ICT UPDATES

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Ethiopian Institute of Agricultural Research

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2nd EDITION

DIGITAL DAY

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What's New?

Overview

This Second Edition of ICT's newsletter on *ICT for Agricultural Research* from EIAR ICT Team was focused to summarize the digitalization and digitization activities, digital services and future plans and recommendations on ICT EIAR's digital agricultural research. It will provide an overview of digitalization and digitization, Research Digitalization model, Data collection platforms, Data management platforms, Information Dissemination platforms works. This newsletter update was an ICT Team Yearly Published Bulletin to provide overall information on our previous and upcoming activities on the institute's digital agricultural research system.

ICT for Agriculture

Dr. Feto Esimo, EIAR, DDG

E-agriculture encompasses conceptualizing, designing, creating, analyzing and applying innovative ways of using ICTs in the rural domain, with a primary focus on farming. One way to introduce ICTs into agriculture efficiently and effectively is through a comprehensive national strategy that will prevent e-agriculture projects from being implemented in isolation, resulting in a duplication of efforts and resources, and will instead use synergies to enhance efficiency. An e-agriculture strategy can offer critical support for rationing resources (financial and human) to better harness ICT opportunities. ICT services are growing more than ever in the agricultural sector in many countries and are playing a major role in increasing agricultural production and productivity as well as supporting research activities with modern ICT technology.

The Ethiopian Agricultural Research Institute also understands the importance of ICT and to achieve its vision, to fulfill the role given to the institution in the required quantity and quality from the Digital Ethiopia 2025 strategic plan and to ensure that the operational systems are supported by information technology to carry out modern technology-assisted research works.

Besides, it enables to establish a technology-assisted information exchange system and to provide users with efficient and up-to-date information on a cost-effective basis. The Information and Communication Technology Unit was structured as a team at the directorate level.

THIS ISSUE DEALS WITH:

SMART AGRICULTURE STARTS WITH SMART TECHNOLOGY

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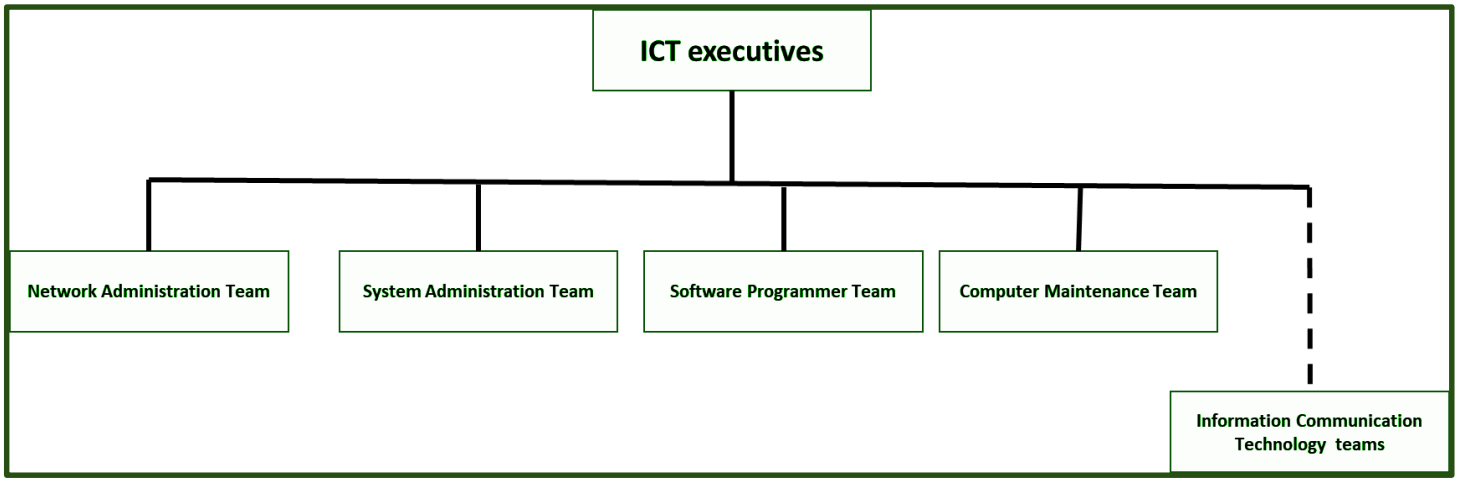
EIAR ICT Organizational Structure Overview

The Information Communication Technology executive is responsible for the management of the EIAR digital system building the ICT infrastructure, developing applications and systems, and providing efficient and quality maintenance and technical services; it is also organized to carry out the main tasks of agricultural research digitalization and digitization with IT technology. In the institute, the main reasons to organize an ICT Executive were to perform the following tasks efficiently and effectively.

- Coordinating the ICT infrastructure of the institute and its centers, building, and deploying ICT systems in a consistent manner, and monitoring the digital Services.
- Organizing the institute's research and administrative data with the help of IT technology in collaboration with the relevant departments, archives, repositories. Moreover, Preparing digital data collection system from various sources as inputs for research and analysis;
- Accelerating the exchange of information by making the procedure in the institution supporting by IT technology by modernizing the service delivery, providing regular maintenance and assistance services;
- Ensuring the transfer of technology by adapting to the technology that changes every season and by exchanging experiences from different countries;
- Creating a new way to find, identify, organize and analyze various indigenous and foreign technology and innovation results; and
- Performing other tasks necessary for the effectiveness of the work, executing tasks given by the head of the sector.

ICT for Better Agricultural Research

The Information Communication Technology Executive is headed by an executive at the headquarters, and a team is organized to manage the Information Communication Technology operations at each center. The following groups will be organized under the leadership of the head office.



Some of the growing ICT services at EIAR are listed as follows:

- Web Hosting
- Network design, Installation and supervision
- ICT Technical Specification
- General ICT Consultancy
- ICT related technical training
- Software development and evaluation
- Agri-Net Services
- Content Digitization and research data retrieval
- Advise and consult the institutional management on the acquisition of ICT resources and related issues
- Carry out researches in ICT for Digital Agricultural research

ICT Services at EIAR

"Digitization is an input for big data analytics "

Digitization

Digitizing a research data is a tedious task and challenging because of diversity of massive data. In order to overcome the issue, we are applying different ICT technologies and platforms which help us converting huge advisory information and production manuals quickly into a digital format within a short period of time to produce an input for the big data analytics for further analyzing and mining the required agricultural information.

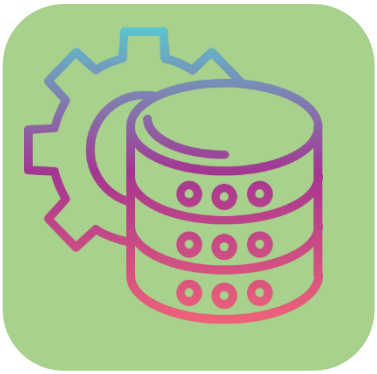
Digitalization

Is the use of excellent digital technologies, innovations, and data to transform business models and practices across the agricultural value chain including production, post-harvest handling, short advisory information that are respond to the target user which is in the hands of the farmer and development agent's (DA's) to improve their yields.

“Research Digitization Models”

Involves the process of designing and developing different platforms to utilize enabling systems for enhancing the research process from data collection up to the knowledge management and information dissemination.

Data Collection platforms



Data management platforms

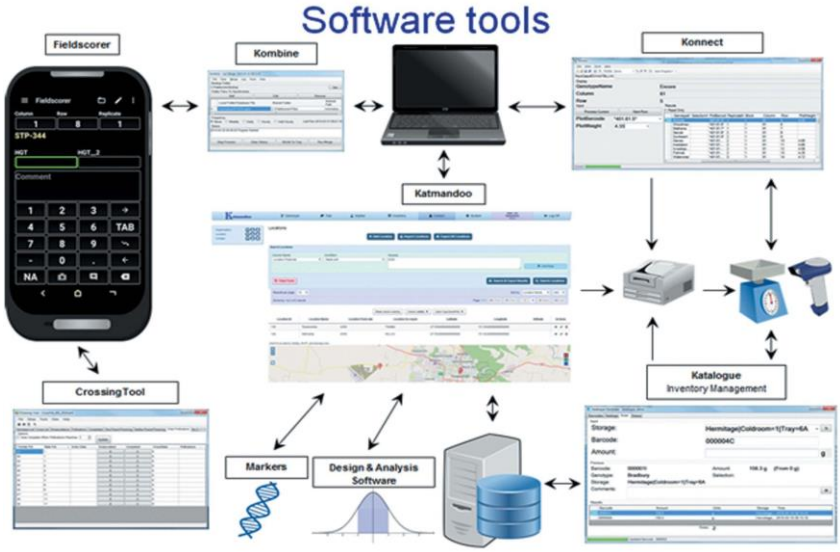
Information Dissemination platforms

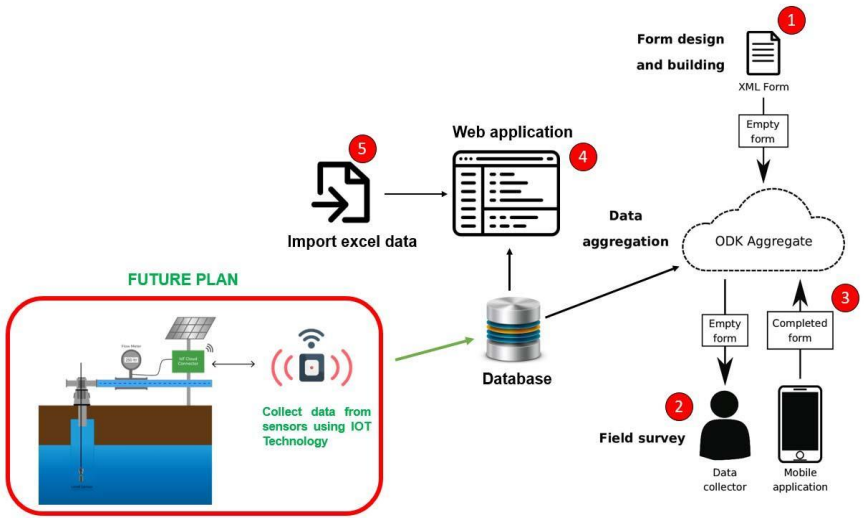
Data collection platforms:

Tools that helps the researcher and DA's collecting raw data from the farm field and sending it to the central location for data management activity.

Field Scorer app

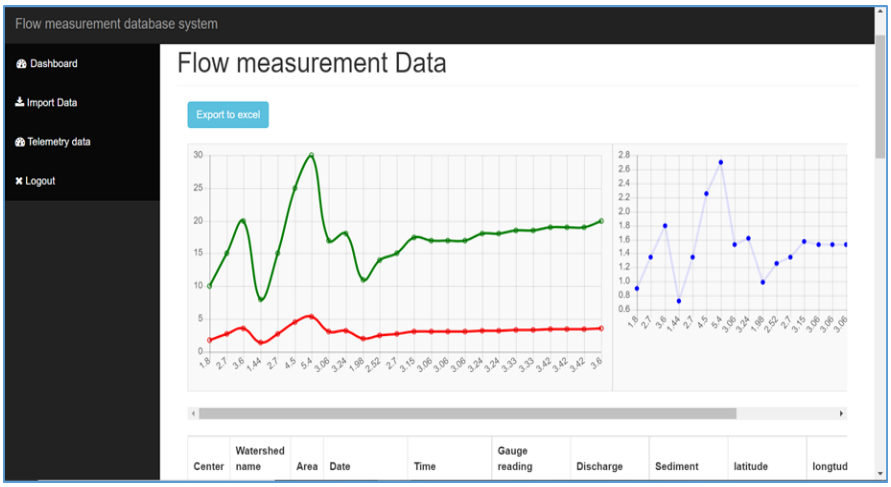
It's a software application of field-based electronic data capture solutions available. It's a very user-friendly mature field scoring application (>10 years) with a large number of users (flexibility to work across multiple crops and users) time and date stamp of every data-point suitable for any android device including phones and tablets.





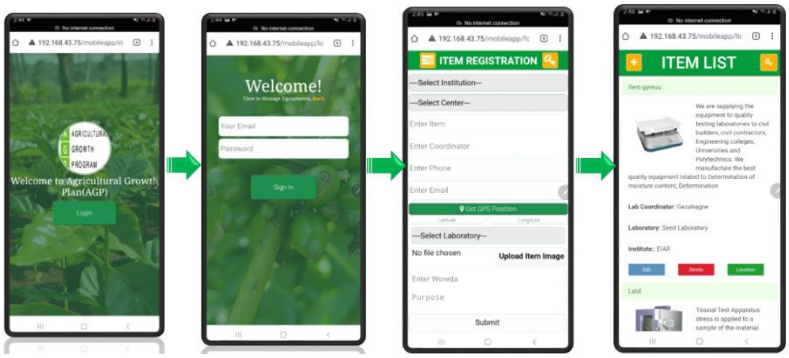
Water flow Monitoring System

A system that reads the flow of water surface collecting flow data three and four times a day remotely and shows the collected data in a dashboard.



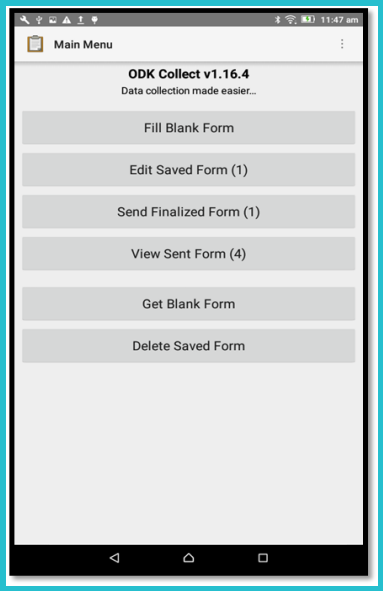
Laboratory Equipment recording & Tracking App

It is a systematic collection of equipment's information in a georeferenced way that is used to assess the progress of specific item by having the necessary information like item criticality, performance level, damage status, scheduled report and reporting of incidents happened in the laboratory that is caused by laboratory equipment.



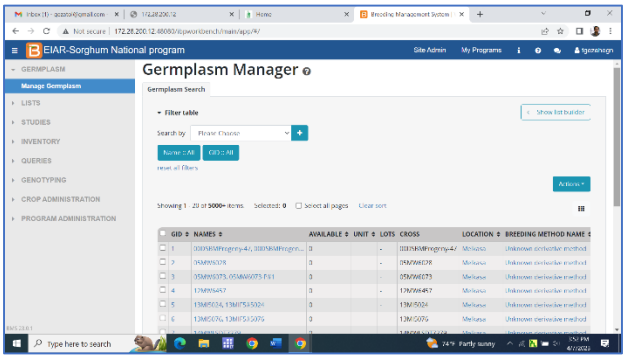
ODK Mobile App

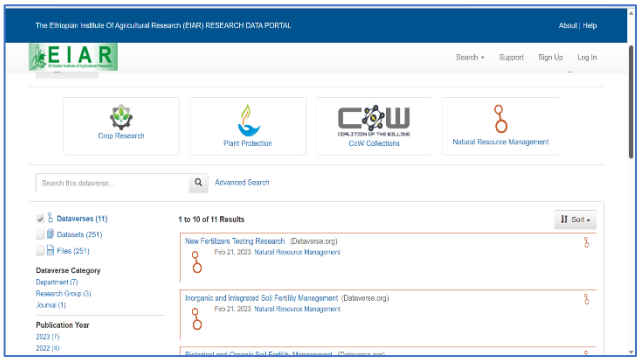
Wheat Disease surveys were increasingly conducted using a surveillance app developed using ODK for digital collection of surveillance results in near-real time and aggregating the following fields survey data from different locations of the country into the EIAR HQ's central server with the vicinity of internet connection.



DATA MANAGEMENT PLATFORMS

The agricultural sector needs a comprehensive and interactive data management software solutions used for collecting and managing research data and designing interactive databases that collects information from all available ICTs and mobile applications which can be used to the agricultural target specific users and for big data, Artificial intelligence algorithms to process and analyze large research data sets from different sources.





INTEGRATED BREEDING MANAGEMENT SYSTEM

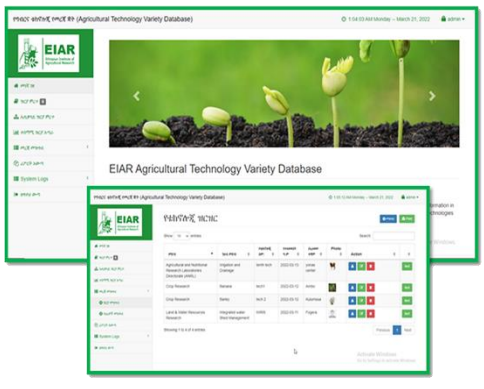
An integrated software package designed to facilitate plant breeding logistics, data management, analysis and decision support for any crop. It contains a powerful database which automatically collects and integrates data from plant breeding activities such as genealogy, inventory, characterization, and evaluation.

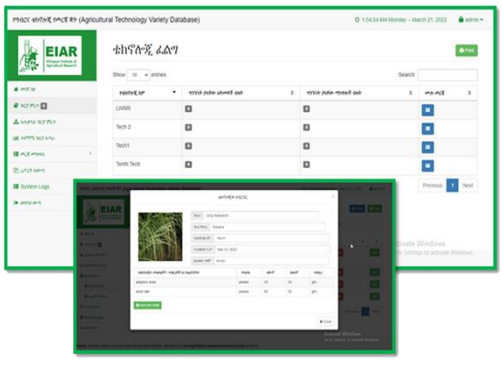
RESEARCH DATA HUB

It is a data-driven solution for online storage, sharing and publishing of agricultural research data.

AGRICULTURAL CROP VARIETY DATABASE

Agricultural Technologies database is Web Applications software currently developed to organize all agricultural technologies and their associated information in such a way that users can access it easily within and outside the vicinity of EIAR compounds. This facilitates easy access of all required information of agricultural technologies developed by the National Agricultural Research System (NARS).





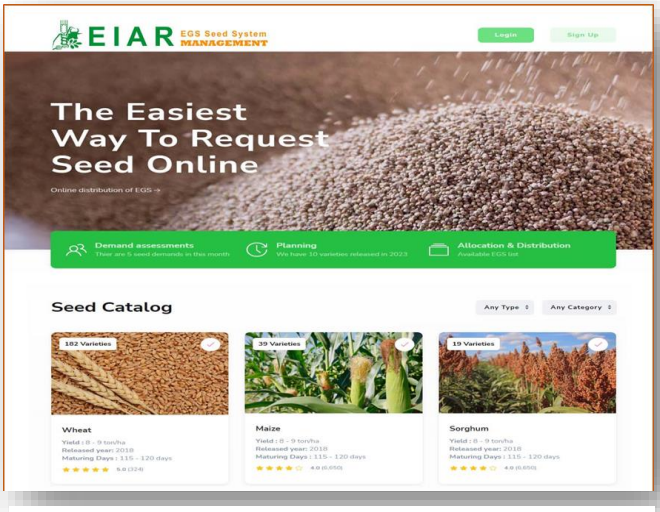
Online Publication
Repository Service

Developed to collect, preserve and distribute digital research materials. Moreover, Repositories are important tools for preserving a legacy.

Crop Protection
Retrieval Database

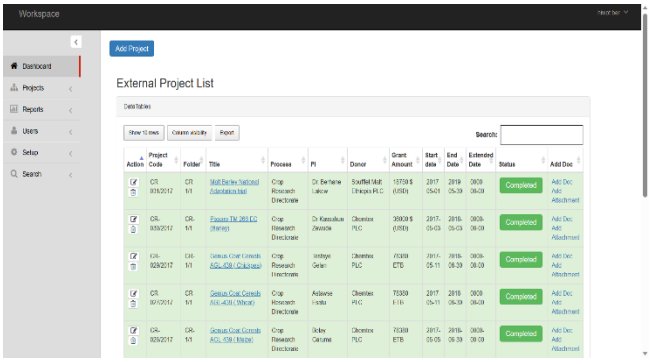
Data management system for Disease, insect pest and weed resources includes a causal agent's data and a web retrieval database.

EGS Seed Tracking
System



- A system that controls the amount of seed produced from the research centers for seed producers' usage and tracks EGS seed requests online

Research Project
Management System



Tools to manage external projects activities from registering individual projects, uploading MOU, budget transferring, tracking project status and project close out.

Every app is a new opportunity to make a difference

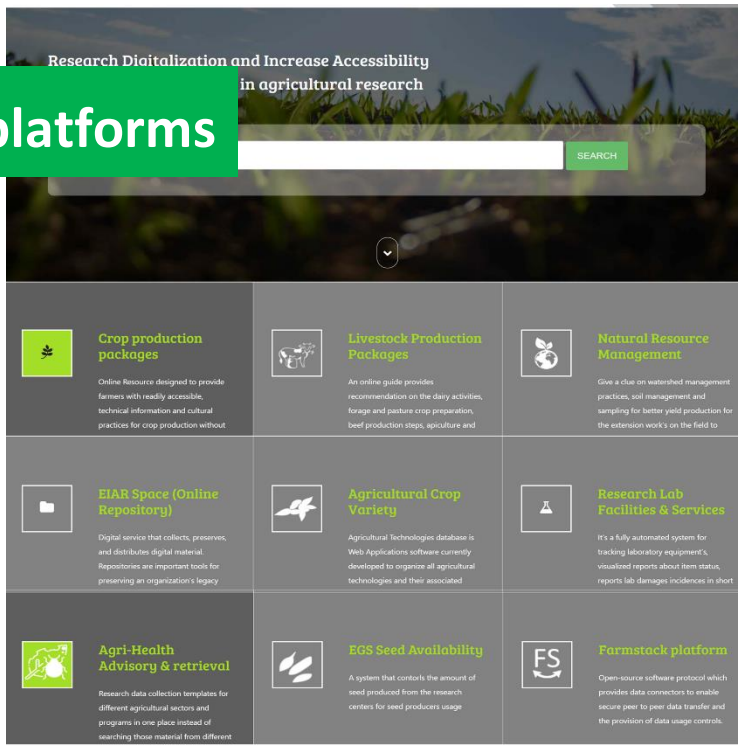
E-learning

Platform where researchers could digitally exchange knowledge, information, and experience from a centrally-managed database, used to train junior researchers without necessarily moving them from their center, facilitates mentoring programs to be arranged among senior and junior researchers and to retain senior researcher's knowledge and experience.

INFORMATION Dissemination platforms

An online platform that provides organized gateways to information or acts as an aggregator of knowledge, different platforms seamlessly communicating using an API integration method to get a bundle of applications in a one window advisory service.

Research Knowledge-Bank

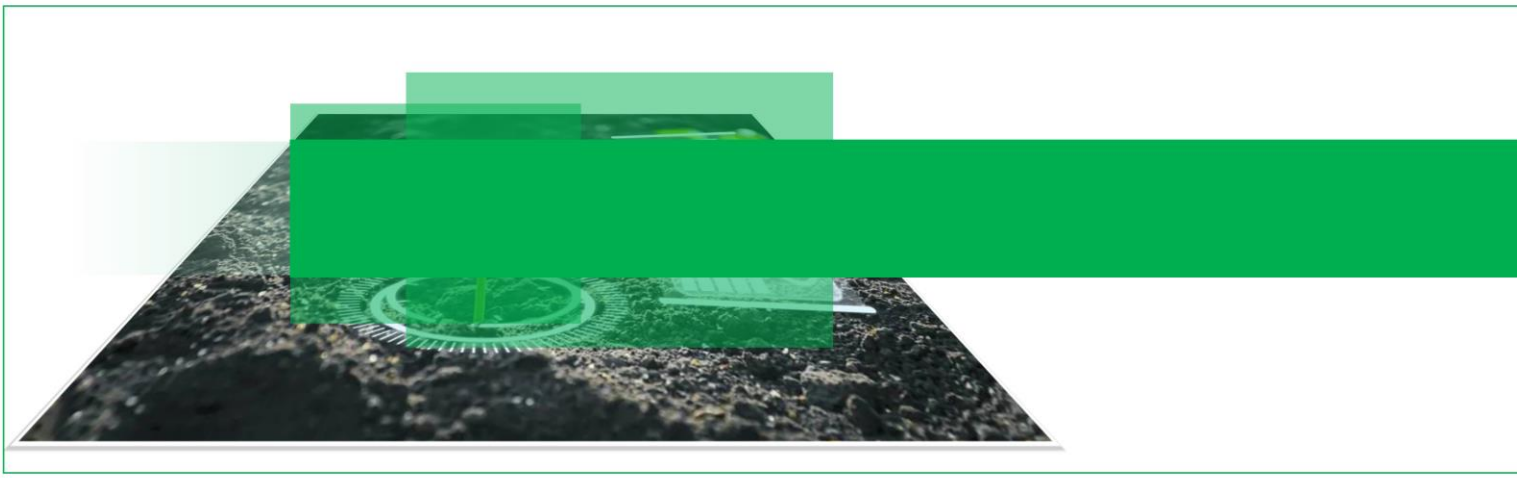


Digital Crop Production Packages

A Content Management System (CMS) designed to provide development agent's (DA's), farmers to get increased access to updated research based production technology packages, disseminate new research findings timely for all beneficiaries and used as a reliable resource to innovate.

7604 Short Message Service

ICT were shown to be broadening the range and increasing the quality of extension services, likewise interaction between extension agents and farmers is more interactive to ensure them receive up-to-date data and knowledge timely, complete, accurate using SMS-based agricultural information system which serves as a platform where those entities can share agricultural information through their mobile phone.



The Future Plans and Recommendations

The EIAR ICT Directorate is contributing to the service delivery of the institute supported by modern ICT technology and to provide efficient and modern service delivery. We are planning and carrying out various activities to achieve these tasks.

- Improving the Digital agricultural services Availability (24/7)
- Making accessible the Digital agricultural services globally
- Developing a centralized data collection and repository systems.
- Starting data publishing and implementing DOI (digital Object Identifier)
- Making online journal processing Systems.
- Developing a Smart Agricultural Research System.
- Adopting the Breeding Management Systems (BMS) to all research programs,
- Automating research review process Systems