



Smarter Agriculture, Greater Food Security

Mobile networks, digital technologies, and superior seed can help reverse food shortages and prevent nutrition deficits

In the early days of lockdown in the Philippines, stores were closed, movement across the country was heavily restricted and workers were forced to stay at home. Tanay farmer Sonny Reyes realized that his pineapple harvest was not going to make it to market. Until government officials exempted food supply trucks from entering Metro Manila, he wouldn't get past the checkpoints. Which would mean he wouldn't be able to repay the \$3,000 loan he had taken out and he would not have the money to send his kids to school.¹

While the COVID-19 pandemic disrupted markets everywhere, its impact was particularly devastating on emerging market countries. The Global Food Security Index (GFSI), which tracks food security across 59 indicators in 113 countries, shows that in 2020, rural supply chains and information networks, fragile in the best of times, collapsed during lockdowns, destabilizing food supplies and undermining nutrition for millions in Southeast Asia and sub-Saharan Africa. "The pandemic is restricting smallholder farmers' access to markets in ways that will impact agricultural production and incomes going forward," observes the Economist Intelligence Unit (EIU), which produces the model and authors the annual report accompanying the GFSI. Not surprisingly, the 2020 index reveals a sharp decline in food security worldwide, accelerating the previous year's downward trend.

Yet the just-released EIU report also highlights how mobile networks, digital technologies, and superior crop varieties can offset challenges to food security and farmers' livelihoods. Corteva Agriscience, sponsor

of the GFSI, is advancing agriculture by employing all three strategies. In developed markets, the company equips farmers with digital tools that help them access data crucial to managing their farms more efficiently and profitably. In emerging markets, Corteva leverages mobile apps and social media to communicate with smallholder farmers, connecting them to supply chain partners so they can anticipate shifts in market demand and making food systems more transparent so they can more easily participate in them. Coupled with Corteva's advanced seed breeding technology, these initiatives make agriculture smarter, supply chains stronger, and food systems more resilient and inclusive.

Digital technology helps farmers farm smarter

Food security, defined as the state in which people at all times have physical, social and economic access to sufficient and nutritious food that meets their dietary needs for a healthy and active life, has declined worldwide since 2019. Poverty, conflict, and extreme weather have all contributed to this ongoing decline, with the COVID-19 pandemic exacerbating the effects of all three in 2020—particularly in Southeast Asia and sub-Saharan Africa.

Agriculture holds enormous potential to reverse this trend and put the world on a path to reaching the United Nation's Sustainable Development goal of Zero Hunger. Digital technologies such as SMS-based platforms, for example, are transforming food systems by bolstering the ability of smallholder farmers to anticipate and meet market demand. The EIU report notes that high mobile phone penetration rates and

digital friendly attitudes have improved access to food market data— a crucial driver of food security— in 63 countries, most of them in Asia and sub-Saharan Africa. Moreover, thanks to the ubiquity of basic 2G channels like text and voice, the availability of services that provide agronomic advice, weather predictions, and price information on inputs like seed and fertilizer has soared in the past decade. As a result of this increased access to data, the EIU reports that crop yields in sub-Saharan Africa and India have increased by 4 percent.

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Corteva Agriscience is harnessing digital technology and mobile networks to empower farmers by helping them stay abreast of crucial market developments, consult with agronomists and plant scientists, and connect directly to consumers. Already, Corteva is delivering information and advice directly to producers' smart phones in North America. Corteva's farm management software from Granular enables farmers to make data-driven decisions that help improve their yields and incomes through sustainable practices. The software helps them identify crops best suited to their fields; source and compare prices on inputs; determine what to plant and the best time to plant it; and know when and where to administer water, fertilizer, and pesticide to help maximize yields. In Africa, Corteva is equipping smallholder farmers with mobile apps that identify plant pathogens and alert them to local disease threats. In Kenya, Corteva collaborates with Safaricom DigiFarm, an integrated mobile platform that connects smallholder farmers to quality farm products, customized information on best practices, and financial and credit services, helping them share information and conduct transactions more easily. And in the Philippines, by collaborating with non-governmental organizations such as AGREA,

Corteva is leveraging local networks and social media to bridge the logistical hurdles that disrupt the food supply and exacerbate food insecurity.

Indeed, it was AGREA, a social enterprise dedicated to helping Filipino farmers sustainably feed Filipino families, that saved the Tanay pineapple farmer Sonny Reyes from financial ruin. Cherrie Atilano, AGREA's millennial founder and a farmer herself, helped him source a government-owned truck that would get past checkpoints so he could deliver his pineapples to Metro Manila—where grateful consumers bought them. This success inspired Atilano to create an online platform, fueled by social media, that would connect urban consumers to local producers like Reyes.² Through its #MoveFood initiative, AGREA also acted as a mobile marketplace, buying 177 metric tons of produce from 20,000 farmers and selling (or donating) it to feed 70,000 families and 4,500 frontline healthcare workers by August 2020. To further advance these great efforts, Corteva Agriscience made a Global Giving grant to AGREA, supporting both its Move Food and Rise Against Hunger initiatives.³

Improving food quality, as well as quantity

Mobile networks and digital technologies help farmers make more food available to consumers. But food security depends on consumers getting adequate nutrition, not just adequate calories. Farmers must be equipped to meet market demand and dietary requirements—especially where consumers are malnourished. The EIU report finds that countries in Asia, Latin America, and Sub-Saharan Africa all struggle to provide their citizens with food that meets micronutrient thresholds.

The report notes that government policies can help. "Countries like Bangladesh, Indonesia, El Salvador and Kenya are shaping food value chains in a way that farmers produce food items that are profitable as well as high in nutrition," the authors observe. But so, too, can private initiatives. Corteva is working with food companies and grain processors, among others, to help farmers anticipate both consumer trends and nutritional needs so they can meet them more consistently. For example, in Kenya, Corteva and Land O'Lakes have launched an alliance to increase the quantity and quality of milk produced by women smallholder dairy farmers. Corn silage produced by farmers utilizing seeds from Corteva's seed brands, such as Pioneer® and Pannar®, is a key source of feed for dairy cows. By feeding their cows corn silage and

improving their dairy production practices, women smallholder farmers are able to sustainably increase their productivity, meeting the demands of local consumers and boosting the availability of nutritious food products.

Supplying consumers with adequate nutrition starts with farmers planting seed that will yield it.

Corteva is working with key public research institutions such as International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), to fortify staple crops such as millet,⁴ which is an important source of protein and energy for 130 million people in sub-Saharan Africa. Increasing millet production and nutrition plays a vital role in improving food security, health, and incomes in the 28 countries where it sustains smallholder farmers and their families.⁵

Corteva also recently participated in a collaboration that resulted in the first sequencing of the oat genome. The gene sequence, which has since been shared as an open-source asset, enables oat breeders worldwide to develop varieties of oat—naturally a key source of nutrients like thiamine, iron, phosphorus, magnesium, and manganese⁶—that can be grown by farmers more reliably and profitably. Superior varieties of staple crops boost yields, improve farmers' livelihoods, and solve micronutrient deficiencies, a crucial step in ending the hunger that afflicts some 690 million people worldwide.⁷

Food security takes a village—and then some

Smart agriculture is making nutritious food more consistently available to the growers and consumers who make up 80 percent of the world's food-insecure population.⁸ That's progress to celebrate. But to reverse the decline in food security, we need informed, coordinated, and sustained action.

That's why Corteva Agriscience sponsors the GFSI. Now in its ninth year, the data-driven model examines food availability, food affordability, food quality and safety, and natural resource resilience in 113 countries in order to surface ways to secure food systems overall. The 2020 research report produced by the EIU affirms the importance of policy adoption and infrastructure investment in building resilience to climate change. It also addresses structural inequities that widen income gaps. And, it underscores the centrality of agriculture in making nutritious food available to the world's most vulnerable populations.

The challenges raised by this year's report inspire Corteva to continue to lead the field in agricultural innovation. By making agriculture smarter, Corteva is supporting the farmers who sustain our food supply—protecting food security by protecting their livelihoods.

Why Corteva Agriscience Sponsors the GFSI

The Global Food Security Index (GFSI) is produced annually by the Economist Intelligence Unit (EIU), an independent research entity. The GFSI has proven to be a trusted resource for governments, NGOs, and private enterprise worldwide, equipping them with reliable data to take informed and meaningful action. Corteva's eight-year sponsorship of the GFSI aims to support these efforts by making the index and reports available to all for free.

GFSI 2020 highlights the need for agricultural innovation by showing we must collectively work to address:

- The threats to agricultural production posed by climate change and natural resource scarcity;
- The demand for not just more food, but more nutritious food—and more responsive food supply chains;
- The potential of innovation and technology to improve the sustainability of agriculture.
- As an agricultural innovator, Corteva Agriscience is doing its part. Its solutions make food systems more resilient, smart, and sustainable, helping secure the global food supply and increase global food security.

Footnotes:

1. <https://www.eco-business.com/news/to-achieve-food-security-in-post-lockdown-philippines-linking-farmers-to-consumers-is-not-enough/?sw-signup=true>
2. <https://www.eco-business.com/news/to-achieve-food-security-in-post-lockdown-philippines-linking-farmers-to-consumers-is-not-enough/?sw-signup=true>
3. Internal communication from Elizabeth Hernandez, APAC External Affairs and Sustainability Leader for Corteva
4. <https://www.icrisat.org/icrisat-and-corteva-agriscience-agriculture-division-of-dowdupont-collaborate-for-sharing-advanced-breeding-technologies-to-improve-crops-that-feed-millions/>
5. <http://www.afripro.org.uk/papers/Paper02Obilana.pdf>
6. <https://nutritiondata.self.com/facts/cereal-grains-and-pasta/5708/2>
7. <https://www.actionagainsthunger.org/world-hunger-facts-statistics>
8. <http://www.fao.org/cfs/home/activities/smallholders/en/>