



Collective Action on Inclusive Digital Transformation of Agriculture in Latin America and the Caribbean

Good practices for inclusion in the digital transformation of agriculture in Latin America and the Caribbean

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Presentation

The document “Current Scenario and Needs for the Development of an Inclusive Digital Agriculture (IDA) Program for Latin America and the Caribbean” (FORAGRO, 2022a) describes the current conditions and the most relevant challenges facing Inclusive Digital Agriculture in the region.

This study highlights the need to strengthen digital ownership and integration in family farming. To advance this purpose, a series of initiatives with shared characteristics of digital inclusion that are useful as a reference for developing an inclusive digital agriculture program in Latin America and the Caribbean have been documented.

The research process documented twenty-five cases of Inclusive Digital Agriculture practices in the region. These examples highlight the conditions necessary for incorporating digital technologies in agricultural production, thus benefitting small-scale producers (FORAGRO, 2022b).

An analysis of the cases has been conducted to identify common aspects and key practices for the successful integration of the digital world in small-scale agriculture. Fourteen good practices were identified from the different experiences analyzed (Table 1) and these good practices were grouped in five broad categories:

1. Development of communication processes for agriculture based on technological tools accessible to family farmers.
2. Inclusive development and technological co-design with the significant involvement of family farmers.
3. Collaboration and associative processes as the basis for inclusive digital agriculture.
4. Transformation of technical assistance with the intensive use of data and digital tools.
5. Empowering family farmers and their organizations with a focus on appropriate technology and technological sovereignty.

Table 1. Good practices in the cases analyzed

Category	Good practice	Cases
1. Development of communication processes for agriculture based on technological tools accessible to family farmers	a. Functionality without connectivity	<ul style="list-style-type: none"> • TAC • Digital. Escale • Agromóvil • Coffee Cloud
	b. Communication via instant messaging	<ul style="list-style-type: none"> • Farmvue • Agros • Farmer Box • Cacao producers • Agromóvil • Emilpa • Agros • AgriNeTT • Farmer Box
2. Inclusive development and technological co-design with the significant involvement of family farmers	c. Participatory technology design	<ul style="list-style-type: none"> • Digital. Escale • Cacao Móvil • Coffee Cloud • Farmvue
	d. Needs-based, intuitive, user-oriented technology design	<ul style="list-style-type: none"> • Córdoba Argentina-Cabaña La Ovis • Emilpa • Digital. Escale • Agros • Agromóvil • AgriNeTT • Cacao Móvil • App Maga • Chocolate 4All • SIMMAGRO • Aldea Global • Farmer Box • Mi Lote
	e. Pilots and support	<ul style="list-style-type: none"> • Digital. Escale • Farmvue • Aldea Global • AgriNeTT
3. Collaboration and associative processes as the basis for inclusive digital agriculture.	f. Associative processes	<ul style="list-style-type: none"> • Uruguay-Canelones and Salto • Córdoba Argentina-Cabaña La Ovis • Cacao producers • Agromóvil • Emilpa • Agros • AgriNeTT • Agrojusto • Cacao Móvil • Coopetarrazú • Farmer Box
	g. Partnerships and social support networks	<ul style="list-style-type: none"> • Uruguay-Canelones and Salto • Paraguay-Ciervo Cua • Chile-Coopeumo • Brasil-Wagner Canal • Digital. Escale • Cacao Móvil • SIMMAGRO • Emilpa • Coffee Cloud • Farmvue • Coopetarrazú • Agrojusto • Agromóvil • Agros
	h. Collective commercialization, fair trade, and reduction of intermediation costs	<ul style="list-style-type: none"> • Uruguay-Canelones and Salto • Paraguay-Ciervo Cua • TOSEPAN • Agrojusto • Cacao Móvil • Coopetarrazú • AgriNeTT • App Maga • Emilpa

Category	Good practice	Cases
4. Transformation of technical assistance with the intensive use of data and digital tools	i. Transformation of technical assistance	<ul style="list-style-type: none"> Uruguay-Canelones and Salto Córdoba Argentina-Cabaña La Ovis Chile-Coopeumo Brasil-Wagner Canal <ul style="list-style-type: none"> TOSEPAN TAC Agrojusto Chocolate 4All Emilpa Farmer Box
	j. Appropriate languages, formats and resources	<ul style="list-style-type: none"> Uruguay-Canelones and Salto Mi Lote <ul style="list-style-type: none"> Emilpa Farmer Box
	k. Applications and remote support	<ul style="list-style-type: none"> Brasil- Wagner Canal Mi Lote Aldea Global <ul style="list-style-type: none"> Farmvue AgriNeTT
5. Empowering family farmers and their organizations with a focus on appropriate technology and technological sovereignty	l. Capacity building and creation of a unique digital identity	<ul style="list-style-type: none"> Uruguay-Canelones and Salto Córdoba Argentina-Cabaña La Ovis Paraguay-Ciervo Cua Chile-Coopeumo <ul style="list-style-type: none"> Brasil-Wagner Canal Agrojusto Agridigitalización Agros Coopetarrazú
	m. Proprietary technology and democratization of access	<ul style="list-style-type: none"> Chile-Coopeumo TOSEPAN TAC Digital. Escale <ul style="list-style-type: none"> Aldea Global Agros
	n. Free software and open-source data	<ul style="list-style-type: none"> Cacao Móvil App Maga Chocolate 4All Mi Lote <ul style="list-style-type: none"> Coffee Cloud AgriNeTT Farmer Box

The categories and good practices are described below:

1. Development of communication processes for agriculture based on technological tools accessible to family farmers

One of the most relevant aspects in these good practices is the development of communication processes with family farmers, by using technological tools that are both familiar and accessible to them.

- a. **Functionality without connectivity** (E.g., in the cases of [AGROS](#) and [AGROMÓVIL](#)): Some of the cases studied incorporate functions that do not require connectivity for accessing data, information and technical assistance for the family farmers. Mainly SMS text messages and calls are used, which are sometimes programmed ahead of time through pre-drafted press releases or newsletters, and in other cases via message exchanges at certain times. In some of the examples there is a mix of online and offline mechanisms. This means that the tools

have functionalities that use the Internet and are combined with others that do not require an Internet connection. The case studies showed that a disconnected cell phone is still a very important tool for small-scale farmers, so these IDA strategies should be considered based on these good practices.

- b. Communication via instant messaging** (E.g., in the cases of [AGROS](#) and [AGROJUSTO](#)): Another practice worthwhile mentioning is the creation of technical assistance groups that communicate via chat or instant messaging platforms, especially WhatsApp, which is the tool utilized the most by family farmers. These are used for alerts, recommendations, data and information for production processes, commercialization, opportunities that arise, among others. It is important to note that cell phones are the number one choice utilized to exchange information with other family farmers. Unlike SMS messages and calls, instant messaging platforms allow the participants of the groups to easily exchange all sorts of information such as images and videos. These characteristics make instant messaging a powerful digital tool for small-scale production; however, it requires connectivity, which is not always possible in the rural regions of Latin America and the Caribbean.

2. Inclusive development and technological co-design with the significant involvement of family farmers

The development of technologies that will be used by family farmers should be aligned with their existing needs and capacities. Therefore, all technological tools that are developed for improving family farming must be co-designed based on a truly participatory process.

- c. Participatory and collaborative design and development of technological tools** (E.g., in the cases of [FARMVUE](#) and [COFFEE CLOUD](#)): One of the most relevant features of the documented success cases is that they stem from a collaborative and participatory process, where family farmers are specifically involved in the ideation, design and development of the technology. One condition for the successful development of technology is that all of the steps of the various technological platforms and applications must be fully connected to the requirements of small-scale production. In addition to guaranteeing adequate technological tools for family farmers and the contexts in which they carry out their economic activity, this also promotes user-friendly design, resulting in solutions that are intuitive and easily understood and utilized by family farmers.

- d. **Technological development based on documented family farming needs** (E.g., in the cases of [AGROS](#) and [DIGITAL. ESCALE](#)): Several documented cases indicate that technological development is successful when supported by prior studies that clearly describe the territories where they will be used, the productive processes, and the needs of family farmers to ensure that digital technologies appropriately respond to the demands and potential of small-scale agriculture.
- e. **Monitoring and follow-up of digital technologies for IDA prior to putting them to use** (E.g., in the case of [DIGITAL. ESCALE](#)): Several documented experiences partly owe their success to the use of prototypes and pilot testing before putting technological applications, processes and functionalities aimed at inclusive digital agriculture into operation. Other good practices include the training of family farmers and conducting assessments before and after the practice is implemented, by using adequate monitoring systems that can detect the necessary transformations in a timely fashion, according to needs that emerge. In other words, it is crucial to bear in mind that the IDA process does not start nor finish with the technical development of the platform.

3. Collaboration and associative processes as the basis for inclusive digital agriculture.

These cases highlight the importance of collective and associative actions for the development of an inclusive digital agriculture that not only addresses costs but also defines the role of technologies in productive processes.

- f. **Associative processes** (E.g., in the cases of [COOPETARRAZÚ](#), [COOPEUMO](#), [AGROJUSTO](#) and [CACAO MÓVIL](#)): The cases studied underscore the importance of associative processes for integrating digital technologies into small-scale farming. There is much evidence demonstrating that this is a good practice, but what stands out most is that the costs of incorporating digital technologies, in terms of infrastructure and technical capacities for its integration and use in agriculture, as well as the social aspects of mainstreaming these technologies, is only possible through association. Small-scale producers and family farmers cannot easily obtain the necessary technologies for improving their agricultural processes on their own because of the resources that are involved. Based on the cases studied, it is also noteworthy that the use of digital technologies requires specialized and multidisciplinary teams, and this is only possible in an associative way, since the group must

receive ongoing training in a sector that requires both creativity and specialization. Another key issue is the governance of technology and the decisions regarding how this technology is used. This must be a collective process to benefit more family farmers, and the associative model is the only one that meets this requirement while defining the priorities of technological development to strengthen collective production and not just that of an individual. This helps develop not only agriculture, but also a region or territory, and guarantees the initiative's sustainability, unlike the projects that often conclude when external funding runs out.

Another relevant aspect in the case of COOPEUMO in Chile, Tosepan in México and Coopetarrazú in Costa Rica is the use of digital technologies to strengthen management and administration processes in the associative companies, thus supporting their sustainability and their impact on the region. These cases reveal the importance of digital technologies in strengthening farmers' organizations, including unions and associations.

- g. **Collective commercialization** (E.g., in the cases of [EMILPA](#), **Canelones and Salto in Uruguay** and **Ciervo Cua in Paraguay**): Another documented good practice is the use of digital technologies to facilitate collective commercialization among family farmers and gradually do away with intermediaries between the farm and the market-consumer. Digital tools also contribute to the management of collection centers that favor both processes and the contact between producers and their communities in order to organize trade based on mutual support. Collective commercialization also enables contact with suppliers and streamlines productive chains through the use of digital technologies such as social media, instant messaging and video conferencing tools.
- h. **Multi-stakeholder partnerships** (E.g., in the cases of [SIMMAGRO](#), [TAC](#) and **Cabaña La OVIS in Argentina**): Most of the cases studied are supported by associative processes or multi-stakeholders partnerships. These alliances with academia or the public sector contribute to the development of inclusive digital agriculture, sometimes in the form of funding, other times as technical support, or as part of the organizational strengthening and also in the development of technical studies or technologies once they have been collectively designed. In some cases, this support is reflected in the formulation of public policies. Many of the cases identified are based on projects with funding for a specific period.

4. Transformation of technical assistance with the intensive use of data and digital tools

One of the most relevant transformations is the notable change brought about as a result of accompanying and providing technical assistance to family farmers. This has a significant impact on the training processes of people who will be providing agricultural technical support and those who practice agriculture in general.

- i. **Transformation of technical assistance** (E.g., in the cases of [COOPETARRAZÚ](#), [EMILPA](#), [TAC](#), [Wagner Canal of Brazil](#)): Another noteworthy aspect of these success cases is the transformation of technical assistance based on data-driven evidence. This refers to data taken in the field in real time with different tools like sensors, drones, geographic information systems, tablets, or manual systems, which are combined with historical data gathered by agriculture organizations and data from social media or other sources at a national level. Agricultural technical assistance increasingly requires strengthening its capacity for data science and big data analysis.
- j. **Languages, formats, and methods for sharing data and information** (E.g., in the cases of [TAC](#) and [AGROJUSTO](#)): A fundamental aspect for many of the success cases is the family farmers' access to information and data. However, these examples are successful due to real-time information and data made available through mechanisms that reach small-scale family farmers (always via cell phones and SMS messages or WhatsApp, as previously mentioned), and most importantly, because they are based on a communication process that is easily understandable to family farmers. Oftentimes these data and information are accompanied by recommendations that are also adjusted to the family farmers' conditions. The language, formats and modes of information and data-sharing play a key role.
- k. **Applications and remote support** (E.g., in the case of [Wagner Canal of Brazil](#), [AgriNeTT](#), [Farmvue](#), [Mi Lote](#)): Another relevant feature of these cases is the added value of digital technologies in making technical assistance more streamlined and efficient. A noteworthy example is the case of applications developed to identify pests or issues with the crops, or to conduct soil analysis, which can pinpoint specific problems through images and provide recommendations. As well as those that contribute to the administration and management of farms and production. On many occasions, these applications work with artificial intelligence using big data. An example of this is the use of digital technologies for remote

technical assistance via imaging of the farms or crops and through instant messaging to identify and solve concrete problems.

5. Empowering family farmers and their organizations with a focus on technology ownership and sovereignty

Digital technologies, when implemented within a framework of inclusion, can strengthen family farmers and their organizations, not only considering technical aspects of production, commercialization, access to services and technology ownership, but also in terms of their collective work and organization.

- i. Installed capacity building in digital technologies for producers** (E.g., in the cases of [CHOCOLATE 4ALL](#), [AgriNeTT](#), [Canelones and Salto in Uruguay](#) and [Ciervo Cua in Paraguay](#)): Another condition that stands out in the documented cases is the importance of strengthening producers' skills and knowledge regarding the use of digital tools, particularly those that utilize cell phones. The cases demonstrate how the latest knowledge for handling basic tools like email, instant messaging or videoconferencing and the use of social media have been decisive in making qualitative leaps forward in trade, digital identity, technical assistance, organizational strength, among many others. Training with an ownership approach and focusing on agricultural processes has played a key role in these qualitative leaps in the cases studied. This also constitutes a crucial strategy for young people to contribute to agriculture development in rural areas.
- m. Developing specific and appropriate technology for small-scale family farmers** (E.g., in the cases of [DIGITAL. ESCALE](#), [TOSEPAN](#), [COOPEUMO](#)): Some of these cases owe their success to the development of low-cost technology devices and when farmers develop their own connectivity projects, which are designed and managed by organized producers as is the case with community networks. This also contributes to technological sovereignty and the development of non-extractive businesses (of data and knowledge) of the digital society. The processes of developing community networks are based on the creation of communication strategies for rural communities in accordance with the needs and conditions of family farmers. The goal is not to achieve the latest digital technology, but to ensure that these technologies are adequate and in keeping with the local identity.

- n. **Free software and open-source data** (E.g., in the cases of [CACAO MÓVIL](#) and [COFFEE CLOUD](#)): Another condition for achieving greater inclusion is the use of free software that enables access and transformation of the required digital tools and the strengthening of technological sovereignty. The cases studied showed the importance of open-source data that can be used for decision-making in agriculture processes.

Concluding remarks

This analysis of good practices demonstrates that working from an inclusive digital agriculture perspective requires the adaptation of technological strategies to the realities of family farmers, by building technologies from an inclusive and participatory approach, where the tools to be developed are jointly designed with the producers.

One of the key priorities is training for technology ownership (not instrumental training) and developing information and communication strategies that are aligned with the context, utilizing accessible and understandable technological tools for the target farming families.

In rural areas where mainly family farming is practiced, the conditions for adequate connectivity (uninterrupted Internet connection, adequate bandwidth, necessary devices) are very limited; therefore, developing their own connectivity solutions through multiple configurations of community networks has emerged as an alternative that is proving to meet the needs of rural men and women.

In a framework of inclusive digital agriculture, the aim is not to provide the latest digital technologies to family farmers, but to jointly develop solutions adjusted to their different realities, with a view to fostering collective and associative mechanisms.

Based on the conversations held with the leaders of these experiences, which were chosen as examples to synthesize these good practices, one can conclude that there are several initiatives in the Latin America and Caribbean region, some of which are presented in this study and on the website <https://includas.gfar.net/>. However, they are still isolated initiatives. For inclusive digital agriculture to be more widespread in the region, public policies and initiatives must be developed with a regional vision, with the necessary financing and by applying strategies based on truly

participatory processes of farming families -organized or not- and following the good practices and lessons learned that have been documented in this and other studies.

References

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