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Can agriculture save the planet? Insights from COP28 and beyond

Summary

The discussions at COP28 highlight the critical role of agricultural innovations in achieving food security and climate goals sustainably. The acceptance and adoption of these innovations by society are paramount. If the public does not support the introduction of such technologies, even the most groundbreaking scientific solutions will remain underutilised. Science tells us what we can do, but, ultimately, it is the public that tells us what we should do. Therefore, engaging consumers in discussions about food production is essential, writes Jack Bobo, Director of the University of Nottingham Food Systems Institute.

This paper is by Jack A. Bobo, director of the Food Systems Institute, University of Nottingham and is from the [Science for Sustainable Agriculture](http://www.scienceforsustainableagriculture.org) website.

As the world's attention turns to the [COP28 conference](https://www.cop28.org/) in Dubai, a pivotal event in the environmental calendar, the focus on sustainable food systems has never been more critical. The [Emirates Declaration on Sustainable Agriculture, Resilient Food Systems, and Climate action](https://www.cop28.org/declaration), a groundbreaking document set to shape the future of environmental policy and action, recognises the intricate link between food production, nutrition, and climate change. This declaration underscores the urgent need for innovative and sustainable approaches to meet the growing global demand for food.

The COP28 meeting, bringing together global leaders, environmental experts, industry, and policymakers, emphasises the essential role of agriculture in combating climate change. The discussions and commitments made here will pave the way for transformative changes in how we produce, consume, and think about food.

In our contemporary society, it's deeply troubling that more than 800 million people continue to face hunger daily, with as many as 9 million succumbing to hunger and nutrition-related diseases each year. This translates to 25,000 lives lost each day, or one person every 4 seconds. This is one reason that many refer to our 'broken food system'. But, if our food system IS broken, then when was it not broken? In fact, aside from the last few years as a result of Covid, substantial progress has been made over the last few decades in reducing hunger and improving agricultural efficiency.

When considering the effectiveness of our food system, we should ponder its evolution. Was the situation better 5, 10, or 50 years ago? Currently, about 10% of the global population goes to bed hungry, a significant reduction from 20% four decades ago and 30% six decades ago. It's hard to imagine a time when the outcomes from our food system were markedly better. This improvement is a testament to the strides made in agricultural productivity and innovation.

The Emirates Declaration brings to light the need for a holistic approach to agriculture and food production, one that balances the need for increased food production with the imperative of environmental sustainability and nutritious and equitable outcomes. Innovations in farming, as evidenced by the dramatic improvements in the United States' corn production between 1980 and 2011, demonstrate the potential of modern agriculture: a 35% reduction in greenhouse gas emissions, 40% less land and energy usage, 50% less water consumption, and 60% less soil erosion, according to the USDA. The numbers are similar in the UK and many other countries for many crops as well as livestock production.

However, as impressive as these statistics are, the reality is that our efforts are not accelerating fast enough to meet the challenges posed by a growing global population. The problem is not so much that things are bad and getting worse, but that they are good and getting better, but not fast enough. With the population expected to reach 9.5 billion by 2050, the UN Food and Agriculture Organisation (FAO) estimates that we need to increase food production by 50-60% and double protein production.

The discussions at COP28 highlight the role of agricultural innovations in achieving these goals sustainably. The acceptance and adoption of these innovations by society are paramount. If the public does not support the introduction of such technologies, even the most groundbreaking scientific solutions will remain underutilised. Science tells us what we can do, but, ultimately, it is the public that tells us what we should do. Therefore, engaging consumers in discussions about food production is essential.

One of the challenges is the difference between how many consumers think about sustainability and how many farmers and companies approach the questions. Many consumers focus on what I refer to as 'local sustainability', associating the reduced use of fertilisers, water, pesticides, and avoidance of modern breeding technologies with greater sustainability. However, this approach can lead to decreased yields, necessitating increased production elsewhere, often with more significant environmental impacts. The benefits of local sustainability are felt locally, but the impacts are global, because somebody has to make up the difference.

The European Union's Farm to Fork strategy, pursues a similar approach, calling for reductions in pesticides and fertiliser and expansion of organic production. While such an approach may reduce the environmental footprint of agriculture in the EU, it will shift the footprint to other regions of the world.

Alternatively, many farmers, companies, and governments advocate for more intensive farming systems. The intensive systems produce more food but often at a cost of greater local impacts. This approach, which I refer to as 'global sustainability', delivers global benefits, because less land is used in other places, but the impacts are felt locally. There will always be trade-offs between the two systems, but the gap between has narrowed over time as each improves.

According to the recent FAO State of Food and Agriculture report, the cost of our food system is more than \$10 trillion. As we endeavor to produce food sustainably and nutritiously, it is crucial to consider the most effective locations and methods for agriculture, always striving for continuous improvement. Helping all of the stakeholders in the food

system be aware of these trade-offs is critical to making better decisions about where to farm in a less intensive manner and where the system would benefit from intensive production.

Innovations in agriculture have enabled significant productivity increases over the decades, often with reduced resource utilisation. While deforestation for agriculture is a concern, it's also true that agricultural advancements have played a key role in preserving vast forest areas. If we were farming today with 1960s technology, we would need 1 billion hectares of land to produce the food we do today, which require cutting down more a third of all the forests on the planet to expand production.

Sustainability is a journey, not a destination. The agricultural sector has been on this journey for over a century, driven by science and innovation. The difference is that farmers were generally making decisions to increase the production and the economics of their operations rather than to achieve sustainability goals. How conservationists and farmers communicate about these issues can often be a barrier to understanding, which can make cooperation and collaboration more difficult.

At the University of Nottingham Food Systems Institute, we are committed to fostering a conversation about sustainable food production and innovation. The insights and commitments from COP28 provide a crucial framework for this dialogue, guiding our efforts to develop sustainable, efficient, and equitable food systems.

As we navigate the next 30 years, a period that will be pivotal in the history of agriculture, our focus must be on ensuring food security for the growing global population while minimizing our environmental footprint. The lessons learned and the strategies developed at COP28 will be instrumental in shaping this journey.

The future of our planet and the well-being of its inhabitants depend on our ability to innovate, collaborate, and implement sustainable practices in agriculture, while also delivering healthy and nutritious food. By embracing the challenges and opportunities presented by COP28 and beyond, we can work towards a future where no one goes to bed hungry, and the planet thrives.

Jack A. Bobo's career spans international law, food and environmental policy, and behavioural science. He joined the University of Nottingham as director of the Food Systems Institute from The Nature Conservancy, one of the world's largest conservation organisations, and previously served as Chief Executive Officer of Futurity, a food foresight company; as Chief Communications Officer and Senior Vice-President for Global Policy at Intrexon Corporation, a synthetic biology company; and as Senior Advisor for Global Food Policy at the US Department of State.

Alan Spedding, 5th December 2023

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