Building a Food-Secure Future with Smarter Agriculture

Meeting the world's demand for adequate food and better nutrition is an ongoing challenge that technology can help solve.

As farmers work to meet the needs of a changing planet, their tools must constantly evolve. For example, when locusts threatened to destroy more than $1.5 billion in African agricultural products, farmers found one important tool in the palm of their hands: a new smartphone app developed by UN-backed PlantVillage called eLocust3M. Using Artificial Intelligence, satellite technology and an on-the-ground team, growers tracked, photographed, and shared data about the pests, predicting their movement so that farmers could prepare. Between the spring of 2020 and 2021, more than 240,000 locust records were collected through the app in East Africa.

There are newer challenges to contend with as well: the COVID-19 pandemic has disrupted global markets, with a particularly negative impact on emerging countries. The Economist Impact's Global Food Security Index (GFSI) 2021 report revealed that this pandemic, as well as political and economic disruptions, and the wide-ranging impacts of climate change, have taken a global toll.

Given these factors, it is not surprising that hunger has continued to rise, as it has every year since 2014. This year, Economist Impact's report showed sharp declines in food security in Haiti, Brazil, and Sub-Saharan Africa, as well as in nations like Norway and Portugal, and in areas of political unrest including Syria and Venezuela.

The 2021 Economist Impact report also has good news, citing major improvements in food security in Oman and Tanzania, where market access and infrastructure for growers have increased significantly. According to the report, as mobile phones have been increasingly available, farmers now have better access to markets and banking. Technologies like these and others will be critical for the future of global food security.

Corteva Agriscience, sponsor of the GFSI, is advancing new agricultural technologies to help address global need. In emerged markets, the company equips farmers with digital tools that help them access data crucial to managing their farms, while optimizing efficiency. 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, and food systems more resilient and inclusive.

Investing in Smart Tools for Smarter Farming

Despite recent setbacks, the United Nations' Sustainable Development Goal of Zero Hunger can still be attainable, but, according to the Economist Impact report it may take longer than hoped. Agriculture that evolves along with human need, and in response to our changing climate, will be critical to this achievement. Technology can help. The growing availability of, and familiarity with mobile technology means that technologies like SMS-based platforms are now used to meet and anticipate market demands. According to the Economist Impact in its report, technologies like these are so important

that, in 2020, it was reported that due to an increase in access to food market data, crop yields in sub-Saharan Africa and India increased by 4 percent. However, the report also stresses "Additional investment, particularly public investment in research [and] innovation in agriculture is necessary to address current and future food system challenges." The Economist Impact report states that this must be done in concert with building climate resilience.

A new mobile application launched by Corteva Agriscience in collaboration with Plantix in August 2021 shows the tremendous potential of investments in agricultural technologies. The app, FarmFundi, helps farmers identify pests and diseases in just a few moments. Across Middle East and Africa, farmers can tap into Corteva's extensive network of crop scientists and local agronomists to help determine the best method of treatment. The app also allows farmers to see the problems and pests that other local growers are facing, so that they can better prepare. By connecting to local and global expertise, farmers can more quickly single out the cause of a distressed crop, saving time and money, and avoiding expensive mistakes. With widespread adoption, FarmFundi can help boost food security, since researchers estimate that invasive pests alone cost African farmers $74.3 billion annually. Overall, insects and other pests challenge food security in Africa by causing $21.5 billion dollars in losses each year. With tools like FarmFundi, Corteva is helping farmers connect to each other to share knowledge and bridge the information gaps that disrupt the food supply and exacerbate food insecurity.

Focusing on Nutrition While Boosting Food Security

New technologies are crucial in helping farmers advance crop protection and output. However, food quality and nutrition are equally important when it comes to achieving food security goals. "Studies show that eating healthier food is more expensive, and healthy diets are out of reach for 3 billion people," Economist Impact notes in its report. "Today's food systems are characterized by unequal access to nutritious food," the report continues, "and diet-related disease remains the primary cause of premature mortality globally." The Economist Impact report finds that countries in Asia, Latin America, and Sub-Saharan Africa all struggle to provide their citizens with food that meets micronutrient thresholds.

A recent increase in food safety net programs may help to address nutritional needs. The Economist Impact report notes that the GFSI shows that more countries have food safety nets compared to a decade ago, but the number of these programs struggling to find adequate funding jumped from 36 in 2019 to 51 in 2021. As the report notes, "Transparent, stable, well-targeted support programs will best withstand the test of unexpected economic shocks and other crises."

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Government policies, the Economist Impact report asserts, can help. The creation and adaptation of national nutritional standards was the biggest driver of change for eight of the ten most improved countries in the report. Overall, "countries are becoming more committed to setting national standards, including dietary guidelines, nutrition plans and monitoring."

However, private initiatives are also critical. 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 planting seeds from Corteva's seed brands, such as Pioneer® brand and Pannar® brand, 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.

Corteva Agriscience 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,[1] 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.[2]

In another significant breakthrough for agriculture, Corteva recently participated in a collaboration that resulted in the first sequencing of the oat genome. The gene sequence has been shared as an open-source asset, empowering oat breeders to develop more nutritious varieties that grow reliably, providing better nutrition while helping to boost small farmers' yields. This new genome was accessed more than 5,000 times in the first year of its release.

New Technologies for a Food-Secure Future

A wide array of new technologies, ranging from new seed varieties to digital platforms, show promise in connecting smallholder farmers to better outputs, ultimately helping to achieve the United Nations Sustainable Development Goals related to the improvement of food systems.

While the power of these new technologies is encouraging, more will be needed to reverse the current trend of increasing food insecurity. Sustained research, development, and funding will be required to ensure a food-secure future.

This year's Economist Impact report 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 in the report reinforce the need for agriculture innovators such as Corteva. By making agriculture smarter, Corteva is supporting the farmers who sustain our food supply—addressing food security challenges by helping to protect their livelihoods.

Why Corteva Agriscience Sponsors the GFSI

The Global Food Security Index (GFSI) is produced by Economist Impact, an independent research entity. GFSI is a dynamic quantitative and qualitative benchmarking model produced each year, constructed from 58 unique indicators that measure the drivers of food security across 113 countries. 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 ten-year sponsorship of the GFSI has provided support to these efforts.

GFSI 2021 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 remains focused on building a more resilient global food system, leveraging the power of its innovation and harnessing its global scale and market presence to addressing pressing food security challenges globally.

To learn more, visit gfsi.corteva.com.

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[1] https://www.icrisat.org/icrisat-and-corteva-agriscience-agriculture-division-of-dowdupont-collaborate-for-sharing-advanced-breeding-technologies-to-improve-crops-that-feed-millions/

[2] http://www.afripro.org.uk/papers/Paper02Obilana.pdf