




INITIATIVE ON
Digital Innovation



AgriLAC Resiliente:
Resilient Agrifood Innovation
Systems in Latin America and
the Caribbean

TRAINING REPORT

Diploma Course on Digital Agriculture in Guatemala

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Summary CGIAR Research Initiatives on Digital Innovation and AgriLAC Resiliente have collaborated with different stakeholders to implement digital agriculture approaches for professionals in critical locations in the Central American Dry Corridor in 2022. The university diploma course aimed to strengthen the technical capacity of agricultural professionals in digital agriculture and allow them to make more informed, data-driven decisions in agrifood systems. The 90-hour diploma course is organized into five modules (i) Human-centered design and digital inclusion, (ii) Data collection, data management, and data integration, (iii) Data science, (iv) Crop modeling, and (v) scaling digital innovations. Twenty-six agricultural professionals from various institutions, from government, non-government organizations (NGOs), growers' associations, and educational institutions to the private sector, completed the course on 16 December 2022.

Date: **22 December 2022** // Work Package: **5. Platforms & Services**

Partners: **ABC, Universidad CUNORI, and Ch'orti' Regional Farmers Association (ASORECH)**



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Introduction

In the context of climate change, accelerated degradation of natural resources, a significant increase in overweight and obesity rates, and a decrease in agricultural productivity in Latin America and the Caribbean, the region faces the challenge of transforming agrifood systems into more productive, sustainable, profitable and resilient models, generating healthier food so that the region can continue to be a pillar of food security worldwide.

In this transformation process, digital innovations in agriculture have the capacity to transform agrifood systems as well as the potential to transform rural communities by improving livelihoods and strengthening their resilience to climate change. Digital innovations in agriculture contribute to greater efficiency in agricultural processes, more reliable decision-making processes, reduction in uncertainties, and contribute to better management of risks.

Agriculture in the Dry Corridor is characterized by smallholder farmers cultivating basic grains combined with cash crops such as bananas and coffee in the hills and

mountains and larger-scale commercial, export-oriented operations in the valleys (fruits and vegetables). At least 73% of Guatemala's municipalities are located within the Dry Corridor, including most of the areas of the Chiquimula and Jutiapa departments on the border with El Salvador and Honduras. These two countries have a significant proportion of their municipalities within the Central American Dry Corridor (nearly 100% and 80%, respectively).

As part of the CGIAR strategy in Latin America, an alliance with the academic world for the training of human resources is key to scaling concepts and practices in digital agriculture. Among the key organizations in the region, the University Center East (CUNORI) of the University of San Carlos of Guatemala and the Ch'orti' regional farmers association (ASORECH) located in the city of Chiquimula stand out.

CUNORI analyses and disseminates concepts, practices, and technologies in collaboration with governmental and non-governmental entities across different careers and offers postgraduate and diploma (*diplomado*) courses. The latter are short courses designed for professionals. In particular, CUNORI has implemented different short university training programs that combine face-to-face and virtual teaching/learning sessions to introduce, discuss and deepen the understanding of key concepts, practices, and technologies in the framework of the experiences of participating professionals. ASORECH and CUNORI work together in the implementation of these postgraduate courses. ASORECH has extensive experience in the implementation of projects funded by international cooperation and supports CUNORI with all the logistics and paperwork required to execute the activities planned with the university.

The rationale behind the diploma course

Currently, agriculture is facing a new revolution driven by the development of Information and Communication Technologies (ICT). ICTs are used today in different steps and dimensions of the agrifood systems, such as in data collection, monitoring, deployment, and dissemination of information.

This information is used in the decision-making of agrifood systems and in the optimization of other agricultural processes. To achieve this optimization, digital innovations, technologies, tools, and methods are used, such as drones, satellites, GPS, Internet of Things (IoT) on-site and remote sensors, smart devices, voice and text messages, multispectral cameras, robots, and unmanned ground vehicles that are coordinated through software developments, Big Data, advanced analytics, and blockchain, among others. With this new digital agriculture, we continue to seek to achieve an economically viable, environmentally friendly, and socially just agriculture.

This diploma course contributes to the strengthening of the participants' capacities to enable them to discover and contribute to the optimization of agrifood systems from the economic, social, and environmental points of view through the use of digital technologies.

The objective of the diploma course

The main purpose of the diploma course is to strengthen the technical capacity of technicians and agricultural professionals in digital agriculture, which allows them to make more informed decisions in agrifood systems, including the optimization of the systems in light of the economic, environmental, and social benefits.

Specific objectives include the following:

- Discover and apply strategies that contribute to the optimization of agrifood systems using digital technologies, user-centered design principles, and the application of data analytics.
- Improve the access, use, and impact of ICTs and discuss/envision how to create more inclusive digital systems.
- Develop skills and knowledge on the use of ICTs with a user-centered design perspective.
- Identify the appropriate data management strategy based on the requirements of the agrifood systems.
- Apply diagnostic descriptive and predictive analytics techniques in agrifood systems.
- Apply a user-centered design approach.
- Analyze and interpret the information available to solve problems associated with agrifood, agribusiness, and environmental protection systems.
- Know about the different strategies to scale digital innovations.

Geographic scope and CGIAR context

Latin America and the Caribbean (LAC) biodiversity and forests play key roles in global environmental sustainability, ranking among the top 6 of the 10 ten most biodiverse countries in the world — featuring 23% global forest coverage, 36% CO₂eq stock kept in forests, and 33% total volume of renewable water resources. However, LAC agriculture — driven by desperation, poverty, inefficiency, and inequality — uses 33% of LAC land area, nearly 75% of its freshwater resources, and generates almost 50% of its greenhouse gas emissions — 70% of which are from livestock.

In Guatemala, agricultural professionals: (i) are not very familiar with digital tools, (ii) have limited knowledge of interpreting data, and (iii) lack a vision beyond sustainable crop production and an entrepreneurial spirit.

In this context, One CGIAR has set up global initiatives with the idea of operating more efficiently in the regions. Two of these initiatives, Digital Innovation and AgriLAC Resiliente, joined forces to strengthen local capacity in Guatemala with the aim of transforming agrifood systems in the region.

Student profiles

- Experience of at least one year in governmental and non-governmental institutions, projects, programs, municipalities, or associations.
- Basic prior knowledge of statistics.
- Ideally with knowledge of quantitative and analytical methods.
- Ability to communicate orally and in writing.
- Professionals with a background in agrifood, food safety, and environment sectors.
- Availability of the time required to participate in the diploma course.

Competencies developed by the graduates of the diploma Course

- Use of digital technologies, applying user-centered design principles, and the application of management and data analytics.
- Use ICTs to create more inclusive digital systems.
- Manage the data according to the needs of the agrifood system.
- Apply analytical techniques to data of the agrifood systems.
- Interpret the information available to solve problems associated with agrifood, agribusiness, and environmental systems.
- Have a better understanding of how digital technologies can be scaled (from private and public perspectives).

Curricula - Modules¹

1. Human-centered design and digital inclusion (18 hours)
2. Data collection, management, and integration
 - a. Evaluation (2 hours)
 - b. Data collection (6 hours)
 - c. Data monitoring (7 hours)
 - d. Data management and integration (4 hours)
3. Data science (7 hours x 3 days; 24 hours)
4. Crop modelling (7 hours x 3 days; 24 hours)
5. Scaling digital innovations
 - a. Innovation scaling (7 hours)
 - b. Digital innovation examples from private and public sectors (7 hours)
 - c. Evaluation of the final projects (4 hours)

¹ See [Diploma Course on Digit Ag - 5 Modules report SPANISH.pdf](#)

Photo Documentations

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Graduation ceremonies

