

GFRAS 2023



Digital Advisory Services

Global Lessons in Scaling Up Solutions



global forum for rural advisory services
forum mondial pour le conseil rural
foro global para los servicios de asesoría rural



2023, GFRAS

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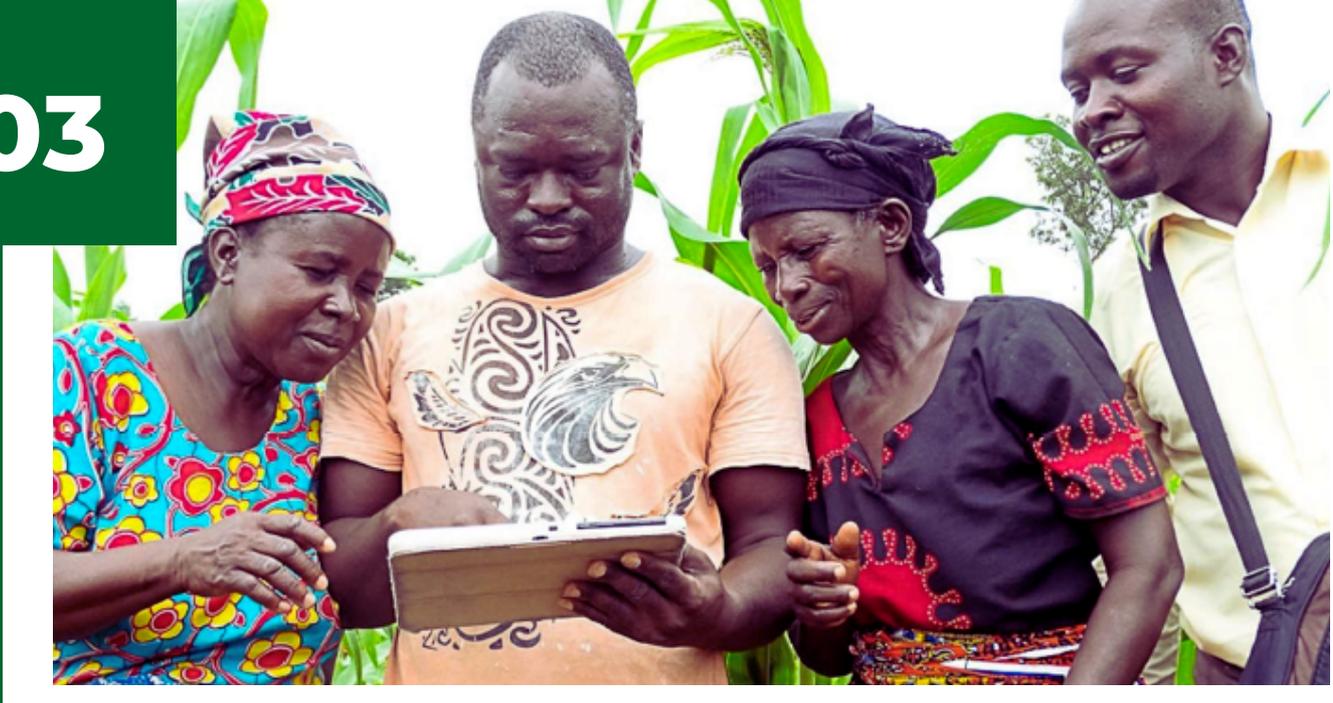
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Cover photo taken by Mr. Atang Syafei. An extension worker (Mr. Ipuk Darmanto) in Indonesia explains methods of controlling potato plant diseases by the use of MyAgri digital solution to a farmer (Mr. Alo). Lembang Sub-district of West Bandung District, West Java Province. All other photos have been licensed for use in this publication.

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CONTEXT

The Global Forum for Rural Advisory Services (GFRAS) has performed, between May 2022 and August 2023, an examination of the status of Digital Advisory Services across four of its regional networks, namely in Anglophone and Francophone Africa, Latin America, and Southeast Asia, with the goal to inform Rural Advisory Services (RAS) stakeholders (extension services, decision makers, development partners etc.) about:

- Current potentials and challenges regarding digitalization and advisory services and how these processes are contributing to strengthening food systems;
- Proven approaches to providing digitally supported climate advisory services at scale that are economically viable and offer the potential to enhance the livelihood and resilience of millions of smallholder farmers; also to bring climate adaptation into focus and,
- The operational and institutional implications of using such digital advisory services for the extension agents, reach and quality of services, their agencies and the broader Agricultural Knowledge and Innovation Systems (AKIS/AIS).

GFRAS' global advisors for this work briefed the regional teams information on the global context for the use of digital solutions in agriculture including advisory services as well as a list of key related documents, so the teams could build on innovations and lessons learned globally. Four regional reports were produced based on information collected within each region and their local actors, considering the impact, opportunities, and pitfalls for the development and sustainable implementation of digital solutions in each region, and the potential role of the public and private sectors. They are presented as annexes to this report, which draws conclusions from the work done by the regions in order to create a global picture of the status of digital RAS, what extension officers need in order to use digital extension services, and what are lessons learned from the successful implementation of digital solutions that can help shape future tools.



The term **agricultural advisory services** (used here interchangeably with the term ‘agricultural extension’) refers to initiatives to help farmers to:

- Improve the productivity and profitability of their farming operations;
- Become more effective at working together with other farmers, with agribusiness and value chain actors, and with other partners (agricultural research and local community government, for example) on common issues and opportunities; and
- Use natural resources in more sustainable ways.

Nearly all countries have public programs providing such services to farmers. Most countries also have a variety of private sector operatives providing technical assistance and advice to farmers including farmers’ organizations, and the world’s low-income countries typically also have a broad array of agricultural advisory service initiatives being carried out by NGOs.

There is a strong “public goods” rationale for some aspects of agricultural advisory services. In practice, agricultural advisory services can and have had well-documented significant impact, but these programs have struggled with significant challenges that have hindered much greater impact. In particular, in many settings it has proven very expensive and difficult to reach and interact with more than a small percentage (often no more than 10% - 20%) of farming households. Often, the households reached are located close to urban areas and roads, while many poor farming households are in remote settings making it costly for extension to reach the last mile. Further, agricultural advisors in remote locations have faced challenges in accessing and processing (given their own often-limited levels of formal education and training) valuable information that could be quite impactful for their farming clientele. As a result, both the reach and quality of advice available from agricultural advisory services has often fallen far short of what might be achieved.

Digital tools offer the prospect of overcoming these challenges to improve the efficiency, the relevance, the reach, and the impact of these services. Mobile phones and access to internet are increasingly prevalent even in the most remote areas. This is making it possible to break the isolation from knowledge and information and make connections that farmers and other agribusiness entrepreneurs have long struggled with – and not only is it possible, but as phones and internet become less expensive, breaking the isolation and providing much-enhanced advisory services is also increasingly affordable.

Private service providers (both for-profit and NGOs), donor-funded projects, mobile network operators and others are offering a wide range of digitally-enabled extension services, tapping a range of digital tools from radio to low-cost video, geospatial data and services, mobile voice and data services, even television and combinations of all of these. Independent evaluations are now showing that some of these digital services are dramatically increasing the reach of extension services as well as their impact. Some - albeit far too few - are now scaling to 100,000s and even millions of farmers.

No real professional consensus has emerged as to the role of the public sector in supporting the use of digital tools in agricultural advisory services, whether they are provided directly by the public sector (as in agricultural ministry based public agricultural extension programs), by NGOs, or by private sector actors. It was anticipated that the case studies considered in this report might help to shed light on: the role of the public sector in supporting the use of digital tools through agricultural advisory services; and, how the public sector might best play this role.

The Digital Principles presented below were created in a community-driven effort including donors and implementing organizations, such as UNICEF and the World Bank between 2000 – 2017. They consist of nine living guidelines that are designed to help integrate best practices into digitally-enabled programs and are intended to be updated and refined over time. They include guidance for every phase of the project life cycle, and are part of an ongoing effort among development practitioners to share knowledge and support continuous learning.

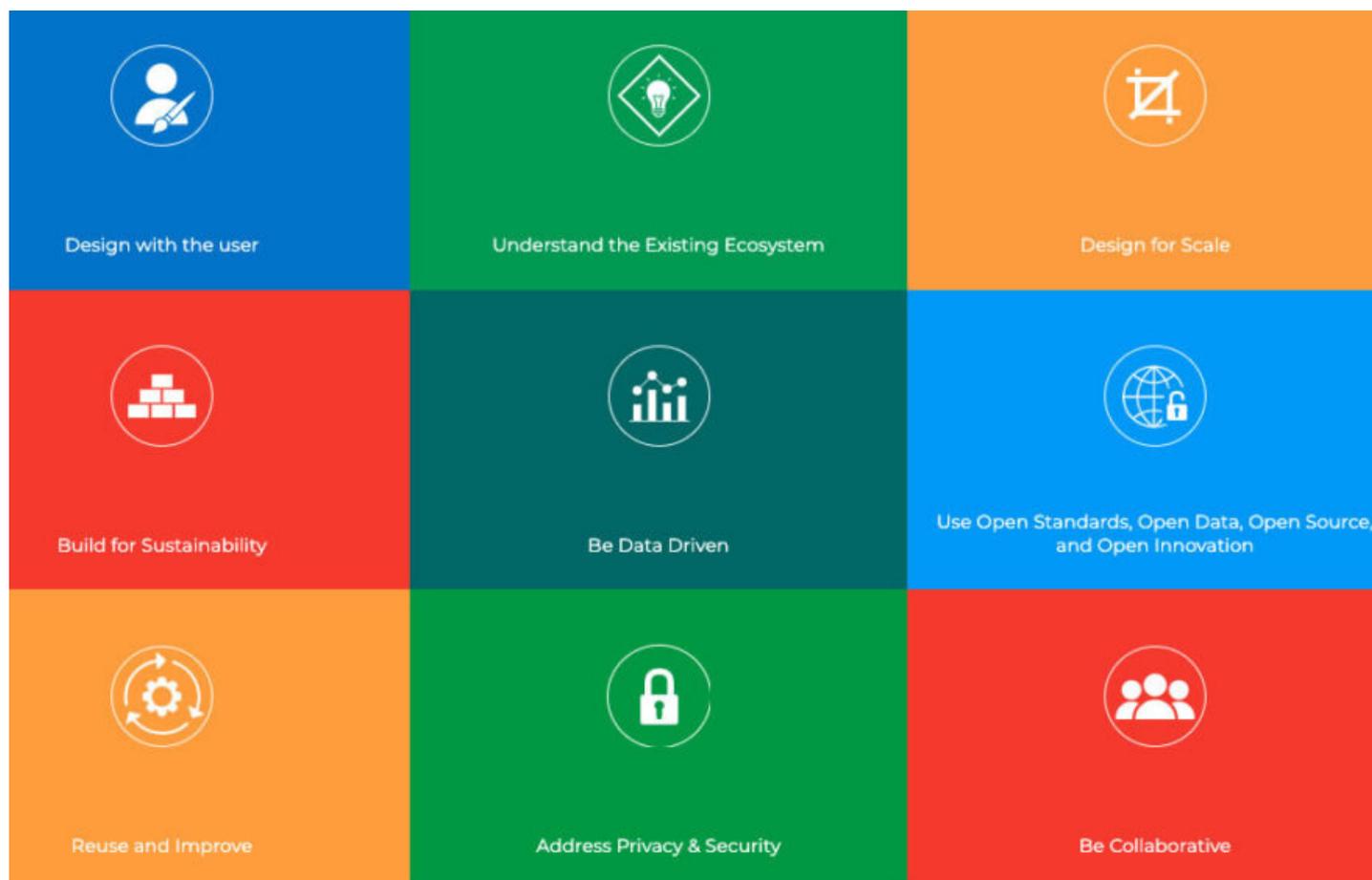


Fig.1 - Figure outlining the nine “Digital Principles”

LINKING TO THE DIGITAL PRINCIPLES

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Based on the findings from the four regional studies and backed by a literature review, the following is a stepwise guide ranging from the initial idea to develop a digital RAS-integrated solution, to reaching a scalable product. This also includes a set of recommendations as to what should be considered when investing in digital agriculture extension and advisory service systems. These are linked to the nine Digital Principles presented before.

FORM TEAM WITH THE RIGHT SKILLS (DESIGN WITH THE USERS)

It is very important that the design teams are multidisciplinary and represent different stakeholders. They need to composite the views of the beneficiaries/users (farmers and field advisors), the potential private sector partners (mobile service providers, input suppliers and purchasers), professionals in programming and digitization, investors, and host organization representatives.

ASSESS THE ENABLING ENVIRONMENT (UNDERSTAND THE EXISTING ECOSYSTEM)

Teams need to take a deep dive into understanding the local conditions. What is the prevailing policy framework? What are the digital solutions already available? What are the particular social and institutional structures that exist? The deep dive needs to be multifaceted and look at culture, gender norms, political environment, economy, technology infrastructure, as well as prevailing drivers and prohibitors in the agriculture sector and in the advisory service provision.

FIND THE RIGHT PARTNERS AND INVESTORS

This is not part of the guiding principles for digitalization. It is costly and time consuming to develop scalable digital solutions. Therefore, having partners that can both secure financial and technical capacity are crucial prerequisites for engaging in the development of digital solutions for the agricultural sector.



DESIGN THE SERVICE FOR SCALE (DESIGN FOR SCALE)

Achieving scale requires adoption beyond an initial piloting phase and often necessitates securing funding or partners that take the initiative to new communities or regions. Designing for scale means thinking beyond the pilot and making choices that will enable widespread adoption later. This again links to the business model which the digital service will be based on.

DEVELOP THE BUSINESS MODEL (BUILD FOR SUSTAINABILITY)

To be successful in developing and providing digital services at scale, the service needs to be based on a clear and realistic business model. Digital solutions are not only expensive and time-consuming to develop, but they are also very expensive and labor intensive to maintain, update and expand. Without a clear plan for how to survive beyond the initial investment phase, it is very unlikely that the investment will be sound.

MOVE TO SCALE (BE COLLABORATIVE)

This is the crucial part of the development of successful digital agricultural advisory services. The recommendation from the Digital Principles is spot on: be collaborative. To do that, you need to work with a variety of partners.

START ROLLOUT WITH BUILT IN FEEDBACK AND ADAPTATION (BE DATA DRIVEN, USE OPEN SOURCE, REUSE AND IMPROVE, ADDRESS PRIVACY AND SECURITY)

Here, the Digital Principles provide some fundamental recommendations. It is very important to base the digital service on reliable, easily accessible, and affordable data (e.g., real-time weather and market data). At the same time, it is essential to perform continuous collection of data to keep improving the quality and relevance of the services provided. The recommendation to use open-source software is also very relevant.

Data ownership and security are essential areas to address and to explain to users and customers. We all want our data and privacy protected, so data security needs to be addressed upfront.

Start early on with testing and piloting to get feedback on relevance, easiness, bugs, etc. Short learning loops help entrepreneurs identify potential restrictions, adjust the business model, and extract lessons learned for scaling out to new services or up to new user segments.

FINDINGS

Four teams carried out studies on the digital advisory landscape in their respective regions, covering both positive and faulty solutions in a total of fifteen countries. In Latin America, they started with a broad mapping and screening of digital agricultural advisory services. Out of the 80 different services reviewed, the vast majority had under 5,000 active users. Private sector-led initiatives dominated the scene, constituting 60% of the investigated services, while public sector accounted for 28% and public-private partnerships (PPP) only 12%. Six solutions were selected for more in-depth study, from six countries. In Southeast Asia, the team decided to focus on two large public sector driven PPP's for detailed study. For Indonesia, the team provided a screening with 16 services out of which six have more than 50,000 registered users. This is both an indication of digital penetration and the size of the population. In Anglophone Africa, they selected seven cases in three different countries which consisted of a mixture of private and public sector driven services, with a variety of user numbers - while some accomplished over a million users, others still struggled going to scale. In Francophone Africa, they looked at eight cases from three countries, also here in a mixture of private and public sector driven services. Most of the selected cases in Francophone Africa had under 2,000 active users. Below is a reflection on the findings from the four regions, in each case examining some of the success factors and challenges that occur when developing and scaling digital agricultural advisory services into sustainable services and/or profitable businesses.

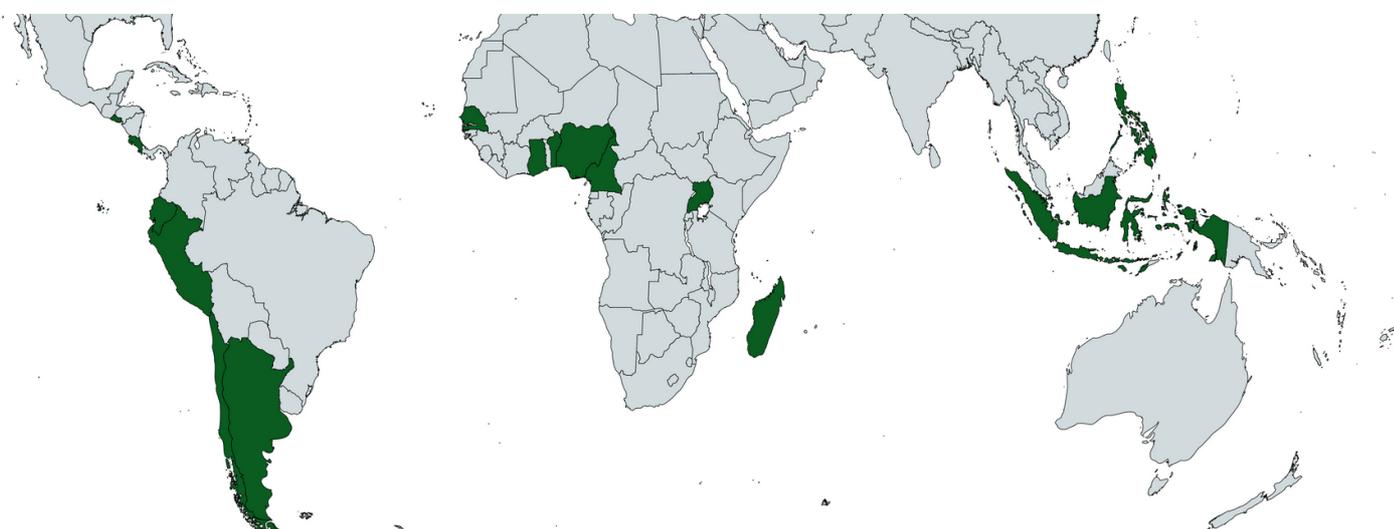


Fig. 2 - Map displaying the countries surveyed in the study

FORM TEAM WITH THE RIGHT SKILLS

While the Digital Principles emphasise the need for involving the users/customers already in the design phase, this has often proved to be challenging. A study done by McCampbell, et. al. (2021) showed that the principle of user involvement in the design phase is difficult when the users have low or no ICT literacy. Their involvement tends to be superficial, and they are often not present when decisions are made, which means it often ends up being more window-dressing than actual co-creation of knowledge.

What we see from the study is that public sector led initiatives are less likely to have user involvement than those developed by the private sector. Public sector driven initiatives tend to be more bureaucratic, top-down and supply-driven which displays a blueprint approach where persons using the service are merely seen as 'users' or 'beneficiaries'. This is probably a reflection of the general view most public sector organizations in the global south have of its citizens: they are receivers of public services. While private sector-led initiatives tend to be more flexible and more customer-service oriented, they do not have the time and money to run big and slow blueprint processes but rather operate through more iterative processes of 'trial and error'. They also have a fundamentally different view of the users, seeing them as customers rather than beneficiaries. In principle, for private sector-led initiatives, the beneficiary is the service provider, not the user. But to benefit, the provider needs to gain and retain customers and, ultimately, to do that, one has to intimately understand the needs of their customers.

As to who needs to be in the team, it is primordial to involve ICT specialists to develop the software. Especially in Africa, actors in this realm are reporting challenges with recruiting and retaining professionals in programming and digitization. These professionals are in short supply on the continent, which means they are in high demand and have a significant cost. The high cost is especially a challenge for the private sector actors as they tend to have a lower funding envelope. Government-run initiatives are often backed by donors or international institutions, such is the case of **MyAgri** in Indonesia (supported by Wageningen University) or **RCMAS** in the Philippines (developed in partnership with the International Rice Research Institute - IRRI).

The private sector entities most often involved in public-led digital services are the mobile service providers. Such is the case in Nigeria, where the public **National Farmers Helpline** (NFHL) works closely with MTN, Glo, Airtel and 9Mobile. It is an advantage to include mobile service providers as partners from the beginning, but this might be more difficult for private initiatives than for public ones. Private sector initiatives often need to prove themselves in terms of outreach before the mobile service providers are interested in a partnership, while public systems are expected to be able to operate at scale due to a higher initial funding envelope. Other partners, like input suppliers, purchasers, and financial institutions tend to become involved a bit later in the process.

ASSESS THE ENABLING ENVIRONMENT

While assessing or understanding the enabling environment is important, it is also resource demanding. There are multiple variables that need to be considered, and the ecosystem for digital agriculture is fluid, multifaceted and ever-changing. This requires that digital development practitioners not only make a good initial assessment, but also regularly reassess the context they operate in to check their assumptions. In Latin America and Africa, the studies highlight that the policy framework for promoting digital advisory service is not very strong. As formulated in the Latin American report:

"There is limited progress in the development of policies and strategies for digitalization in agriculture and in particular the extension systems."

CEPAL, 2021.

Part of the existing ecosystem is determined by how the agriculture extension and advisory services are currently configured. As exposed earlier, these systems most likely only reach a fraction of the farmers needed, and not always with currently relevant information and services. As seen in other sectors that digitalized long before the agricultural sector, trying to digitalize systems that are poorly functioning tends to carry along the same problems that prevailed before digitalization. For example, public systems insisting on reaching the poorest farmers – often a demand if development partners are engaged – is in many cases a route to failure. This happens because the efforts involved in reaching the last mile makes the system too costly for governments to run and it is difficult to develop Public Private Partnerships (PPP) with the private sector when the target group is non-commercialised farmers.

The typical picture in such digital services is that once the donors withdraw their financial support, the public sector is unable to maintain the service. The enabling environment is not there and digitalizing an inadequate advisory system will not remove its underlying systemic challenges. A digital solution is not a quick fix or a silver bullet, it cannot substitute for extension workers and advisory service providers or someone else present in the local community that can provide an interface between the farmers and the technology. Digitalizing functioning systems, on the other hand, can be very effective, as is the case with the NGO-based fruit and vegetable real time price system (**SIEL**) in Madagascar. SIEL had a successful transfer to a digital format because the system had been functioning well long before it was digitalized.



In donor/public driven initiatives there seems to be a tendency to overlook or ignore the competitors from the private sector within the digital service provision space. Such was the case in Cameroon, where the Ministry of Trade recently launched a digital platform that is in direct competition with the **Jangolo** platform that has already been in operation for over five years. Had they performed a good assessment, they might have concluded it being a better investment for the government to sign a Memorandum of Understanding with Jangolo to capitalise on the investment made and the customers already captured. The Francophone report refers to similar problems in Madagascar without entering into concrete examples. As they state, the government's role is to create an enabling environment, instead it seems to use its limited resources on competing in the market. This is an important point that governments and the donor community need to pay attention to. When working with government in a given country, there might be some private sector initiatives that fly under the radar either because they have not yet gone to scale, or because the central decision-making public staff is not aware of them.

In Latin America, they emphasize that the region should focus on actions to improve the enabling environment, and not limit attention to assessments. The region should build a framework of public policies, priorities, investment, and policy instruments in partnership with the private sector, to stimulate development of the digital ecosystem in extension. Latin America must continue to invest in improving broadband internet access in rural areas and reduce its cost to increase accessibility. Improving connectivity and closing gaps in access and use for excluded populations and between rural and urban areas should be a priority for policy interventions.

In Asia, the services investigated are public and have managed to go to scale. That they have been able to achieve scale is most likely linked to the enabling environment. In general, the government system in Indonesia and in the Philippines (the two countries investigated) is robust, the public institutions are fairly well functioning, and the civil servants are well educated. This makes the prevailing ecosystem more conducive to operate in both countries for public and private actors alike. Another interesting observation from Asia is that farmers are increasingly searching for information on the internet themselves, which is a factor that digital service providers have to take into account.

FIND THE RIGHT PARTNERS AND INVESTORS

An important aspect of digital extension looked at in this study are the advantages and disadvantages of public versus private-driven services and the role of public private partnerships (PPP).

Public Sector Driven Solutions:

The experiences in Anglophone Africa make it clear that publicly-run digital services are struggling because they are embedded in bureaucratic and rigid systems. If the public sector is weak and poorly functioning, it is most likely that government-run initiatives will have the same inherent challenges. The National Farmers Helpline (NFHL) in Nigeria is a good example of the challenges that public systems might encounter.



It is a government-run initiative that started in 2011 and became operational in 2018. It has been quite successful with almost 400,000 people registered and around 4,500 active users per month. One of the greatest challenges to its continued success and upscaling is its civil service approach to its operations and management. Although all the right investment and tools were available to seamlessly operate a helpline centre, the centre's operations were grossly inadequate as staff consisted of civil servants following public rules. This means that services are inaccessible to farmers/users outside normal working hours (9:00am and 4.00pm) and also on Saturdays and Sundays. A big underlying challenge with public systems is that neither the decision makers (politicians) nor the employees (civil servants) or the development partner organization staff (civil servants) have personal gains nor losses linked to their performance. They neither benefit from successes nor suffer from failure. The motivation to excel is not as strong as in private sector driven initiatives. In contrast, **Novus Agro**, a privately operated service also available in Nigeria, is accessible to farmers throughout the whole day and during weekends. Similar observations were made in Uganda and Ghana where private sector operators' function seven days a week and not only during public working hours. NFHL is aware of this challenge and is considering a gradual reduction in subvention by FMARD/government and transferring operation and model to private for-profit organization. However, the plan is that this should happen latest by 2029 which might be too late in a very dynamic market. Not only can the public systems be inhibited by rigid rules and regulations systems, they are also more susceptible to changes in government. Both NFHL in Nigeria and the public rice advisory system RCMAS in the Philippines have suffered from changes in government staff, structures and priorities.

Depending on the prevailing political culture in a country, external investors should be very cautious in investing in publicly-run services, as even success cases might fall victim to political rivalry and personal ambitions of political leaders. In Latin America, they found that public sector driven initiatives like **ASA Virtual** in El Salvador and **INIA** in Chile tended to favour topics like agroecology and adaption to climate change. These platforms had dedicated users but found difficulties in going to scale. A likely explanation is that these topics are not perceived by farmers as addressing their most immediate needs. **PLATICAR** in Costa Rica, is also a public sector driven service and focused on more traditional agronomical advice to extensionists and farmers alike. It has passed the mark of 250,000 users. This might indicate that while climate-relevant and long-term sustainability related issues can be integrated into digital solutions, they should not be offered as stand-alone services but rather embedded into services that address farmers' immediate needs.

Private Sector Driven Solutions:

For the private sector, successful actors in this domain have all been very adaptive and flexible. In the initial phase, access to finance is essential and is something they often struggle with. Private sector actors cannot afford long development processes, many therefore adopt a 'trial and error' approach and build a customer feedback option into their services right from the beginning. The studies clearly showed that this led to strong relationships between the private sector providers and the end-users, be they advisory service providers and/or farmers. Most private sector actors cannot afford the luxury of providing free-of-charge services and therefore must engage partners from day one to build a sustainable business model. Based on the regional reports and background literature, it is very clear that apps containing many different services have a strong competitive edge. Bundling services as described in CTA's Digitization of African Agriculture (Tsan, et al. (2021)) requires involvement of a series of different partners, among them input suppliers. They partner to use the app not only to promote their products (turnover) among the users, but also to increase the quantity and quality of their support service in the form of agronomic advice provided together with the product (competitiveness) alongside guarantees of authenticity of the products (reduce competition from cheap dealers selling expired or counterfeit products).

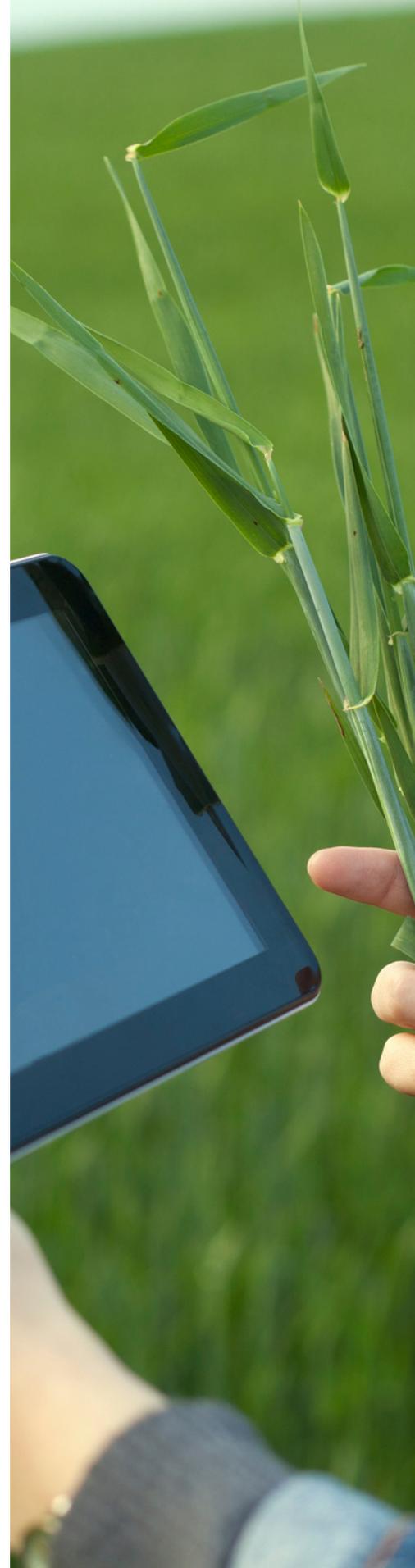
The ability to provide such services through the app makes it so attractive for input suppliers that they often are willing to pay for getting access to the subscribing farmers. The same is also the case for financial institutions. They can access a large and normally inaccessible clientele through the app offering mobile-pay micro credit to farmers.

The users' accurate farm and crop data can be used as collateral for the financial institution. Again, the ability to provide service to more customers is so valuable to the credit institutions and the farmers that the private digital service provider can put a small commission on each transaction done through the app. Also, purchasers and retailers are willing to pay for getting access to the platform. They can use farm output data to increase logistical efficiency, predictability and reliability of supply of products to the market. The more successful a platform is in terms of attracting many active customers, the more valuable it becomes to the partners and the more attractive it becomes to the customers. Services like **Esoko** in Ghana experienced lingering difficulties in going to scale but with the inclusion of credit services the number of customers increased rapidly.

Public-Private Partnership Driven Solutions:

Based on the findings, there seems to be an untapped option for sequential public private partnerships, where the public sector is the dominant partner in the development phase and the private sector becomes the dominant partner in the operational and scaling phase. Designing the development and operation of new digital agriculture extension and advisory services in this way will draw on both sides' comparative advantages and compensate for their weaknesses.

The main obstacle for private sector-led initiatives is that the initial development phase is costly and tends to be lengthy. It requires a lot of capital, access to expensive software developers, and programmers. The investigated success cases clearly show the benefit of involving international partners, which might be more difficult for private sector led initiatives than for governments. Involvement of public/donor funding in the development phase can provide the required financial stability and access to competences. It is very evident that a lot of good digital service platforms have been developed in the public domain. As shown in this study, the challenge for public systems is mainly in the operation and scaling phase. As discussed, public systems are prone to political changes which threaten long term sustainability, operate within rigid bureaucratic system, often lack a clear business model, and tend to treat users as beneficiaries rather than customers. The private sector, on the other hand, seems to have the culture and mentality to bring things to scale through functional business models and a clear attention to customers' (users') requirements. While such a sequential public private partnership has some clear advantages, it would not be without challenges. Aside from the normal challenges PPPs face, this approach would be vulnerable in the transition phase. Who calls the shots in this phase and when is it the right time to move from one ownership model to another? These issues need to be discussed and agreed during the design phase. It is important that the private sector partners are involved from day one and that the public sector partners remain influential in the business phase. The first is to secure proper buy in and influence in the design phase, the second to secure that public priorities are addressed (e.g., what type of users to target). It is also important to get part of the revenue back to the public sector, especially if development partners are financially involved. This tends to add an additional layer of complexity. Many development partners are still grappling with how to involve private sector partners without skewing the market and even more importantly without risking negative response from their constituency or the press. The conditionality development partners require for accepting private sector engagement is often so rigid and over controlling that it becomes counterproductive.



DESIGN FOR SCALE

Several aspects of this step have already been addressed above. Offering a variety of services that cater for the farmers' different needs makes the digital service attractive. If multiple services are offered within one app/platform, there is little incentive for users to seek elsewhere. Such a successful platform could include:

- Agronomic advice;
- Assistance with record and bookkeeping;
- Access to updated weather information;
- Access to market information, including prices and customers' preference for quality and types of crops;
- Purchase of quality-guaranteed inputs that include professional advice on proper and safe use;
- Access to credit, and more.

Not addressed so far is how to deal with the human/technology interface and how to operate in areas without mobile coverage. Again, the examples show the private sector as being most innovative in finding solutions to these challenges. Many of the private sector driven initiatives operate with field staff as intermediaries between the farmer and the technology. This can be done via local extension officers, interested farmers or trained young people. The advantage of working with such intermediaries is that the technology barrier lowers significantly, trust can be built between the user/customer and the service provider.

It presents a blended model, where the farmer interacts with the person, whom while might not having a formal education as an extension officer can use the digital information to provide relevant services and advice to the farmer. The reason public based systems are not using field staff to the same degree was not analysed in the study. A likely explanation is that it makes the public good service too costly, but it can also be a procedural/legal issue for the public sector to pay salaries to people that are not employed as civil servants. Whatever the reason, it does seem to give the private sector driven initiatives a better basis for going to scale.

One prerequisite for scaling that all four reports address is the need for capacity building in terms of ICT literacy, especially among agriculture extension and advisory service providers but also for farmer and other value chain actors. As recommended in the Latin American report:

"Concentrate actions on digital education for extensionists, promoters and producers, not only in the use of Digital Innovations, but also to promote technological innovations and collaboration among extension actors."

RELASER/AGRARIA, 2023



DEVELOP THE BUSINESS MODEL

In publicly operated systems, governments and/or overseas development aid (ODA) donors often provide services as free public goods to small scale farmers. There is nothing wrong with such a business model, provided the government is willing to allocate the resources necessary for the operation of the free digital service and as long as there is continuity when governments change. What is evident from the literature and the study is that public operated systems in most cases allocate sufficient resources for the successful development and testing of a digital advisory services but struggle with securing adequate funding for the operational phase and the cost of scaling. The same challenge is seen in many NGO-driven initiatives which also tend to depend on overseas development aid funding. Private sector actors might have a better understanding of these challenges and try to build a business model that can cater for the operational costs. Still, finding sufficient resources for scaling is also tricky for the private sector.

The study in Latin America identified five different business models for digital advisory service provision. The models depend on the kind of services providers and the target users.

1. The free public model in which the user does not pay directly (but over the taxes) is a free service open to all producers with access to mobile phone or the internet. **This is the dominant business model for public services.**
2. Provision of information to fee-paying users; these are in Latin America generally run by private companies who require registration and charge users, and operate in a supply and demand model for producers who can afford to assume the costs. In Africa, this model is also successfully used for small scale commercial farmers. **Services based on this business model are normally not available for poor smallholder farmers.**
3. Input supplier companies that offer the digital services incorporated within the sale of inputs; the cost of the services is assumed by the user. **This is one of the most common business models for private sector run services. Other partners like mobile service providers, purchasers and credit institution can have the same type of arrangement. As there needs to be a commercial potential, it is not likely to target the poorest farmers.**

4. Integration of digital advertising of input and services providers, financing the digital technical assistance provided by experts who receive incentives; costs are assumed by advertisers on these platforms, eliminating the need for the user to pay for the services. **There are not many cases with this model. To be attractive to commercial advertisement the service must reach a large audience. Services using social media platforms can use this model.**

5. Producer organizations' model, in which the cost of the services is assumed by the users indirectly by deducting a cost per product sold by the organization. In Latin America, producer organizations for coffee, sugar cane, bananas and oil palm operated digital extension platforms with public sector support. **This model is suitable for big producer organisations as the turnover volume must be substantial to cover the cost of running and updating the information, or as seen in Latin American cases, through PPPs.**

An ideal system might be a PPP where the public partner targets poor farmers with free services and the private partner targets the small, medium and large-scale commercial farmers. The study did not find any clear examples of such a model being implemented.



START ROLLOUT WITH BUILT IN FEEDBACK AND ADAPTATION

In using feedback from users, we see clear differences between private and public sector driven systems. The private sector almost always focuses on easy-to-use continuous feedback features either built into the app, via a call line or through the use of field staff to systematically obtain and report customers' feedback. In the case of the experience in El Salvador, it was possible to identify restrictions on access to services, lack of incentives for virtual extension workers and others that allow the experience to be expanded at the national level. Public systems tend to use periodical surveys to capture users' opinion. The difference seems to be that private sector can react faster and users see a response to their feedback, while the public sector system is only periodically reviewed, so feedback loops take more time and are less responsive from the point of view of the clients. The difference in feedback systems results in the private sector service development being more data driven than the public. An important point about data that was raised by Latin America was that the available information on the impact on farm of digital services was very poorly addressed by the studies service system and in the literature.

The issue of data privacy and security was not specifically addressed. The study did not look at the technical part of the different services as this was not its focus.

MOVE TO SCALE

In the study there were several services that had successfully gone to scale (for more information please refer to the annexes).

In Anglophone Africa, privately operated Esoko has more than 1.6 million users in six Anglophone countries, with 700,000 users alone in Ghana from where it originated. The business model is that users pay a fee for accessing the services. Esoko's revenue model includes subscription fees, transaction fees for financial services, and fees for data collection and analysis services. In Uganda, the private company **EzyAgric** has around 100,000 active users. The business model is based on charging a commission on transactions made through its platform, such as loans disbursed to farmers and sales of agricultural inputs and produce. Additionally, they provide value added services, such as data analytics and market insights, to agricultural value chain actors, for which it charges fees. There are two public services studies in Anglophone Africa, **MoFA e-Agriculture** in Ghana and NFHL in Nigeria, with around 250,000 registered users each, but with less than 10,000 and 5,000 monthly active users, respectively.

In Francophone Africa, the **3-2-1 Hotline** in Madagascar operated by a PPP has almost 3 million key messages heard per month. The business model is that farmers/customers pay to use the hotline. If customers subscribe to the partner mobile service provider Airtel the first six calls per month are free. About 70% of the callers are men, which indicated that even relatively simple digital tools still have a gender bias. The other digital services at scale presented in the Francophone study is Jangolo in Cameroon, run by a private company. It has 70,000 registered users and 3,000 visits per day. The business model is either via a subscription model or via a 7% commission of any trade done using the platform.

In Latin America, the private sector led platform **Agroconsultas** operating in Argentina and Uruguay reaches 280,000 unique users with high access from young advisors or extensionists (45%), producers and farmers (20%) and agronomy students (10%). Their business model is the integration of digital advertising of input and service providers. The public sector initiative PLATICAR funded by the government of Costa Rica is almost as big with more than 250,000 users. INIA-Chile is a public run early alert service for potato production that uses data provided by CGIAR and FAO, which does not qualify them to as PPPs, as these are international organisations.

In Southeast Asia, the two cases analysed are both public platforms with some degree of PPP. In Indonesia, MyAgri was selected with more than 50,000 active users as the most successful digital public platform in agriculture advisory service. The business model so far is a free public good. In the Philippines, RCMAS is a government-run digital agricultural extension platform and the cost is shared between the federal and the local public systems.

CONCLUSIONS

After screening numerous services and selecting specific successful digital RAS solutions for a more in-depth analysis, the activity undertaken by the four regions lets us conclude the following as indicative for improving the reach and sustainability digital RAS and continue to contribute to the betterment of living conditions in rural and peri-urban areas:

1. Several digital advisory services have successfully gone to scale, albeit a small number compared to the large pool of available solutions.
2. Successful digital agricultural advisory services are addressing user needs, bundle services, include multiple partnerships, have robust business models, and iterative learning processes. User involvement for performance feedback is a key success factor.
3. User involvement in the design phase is recommended and desirable but challenging when users have low ICT literacy.
4. Without a plausible business model, it is difficult to go to scale.
5. Policy frameworks for promoting digital advisory services seem weak in Latin America and in Africa while they appear more progressed in Asia.
6. Public-led services are strong in the development phase but struggle to maintain operation and scaling due to bureaucratic and rigid systems that are subject to political changes.
7. Private sector-driven initiatives face challenges securing funding in the development phase, but once developed they are more robust, adaptive, flexible and data driven through customer feedback systems.
8. Sequential public-private partnerships designed so the public sector leads the development phase and the private sector takes lead once operational might be a way forward.
9. Sequential public-private partnerships will not guarantee success but have the potential to increase the return to investment in digitalisation.
10. There is still need for a deeper understanding of the dynamics of successful scaling of digital extension services.

STRENGTHS AND PITFALLS OF THE PUBLIC AND PRIVATE SECTORS

In the dynamic landscape of digital solutions for agriculture, both the public and private sectors play crucial roles in spearheading innovation through the development of advisory services and applications. The public sector, with its regulatory authority and broad societal focus, often ensures accessibility and inclusivity in the deployment of digital tools. On the other hand, the private sector, driven by market dynamics, excels in rapid technological advancements and tailored solutions. However, while each sector boasts distinct strengths, they are not without their pitfalls. The public sector may grapple with bureaucratic hurdles and slower adaptation to emerging technologies, whereas the private sector may prioritize profit over equitable access, potentially leaving certain demographics underserved. A nuanced exploration of the strengths and pitfalls of these sectors is essential to harness their collective potential for a more comprehensive and sustainable digital transformation in agriculture.

RECOMMENDATIONS

EMERGING FROM THE STUDY

The purpose of this analysis is to uncover lessons learned through case studies from three continents, and to identify key issues for which further examination and work would be merited to inform future design and analysis of digital advisory services. Several points emerging from this exercise are provided here:

There is a large and growing literature about the use of digital tools in service delivery across sectors in developing countries. This literature has identified a variety of factors in project/program design and in the enabling environment that are associated with successful outcomes, including the very useful Digital Principles. Yet, it is evident from working with the study's teams that none widely accepted and user-friendly structured methodology has yet emerged. A framework to analyse and guide - in practical specificity - the adequacy of project/program design for digital agricultural advisory services investment for easy comparison is desired. The development of such a structured framework is a task that begs for the attention of the global community.

Far too few of the successful digitally supported rural advisory services systems are sufficiently scaled. Before investing in developing new costly systems, investors should consider investing in scaling existing effective and reliable systems, regardless of whether they are operated by public, private, not-for-profit actors or a combination of those.

Impact and return to investment are likely to be much higher when investing in scaling, rather than in redeveloping solutions. The "Scaling Up" Community of Practice can be a relevant starting point.

See:
www.scalingcommunityofpractice.com

For investment in the public sector what is needed is user-friendly guidance about the systemic role of the public sector in supporting the use of digital tools in agricultural advisory services by creating an enabling environment. This could include:

Create a policy framework that allows the private sector and not-for-profit actors to operate in the advisory services space.

The role(s) of the public sector in supporting and facilitating the start-up phase of incorporating digital tools into advisory services, whether the provision of the advisory services is done by the public, the private sector, the not-for-profit actors, or a combination of those through public-private partnerships.

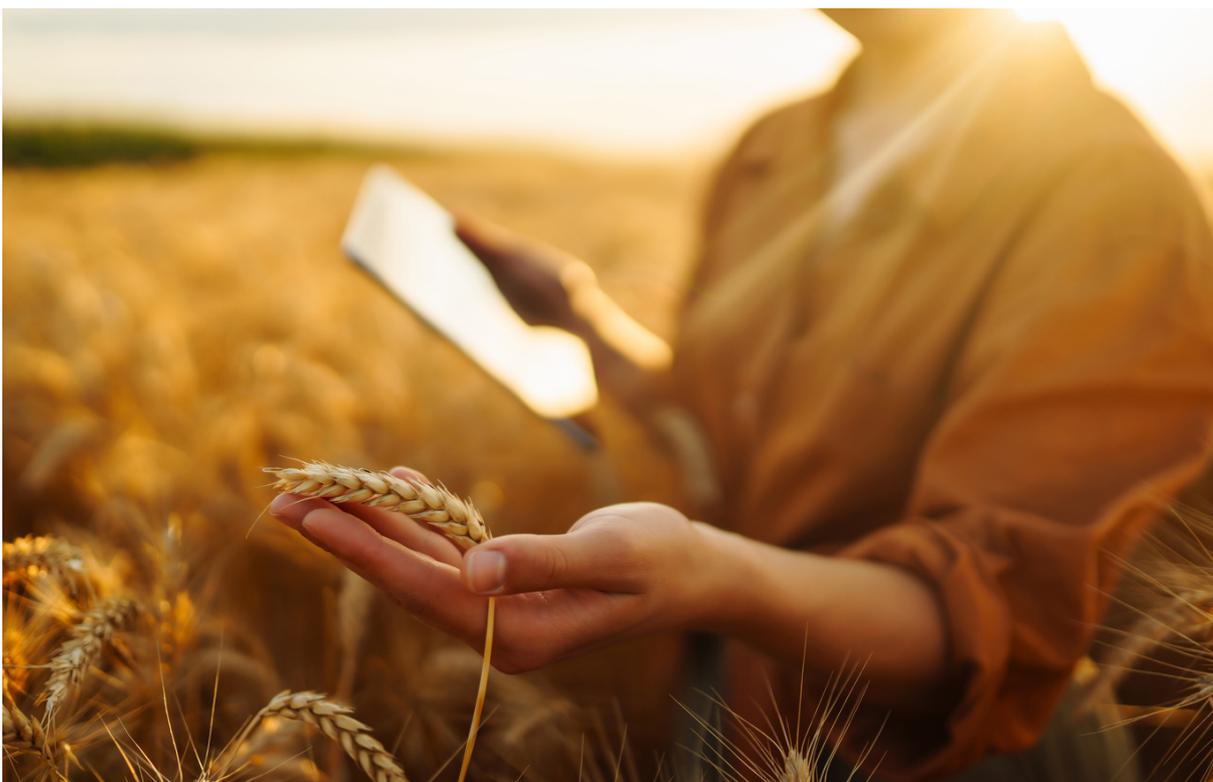
Sharing successful business models for public-private partnerships. This could include models that offer needs-based offline digital services for poor farmers and online user-fee based services for commercialised farmers. Also consider how to include illiterate farmers and the use of local languages.

A policy and institutional framework for developing and maintaining human capital at national and local levels in agricultural advisory services including the integration of digital tools in service provision.

Supporting the development, maintenance of, and access to relevant updated data and information needed to super-charge the relevance and impact of agricultural advisory service projects/programs.

Address the issue of data governance in the policy framework as farming data is steadily moving to digital form. Secure that farmers and farming organizations can own and use this data themselves.

Developing rules and regulations on the use of machine learning and artificial intelligence (AI) so secure the authenticity and relevance of the service provided.



In addition to the four regional studies performed by the GFRAS Regional Networks in Anglophone and Francophone Africa, Latin America, and Southeast Asia, GFRAS also consulted the following studies in the making of this report:

- CEPAL (2021) Digitalización y cambio tecnológico en las PYMES agrícola y agroindustriales en América Latina.
- FAO's Status of Digital Agriculture in 47 Sub-Saharan African Countries (2022) Aguilar-Gallegos, N., Klerkx, L., Romero-García, L. E., Martínez-González, E. G., & Aguilar-Ávila, J. (2021). Social network analysis of spreading and exchanging information on Twitter: the case of an agricultural research and education centre in Mexico. The Journal of Agricultural Education and Extension, 1-22. <https://doi.org/10.1080/1389224X.2021.1915829>
- Tsan M., S. Totapally, M. Hailu and B. Addom (2021) Digitization of African Agriculture (2018/2019). CTA 241 pp. Aguilar-Gallegos, N., Klerkx, L., Romero-García, L. E., Martínez-González, E. G., & Aguilar-Ávila, J. (2021). Social network analysis of spreading and exchanging information on Twitter: the case of an agricultural research and education centre in Mexico. The Journal of Agricultural Education and Extension, 1-22. <https://doi.org/10.1080/1389224X.2021.1915829>
- GSMA Digital Agriculture Maps (2020) Aguilar-Gallegos, N., Klerkx, L., Romero-García, L. E., Martínez-González, E. G., & Aguilar-Ávila, J. (2021). Social network analysis of spreading and exchanging information on Twitter: the case of an agricultural research and education centre in Mexico. The Journal of Agricultural Education and Extension, 1-22. <https://doi.org/10.1080/1389224X.2021.1915829>
- Digitalisation of agricultural knowledge and advice networks: A state-of-the-art review. (2020)
- Evidence from India: Impact of mobile phone technology on the performance of agricultural extension services. (2021)
- Digital and virtual spaces as sites of extension and advisory services research: social media, gaming, and digitally integrated and augmented advice. (2021)
- McCampbell M., C. Schumann, L Klerkx (2021) Good intentions in complex realities: Challenges for designing responsibly in digital agriculture in low-income countries. Sociologia Rurali Volume 62, Issue 2 p. 279 -304.



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