ICRISAT

Digital Agriculture

Background

Digitalization of farming has a key role to play in Transforming Agri-Food Systems. ICRISAT uses a web/value chain approach and digital technology to enhance agri-food systems in the drylands. Key research areas include weather advisories, mapping drylands and crops, using IoT for irrigation and nutrient management, developing spatial products for climate modeling, land degradation assessments, yield assessments, and using sensors and modeling tools for pest and disease management.

The iHub

The iHub at ICRISAT headquarters in India accelerates progress towards long-term Sustainable Development Goals (SDGs) through digital agriculture advancements. It brings together agricultural technology entrepreneurs, scientists, and technology experts to integrate digital technologies throughout the agriculture value chain to enhance the productivity and income of smallholder farmers. The iHub serves as a central location for tech entrepreneurs looking to use agriculture, IT, IoT, and Big Data to address on-ground issues faced by farmers.

Digital Technologies

The Intelligent Agricultural Systems Advisory Tool (ISAT): ISAT delivers concise farm advisories via SMS. These messages are generated after analyzing local and global historical climate data, current and forecasted weather, crop systems, and soil-related information. It is a joint effort between ICRISAT, Microsoft, the Indian Meteorological Department, and the Acharya NG Ranga Agricultural University, India.

The Sowing App: A collaboration between ICRISAT, Microsoft, and the Government of Andhra Pradesh, India has resulted in an app that advises farmers on the optimal time to sow crops based on weather conditions, soil, and other factors, delivered in local languages through SMS.

STARS-One Android App: Developed by MANOBI S.A. and ICRISAT along with other STARS partners, this app provides remote diagnostic metrics on crop performance, soil fertility, and yield gaps for individual smallholder fields.

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MRIDA: MRIDA, which stands for Managing Resources for Integrated Development of Agriculture, is a game app that allows players to explore the impact of their and others' actions on the sustainable management of resources such as groundwater, fertilizer, and crop selection. The app was developed as part of a research project by ICRISAT to thoroughly evaluate agricultural management practices for their carbon sequestration potential.

Meghdoot: Meghdoot, a joint effort by ICRISAT, the India Meteorological Department (IMD), the Indian Institute of Tropical Meteorology (IITM), and the Indian Council of Agricultural Research (ICAR), aims to provide farmers with critical information through a user-friendly mobile application. The app delivers district and crop-specific advisories from Agro Met Field Units (AMFUs), available every Tuesday and Friday, along with weather forecast and historical data, right to the farmers' fingertips. The advisories are also provided in local languages where available.
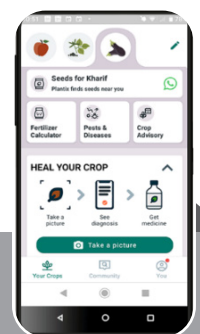
The Plantix App: This AI-backed pest and disease identification app was developed by PEAT (Progressive Environmental and Agricultural Technologies), Germany, in partnership with ICRISAT and State Agricultural Universities in Telangana and Andhra Pradesh, India. It assists farmers in identifying crop pests and diseases and provides recommended solutions. The app uses geo-tagging for all images, allowing for real-time monitoring of pests and diseases.

SERVIR West Africa

SERVIR West Africa, a regional hub of a worldwide program run by NASA and USAID in partnership with ICRISAT, uses earth observations to enhance resilience to climate change. This hub focuses on creating demand-driven information services through collaboration and open science, with a goal to support smallholder farmers by providing them with granular, transparent, and self-sustaining ecosystem services. The hub also offers affordable and accessible credit advice to farmers for sustainable development and food security.

Knowledge Sharing

ICRISAT frequently trains NARS partners in India from organizations such as National Academy of Agricultural Research Management (NAARM), National Institute of Agricultural Extension Management (MANAGE), National Institute of Plant Health Management (NIPHM), State Agricultural Universities, and the National Bank for Agriculture and Rural Development (NABARD). Over 265 thousand farmers from 162 FPOs affiliated with the Society for Elimination of Rural Poverty (SERP) and the Government of Andhra Pradesh, India have been trained in using digital tools to improve crop productivity. During the COVID-19 pandemic, the team conducted 845 remote training sessions on the "Plantix" app for 1337 FPOs and 14,658 farmers, in local languages. These trainings impacted over 1 million farmers, leading to a 30% increase in crop productivity.

The Impact

1. Digital soil health mapping over 10 million hectares and agro-advisory on precision nutrient application benefited >5 million farmers with economic benefit of US$ 453 million.
2. Science and digital tools for Climate Smart Agriculture practices and Climate Information Services help manage climate risks and build resilience for >10 million smallholder farmers.
3. Digital tool (Plantix app) has helped 50 million users/farmers diagnose pest and disease incidence and nutrient deficiency in 35 crops with 20-40% reduction in crop damage.

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