation? – The Guardian, July 16, 2015
- How Tech Can Stop the Coming Food Crisis – Fortune, May 1, 2015
- Food System, Agribusiness and Beverage Risk Management Report – Aon report