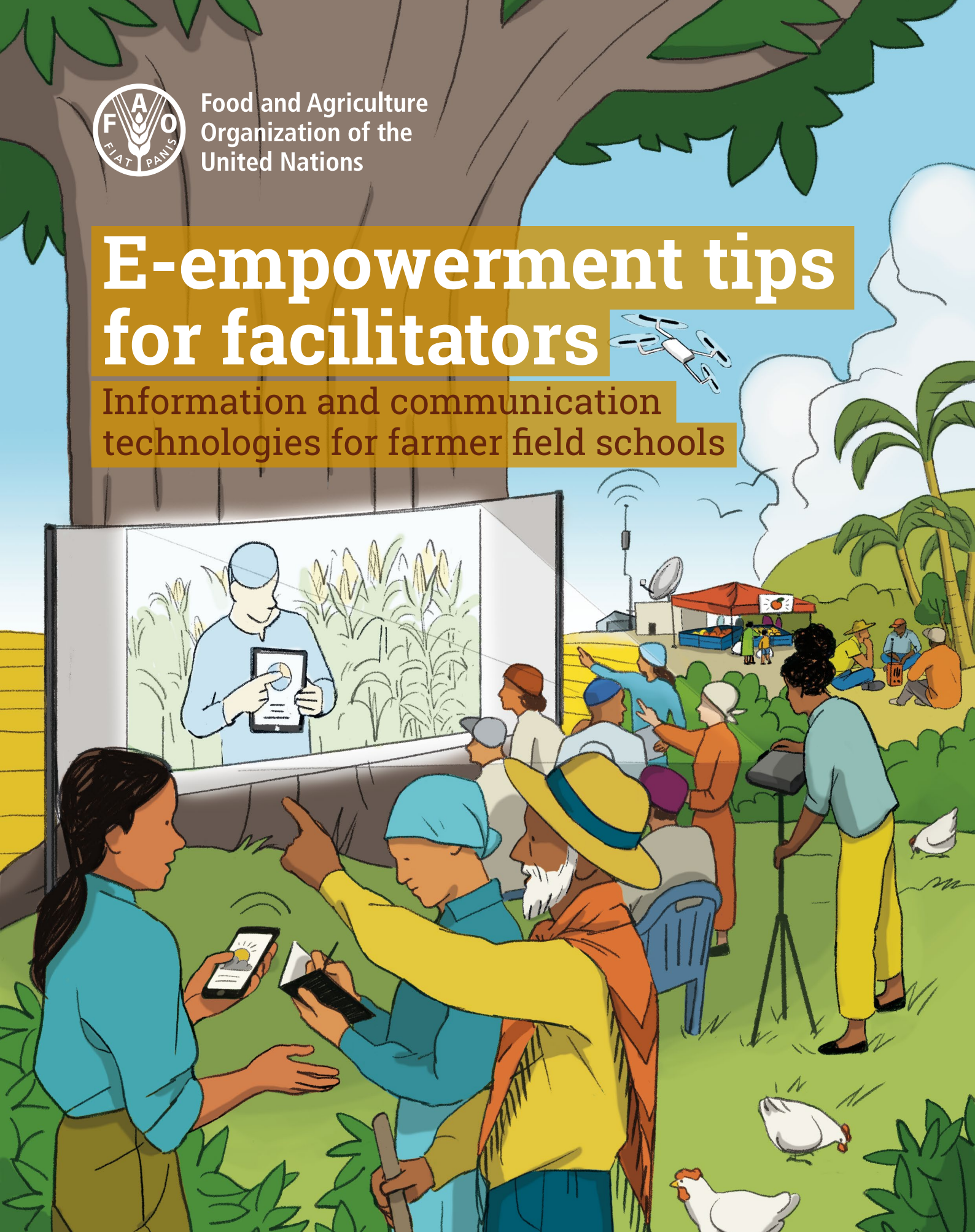




Food and Agriculture
Organization of the
United Nations

E-empowerment tips for facilitators

Information and communication
technologies for farmer field schools



With the technical support of:



E-empowerment tips for facilitators

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Foreword

Food insecurity and malnutrition are worsening across the world. For instance, up to 828 million people suffer from chronic hunger, even as the incidences and severities of climate shocks and economic crises and conflicts are increasing. These threaten the achievement of the Sustainable Development Goals. The Food and Agriculture Organization of the United Nations (FAO) is responding to these challenges through its Strategic Framework 2022-2031, which is underpinned by the aspirational four betters – better production, better nutrition, a better environment, and a better life for all – leaving no one behind.

The Strategic Framework emphasises farmer-centred innovation as means to transform agrifood systems to become more efficient, inclusive, resilient and sustainable. The Farmer Field Schools (FFS), which empowers farmers with appropriate skills, knowledge, and information to improve their decision making, is a proven means to achieve this aim of transforming agrifood systems. The approach is holistic and especially places the farmer at the centre of innovation in their farms by engaging them in experiments and study processes to co-create knowledge and technologies. With time, participating farmers become local experts in their farms.

In the last four decades, the FFS approach has been successfully used in over 100 countries, reaching an estimated 20 million farmers. Since its pioneering by FAO in the 1980s for integrated pest management in rice monocropping systems in Indonesia, the FFS approach has been used successfully for most cropping systems and in agropastoral and pastoral systems in the rest of Asia, Africa, Latin America and the Caribbean and Europe. The use of FFS has since transcended pest and disease management in crops to encompass various themes, including land and water management, climate change adaptation and disaster risk reduction.

Despite the successes, there is the need for FFS practitioners to continuously adapt the approach to new and emerging challenges, which are faced by farmers. These include unpredictable weather patterns (e.g. floods and drought); new pest and disease outbreaks; deteriorating land, water and forest resources and recurrent disasters, all which affect agricultural productivity. Additionally, the shortcomings to the FFS approach that were exposed by the lockdowns due to the recent COVID-19 pandemic underscored the need for alternative means to engage with, and reach out to, farmers in the co-development of solutions. This guide for facilitators on mainstreaming information and communication

technologies (ICTs) in the FFS process is a response to this need. This is because it provides guidance for FFS practitioners and farmers to leverage ICTs to adapt new and improved diagnostic tools and access regular, quality and timely information from diverse sources.

I am confident that this guide is a valuable contribution to the continually increasing repertoire of FFS tools and so recommend it most enthusiastically to FFS practitioners, farmers and all those who strive to ensure that farmers have a choice of solutions, which work for them.



Xia Jingyuan

Director of Plant Production and Protection Division

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Abbreviations and acronyms

AYA	African Youth Agripreneurs
CGIAR	Consultative Group for International Agricultural Research
CIP	International Potato Centre
DIG	Development in Gardening
ERA	Entrepreneurs for Rural Access
FAO	Food and Agriculture Organization of the United Nations
FAW	fall army worm
FFS	farmer field schools
GMOs	genetically modified organisms
GPS	global positioning system
GSMA	Global System for Mobile Communication Association
ICT	information and communication technologies
IFAD	International Fund for Agricultural Development
IFPRI	International Food Policy Research Institute
IT	information technology
M&E	monitoring and evaluation
MEL	monitoring, evaluation and learning
MT	master trainers
NARI	National Agriculture Research Institute
ODK	Open Data Kit
SHARP	Self-evaluation and Holistic Assessment of climate Resilience of farmers and pastoralists
SLM	sustainable land management
TECA	technologies and practices for small agricultural producers
TOF	training of facilitators
UNESCO	United Nations Educational, Scientific and Cultural Organization
WOCAT	World Overview of Conservation Approaches and Technologies

Reminder: Keep your farmer field schools (FFS) field-based and open to all. There are different ways in which FFS participants can communicate and reach out to each other within their communities, regions, and other parts of the world. Some farmers and herders may have experience using phones and smartphones that can complement field learning while others may have just started. Do not exclude anyone! They may be simple farmers, or cultural and opinion leaders, or the most important members with senior positions with knowledge of crops and livestock and aquaculture that no expert can match. Everyone brings their own experiences and knowledge to the FFS – and this is what makes the FFS process inclusive, diverse, and locally exceptional!





Chapter 1

About these tips

This document builds on efforts by practitioners to improve farmer field schools (FFS) processes and adopt to new ways of facilitating FFS processes including during the peak of the COVID-19 pandemic, when governments imposed lockdowns across the globe, which made normal face-to-face facilitation difficult.

This document is primarily intended to inspire you, FFS facilitators, to integrate the use of information and communication technologies (ICTs) in FFS processes. Master trainers (MTs) will also find it valuable as an awareness-raising exercise and thus include certain aspects when designing and delivering facilitator training. The document is not a blueprint on ICTs, but a resource for you to build on the knowledge that you and FFS already have and expose you to more possibilities and opportunities in the day-to-day running of FFS in your different contexts. What it provides is not solutions but rather learning points for self-awareness.

The document is thus presented in the form of tips. It identifies and lists a variety of basic ICTs and online resources from various sources to enable you to pick what works in your context, based on your understanding, interest, ease of use, and access. Some tools will enrich your knowledge, information, and skills, enabling you to be 'technically strong' in facilitating the FFS, while some may facilitate better understanding of new concepts by farmers.

In the pages that follow, you will also find examples, some case studies, and experiences from a range of actors within and outside FFS confines, to motivate you to be active users of ICTs relevant to the facilitation of the FFS process. They are also intended to enable you to create awareness among FFS, build on whatever knowledge they already possess, and appreciate the added value of using ICTs so that they can participate in evaluating and selecting those that may be relevant in running and managing their farming activities across the production chain and beyond. You need to support and encourage them to try them out and gradually embrace their use. Remember that even farmers who live in areas with good connectivity and have access to smart devices and internet data may not be digitally literate, so you may need to factor into the process basic digital skills development sessions to help them benefit from digital tools. ICTs are developing at a very fast pace, with new tools being generated every day. These are only a sample, and you will need to continually explore and keep yourself updated.

The aim of this guide is to provide you with an understanding of the digital space, so that you contribute effectively to the delivery of advisory services to farmers. This should enable them to improve the production and productivity of their agriculture and linkages across the production chain.

E-empowerment

E-empowerment is used in this guide to mean the creation of awareness among FFS and the provision of relevant information and basic skills on the use of information and communication technologies, enabling farmers to appreciate their importance in farming and production in general and motivating them to use them in their day-to-day farming activities where appropriate.

E-empowerment thus means **giving farmers the opportunity to find their way within the ICT environment and enabling them to adopt and use those ICTs that are relevant to their needs and readily available, so that they become active participants in the digital space.**

It is important to note that ICTs are designed to **complement** the face-to-face facilitation of FFS, the hands-on and experiential learning processes and **not to replace** them. However, under peculiar circumstances such as COVID 19, protecting people's lives takes precedence over any technical principles. New similar challenges may arise in the future. It is important to be prepared to adapt to the challenge at hand without losing the essence of experiential hands-on learning processes.

Identify learning areas where the use of ICTs will improve farmers understanding of concepts or phenomena; or where ICTs can introduce ideas that may be difficult to do here and now in your FFS and participants may need more time to explore and discuss. Provide complementary resources using combined methods and aim to find the appropriate way of introducing ICTs during the FFS process.

Chapter 2

E-empowerment

Farming communities all over the world are continuously faced with challenges that affect the productivity of their agriculture. Disease and pest infestations and incidences, the deterioration of the environment, and the degradation of their lands, soils and water resources, among other problems, are becoming ever more intense, frequent, and widespread. In light of this, there is a need to continuously adapt to changes in the environment and overcome challenges through innovation, new technologies and techniques, new knowledge, information, and skills by the farming communities.

The FFS approach addresses challenges according to their context, and therefore offers farmers the chance to evaluate their environment and quickly adapt to changes to improve the farming processes and productivity of their farms. For the FFS to achieve its objectives of empowering farmers with the required knowledge and skills to become experts in their own fields and make informed and timely decisions, the hands-on learning processes must be strengthened by embracing appropriate tools that improve its efficiency. Problem diagnosis processes, pest and disease identification procedures through regular physical observations and scouting of the fields, monitoring soil and range health, and monitoring and evaluation processes can all be improved through adopting new tools. This e-empowerment resource guide provides some ways to achieve this.



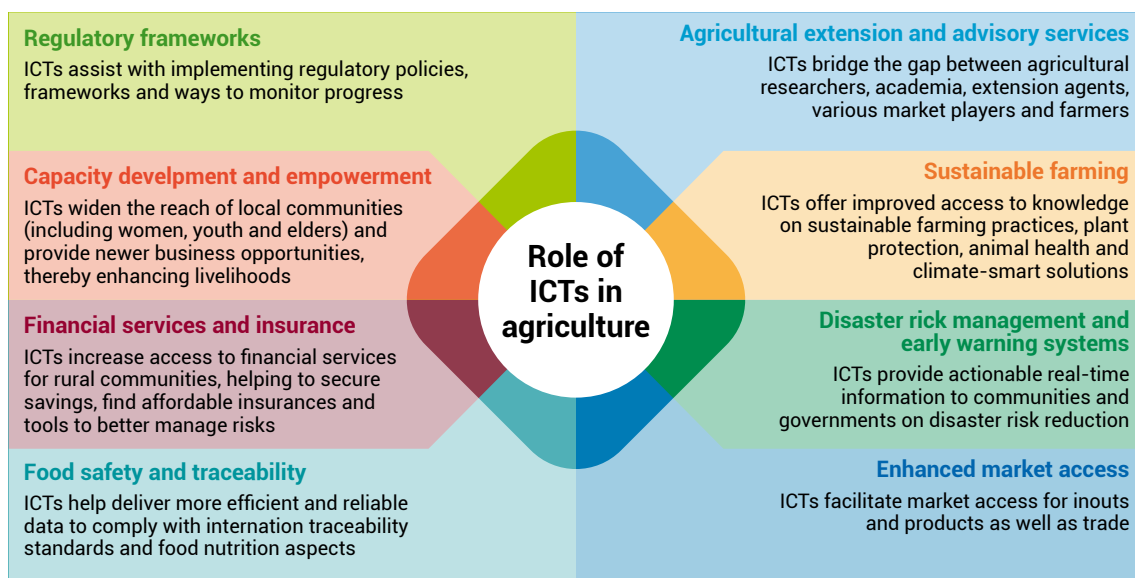
2.1 The role of information and communication technologies

E-empowerment for FFS through the use of ICTs offers a range of advantages. A simple picture on a smartphone or tablet can aid the identification of pests, diseases or deformities in animals or plants. A video can be used to demonstrate how a practice is implemented during a training session, or share experience from other farmers elsewhere, or simply present the success story of a practice or technology that has been successfully taken up by other farmers to encourage and motivate FFS participants. Many farmers and extension workers are already using ICTs. E-empowerment is intended to build on these existing efforts and opportunities to motivate more actors at community level to get onboard.

According to the Food and Agricultural Organization of the United Nations (FAO), the use of ICTs can contribute to “meeting future global food needs through collection and sharing timely and accurate information on weather, inputs, services, markets, and prices, by feeding information into research and development initiatives; by disseminating knowledge to farmers; (and) connecting producers and consumers.” The capacities of agricultural producers can also be strengthened through embracing digital technologies, which can contribute to better market access, greater climate resilience, disaster risk management and local economic development through decent jobs and higher incomes (FAO and IFPRI, 2021).

The diagram below presents the role of ICTs in agriculture.

Figure 1: The role of ICTs in agriculture



Source: FAO, 2018. International Telecommunication Union adapted from –E-Agriculture Strategy Guide (Piloted in Asia-Pacific Countries). www.fao.org/3/MW402EN/mw402en.pdf

2.2 Opportunities and limitations of information and communication technologies in farmer field schools

As you embrace ICTs to complement your facilitation of FFS, it is important to reflect on both the opportunities that ICTs provide in supporting FFS processes as well as their inherent limitations and risks, in order to define mitigation measures from the onset for successful integration.

Table 1: **Opportunities and limitations for use of information and communication technologies in farmer field schools**

Opportunities	Risks	Possible mitigation
<ul style="list-style-type: none"> ■ Improved access to new information, farmer education on digital literacy, sharing experiences from wider sources within/outside the FFS community by farmers and facilitators ■ Contribute to and facilitate community-wide ecological awareness and problem-solving through alert, diagnostic and monitoring systems e.g. fall army worm (FAW), natural resource management tools, geographical information system mapping, fish stocks assessment tools ■ ICTs can improve communication by reaching out more democratically (e.g. to women, youth) and thus providing tools and larger data sets to empower the facilitator in analysing the information ■ Improved access of facilitators to advisory support systems and multiple data sets for technical information based on needs (weather, soils, vet services, markets, global positioning system GPS)/site mapping ■ Facilitate networking among facilitators and FFS for peer learning and mentoring ■ Facilitate collective activities (market information, bulk buying, bulk selling) and finance ■ Timely monitoring of results for quicker problem-solving 	<p>Cost & economic exclusion</p> <ul style="list-style-type: none"> ■ Inaccessibility of ICTs to farmers due to cost of devices, internet access, and poor connectivity in rural areas ■ High cost of data collection, management, and storage 	<ul style="list-style-type: none"> ■ Start simple, tailor solutions to context (e.g. offline apps) ■ Use common basic, accessible tools like community radio, basic phone ■ Contextualize new content to resonate with local realities and examples
	<p>Digital literacy & learning process</p> <ul style="list-style-type: none"> ■ Lack of knowledge of ICT use ■ Mistrust of ICT tools by farmers & preference to learn from peers ■ Loss of touch with human interaction ■ High risk of exclusion of certain individuals and groups because of connectivity arising out of low literacy levels, therefore disempowerment ■ Content may not be relevant, and the language used online may be a barrier 	<ul style="list-style-type: none"> ■ Bridge the gender digital gap by engaging women and youth in rural areas to provide services to disadvantaged groups/FFS/communities ■ Identify/prioritize farmer's needs, simplify and tailor content, translate into local languages ■ Provide capacity building on ICT to farmers and facilitators ■ Capitalize on experience, find synergies
	<p>Quality</p> <ul style="list-style-type: none"> ■ Simplistic view of agro ecosystems dynamics leading to wrong decisions ■ Potential reduction in quality of joint experimentation and learning dilute the impact of FFS ■ Reintroduction of top-down approach to extension delivery ■ Biased, non-contextualized, non-actionable online information 	<ul style="list-style-type: none"> ■ Make ICTs complementary rather than replacing field discovery learning approaches in FFS ■ Prioritize the collection of relevant/meaningful data for decision-making/research into use ■ Establish feedback loops – two-way interaction between farmers and facilitators ■ Verify and filter online information before use

Source: Adapted from an unpublished report on a technical workshop by FAO and its partners on FFS and digitalization. Rome.

2.3 Turning opportunities into reality to make information and communication technologies work for farmer field schools

You can make the above opportunities a reality: i) together with other facilitators, evaluate your own capacities, interests and knowledge and produce workable strategies on how you can advocate for use of ICTs in your organization, and how you can support farmers; (ii) engage farmers to assess the potential of ICTs in FFS. Use the criteria below to evaluate opportunities and challenges and help farmers to draw own roadmap to make ICTs work for them in their setting. These two digital competence frameworks are valuable resources for your use: European Union DigComp (version 2.2. just released, <https://bit.ly/3UYdZYI>) and the United Nations Educational, Scientific and Cultural Organization's Framework of Reference on Digital Literacy Skills (<https://bit.ly/2N5jbVB>).

Table 2: **Assess your context for ICT integration**

<i>List down several ICTs that are common and known to you and the farmers</i>	
Action	Parameters
1. Use an appropriate tool to assess them against these parameters to select relevant ones for FFS	<ul style="list-style-type: none"> ■ Awareness of ICTs – do they know it and its use, have they used it? ■ Availability/accessibility- do the farmer or their family members use ICTs? ■ Affordability – what is the cost, and what strategies can be used? ■ Appropriateness – in what ways can farmers use ICTs? ■ Adaptability – is it flexible enough to address more than one need?
2. Evaluate the barriers to access and use of the selected ICTs and together with farmers, and discuss how to overcome them	<ul style="list-style-type: none"> ■ Connectivity – availability of internet services ■ Cost – how much, can farmers afford, how can they to pay for the service? ■ Content – what is relevant to the farmer, for what do they need the ICTs? ■ Capacity – what is available in terms skills, resources, etc... what is the gap? ■ Confidence – to navigate a particular ICT
3. Assess the requirements for the access and use of the ICTs selected	<ul style="list-style-type: none"> ■ Process – e.g. is it easy to acquire a sim card for a mobile phone? What do they require? how long does it take? ■ People-centred – can the ICTs enable reach out to more farmers in the community? ■ Practices – can the ICTs facilitate learning of new practices? ■ Participation – does the ICTs enable the participation of farmers, does it allow for two-way communication, does it allow discussion, etc.?
4. Assess opportunities within reach that you and the farmers can harness	<ul style="list-style-type: none"> ■ Infrastructure – is there communication infrastructure that allows for connectivity? ■ Investment – are there institutions that have invested in providing communication services within the community? Are there service providers that have invested in farmer-centric products e.g. digital financial services, digital information services for agriculture, market information services etc.? ■ Innovation – what innovations can you suggest or implement to make ICTs work? ■ Inclusiveness -- are these services pro-farmer/pro-poor, are there specific products suited for the farmer?
5 Finally, for the selected options discuss how to ensure:	<ul style="list-style-type: none"> ■ Simplicity ■ Scalability ■ Sustainability

Source: Adapted from a presentation by Sophie Treinen (FAO, 2021) at the 1st conference on Farmer-centric On-Farm Experimentation, Session IV-Policy linkages.

Chapter 3

Information and communication technologies tools and some farmer field school features

Some tools are free. Most do not even need a computer if you have a smartphone. Before smartphones, radio, TV, emails, SMS, and phone calls were best options. These days with the smartphone and Internet spreading, borders are falling, costs are falling, and accessibility growing. With higher literacy levels – and a reason to be literate – many people are getting online and staying connected in their communities and globally!

Figure 2: Key features of FFS



ICTs can complement some features of FFS including: **(i) supporting discovery-based learning processes; (ii) strengthening farmers' decision-making processes; (iii) connecting people and groups for shared knowledge, risk management and collective action; and (iv) supporting monitoring, evaluation and learning.**

Discovery-based learning lies at the core of the FFS approach, empowering farmers with the “art” of inquiry, coupled with the curiosity to understand complicated phenomena through observation, analysis and synthesis, in order to take informed decisions on their farms. **Informed and timely decision-making** has a direct impact on the production, productivity, yield and profitability of farming. Farmers learn not only through experimentation, but also through the experiences of other farmers, and knowledge and information from other sources. **Connecting for shared learning** reinforces the learning process to create communities of farmers who are able to take charge of their production processes, and who can seek assistance and knowledge, when needed, and are not hesitant in doing so. Enabling farmers to participate in **monitoring and evaluating** their processes is key to fostering learning.

Among many FFS, these processes have hitherto most likely been facilitated with minimal use of ICTs. As highlighted in the previous sections, more efficiency and success can be achieved with improved integration of basic ICTs. Such processes have thus been considered as a key focus in this guide.

In the next section, we attempt to highlight how ICTs can be integrated to strengthen each of the features. As you navigate through the examples, think about what can work in your FFS, what else could be possible, and how farmers can be supported to embrace the use of relevant ICTs to strengthen these key processes during facilitation.



3.1 Supporting discovery-based learning processes

Many websites and platforms will provide you with technical information and practices to enrich your and the farmers' knowledge. There are plenty of farmer-to-farmer educational videos, podcasts, and so on, from various contexts. This section contains some examples to give you and the farmers exposure to new experiences and tools and motivate you to try out those that are applicable to your situation.

Box 1: Access online resources on technical information

Example: World Overview of Conservation Approaches and Technologies (WOCAT) Promoting sustainable land management

WOCAT, together with its network partners, has developed a well-accepted framework and standardized tools and methods for the documentation, monitoring, evaluation and dissemination of SLM knowledge, covering the steps from data collection, including questionnaires, to the Global WOCAT SLM Database, to using the information for decision support. The Global WOCAT Database provides free access to the documentation of field-tested SLM practices from different places in the world and offers practitioners the opportunity to share their own SLM practices. Due to its longevity and wealth of knowledge, WOCAT's Database has been officially recognized by the United Nations Convention to Combat Desertification as the primary recommended Global Database for best SLM practices.

SLM in the context of WOCAT is defined as the use of land resources – including soil, water, vegetation and animals - to produce goods and provide services to meet human needs, while ensuring the long-term productive potential of these resources and sustaining their environmental functions. SLM practices support land users, among others, to: (i) enhance land productivity and water use efficiency; (ii) improve the provision of ecosystem goods and services; (iii) promote sustainable use of biodiversity; (iv) contribute to food security and climate change

adaptation and mitigation; and v) reduce disaster risk and land and water conflicts.



More WOCAT resources:

Global and national SLM knowledge products: www.wocat.net/en/slm/wocat-knowledge-products;

SLM training materials: www.wocat.net/library/media/63/; and

SLM videos: www.wocat.net/en/wocat-media-library/?page=&search=&media_type=5&languages=&year_gte=&year_lte=&continent=&countries=



WOCAT can be a valuable resource for you to select relevant content and practices that may guide the design of FFS experiments, as well as enable you to bring new information, and knowledge to the FFS.

The Digital Green website (www.digitalgreen.org) provides a wealth of original high-quality learning content that may be shared with FFS participants.

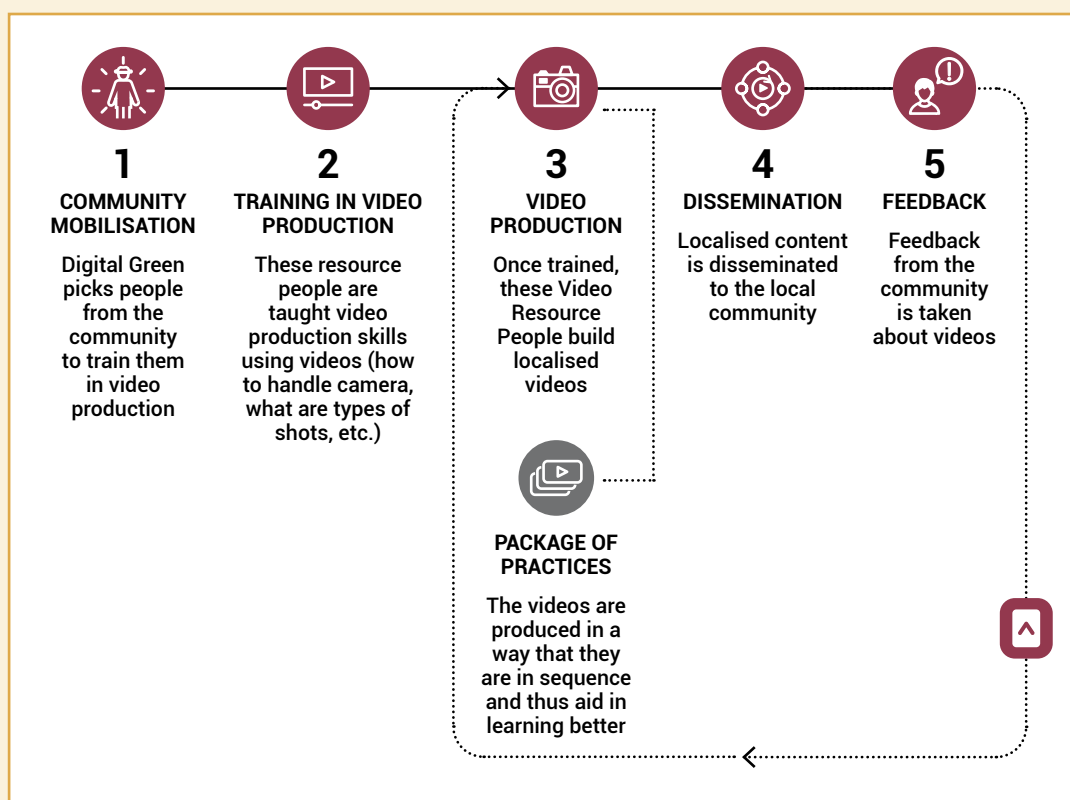
Box 2: Access to learning content by rural farmers

India's Digital Green operates in environments with limited infrastructure and financial resources. The platform disseminates targeted agricultural information to small-scale and marginal farmers in India through free digital video. Their content is community-based and is produced by farmers and experts to ensure its relevance to local conditions (crops, climate, soils, farming practices etc.).

The topics vary and are sequenced to enable the farmers to learn progressively. Videos enable the customization of the materials.

Digital Green uses local facilitators to engage the audience in discussion and capture farmers' feedback and collaborates with existing people-centred extension systems to amplify their effectiveness, thereby tapping into local social networks to connect farmers with experts.

The diagram below shows Digital Green's approach to developing digital videos:



Source: www.digitalgreen.org/videos



Visit their website – access is free! You can download videos on your mobile devices or save them to a DVD to show to FFS groups. You can also produce your own videos with the FFS to showcase their work and innovations, thereby motivating farmers and giving the FFS a voice.

Look at the examples below and reflect upon how the information and technologies can be used during the FFS cycle.

Find free information and high technology tools at <https://theorganicfarmer.org> for print, radio, and audio podcasts, add members, send emails to all, and exchange information.

Visit the Multimedia Peasant School at <https://agroecologia.espora.org/general> to find videos featuring experiences and processes and Indigenous knowledge on how the peasant-to-peasant agroecological movement works.

Learn how small-scale farmers, pastoralists, fishers, Indigenous Peoples, faith communities, women and young people from across Africa are raising their voices for food sovereignty by advocating for Agroecology at the Alliance for Food Sovereignty in Africa <https://afsafrica.org>. Or visit the Agroecology Learning Alliance library to strengthen knowledge and experience sharing among agroecological initiatives and actors: Agroecology Learning alliance in South East Asia: <https://ali-sea.org>.

Videos on technical subject matter are a great, lively, and visual way to explore agricultural innovations, such as found in the Access Agriculture website (www.accessagriculture.org) and its AgTube (www.agtube.org), a dedicated video-sharing video platform focusing on agricultural practices.

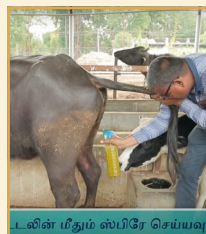
Box 3: Platforms for sharing and learning

EcoAgTube is an initiative of Access Agriculture. It is a video sharing platform like YouTube. It provides space for those interested in sustainable agriculture and sustaining the environment to share their experience and local innovation. Anyone can **upload their own videos including farmer training**, in any language, if they do not

feature agrochemicals or genetically modified organisms. Videos can be **in any format and style**, and the categories are broader than just agriculture. For instance, some are related to community action or capacity building. FFS trainers, facilitators and farmers can make use of this platform to share video stories with the broader community.



Ethnovet formulation for worms



Ethnovet formulation for ticks



Bucket irrigation for tomatoes



How to control rats in rice



Fishpond management

All photos: © EcoAgTube



Upload and share your own video clips in any language to inspire, engage, empower and activate others in your country and across the world.

Use **social media** platforms to learn about and share what is happening within the FFS community. Many social media platforms provide listening-in, texting and messaging services for information exchange. Some platforms comprise people unknown to FFS while others may target audiences well known to FFS. They could be international efforts geared towards addressing specific subject matter of global concern or local/regional platforms to address local issues of concern:

- WhatsApp groups for sharing information e.g.
 - the Francophone FFS network WhatsApp group <https://chat.whatsapp.com/BZzAtaSbz2kGG9FH5q9Ysl> is a regional platform set up by the Francophone FFS fraternity to share information, among French-speaking West African countries implementing FFS. You can join the group to learn and participate where applicable.
 - Fall Army worm (FAW) WhatsApp group at <https://chat.whatsapp.com/Eivcq5geBbqFawB0812nbi> is an international platform bringing together different actors to discuss the armyworm problem, post stories, questions, pictures, videos, seek solutions, etc. Join to participate and access valuable information on the FAW.
- The global FFS platform on Facebook at www.facebook.com/groups/354416366134208 brings together FFS practitioners from all over the world, and provides information resources, discussion fora and posts from all over the world from FFS practitioners and those interested in FFS. Connect and participate/access/share information.
- YouTube (www.youtube.com) allows you to search for and watch videos, create playlists to organize videos and group them together, create your personal YouTube channel or FFS YouTube channel and upload videos for sharing with the entire world (*Just tag the videos #FarmerFieldSchools so that others can easily find them*). You can also comment on or share other YouTube videos. Find some videos about FFS here www.youtube.com/watch?v=fo1HXzeOB-8&list=PLzp5NgJ2-dK5-Q-cMQiMQd27RH2pbXyeB.
- You can explore the Soil Food Web School YouTube channel to learn how to help farmers restore their soil, increase their profits, and grow food in harmony with nature at www.youtube.com/channel/UCSAU5ludwNyqMHBaR1ZfheQ.

3.2 Strengthening farmer decision-making through improved access to information and analytical tools

In light of ever-changing weather patterns, recurrent and widespread pest and disease infestations, deteriorating environmental, water, and soil conditions, farmers need to access adequate information to aid their planning, forecasting, and management on their farms. They need locally appropriate tools, applications, and services to support their decision-making processes. These could range from pest and disease recognition applications to those that monitor weather, crops, livestock, and soil conditions, among others.

Your FFS groups can use low-cost mobile phone applications to get alerts on the weather patterns to inform the onset of planting, types of seeds suited for their locations, and their sowing regimes, market information to aid their marketing activities etc. You can reach out to service providers and technical experts to seek advice or information on various aspects. Here are some examples of smartphone applications which have been used in the past as part of FFS programmes and can offer ideas and lessons on how to integrate apps in your FFS groups.

Box 4: Connecting farmers to experts through messaging services

Example: International Fund for Agricultural Development (IFAD) in Cambodia using Chamka app

Chamka App is an online chat messaging service that connects farmers to agriculture experts for technical information, as well as to input suppliers and markets. Rolled out in 20 provinces in Cambodia, the app provides digital advisory and input supply to smallholder farmers for four value chains including chicken, rice, vegetables, and fish. More than 50 000 farmers and 40 input suppliers are registered on the platform to date.

The app:

- › provides e-learning and technical advice by agricultural experts to farmers on crop management and how they can respond to emergencies.

- › offers remote and online extension services; and
- › provides a virtual marketplace platform for smallholders to sell their produce and buy agricultural inputs; and for suppliers to post their products and receive orders directly from farmers.

Extension workers and FFS facilitators have been trained to support adoption of the app by farmers' groups and during FFS training.

The Chamka app is downloadable on iPhone and iPad.

Chamka – Apps on Google Play
<https://play.google.com/store/apps/details?id=com.bronx.chamka&gl=US>

- The International Potato Centre (CIP) uses WhatsApp to take pictures, make short videos, and share with groups or experts for help.

Box 5: Using WhatsApp to deliver extension in the Northern Highlands of Peru

Case Study: CIP and CGIAR delivering extension in the highlands of Peru

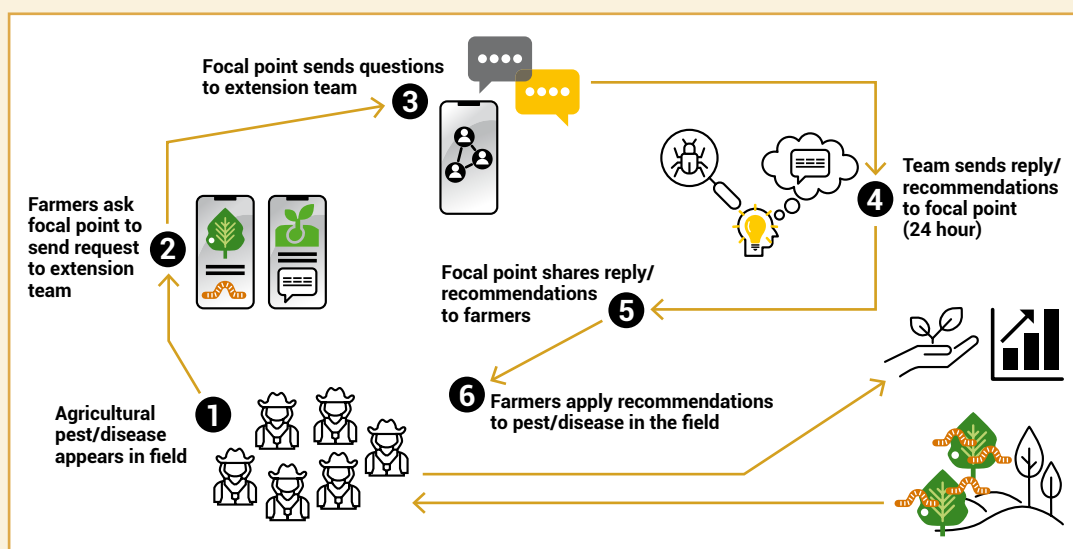
CIP found that less than 2 percent of farmers in Peruvian Andes receive extension services due to the shortage of extension agents. As a result there is lack of knowledge of modern agricultural techniques, leading to low productivity of farms. To reach out to the farmers, the CIP embraced the WhatsApp messaging service, using its distinctive features for communication (texts, calls, voice recording, sharing of pictures and videos of affected crops).

CIP worked with two experts including a focal point/local expert who owned a smartphone and selected by the communities to represent them and a national expert. Both were trained on the use of the WhatsApp messaging services:

- Farmers in each group contact their representative about any problems they experienced (e.g. pests, diseases, etc.), land preparation, use of fertilizers, insecticides, fungicides, etc.
- They bring samples of their potatoes exposing any damages in their crops, samples of bugs.

- The focal point takes pictures or short videos and submits them via WhatsApp along with the questions asked by the farmers to the expert from the crop management division and to the professor from the department of agronomy in the national university.
- The experts reply within 24-48 hours, using WhatsApp, with messages, answers, and recommendations to the local expert, who then conveys the messages to the farmer.
- Because of the repetitive nature of some of questions, the relevant answers are collected in an advice database. This subsequently enables the expert team to address similar questions from farmers more quickly.

Lessons learned: Limited mobile phone coverage and internet access in several villages limited the number of queries from villages and led to low participation in the pilot (only 39 percent of households in the selected communities were active). Farmers also criticized the poor performance of the focal points, who were not available when farmers needed them to share the feedback provided by experts. The lack of motivation of the focal points was the reason for their limited performance.



There are many free/low-cost applications for the recognition and management of pests and diseases in both crop and livestock. Search online and learn how to diagnose pests and diseases, or conduct surveillance and pest tracking to assist the farmer to timely take management decisions.

- Plant Net, Plant Village, Bee Scanning (Box 6), and FAW monitoring and early warning system apps use artificial intelligence to help farmers identify pests, weeds, or disease correctly and get information, especially at the beginning of an outbreak when the invasive species are not yet very well known by field staff and farmers.

Box 6: Using apps for management of production challenges

Bee Scanning app for analysing the health of bees

BeeScanning is a digital app used by beekeepers globally in Africa, Asia and the Pacific, Europe and Central Asia, Latin America, and the Caribbean, Near East and North Africa.

The app is used to analyse the health of bees rapidly and easily. Using nothing but a mobile phone, this app can:

- › enable the farmer to photograph the bees on the comb;
- › find and count varroa mites, the first cause of honeybee colony losses worldwide;
- › find sick brood instantly using the camera without hurting the bees; and
- › analyse bee images in seconds giving the farmer instant results for early detection of varroa and sick broods in hives and management.

Benefits:

- › The app enables reduction of bee mortality and increases productivity; and
- › It saves beekeepers time and expense.



© beescanning.com



The app is free for up to two hives. An annual subscription of around USD 20 applies to more hives. If FFS have invested in apiary for income generation, a minimal annual cost per member applies for the group to access this app.

Different Apps may provide varied information. Take time to research and learn their respective features and how you can use them to benefit your FFS and improve your knowledge and work. Here are some examples:

- Geographic information systems and agrometeorological technologies can aid better land use planning, crop forecasting and early warning systems or monitor threats from the growing number of natural disasters.
- Weather-based advisories enable farmers to plan their cropping and livestock calendars in advance for timely interventions. See **Farm Precise** (<http://farmprecise.org>) example below:









Box 7: Providing advisory services based on real time weather

FarmPrecise app from the Watershed Organization Trust

The FarmPrecise app provides advisories based on real-time weather and 5 days forecasts from the Indian Meteorological Department and Open Weather services for more than 25 crops in five languages for four States in India. FarmPrecise promotes sustainable agriculture practices including integrated pest management, optimal fertilizer uses and irrigation for improving crop productivity and reducing costs for smallholder farmers.

- Advisories are real-time and tailored to farm conditions. Weather data is available from multiple sources to enable farmers plan their farm activities.
- It is interactive – the farmer inputs specific data, identifies the problem and participates in defining solutions that can be shared.
- Enables timely decision-making that contributes increased productivity, reduced losses, and lower costs.

<http://farmprecise.org>

 <p>Weather forecasts for 5 days</p>	 <p>Crop & farm specific advisory</p> <p>Farmer-crop-phenology specific advisories which integrate the following:</p> <ul style="list-style-type: none"> • Crops, varieties and cropping pattern • Cultural practices • Irrigation management • Nutrient management • Pest and disease management 	
 <p>Fertilizer calculator</p>	 <p>Crop specific pest & disease library</p>	 <p>Farmer interaction</p> <ul style="list-style-type: none"> • Community forum • Support chat • Phone call
 <p>Farm diary (expense/income)</p>	 <p>Mandi commodity prices</p>	 <p>Agriculture – news/events/ govt. schemes</p>



**Do you work in India? Download the App from Google Play store, it's free!
Or support the farmers who have the means to download and use the app.**

3.3 Connecting farmer field schools for shared knowledge and joint action

FFS need to connect to other FFS, to services and service providers, as well as share information and knowledge with other community members for their benefit or for concerted action to solve wider problems. You can use a wide range of tools to keep FFS connected and active, ranging from basic mobile phones, smartphones, email addresses, to various apps, social networks, and platforms.

- Support FFS to connect to existing online platforms and networks to facilitate exchanges with other FFS practitioners, and relevant stakeholders (e.g. facilitators' WhatsApp groups, online email discussion groups, websites, Facebook groups).
- Using YouTube channels, you can make your own broadcasting station by defining your Channel and then uploading videos to your channel to complement your facilitation of the FFS learning sessions.
- Subscribe to newsletters and communities of practice like the FFS d-groups <http://dgroups.org/fao/fieldschools>; or Google groups, Yahoo groups; or www.hortidaily.com for news about high-tech greenhouses.
- Skype, Zoom, and MS Teams all support group online meetings. (*find details on how these can be used during the FFS cycle in table 4, "Integrating ICTs in the FFS processes"*).
- Use smartphone apps like Twitter, Tiktok, WeChat, Telegram, Vimeo, and many others for regular messaging, to exchange photos, papers, brochures, videos, calls, and even conduct surveys. You need to set up an account to use these apps. (*Find details on how to use these under the section on resources for facilitators use, Box 29*).
- Radio programmes with call-in options for example Farm Radio (<https://farmradio.org>), are cheap and easy for farmers to access and to connect to relevant programmes, and access information from various sources. These call-in programmes are a chance to discuss the challenges they face in their farms with technical experts.

The boxes 8,9 and 10 below provide some examples of how smartphone applications have been used to enable farmers access advisory and other information services from technical providers.

Box 8: Connecting smallholder farmers to information services

M-Kilimo case study: Kenya

www.gsma.com/mobilefordevelopment/wp-content/uploads/2012/04/mkilimocasestudyfinal-1.pdf

M-Kilimo is a farmer helpline accessible to all Kenyans who own a mobile phone, irrespective of the network of affiliation. The service is intended for smallholder farmers focusing on four areas of enquiry including:

- › agriculture tips and efficient farming practices;
- › questions on plant and animal diseases and treatment;
- › agriculture-specific weather forecasts; and
- › market price information (sourced from the Ministry of Agriculture).

How it works:

- › The call from the farmer is automatically distributed to an available agricultural expert.
- › The system automatically logs and stores data on the type of call (in or outbound) time of the call, duration, waiting time, name of expert handling.
- › The agriculture expert keeps a profile of location of the callers, type or agronomy, size of their farm, and other information.
- › The details of the farmers question are noted by topic (e.g. chickens, disease, etc.), which are tagged to ease future searches.

The service is offered in several local languages where necessary, alongside the national languages of Swahili and English. At a call cost ranging from USD 0.0084 to 0.025, farmers can call in and get real-time support from experts on any area of concern in agriculture including horticulture, aquaculture, climatology, pest and diseases, animal husbandry, agricultural engineering, marketing advice, environmental and veterinary issues. Some problems are resolved during the call, while complicated questions are referred to a subject matter specialist who provides quality assurance of the service. Facilitators should create awareness among FFS groups within reach of such services to make the best use of them.



You can help the farmer to take advantage of such opportunities in your country/location by creating farmer awareness about the use of ICTs and how they can benefit from such services.

Box 9: Delivering extension messages using mobile apps

Development in Gardening (DIG) experience using Telerivet

Telerivet is an Android and iOS app for creating messaging systems across clients at very low cost.

During the COVID-19 pandemic lockdowns, DIG explored different options to continue providing important communication to FFS farmers. After analysing various tools, DIG selected an ICT tool called Telerivet Gateway for its cost-effectiveness, user-friendly platform, ability to track communication points at the organizational level, and smartphone features. Telerivet enabled the creation of a bulk SMS message centre for each country where they work, by simply downloading the app on one phone. The app allowed DIG to seamlessly upload all farmer contact information by directly uploading their existing farmer database that included contact information, location, group type, and more. The compatibility feature made the software seamless to use.

The Telerivet platform allows the user to further segment communication channels to create tailored messaging to subgroups. For example, if you wanted to message all the women members of FFS groups in Uganda, you could reference the Excel spreadsheet, create a filter, and send specific messages out to that group. Additionally, messages can be selectively sent to individual groups, group leaders only, all contacts, etc. This enabled DIG to easily create both tailored messaging and mass messaging which improved communication with farmers.



Learn about and download this app from the internet.
Download Telerivet Gateway app
[\(<https://telerivet.com/gateway>\).](https://telerivet.com/gateway)



©FAO/Christiane Monsieur

- In the Gambia, facilitators used WhatsApp to connect farmers, facilitators and technical experts for learning and information sharing. They share their experience in the Box 10 below.

Box 10: Connecting farmers, facilitators and technical experts using WhatsApp

Case Study: The Gambia

Mustapha connects farmers, facilitators and the technical departments of agriculture and livestock using WhatsApp

Mustapha narrates:

"Farmer field schools were re-introduced in the country by FAO through donor-funded projects in 2017. During the training, the FFS facilitators (farmers and extension workers) decided to create a WhatsApp group to exchange information, ask questions and obtain feedback from fellow farmers, while the technical Departments of the Agriculture, Livestock and National Agriculture Research Institute (NARI) used the platform to support farmers resolve crop and livestock production-related problems. To facilitate access to everyone, FAO Gambia procured

396 smartphones and distributed them to 375 FFS facilitators.

The experience has been amazing; the provision of rural agriculture advisory services has changed dramatically. Farmers are now able to upload pictures of diseased and pest-infested crops and livestock on the platform and ask technicians for solutions. For instance, in 2021/2022 vegetable production season has seen widespread onion bulb rot, picture of affected crops was simply uploaded and currently the disease is being investigated by NARI. The platform has transformed over the years from agricultural production-related problem solving to the marketing of produce (crops and livestock), thus increasing farmers' access to market in rural areas. It has increased access to information on the prevailing market prices of food commodities, social cohesion between participants of the FFS, etc."

- The African Youth Agripreneurs (AYA) online community provides a safe space for youth to discuss issues of interest, access information and services, and online training, network and services for young farmers and agripreneurs.

Box 11: Online platforms for learning

The AYA Platform

In 2021, inspired by rural youth, demand for cross-country learning and knowledge sharing, FAO conducted a rapid assessment with over 360 young people in agribusiness, in partnership with the Eastern Africa Farmers Federation and youth-led organizations in Kenya, Rwanda and Uganda. The study investigated youth ICT access and interactions with digital technologies, either as

agripreneurs, service providers, or members of networks and farmer organizations. Among the key insights are youth perceptions and current uses of ICT-based agribusiness support services such as e-commerce, e-learning and online mentoring.

To learn more check the infographic: *Identikit of East African youth agripreneurs in the digital space* (www.fao.org/documents/card/en/c/cb9297en) or read the full report:



Ready to go digital? Assessing the digital readiness of young agripreneurs in East Africa (www.fao.org/3/cb8026en/cb8026en.pdf)

Oriented by this assessment and further engagements with prospective users, FAO designed and launched **AYA** online community as a go-to platform with youth-friendly informative and attractive content, otherwise dispersed, to help youth develop their business, innovate and add value to their products, network and learn from each other.

The platform offers:

- › Curated digital content and youth-friendly learning resources about topics of outmost interest among the youth such as the Fit4Finance series (www.ayaplatform.org).
- › Thematic discussion areas dedicated to in-demand topics prioritized by youth, including key agricultural value chains as well as **opportunities, access to finance, success stories**.
- › Live **info sessions** (www.youtube.com/live/U-EZqo69C-A) about the platform, how to join and how to make the most of its features.

- › Delivery of online courses such as the self-paced **agribusiness training for youth-led micro, small and medium enterprises** (<https://bit.ly/3LoxAgZ>) and blended training, mentoring and group coaching such as the ongoing program targeting 90 young women agripreneurs in partnership with the African Women in Agribusiness Network.
- › Hosting and co-facilitation of private exchange groups for continuous learning and networking after training or mentoring experiences, like the **GAF Academy** alumni (gafafrika.com).

The platform has over 1 500 registered youth members, and continues to grow and share on a regular basis from across the entire African region.



Are you a youth? Join and be part of this platform. It's free!

AYA services



Community:

possibility to interact extensively with other youth agripreneurs by sharing information, knowledge, personal experiences on agribusiness and any other activity in the food system.



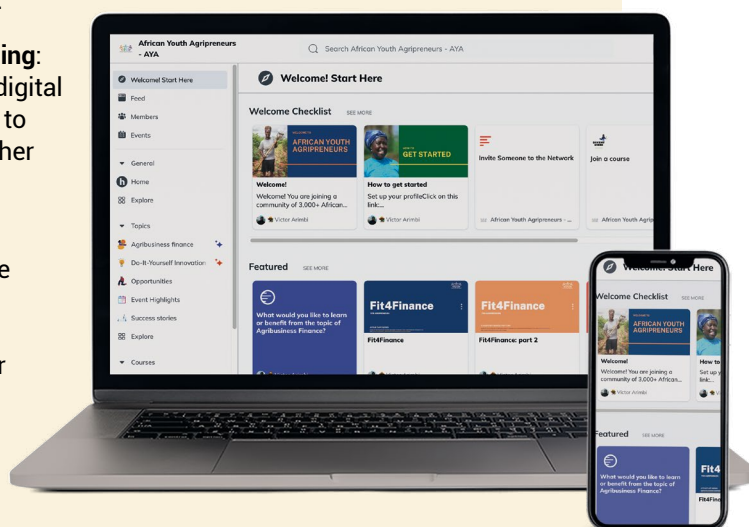
Learning, Mentorship and Coaching:

e-learning courses and curated digital content on agribusiness, access to finance, service providers and other topics of interest.



Do-it-yourself innovation:

access to toolkits that encourage youth entrepreneurs to easily adopt or develop innovation and digital technologies to bring their agribusiness to the next level.

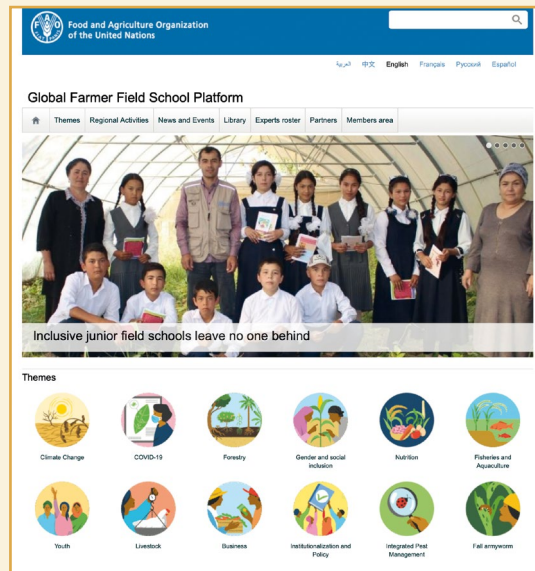


The FAO Global FFS Platform provides space for practitioners to exchange information, ask questions about technical subject matter for support from a global community, post success stories and reports of your work, and share innovations for other members to learn from.

Box 12: Using online platforms to facilitate interaction in communities of practice

The Global FFS platform website is a one-stop centre that provides space for practitioners worldwide to connect, find information and expert resources

- › A library for information (articles, training material, studies/assessments, etc.): www.fao.org/farmer-field-schools/knowledge-repository
- › News events, success stories, thematic pages: www.fao.org/farmer-field-schools
- › An expert roster to provide required for different programmes: www.fao.org/farmer-field-schools/expert-roster
- › A D-Group for interaction with over 1 500 practitioners from 130 countries: <https://dgroups.org/fao/fieldschools>



Visit the *Global FFS Platform* at www.fao.org/farmer-field-schools

About d-groups

A d-group (or online discussion group) is a tool that uses email as a mode of communication. It is an online platform for individuals and organizations who are interested in the same topics to start fostering new groups and communities.



3.4 Monitoring, evaluation and learning of farmer field school activities

ICTs can provide real-time information instantaneously and enable its quick escalation to those in charge of analysing and using it. Use of ICTs in monitoring and evaluation (M&E) is therefore less time-consuming and may provide higher-quality data than paper-based M&E. In addition to supporting M&E of FFS, ICTs can be used to empower farmers themselves to better monitor their activities and experiments to optimize their practices. Some apps articulate farmers recording with provision of more tailored advice, thereby connecting better monitoring, evaluation and learning (MEL) with strengthening farmers decision-making.

- Example: use the FAO Self-evaluation and Holistic Assessment of climate Resilience of farmers and Pastoralists (SHARP+) tool to identify areas of weak resilience at household level and provide a baseline upon which changes can be built.

Box 13: Facilitating real time information collection and sharing

The SHARP survey tool

SHARP+ is a customizable digital survey using a tablet-based application (software application using the Android programming language, available on Kobo Toolbox – see box below for how Kobo works) which can be filled in directly by the facilitator or an enumerator in charge of data collection.

- › The survey includes questions related to critical aspects of the household and farm system covering the environment, social, agricultural practices, economic and governance factors so as to assess in an integrated manner all aspects of the farm/pastoral system using a holistic approach.
- › The tool seeks to collect information as well as farmers' self-assessments of their level of satisfaction regarding the livelihood/farm/pastoral system. The results should be shared with farmers for their information and action as necessary.

- › Based on the responses, resilience scores are compiled that allow users to identify the least and most resilient aspects of the household and farming system with the aim of strengthening them.
- › The tool can therefore help FFS designers target key training topics based on the SHARP+ results: those aspects of the household and farm system with the lowest resilience scores.
- › It can thus be used during the preparation phase, before the actual training, by collecting data directly from participants or farmers in the region. It can also be used later, sometime after the FFS has ended, to assess its impacts on the resilience of participants and other farmers.

Guidance on downloading the SHARP application is available here: www.fao.org/in-action/sharp/resources/sharp-tablet-application

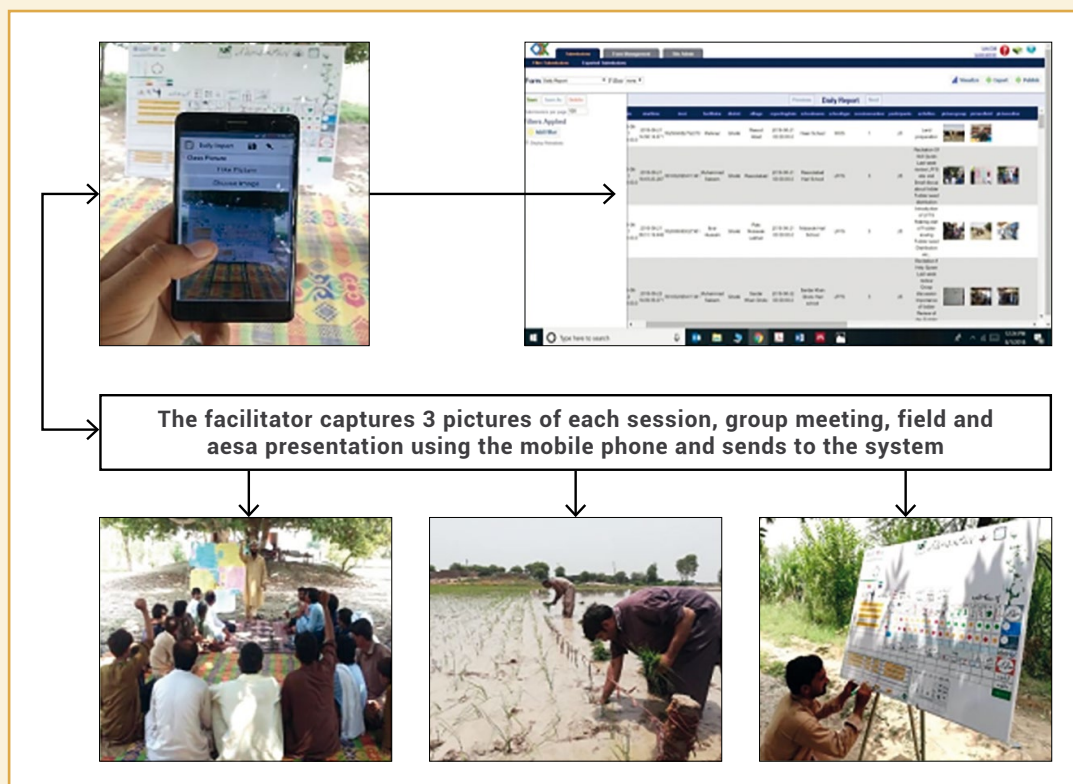
The Open Data Kit (ODK) is a free set of open-source applications to help you create questionnaires that you can fill out on an android mobile phone or tablet. It captures data including GPS coordinates for real-time mapping of responses. You can view the aggregated information on a central server and retrieve the aggregated data to your computer for analysis. Use Google forms, a fast, user-friendly, and widely accessible online tool to get information through surveys, quizzes, feedback, among other uses. Besides collecting information, you can also include photos, videos, and files, in your form. It also allows respondents to upload files in their responses, too. It is free. Box 15 provides an example of how FAO Pakistan used ODK to build its FFS M&E system for motivation.

Box 14: Using Open data source software & tools for MEL

Case Study: FAO Pakistan

FAO Pakistan is embracing the opportunities presented by Open-Source Data tools to improve its FFS M&E. Using the ODK to complement its M&E framework, FAO Pakistan can monitor the facilitation of FFS sessions in remote locations among widely spread out FFS. Using standardized online activity report formats, facilitators use mobile phones to collect information during field

visits and upload to the system. For every session, facilitators take three pictures including a group session, field session and agroecosystem analysis presentation which is sent to the system in real time as evidence of their presence in the field. Supervisors and managers remotely monitor the facilitators work in the field through activity reporting formats on: a FFS formation report, a FFS facilitator daily report and a climate-smart agriculture site report.



- Use Kobo Collect to collect and analyse FFS data. Kobo can be used for field surveys. With the help of a mobile phone or tablet, you can export data from Kobo to Excel. It is free and can gather data offline – once you have an internet connection, the data is sent to the Cloud. This allows multiple people to access the data in different places. It is also easier to aggregate and convert data into diagrams, charts, etc. However, it takes time to prepare the questionnaires, and time to fill them. Box 15 provides an example of how Oxfam Novib used Kobo collect to support the M&E of their FFS activities.

Box 15: Online tools for monitoring and evaluation

The Oxfam Novib experience – using the Kobo toolbox

Oxfam Novib used the Kobo toolbox to create an information exchange forum for the researchers and the farming communities engaged in their participatory plant breeding programme. To ensure the success of the programme, the plant breeders provided high-quality planting materials to FFS, and in return FFS provided information on the performance of the materials in their fields, and the breeding lines and varieties that responded best to FFS objectives. The toolbox was invaluable in facilitating the documentation, storage, processing and sharing of data. Oxfam Novib also used the tools to mitigate restrictions on movement imposed during COVID-19 to track FFS activities, participation by women, and their satisfaction with results, among other parameters. They provided farming communities with basic digital training. Below is their assessment of the tool.

Advantages

- › easy to use with basic (digital) literacy, all facilitators require is a phone or tablet.
- › offline data collection where no internet connection is possible; the data is stored and sent to the server when a connection becomes available.

- › facilitators registered numbers, responses, and opinions in multiple local languages without using pen and paper, reducing errors, and allowing information to be stored and shared more efficiently;
- › it is easy to aggregate data, compare information from different FFS and see trends or changes over time.

Downside

Because of the number of variables, options, and languages that needed to be included, tables and questions, it took Novib two years to make a usable tool. The Kobo forms were sluggish and caused data files to expand exponentially, with hundreds of columns of mostly empty data.

Lesson

Kobo's built-in analysis and data visualization tools, are convenient for simple questionnaires. Facilitators can easily use the tools for simple data collection and analysis tasks in the FFS. For complex functions, it is easy to export data to other programs such as the Excel dashboard for clean-up and for interactive visualization including farmers.



Creating an account on KoboToolbox – KoboToolbox documentation

https://support.kobotoolbox.org/creating_account.html

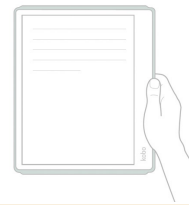
Kobo is a free open-source tool that provides simple, robust and powerful tools for mobile data collection in the field. All you need is an account and it's all yours. Plus, you don't need technical knowledge to manage the process – enumerators can be trained within minutes! With this toolbox you can:

- › easily and quickly design your own forms for data collection without expert advice.
- › collect data using your phone, tablet or browser, and synchronize, protect and access it in real time.
- › analyse and manage the data in various forms: summary reports, charts, graphs, and tables

- › export your data any time in Excel, CSV, KML, ZIP and SPS formats depending on its intended use; and
- › add GPS location, and also upload pictures.

Kobo set-up process

- SET UP YOUR ACCOUNT
- DESIGN THE FORM
- COLLECT THE DATA
- ANALYSE THE DATA

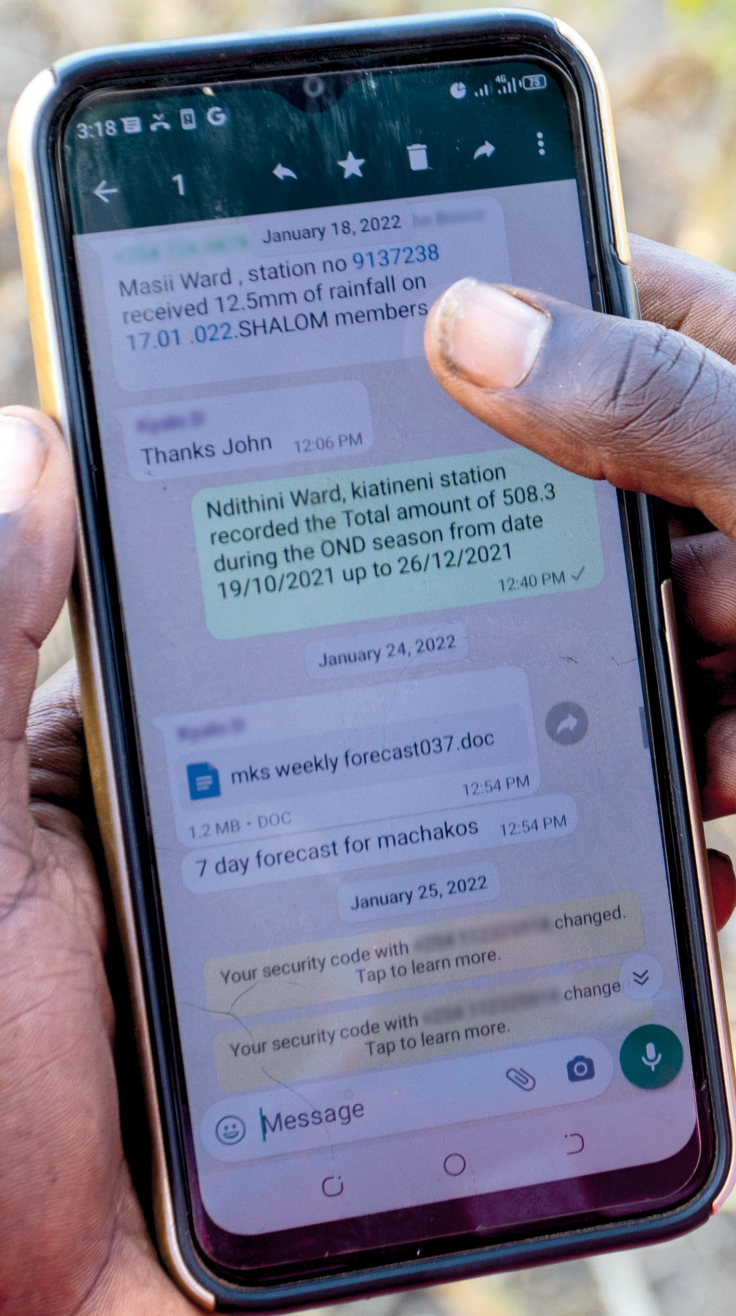


3.5 Pros and cons of information and communication technologies tools

Facilitators and trainers need to apply critical judgement in the use of ICTs within the FFS groups. We have described how these ICTs tools may be used to support FFS in four main functions, with some tools contributing to different functions. Their uses may be similar or differ, and each comes with advantages and disadvantages. Some are highlighted in the table below:

Table 3: Pros and cons of some information and communication technologies tools

Tools	Pros	Cons
WhatsApp Telegram Instant Messaging	<ul style="list-style-type: none"> User-friendly Widely available Versatile (can be used for individual or group communications, text, or voice messages) 	<ul style="list-style-type: none"> Requires smartphone Access bears a cost in terms of data
Zoom	<ul style="list-style-type: none"> Versatile can host up to 500 people Ability to dial in Can operate on low bandwidth 	<ul style="list-style-type: none"> Annual licence payments (but there is a free version with reduced options for meetings up to 45 minutes and 100 participants) May be prone to hacking
Teams	<ul style="list-style-type: none"> Ideal for corporate settings Integration of Microsoft office products 	<ul style="list-style-type: none"> Does not perform well under low bandwidth Less user-friendly
Radios	<ul style="list-style-type: none"> Greatest rural penetration Use of local/vernacular languages Ideal for call-in programmes 	<ul style="list-style-type: none"> Voice only, no visual support Difficulty in monitoring impact/outreach
Television	<ul style="list-style-type: none"> Visual assistance for learning, does not require literacy Attractive – “Seeing is believing” Widely available 	<ul style="list-style-type: none"> Often does not provide two-way communication
Videos	<ul style="list-style-type: none"> Visual assistance to learning, does not require literacy Attractive – “Seeing is believing” Available to anyone with a smartphone Can be done with translation 	<ul style="list-style-type: none"> Low-quality if filmed on mobile phone High production expenses if using professionals Possibility to get feedback or not from users depends on platform used for dissemination Users might require internet (data) to view videos especially those hosted on websites
Open Data Kit Kobo Collect Google sheets	<ul style="list-style-type: none"> Reduces paperwork Can be used on phone and in areas without internet coverage Real-time GPS integration 	<ul style="list-style-type: none"> Requires training Prone to harsh weather conditions in the field
Surveys	<ul style="list-style-type: none"> Effective for market research or to get feedback, at scale Uses crowdsourcing Can work offline 	<ul style="list-style-type: none"> Requires advance training and planning



3:18 [Signal] [Battery]

1 [Back] [Star] [Trash] [Share] [More]

January 18, 2022

Masii Ward, station no 9137238 received 12.5mm of rainfall on 17.01 .022.SHALOM members

Thanks John 12:06 PM

Ndithini Ward, kiatineni station recorded the Total amount of 508.3 during the OND season from date 19/10/2021 up to 26/12/2021 12:40 PM ✓

January 24, 2022

mks weekly forecast037.doc 12:54 PM
1.2 MB · DOC

7 day forecast for machakos 12:54 PM

January 25, 2022

Your security code with [redacted] changed. Tap to learn more.

Your security code with [redacted] change

Message [Attachment] [Camera] [Voice]

Chapter 4

Integrating information and communications technology in the farmer field school cycle

E-empower & motivate farmers to become creators of content, not just passive consumers!!

As FFS master trainers or facilitators, you have most likely used ICTs during some of the processes in the FFS. During the training of facilitators, trainers often use video to introduce how FFS works, or show examples of successful FFS or just pictures of plants or animals under discussion. Thus, use of ICTs in FFS is not new. However, it is important for trainers and facilitators to always remember that FFS is a learner-centred approach, which emphasizes the hands-on participation of the individual during learning. **The use of ICTs cannot replace the need for critical thinking and informed decision-making based on individual and group assessment of field situations – a hallmark of the FFS learning process.** ICTs should be used to complement the FFS learning process.

- Employ the FFS principle of “location specificity” in integrating ICTs in FFS processes through a participatory engagement with farmers to understand their needs, gaps, priorities, what they would like to learn, adapt, or improve to identify the appropriate ICTs to use. (Use Table 2, *Assess your context for ICT integration*)
- Promote farmer participatory education and training courses on digital literacy, building on what they already know, to strengthen their capacities and skills for searching and accessing digital Agricultural Extension and Advisory Services and information through available digital devices, including radio, TV, and mobile phones in rural areas. (ICT uses for inclusive agricultural value chains. www.fao.org/3/aaq078e.pdf).
- Analyse and identify gaps between smallholder farmers' realities and their potential, which could be harnessed through the various tools examined above. Set up goals for empowering smallholder farmers to access the services (www.fao.org/publications/card/en/c/CB5944EN/).

Below are some useful examples on how ICTs can be integrated/used during different stages of the FFS process, plus references to resources for your further reading. Some of these tools were introduced in the previous section but the table will guide you on the right time to use them!

Table 4: **Examples of information and communication technologies during key farmer field school processes**

Key FFS processes	ICT examples and uses	References and resources
<p>Project concept and formulation</p> <p>There is usually exchange of information locally and internationally among FFS facilitators, MTs, with their organizations to describe the FFS approach and share examples from other programmes. The first step is often just explaining the FFS process, giving evidence of its effectiveness and defining goals. Other steps may include mobilizing expertise and asking for resources on specific adaptations of FFS or aspects of activity planning and budgeting.</p>	<ul style="list-style-type: none"> ■ Online materials – share FFS video. ■ Work together through: Zoom, WhatsApp groups and other platforms for group meetings. Zoom has features such as a whiteboard and team document (whereby all members can work on the same document) for brainstorming, and writing/editing on the host side. Google has a drive for pictures and documents, Google docs for workspace sharing and "Jam" board – a virtual whiteboard on which to share ideas. ■ E-learning courses. Project formulators can access e-learning courses on the basics of the FFS approach and project formulation, developed by the Global FFS Platform on the FAO E-learning Academy. 	<ul style="list-style-type: none"> ■ FFS YouTube channel: https://tinyurl.com/FFS-youtube ■ Download FFS Guidance Document www.fao.org/3/a-i5296e.pdf ■ FAO FFS Platform d-group for information gathering on topic www.fao.org/farmer-field-schools ■ Upcoming E-learning course of formulation of FFS programmes (FAO e-learning academy)
<p>Curriculum development</p> <p>Putting together a curriculum requires the collaboration of a group of people -usually including an FFS curriculum facilitator/master trainer, working with and guided by technical content experts to prepare materials following phenology or management decisions (daily, weekly, monthly, seasonally, annually). They will also need to add materials on group formation, digital literacy education, group dynamics, field days, graduations, and post-FFS organization. MEL tools and activities should be built into the curriculum with information collection and pre-test and post-FFS testing.</p>	<ul style="list-style-type: none"> ■ Online materials: Examples of FFS curriculum from the Global FFS Platform Library or other websites, e-learning, group dynamic activities book, M&E guidelines; platform for facilitators to exchange, access information and hotline system? ■ Work together: FFS curriculum facilitators, FFS group dynamic facilitators, and technical experts can work together with tools such as Zoom (with whiteboard and remote document sharing, the possibility to split participants in smaller groups for group sessions and possibility to record sessions and share later), Skype, email, and other tools. ■ Relevant material for the workshop can be stored on a Google Drive folder accessible to all training participants (including agenda, presentations, recordings of sessions, Q&A sheets). Participants can also create their own shared folders with assignments (if needed). Google documents can be edited jointly by participants. Google Jamboard can be used to facilitate joint discussions and learning ■ Large documents can be shared via WeTransfer and Transferbigfiles.com; dedicated WhatsApp groups can be created. 	<p>Course: Introduction to the farmer field school Approach https://bit.ly/3L7fzm2</p> <p>Course: Implementation of farmer field school Programmes https://bit.ly/3mZSXfo (FAO e-learning academy)</p> <p>Best practices for collaborating with Microsoft 365 https://bit.ly/4416GTA</p> <p>FAO FFS Platform (www.fao.org/farmer-field-schools) d-group for gathering existing curricula and learning modules on topic but also to find experts that may contribute to curriculum development</p> <p>Google Drive https://drive.google.com</p> <p>Zoom (https://zoom.us)</p> <p>Jamboard https://jamboard.google.com</p> <p>WeTransfer - Send Large Files & Share Photos https://wetransfer.com</p> <p>Transferbigfiles.com</p>

Key FFS processes	ICT examples and uses	References and resources
<p>Training of Trainers</p> <p>Both primary and refresher trainings of facilitators (TOFs) will cover technical information on FFS, using participatory active learning activities for technical topics, basic adult education concepts and methods, group dynamics, FFS organizations with bylaws, regular meetings, M&E, reporting, alumni activities such as farmer facilitators and market strategies. After the TOF, trainers can access technical materials for their reference and keep in-contact for regular sharing and problem-solving.</p>	<ul style="list-style-type: none"> ■ Online materials: access FFS Guidelines, handbooks, technical materials, videos of many kinds. ■ Work together: meet/train online using video tools like Zoom or Skype to join events, especially to stay connected with trainees in between the TOF training sessions. ■ Record: Using video tools – such as Zoom – and share. ■ M&E: online survey to evaluate TOF and identify capacity gaps ■ Network: Keep trainers linked with Google groups to send out materials, instant messaging tools like WhatsApp, Viber, Line, etc. Regular meetings after TOF with Zoom, Skype. Use Twitter/TikTok type for sharing experiences. ■ Training programme: EcoAg Tube or FFS YouTube Channel for the overall programme to share and save video records, or broadcast your training on Facebook 	<p>FFS e-learning course Access agriculture – www.agtube.org</p> <p>Livestock and dairy https://knowledge4food.net/knowledge-portal/livestock-and-dairy</p> <p>Online course for FFS on Nutrition and Local Food Plants https://sdhsprogram.org/document/online-course-for-farmer-field-schools-on-nutrition-and-local-food-plants</p> <p>FAO Smart Fish platform FAO's Virtual Learning Centres https://virtual-learning-center.fao.org</p>
<p>FFS implementation</p> <p>During the FFS implementation period, the participant group will develop technical skills and group skills. FFS groups need to establish bylaws/standards, record-keeping and M&E. Implementation of hands-on technical topics, group dynamics, post-FFS planning can be complemented with online materials, webcasts. FFS linking to other FFS through networking and alumni associations can help with future marketing schemes or simply good socialization.</p>	<ul style="list-style-type: none"> ■ Online materials: A variety of group dynamics, handbooks, FFS Guidelines, technical materials, videos. ■ Video and webinars: Individual and group watching on YouTube and many other sources can complement hands-on learning activities. Use Google, etc. to find them! Make your own video with photos linked together or video materials (keep them short!) to document innovative practices or experiments developed in your FFS. Upload your videos onto Youtube or Agtube, share them on the global FFS d-group. ■ Work together: Set up your Facebook page for each FFS or group of FFS or have a national alumni site. Share experiences! ■ Record: Using video and pictures to share experiences and insights or to do problem-solving when needing additional expertise. ■ Network: Use FFS-linked messenger tools like WhatsApp, Viber, Line, or Twitter/TikTok type for sharing experiences. ■ Agricultural ICTs: can improve farmers' decision-making processes through: i) access to a wider catalogue of possible options that can be tested along FFS including agroecological and regenerative agriculture options; ii) monitoring and diagnostic support (for soils, water, pests, diseases), weather forecasting, environmental monitoring, advisories, and equipment control (e.g. greenhouses, rice field irrigation, all kinds of robots, hydroponics, aquaponics with fish, sensors); and iii) farm business planning, recording and analytical tools for better prioritization of enterprises. 	<p>Digital Green (example of using video for extension) www.digitalgreen.org/videos</p> <p>Lowell – an agriculturist in Philippines https://youtu.be/PUG0jkTlkvk</p> <p>The future of agricultural extension in Africa is digital – International Livestock Research Institute (ilri.org) https://bit.ly/40y6QiE</p> <p>Unleashing the potential of Africa's youth through innovation in agriculture https://bit.ly/3n02m6G</p> <p>Supporting experiential learning farmprecise.org (free downloadable)</p> <p>Access Agriculture (catalogue video) www.accessagriculture.org</p> <p>WOCAT (catalogue of SLM practices), www.wocat.net</p>

Key FFS processes	ICT examples and uses	References and resources
<p>Reporting and MEL</p> <p>ICTs can be used to collect and make available information timely and enable its quick escalation from FFS groups and facilitators to master trainers, programme teams and beyond. While it needs to be well planned, it allows saving time compared to paper-based M&E.</p>	<ul style="list-style-type: none"> ■ Pre- and post-tests and Satisfaction surveys (using Survey Monkey or Google Forms). ■ Data collection (Open Data Kit, Kobo Collect) for monitoring learning, knowledge, adoption, and results of innovations tested. ■ Participatory video to document stories (e.g., Digital Green videos, or access to technical information) (e.g. via Access Agriculture). ■ Sharing pictures to document impact (negative/positive), audio messages, short videos, anything that can be done using a smartphone. ■ Documenting and sharing best practices and innovations, including farmer-to-farmer. 	<p>Access Agriculture www.accessagriculture.org</p> <p>WOCAT www.wocat.net</p> <p>Kobo Toolbox www.kobotoolbox.org</p>
<p>Post-FFS</p> <p>At the end of the FFS cycle, groups and individuals can stay connected and continue working together. Often groups form networks and engage in collective marketing activities. They may also shift focus to another level of farming and therefore attain or new group structures. They also face new challenges and may require new and wider sources of information and knowledge.</p>	<ul style="list-style-type: none"> ■ Networking: FFS contribute to strengthening existing group or lead to new networks and group actions. So many tools contribute to good networking such as Viber, WhatsApp and other messaging services, Facebook, Twitter, TikTok, etc. Network-building can be actively facilitated by helping groups organize their own identities and sharing contact information during a FFS session. ■ Marketing: Examples include: <ul style="list-style-type: none"> ■ alumni and networking activities, e.g. via WhatsApp groups; ■ sales and marketing, e.g. through WhatsApp groups; and ■ market price collection and dissemination e.g. via mobile phones, radio etc. 	<p>https://dgroups.org/fao/fieldschools</p> <p>https://fairtradeafrica.net</p> <p>www.rainforest-alliance.org/utz</p>

Sign up for FAO's farmer field school platform and d-group. A great source of information and a place where you can share your experience with more than 1800 members from 134 countries and ask others in the FFS community about their experiences and challenges.



Chapter 5

How to overcome barriers to information and communications technology use in farmer field schools

The use of ICT requires the existence of some basic conditions including infrastructure, connectivity, affordability, literacy/ICT education and institutional support (FAO, 2019a). Therefore, as facilitators and master trainers, you need to take stock of the context in which you operate to ensure that the majority farmers are not excluded from the learning process because of technology. Common barriers include digital access (ownership of tech devices, broadband coverage in the locality, affordability of internet data) and digital literacy (ability to operate in digital environment effectively and safely) especially among women. You (and farmers) need to use or acquire devices and gadgets to access information and learn how to use the ICTs to access information and to deliver services. You must also ensure that farmers' critical thinking and decision-making abilities are not lost in the process, but rather further enhanced, and take precaution to avoid misinformation. Below is a set of examples and experiences from practitioners that can be learned/used to overcome challenges in the use of ICTs.

5.1 Gender and information and communications technology

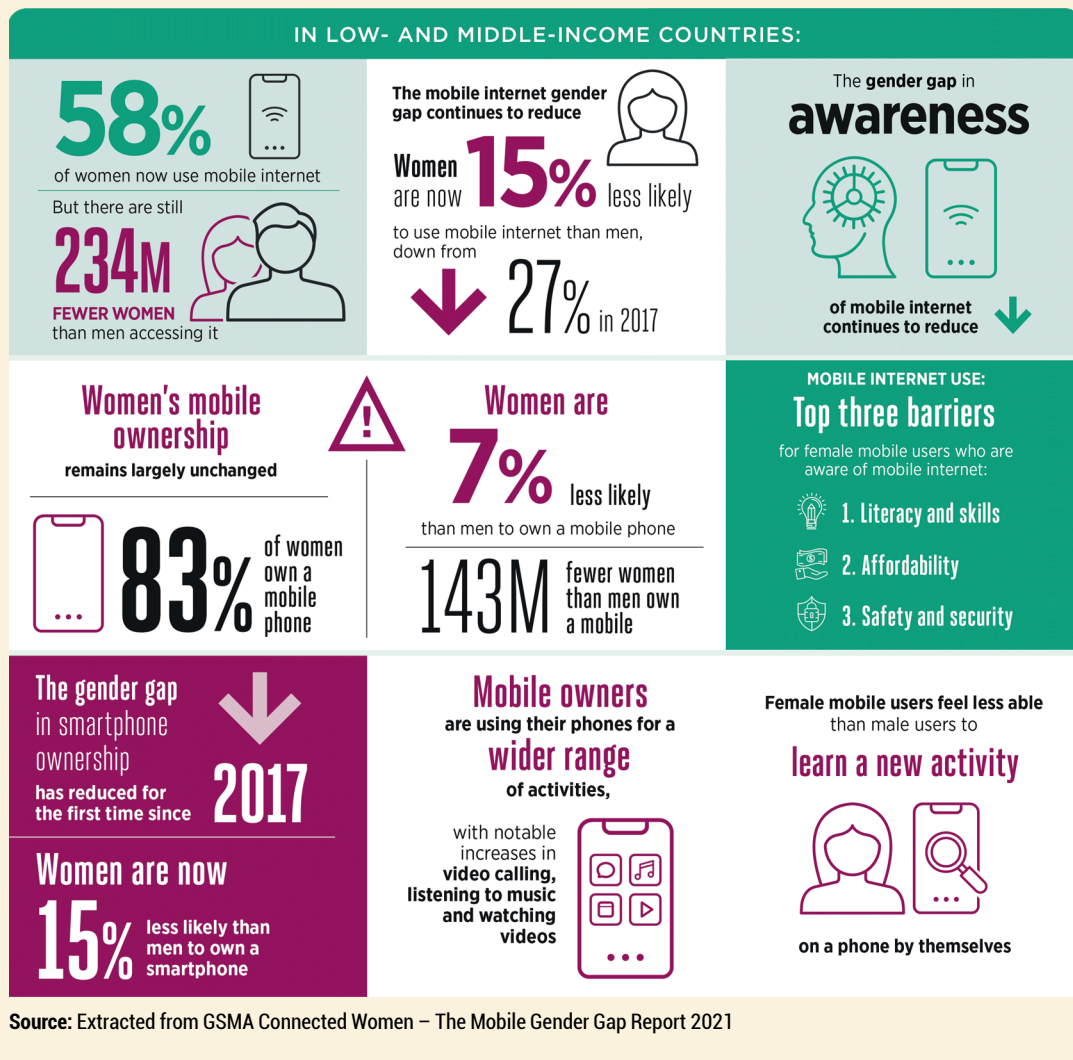
Gender disparities in the use of ICTs in the rural areas prevent especially youth from achieving their full potential in the agriculture sector (see Box 16). A range of technologies exist that can be adapted to the local environment, therefore, think outside the box to explore opportunities that can be embraced by the youth, women and men farmers.

Box 16: Gender and ICTs

Facts on the gender mobile gap and mitigating actions for FFS

You play a key role in mainstreaming gender in FFS field activities. Here, we focus on mobile phone usage because it is the most accessible ICT gadget for internet connectivity for rural farmers, especially in the low and middle developed countries. Other accessible ICTs are radio and TV which are easily accessible where they exist. According to the 2021 Mobile Gender Gap Report (GSMA Connected Women – The Mobile Gender Gap

Report 2021 <https://bit.ly/3H7Dn8a>), “owning a mobile phone and accessing the internet can be life changing, yet mobile ownership and use remain unequal. Women are still less likely to have access to mobile phones and use mobile services.” The most affected groups are those with low literacy levels, low incomes, live in rural areas or have disability. Other limiting factors include social norms and discrimination, affordability, the lack of adequate infrastructure and/or relevant and customized content.



How to better integrate gender in initiatives for ICTs in the FFS

This role may be more suited for supervisors, managers, or team leaders. However, your role at field level is paramount. Where ICT is part of the organization's agenda, you need to update yourself with the right information and strategies on gender to ensure successful implementation. However, in cases where the organization may not consider ICT as a priority or is not promoting it for some reason, you (both facilitator and MTs) may take the lead to promote, advocate for, and champion the use of ICT within the organization to complement the facilitation of the FFS processes. Below are some tips on how to promote, integrate, mainstream ICTs in FFS.

- First, you need to understand your context looking at both online and offline aspects that can determine the digital readiness of your FFS members (refer to criteria in table 2, "assessing the context for ICT integration). You may find significant differences according to the gender and age of farmers and it is vital to keep those into account when choosing the most appropriate ICT tools.
- Create awareness of all categories of gender, ensuring the participation of men, women, and youth in all processes involving use of ICTs, and especially awareness on the importance of ICTs including women in the process in terms of adopting ICTs.
- Adapt content to the needs of men and women for example translations into local languages and repackage into suitable/simplified formats. Some ICT providers have options for accessing their products in local languages. Use these to raise the awareness of farmers. If it is necessary, and depending on the volume of your activities, "raise the alarm" – ask your organization to approach internet service providers with a view to tailoring certain products for farmers' use. They might be interested.
- Use the appropriate mix of platforms and technologies adapted to local needs and contexts to effectively reach more men and women (for example broadcasts using community radios, and dissemination of content using community videos, basic mobile phones today have radio functions, etc.).

5.2 How to deal with the challenges of low digital literacy

Despite high illiteracy rates, mobile technology is being adopted in developing countries at a high rate, though predominantly for voice calls (**GSMA Digital Inclusion Report** <https://bit.ly/3LqFnef>). Providing digital literacy to the FFS is critical for them to acquire basic skills to use information technologies. You the facilitators and master trainers have a big role to ensure this. In order to succeed, you will need some level of skills, awareness and understanding of usability of common ICTs. This will enable you pass on the required skills to the farmers who will require numeracy, information handling and communication skills.

You will have to explore all available avenues to find relevant means to bring ICTs nearer to the communities. Training may be a necessity, find avenues either within your organisation or on your own to equip yourself with the basic knowledge about ICTs. As much as feasible, build

on what is available, and what the farmers already use. Use “participatory communication approaches” to facilitate farmers involvement in “decision-making dialogue, knowledge sharing and partnerships with development stakeholders” (World Bank, 2017). In the sections that follow, you will find boxes containing some examples about how farmers can connect with each other, and the rest of the community participate in discussions, learn, and agree on important decisions in support of their farming activities through use of ICTs suited to their circumstances.



Some tips for the facilitator!

Some tips for your organization!

Integrating adult literacy training in FFS could be a means to enable farmers to embrace relevant tools. Most FFS programmes have financial literacy programmes integrated in the curriculum. This includes numeracy and weights topics. Some of these approaches include FAO’s rural finance schemes, the village community banks and village savings and loan associations. The functional adult literacy programmes are basic and relevant to rural farmers. While you may not be the decision-maker for integrating such programmes, you can promote and catalyse the integration of ICT literacy in the FFS by advocating for partnerships with relevant institutions offering such services.

And for you!

Begin by improving your own digital skills so that you can better support farmers. For example, the Digital Competence Frameworks like the European Union DigComp or the [UNESCO Framework of Reference on Digital Literacy Skills \(https://bit.ly/2N5jbVB\)](https://bit.ly/2N5jbVB) will help you identify your key areas of digital competence and to build those competencies to help you in planning farmers trainings.

Apply basic FFS principles of learning by doing to enable farmers to adapt. Start simple, work with the easy-to-use and learn ICTs like the radios, mobile phone, which require basic literacy to use. Involve the farmers in deciding their participation, for example by discussing with them how they can be part of the local radio programmes, what they would wish to contribute, learn, or share, link them to the radio programmers. Show them how to connect and text, video call, using relevant applications, and explain how to navigate them, and how they can communicate with you and with each other.

5.2.1 Training farmer field schools to use information and communication technologies tools

Despite digital literacy being one of the main impediments to promoting ICTs in rural areas, you as the facilitator can be the driver of the change needed in the communities by creating basic awareness on some of the technologies you are well versed with. In the box below is an example of where the FFS curriculum was adjusted to integrate training on the use of agromet services for farmers to support their farming decisions.

Box 17: Training farmers to use agromet services for decision making

Case study: IFAD Project – Andhra Pradesh – India

An IFAD-funded project invested in 105 climate information centres that were managed by farmer organizations to serve over 63 000 farmers and herders. They partnered with service providers for agromet advisory services and to disseminate weekly advisories to farmers through pre-recorded voice messages. To enable FFS to utilize the services, the training included climate-sensitive planning in the FFS curriculum on the use of agromet services to empower the farmers to use such information to make appropriate decisions for the management of their crops and livestock. A total of 62 443 farmers (96 percent of the target and 76 percent of total households reached) from FFS and other producers reported adopting improved practices that enabled the reduction in production costs, increased resilience by adopting mixed cropping, drought-resilient varieties, drought-proofing, which impact positively on crop yields.

Lessons learned

- › Developing capacity of producer organizations to use such advisories; integrating climate advisory in FFS

curriculum and using of recorded voice messages in local languages (rather than SMS) helped enhance the dissemination and use by farmers beyond FFS beneficiaries.

- › Use of localized agromet data enabled farmers to integrate their own local forecasting knowledge and enabled advisories to match the high variability of rainfall patterns and temperatures in terms of seasons and localities.
- › Agromet advisories are insufficient. Collaboration with research and extension to translate climate forecasts into crop advisories that can be discussed in FFS (including alerts on pest and diseases, potential implications on crop choice and planning, etc). Involving FFS in interpretation is key to ensure integration of local knowledge and practice.

Source of content: Andhra Pradesh Drought Mitigation Project (APDMP) project completion report, 2022

www.ifad.org/en/web/operations/-/project/2000001420

5.2.2 Using community radio to bridge the literacy gap

Radio continues to be the most widely used technology in rural areas because it is affordable and accessible to the rural communities. Where there is no electricity, it can be powered by batteries or solar, which makes it a convenient alternative to receiving and sharing information. Radio plays a big role in promoting informal learning, thus bridging the digital literacy gap in many communities. Today, many local radio programmes give farmers an opportunity to learn and exchange views in their local languages.

The Dimitra listeners' clubs and talking radios (see Box 19) offer an insight into how farmers with low literacy levels can embrace the use of ICT through community radio.

Box 18: Solar radios bridge digital literacy

Case Study: Dimitra Listeners Clubs

The FAO Dimitra Clubs (set up in several Sub-Saharan African countries including Burundi, Democratic Republic of Congo, Ghana, Niger, and Senegal), are voluntary, informal groups for women, men and youth who discuss common problems and determine ways to address them by acting together and using local resources. Agriculture is a common theme, but it is not the only one; other topics include climate change, education, health, infrastructure, nutrition, peace, and women's status. Although FAO facilitates their set-up and provides them with training and coaching, the clubs are self-managed.

How it works:

- Community members mobilize themselves into Dimitra clubs.
- Each is equipped with at least one solar-powered radio.
- They partner with community radio stations to broadcast their discussions live, air their views, learn from one another, and

spark dialogue in the wider community and beyond.

- They sometimes combine with mobile phones to improve the sharing of information and networking among members and the wider community.
- The community discussions usually lead to important decisions being taken with consensus among club members and the support of the wider community.



Dimitra Clubs, Moulere, Niger

5.2.3 Using translated videos to make information and communication technologies work for communities with limited digital literacy

Access Agriculture uses a video-led learning approach to enable farmers in remote rural areas in Africa and Asia to learn about agroecological principles and rural entrepreneurship, combining scientific and indigenous knowledge. The Access Agriculture platform hosts more than two hundred high-quality videos that have been translated in more than 90 local languages. Whether or not farmers have basic literacy, they will be able to follow the translated videos. The platform is free for access and the videos are disseminated in two ways:

- 1 Individuals/facilitators like you can access the platform, view, download and use the videos as they find relevant. You will find the videos enriching to your work and practical for FFS learning. Visit their website www.accessagriculture.org; and here is their user guide on how to download videos from the platform: [PowerPoint Presentation \(accessagriculture.org\)](#).

- 2 Access Agriculture also disseminates videos using their young Entrepreneurs for Rural Access (ERA) model (see box 19). The youth population in rural areas is a potential resource for engaging in promoting digital literacy. Youth are dynamic, they enjoy using electronic gadgets, experimenting, researching, and trying out new ways of doing things. They want to be in sync with the rest of the world and are attracted to the digital world to connect and interact with their peers. Tap into this vital youth resource to champion awareness among farmers and support their learning.

Box 19: Bridging digital literacy through translated videos

Case Study: Access Agriculture Entrepreneurs for Rural Access model for engaging youth and women in agriculture.

www.accessagriculture.org

The ERA especially targets the unemployed youth population in rural areas, the majority of whom do not consider agriculture as a viable occupation. Yet those who wish to enter agriculture are in search of new knowledge and skills to adapt to a changing world. Using ICTs, the ERA model provides opportunities for these youth and women to take up agriculture as a profitable business.

How it works:

- › Through its Young Entrepreneurship Challenge Fund, Access Agriculture invites young people to propose innovative ideas to do business by dissemination of agricultural training videos in rural areas. The winners, known as ERA receive a solar-powered Digisoft smart projector containing all Access Agriculture videos. The projectors can be used without electricity or the internet, even in the most remote areas. A professional team from Access Agriculture coaches the ERAs for a defined period.



Find more about the Young Entrepreneur Challenge fund and read success stories here [Young Entrepreneur Challenge Fund | Access Agriculture \(https://bit.ly/440qQx0\)](https://bit.ly/440qQx0)

Listen to the Podcasts [Access Agriculture \(podbean.com\)](https://www.accessagriculture.org/podcasts)

Test your agricultural knowledge and participate in the Monthly quiz: [Monthly quiz | Access Agriculture \(www.accessagriculture.org/monthly-quiz\)](https://www.accessagriculture.org/monthly-quiz)

Visit, sign up, download, upload and share videos on [Home | EcoAgtube \(www.ecoagtube.org\)](https://www.ecoagtube.org)

5.3 How to deal with connectivity challenges and lack of/inadequate information technology infrastructure

5.3.1 Connectivity

Connectivity enables farmers and agricultural workers to use the internet, mobile and social networks, thus improving access to information and services especially for rural communities. These are enablers that facilitate digital transformation. Connectivity is determined by several factors, including the availability of IT infrastructure, internet access, mobile subscriptions, level of network coverage, electricity supply, the availability of resources to buy equipment and gadgets (phones, computers etc.) and to pay for internet credit (Trendov, Varas and Zeng, 2019). However, most farmers in the rural areas have limited connectivity due to a combination of factors highlighted above.

You will need to explore available avenues to ensure that farmers are not left behind. For example, basic rural radio and analogue television, which do not rely on internet connectivity and sometimes electricity for powering, are widely used. Farmers can access weather and market information services freely. Remember once again that ensuring that women farmers can access ICTs may need specific measures adapted to their own gender-specific challenges. Below are some examples of innovations that have worked in areas with internet connectivity challenges.



Box 20: Overcoming connectivity challenges

Talking Books in Ghana

Talking books use a small portable recording device which serves as an audio library, loaded with information and distributed to remote areas where they are needed. The scheme is targeted for those with few or no literacy skills, lack electricity, have unreliable or expensive mobile networks, those with no phones, and those who are wary of technology. The technology disseminates information created and recorded by local



Dimitra Clubs, Gasseda, Niger

experts for rural communities (description of farming techniques, spacing of different crops, etc.). New audio recordings are constantly added to talking books every 1-3 months via USB via a smartphone, tablet, or laptop. Users can also record own messages to ask questions, expand ideas and relay feedback.

Advantages:

- › affordable, simple to use
- › runs on batteries
- › stores up to 140 hours of audio content
- › can withstand dust storms and rain
- › indented touch buttons can be used by the visually impaired to navigate
- › it can be used at night
- › a simple audio menu offered in a range of local languages and dialects enables users to select their preference
- › audio content can be replayed as needed including for groups of people
- › can be shared/loaned to third parties.

5.3.2 Inadequate information technology infrastructure and connectivity

Lack of or inadequate IT infrastructure affects the connectivity of communities. Its absence is an impediment to promoting ICTs in the rural areas, due to the costs involved in setting up and/or acquiring such infrastructure – decisions which are often not within reach of the farmer: they require big government or private companies. At farmer level, small infrastructure including digital tools such as tablets, laptops and smartphones are relevant. However, these too may be costly for the average farmer to afford and may require a level of literacy for their use, although this might vary across the globe depending on income and literacy levels.

- If they cannot afford to buy a phone, tablet, or computer, you can help farmers to take advantage of existing infrastructure (see the example Box 22 describing IFAD's experience in Malawi below) to connect with the world and to facilitate their farming processes and decisions. Alternatively, you could use your personal smartphone or tablet to introduce them to basic advantages and uses of simple tools.

- Look for alternatives within farmers' reach. For example, a cheaper means is for you to look out for bigger entities (e.g. processors and aggregators) that may already have established ICT infrastructure and can provide opportunities for farmers to undertake collective activities (e.g. production, input sourcing, and market information).

Aggregators are those entities that bring products or services together from multiple sources to create a larger and more consistent supply to meet consumer demand.

Processors convert large volumes of fresh products into different forms for sale/ consumption. This can involve basic activities like washing, trimming, packaging, or value addition, for example making oil out of nuts.

Both can include the provision of other services like extension, marketing linkages to the farmers.

- Aggregators and processors require volumes to be competitive and sustain their presence in the market. They will thus usually require infrastructure to make their processes efficient.
 - *The FFS groups and networks are a ready source for aggregated demand (demand for aggregator and processor services), and group collateral. They can use the ICT infrastructure set up by these large entities to access inputs and services and market their products.*
 - *Organize FFS to undertake collective activities (aggregate demand) for example accessing inputs in bulk, extension services, marketing, and market information.*

The processors and aggregators are increasingly developing farmer service centres in support of agricultural extension where farmers can access services at minimal cost. Below are examples of use of resource centres for farmer learning in Malawi and tractor hire services provision in West Africa based on aggregated demand.

5.3.2.1 Promoting access to information through resource centres – Malawi

Box 21: Farmers aggregate demand to connect for learning

IFAD Experience: Promoting access to information through resource centres equipped with ICTs

In Malawi, farmers can access advisory information and learn from each other through resource centres in their areas equipped with ICT equipment, where videos on specific

issues related to farming are played. These resource centres help bridge the digital divide as they can be accessed by any farmer – whether or not they have ICT equipment – and are managed by public extension staff. FFS groups can get the opportunity to learn new topics from the resource centres and allow information sharing among group members.



Tips for the facilitator

Here is a tip you can use:

- If one individual has a phone, the group can use it to send one rather than 30 messages.
- If none of the members owns a phone, they could all contribute small amounts to pay a phone operator to send the message on behalf of the group. Otherwise, it would be costly to access/connect to the service as individuals
- Provide basic awareness using basic tools to enable FFS to connect to service providers and request services
- Farmers will be able to collectively embrace ICTs and establish linkages to access services from providers, connect and access services at minimal cost.

As you can see from the Malawi example above, farmers did not have to pay for the cost of IT infrastructure, but instead use existing infrastructure and benefit from economies of scale through working and connecting collectively.

5.3.2.2 Linking smallholder farmers to extension services through digital platforms

5.3.2.2.1 TROTRO Tractor in Ghana – using short messaging to deliver services

TROTRO Tractor is an agricultural technology company that connects farmers to tractor operators using a mobile platform through a USSD code programmed into SIM cards. The company creates awareness using community radio stations and by conducting educational activities in community centres, and sometimes works with officers from the Ministry of Food and Agriculture to sensitize farmers and set up location-based agents to help local farmers to access services.

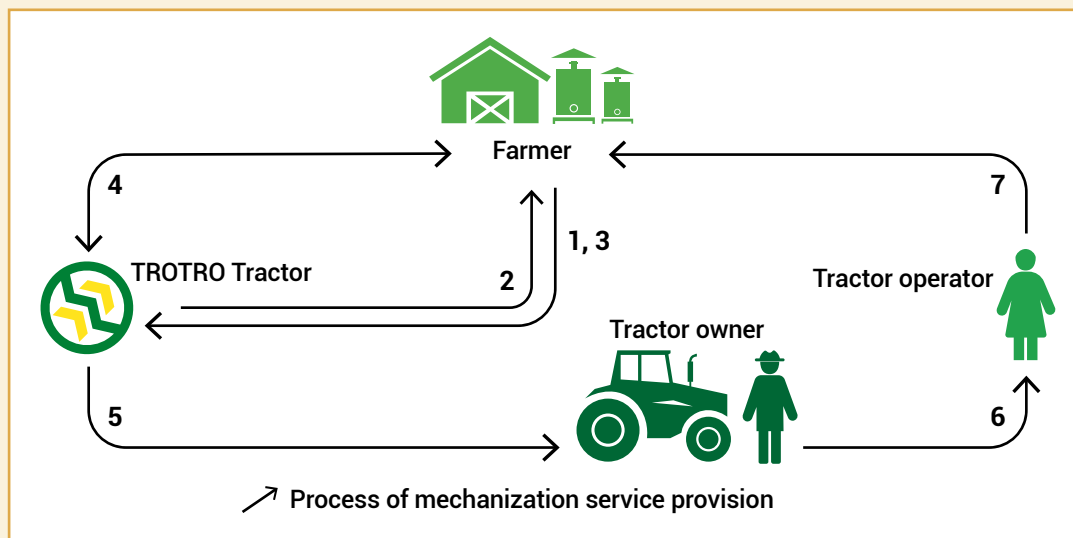
It is an on-demand platform where farmers can obtain services from a network of tractor owners/operators via SMS.

- The platform enables farmers to request, plan and pre-pay for tractor services as needed.
- Tractor owners use a GPS device to monitor the movement of their equipment and to locate the closest tractors to the farmer for service delivery.
- TROTRO earns a 10 percent commission (from tractor owners) on all ploughed hectares and earns from sales of GPS devices for tractor monitoring and safety.

Box 22: Connecting for extension services through sms

TROTRO tractor hire service – Ghana Process net map for provision of tractor hire services

1. The farmer dials *718*85#
2. A prompt appears for the farmer to input their details stating their location and land areas for which service is requested
3. The farmer makes a payment using the mobile phone for the service
4. TROTRO Tractor receives the request and compares it with other requests received to aggregate demand
5. The request is matched with a tractor owner nearest to the farmer's location based on GPS
6. A field agent is sent to confirm land area size and its suitability for tractor ploughing
7. If there is sufficient demand from the same area, a tractor is dispatched to provide service
8. If demand is not sufficient after 24 hours, the request is cancelled, and the farmer receives a full refund. The farmer can then make another request for the service



Source: Extracted from Anidi, O., Mayienga, S.M. and Mpagalile, J. 2020. *Use of information and communications technology tools for tractor hire services in Africa - Opportunities and challenges*. Integrated Crop Management No. 25. Rome, FAO.



You can explore this and connect FFS to TROTRO Tractor or a similar hire service if it exists in your area

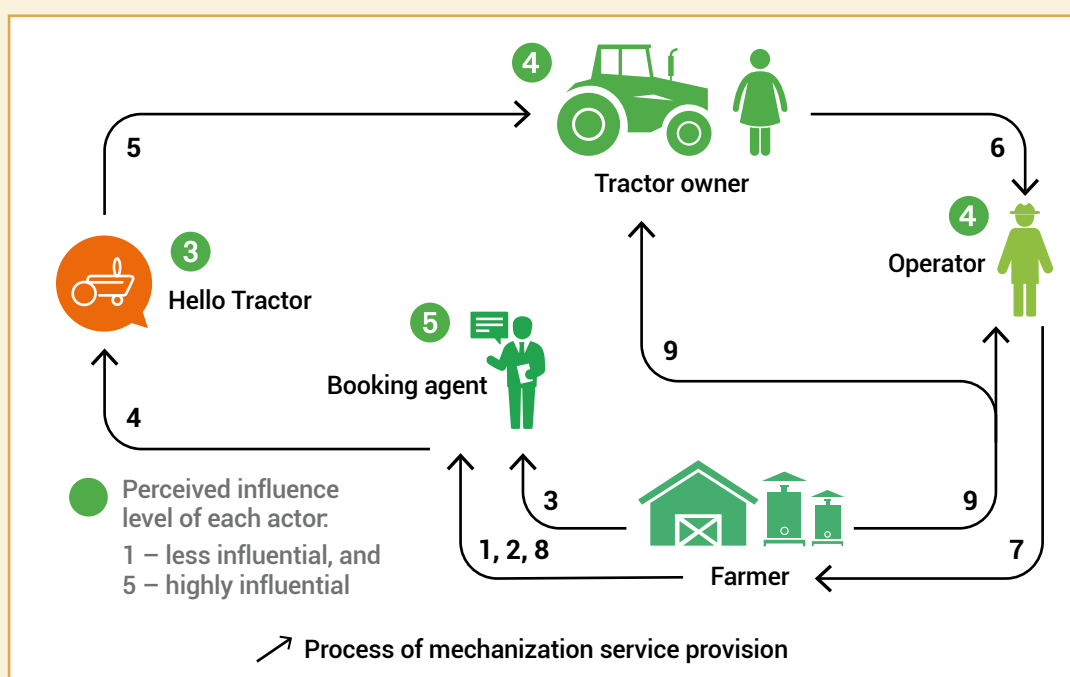
5.3.2.2 Hello Tractor in Nigeria – using agents to deliver services

Learn from Hello Tractor, a technological start up with a platform linking smallholder farmers to tractor owners. The operation model involves a booking platform to request tractor services and a GPS tracking device to monitor equipment. The booking platform comprises a mobile app and an agent who aggregates demand from farmers in each location and makes bookings. To make a request, there must be sufficient demand from the farmers in a particular location and if necessary, bookings from nearby communities may be merged. The tracking device performs monitoring functions, gives access to data and information on machinery use, and provides information on maintenance requirements, for example fuel level. Farmers can use data on machinery use to provide proof of usage to access credit services.

Box 23: Connecting for extension services through aggregated demand

Hello tractor in Nigeria Process net map for provision of tractor hire services – Nigeria

1. The booking agent makes initial contact with the farming community
2. The booking agent uses the booking app to aggregate farmer demand
3. The farmer pays a commitment fee
4. The farmers request is sent to Hello Tractor with detailed information on each transaction
5. The request is linked with the nearest tractor owner
6. The tractor owner approves the transaction
7. The operator provides the requested service to the farmer
8. Services are monitored to ensue satisfaction and to keep track of payments
9. Final payment for services are made to the operator or tractor owner



Source: Extracted from Anidi, O., Mayienga, S.M. and Mpagalile, J. 2020. *Use of information and communications technology tools for tractor hire services in Africa - Opportunities and challenges*. Integrated Crop Management No. 25. Rome, FAO.

5.3.2.3 Connecting small scale dairy farmers to markets in remote locations in Kazakhstan

Collect mobile for dairies software enables small scale dairy farmers in remote Kazakhstan to access market information on the pricing of agricultural products (inputs and outputs) and to find and connect to suppliers, buyers, or logistics providers, such as storage facilities and transport companies.

Box 24: Addressing inadequate infrastructure challenges in remote locations

Collect Mobile for dairies in Kazakhstan

Collect Mobile – Open Foris
<https://openforis.org/tools/collect-mobile>

The Collect Mobile app was developed by FAO to connect small-scale dairy farmers in Kazakhstan to processors. The farmers own fewer than 5 animals but produce 80 percent of the country's raw milk. The farmers are in remote locations across the country, thus posing challenges along the supply chain, including a lack of coordination between processors and farmers due to no or limited contact, and long distances to dairy plants, and therefore high transportation costs and spoilage risks. This also made it difficult to uphold the milk industry standards.

Collect Mobile is an interactive and customizable mobile software that can be used on any Android phone or tablet equipped with GPS. Milk processors use the app for several purposes:

- › conduct surveys on ground and geo locate current and potential raw milk suppliers across the country.
- › optimize collection routes, reduce transportation costs, forecast the capacity need for cooling tanks and refrigeration transport.
- › receive accurate information about existing sources of raw milk, volume, seasonal availability, growth potential of each supplier.
- › collect mobile promotes direct interaction between processors and smallholder farmers.

- › enable dairy companies to provide targeted advice on various topics from improved milk hygiene to farm management.
- › enable smaller farms to comply with food safety standards and grow their businesses; also assist dairy companies in taking informed decision on supply chain management and expanding investment.

In addition to the collect mobile app, there is the Smart milk portal (<https://smartsut.com>), a 'one-stop shop' for information and knowledge on good farming practices and food safety and quality standards using video tutorials, a farmers' handbook and animation posters with simple messaging. The portal is designed for dairy farmers, milk collectors, processors, and consumers.



Visit the site and access available resources if you understand Kazakh or Russian languages.

www.fao.org/fao-stories/article/en/c/1402540

<https://smartsut.com>

Chapter 6

Additional resources for facilitator's use

Box 25: Access free e-learning

Access to knowledge and education about the effective use of open data in tackling the food security and nutrition challenges by building capacity of potential stakeholders is crucial to foster an innovative environment to maximize the outreach of FFS programmes, as well as enhancing awareness about the principles of data, information, and knowledge sharing.

Here are some open and free online courses that can help farmers, facilitators and master trainers improve and consolidate their knowledge related to FFS and agriculture in general.

Massive open online courses (MOOCs) facilitate access to knowledge and education to thousands of participants all over the world. MOOCs address gaps and needs and have an impact in the agriculture community through the services and tools provided. Through the MOOC's, individuals and organizations gain skills and competencies they need to perform effectively in their work environments.

- › **Access to scientific information resources in agriculture (Asira) online course for low-income countries.**
<http://aims.fao.org/moocs-asira>
- › **Agora online course: fundamentals of information literacy and access to global online research in agriculture**
<http://aims.fao.org/moocs-agora>

- › **Open data management in agriculture and nutrition online course**
<http://aims.fao.org/moocs-ODM>
- › **Farm data management, sharing and services for agriculture development**
<http://aims.fao.org/moocs-FDM>
- › **Research4life**
<http://aims.fao.org/moocs-R4L>

The FAO e-Learning Academy offers over 350 multilingual self-paced e-learning courses, accessible free of charge online, and in downloadable format. The FAO e-learning courses enable students to learn about a subject based on individual needs and interests at their own pace, anywhere and at any time. The design approach is learner-centred, collaborative, multiplatform and multilingual. Course design starts with a detailed target audience analysis, is based on realistic and measurable learning objectives, and includes knowledge assessment tests.

- › Check out now the new e-learning courses on FFS: **Introduction to the farmer field school approach and Implementing farmer field school programmes**
<https://elearning.fao.org/course/view.php?id=724>
- › Also check out Oxfam's new online course for **farmer field schools on nutrition and local food plants**
<https://sdhsprogram.org/document/online-course-for-farmer-field-schools-on-nutrition-and-local-food-plants>

Box 26: Use online resources to enrich your technical knowledge and information

As a FFS facilitator, you will probably be technically well informed. You may have recently graduated and are well equipped with knowledge from the institutions of learning, but you may not have had sufficient experience in the field, interacting with the farmers. You will need information resources, examples, experiences, practical stories etc. of how farmers, extensionists, and advisory service providers do their work. Several websites can give you information to enrich your acquired knowledge.

Learn from **TECA (Technologies and practices for small agricultural producers)**, a virtual space connecting scientists, development practitioners, agricultural extension and advisory services, farmers, and their organizations, to share experiences, knowledge, and information on successful agricultural technologies and practices that can help family farmers in the field. You will access practical information on proven agricultural innovations, which promote a sustainable and inclusive rural transformation and contributes to the SDGs.

How it works:

Search the wide range of technologies and practices by inserting one or more keywords, and/or by filtering according to language, category, country, region, related SDGs, or source.

Technologies and practices **TECA** (<https://teca.apps.fao.org/teca>) can be downloaded as a PDF for later reference or use by clicking on the download icon.

TECA latest technologies

in English:

- › **Farmer Field Schools and agroecology: Tools for sustainable agricultural systems**
<https://teca.apps.fao.org/teca/en/technologies/10090>
- › **Design and plan a field demonstration in six steps: H2020 FarmDemo guide**
- › **Complex rice systems, Indonesia**
<https://teca.apps.fao.org/teca/en/technologies/10104>

in French:

- › **Préparation de charbon végétal une alternative durable pour préserver les arbres**
<https://teca.apps.fao.org/teca/fr/technologies/10089>
- › **Construction d'un système de captation des eaux de pluie**
<https://teca.apps.fao.org/teca/en/technologies/10086>

in Spanish:

- › **Las Valonas, construcciones de piedra seca para proteger los olivos, Territorio Sénia, España**
<https://teca.apps.fao.org/teca/en/technologies/10074>

in Portuguese:

- › **Siderações e culturas de cobertura para melhorar solos com baixo teor de matéria orgânica**
<https://teca.apps.fao.org/teca/pt/technologies/10077>

Box 27: Conduct training virtually for FFS or trainers

Since the spread of COVID-19, the world has shifted to internet and mobile phone connectedness, increasing South-South communication and cross-country exchange of experiences. Online trainings have become inevitable to ensure continuity of services. For FFS, it is important that online trainings maintain the quality of the learning and the active engagement of the participants.

Shifting from conventional to online agricultural trainings to prepare for FFS work requires a shift in mindset to:

- › envisage the lasting effects of COVID-19 once the immediate crisis has ended.
- › plan a radical change in implementing global development programmes;
- › remain ready to shift more responsibilities to national teams; and
- › reassign travel budgets to strengthen global IT connections and increase trainings in a national context.

Here are some tips for successful online trainings:

- › **Ensure the FFS learning process is guaranteed:** include master trainers with experience in FFS work, so they can guarantee that the process works as intended – for example, empowering the team, ensuring everybody participates in sub-group discussions, paying attention to gender group dynamics, and involving youth.
- › **Make workshops and trainings as participatory as possible:** do not hesitate to ask participants about their expectations from the training, what they would like to learn and what they would like to include in the curriculum. This will make sure they are interested and that the training is adapted to their needs.
- › **Be mindful of everyone's connectivity levels and proficiency with technology.** Select tools and exercises according to participants' needs and the available infrastructure.
- › **Make it interactive!** Online trainings can be tiring, and it is difficult for participants to stay focused for more than two hours in front of a screen. Be creative and think of ways

to make the sessions more interactive, use icebreakers or make use of interactive online tools such as:

- Menti – Allows you to use mobile phones or tablets to vote on any question a teacher asks, increasing student engagement. www.mentimeter.com
- Prezi – Allows you to create interactive visuals that appear right next to you on screen as you present, for virtual presentations that engage, inspire, and educate. [Prezi Next Tutorial – New Version https://binged.it/3oEZfry](https://binged.it/3oEZfry)
- Miro – Besides the regular online whiteboard features of uploading images, creating notes, and drawing in different colours and sizes in freehand mode the app offers a great template library to conveniently find the right structure you need for your whiteboard. [Getting Started with Miro – Bing video https://miro.com](https://miro.com)
- Mural – a versatile online whiteboard tool for remote meetings. It is particularly strong as a team tool, allowing you to create different rooms for your board with differentiated access rights. [How to use Mural for workshops & meetings https://binged.it/443F7ci](https://binged.it/443F7ci)
- Klaxoon – a day-to-day solution that boosts participation and memorization during trainings, meetings, and conferences. Klaxoon offers twenty new ways to interact within a group. Based on your content, you can propose simple, playful, and effective activities: quizzes, surveys, challenges, brainstorming activities, and live messaging.
- [The basics to revolutionize your meetings https://binged.it/3AsPSri](https://binged.it/3AsPSri)
- Gather – centred around fully customizable spaces, Gather makes spending time with your communities just as easy as real life. [How to Use Gather. Town https://binged.it/3LqfOsP](https://binged.it/3LqfOsP)
- Topia – a more human video chat in a customized virtual world. [Student using Topia App with Popplet for descriptive writing; Topia App tutorial https://binged.it/3oldndn](https://binged.it/3oldndn)

Box 28: Use video to share information in the FFS

Why use videos?

- › For documentation and as a future resource
- › To share important messages
- › To remind people of good practices before certain times of the year (such as dipping, harvesting or sowing)
- › It is cost-effective
- › It can easily be duplicated and spread to other areas
- › It is not necessary to be able to read and write to learn from a video
- › It is easy to learn from – the viewer both sees and hears information (this can be enhanced by providing practical exercises to do after watching the video)
- › It can stimulate new practices and demand for new support
- › It can help farmers understand the 'why' behind new practices

- › It has lasting impact – seeing and hearing information makes it easier to remember
- › It can be translated into other languages

How to develop video content

- › **Keep content short and simple.** Short community and testimonial videos should last maximum 2–3 minutes to avoid fatigue.
- › **Adapt to the local context** (local language, relevance, content needs). This can be done by looking into existing content which might be publicly available and can be reworked (such as shortened/combined) to achieve new objectives.
- › **Stimulate learning and critical discussions**
Remember to apply the principles of FFS learning to any content you create. Use experiments, observations, and questions to stimulate curiosity, learning and more questions from other participants.



Box 29: Facilitate interaction through social media

Below are examples of some free common social media-sharing applications for you and your FFS to share good moments, innovations and results they are proud of among

themselves and outside the FFS. You can also make videos for your FFS members or trainees and share them more widely on many other social media platforms.



Vimeo (<https://vimeo.com>) allows members to view, upload and share videos and includes both a free and paid service. It also provides users with a video school to improve their own production for long-term personal/financial gain.

Learn how to make videos using Vimeo <https://vimeo.com/blog/post/creating-video-on-your-phone>; <https://vimeo.com/blog/category/video-school> and then join their platform to record, edit and upload lengthy videos.



Twitter (<https://twitter.com>) is used to connect to audiences of choice, advertise products, post a message or video, ask a question, post announcements, alerts, share stories, read stories, etc.

Learn how use Twitter: www.wix.com/blog/2016/10/twitter-guide-for-beginners



TikTok (www.tiktok.com) allows you to make, edit and share videos easily and directly on your phone! You can also tag the videos #FarmerFieldSchools.

Set up TikTok on your Android phone: <https://later.com/blog/how-to-use-tiktok>



Telegram (<https://telegram.org>) helps you send and receive messages, video files, voice notes.

Follow this link to learn how to install and use Telegram: www.wikihow.com/Use-Telegram#Sending-and-Receiving-Messages



WeChat (www.wechat.com) is a free messaging using text, voice or broadcast (one to many), or video conferencing, also used for sharing of photographs, videos and locations.

Follow the link to learn more, install and use the service: www.wikihow.com/Use-WeChat



Box 30: How to recognize trustworthy information

In the effort to integrate ICTs in the FFS, you will need to carry out a lot of reading and research online, on several websites and other media. Not all websites and social media platforms contain authentic information. Some articles you read may contain incorrect information or advice which can affect decision-making. It is important to develop a critical understanding of the information shared through social media and the internet. Below is what you can do to avoid getting trapped in a web of false information.

Objective

By the end of the session, participants will know where to find and how to recognize and disseminate reliable information on agriculture, for instance on pest and pesticides, animal health practices, climate change, etc.

Activity

Together with participants, choose an important and yet controversial topic which is likely to be subject to disinformation (for instance: the need to vaccinate animals, climate change, effective measures to manage FAW, COVID-19, etc.).

Ask participants the following questions:

1. Have you heard rumours or fake information about [the chosen topic]? Have you believed something about this topic at some point and later discovered it was wrong?
2. Would anyone specifically benefit from this information (for instance a private company seeking to increase sales and profits, a group of people wanting to spread incorrect information)?
3. Where did the wrong or biased information or rumour come from? How did you find out it was not true? How can we identify unreliable news? (See What to look out for below).
4. What are reliable sources of information in our country or context? How can we

look for alternative sources of information and views to put this information in perspective?

5. How can we share correct information around us?

Keep in mind

- › Some fake or biased news contain a mixture of correct and incorrect information, making falsehoods difficult to spot.
- › Trusted friends and family, extension agents and lead producers, may also share fake news. They might not have read the full story before sharing.
- › Before you decide to share, make sure you read stories properly and check thoroughly (see **What to look out for** below) to determine the accuracy.
- › Any story that claims a much higher level of certainty than other stories may be questionable. People seek certainty in a context of uncertainty, anxiety, and panic (e.g. when a new pest, disease or threat arrives in an area). It is only natural to more readily accept information that resolves, reassures, and provides easy solutions (such as using a product to solve a complex problem) – but be careful: the easy way may be the wrong way.
- › Similarly, if a story is especially surprising or upsetting, it is worth double-checking – fake news will often try to grab your attention by being more exaggerated than real stories.
- › Be cautious – people may try to launch cyberattacks and commit crimes. Hackers and cyber scammers take advantage of any crises or stressful situation by sending fraudulent emails and WhatsApp messages (sometimes pretending to be a reputable organization) to trick you into clicking on malicious links or opening attachments – and if you do you may reveal your username and password, which can be used to steal money or sensitive information.



› Reputable organizations such as the Food and Agriculture Organization of the United Nations (FAO) will:

- never ask for your username or password to access safety information.
- never email attachments you did not ask for.
- never charge money to apply for a job, register for a conference, or reserve a hotel; and
- never conduct lotteries or offer prizes, grants, certificates, or funding through email

What to look out for (The conversation, 2020)

Source.

The golden rule is: "Question the source of information." In cases of misinformation, references are often made to "experts from country X or Y" or prestigious universities or studies. Check on official websites to see if the same story is repeated there. If a source is "a friend of a friend," this is a rumour unless you also know the person directly. If a source is a private company or the foundation set up by a multinational, ask yourself whether the solution provided is the cheapest and most effective solution. If you are reading a news article, check whether the newspaper or article has a reputation of trustworthiness, neutrality, and transparency about funding.

Fake social media accounts.

Some fake accounts mimic the real thing. For example, the unofficial Twitter handle @BBCNewsTonight, which was made to look like the legitimate @BBCNews account, shared a fake story about a celebrity testing positive for COVID-19. Media platforms try to remove or flag fake accounts and stories and to verify real ones – but they do not always manage, so beware!

Logo.

Check whether the logo of the organization used in the message is the same as on the official website.

Incorrect English.

Credible writers and organizations do not usually make repeated spelling and grammar mistakes. Also, anything written entirely in capital letters or containing a lot of exclamation marks should raise your suspicions.

Over-encouragement to share.

Be wary if the message pushes you to share – this is how viral messaging often works.

Fact-checking websites.

Use websites such as APFactCheck and Full Fact that highlight common fake news stories. You can also use a search engine to look up the title of the article to see if it has been identified as fake news by the mainstream media.

Trusted sources of information.

For the best and most reliable agricultural information on specific pest, diseases or threats you can consult your national government agriculture and environment websites as well as key websites such as the FAO website www.fao.org and CGIAR centres (www.cgiar.org/research/research-centers), or websites of renowned research institutions in agriculture working on specific crops. If an article tries recommends a specific type of product or an easy solution to a complex problem, make sure the article comes from a neutral source and not a private company making profits from sales. Primary sources are better than news articles.

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