

TECHNOLOGY & SCIENCE-BASED SOLUTIONS



Science-based solutions and technology enhances agricultural sustainability, increases access to food, and helps mitigate and adapt to climate change while reducing agriculture's environmental footprint.

- Science and innovation are essential tools for reducing hunger and malnutrition to meet the needs of a growing global population.
- Science-based, data-driven decision-making improves sustainability and resilience throughout food systems.
- Improving access to science and evidence-based innovation expands the toolbox for farmers, fishers, and ranchers and bolsters food security.
- Non-science based regulatory frameworks can create barriers to innovation. Adoption of internationally recognized science- and risk-based standards [Codex, IPPC, OIE] ensures safety and supports trade.
- Digital, data-based technology allows producers to incorporate productivity-enhancing and climate-smart practices into their businesses at less cost.
- Inclusive access to advances in agricultural research and development leads to global innovation and place-based solutions.
- Science-led agricultural practices, such as precision agriculture, biotechnology, new perennial crops, agroforestry, and integrated pest management, help build soil health, protect biodiversity, and reduce agriculture's GHG footprint.
- Science is critical to promoting sustainable productivity growth and improvements in the efficient use of precious natural resources while also addressing global food security and nutrition needs.
- Scientific and regulatory organizations and institutions around the world support evidence-based methods for evaluating biotechnology and bio-engineered products. Sound data are critical for determining the safety of new crops.
- Regulatory cooperation between trading partners over biotechnology and bio-engineered products is essential and must be based on sound science. Enhancing trade in these products will connect producers and their foods to hungry people in distant locations.
- Farmers, fishers and ranchers need access to a wide range of tools in order to adopt practices that work best for them. New technologies can supercharge their efforts to combat pests, diseases, and adapt to new weather patterns, all while delivering nutritious foods to the world.

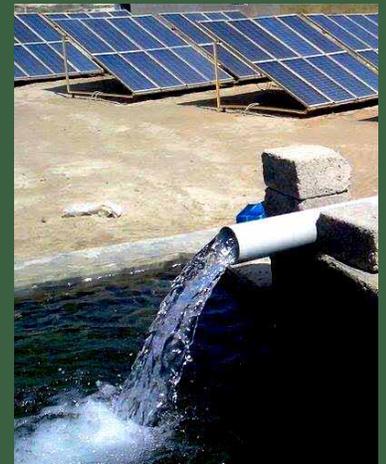
“We must reaffirm support for science-based and data-driven decision-making and promoting innovations of every type...including new scientific methods, cutting-edge technologies, and ecological, bio-secure management approaches.”

*U.S. Agriculture Secretary Tom Vilsack,
Global Food Security Symposium,
May 11, 2021*

Science and technology at work:

Solar-Powered Pumping Systems in Pakistan

A recent USDA partnership with the International Center for Agricultural Research in the Dry Areas (ICARDA) called, “Watershed Rehabilitation and Irrigation Improvement: Demonstrating and Disseminating the Best Practices and Technologies to Help Rural Farmers in Pakistan,” engaged Pakistani farmers to support the adoption of innovative, high-efficiency irrigation systems powered by renewable energy. By linking high-efficiency irrigation systems with solar energy systems, the USDA-ICARDA project has helped farmers in Pakistan achieve higher water-use efficiency, energy efficiency, and cost-efficiency.



<http://pcwr.gov.pk/wp-content/uploads/2020/Water-Management-Reports/Solar%20Powered%20Pumping.pdf>



<https://www.cgiar.org/annual-report/performance-report-2019/aflasafe/>

Bio-Control in East Africa

In East Africa, USDA projects are supporting the adoption of an innovative bio-control product, AflaSafe, which was co-developed through a collaboration between the USDA Agricultural Research Service and the International Institute of Tropical Agriculture. AflaSafe significantly reduces widespread mold contamination in grains like corn and multiple other crops like peanuts and peppers that produce compounds called aflatoxins that are toxic to humans (1 out of 3 cases of liver cancer in Africa is attributed to ingestion of aflatoxins). The adoption of AflaSafe in East Africa is helping reduce post-harvest loss while improving human health.

Feed Formulation Software in Vietnam

A USDA partnership with the University of California Davis and the Vietnamese Ministry of Agriculture and Rural Development is helping Vietnamese producers adopt a feed formulation software that is contributing to sustainable livestock production and climate change mitigation in Vietnam (livestock are a significant source of methane gas emissions). The adoption of the software is strengthening Vietnam’s national capacity to provide robust feed ration recommendations to its livestock producers, which in turn is helping producers increase their productivity and lower their costs, while simultaneously supporting national low emission development goals for Vietnam’s dairy sector.



<https://agrilinks.org/post/ration-formulation-software-enhances-farmer-productivity-decreases-emission-intensity>



<https://www.cgiar.org/innovations/harnessing-the-power-of-data-to-transform-food-systems/>

Harnessing the Power of Data to Transform Food Systems

FishBase was first developed by CGIAR researchers at WorldFish in 1988 as a database on six diskettes and covering 200 species. It is now an online encyclopedia available in 14 languages, making available crucial information on more than 34,000 freshwater and marine species, and visited by more than 900,000 people each month. It is currently one of the most cited fisheries resources in the world. The large amount of information (‘traits’) on most fish species that FishBase incorporates has enabled numerous meta-analyses – statistical analysis combining the results of multiple studies – on fish. FishBase also serves as a key data source for the management of fisheries and aquaculture in numerous countries, and the monitoring of their biodiversity.