

This is a **fictional** opinion article by a History undergraduate, recently with us for vacation work. Written as if by an imaginary journalist 30 years from now, it offers a Millennial's view of what the public may then be reading about the previous half-century of agricultural change. The text contains some edits by the Foundation.

What do you think of the predictions? We look forward to your comments! [syngenta.foundation@syngenta.com](mailto:syngenta.foundation@syngenta.com)

## Halfway to where? How developing-world agriculture has changed in the last 50 years

*Thomas Hohmann, Agricultural Correspondent, September 12th, 2050*

Since the millennium, farming in the developing world has moved from mostly low-yield, subsistence farming to become increasingly intensive and sophisticated. Many of the same agricultural innovations that led the developed world to make the transition from agrarian to urban societies have now occurred and are still occurring in developing countries. Fertilizers, pesticides, mechanization and other ingredients of intensive farming have been introduced there comparatively fast. Developing countries in Africa, Asia, and South America have undergone significant societal change, in particular through population surges and rapid urbanization.

### **The Mobile Revolution**

In the first two decades of the 21<sup>st</sup> century, the rise of mobile phones and smartphones profoundly changed our parents' – and particularly grandparents'! – daily lives. These new tools were not just limited to people of higher incomes. Smallholder farmers in many developing countries were able to afford them, too, and now also had the electricity to power them. These devices made rural life much easier. Farmers could now quickly communicate with family members many miles away, and use phones to make payments or acquire agricultural information. The proliferation of cheap smartphones in the 2010s also gave many farmers access to the internet for the first time. This allowed them to more easily keep up to date, and to learn more about agriculture. Free apps enabled farmers more efficiently to analyse crop yields, view weather forecasts and maps, perform calculations, and access many other services. Mobile phones, in short, made their work easier, from planting to harvest.

### **The Rise of the Drones**

In the late 2010s and 2020s, advances in computing and batteries made cheap and easy-to-use multi-rotor widely drones available to the public. The “poor man's airplane” opened the door to new farming practices. Soon after drones were adopted by large-scale growers in the developed world, they became affordable for rural communities in developing countries. Farmers could now get a bird's eye view of their crops, and even use drones for precise pesticide application or pollination. By reducing any excess pesticide use, drone technology helped further to decrease the operating costs of farmsteads and avoid damage to the environment and human health. The emergence of the “Internet of Things” (analogous to our modern Cybercircle) enabled drones and other tools like soil diagnostic sensors to work together for efficient farming.

### **The Decline of Subsistence Agriculture**

After the “Green Revolution” some 90 years ago, food surpluses helped fuel rapid migration in much of the developing world, from the countryside to urban centers. In the 2020s, this demographic trend began reaching a tipping point. The average age of farmers – i.e. those

who had not migrated – had already risen above 60. The decline in rural population density meant that far fewer people were available to work the land, raising labour costs significantly. In many regions this led to rapid consolidation of farms into larger and larger commercial estates, heralding the passing of “subsistence” farming in most of the developing world. The estates’ large size and available capital, combined with the increased labor costs, created the conditions for large-scale mechanized agriculture. Industry caught on to this new demand, and began rolling out affordable, environment-specific tractors and other machinery for use in the developing world. These new machines fitted well into the growing family of interlinked agricultural devices, enabling farmers to use them more efficiently and sustainably.

### **Controversial Crops**

Our century has seen the rates of increase in crop yields slow markedly below those achieved by the Green Revolution. However, advances in seed treatment have also helped to increase productivity. At the same time, advances such as the now familiar CRISPR have created many new applications for efficient, accurate gene editing. In some regions, however, genetically-modified (GM) crops have not taken off. Public mistrust and slow regulatory approval prevented their rise in some developed countries, and to a large extent in developing countries, whose public already couldn’t trust their own food regulatory agencies. While some countries adopted GM to a significant extent, often in response to environmental pressure on agriculture, the markets for such produce mostly remain limited.

Selective breeding, however, has also received much attention, but without the public or government scepticism shown towards GM. Humans have been breeding crops for thousands of years. However, advances in biology, and increased interest, have created many more opportunities for targeted selective breeding, with more potent effects. Crops selectively bred for drought resistance, vitamin enhancement, and many other useful traits have proliferated throughout the developing world in the last several decades. This spread has had noticeable benefits in many countries suffering from food insecurity. Today, the international think-tank AliMental believes that less than 1% of global crop output comes from varieties not developed this century.

### **Population Milestone**

A couple of years ago, as we all remember well, the world’s population crossed the ten billion threshold. In 2007, the FAO (forerunner of today’s Globcal) predicted that by 2050 global food output would need to increase by 70% in order to satisfy an expected nine billion! Over the last few decades, as billions of people’s incomes increased, so did their demand for a larger and more varied diet. Meeting this demand led to many unsustainable practices. In the tropics, huge tracts of forest were cut down or burned to make way for monoculture farming and livestock ranching. While advances in technology made farming more environmentally sustainable in some ways, they did little to stem the overall cost to the planet. Harvest failures and pest outbreaks have steadily increased, and continue to do so.

Since the millennium, much action has been taken in the developed world to reduce emissions, and to counteract climate change through technologies such as cloud-seeding. The developing world has planted billions of trees. But scientists say this is still not enough. Despite nearly 100 years of warnings, human civilization is still nowhere near environmental sustainability. We can only hope that by 2100 we will be on track to containing the damage we do to the environment, while still being able to feed our children.