JLIFAD

Investing in rural people

Information and Communication Technology for Development (ICT4D) Strategy

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Appendix

Abbreviations and acronyms

ADB	Asian Development Bank
AfDB	African Development Bank
ASAP	Adaptation for Smallholder Agriculture Programme
CGAP	Consultative Group to Assist the Poor
COSOP	country strategic opportunities programme
CTA	Technical Centre for Agricultural and Rural Cooperation
FAO	Food and Agriculture Organization of the United Nations
GIS	geographic information system
GPR	Global Engagement, Partnership and Resource Mobilization Division
HRD	Human Resources Division
ICT	information and communication technologies
ICT4D	information and communication technology for development
IOE	Independent Office of Evaluation of IFAD
ITU	International Telecommunication Union
KM	knowledge management
M&E	monitoring and evaluation
ORMS	Operational Results Management System
PoLG	programme of loans and grants
PMD	Programme Management Department
RIA	Research and Impact Assessment Division
SDG	Sustainable Development Goal
WFP	World Food Programme

I. Introduction

1. The concept of information and communication technologies for development (ICT4D) has been gaining prominence, fostered by the fast pace of progress in technology and growing evidence about the profound impacts it can deliver. Specifically, ICT4D refers to the potential use of information and communication technologies (ICT) to achieve accelerated and scaled-up social and economic development.

2. In agriculture, ICT4D could contribute to increasing farmers' productivity and incomes, strengthen resilience to climate change and improve access to and participation in markets – particularly for most marginalized groups such as youth and women.[1] However, ICT is not evenly accessed or adequately utilized by smallholder farmers, especially women producers and young rural entrepreneurs. For example in 2017, only 30 percent of youth used the Internet in least-developed countries, compared to 94 per cent in developed countries[2] and only 25 percent of users of digital agriculture solutions in sub-Saharan Africa are women.[3] Accelerated action is needed to harness the potential of ICT4D in agriculture and rural development.

3. The United Nations Secretary-General's Strategy on New Technologies[4] guides the United Nations-wide approach to the use of digital technologies in order to accelerate achievement of the Sustainable Development Goals (SDGs). The strategy identifies food security as a critical area "likely to be profoundly disrupted by technological and scientific advancements", envisions a prominent role for youth in this area and recommends the development of targeted measures to address existing "barriers faced by women, indigenous people, rural populations and others who are marginalized". Similarly, the 2019 G20 Agriculture Ministers' Declaration highlighted the potential for digitalization to increase agricultural production and productivity while improving sustainability, the efficient use of resources, employment and entrepreneurial opportunities, and living conditions – especially in rural areas.[5]

4. IFAD's Strategic Framework 2016-2025 recognizes the centrality of ICT in promoting food security and sustainable, inclusive rural transformation. This includes expanding the uptake of new ICT within IFAD.[6] The strategic framework notes that IFAD will leverage the surge in mobile phone and smartphone ownership to facilitate access to market information and financial products and services, as well as weather information to enhance capacity for predicting and adapting to climate change. The importance of ICT4D in fostering rural transformation was underscored during consultations on the Eleventh Replenishment of IFAD's Resources[7], in which IFAD committed to develop an ICT4D strategy for presentation to IFAD's Executive Board for endorsement. This strategy is timely since IFAD aims for significant growth up to 2030 in order to deliver greater impact through a diversified portfolio.

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[1] Lio, M. and Liu, M.C., ICT and agricultural productivity: evidence from cross‐country data, *Agricultural Economics* 34(3), 221-228 (2006); World Bank, ICT in agriculture (updated edition): Connecting smallholders to knowledge, networks, and institutions, Washington, DC: World Bank (2017).
[2] ICT statistics, Geneva: International Telecommunication Union (ITU) (2017) available at https://www.itu.int/en/ITU-D/Statistics/Documents/facts/ICTFactsFigures2017.pdf.
[3] Digitalisation of African Agriculture Report 2018-2019, Wageningen: CTA (2019).
[4] United Nations, Secretary-General's Strategy on New Technologies (2018).
[5] G20, Agriculture Ministers' Declaration (2019; zero draft); Global Forum for Food and Agriculture Communiqué, Agriculture goes digital – smart solutions for future farming (2019). Retrieved from: https://www.bmel.de/SharedDocs/Downloads/Landwirtschaft/Welternaehrung/GFFA_2019_Kommunique_EN.pdf;jsessionid=E7B6C10067566DE6321BA211342D8597.1_cid288?__blob=publicationFile.
[6] IFAD, Strategic Framework 2016-2025: Enabling inclusive and sustainable rural transformation (2016).
[7] IFAD, Report on the Consultation on the 11th Replenishment of IFAD's Resources: Leaving no one behind, IFAD's role in the 2030 Agenda (2018).

5.   The objective of the ICT4D strategy is to provide IFAD with a framework for leveraging ICT to increase development impact and improve the economic and social conditions of rural people through increased agricultural productivity, greater benefits from market participation and strengthened household resilience. To this end, the strategy proposes four action areas: (i) promote scalable uptake of ICT4D solutions; (ii) strengthen ICT4D partnerships; (iii) enhance ICT4D knowledge management and sharing; and (iv) build internal ICT4D awareness, capacity and leadership. While these action areas could imply upgrading specific ICT capabilities to improve the quality, efficiency, and effectiveness of IFAD's delivery, the use of ICT to support the Fund's core business processes and activities is not within the scope of this strategy (see box 1).

6.   This strategy covers 2020-2030, with a mid-term review expected in 2025. Its development was informed by: (i) the potential uses of ICT for small-scale agriculture and rural development in line with United Nations, G20, and development partners' objectives (see appendix VI); (ii) lessons learned from IFADs' and development partners' experiences; and (iii) consultations with IFAD technical specialists and country directors (see appendix VI) as well as private-sector actors.

Box 1
Differences between an ICT, an ICT4D and an innovation strategy

An ICTs strategy defines how an organization uses information and communication technologies to sustainably create value, maximizing the return on ICTs investments.

An ICT4D strategy guides an organization's programming and implementation efforts in the application of ICT to achieve development results. In the present document, ICT4D refers to the broader set of digital tools and use cases, sometimes referred in the literature, more recently, as *digital for development* or *digital development*.

An innovation strategy aims to support an organization to develop better solutions by adopting, adapting, or generating new ideas, approaches, practices, products, services, or technologies.

II. IFAD's ICT4D experience to date

7.   This section draws on: (i) the findings of a 2018 internal stocktaking exercise to assess the use of ICT in the design, implementation, monitoring and evaluation (M&E) of IFAD's programme of loans and grants (PoLG); (ii) a desk review of IFAD project documents; and (iii) consultations with IFAD staff at headquarters and in country offices. Highlights of IFAD's experience to date include the following:

- Most of IFAD's strategies and guidance documents developed in the past decade (including the Private Sector Engagement Strategy, the Climate Change Strategy, the Rural Finance Policy and the Rural Youth Action Plan) recommend increasing the use of ICT for agriculture development and rural transformation. However, these recommendations have not translated into a substantial number of IFAD projects using ICT4D (see appendix IV).

- Despite positive results achieved by some projects (see box 2 and appendix II), most ICT4D initiatives have been funded by grant resources dedicated to stand-alone interventions that were not linked to the PoLG, and were not scaled up or replicated.

- While the uptake of ICT4D in IFAD's operations has been limited and ad hoc, there were notable exceptions in the areas of digital financial inclusion, remittances and geospatial technologies (see appendix II).

- Although ICTs are increasingly used to facilitate M&E in IFAD (see appendix II) and inform project design, there is no existing framework for data-driven

interventions to expand IFAD's development impact. Barriers to systematic use of these tools include the use of stand-alone tools for programme M&E, and the disconnected nature of data generated from corporate-level systems. In addition, the dissemination of results and lessons learned is not built into impact assessment and there are no staff supporting the inclusion of ICT4D solutions at project design, monitoring, evaluation and impact assessment.

- Out of the 10 winning proposals of IFAD's 2019 Innovation Challenge, seven (see appendix II) directly leverage ICT4D. These figures suggest IFAD's increased willingness to incorporate, test and develop ICT-enabled solutions.

Box 2
Leveraging ICT4D to promote women's empowerment, youth and climate-smart agriculture

Between 2015 and 2018, IFAD partnered with Farm Radio International in the United Republic of Tanzania as part of the Upscaling Technologies in Agriculture through Knowledge Extension (UPTAKE) project to utilize rural radio and mobile phones to promote the uptake of agricultural technologies among smallholder farmers. Over 6 million text messages about beans, maize, Irish potatoes and cassava were sent to smallholder farmers. An estimated 760,000 women farmers received information through radio or text messages on targeted technologies for these crops. Approximately 55,000 women farmers in eight regions reached by the radio broadcasts and mobile services reported increased use of one or more of the targeted technologies. In addition, the project established targeted broadcasting channels to ensure that women can speak out about issues that affect them. For example, a radio programme called Her Farm Radio was created to elicit feedback from women farmer groups.

The Anacafé project, funded by an IFAD grant and completed in 2018, was implemented by the Guatemalan National Coffee Association. It widened the range of services offered to enable climate-smart coffee production. Various ICT measures were implemented for more efficient and accurate data collection at coffee farms. Drones replaced the traditional airplanes and satellites that produced low-resolution aerial images at high cost. Data loggers were installed to generate real-time alerts and build smallholders' resilience to climate change. In addition, a virtual national information system was developed to centralize information generated by Anacafé and expand the coverage of its services, especially to smallholders. The project enabled 124,954 smallholder coffee growers to respond to impacts of changing climate, including rust plague and drought. As a result, the use of this tool was expanded to the national level.

Through the Financing Facility for Remittances, IFAD partnered with the Babyloan crowdfunding platform in 2017 to create a dedicated space through which Malian Diaspora based in France could invest in projects launched by young people in rural Mali (in this case among beneficiaries of the *Formation professionnelle, insertion et appui à l'entrepreneuriat des jeunes ruraux* project funded by IFAD). As of January 2019, 167 young entrepreneurs had attracted more than EUR 100,000 from individual investors. A second phase of the project aims to scale up these activities in both Mali and countries where Malians have immigrated.

III. Lessons learned from IFAD and development partners' experience

8. Valuable lessons can be drawn from IFAD's experience with ICT4D, including work by the Independent Office of Evaluation of IFAD (IOE),[8] as well as from development partners, governments and the private sector. The following lessons have been highlighted:

- **Internal systems, tools and leadership are necessary to support IFAD-wide uptake of ICT4D.** The absence of an ICT4D strategy and tools at IFAD has meant that staff lacked clear guidance and instruments for using

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[8] IOE. Information and Communication Technologies for Evaluation (ICT4Eval) international conference: Using innovative approaches to development evaluation. 6 and 7 June 2017. Rome: IFAD.(2017).

ICT systematically throughout the PoLG to increase impact. The experiences of other development partners[9] also indicate that leadership is "one of the most important factors" in supporting the digital transformation of humanitarian and development organizations. Strong ICT4D leadership also helps to break organizational silos by connecting digital capabilities that are scattered throughout the organization. Finally, it enables ICT4D champions to be recognized and rewarded.

- **Well-designed partnerships are effective at delivering scaled-up and improved results.[10]** Finding complementarities in ICT4D capacity and expertise among partners is critical for multiplying the impact of IFAD's work in a cost-effective manner. For example, a partnership with Intel in Cambodia enabled the design, testing, and implementation of integrated ICT-based advisory services for smallholder farmers. For partnerships to yield results, experience[11] shows that it is important to: (i) have the interest and commitment of a critical mass of staff; (ii) explicitly include the sustainability and scalability of ICT4D initiatives in the partnership agreement; and (iii) secure support at the country level, including infrastructure and partner capacities.

- **Knowledge sharing on ICT4D fosters increased uptake.** When resources are limited, internal capacity can be developed by internal champions who promote information sharing. IFAD's GeoSpatial group and associated GeoSpatial Day is one example of how knowledge sharing can lead to greater impact and amplify the benefits of IFAD's partnerships (including with organizations such as the European Space Agency and the World Food Programme [WFP]).

- **Successful ICT4D initiatives must be people-centric.[12]** Experience shows that successful ICT4D initiatives take into account beneficiaries' personal, social and economic needs as well as their skills and learning demands.[13] Furthermore, development organizations are accountable for mainstreaming issues like privacy, ethics and inclusiveness in ICT4D interventions, particularly when working with vulnerable and marginalized populations.

IV. IFAD ICT4D strategic framework

4.1. Vision and theory of change

9. By 2030, the strategy's vision is to create rural societies in which people have inclusive access to ICT-enabled services and solutions to achieve food security and prosperity that leaves no one behind. Figure 1 illustrates the underlying theory of change.

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[9] Catholic Relief Services, Health Communication Capacity Collaborative, Microsoft, NetHope, Organizational guide to ICT4D: Leveraging technology for international development, NetHope (2017).
[10] Appendix III presents the results of three existing ICT4D partnerships established by IFAD.
[11] Unwin, T, Multistakeholder partnerships, *International Encyclopedia of Digital Communication and Society* (2015):1-10.
[12] IOE, Proceedings of the ICT4Eval International Conference: Using innovative approaches to development evaluation". Rome: IFAD (2017).
[13] Mathison, S., ICT for poverty reduction: Myths, realities and development implications. In: Weigel, G. and Waldburger, D., ICT4D-connecting people for a better world: Lessons, innovations and perspectives of information and communication technologies in development. (2004).

Figure 1
Theory of change for IFAD's ICT4D Strategy

Development impact	Accelerated and scaled-up social and economic development for smallholder households and poor rural people enabled by ICT4D solutions and interventions
Development outcomes	1. Poor rural people's productive capacities increased 2. Poor rural people's benefits from market participation increased 3. Strengthened environmental sustainability and climate resilience of poor rural people's economic activities
Key outputs	1. IFAD and its partners have more awareness, stronger capacity and better tools to design, implement and use ICT4D projects. 2. Additional ICT4D resources and solutions are mobilized by IFAD from partners. 3. Greater use by smallholders of cost-effective ICT-enabled solutions, fostering improved access to information, services and financial inclusion thanks to improved availability, awareness and capacity. 4. Increased use of ICT4D solutions in targeting, monitoring and impact measurement for agriculture development.
Action areas	1. Scalable uptake of ICT4D solutions (particularly those providing information on markets and weather, services and financial inclusion) 2. Strengthened ICT4D partnerships 3. Knowledge management and sharing related to ICT4D enhanced 4. Building internal ICT4D awareness, capacity and leadership
Development challenge	Smallholders and rural households cannot access timely information (including on weather), services, markets and financing to perform agriculture activities because they are difficult and costly to reach, and they lack awareness and skills despite available ICT4D-enabled solutions that could help them to overcome these challenges.

4.2. Proposed focus and action areas

10. This strategy aligns to the strategic objectives of IFAD's Strategic Framework (2016-2025) as ICT4D is meant to be a tool supporting the delivery of corporate priorities and development results. Hence, the ICT4D strategy will aim to contribute to achieve corporate impact around IFAD's strategic objectives, i.e.:

    • Increase poor rural people's productive capacities

    • Increase poor rural people's benefits from market participation

    • Strengthen the environmental sustainability and climate resilience of poor rural people's economic activities

11. To this end, the strategy proposes four action areas.

12. **Action area 1 – Scalable uptake of ICT4D solutions.** The aim of this area is to increase the use and uptake of ICT4D in IFAD's operations. A flexible approach is needed when selecting technologies due to the rapid pace of technology change. Yet, while a relatively flexible approach should also be adopted for the thematic areas, it is recommended to particularly seek to promote ICT4D interventions that foster improved access to information (notably market and weather), services and financial inclusion. These three focus thematic areas were identified based on: (i) alignment with IFAD's Strategic Framework and growth vision; (ii) IFAD's comparative advantage and cross-cutting priorities (women, climate, nutrition and youth); and (iii) previous work on ICT4D by IFAD and development partners.

13. The envisaged activities for this action area are:

    • Systematically assess the potential ICT4D entry points during preparation the design of country strategic opportunities programmes (COSOPs) and projects, with special efforts to identify solutions promoting IFAD's cross-cutting priorities of youth, women, climate and nutrition;

    • Support countries in identifying barriers that prevent smallholders and rural households from using ICT-enabled solutions to increase productivity, climate resilience, market benefits and financial inclusion, and help to design appropriate strategies to overcome them;

    • Build on the existing use of geospatial and other technologies (see box 3) to improve geographic and beneficiary targeting in the design of COSOPs and projects , inform the targeting of IFAD's investments and monitor impacts; and

    • Once sufficient ICT4D capacity and experience have been built, engage in policy dialogue with governments and build partnerships to promote ICT4D for sustainable rural transformation.

> **Box 3**
> **Potential for scaling up the use of geospatial data in IFAD operations**
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> **Spatial targeting is central to IFAD's work,** including assessments of vulnerability, food security and access to markets. However, the quality of information varies from country to country. To overcome this challenge: (i) a minimum critical dataset can be created for each area; (ii) data on different issues can bundled into a form that is useful for COSOP design teams; and (iii) data can be disseminated to country offices to initiate discussions with IFAD colleagues and governments.
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> **The new COSOP guidelines and Social, Environmental and Climate Assessment Procedures (SECAP) templates present data spatially.** The new electronic format for COSOPs and project design reports enables the inclusion of embedded links to maps, graphics, associated statistics and text from GeoNode. Some types of datasets can also be automatically updated.
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> **Geospatial analysis can inform IFAD's choice of investments,** especially when coupled with a robust and context-specific theory of change. This should be among the Fund's priority applications.

14. **Action Area 2 – Strengthening ICT4D partnerships.** Partnerships are critical for IFAD and governments to increase rural development initiatives' scale, outreach, impact and funding (see appendix III). IFAD's partnership approach must be flexible enough to accommodate different types of collaboration, including government-led and public-private partnerships, co-investments and community-supported initiatives. It should cover a wide range of partnerships with: (i) global ICT technology providers; (ii) local national and regional providers, including niche actors in the fintech and digital agriculture space; and (iii) development partners that are actively addressing ICT infrastructure gaps – a necessary condition for any ICT4D intervention's success.

15. The envisaged activities for this action area are:

    - Promote partnerships (and strengthen existing ones) with a view to: (i) enhancing the delivery of ICT4D solutions to governments and beneficiaries; and (ii) build IFAD's own capacity, making special efforts to foster partnerships that support the inclusion of youth and women;

    - Use IFAD's expertise and convening power to encourage stronger dialogue and collaboration among stakeholders in the digital agriculture space, taking an active role in shaping global and regional ICT4D initiatives such as the International Digital Council for Food and Agriculture;

    - Establish partnerships to support the upgrade and expand IFAD's data collection, processing, and analytical capacity to inform and/or enhance the efficiency of the design of interventions;

    - Strengthen collaboration with the other Rome-based agencies in ICT4D based on complementarity (e.g. in the design of national strategies and projects, M&E and impact assessment through the use of geospatial technologies), and expand the sharing of data, products, services, analytical capacity and lessons learned; and

    - Build on partnerships such as that with the Centers for Learning on Evaluation and Results to establish the Program in Rural M&E (PRiME) for training and certifying government officials engaged with IFAD, and

strengthen IFAD country programmes' ICT4D capacities for measurement, monitoring and assessment of development results.[14]

16. **Action area 3 – Enhancing ICT4D knowledge management and sharing.** The objective of this action area is twofold. First, help IFAD staff involved in the design and implementation of the PoLG to deliver stronger results by (i) promoting more accurate and timely data collection and analysis on PoLG to inform future design and implementation and (ii) leverage on ICT4D knowledge produced by relevant stakeholders. To support this, ICT4D needs to be integrated into IFAD existing knowledge management (KM) systems and tools that form part of the IFAD's overall corporate KM system. Second, contribute to greater availability of knowledge products and data on ICT4D in agriculture as well as peer knowledge sharing.

17. The envisaged activities for this action area are:

- Promote the systematic and integrated management of project data and results to inform the design and implementation of future interventions;

- Increase the use of technology in M&E and impact assessment by: (i) increasing and improving the datasets currently used for these activities; (ii) expanding the tools to interrogate and disseminate that data (artificial intelligence and data science are fundamental in detecting trends and driving predictive analytics);

- Develop case studies, lessons learned, toolkits and templates related to the use of ICT4D in IFAD's operations, and host them in an IFAD-wide ICT4D repository along with external resources;

- Advancing knowledge and fill data gaps related to the use of ICT in agriculture and rural areas, including through the production of knowledge products;

- Organize knowledge-sharing events that foster peer-to-peer sharing of lessons learned from ICT4D projects;

- Promote a dedicated ICT4D community of practice that includes IFAD headquarters, sub-regional hubs, centres of excellence for South-South and Triangular Cooperation and knowledge sharing, and external experts; and

- Build on the existing work of IOE and IFAD's Research and Impact Assessment Division to expand the use of ICT-based tools for M&E and impact assessment and develop a common toolset to capture baseline, mid-line, end-line and annual outcome data.

18. **Action area 4 – Building internal ICT4D awareness, capacity and leadership**. Raising awareness and building capacity are key to accelerating the uptake of ICT4D in IFAD's work. Training and guidance in the use and potential of ICT4D solutions are critical for IFAD increasing the awareness of staff implementing the PoLG. It is equally important to ensure coordination among IFAD's divisions through clear leadership in order to avoid duplication and maximize synergies. The envisaged activities for this action area are:

- Develop and implement a training programme for building the expertise and competence of IFAD staff in ICT4D;[15]

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[14] Bangladesh: Promoting agricultural commercialization and enterprises. Project supervision report – main report and appendices, Rome: IFAD (2017a).
[15] IFAD is currently conducting an in-depth skills assessment to identify gaps to achieve its growth vision by 2030, and ICT4D is an area where such gaps will be clearly highlighted.

- Hire experts and create a roster of consultants to support the design of ICT4D interventions within IFAD's PoLG;

- Organize presentations and capacity-building events during regional and hub planning meetings, and regional implementation workshops highlighting success stories and opportunities for technology-driven interventions within each region;

- Raise internal awareness through communication initiatives about the potential of ICT4D to scale up impact, improve effectiveness and increase staff engagement in this area through internal events such as hackathons, bootcamps, brown-bag lunches and other communications;

- Develop incentives for IFAD staff to promote ICT4D in IFAD's PoLG – this could be done through performance indicators, dedicated ICT4D resources or internal recognition awards;

- Establish internal coordination mechanism for ICT4D initiatives to optimize the use of resources available to IFAD's staff; and

- Establish focal points within divisions in charge of implementing IFAD's strategies and policies including the Private Sector Engagement Strategy, Knowledge Management Strategy, and Environment and Climate Strategy to identify and establish entry points for implementing the ICT4D agenda (see appendix IV for a discussion of entry points)

4.3. Proposed implementation modalities

19. Considering the multi-disciplinary nature of ICT4D, a cross-departmental task team will be established to: (i) ensure the implementation and in-house coordination of related ICT4D activities; and (ii) maximize synergies with ongoing efforts. This task team will include staff from the Information and Communications Technology Division, the five regional divisions, the Sustainable Production, Markets and Institutions Division, the Environment, Climate, Gender and Social Inclusion Division, the Research and Impact Assessment Division, the Global Engagement, Partnership and Resource Mobilization Division and the Change Delivery and Innovation Unit.

20. A modular approach will be adopted to accelerate and expand the impact of the ICT4D strategy through selected investments in human resources, capacity-building, knowledge sharing, access to ICT4D solutions supporting the PoLG and internal collaboration. Task team activities will be funded through IFAD's existing budget while additional resources will be sought through existing and new partnerships. IFAD will also support one full-time equivalent staff and associated operational costs to facilitate the implementation of the strategy. Awareness raising and capacity-building of governments and beneficiaries – including in M&E and impact assessment – will be funded by embedding activities into IFAD's PoLG and private-sector interventions, and mobilizing resources through partnerships.

4.4. Implementation principles

21. The nine Principles for Digital Development,[16] established in consultation with other United Nations agencies and multilateral development banks to promote the inclusion of ICT in international development initiatives, will be IFAD's main reference for ICT4D activities. Five core criteria will inform the delivery of ICT4D activities in IFAD:

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[16] These principles are: (i) design with the user; (ii) understand the existing ecosystem; (iii) design for scale; (iv) build for sustainability; (v) be data driven; (vi) use open standards, open data, open source and open innovation; (vii) reuse and improve; (viii) address privacy and security; and (ix) be collaborative. See: https://digitalprinciples.org/.

(i) **Alignment with IFAD's mandate and corporate strategies**. This ICT4D strategy will be fully integrated into IFAD's corporate priorities, strategies, policies and action plans. Its implementation will be based on the ongoing work of IFAD's staff, who are already using ICT4D methods and tools. The ultimate goal is to enable the Fund to leverage ICT4D across its country programmes and projects for accelerated and stronger delivery.

(ii) **Development-driven selectivity of ICT**. ICT4D must be impact driven – not technology driven. ICT4D will be integrated within IFAD's projects to support rural transformation, tailored to local contexts (with variable connectivity and affordability of services).

(iii) **Responsible data.** Data are fundamental to inform evidence-based decisions and is increasingly important to development actors' value propositions. Given IFAD's unique focus on rural poverty, building a global dataset that encompasses many cross-cutting themes will enhance IFAD's impact on smallholders. Data quality, security and the ethics of data use will be top priorities in project design and implementation. To ensure this, IFAD will strive to strengthen its legal framework under the authority of the President and in line with the United Nations Personal Data Protection and Privacy Principles, and the Data Privacy, Ethics and Protection – a guidance note on big data for achievement of the 2030 Agenda, approved by the United Nations Sustainable Development Group. IFAD will also leverage on the work of other development partners: for example, WFP established a data governance framework in 2014 with policies and authorities that could inform IFAD's efforts in this area.[17]

(iv) **Prioritizing ICT building blocks**. As highlighted by the Digital Impact Alliance and the International Telecommunication Union (ITU), ICT4D initiatives tend to focus on the development of new products and services, leading to the duplication of efforts, waste of resources and disturbance of local technology markets. IFAD supports these principles for digital development designed for scalability and extensibility, and interoperability, based on international standards.

(v) **Do no harm.** IFAD will pursue a do no harm approach to minimize the harm caused by ICT4D interventions, and will strive to mitigate any possible negative impacts of the use of ICT4D. All ICT4D interventions and the use of ICT to inform decision-making will be in line with the values and obligations defined by the Charter of the United Nations and The Universal Declaration of Human Rights.

V. Reporting, measurement and monitoring

22. A comprehensive monitoring, evaluation and learning system will support the implementation of this strategy and track progress. The system will enable the collection of data and other information by mainstreaming corporate data-collection tools to measure results against the strategy's results framework (see appendix I). In collaboration with the interdepartmental Results and Impact Management System task force, existing indicators will be developed for this reporting and the organization's Operational Results Management System (ORMS) will be updated to ensure adequate reporting of results achieved through ICT4D initiatives. The system will also enable IFAD to document knowledge and support decision-making

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[17] The main reference for data protection in WFP is the Guide to Privacy and Personal Data Protection, built on five standards that inform personal data protection across the entire data-processing cycle.

and learning on ICT4D throughout IFAD. Regular progress reports will be shared with the Executive Board.

VI. Risks and mitigation measures

23. ICT4D use could lead to risks for IFAD, its partners and ultimately its beneficiaries. Technology risk includes the possibility that the digital solutions adopted will not deliver the expected benefits due to improper functioning or technology limitations (e.g. infrastructure, e-readiness). Implementation risk is related to the potential of failing to achieve the expected objectives and delivering the expected outcomes due to limited awareness, motivation, capacity among partners, or a lack of direct influence over ICT4D implementation. Financial risk is related to the erroneous costing of digital technologies or costs exceeding planned budgets as a result of exogenous factors. Finally, partnership risk refers to the: (i) possible lack of interest, commitment, and support from partners; and (ii) risk of harming beneficiaries because of unintended negative effects of the ICT4D intervention.

24. The below table describes the main mitigation strategies to address these risks. A detailed description of these strategies is provided in appendix V.

Risk	*Mitigation strategy*
Technology	Define realistic targets by considering countries' ICT infrastructure and readiness for technology adoption in ICT4D projects and programmes, and tailor applications to local conditions.
	Establish complementary partnerships.
	Raise awareness among staff and partners of cybersecurity and data-protection issues.
	Update existing systems and continuously review and implement robust security measures.
Implementation	Ensure full participation of local partners in project implementation.
	Maintain agile project management in the development of new products and services.
	Develop capacity of staff and partners designing and implementing ICT4D projects through training and partnerships.
	Establish procedures for the responsible use of data throughout the implementation of ICT4D projects.
	Raise awareness and capacity of staff and governments to innovate with ICT4D.
	Advance collaborative learning and knowledge sharing.
Finance	Conduct financial analysis with mitigating measures at the project design stage.
	Undertake realistic and cost-effective ICT4D budgeting based on estimations of ICT4D costs.
	Develop robust project budget management and control procedures.

	Partnerships with governments, other United Nations organizations, international financial institutions and private-sector actors to leverage more resources and expertise.
Partnerships	Raise awareness of the importance and urgency of leveraging ICT4D solutions for achieving the SDGs.
	Engage with governments, other United Nations organizations, international financial institutions and service providers.
	Set strict and clear rules about the terms of partnerships and the use of data and protection of the users.

VII. Conclusion

25. Ending poverty and hunger is the top priority of the 2030 Agenda for Sustainable Development. As a specialized United Nations agency and international financial institution focused on agriculture and rural development, IFAD must accelerate its efforts to promote the inclusive and sustainable transformation of rural areas in developing countries. ICT4D offers valuable opportunities for IFAD to strengthen its development impact and enhance the design, management and reporting of its operations' results. The objective of this ICT4D strategy is to establish a strategic direction, action areas and guiding principles for leveraging ICT4D to achieve the Fund's Strategic Objectives and organizational priorities.

Results Measurement Framework

The results indicators used to measure the success of the ICT4D strategy are:

Code	Indicator	Responsible Team
Action area 1	Scalable uptake of ICT4D solutions	
1.1	Number of Country Strategic Opportunities Programmes (COSOPs) or Country Strategy Notes (CSNs) identifying ICT4D opportunities to advance development results	Programme Management Department (PMD)
1.2	Number of projects and grants with evidence of improved productivity that incorporate ICT4D solutions	PMD
1.3	Number of projects and grants with evidence of improved benefits from market participation that incorporate ICT4D solutions	PMD
1.4	Number of projects and grants with evidence of strengthened climate resilience that incorporate ICT4D solutions	PMD
1.5	Number of projects that have integrated the use of ICT4D in the design (targeting), M&E, or impact assessment	PMD/ Research and Impact Assessment Division (RIA)
1.6	Number of interventions designed with geospatial technologies for geographic and beneficiary spatial targeting	ICT4D Task Team
1.7	Number of projects embedding ICT4D solutions into their design and implementation modalities	ICT4D Task Team
1.8	Number of policy-relevant knowledge products completed including IFAD promoted ICT4D in agriculture and rural development.	ICT4D Task Team
Action area 2	Strengthening ICT4D partnerships	
2.1	Number of partnerships established in the area of ICT4D	GPR
2.2	Resources (monetary and in kind) mobilized through partnerships in ICT4D solutions	GPR
2.3	IFAD participation in international, regional and national level initiatives on ICT4D for sustainable	ICT4D Task Team

Code	Indicator	Responsible Team
	rural transformation.	
2.4	Number of collaborative activities / projects with Rome-based agencies	ICT4D Task Team
Action area 3	Enhancing ICT4D knowledge management and sharing	
3.1	Number of knowledge products and tools developed to inform ICT4D use in IFAD's PoLG	ICT4D Task Team
3.2	An ICT4D repository operational	ICT4D Task Team
3.3	An ICT4D community of practice operational	ICT4D Task Team
3.4	Number of users of the information repository by IFAD staff	ICT4D Task Team
3.5	Number of design processes informed by use of ICT4D tools	ICT4D Task Team
3.6	Number of projects using ICT-based tools for M&E and impact assessment	RIA/PMI
Action area 4	Building internal ICT4D awareness, capacity and leadership	
4.1	Number of trained IFAD staff actively applying ICT4D knowledge in their area of responsibility	HRD and ICT4D Task Team
4.2	Number of technical trainings on ICT4D delivered to IFAD staff	HRD and ICT4D Task Team
4.3	Number of presentations and capacity building events organized during regional and hub planning meetings/retreats and Regional Implementation Workshops	ICT4D Task Team
4.4	Number of staff engaged as focal points and drivers of change in for IFAD ICT4D agenda	HRD
4.5	Number of events to raise internal awareness about the potential of ICT4D to scale up impact, improve effectiveness of interventions and increase staff engagement	ICT4D Task Team

Selected examples of IFAD's ICT4D projects and applications to date

1. Financial inclusion projects

IFAD has been promoting financial inclusion through ICT-based solutions both through its PoLG and special facilities. On the PoLG, in early 2018, IFAD's financial inclusion team conducted a mapping exercise of all ongoing financial inclusion projects and activities financed by IFAD including ICT-based activities. As at 31 December 2017, ICT4D activities within financial inclusion projects comprised 17 projects, listed in the below table.

Country/Region	Project Name
Afghanistan	Rural Microfinance and Livestock Support Programme
Cambodia	Accelerating Inclusive Markets for Smallholders
Bolivia	Economic Inclusion Programme for Families and Rural Communities in the Territory of Plurinational State of Bolivia
Colombia	Building Rural Entrepreneurial Capacities Programme: Trust and Opportunity
Egypt	Promotion of Rural Incomes through Market Enhancement Project
Ethiopia	Rural Finance Intermediation Programme II
Kenya	Programme for Rural Outreach of Financial Innovations and Technologies
Kyrgyzstan	Access to Markets
Kenya	Kenya Cereal Enhancement Programme (KCEP)
Nepal	Samriddhi - Rural Enterprises and Remittances
Nepal	Kisankalagi Unnat Biu-Bijan Karyakram
Philippines	ACCESS DIASPORA
Senegal	Agricultural Development and Rural Entrepreneurship Programme (PADAER I)
Swaziland	Rural Finance and Enterprise Development Programme
Uganda	Project for Financial Inclusion in Rural areas
Zambia	Rural Finance Expansion Programme
South Asia, East and Southern Africa, West Africa, Latin America	Inclusive Rural Finance for Smallholder Families and Other Vulnerable Groups Programme

The results of three initiatives are hereby presented: (a) the e-voucher system launched by the Kenya Cereal Enhancement Programme (KCEP); (b) the remote sensing-based index insurance launched in Senegal within the Agricultural Development and Rural Entrepreneurship Programme (PADAER I); and (c) the Inclusive Rural Finance for Smallholder Families and Other Vulnerable Groups Programme.

(a) The **e-voucher system**, introduced by the **Kenya Cereal Enhancement Programme (KCEP)** and launched with the support of the European Union (EU), is an electronic platform to improve smallholder farmers' agricultural productivity and to transition to a market-oriented and commercial agricultural system. After registering on a web portal, farmers open bank accounts with Equity Bank Limited (EBL) and are issued with customized debit (ATM) cards containing different 'e-wallets' which they can use to purchase farm products or inputs from selected agro dealers. There is an e-wallet for each of the different products offered, so that farmers can distribute their funds across

different expenses. At the same time, financial literacy training and a weather-based crop insurance scheme are offered.

Farmers using e-vouchers are referred to participating agro-dealers depending on their stocking capacity. This creates a fair distribution system with a good farmer-to-agro-dealer ratio, ensuring inclusivity and coverage. The electronic platform ensures that payments made to the agro-dealers are both immediate and traceable. The agro-dealer's trade is not restricted to programme farmers, and the farmers are not obliged to buy from programme agro-dealers for their other farming activities.

The institutional and technological innovations introduced since early 2016 under KCEP have produced results in terms of efficiency, transparency and reducing linkages and corruption. Within the first two years:

- Governments, both national and in the targeted counties, have seen the added value and potential of the e-voucher in terms of agricultural modernization, acknowledging the programme as one of the national flagship initiatives.

- A total of 23,622 smallholder farmers (48% women, 17% young women and men) out of a target of 40,000 have accessed e-voucher products.

- The value of the total transacted e-voucher inputs amounts to some US$4.7 million over three consecutive cropping seasons.

- Empirical results show that farmers with access to e-vouchers for inputs had higher agricultural productivity than those without.

(b) Thanks to the Agricultural Development and Rural Entrepreneurship Programme (PADAER I), the **remote-sensing based index insurance** was introduced in Senegal.

As opposed to 'traditional' indemnity insurance, index insurance is built on historical data, and it uses current season data to verify when a payment is triggered. Generally, all farmers within a given area purchase the same policy, for the same price, and receive the same payouts when the index triggers. The reduced administrative costs and the simplified and automated claims processes make index insurance more accessible for smallholder agriculture. The standardized nature of the product also means that it can be bundled with other services, such as credit or inputs, and delivered through aggregators. It protects against covariate risks which affect many people in the same area and at the same time, be it a local area, across a region or a whole country.

However, limited availability, accessibility, quantity and poor quality of data on the ground are some of the primary technical constraints preventing scale-up and sustainability of index insurance. Without sufficient quality data, either it is impossible to design products for some areas and countries, or products that are designed can become unreliable, not compensating when they should.

One of the main risks faced by smallholder farmers in the PADAER is drought. PADAER I supported farmers' organizations with a package of inputs and services. Using satellite data or 'remote sensing' enabled expansion of index insurance to regions where populations are dispersed, and ground data is lacking and difficult to acquire. With financing from the Agence Française de Développement, the IFAD-WFP Weather Risk Management Facility partnership, of the Platform for Agricultural Risk Management, worked with the R4 Rural Resilience Initiative, its private sector collaborators in-country, and PADAER.

Index insurance based on remote sensing was introduced in the package of inputs and services for members of farmers' organizations in PADAER. By 2017, smallholders in 69 PADAER farmers' organizations and unions within Kolda and Tambacounda were participating. Farmers received payouts due to poor rainfall in 2015 and 2016. Further scaling-up is planned in PADAER II.

Index insurance based on remote sensing is now being assessed for use in other IFAD-financed projects working on crop insurance, including: RUFEP in Zambia, PASIDP II in Ethiopia, ASPIRE in Cambodia, VODP II in Uganda, and KCEP-CRAL in Kenya.

(c) The **Inclusive Rural Finance for Smallholder Families and Other Vulnerable Groups Programme** is a five-year IFAD grant to the Consultative Group to Assist the Poor (CGAP). Since 2017, the programme contributes to global effort to enhance development of innovative solutions for financial inclusion through practical research and active engagement with financial service providers (FSPs), policymakers and other partners. Participating rural FSPs benefit from improved client metrics, market intelligence and expanded digital solutions for smallholders, women and other vulnerable groups. Indirect target groups that will ultimately benefit from this grant include: rural women, youth and vulnerable households; smallholder farmers dependent on agriculture for subsistence and/or income; and migrants, refugees and internally displaced people (IDPs).

The workstream on vulnerable groups such as migrants, refugees and IDPs, women and youth builds on CGAP data and analysis (e.g. Financial Inclusion Insights, Finscope, Global Findex) and from the financial diaries and national surveys of smallholder households, and incorporates the results of other data-collection efforts. Grant activities related to financial inclusion are designed to expand the evidence base for financial inclusion among vulnerable groups, as well as other groups excluded from the financial solutions they need to manage their lives.

The other main workstream on digital financial solutions for smallholder families (farming and rural enterprise) focuses on more-extensive client information and specific financial solutions that meet particular client needs. These experiences help FSPs better understand and their clients and seize opportunities to leverage relevant technology, e.g. through digitizing agricultural value chains, to increase outreach, expand their portfolio of solutions and lower delivery costs.

Some of the results after less than three years are the following:

- **Understanding how companies that finance assets for the poor (e.g. PAYGo Solar) manage the risk of their lending portfolios in order to develop guidance on best practices.** CGAP has launched a pilot between a microfinance company (MicroCred) and an asset financing company (Baobab+) to test the possibility of pooling best practices from each. CGAP has engaged an experienced venture capital investor to lead this workstream and partnered with International Finance Corporation and the Global Off Grid Lighting Association (GOGLA) on this.

- **Managing FinEquity, the women's financial inclusion community of practice (COP).** FinEquity continues to update members on developments in women's financial inclusion through Digital Financial Services (DFS), including data & measurement, social norms, and technology.

- **Exploring innovations in technology and business models.** CGAP generates insights and advice for IFAD and its other members as well as other stakeholders to enable providers to offer affordable, responsible, and accessible financial solutions to poor people. CGAP will also identify areas where more in-depth work is necessary.

- **Scaling the basic enablers of DFS.** CGAP has completed an internal strategy on how CGAP's policy work can build the capacity of policymakers. A technical note on rules on safeguarding customer funds held by e-money issuers has been issued. Three more technical notes targeting regulators on (i) new licensing categories (e-money issuers, limited purpose banks such as payments banks, and digital banks), (ii) agent types and structures, and (iii) on risk-based customer due diligence have been drafted.

- **Linking excluded women to markets through e-commerce platforms.**
  To start and grow their enterprises, female entrepreneurs and value-chain suppliers worldwide leverage a range of digital platforms, from simple social networking platforms such as Facebook ("f-commerce") to formalized e-commerce platforms that offer a range of integrated business services. These informal and formal developments offer new opportunities for women's economic benefit and inclusion and could also offer access to a range of financial services (e.g. payments, credit, financial literacy enhancement, transfers), both associated with and apart from their commercial transactions. CGAP is exploring the hypothesis that the increasing adoption of e- and f-commerce will drive faster adoption of digital financial services among excluded and under-served women and promote their economic, financial, and social inclusion.

Further work in the use of ICTs to promote financial inclusion has been done through the **Financing Facility for Remittances**, thanks to which projects have been implemented in Kenya, Uganda, Malaysia, Pakistan and Bangladesh. In Kenya and Uganda, the FFR is partnering with Equity Bank to provide low-cost, cross-border mobile money transfers across the Kenya-Uganda corridor, linked with savings, loans and other financial services.

In the corridors between Malaysia and Pakistan and Bangladesh, FFR is partnering with ValYou, a Mobile Network Operator (MNO) to allow migrant workers originating from rural areas and their families to use a low-cost app and a wallet-based mobile-enabled remittance system, and providing the target group remittance recipients access to additional financial services that meet their needs. In 2018, over 11,354 new wallets were created in favour of Pakistani migrant workers in Malaysia who send money to Pakistan, exceeding the original goal.

In Bangladesh, the newly-launched wallet-to-wallet integration with bKash and Rocket received an overwhelming response, with over 44,262 new wallets created at the sending side in just 18 months for Pakistan and 11 months for Bangladesh. The ValYou Mobile Wallet App is Malaysia's first mobile wallet providing international remittances with the Application Programming Interface connecting to major corridor banks/financial institutions. ValYou is the only MTO connected to the EasyPaisa wallet directly for Pakistan, enabling remittance receivers to cash out at over 80,000 cash-out points. For Bangladesh, ValYou is the first wallet-to-wallet integration system, with over 170,000 cash-out points. To further enhance customer loyalty, ValYou also launched domestic and international Telco top-up services for over 13 countries, enabling senders to perform airtime top-up for their loved ones back home.

2. IFAD projects supporting increased access to information and markets through ICTs

The *PROMAFI* project in Paraguay entered into force in November 2018 and it will implement actions directed to increase the ITC access of smallholders (target: 2,435 farmers using ITC). The project supports the development of a free Search Engine to improve access to agricultural information and technical advice on production and marketing. The information will be accessed through basic phones using SMS or phone calls and without need for internet. The service will be offered through a strategic collaboration with one mobile network operator.

The *Developing geo-referenced socio-economic data system and information for effective rural planning and development in isolated regions of Peru* is a grant under implementation by UNFPA in Peru. The programme aims at developing a system of a geomatics and geo-spatial regional database to provide policy-makers with an innovative and high-technological instrument to develop more suitable and diversified programs to address the needs of the populations. The project will pilot the instrument in the VRAEM (valley of the Apurímac, Ene and Mantaro rivers) region, one of the most isolated and poorest regions of Peru.

IFAD has been pioneering the use of ICTs to provide rural people's access to key information for their livelihoods via mobile phones, the Internet and email, since the 2000s.

In Tanzania[18], an early IFAD ICT4D project showed value after just one agricultural season, as the farmers agreed on the significant impact on their access to markets, their production, and their incomes. The farmers demonstrated to be particularly responsive to the increased opportunity provided by market access and a fair price: some smallholder farmers doubled or even quadrupled their market volume. The return on investment was also particularly high: project activities contributed to a gross increase in income of beneficiaries of more than USD 1.8 million with an initial investment of USD 200,000. In Zambia, an IFAD-funded smallholder enterprise marketing programme in cooperation with the Zambia National Farmers Union (ZNFU), supported the design of a communication service to provide farmers with accurate and up-to-date agriculture and market information covering the entire value chain. The service enabled smallholder producers to make informed decision about what to grow, volumes required, storage, processing, marketing and investment opportunities. Evidence showed that access to the service established through the IFAD-funded programme better enabled smallholders and traders to access and use relevant, up-to-date, and actionable information to shape decision-making[19].

3.   IFAD engagement with geospatial technologies

IFAD is very actively engaged in geospatial data. The below table lists a selection of the geospatial initiatives undertaken by IFAD since 2012.

Initiative	Time	Countries
Development of undernutrition maps of Bangladesh	2012	Bangladesh
Study on climate change impacts on pastures and livestock systems in Kyrgyzstan	2013	Kyrgyzstan
Support to herding from space in Niger	2013	Niger
Vulnerability assessment	2013	Yemen
Micro watershed level characterization in Cape Verde	2013-2019	Cape Verde
Use of GIS and Earth Observation technology for drainage problem and maladaptation of rice production systems in Cote D'Ivoire	2014-2020	Cote D'Ivoire
Use of Earth Observation tools for better project design	2015	Morocco
Mapping pilot sites, targeted basins and agricultural commodities in Cameroon	2015-2021	Cameroon
Landscape rehabilitation in Nigeria	2015-2021	Nigeria
Climate vulnerability assessment in Niger	2015-2023	Niger
Conflict impact on irrigation systems in Iraq and Syria	2016	Syria, Iraq
Development of El Niño Southern Oscillation (ENSO) Country Profiles	2016	Bhutan, Cambodia, Indonesia, Lao People's Democratic Rep, Viet Nam, Philippines, Angola, Ethiopia, Lesotho, Madagascar, Malawi, Mozambique, Swaziland, Zambia,

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[18] Clive Lightfoot, Helen Gillman, Ueli Scheuermeier, Vincon Nyimbo "The First Mile Project in Tanzania," Mountain Research and Development, 28(1), 13-17, (1 February 2008).
[19] Terry Leahy, Debbie Jean Brown. (2016) 'People are Trying to be Modern': Food Insecurity and the Strategies of the Poor. Forum for Development Studies 43:3, pages 489-510.

		Zimbabwe, Argentina, Colombia, Dominican Republic, Guatemala, Peru, Djibouti, Egypt, Turkey, Congo(The Democratic Republic), Liberia, Nigeria, Sierra Leone
NATRIPAL CADT and Advocacy Project (Indigenous Peoples Assistance Facility)	2016-2017	Philippines
Service provision for cocoa value chain development (Component C)	2016-2023	Benin
Evaluation of an irrigation project in Georgia	2017	Georgia
Projet d'amélioration de la résilience des systèmes agricoles au Tchad (PARSAT)	2017-2018	Chad
Coffee and cocoa value chain study in Comoros	2017-2022	Comoros
Geo-referencing for water table trend appraisal	2017-2025	Mauritania
Development of a water balance model	2018	Cape Verde
Development of a remote sensing tool for index insurance	2018	Senegal
Monitoring shearing shed locations	2018	Lesotho
Including the Family Resilience Model into baseline surveys of new projects	2018/2019	Dominican Republic, Guyana, Nicaragua
Impact assessments with incorporating climatic variables	Ongoing	Uganda, Bangladesh, Ethiopia, Mexico, Senegal, Indonesia, Tajikistan, Chad, Malawi
Support to pasture monitoring in Kyrgyztan	Ongoing	Kyrgyzstan
Geo-referencing poverty in ESA using MPAT tool	Ongoing	Tanzania, Zimbabwe, Seychelles, Kenya, Lesotho, Swaziland
Support to climate analysis for 24 countries	Ongoing	Burkina Faso, Ghana, Nigeria, Senegal, Chad, Djibouti, India, Morocco, Cape Verde, Cameroon, Mauritania, Niger, Azerbaijan, Congo(The Democratic Republic), Congo, Benin, Gambia, Moldova, Mali, Montenegro, Liberia, Kyrgyzstan, Tajikistan, Turkey

The below table lists grants that were recently funded by IFAD where geospatial technology has been incorporated.

Grant name	Time	Countries
Smart Information and Communications Technology (ICT) for Weather and Water Information and Advice to Smallholders in Africa	2011-2014	Egypt, Sudan, Ethiopia
The Land and Natural Resource Tenure Security Learning Initiative in East and Southern Africa (TSLI-ESA II)	2013 - 2018	Kenya, Uganda
Geo-referenced RIA impact assessments	2015	China
Watershed development in Gambia (CHOSSO project)	2015 - ongoing	Gambia
Earth observation for decision-making in West and Central Africa (EODM)	2016 - 2019	Cameroon, Mali, Senegal
IFAD/ICRAF grant on Earth Observation in East Africa	2017 - 2021	Swaziland, Uganda,

working with the Land Degradation Surveillance Framework (LDSF)		Malawi, Lesotho, Kenya
Mainstreaming adaptation (and mitigation) into IFAD country strategies & investments through better use of geo-spatial data, tools and analysis	2019 - 2021	5 regions

Among notable initiatives, in Yemen IFAD invested in the combined application of GIS modelling, earth observations and social vulnerability assessments for climate change vulnerability mapping. Thanks to the appropriate use of these technologies, IFAD staff was able to identify target areas and communities according to their vulnerability to climate change, and to set out infrastructural adaptation plans according to local risk levels and the needs of the rural population (e.g. designing plans for building retaining walls, establishing water catchment ponds, dry wall terraces and other key infrastructure). This approach not only improved targeting by reducing biases in project design, but also advanced the development of monitoring and evaluation systems to assess project achievements[20].

IFAD-supported Adaptation for Smallholder Agriculture Programme (ASAP) enhanced stakeholder access to high quality data and diagnostic evidence on ecosystem health and household resilience, as well as the capacity to use such data and evidence to strengthen the design, monitoring, and ongoing refinement of programme interventions and investments.[21]

Pilots in earth observation and spatial analysis approaches has also shown the potential for the use of ICTs to target, monitor and assess programme outputs and outcomes. Geospatial data are used to support IFAD operations throughout the entire project cycle (IFAD Social Reporting Blog, 2019)[22]. Within this framework, geospatial technologies have been applied for more rigorous impact assessments, under the IFAD Development Effectiveness Framework (2016) and IFAD Impact Assessment Agenda. For example, to assist and improve the organization's effectiveness and efficiency in managing and supervising projects/programmes, IFAD has been using drones in Global Environment Facility (GEF) funded projects in its supervision mission in Africa (e.g. project PARSAT in Chad and Prodaf in Niger) to improve data collection and analysis for decision-making which can also augment the knowledge management in the region. In Uganda the ICT division helped improving the organization and partners' ability to carry out data collection and processing, integrating sophisticated vector-raster analysis, statistical computations and 3D visualization.

Another key tool supporting staff operational capabilities is the Geographic based project information system (GeoNode), which is a corporate GIS-based platform designed to effectively manage, visualize and share GIS and Earth Observation data at IFAD. Among its functions, it brings GIS capabilities into the Operational Results Management System (ORMS), providing project location visualization for central access point by project teams as well as automatically embedding the maps within design reports. It supports knowledge management, decentralisation and transparency in IFAD's operations.

IFAD staff working in the area of geospatial technologies established a technical network to expand and improve their use of such technologies, which contributed to mainstreaming geospatial technologies across 57 initiatives in 73 countries across 11 divisions. Within this framework, IFAD hosted so far 11 earth observation clinic visits (meetings between Earth Observation and GIS experts and IFAD staff). Most of the work is handled by an active Geo Group working in partnership with key geospatial partners, such as the ESA and WFP to explore and utilise EO data. The technical network is

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[20] Gilbert Houngbo (2017). In: ITU. "Fast-forward progress: Leveraging tech to achieve the Global Goals". Geneva, Switzerland: ITU.
[21] IFAD. (2017b). Beyond the Static – Operationalizing Earth Observation Assisted Frameworks for Assessment and Monitoring of Ecosystem Health in IFAD ASAP Project Areas. Retrieved from http://www.worldagroforestry.org/sites/default/files/icrafIFAD_EO_summary-.pdf.
[22] IFAD Social Reporting Blog. (2019). THE IMPORTANCE OF GEOREFERENCING YOUR PROJECT INTERVENTIONS – THE CASE OF CAMEROON. Retrieved from http://ifad-un.blogspot.com/2019/02/the-importance-of-georeferencing-your.html.

particularly active in raising awareness, sharing experience and achievements through events such as the Geo Days. In 2019, members of the technical network received a grant to mainstream adaptation (and mitigation) into IFAD country strategies & investments through better use of geo-spatial data, tools and analysis.

5. Pilot projects established through the Innovation Challenge

The Innovation Challenge launched by IFAD in 2019 collected proposals from IFAD staff. Engagement was extremely high, testifying the value that staff sees in innovative intiatives. As an outcome, IFAD's EMC highlighted the need to continue to invest in mechanisms like the Innovation Challenge to nurture innovation at IFAD by piloting new ideas, capturing lessons learnt and scaling up successes.

Out of fifty proposals, ten were selected (two of which were merged into a single one) and awarded a total of 709'000 USD. Eight of the resulting nine winning proposals directly leverage ICT to achieve IFAD's strategic development objectives. Four of them have a geospatial focus: (a) Geo-scan solution for a rapid spatial data collection and dissemination on a country basis; (b) Integrating Indigenous Peoples Lands in Operations (IIPLO); (c) Leveraging on Artificial Intelligence and Big Data for IFAD2.0; and (d) Systematic Integration of GIS and Earth Observation Innovations in IFAD Operations and Corporate M&E Systems.

The below table lists the basic description of the proposals in the area of ICT4D, and the amount they received.

Description	Funding US$
Fields room and Connecting Lives – A virtual reality experience (ideas to be merged)	120,000
Systematic Integration of GIS and Earth Observation Innovations in IFAD Operations and Corporate M&E Systems	100,000
Geo-scan solution for a rapid spatial data collection and dissemination on a country basis.	74,000
Leveraging on Artificial Intelligence and Big Data for IFAD2.0	83,000
Digitalization of Business Plans within IFAD projects	100,000
Crowdfunding 2030. A joint effort for the SDGs*	60,000
Integrating Indigenous Peoples Lands in Operations (IIPLO)	100,000

Achievements from key ICT4D partnerships

Annex III discusses a sample of three existing partnerships that IFAD established in the ICT4D area of work with the European Space Agency (ESA), Intel Corporation, the World Food Program (WFP).

1.   Partnership with the ESA

Partner name:	ESA
Country/Region:	Botswana, Gambia, Madagascar, Niger, São Tomé and Príncipe, and Vietnam.
Dates: Year Start/ Year End:	2008 – present
Purpose of the Partnership	ESA began collaborations in 2008 with a strategic player in the domain of agriculture; IFAD. Initially, three small-scale activities focussed on Madagascar, but these laid the ground for five more substantial demonstration projects that began in 2010. IFAD found particular use in (such as Sentinel 2).
Key Partner Obligations / Contributions	ESA provides free access to open-source data from ESA satellites, as well as support to capacity building of IFAD staff, project teams and the partner governments.
Impacts/Key outcomes:	A series of trials were implemented, supporting the identification of rice acreage, inundation areas and land parcels in Madagascar, supporting analysis of land use, land cover and crop monitoring in Niger, Gambia, Botswana and São Tomé and Príncipe, Vietnam. Particularly, the following activities were funded: • Land use/land cover and erosion risk in Niger • Land use/land cover and crop type monitoring in the Gambia • Land use/land cover and crop health monitoring in Botswana • Forest monitoring in São Tomé and Príncipe • Historical change monitoring in Vietnam ESA contributed to provide technical support to IFAD's Adaptation for Smallholder Agriculture Programme (ASAP), particularly for project baseline assessments and impact monitoring in agriculture projects. Finally, ESA supported capacity building of IFAD staff, project teams and the government counterparts in different areas of the world (e.g. Ethiopia, 2018) to increase the uptake of geospatial technologies in different stages of project cycles (planning, preparation, implementation, monitoring and evaluation)..
Lessons learned/Keys to success:	The collaboration was instrumental to raise awareness within IFAD about how Earth observation technology can be customised to IFAD activities around the globe (i.e. including but not limited to assisting in establishing country strategy plans, assessing food security, managing water and adapting to climate change). Within this framework, the partnership proved to be a key driver for expanding the use of Earth Observation technology in IFAD-financed project design, specifically to tackle climate change issues. A key factor for partnership success was the scalable process established: the first successful trials conducted in Madagascar led to the trials in other 5 countries, and then beyond. Finally, another key factor for partnership success was the particularly high commitment and interest of a critical mass of staff, which supported the establishment of a network of staff using geospatial technologies in their work as well as promote mainstreaming of such technologies across the organization.
Information Sources	https://www.spacefordevelopment.org/wp-content/uploads/2018/11/Space4IDA-FINAL-V1.pdf https://www.esa.int/Our_Activities/Observing_the_Earth/Developing_agriculture_from_the_sky https://ifad-un.blogspot.com/2014/10/mapping-future-for-smallholder-farmers.html

	https://ifad-un.blogspot.com/2018/02/eo4sd-agriculture-and-rural-development.html https://www.eo4idi.eu/sites/default/files/publications/eo4sd_agri_v3.pdf http://eo4sd.esa.int/2016/11/10/agriculture-and-rural-development-theme-overview/

2.   Partnership with the Intel Corporation

Partner name:	Intel Corporation
Country/Region:	Cambodia
Dates: Year Start/ Year End:	2014 - present
Purpose of the Partnership	Support the efforts of the government of Cambodia to export over 1 million tons of rice a year.
Key Partner Obligations / Contributions	Intel provided free access to the farming apps, called the eAgro suite, developed as part of the Intel-Grameen partnership, and provided free technical support for scalable uptaking of the solution across different areas as well as replicate it in other countries.
Impacts/Key outcomes:	Intel Corporation delivered innovative ICT tools to local entrepreneurs across 210 locations in Cambodia to help farmers testing soil, buying seeds and connecting to markets. Particularly, smallholder farmers have been provided a step-by-step software program to analyze soil, determine fertilizer requirements, receive advice on best seeds to use and how to manage pests and diseases. Beyond the project in Cambodia, the partnerships allowed engaging Intel Corporation to test ICT4D solutions in four clusters (Pinghale, Uttarganga, Sano Surkhet and Mahelkuna) in the Surkeht District of Nepal in 2015.
Lessons learned/Keys to success:	A key factor for the success was the complementarity of capacity and expertise between IFAD and Intel This allow expanding access to IFAD's knowledge expertise at a fraction of the cost. Another key factor for the success was the explicit inclusion of sustainability and scalability in the design of the ICT4D initiative, which allowed the rapid scaling-up of the ICT solution offered to farmers. Partnerships created positive spillovers in terms of access to technical capacity tu undertake activities in other countries (Nepal).
Information Sources	https://www.ifad.org/en/web/latest/news-detail/asset/39070734 https://www.intel.com/content/dam/www/public/us/en/documents/solution-briefs/iot-agriculture-farm-to-fork-brief.pdf https://news.itu.int/ending-hunger-achieving-food-security-improving-nutrition-promoting-sustainable-agriculture/

3.   Partnership with the WFP

Partner name:	WFP
Country/Region:	Global
Dates: Year Start/ Year End:	June 2014 – July 2019 Partnership will continue in Q3 of 2019
Purpose of the Partnership	The IFAD-WFP Joint Climate Analysis Partnership provides climate assessments to IFAD operations. It aims to fully mainstream climate-considerations into COSOP project design and implementation. IFAD and WFP are doing this by jointly financing a senior climate expert who brings in climate expertise, methodology and data from WFP into IFAD, and closely works together with ECG and ICT to build up climate information services in IFAD.
Cost/funding (if any):	2016 - 2019 funded by Adaptation for Smallholder Agriculture Programme (ASAP) 2019 - 2020 funded by Adaptation for Smallholder Agriculture Programme II (ASAP2)
Key Partner Obligations / Contributions	Historic climate analysis provided to IFAD operations in 42 countries: • Inputs provided to 27 COSOP and project designs, 3 project M&E and 15 SECAPs • 1 impact assessment of irrigation of Agricultural Support Project in Georgia • Detailed climate analysis undertaken for 5 countries (Iraq, Niger, Mozambique, Swaziland and Lesotho) • Analysis of conflict impacts on irrigated agriculture for Syria and Iraq • Support establish a pasture monitoring system in Kyrgyzstan • 34 ENSO IMPACTS profiles - el nino la nina impact (anomalies vs neutral conditions) on rainfall and normalized difference vegetation index (NDVI)
Impacts/Key outcomes:	IFAD design teams are informed about historic climate trends and variability, mainly on precipitation, NDVI and temperature, and take these into account in COSOP and project design
Lessons learned/Keys to success:	• Better internal coordination is needed to raise awareness on the benefit of earth observation and GIS, and coordinate geospatial requests • Geo-referenced data of households and project activities needs to be collected to conduct impact assessments
Information Sources	• ASP Impact Evaluation (see here) • Detailed climate assessment for Lesotho, Eswatini and Mozambique (see here) 34 ENSO IMPACTS profiles (see here)

Key ICT4D entry points for IFAD's strategies, policies, and action plans

Some of the existing IFAD strategies, policies, and action plans, offer crucial indications on the needs and potential use of ICTs across the organization.

1. **Private Sector Engagement Strategy (2019-2024)**

   - ICT4D can directly help achieving the two main objectives of the private Sector Engagement Strategy.

   - Funding opportunities for service providers leveraging ICT4D solutions to support IFAD's target groups could be expanded through IFAD private sector investments. This way, the ICT4D strategy will support the mobilization of private funding and investments into rural MSMEs and small-scale agriculture.

   - The ICT4D strategy will prioritize the adoption of appropriate ICT solutions to expand markets, increase income and job opportunities and strengthen resilience for IFAD's target groups. ICT4D solutions that facilitates the integration of smallholder farmers and rural men and women into global/regional/domestic value chains will be promoted across the PoLG. Moreover, IFAD will promote partnerships with companies providing cost-effective digital solutions in the area of financial inclusion, climate change adaptation, access to inputs and information, and agricultural risk management.

2. **Climate Change and Environment**

   - IFAD's Climate Change Strategy foresees a greater use of new tools and approaches, underlining the need to improve the relevance and quality of climate-related information to smallholders. It highlights current efforts undertaken to strengthen smallholder farmers' financial security in light of climate change and natural disasters, improving community-based adaptation efforts, and building resilience through the use of ICTs.

     Among key deliverables, it specifically foresees the generation and development of appropriate technologies that blend local and technical knowledge through country and global research grants.

   - IFAD's Strategy and Action Plan on Environment and Climate Change (2019-2025) includes ICTs among those technology improvements that can promote environmental sustainability and climate resilience. Particularly, it refers to: (a) new ICTs that can promote adaptation and improved risk management, enabling more comprehensive information gathering; (b) use of ICTs to improve smallholders' access to weather forecasts and market information, thus helping them to better plan agricultural production, obtain better prices and access agricultural extension services; and (c) use of ICTs to open up new market opportunities for green products through e-shops.

     The Strategy and Action Plan also stress the key contribution of ICTs to achieve improved monitoring and evaluation, particularly referring to the use of "quantitative indicators tracked through IFAD's ORMS, complemented by additional information from qualitative indicators, participatory assessments, case studies and other methods."

3. **Knowledge Management**

   - The implementation of the 2007 KM strategy made the case for increased use of ICTs, having driven improvements in technology infrastructure, as well as an increase in the development and dissemination of knowledge products.

- The 2018 KM Strategy and Action Plan highlighted gaps and needs that provided further justification to the expanded use of ICTs with the ultimate goal of increasing efficiency and effectiveness. Among gaps, the strategy mentions fragmentation of information, and lack of specific capacities to manage knowledge effectively. Among needs, the strategy advocates for strengthening the collaborative work of staff, especially in decentralized offices.

  The Strategy also foresaw an increased use of technology across PoLG (especially grants), the expanded adoption of user-centered approaches (consistently with Principles for Digital Development promoted in the ICT4D Strategy).

  Finally, the Strategy identified key priority actions where the ICTs will play a pivotal supporting role: (a) promote virtual collaboration among staff; (b) develop pre-project design knowledge packages for project delivery teams (through pilots); and (c) establish interactive knowledge exchange systems.

4. Innovation

- The Innovation Strategy represents a natural ally for the effective implementation of the ICT4D Strategy, as demonstrated with the organizational Innovation Challenge. For the more, the strategy explicitly foresees the use of "easy-to-use collaborative software" as part of its implementation.

5. Partnership

- IFAD's Partnership Strategy provides entry points to partner for increasing the efficiency of the organization as well as incorporating ICTs in its programs. One of the four categories of partnership identified promotes improved organizational efficiency through an appropriate ICT environment (inter alia). The Strategy also highlighted the need to partner with private-sector players for "increasing information and communications technology activities in IFAD-supported programmes".

6. Rural Finance

- The Rural Finance Policy highlights the key role of innovative tools and approaches to expand the frontiers of rural finance, particularly "piloting new approaches and delivery mechanisms to provide financial services in remote rural areas." Within this framework, the Policy directly refers to ICTs as a key tool to provide services in rural areas as well as support the growth in migrants' capital and remittances flows to rural areas. The strategy also identifies the specific need to strengthen data collection, monitoring of relevant indicators, and the development of management information systems at the micro level.
- The technology impact on financial inclusion is well documented with millions of previously unbanked rural households and smallholder producers reached though relatively simple mobile and agent banking systems.

7. Youth Action Plan (2019-2021)

- IFAD's Rural Youth Action Plan recognizes the comparative advantage of ICTs for youth engagement.

  The Action Plan also concretely identifies a framework for collaboration among the "Environment, Climate, Gender and Social Inclusion division, the Sustainable Production, Markets and Institutions Division and regional divisions to tap into IFAD's grant-funding windows in order to test new ideas,

develop models, and foster innovations in which youth can demonstrate their comparative advantages in terms of creativity, energy, and risk-taking capacity (e.g. information and communications technologies, rural energy)."

The Action Plan includes the key areas where ICTs is expected to have a positive impact on rural youth: promoting youth employment, strengthening capacity and skill development (particularly to expanding their ability to access to knowledge and information and increase their productivity), and expanding access to financial markets through digital financial services. manifold roles that young people can play in terms of technology uptake and support to innovative models

Risk management

A list of the identified risk factors that may contribute to the ICT4D project failure and the mitigation measures are summarised below:

Risks	Mitigating measures
Technology risk ICT4D technologies are not working or not delivering the cost-effective benefits. ICT4D solution becomes outdated after completion. Poor ICT infrastructure in rural regions. Lack of ICT technology readiness. Lack of cybersecurity and data protection. Lack of ICT security management. Inaccurate or incomplete data.	• Establish realistic targets for ICT4D projects by taking due considerations of ICT infrastructure and technology adoption readiness in ICT4D projects and programmes and tailor applications to specific local conditions • Leverage IFAD's partnership to speed up the investment in infrastructure, especially the last mile in poor remote rural areas • Raise awareness of cybersecurity and data protection issues and develop and implement ICT security management plan across all IFAD' operational and programme delivery areas • Regularly update security systems and continuously review and implement good security measures • Develop robust and cost-effective approaches for data collection and access through effective support at the point of collection and with clear responsibilities and accountabilities.
Implementation risk ICT4D projects fail to achieve its objectives and deliver expected results. ICT4D projects have negative impacts on beneficiaries' privacy. Lack of direct influences on ICT4D implementation. Lack of motivation and incentives for ICT4D engagement by local government. Digital illiteracy in poor rural people for taking up ICT4D solutions. Low ICT4D awareness, limited or outdated ICT capacity, knowledge, and skills among relevant stakeholders (IFAD, governments) due to fast moving ICT development. Lack of sufficient consideration of local needs.	• Consult and involve the main target/user groups in the development of the ICT4D implementation plan • Use agile project management with frequent client inputs for the development of any new services/products • Have clearly defined and allocated roles and responsibilities for project management • Establish specific task groups or working groups to closely monitor project implementation process, and establish governance and review processes • Establishment of procedures to ensure the responsible use of data across the whole ICT4D project implementation • Embed ICT4D capacity building in all ICT4D projects design and operations • IFAD will be strengthening its capacity to successfully deliver ICT4D projects through *ad hoc* capacity development initiatives as well as leveraging strategic partnerships • Better understanding of local needs and effective and management bottlenecks • Develop close partnership with government and local communities • Providing incentives to staff and countries to innovate with ICT4D • Guiding farmers through the "on boarding" process and creating incentives to use the application (e.g. providing free airtime) • Sharing and learning of the experience of other UN organisations and IFIs.
Financial risk Investment in ICT4D is too high. Actual cost significantly exceeds initial budget.	• Conduct analysis with mitigating measures at the project design stage • Have realistic and cost-effective ICT budget based on adequate estimation and predication of ICT costs • Have robust project budget management and control procedures • Develop Partnership with governments, other UN organisations, IFIs and private sector companies to leverage more resources and expertise.

Partnership risk Lack of support from government and key stakeholders. Lack of interest to invest in poor remote areas by private sector partners. Lack of understanding of local context by ICT4D developers. Lack of adequate ICT4D supporting strategy and policies in partner organizations. Key partners pulling out. Risks of harm to beneficiaries.	• Raise awareness on the importance and urgency of ICT4D stressing that ICT4D is not a choice, but a request for immediate action for achieving the SDGs. • Strong engagement with governments, other UN organisations, IFIs and service providers. • Perform an inventory of applicable laws and technical standards in the area of privacy protection and cyber security. • Conduct proper due diligence and vet potential partners in technology outsourcing processes, which would include consideration of the partner's data security processes and frameworks, in line with the UN Business and Human Rights Guidelines. • Develop special partnerships with leading organisations promoting and funding ICT4D • Actively engage with government and key stakeholders through capacity building and sharing ICT4D success stories; • Have very strict and clear rules about the terms of partnerships and the use of data and protection of the users. • Establish clear protocols and agreements for terminating any agreement should the privacy and security of IFAD's beneficiaries not be ensured. • Undertaking human rights and conflict sensitivity impact assessments when establishing partnerships, and establishing an independent review panel to review partnerships when needed.

ICT4D strategies and areas of intervention for selected development partners

Agency	Engagement in ICT4D for agriculture	Key links
World Bank	The World Bank supports client countries in leveraging digital technologies for development across five key areas of focus to promote strong and inclusive digital economies: (a) Digital infrastructure to support access to data, information, and knowledge; (b) Digital financial services and digital identification to facilitate transactions; (c) Digital innovation and entrepreneurship need a supportive ecosystem of government regulations and access to financing; (d) Digital platforms, including e-commerce and e-government, drive usage and foster economic activity; and (e) Digital literacy and skills create a digitally savvy workforce and boost competitiveness. In Fiscal Year 2018 (FY18), the World Bank portfolio included 28 standalone ICT-related projects (total commitments: $1.28 billion). World Bank interventions in the digital sector are informed by in-depth research and analysis, and partnerships are a key area of functional work in ICT4D (e.g. the partnership with ITU on Measuring ICT for Development, or the Partnership for Open Data with the Open Data Foundation and Open Society). The World Bank does also contribute to the *Open Development Technology Alliance*, a knowledge platform facilitating knowledge sharing on ICTs. Thanks to the contribution of the Republic of Korea, in 2008 $15 million *Korean Trust Fund for ICT4D* was established to support activities such as feasibility studies, training modules and strategic plans, through which the World Bank has prepared projects in three areas. One of these areas is "Green IT", explicitly focused on improving the climate resilience of agriculture and water resource management systems through digital technologies. The World Bank has been pioneering the use of ICTs to support agriculture and rural development. It published a comprehensive sourcebook on ICTs for agriculture ("ICT in agriculture: connecting smallholders to knowledge, networks, and institutions) in 2011, a second version of which was published in 2017. The 2017 World Development Report ("Digital Dividends") focused on ICT4D, and a section of the report was dedicated to agriculture. The 2018 report "Data-driven Development" referred to potential uses of Big Data technologies in the agri-food sector: (a) increased/expanded data usage and integration in heavy supply chain sectors, like agribusiness; (b) AI to maximize yields and improve agricultural practices based on multiple data sources; (c) text mining and text analysis to support agricultural development and build food security. In 2019, the World Bank published a report ("The Future of Food - Harnessing Digital Technologies to Improve Food System Outcomes") that presents the opportunities offered by ICTs – the main ones being: (a) better transparency of agricultural value chains; (b) smarter farms; and (c) improved public services. It also highlights some of the risks (i.e. over-concentration of service provider market power, poor data governance, and potential exclusion of marginalized groups). It provides entry points for public-sector action to: (a) expand rural network coverage; (b) foster digital entrepreneurship; and (c) facilitate the demand for ICTs in the food system. The report also provides guidance to prioritize actions using a Maximizing Finance for Development (MFD) approach to raise efficiency, equity, and environmental impacts, while mitigating/minimizing the risks associated with ICTs. ICT4D components are also specifically included in the World Bank's projects in the area of agriculture.	http://documents.worldbank.org/curated/en/522141499680975973/ICT-in-agriculture-connecting-smallholders-to-knowledge-networks-and-institutions https://www.worldbank.org/en/topic/digitaldevelopment https://www.worldbank.org/en/publication/wdr2016 https://www.worldbank.org/en/topic/digitaldevelopment/publication/data-driven-development

Agency	Engagement in ICT4D for agriculture	Key links
	The World Bank endorsed the Principles for Digital Development.	
ADB	The Asian Development Bank recognized the potential of digital development both internally and across its projects and programmes. In March 2018 the Asian Development Bank (ADB) created the Digital Technology for Development Unit to help countries leverage ICTs for development as well as implement new digital reforms supporting the modernization of ADB's business processes. To guide the modernization of ADB's through digital technologies, the organization prepared a Digital Agenda, which comprises 6 different programs: (i) Empower operations to be integrated, flexible, efficient, inclusive, and transparent with accountability; (ii) Enable flexible and innovative financial products and services; (iii) Renovate administrative and corporate systems; (iv) Enable digital workplace and connected data; (v) Foster IT service excellence through optimal use of secure, modern technology; and (vi) Prepare ADB for the future by experimenting with new technologies in an innovation sandbox. Externally, the ADB expanded the use of digital technologies in its operations, and started to help partner countries to build an enabling environment for improved use of ICTs, based on three axes: (1) reliable ICT infrastructure; (2) skilled human resources; and (3) enabling policies and regulatory environments. In April 2017, the ADB launched the High-Level Technology (HLT) Fund, a multi-donor trust fund promoting the integration of HLT and innovative solutions into ADB-financed and administered projects throughout the project cycle through ad hoc grant financing. Among the areas of focus, there are: climate change mitigation and adaptation, including resilience to disaster risks. The ADB prepared an investment framework for digital technologies in health, which could be used as a reference to inform the development of similar investment frameworks in agriculture. Notable partnerships in this area is the one with the Republic of Korea, thanks to which in 2006 the e-Asia and Knowledge Partnership Fund was established to bridge the digital divide, promote improved access to information and knowledge through ICT in the Asia and Pacific region. Regarding agriculture, there are no strategic focus on ICT4D in this area. Nevertheless, there is inclusion of ICT4D in projects targeting agriculture. For example the regional project "Digital Solutions for Improved Efficiency in Value Chain Systems" in Pakistan, Tajikistan, and Viet Nam. The project is funded by the e-Asia and Knowledge Partnership Fund.	https://www.adb.org/news/adb-supports-digital-technologies-innovative-development-solutions https://www.adb.org/site/funds/funds/high-level-technology-fund https://www.adb.org/publications/guidance-investing-digital-health https://www.adb.org/projects/49054-001/main
African Development Bank (AfDB)	The AfDB has recognized the potential of ICTs to support agricultural and rural development in Africa. As part of the AfDB's efforts, the Technologies for African Agricultural Transformation (TAAT) initiative has been established to scale up appropriate agricultural technologies from the CGIAR and national systems across Africa. The TAAT targets a total investment of US $800 million. While focused on agricultural technologies, the inclusion of ICTs is foreseeable in the next future. The AfDB developed the Africa Digital Financial Inclusion Facility (ADFI) to accelerate digital financial inclusion across Africa, with a goal of promoting access to the formal economy for 332 million more Africans (60% women). The ADFI follows up the initiative supporting the Central Bank of West African States (BCEAO) to upgrade and foster interoperability of the digital payment systems of the eight West African countries belonging to the West African Economic and Monetary Union (WAEMU). The initiative (worth	https://www.afdb.org/en/topics-and-sectors/sectors/information-communication-technology https://www.afdb.org/en/adfi https://www.afdb.org/fileadmin/uploads/afd

Agency	Engagement in ICT4D for agriculture	Key links
	USD 11.3 million in grant funding was supported by the Bill and Melinda Gates Foundation).

In 2019, the AfDB published the "Creating decent jobs strategies, policies, and instruments" policy research. In the document, the use of ICTs for creating new job opportunities, and the potential of increasing labor productivity in agriculture through innovation in production as well as better access to markets is explicitly referenced.

Among ICT4D initiatives in the area of rural development, it is worth mentioning the *Jobs for Youth* initiative, which focuses primarily on agriculture, industry and ICT with a Rural Microenterprise ($54M) project launched in Malawi, Nigeria, and Burkina Faso. | b/Documents/Boards-Documents/Bank_Group_Strategy_for_Jobs_for_Youth_in_Africa_2016-2025_Rev_2.pdf

https://am.afdb.org/sites/default/files/AfDB18-16_Jobs_English.pdf |
| IADB | ICTs are an integral part of IADB's work, which has been improving the use of ICTs internally as well as mainstreaming the use of digital technologies across projects and programs in different sectors.

Partnerships are a key element in the area of digital technology. Among notable partnerships, IADB established an alliance with Telefónica to promote digital transformation and socio-economic development programs in Latin America through 2017-2020.

IADB also established a partnership with Mastercard to support Big Data technologies to support sustainable mobility in Latin America and the Caribbean.

Internally, IADB has been expanding the use of ICTs for designing and monitoring the organization's work through various initiatives, such as the "Code for Development" one that promotes the reuse of open source software. A specific digital strategy has also enabled improved Knowledge Management across the organization.

A flagship initiative in the area of ICT4D is the FintechLAC, a Regional Public Goods initiative that seeks to support the development, consolidation, and integration of a Fintech ecosystem in LAC through the promotion of policies and regulations, as well as the institutional strengthening for ecosystem actors. FintechLAC is the first Public-Private group of Fintech in Latin America and the Caribbean, and it is formed by a group of financial regulators and supervisors and Fintech associations from 15 countries.

With regards to ICT4D in agriculture, IADB has been integrating digital technologies to support agricultural productivity while adapting to climate change, and it has supported technology adoption in line with organization's main areas of work.

Recent initiatives include the formulation of investments in the area of digital agriculture in Honduras and Uruguay, thanks to the collaboration with the FAO's Investment Center.

IADB is also committed to support the creation of enabling environments at the national level in the area of digital agriculture. In Honduras, a national conference to showcase promising ICT for agriculture innovations was organized in 2019. | https://www.iadb.org/en/news/telefonica-idb-and-iic-promote-digitalization-economy-latin-america

http://code.iadb.org/en

https://blogs.iadb.org/conocimiento-abierto/en/la-estrategia-digital-que-nos-llevo-a-las-10-millones-de-descargas/

https://www.iadb.org/en/news/idb-and-mastercard-launch-new-resource-center-digital-transport-cities

https://www.iadb.org/en/sector/initiatives/digital-finance-innovation/fintech

http://www.fao.org/americas/noticias/ver/en/c/1197760/

https://www.fontagro.org/es/publicaciones/prensa/otras-noticias/congreso-internacional-de-innovacion-tecnologica-para-el-sector-agropecuario-agrotech-2019-san-pedro-sula-honduras-28-y-29- |

Agency	Engagement in ICT4D for agriculture	Key links
		de-marzo/
FAO	FAO has traditionally been the UN agency mandated to use digital technologies to bridge the rural-urban divide. As part of the World Summit on Information Society (WSIS) process, FAO has been managing the largest community of practice in the area of ICT4D in agriculture (E-agriculture). The community mobilizes counts 15'000 participants, who are mobilized through online discussions to map existing knowledge and practices. FAO has been integrating the use of digital technologies in its work over the past 30 years. This led to several initiatives that developed FAO-branded digital tools to support the organization's strategic and functional objectives, as well as direct support to member countries and partners through technical assistance and capacity development in the area of ICT4D. Among the different teams in the organization that have contributed to ICT4D, the Communication for Development team's work should be highlighted as it has been focusing on the integration of low-tech solutions, traditional media, and innovative ICTs supporting the bottom-up appropriation of ICTs through specific methodologies and guidelines since the early 2000s. In 2017 the organization went through a revision of its strategy on the use of ICT4D. Through a facilitated consultation process, new areas for interventions and engagement were identified. Digital technologies were identified not only as tool for providing internal ICT services but also to support organizational delivery. Key areas of action included the improved use of data and information management to support monitoring of SDGs, earth observation technology to strengthen improved production systems and resilience, piloting the use of emerging technologies as blockchain and drones. As part of its work in the area of ICT4D, FAO built strategic partnerships to accelerate the delivery of results: partnerships have been already established with private sector organizations like Google and Telefonica, as well as with UN agencies like ITU and WMO. Furthermore, FAO convened experts in different seminars and workshops to promote knowledge sharing and collaboration in this area (e.g. Digital Agriculture Transformation seminar, the International Symposium on Agricultural Innovation for Family Farming). As part of its support to member countries in the area of ICT4D in agriculture, FAO developed a comprehensive E-Agriculture Strategy Guide to provide governments a guiding framework for governments in developing national e-agriculture strategies. The area of digital agriculture was also incorporated as a new area of work from FAO's Investment Center, which supported the World Bank and the IADB in formulating investments in this area. FAO endorsed the Principles for Digital Development.	http://www.fao.org/e-agriculture/ http://www.fao.org/3/a-i4605e.pdf http://www.fao.org/about/meetings/digital-agriculture-transformation/resources/fao-digital-services-portfolio/en/ http://www.fao.org/about/meetings/agricultural-innovation-family-farmers-symposium/en/ http://www.fao.org/communication-for-development/en/ http://www.fao.org/support-to-investment/news/detail/en/c/1170072/
WFP	WFP has embraced ICTs to increase organizational efficiency and effectiveness. Data is surely at the core of WFP's action to improve the work of the organization, particularly supporting data-driven decision making and increasing accountability to vulnerable populations. Among the most notable initiatives, the mobile Vulnerability Analysis and Mapping (mVAM) is representative as it employs an integrated array of open source digital technologies and low-tech solutions to improve data collection related to food supply in fragile countries and access by vulnerable populations. These technologies allow the mVAM team to create voice-based surveys and automated information hotlines to inform vulnerable populations through traditional phones in their language and at no cost for them.	http://mvam.org/ https://innovation.wfp.org/projects https://innovation.wfp.org/tanzania

Agency	Engagement in ICT4D for agriculture	Key links
	Partnerships with private sector organizations and United Nations organizations are a key element to improve WFP's work in this area. Within this framework, WFP notably participated to the United Nations Global Pulse, a flagship innovation initiative of the UN Secretary-General on big data. WFP has been experimenting with Global Pulse solutions in the area of Big Data since its establishment through the posting of staff and collaboration across different projects. Another strategic area of focus is that of innovation. Thanks to a partnership with the Government of Germany, WFP established a global *Innovation Accelerator* that identifies, supports and scale up innovative solutions to hunger. The Accelerator supports both innovators inside the organization as well as external private sector organizations through financial support and access to a global network of experts. While focusing on innovation at large, the Accelerator has provided support to a wide range of projects focused on digital technologies. These include the use of blockchain, helping youth to develop digital skills, UAVs for cargo delivery, tackling malnutrition with real-time data, leveraging artificial intelligence and aerial imagery for improved response to emergencies. To complement the work of the Innovation Accelerator, WFP established the first WFP Innovation Hub in Tanzania with the aim of identifying, piloting and scaling up innovations for zero hunger in Tanzania, as well as and make available WFP's field logistics and IT expertise to partners in the region. Like IFAD, WFP is a member of the Better Than Cash Alliance. WFP endorsed the Principles for Digital Development.	
Technical Centre for Agricultural and Rural Cooperation ACP-EU (CTA)	The CTA is a renown pioneer in the application of ICT4D in agriculture, with three decades of experience in leveraging digital technologies in the agriculture and rural development domain. CTA promoted the use of Web 2.0 and social media tools for agriculture and rural development by training over 5000 people in African, Caribbean and Pacific Group of States (ACP) countries. In 2013, CTA organized the first ICT4Ag International Conference in Rwanda to engage the global development community in the use of ICTs in agriculture. CTA continues acting upon the recommendations from this conference. At present, CTA focuses on three practice areas: (a) promoting ICTs for resilient agri-food systems and profitable agribusiness; (b) supporting precision agriculture using remote sensing technologies and intelligent management of big and open data among medium and small-scale farmers; and (c) support ICT and entrepreneurship (with a focus on youth) for inclusive agri-food systems and modernised value chains. CTA's projects target four main areas of actions: (a) promoting the application of ICTs to develop value chains; (b) facilitating access to ICT solutions by promoting enabling environments; (c) fostering ICT-enabled innovation and entrepreneurship in agriculture by youth; and (d) providing institutional and grassroots capacity building in the use of ICTs for agriculture. CTA offers a key knowledge sharing service to the whole community working in the area of ICT4D in agriculture, through publication of magazines (ICT Update, Spore), facilitation of mailing lists, dialogue with policy makers, as well as in-country workshops supporting extension service providers, agricultural researchers, farmers and farmer organisations. Among its strategic areas of action, CTA includes the following: (a) collaborate with the private sector to make ICT4Ag Value Added Service (VAS) provision more sustainable; (b) continue to engage with policymakers in creating enabling environments for ICT applications to thrive; (c) support farmers and farmer organisations to go beyond consumers and become service providers to their members; (d) partner with other international development organisations working this area to avoid duplication and have	http://ict4ag.cta.int/ https://ardyis.cta.int/ https://ictupdate.cta.int/en https://spore.cta.int/en

Agency	Engagement in ICT4D for agriculture	Key links
	greater impact; (e) engage investors in exploring the potential for investing in the sector; and (f) work with researchers to show ICTs impact in the agricultural sector.	
USAID	Among aid agencies, USAID has been a pioneer in the area of ICT4D for agriculture. More recently, USAID launched a three-year collaboration between the U.S. Global Development Lab and the Bureau for Food Security named "Digital Development for Feed the Future" (D2FTF) to advance the ICT4D for agriculture field. Through the D2FTF, USAID supported the development of a set of case studies highlighting how development organizations are using digital tools and technologies to meet their goals more efficiently and effectively in the area of agriculture and rural development. Particularly, the D2FTF focuses on four categories of ICT4D tools, based on evidence on their impact: (1) precision agriculture; (2) digital financial services; (3) data-driven agriculture; and (4) ICT-enabled agricultural extension. Moreover, through D2FTF the use of ICTs tools in these four categories was scaled up through direct technical assistance to Feed the Future programs, capacity building for Feed the Future teams, and strengthening the knowledge base on best practices in digital agriculture and food security. As part of this effort, in 2019 USAID launched the *Digital Frontiers* initiative, a 5-year $75 million to offer support and services to USAID Missions in this area through technical assistance, capacity building, and strengthening best practices. Although not directly targeting agriculture, it is worth noting that USAID tasked a team (i.e. the GeoCenter Plus team) to support the application of advanced data and geographic analysis to international development challenges with the aim of improving the strategic planning, design, monitoring, and evaluation of USAID's programs. The team leverages data and geospatial technologies to increase data-driven decision-making at USAID. It supports expanded and improved collection, management and sharing of data through strategic partnerships (e.g. with the Mapping for Resilience University Consortium, the Foreign Agriculture Service, NASA and other international organizations). Finally, it supports capacity building to integrate data analysis and geographic information for improved decision making of USAID's staff through training and capacity building services to the agency as well as direct technical support (e.g. with mission-based GIS specialists). USAID endorsed the Principles for Digital Development.	https://www.usaid.gov/digitalag https://www.usaid.gov/digital-development/advanced-geographic-and-data-analysis https://www.agrilinks.org/
Federal Ministry of Economic Cooperation and Development of Germany (BMZ)	The BMZ identified ICTs as a key enabler of greater effectiveness. It is expanding the embedding of ICTs in all sectors of its development cooperation and increasing the resources available accordingly. The BMZ selected 7 key areas of focus where it foresees the highest potential of applying ICTs to efficiently and sustainably promote successful development. Among these areas, BMZ explicitly recognized the area of "**Nutrition, rural development, and agriculture**" as a key area of focus. Within this framework, it prioritized the use of ICTs (such as smartphones and mobile phones) to support rural communities – particularly to support the delivery of agricultural information, promoting access to market, accessing weather information and digital financial services to organise their operations more efficiently and increase their earnings. Moreover, the BMZ also highlights the role of geo-referenced data to measure smallholders' property and protect their rights. The BMZ also prioritized the use of ICTs across other action areas to reduce rural/urban digital divide and provide the rural population with better access to education services, financial services, and energy supply thanks to digital technologies.	https://www.bmz.de/en/issues/wirtschaft/nachhaltige_wirtschaftsentwicklung/ikt/digitale_agenda/index.html https://www.developpp.de/en/our-programme-funding-for-development-partnerships-with-business/

Agency	Engagement in ICT4D for agriculture	Key links
	To tackle the limited access to ICTs in rural areas, the BMZ is supporting the continued expansion of **ICT infrastructure** in its partner countries, especially in rural areas. It is investing in broadband cable, as well as in alternative cost-efficient and innovative network infrastructure solutions to enable low cost access to the Internet. Within this framework, the BGZ provided credits to a consortium of operators to lay the 10,000 kilometre-long Eastern Africa Submarine Cable System (EASSy) to expand internet access and improve connectivity to 250 million people in East Africa. To promote the expansion of energy provision in rural areas in Tanzania and Rwanda, the BMZ promoted the adoption of **off-grid energy** systems that can be paid over mobile phones, supplying more than 21,000 households in both countries. The BMZ also seeks to capitalize digital financial technologies (**FinTech**) in the form of mobile payment solutions and new financial technologies like digital wallet solutions or purely digital currencies, based on innovative blockchain technology. Within this framework, the BMZ is promoting the development of mobile payment systems – e.g. it is supporting the Central Bank of Ghana to expand the use of the 'e-zwich' cashless payment system to rural areas. The BMZ is also supporting the strengthening of customers' rights – e.g. helping the National Bank of Uganda to regulate financial markets. Partnerships are a strategic element of the BMZ's work in this area. Within this framework, one of the mechanisms that the BMZ has been leveraging is that of primary public-private partnership (PPP). Through the develoPPP.de programme, partnerships with SAP to support digital accounting for coffee producers in Uganda and with Biopartenaire's to support cashless payment systems in the cacao sector of Cote d'Ivoire have been established. The BMZ applies the Principles for Digital Development.	