Food and Agriculture Organization of the United Nations

GENDER AND ICTs

MAINSTREAMING GENDER IN THE USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES (ICTs) FOR AGRICULTURE AND RURAL DEVELOPMENT

GENDER AND ICTs

Mainstreaming gender in the use of information and communication technologies (ICTs) for agriculture and rural development

The Food and Agriculture Organization of the United Nations

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Preface

While the digital revolution is reaching rural areas in many developing countries, the rural digital divide continues to present considerable challenges. The problem is even more acute for women, who face a triple divide: digital, rural and gender.

This publication looks at the benefits of Information and Communication Technologies (ICTs) when placed in the hands of men and women working in agriculture and in rural areas. It examines the challenges to be overcome and makes recommendations so that rural communities can take full and equal advantage of the technologies.

The publication has served as background material for *Module 4: Extending the Benefits – Gender-Equitable, ICT-Enabled Agricultural Development*, which is part of the 2017 Updated Edition of the World Bank *Sourcebook on ICT in Agriculture: Connecting Smallholders to Knowledge, Networks, and Institutions.*[1]

It is the result of desk study, online fora on gender held in the framework of the e-agriculture Community of Practice (www.e-agriculture.org), and a review of projects and programmes conducted in regions of the world.

FAO's E-agriculture 10 Year Review Report on implementation of the *World Summit on the Information Society (WSIS) of the Action Line C7. ICT Applications: e-agriculture* concludes that while substantial progress has been made in making ICTs available and accessible for rural communities, challenges remain with respect to the following seven critical factors for success: content, capacity development, gender and diversity, access and participation, partnerships, technologies, and finally, economic, social, and environmental sustainability.

This publication starts with a presentation of the challenges and the seven factors of success, followed by an overview of the general existing barriers to women's access to, control and use of ICTs. Finally, it offers a series of recommendations for better integration of gender in ICT initiatives, based on gender mainstreaming throughout the seven critical factors of success, illustrated with concrete examples.

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1 World Bank. 2017. **Updated Edition Sourcebook on ICT in Agriculture: Connecting Smallholders to Knowledge, Networks, and Institutions,** Washington DC, USA, https://openknowledge.worldbank.org/bitstream/handle/10986/27526/9781464810022.pdf?sequence=2&isAllowed=y

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And finally we would like to thank our editor, Clare Pedrick and our graphic designer Marton Szabo.

Acronyms

CIS	Commonwealth of Independent States
EFA	Education for All
FAO	Food and Agriculture Organization of the United Nations
FRI	Farm Radio International
GEM	Gender Evaluation Methodology
ICTs	Information and Communication Technologies
ITU	International Telecommunication Union
LDC	Least Developed Countries
MSSRF	M.S. Swaminathan Research Foundation
NGO	Non-Governmental Organization
SDG	Sustainable Development Goal
UNESCO	United Nations Educational, Scientific and Cultural Organization
WOUGNET	Women of Uganda Network
WSIS	World Summit on the Information Society

GENDER AND ICTs

Mainstreaming gender in the use of information and communication technologies (ICTs) for agriculture and rural development

Chapter 1.
Introduction: the milestones towards gender and ICTs

1

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1.1. The digital revolution

It would be hard to overstate the scope for Information and Communications Technologies (ICTs) to drive agricultural and rural development, especially for the poorest smallholders and other households, whose livelihoods would benefit greatly from improved production, stronger market linkages and the opportunity to engage in agricultural value chains. Yet much of this potential remains untapped, particularly in the case of women, who play a fundamental role in agricultural production, rural income generation and as agents of development.

The digital revolution has changed the way we work, access information and connect with each other. It offers opportunities to those who can use the new technologies, but also presents new challenges for those who are left behind. Although this revolution is reaching rural areas in many developing countries, the rural digital divide is still an issue, and disparities are growing with the introduction of fast-changing technologies. The challenges are especially acute for women, who face a triple divide: digital, rural and gender.

As early as 2003, the Food and Agriculture Organization of the United Nations (FAO), in its plan on action on gender and development,[2] was flagging the changes ushered in by new ICTs.

"New information technologies are radically transforming the way that information and knowledge are disseminated and shared around the world. The technology revolution could accelerate progress towards gender equality, but it could also exacerbate existing inequalities. Much has been written about the digital divide between rich and poor countries: more than 70 percent of the world's Internet users are based in Europe and North America, where – in addition – more than 90 percent of the data on Africa are stored. Similar gaps persist between urban and rural areas and between men and women, especially in developing countries. Rural women usually have less access than men to information and new technologies.

Consequently, they are at a disadvantage in making informed choices about what to produce. Lack of information also limits women's influence in their communities and their ability to participate in decision making. When assessing the opportunities and risks of new technologies, it is essential to give attention to gender differences and to ensuring that women's voice is heard so that technological developments can be exploited in the way that best prevents them from increasing inequalities."

2 FAO. 2003. **FAO Gender and Development Plan of Action (2002-2007)**, Rome, Italy. http://www.fao.org/docrep/005/y3969e/y3969e00.htm

That same year, FAO presented its recommendations for bridging the rural digital divide[3] at the World Summit on the Information Society (WSIS) in Geneva. These recommendations have since evolved, but remain central to the seven critical factors for success for ICTs in agriculture: content, capacity development, gender and diversity, access and participation, partnerships, technologies, and finally economic, social, and environmental sustainability.

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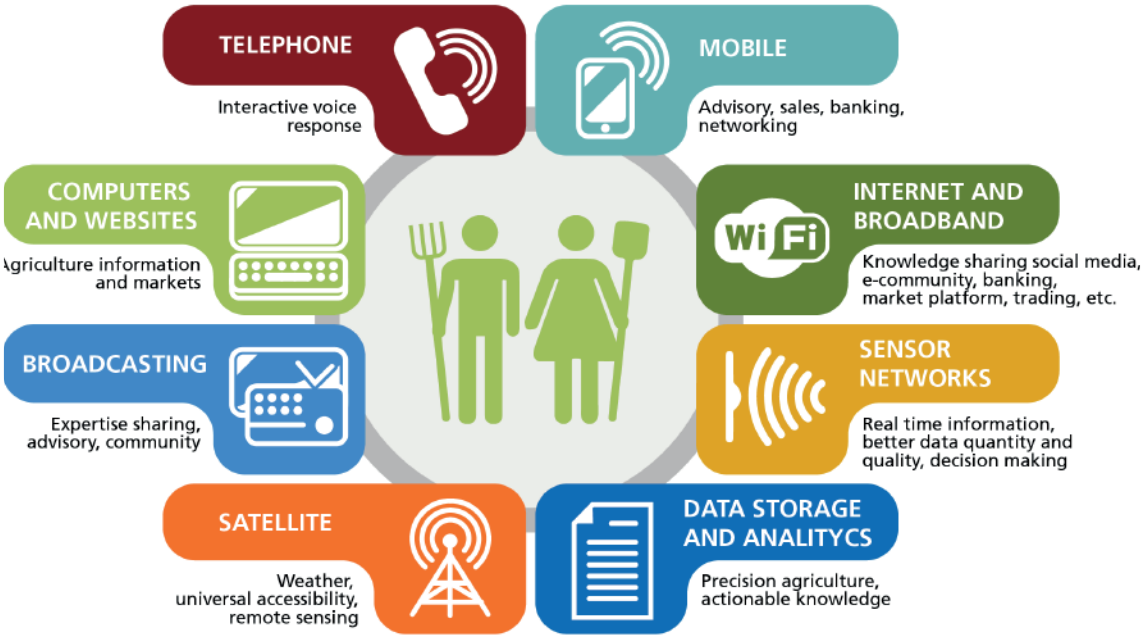
Box 1. Definition of ICTs

Information and Communication Technologies include devices, networks, services and applications. These can range from cutting edge Internet-based technologies and sensing tools to other technologies that have been around for much longer, such as radio, telephones, mobile phones, television and satellites



3 FAO. 2003. **Bridging the Rural Digital Divide**. Rome, Italy. www.e-agriculture.org/bridging-rural-digital-divide-programme-overview

Following the World Summit on the Information Society (WSIS), which was held in Geneva (2003) and Tunis (2005), FAO was assigned responsibility for facilitating the e-agriculture Action Line. During more than a decade of facilitation of the e-Agriculture Community of Practice, gender has always been high on the agenda and has been mainstreamed in the fora of discussions and publications.

After ten years of facilitation, FAO published the *e-agriculture 10 year Review Report: Implementation of the World Summit on the Information Society (WSIS) Action Line C7. ICT Applications: e-agriculture*[4], which looked at initiatives using ICTs in agriculture across the world. It highlighted the seven critical factors of success for moving from pilot projects to a more sustainable approach.

Box 2. The seven critical factors of success

1. Provide adapted and reliable content from trusted sources.
2. Develop capacities for three dimensions: the individual's capacity, organizational capacity and the enabling environment.
3. Mainstream gender and diversity.
4. Increase access and participation.
5. Engage in partnerships, especially public-private.
6. Identify the right mix of technologies.
7. Ensure economic, social and environmental sustainability.

1.2. The Sustainable Development Goals

In September 2015, heads of state and governments adopted the 2030 Agenda for Sustainable Development, a new plan of action for people, the planet and prosperity, with 17 Sustainable Development Goals (SDGs) and 169 associated targets at its core.

One of these targets specifically addresses the empowerment of women though ICTs (Goal 5). Others focus on universal use of ICTs, including access to infrastructure, technologies and information. Targets for several goals mention the importance of taking ICTs into account. The following table highlights the selected objectives with their targets and indicators.

4 FAO. 2005. **e-agriculture 10 year Review Report: Implementation of the World Summit on the Information Society (WSIS) Action Line C7. ICT Applications: e-agriculture**. www.fao.org/3/a-i4605e.pdf

Table 1. Sustainable Development Goals, ICTs and gender

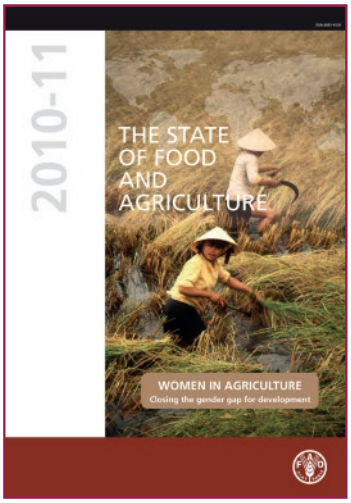
1 NO POVERTY	**TARGET 1.4** By 2030, ensure that all men and women, in particular the poor and the vulnerable, have equal rights to economic resources, as well as access to basic services, ownership and control over land and other forms of property, inheritance, natural resources, appropriate new **technology** and financial services, including microfinance	
2 ZERO HUNGER	**TARGET 2.A.** Increase investment, including through enhanced international cooperation, in rural infrastructure, agricultural research and extension services, **technology development** and plant and livestock gene banks in order to enhance agricultural productive capacity in developing countries, in particular least developed countries	
	TARGET 2.C. Adopt measures to ensure the proper functioning of food commodity markets and their derivatives and facilitate timely access to market **information**, including on food reserves, in order to help limit extreme food price volatility	
4 QUALITY EDUCATION	**TARGET 4.B** By 2020, substantially expand globally the number of scholarships available to developing countries [...], for enrolment in higher education, including vocational training and **information and communications technology**, technical, engineering and scientific programmes, in developed countries and other developing countries	**INDICATOR 4.4.1.** Proportion of youth and adults with **information and communications technology (ICT) skills**, by type of skill
5 GENDER EQUALITY	**TARGET 5.B.0** Enhance the use of enabling technology, in particular **information and communications technology**, to promote the empowerment of women	**INDICATOR 5.B.1** Proportion of individuals who own a **mobile telephone**, by sex
9 INDUSTRY, INNOVATION AND INFRASTRUCTURE	**TARGET 9.C** Significantly increase access to **information and communications technology** and strive to provide universal and affordable access to the Internet in least developed countries by 2020	**INDICATOR 9.C.1** Proportion of population covered by a mobile network, by **technology**
16 PEACE, JUSTICE AND STRONG INSTITUTIONS	**TARGET 16.10** Ensure public access to **information** and protect fundamental freedoms, in accordance with national legislation and international agreements	**INDICATOR 16.10.2** Number of countries that adopt and implement constitutional, statutory and/or policy guarantees for public **access to information**
17 PARTNERSHIPS FOR THE GOALS	**TARGET 17.6** Enhance North-South, South-South and triangular regional and international cooperation on and access to science, **technology** and innovation and enhance knowledge sharing on mutually agreed terms, including through improved coordination among existing mechanisms, in particular at the United Nations level, and through a global technology facilitation mechanism	**INDICATOR 17.6.1** Number of science and/or technology cooperation agreements and programmes between countries, by type of cooperation **INDICATOR 17.6.2** Fixed **Internet** broadband subscriptions per 100 inhabitants, by speed
	TARGET 17.7 Promote the development, transfer, dissemination and diffusion of environmentally sound **technologies** to developing countries on favourable terms, including on concessional and preferential terms, as mutually agreed	**INDICATOR 17.7.1** Total amount of approved funding for developing countries to promote the development, transfer, dissemination and diffusion of environmentally sound **technologies**
	TARGET 17.8 Fully operationalize the technology bank and science, technology and innovation capacity-building mechanism for least developed countries by 2017 and enhance the use of enabling **technology**, in particular **information and communications technology**	**INDICATOR 17.8.1** Proportion of individuals using the **Internet**

1.3. Empowerment of women and gender mainstreaming

A look at the key milestones in the empowerment of women and gender mainstreaming reveals a long history. At the Fourth World Conference on Women, held in Beijing in 1995, 189 countries unanimously agreed "that it was essential to design, implement and monitor, with the full participation of women, effective, efficient and mutually reinforcing gender-sensitive policies and programmes including development policies and programmes at all levels, to foster the empowerment and advancement of women".

Now, more than 20 years later, it is apparent that gender mainstreaming is still not a reality in all policies and programmes. The same is true in terms of initiatives using ICTs for agriculture. All too often, such initiatives consider their beneficiaries as a homogenous group, and do not take into account the differences that exist between women and men. Almost as damaging is the tendency to have specific ICT initiatives that focus exclusively on women, in an attempt to bolster gender mainstreaming in this sector. It is far more effective to work with both women and men, and to explore the relationships and differences that exist among the two groups, in order to make a real impact and work towards changes in a community.

FAO's *State of Agriculture 2011 Women in agriculture: Closing the gender gap in development* asserts that "on average, women make up 43 percent of the agricultural labour force in developing countries, ranging from 20 percent in Latin America to almost 50 percent in East and Southeast Asia and sub-Saharan Africa. The empowerment of women could raise farm productivity by 20-30 percent, increase national agricultural outputs by 2.5 to 4.0 percent and, ultimately, lift 100 to 150 million people out of hunger". Even though women are major producers of food crops in most of the world, they lag well behind men in access to land, productive resources, income from land, education, financial services, information and the ability to share and learn from this knowledge.



Closing the gap in women's access to a broad range of technologies could help free their time for more productive activities, enhancing their agricultural productivity, improving the market returns they receive and empowering them to make choices that are better for themselves and their families. Closing the technology gap requires that the necessary technologies exist to meet the priority needs of female farmers, that women are aware of their usefulness, and that they have the means to acquire them.[5] ICTs are part of the technologies that can close this gap.

5 FAO. 2011. **The State of Food and Agriculture. Women in agriculture: Closing the gender gap**, Rome, Italy, p. vi-vii, http://www.fao.org/docrep/013/i2050e/i2050e.pdf

1.4. The triple divide

It is crucial that both women and men have access to, use and control of ICTs, as these can play a critical role in overcoming the daily hurdles that they encounter as farmers, entrepreneurs and agents of development for their communities.

People living in rural areas, especially farmers in developing countries, face what is known as the **triple divide** (see Box). This is a digital, rural and gender divide, which has the effect of relegating rural women to the most marginalized position when it comes to access to, and use of ICTs. The World Bank's *Gender in Agriculture Sourcebook* underscores the potential for ICTs, when used in a gender sensitive way, to help bridge these divides and advance the processes of social inclusion, with tangible results, including a narrowing of the economic and social divide between women and men.[6]

The use of gender sensitive ICT solutions and applications, combined with traditional means of communication and information based on local needs and expectations, can make a significant contribution to improving gender equality, and hence to alleviating poverty through improved agricultural production.

Box 3. The gender divide in numbers

- 1.2 out of 2.9 billion females own a mobile phone in low- and middle-income countries (41%).
- 1.4 out of 3.0 billion males own a mobile phone in low- and middle-income countries (46%).
- Nearly 2/3 of unconnected (not owning a mobile phone) females live in the South Asia and East Asia and Pacific regions.
- 300 million unconnected females live in sub-Saharan Africa.
- Women are 14 percent less likely than men to own a mobile phone.
- Women in South Asia, where the lowest levels of access are reported, are 38 percent less likely than men to own a mobile phone.

Source: GSMA 2015

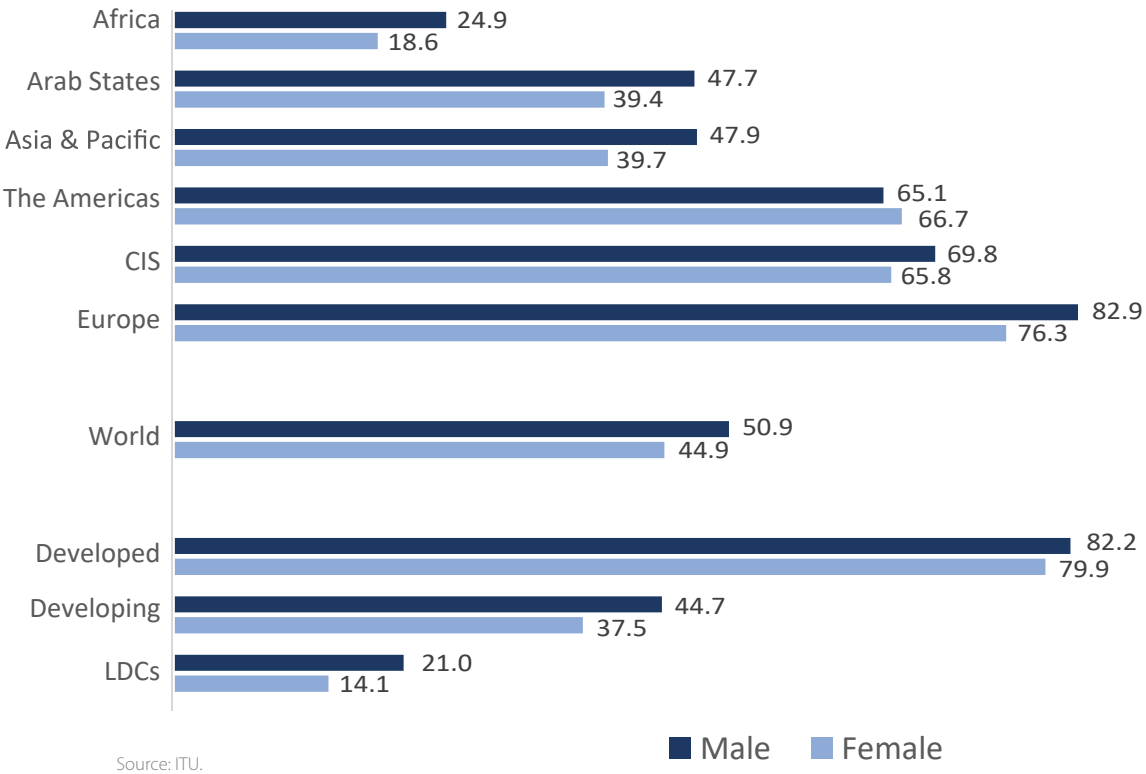
In 2017, the International Telecommunication Union (ITU) estimated Internet penetration rate for men and women in 2017. The proportion of women using the Internet is 12% lower than the proportion of men using the Internet worldwide. While the gender gap has narrowed in most regions since 2013, it has widened in Africa. In Africa, the proportion of women using the Internet is 25% lower than the proportion of men using the Internet. In least developed countries, only one out of seven women is using the Internet compared with one out of five men.

The proportion of men using the Internet is higher than the proportion of women using the Internet in two-thirds of countries worldwide. There is a strong link between gender parity in the enrollment ratio in tertiary education and gender parity in Internet use. The only region

6 World Bank. 2009. **Gender in Agriculture sourcebook**, Washington, USA , http://elibrary.worldbank.org/doi/pdf/10.1596/978-0-8213-7587-7

where a higher percentage of women than men are using the Internet is the Americas, where countries also score highly on gender parity in tertiary education.

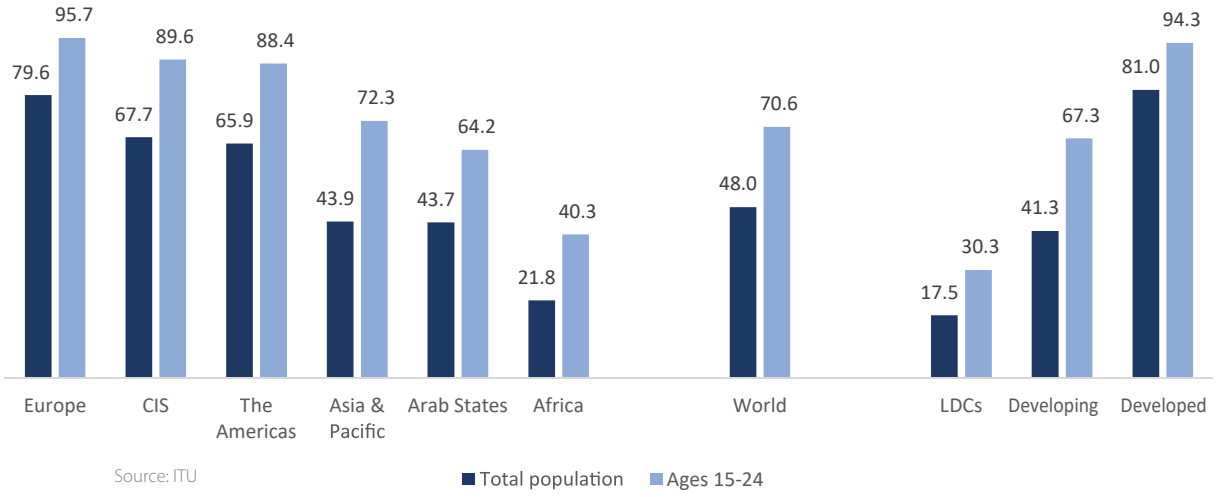
Figure 1: Estimated Internet penetration rate for men and women in 2017



Source: ITU.

Note: Penetration rates in this chart refer to the number of women/men using the Internet as a percentage of the respective total female/male population. CIS refers to the Commonwealth of Independent States, LDCs to Least Developed Countries.

Figure 2: Estimated proportion of individuals using the Internet by age in 2017

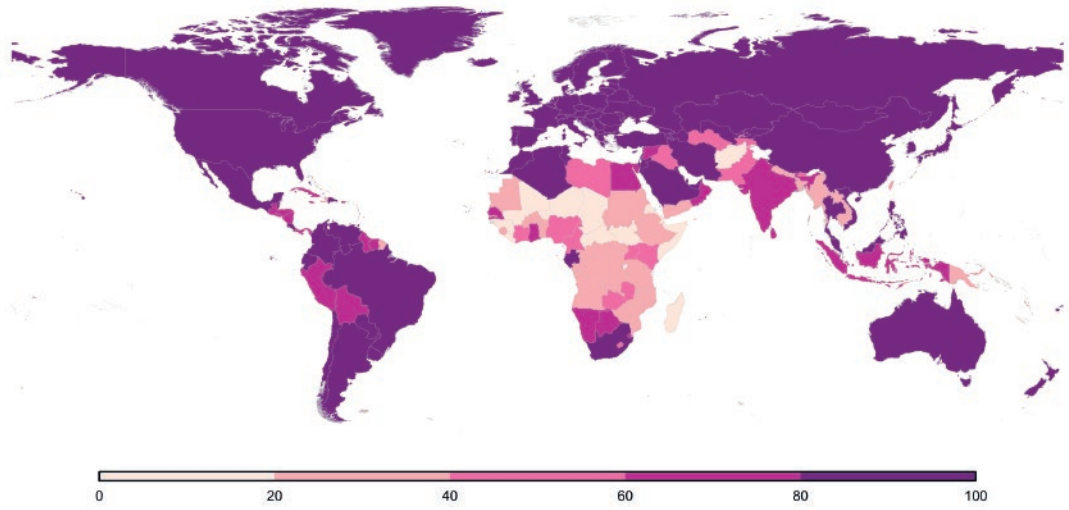


Source: ITU

Within the digital divide there is a generational divide. Some 70 percent of the world's youth are online. An analysis of the distribution of individuals using the Internet by age, shows that the proportion of young people aged 15-24 (71%) is significantly higher than that of the total population using the Internet (48%). Youth is at the forefront of Internet adoption and this is extremely promising.

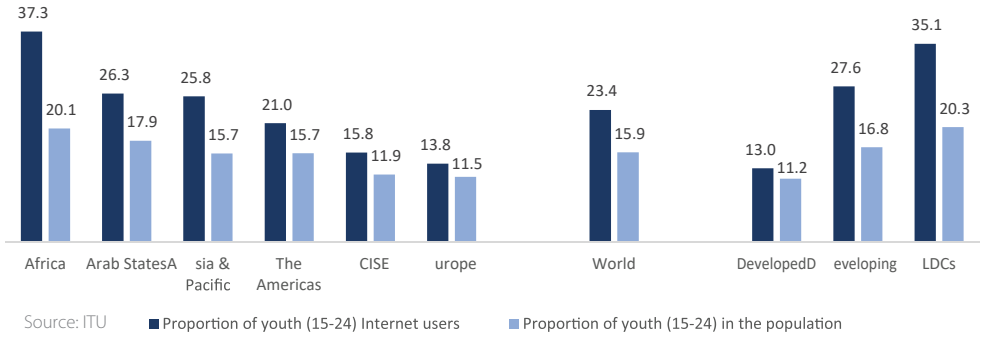
In 104 countries, more than 80 percent of the youth population is online. In developed countries, 94 percent of young people aged 15-24 uses the Internet, compared with 67 percent in developing countries, and only 30 percent in Least Developed Countries (LDCs). Of the 830 million young people who are online, 320 million (39%) are in China and India. Nearly 9 out of 10 young individuals not using the Internet live in Africa or Asia and the Pacific.

Figure 3: Estimated proportion of youth (15-24) using the Internet in 2017



Source: ITU.

Figure 4: Estimated proportion of youth (15-24) Internet users and youth in the population in 2017



Source: ITU ■ Proportion of youth (15-24) Internet users ■ Proportion of youth (15-24) in the population

Young people represent almost one-quarter of the total number of individuals using the Internet worldwide. In LDCs, 35 percent of the individuals using the Internet are young people aged 15-24, compared with 13 percent in developed countries and 23 percent globally.

Box 4. The triple divide : digital, rural and gender

The triple divide consists of the digital divide, the rural divide and the gender divide. The digital divide refers to the gap between demographics and regions that have access to modern ICTs, and those that don't have access, or have restricted access. The rural divide refers to the gap between urban and rural areas in access to ICTs. The gender divide refers to the differences between women and men in access to ICTs, resulting in rural women being relegated to the most disadvantaged position.

Digital divide: In 2017, the International Telecommunication Union (ITU) reports[7] that there are substantial digital divides between countries and regions, and between developed and developing countries, particularly Least Developed Countries (LDC). There are twice as many mobile-broadband subscriptions per 100 inhabitants in developed countries as in developing countries, while the gap between more connected developing countries and LDCs has grown in recent years. Mobile-broadband subscription rates are much higher in Europe and the Americas than in other regions, and more than three times those of Africa. Subscribers in developed countries also tend to benefit from higher bandwidth than those in developing countries.

Rural divide: Due to poor infrastructure, lack of electricity and the fact that they many of the most remote areas are still beyond the reach of a mobile signal, rural communities in developing countries are even more disadvantaged. Low incomes and high levels of illiteracy are additional barriers to possible adoption of ICTs.[8]

Gender divide: Men and women do not have the same access to, use of and control over ICTs. ITU's ICT Facts and figures 2017 reports that the proportion of women using the Internet worldwide is 12 percent lower than that of men. While the gender gap has narrowed in most regions since 2013, it has widened in Africa. Here, the proportion of women using the Internet is 25 percent lower than that of men. In least developed countries, only one in seven women is using the Internet, compared with one in five men. In 2017, the global Internet penetration rate for men stood at 50.9 percent, compared with 44.9 percent for women. In the Americas, the number of women using the Internet is greater than that of men.

Both the World Bank Digital Dividends Report and FAO have issued warnings about the digital divide, and both advocate for the development of a digital strategy:

"ICTs have brought massive changes and have huge potential, but digital dividends are not spreading fast enough, for two main reasons. First, nearly 60 percent of the world's people are offline and cannot fully participate in the digital economy, while digital divides persist across gender, geographical, age, and income lines. Second, some of the perceived benefits of the internet are neutralized by new risks. Vested business interests, regulatory uncertainty, and limited competition across digital platforms could lead to harmful concentration in many

7 ITU. 2017. **Measuring the Information Society Report** 2017 Geneva, Switzerland http://www.itu.int/en/ITU-D/Statistics/Documents/publications/misr2017/MISR2017_Volume1.pdf
8 GSMA. 2014. GSMA, 2014, **Digital inclusion**, www.gsma.com/mobilefordevelopment/wp-content/uploads/2014/11/GSMA_Digital-Inclusion-Report_Web_Singles_2.pdf

sectors. Rapidly expanding automation, even of mid-level office jobs, could hollow out labor markets and worsen rising inequality. The poor record of many e-government initiatives points to the high failure rate of ICT projects and the risk that states and corporations might use digital technologies to control citizens, not to empower them."[9]

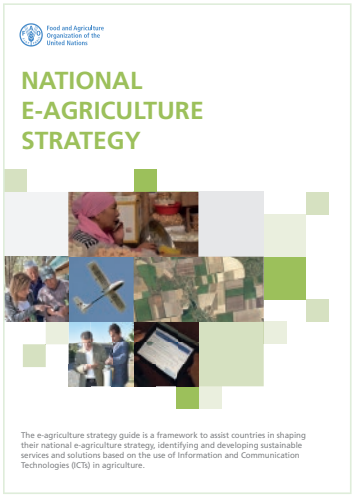
1.5. National e-agriculture strategies

In the agricultural sector, the development of an e-agriculture strategy that mainstreams gender can prevent e-agriculture projects from being implemented in isolation, avoiding duplication of efforts and resources. It also helps to develop efficiency gains from intra-sector and cross-sector synergy. An e-agriculture strategy can pave the way for policy options to bridge the technology divide in rural areas, and ensure equal prospects for rural men and women, young and old, to access ICTs – quickening the pace of innovations, and increasing incomes and job opportunities. Agricultural research, education and extension systems can also greatly benefit from a national e-agriculture strategy.

Establishing standards for open data and interoperability creates conducive conditions for sharing national research outputs and global knowledge. The private sector – such as solution developers, mobile operators and the agro-industry – may profit from an increased clientele, and the provision of better targeted, needs responsive products. With a national e-agriculture strategy, countries move from pilot projects to a broader vision at a larger scale, capitalizing from past experiences, and adopting and adapting what has proved to be effective.

For this reason, FAO with its knowledge of agriculture and of the use of emerging technologies for food security, agriculture and rural development, together with ITU and support from partners, has developed the E-agriculture Strategy Guide[10]. This framework assists countries in developing their national e-agriculture strategy and master plan, which takes gender issues into account.

Developing a national e-agriculture action plan enables a government to draw up a roadmap for its strategy on the use of ICTs for agriculture that implies identifying all activities and their management, coordination and funding, and identifying key actors for the design and implementation of the e-agriculture strategy.



Any effective roadmap for e-agriculture will require a holistic, multi-stakeholder approach, with cross-cutting support spanning various government ministries, including those dealing with innovations, food production and processing, rural development, irrigation and water management, disaster management, telecommunication, governance, transportation, finance and commerce.

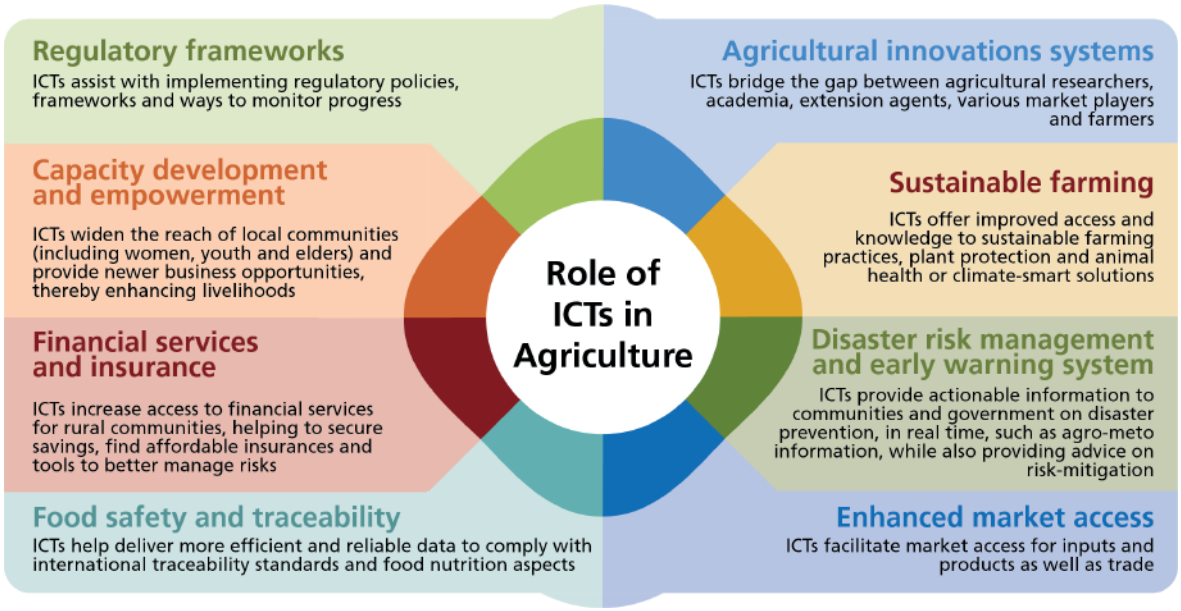
9 World Bank. 2016. **World Development Report 2016: Digital Dividends**, Washington D.C. http://www.worldbank.org/en/publication/wdr2016
10 FAO. **E-agriculture Strategy Guide**. http://www.fao.org/in-action/e-agriculture-strategy-guide/en

In spite of the demand for interinstitutional cooperation, the guide strongly advocates solid facilitative leadership of the Ministries of Agriculture in the region, to develop a coordination mechanism with the telecommunication ministries, create a regulatory environment and standards such as for interoperability, open access, security and data ownership, facilitate dialogue between the private sector IT developers, agribusiness and smallholders, ensure inclusiveness of vulnerable rural populations – men and women – and ensure alignment with national agricultural and rural strategy goals.

Box 5. Definition of e-agriculture

E-agriculture involves designing, developing and applying innovative ways to use information and communication technologies (ICTs) – including digital technologies – in the rural domain, with a primary focus on agriculture, including fisheries, forestry and livestock.

The aim is to boost agricultural and rural development by improving access to valuable information that can help people whose livelihoods depend on agriculture to make the best possible decisions, and use the resources available in the most productive and sustainable manner.



GENDER AND ICTs

Mainstreaming gender in the use of information and communication technologies (ICTs) for agriculture and rural development

Chapter 2. The seven critical factors of success of ICTs in agriculture

2

Chapter 2.
The seven critical factors of success of ICTs in agriculture

In 2015, FAO's *E-agriculture 10 Year Review Report on the implementation of the World Summit on the Information Society (WSIS) of the Action Line C7. ICT Applications: e-agriculture* concluded that, while substantial progress has been made in making ICTs available and accessible for rural communities, challenges remain with respect to the following seven critical factors for success.[11] For each of the challenges, specific recommendations were made.

Success factor 1: Content

Success factor 2: Capacity development

Success factor 3: Gender and diversity

Success factor 4: Access and participation

Success factor 5: Partnerships

Success factor 6: Technologies

Success factor 7: Sustainability

The **third factor of success points specifically to gender and diversity** as one of the remaining challenges to the use of ICTs in agriculture. It states that access and opportunities are not equally distributed among users, creating asymmetries that must be addressed through specific policies, designed to target the source of the inequalities.

However, it is important that gender is also mainstreamed in the other factors of success. For this reason, the current publication does not exclusively address the gender and diversity factor of success, but also explores how gender can be taken into account when putting into practice all the other factors.

11 FAO. 2015. **E-agriculture 10 Year Review Report on the implementation of the World Summit on the Information Society (WSIS) of the Action Line C7. ICT Applications: e-agriculture**, Rome, Italy

2.1. The seven factors of success: challenges and recommendations

Success factor 1: Content

Adaptation of content to local needs, languages and contexts remains a challenge. Appropriate information resources and trusted intermediaries are important for the success of e-agriculture initiatives. Dissemination of information may be constrained if the nature of information does not match farmers' needs in terms of format and relevance. While ICTs can deliver large amounts of information, this does not imply effective use of it. Locally adapted content and existing relationships based on trust are not yet given sufficient attention and priority in development plans. Bringing ICTs and development planning closer together, with information innovations coming directly from the rural communities themselves, remains an often overlooked design consideration in meeting the demands of the poorest communities.[12]

Recommendations:

- Content should be created and adapted from reliable and trusted sources, including local languages and taking into account local contexts, to ensure equitable and timely access to agricultural knowledge by resource poor men and women farmers, foresters and fisher folk in rural areas.
- Useful information must be repackaged and mobilized in formats that meet the different information needs and preferences of different user groups and that can be stored, retrieved and exchanged with ease, taking into account issues of ownership and intellectual property.
- Open access and interoperability standards should be adopted.
- Information innovations coming directly from the rural communities themselves should be fostered and widely shared.[13]

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12 Ibid
13 Ibid

Success factor 2: Capacity development

The individual's capacity, the organizational capacity and the enabling environment: Capacities need to be strengthened at all levels. The focus on improving access to agricultural information without addressing the ability to effectively use the information has not yet yielded the desired reduction of the rural digital divide. Illiteracy, and limited skills in using complex devices to search for information and cultural issues, remain barriers to effectively receiving and using information delivered via ICTs. Models of capacity development should be based on social characteristics, information needs and the function of technology in context. Scaling up pilot ICT projects remains a challenge. Upscaling and mainstreaming projects is often not sufficiently supported by dialogue at organizational and national levels, which could create a policy environment conducive to the effective use of ICTs in agriculture. The price of access to ICTs can be very high in some countries. Pricing of broadband or mobile services is a significant barrier for most vulnerable groups, such as women, youth, older farmers and people living in the most remote areas.[14]

Recommendations:

- As part of national ICT strategies, the development and implementation of national e-agriculture strategies[15] should seek to provide reliable and affordable connectivity and integrate ICTs in rural development to support food security and hunger eradication.
- Governments and the public sector should formulate clear policies that define the principles for their involvement in developing e-agriculture strategies, for example by reducing excessive taxation, by making Internet access universal, affordable, safe and open.
- Digital literacy in rural institutions and communities should be developed and enhanced, taking into consideration local needs and constraints by providing appropriate learning opportunities for men, women, youth and people with disabilities, which will enhance individual and collective decision-making skills.
- The use of ICTs should be promoted to reinforce the resilience capacity of states, communities and individuals to adapt to shocks and natural disasters, food chain emergencies, transboundary threats, socio-economic crises, violent conflicts and protracted crises.[16]

14 Ibid
15 **FAO e-agriculture strategy guide**: http://www.fao.org/in-action/e-agriculture-strategy-guide/en/
16 FAO. 2015. **E-agriculture 10 Year Review Report on the implementation of the World Summit on the Information Society (WSIS) of the Action Line C7. ICT Applications: e-agriculture**, Rome, Italy

Success factor 3: Gender and diversity

Access and opportunities are not distributed equitably among users, creating asymmetries that must be addressed through specific policies designed to target the source of the inequalities. Access for women, youth, older farmers and people living in the most remote areas is hindered by the price of access to ICTs, and by persistent inequalities. Gender inequalities remain a serious issue in the digital economy, as does the gap between urban and rural populations. The digital divide is not only concerned with technological infrastructure and connectivity. It is a multifaceted problem of ineffective knowledge exchange and management of information content, insufficient human resources and institutional capacity, and lack of sensitivity to gender and the diverse needs of different groups. For example, illiterate and older farmers often have less developed digital skills, and are therefore generally less likely to adopt ICTs. Many of the factors that constrain male farmers in adopting more sustainable and productive practices restrict women to an even greater extent. Specific gender barriers further limit women farmers' capacity to innovate and become more productive. Youth's access to and familiarity with technologies, as well as their role in the social dynamics of rural communities, are not sufficiently leveraged.[17]

Recommendations:

- Gender, youth and diversity should be systematically addressed in the planning phase of project design and during the whole project cycle. Women's and youth's access to technology and equipment, as well as potential consequences for social dynamics within communities, should be assessed prior to project deployment in order to address ICT gaps, and ensure sustainable adoption of solutions within communities.
- Gender disaggregated data must be collected in projects and in national ICT related statistics.
- Youth's access to and familiarity with technologies, as well as their role in the social dynamics of rural communities, should be further leveraged in project design and capacity development.[18]

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17 Ibid
18 Ibid

Success factor 4: Access and participation

Access to ICTs is not yet equitable. As previously mentioned, a gender-based digital divide persists, and is more frequent in rural than in urban areas. The digital divide between men and women is widening, despite the growing number of Internet users. Improved access to ICTs alone will not close the gender digital divide. As with the challenges reported in other key areas, proper design and implementation based on a bottom-up and participatory approach, which involves communities themselves, can reduce the potential for information inequity that can be created when introducing new ICTs into a community.[19]

Recommendations:

- Digital inclusion policies with gender perspectives should be promoted to enable men and women to access and use ICTs equally.
- Collaboration and knowledge sharing in agriculture should be fostered via communities of practice, in order to showcase and promote models, methodologies and good practices, so as to achieve effective and equitable use of ICTs for sustainable agriculture and rural development.[20]

Success factor 5: Partnerships

Public-private partnerships are recognized as a critical factor in sustainable business models at community level, but these do not always have to be with large corporate firms. Small, local private companies, local producer organizations and community-based non-governmental organizations (NGOs) often have the social capital to provide trusted information and good quality services. Diverse advisory and extension services offered by different types of providers are more likely to meet the various needs of farmers, as there is no single type of service that can fit all circumstances. With a broader variety of potential partners comes a new challenge: the formal recognition of information and service quality standards, and the partners' agreement to be held accountable for meeting them.[21]

Recommendations:

- Public-private partnerships with a wide range of non-state actors should be promoted for inclusive, affordable and sustainable ICT services and initiatives in agriculture and rural development. This approach will foster widescale use of ICTs and sustainable agribusiness models.
- Encouragement should be given to partnership structures in which farmer or producer organizations and community-based NGOs are strengthened in their ability to adopt and integrate ICTs into their daily operations and service provision to their members.[22]

19 Ibid
20 Ibid
21 Ibid
22 Ibid

Success factor 6: Technologies

Identifying the right mix of technologies that are suited to local needs and contexts is often a challenge, in spite of – or because of – the rapid increase in mobile telephone penetration in rural areas. While this offers significant potential for increasing access to information, challenges related to access and capacity remain in the area of effective use of mobile telephony, as described above. Technologies should be suited to local contexts and needs, and their selection should increasingly take into account the influence that ICTs have on gender and social dynamics. The appropriation of ICTs by youth in support of farming activities is also creating shifts in the social dynamics between youth and older community members, or between rural and urban/peri-urban communities.[23]

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Recommendations:

- Blended approaches, such as a combination of radio and telephone, and locally relevant technologies selected on the basis of in-depth analysis of local needs and existing information systems, should be adopted to increase the efficiency of initiatives for ICT in agriculture, and better serve different users and contexts.
- Mobile information services and voice-based services should be promoted as important tools in agricultural development and business.[24]

Success factor 7: Economic, social and environmental sustainability

Scaling up pilot ICT projects and identifying sustainable business models remain important challenges. On the one hand, pricing is critical to sustainable agribusiness models at community level. Investments are needed to cover the cost of creating content and collecting data. On the other hand, social sustainability can be hindered if clear roles and responsibilities have not been clarified among stakeholders. Measurement and data on the impact of mobile technologies on agriculture are scant and generally anecdotal. Solid information is needed regarding the impact of previous initiatives, including lessons learned, in order to inform the design and approach of future efforts.[25]

23 Ibid
24 Ibid
25 Ibid

Recommendations:

- Access to mobile telephony, Internet and information in general should be possible, and within the price range of the poor.
- During the pilot phase of ICT projects, a sustainable financial recovery mechanism should be identified, so that activities can be continued at a later stage.
- Open access policies and initiatives should be encouraged, so as to make quality information available and accessible to a broader potential user base.
- Technology interventions should be designed to select appropriate and environmentally friendly technologies for collecting, storing, recycling, treating and finally disposing of e-waste.[26]

2.2. Linkages between the factors of success and the principles for digital development

An examination of the principles for digital development shows that these are in line with the seven critical factors of success. These principles offer living guidelines that can help development practitioners to integrate established good practices into technology enabled programmes. They are written by, and for, international development donors, multilateral organizations and implementing partners, and are intended to be updated and refined over time.[27] Both sets are similar and complement each other. The box below shows the linkages. For each principle, the gender lens should be applied.

26 Ibid
27 **Principles for Digital Development**, http://digitalprinciples.org

Table 2. Seven factors of success and principles for digital development

DESIGN WITH THE USER

(link to Success factor 4: Access and participation and to Success factor 6: Technologies)

- Develop context-appropriate solutions informed by user needs.
- Include all user groups in planning, development, implementation, and assessment.
- Develop projects in an incremental and iterative manner.
- Design solutions that learn from and enhance existing workflows, and plan for organizational adaptation.
- Ensure solutions are sensitive to, and useful for, the most marginalized populations: women, children, those with disabilities, and those affected by conflict and disaster.

UNDERSTAND THE ECOSYSTEM

(link to Success factor 3: Gender and diversity and to Success factor 4: Access and participation)

- Participate in networks and communities of like-minded practitioners.
- Align to existing technological, legal, and regulatory policies.

DESIGN FOR SCALE

(link to Success factor 5: Partnerships and to Success factor 7: Sustainability)

- Design for scale from the start, and assess and mitigate dependencies that might limit ability to scale.
- Employ a 'systems' approach to design, considering implications of design beyond an immediate project.
- Be replicable and customizable in other countries and contexts.
- Demonstrate impact before scaling a solution.
- Analyse all technology choices through the lens of national and regional scale.
- Factor in partnerships from the beginning, and start early negotiations.

BUILD FOR SUSTAINABILITY

(link to Success factor 7: Sustainability)

- Plan for sustainability from the start, including planning for long-term financial health, e.g., assessing total cost of ownership.
- Utilize and invest in local communities and developers by default, and help catalyse their growth.
- Engage with local governments to ensure integration into national strategy, and identify high-level government advocates.

BE DATA DRIVEN
(link to Success factor 1: Content)

- Design projects so that impact can be measured at discrete milestones with a focus on outcomes rather than outputs.
- Evaluate innovative solutions and areas where there are gaps in data and evidence.
- Use real-time information to monitor and inform management decisions at all levels.
- When possible, leverage data as a by-product of user actions and transactions for assessments.

USE OPEN DATA, OPEN STANDARDS, OPEN SOURCE, OPEN INNOVATION
(link to Success factor 1: Content)

- Adopt and expand existing open standards.
- Open data and functionalities, and expose them in documented APIs (Application Programming Interfaces) where use by a larger community is possible.
- Invest in software as a public good.
- Develop software to be open source by default with the code made available in public repositories and supported through developer communities.

REUSE AND IMPROVE
(link to Success factor 7: Sustainability)

- Use, modify and extend existing tools, platforms, and frameworks when possible.
- Develop in modular ways, favouring approaches that are interoperable over those that are monolithic by design.

ADDRESS PRIVACY & SECURITY
(link to Success factor 3: Gender and diversity)

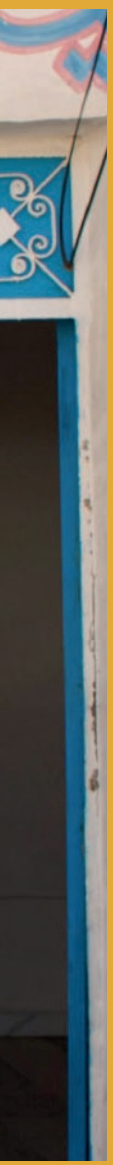
- Assess and mitigate risks to the security of users and their data.
- Consider the context and needs for privacy of personally identifiable information when designing solutions and mitigate accordingly.
- Ensure equity and fairness in co-creation, and protect the best interests of the end-users.

BE COLLABORATIVE
(link to Success factor 4: Access and participation)

- Engage diverse expertise across disciplines and industries at all stages.
- Work across sector silos to create coordinated and more holistic approaches.
- Document work, results, processes and best practices, and share them widely.
- Publish materials under a Creative Commons license by default, with strong rationale if another licensing approach is taken.

GENDER AND ICTs

Mainstreaming gender in the use of information and communication technologies (ICTs) for agriculture and rural development



Chapter 3. Existing gender barriers to women's access to, control and use of ICTs for agriculture

3

Chapter 3.
Existing gender barriers to women's access to, control and use of ICTs for agriculture

A range of specific gender barriers exist to women's access to, control and use of ICTs. These will have an impact on the efficacy of any ICT-based initiative for agriculture and rural development, if the constraints are not addressed in an appropriate way. There is a difference between men and women in terms of access to and control of ICTs, use of these tools, and even which ICTs they use.

3.1. Cultural and social limitations

Cultural attitudes can discriminate against women's access to technology and technology education. For example, it might be inappropriate for women to visit telecentres or cybercafés, or women might be reluctant to visit these because they do not feel at ease. This can be due, for example, to the fact that the telecentre or cybercafé is located next to a bar, and that it is inappropriate for women to frequent that place, or to the fact that it is owned by a man, or only frequented by men. Cultural and social norms can also create mobility constraints for women, which make using telecentres or cybercafés more difficult for them, or even impossible. It is important to think carefully about the location of a telecentre or cybercafé, if one wants to ensure the attendance of women. A venue close to the market or the hospital, where women often go, can be a good choice. At all times, the site chosen must be a neutral and safe place for women and youth to visit.

Women can also be limited in their access to and control of mobile phones. This is because mobile phones are perceived as exposing women to the risk of harassment through unsolicited phone calls, or of having inappropriate contacts with men.[28]

Another example of cultural and social norms is the perception that a society or community has on the use of technologies by women, or their participation in ICT-training, rather than continuing their traditional household duties.

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ICTs can help to overcome some cultural or social barriers. For example, learning, delivered through e-learning on computers or mobile devices, can be brought to people with mobility constraints. Mobile phones allow people to communicate with others in remote locations, enabling them to exchange information without needing to physically move.

28 GSMA Connected Women. 2015. **Bridging the gender gap: Mobile access and usage in low and middle income countries**, http://www.gsma.com/connectedwomen/resources-2/gender-gap/

Box 6. Bicycling info-ladies bring Internet to remote areas in Bangladesh

Info-ladies cycle around remote villages in Bangladesh with laptops, headphones and USB sticks, to bring Internet access to rural villages. They help tens of thousands of people – especially women – to obtain access to a wide range of benefits, from agricultural information to government services, as well as to conduct chats with distant loved ones. In so doing, the info-ladies are expanding Internet access in a country where very few people are online. The project, launched in 2008 by D.Net, a non-profit development research network, recruits and trains women in how to use laptops, browse the Internet and work printers or cameras. Once trained, the women cycle to remote villages with no Internet connections, and provide information and communication services to local people. In the process, the info-ladies create a small business for themselves, while providing an important service to people in remote areas, especially women who have reduced access to ICTs.[29]

3.2. Time and mobility constraints

Rural women's multiple roles and heavy domestic responsibilities limit the time they can allocate to learning about and using ICTs. Compared with men, rural women tend to have a significantly heavier workload. They are generally in charge of fetching water, cooking, taking care of the children and cleaning, aside from the agricultural activities that they manage during the day.

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ICTs can also help women to manage their limited time more efficiently. Mobile phones, and even radio, can help them to access or share information, or benefit from training, without having to travel long distances. Mobile phones can also be used to control machinery remotely.

29 The Guardian. 2013. **Info-ladies go biking to bring remote Bangladeshi villages online**. Retrieved from: http://www.theguardian.com/global-development/2013/jul/30/bangladesh-bikes-skype-info-ladies

Box 7. Remote control for irrigation alleviates time and mobility constraints

Remote irrigation control enables farmers to switch a water pump on and off and check the availability of water without having to examine pumping equipment and fields. In addition to saving time, water and energy, the technology helps producers to outmanoeuvre erratic electricity and water supplies. Because farmers no longer need to be present to irrigate their fields, they can pursue other livelihood activities, and avoiding field visits is an added advantage when safety is a concern.

The judicious use of water and electricity are major issues in India, where well over 25 million pumps deliver water to agricultural fields. Electricity in rural areas is often only available during off-peak hours, at night. Visiting fields after dark is not only inconvenient, but risky, especially for women, who now head farm households in greater numbers as more men leave for cities in search of work. Rather than living with the inconvenience and potential risk of visiting fields multiple times after dark to operate irrigation pumps, some farmers leave their pumps switched on permanently, to operate whenever electricity becomes available. This practice leads to massive waste of energy and water, reduces producers' incomes, and increases soil erosion.

Nano Ganesh, a remote control for water pumps, was developed by the Ossian Group, an Indian company. Simple and low-cost, Nano Ganesh uses electronic hardware with mobile signal connectivity at both ends.

Activated remotely by a mobile phone, the system serves as an interface between the high-voltage starters of the water pumps and the low voltage mobile phones, enabling farmers to switch their water pump on and off from a distance, and to check the water supply in the tank connected to the pump. Irrigation can be timed for the precise duration needed, which prevents excessive irrigation and erosion and preserves soil nutrients and quality. By sending codes on a mobile network, users can also obtain information on the availability of electricity and water. Some Nano Ganesh models can also send a short message to a registered mobile in the event of tampering or attempted theft of the irrigation pump. By the end of 2015, more than 20 000 farmers in India were using Nano Ganesh, and the number is growing. This innovation brings with it additional income-generating opportunities, such as installation, repair, courier services, training, and demonstrations. There are job opportunities for women in the company's rural call centres, electronics assembly, and marketing and training activities.

One of the problems that the device is designed to overcome (irregular electricity in villages and farms) can make it difficult to demonstrate, install, test and commission the technology. Some technicians are reluctant to take up the challenges of working in rural areas. The company needed time and patience to convince farmers to use the technology. On the financial/marketing side, there was a huge disparity between the high costs of research and development, promotion, marketing, training, and after-sales support and a purchase price that was acceptable to farmers. A great deal of time was invested in pioneering the technology, but once it was on the market, rival products emerged. Even so, considerable scope exists for Nano Ganesh to continue expanding in India and other countries with similar challenges, and remote control technology is being adapted to other kinds of agricultural machinery and operations.[30]

30 FAO. 2015. **Success stories on Information and Communication Technologies for Agriculture and Rural Development**, Bangkok, Thailand, http://www.fao.org/3/a-i4622e.pdf

3.3. Finance and control

According to GSMA Connected Women, cost is the most important overall barrier to owning and using a mobile phone.[31] Women often earn less money than men, and are less likely to be able to buy ICT hardware, or pay for access or training. Even in the case of mobile phones, which tend to be increasingly accessible, women are still disadvantaged. When women do own a mobile phone – or have access to any other ICTs – it is important to identify who controls its use in the household. Often, women share their phones with other members of the family or the community, and may only have access to it at specific times of the day or week.

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ICTs offer opportunities to access finance and financial services more easily, through mobile phones. Access to information, possibilities of communicating remotely, and access to e-learning programmes can all empower women and increase the control they have over the use of the ICTs, as well as other aspects of their livelihoods.

Box 8. Pink telephones to empower women in Cambodia

Women for Prosperity, one of Oxfam's partners in Cambodia, implemented a project to promote women's economic empowerment in the Baray District of central Cambodia, providing women with capacity-building, mobile phones and information on market prices of agricultural commodities, as well as weather updates and warnings. In the villages where the project was implemented, most women did not own their own phone. These were either shared within the family, or owned by the men. The project chose to distribute pink phones to ensure that the men would not use them, an idea that was based on another project, where bicycles where bought for women to enable them to travel more easily. After the bicycles were painted pink, the men in the village did not want to use them.[32]

3.4. Literacy and education

According to the Education for All (EFA) *Global Monitoring Report 2015*, worldwide there are still 781 million illiterate adults.[33] The United Nations Educational, Scientific and Cultural

31 GSMA Connected Women. 2015. **Bridging the gender gap: Mobile access and usage in low and middle income countries**, http://www.gsma.com/connectedwomen/resources-2/gender-gap/

32 Sophasawatsakal, C. 2012. **Pink telephones, using technology to empower women in Cambodia**, Retrieved from: http://policy-practice.oxfam.org.uk/blog/2012/03/pink-telephones-in-cambodia

33 UNESCO. 2015. **EFA Global Monitoring Report 2015: Education for All 2000-2015: achievements and challenges**, http://unesdoc.unesco.org/images/0023/002322/232205e.pdf

Organization (UNESCO) estimates that women represent two-thirds of the global non-literate population. Within countries, there are often enormous urban-rural divides, with most illiterate people living in rural areas. In sub-Saharan Africa, half of all women are illiterate. The strongest correlation in literacy statistics is between household poverty and illiteracy.[34]

Introducing ICTs is not always simple for people who are illiterate. Aside from illiteracy, other barriers include technical illiteracy; women's lower education levels can exacerbate illiteracy and technical illiteracy challenges. Sending an SMS can be difficult for people who are illiterate, or have only basic literacy. It is not easy to type a message on a small phone, especially if the same key needs to be pressed several times in order to obtain a specific letter. Using a computer and browsing the Internet can be an even more daunting prospect. Subscribing and unsubscribing to mobile phone services is often challenging, even for literate people, as the instructions are often in English, or the process requires different subsequent actions. When targeting rural women, many programmes or initiatives will choose to use radio, a medium that is accessible to all, whether they are literate or illiterate. Audio programmes, video or images can offer alternatives to written information, and can help to overcome the barriers of literacy.[35]

ICTs can be an incentive to improve literacy. People can be motivated to learn how to read and write when they own a mobile phone, and are anxious to read SMS messages or send messages themselves.

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According to UNESCO, ICTs can serve as tools for acquiring literacy skills. Radio or video, used in combination with printed materials, can make literacy classes more appealing. The combination of audio and visual stimuli will be more effective than visual stimuli alone, and can aid information processing and memory. Various software programmes have been designed to support reading lessons and enhance learning.[36]

34 UNESCO. 2006. **Using ICT to develop literacy**, Bangkok, Thailand, http://unesdoc.unesco.org/images/0014/001464/146426e.pdf
35 Wyche, S. & Steinfield, C. 2015. **Why don't farmers use cell phones to access market prices? Technology affordances and barriers to market information services adoption in rural Kenya**, Information Technology for Development, DOI: 10.1080/02681102.2015.1048184, http://www.tandfonline.com/doi/abs/10.1080/02681102.2015.1048184?tokenDomain=eprints&tokenAccess=yf7CJVVrfksEk2aWeude&forwardService=showFullText&doi=10.1080%2F02681102.2015.1048184&journalCode=titd20
Wyche, S., Densmore, M. & Geyer, B. S. 2015. **Real Mobiles: Kenyan and Zambian Smallholder Farmers' current attitudes towards mobile phones**, Singapore, http://www.susanwyche.com/pubs/a9-wyche-4.pdf Wyche, S., Simiyu, N. & Othieno, M. E. 2016. **Mobile phones as amplifiers of social inequality among rural Kenyan women**, Journal ACM Transactions on Computer-Human Interaction, Volume 23, Issue 3, July 2016, New York, USA, http://dl.acm.org/citation.cfm?doid=2952594.2911982
36 UNESCO. 2006. **Using ICT to develop literacy**, Bangkok, Thailand, http://unesdoc.unesco.org/images/0014/001464/146426e.pdf

Access to literacy education may be limited, or denied, due to social, cultural and geographical factors, or as a result of lack of time to attend classes. ICTs, such as radio, television or the Internet can help to overcome these and other constraints, such as geographical barriers, by facilitating distance learning, bringing the courses to people in remote areas.[37]

Digital literacy should be part of school curricula for both primary and secondary education, as well as for professional education related to agriculture. In 2017, ITU[38] reported that youth are at the forefront of Internet adoption. The young generation should be given preparation, so that they are able to use the new technologies to the best effect.

Box 9. Talking Books in Ghana - No reading required

© Literacy Bridge

Literacy Bridge is an NGO that aims to save lives and improve the livelihoods of impoverished families by providing on demand access to locally relevant knowledge. At the heart of its programmes is the Talking Book, an innovative, low-cost audio computer designed for the learning needs of illiterate people living in the poorest areas of the world. The device links users to valuable information on agriculture and other rural issues. In many rural areas of Ghana, farmers rarely receive visits from extension officials, and when they do have the chance to meet agricultural experts, they cannot always remember all the information. Being illiterate, they are unable to take notes. Other knowledge exchange approaches that do not require literacy have their limitations. Mobile phone solutions require funds for network time or expensive and fragile smartphones. These options are valuable for transmitting simple, time critical information, but they may be less effective as teaching systems. Texts are no use to the illiterate. Local radio programmes reach a wide audience through a single broadcast, but broadcasts cannot be replayed or shared with people who were not present when the programme aired. A single broadcast is generally not enough for someone to learn a new technique. With Talking Books, users can listen to a recording as many times as they need, before incorporating a new practice into their lives. Combining Talking Books with other knowledge exchange approaches can provide good results for illiterate farmers. For example, coupling a Talking Book with a mobile-based intervention combines timely distribution of content with the ability to play lengthier content on demand at no cost. Likewise, adding Talking Books to a radio-

37 UNESCO. 2006. **Using ICT to develop literacy**, Bangkok, Thailand, http://unesdoc.unesco.org/images/0014/001464/146426e.pdf
38 ITU. 2017. **ICT Facts and Figures**. Geneva, Switzerland. https://www.itu.int/en/ITU-D/Statistics/Documents/facts/ICTFactsFigures2017.pdf

based intervention combines radio's broadcast capability with a network of devices that act as local audio libraries. In all cases, those targeted for the Talking Book project are people with oral cultures and few or no literacy skills, families without electricity, communities with unreliable or expensive mobile networks, mothers without a phone, and grandmothers who do not like technology.

How the talking book technology works

The Talking Book is a small portable recording device (12 cm × 12 cm × 6.5 cm, weighing 225 g without batteries), built to withstand dry dust storms and tropical rain, and storing 140 hours of audio content. It is affordable, simple to use, and runs on batteries. The device features indented touch buttons, to facilitate use by visually impaired people and by all users at night. With a simple audio menu offered in a range of local languages and dialects, users can select the information that interests them. The audio content can be replayed as needed, played for family and friends, and easily loaned to third parties. The Talking Book disseminates information created and recorded by local experts for rural communities. Recordings may feature agricultural extension agents describing farming techniques, such as fertilizer preparation, seed spacing and livestock care, or microfinance institutions offering business guidance and explaining topics such as credit and rotating savings plans.

Literacy Bridge does not sell Talking Books. It includes Talking Books as part of on-going partnerships designed to help organizations develop and distribute effective audio content based on formative research and continuous monitoring. Literacy Bridge collaborates with partners to apply good practices in social and behaviour change to address the specific needs of a community, leading to healthier practices and more productive skills. Once loaded with information, Talking Books are distributed to remote areas, where they serve as a rapidly expanding audio library offering information when it is needed. New audio recordings are regularly added to the Talking Books (typically every 1–3 months) via USB from a smartphone, tablet, or laptop. Users can also record their own messages to ask questions, expand on ideas, and relay feedback.

By 2008, 1 000 people had used a Talking Book. By 2015, that figure had risen to 175 000 in Ghana alone. Each month, users listen to more than one million minutes of valuable material. The impact has been significant. Since the launch of the device, Talking Book users have won a variety of farming awards. In 2009, the average Talking Book farmer's harvest increased by 48 percent after one year. In 2012, the average Talking Book farmer's harvest increased by 36 percent after one year.

Literacy Bridge found that families listen to an average of 37 Talking Book messages over a period of six hours each week. Users typically repeat messages four times to absorb all of the information, and the most popular messages are conveyed through songs and drama, on the subject of children. Monitoring features built into the device enable organizations to evaluate the achievement of impact objectives and constantly improve content as a result. The Talking Book's simple design, affordability, and flexible content are highly conducive to rapid expansion and scaling up.

GENDER AND ICTs

Mainstreaming gender in the use of information and communication technologies (ICTs) for agriculture and rural development

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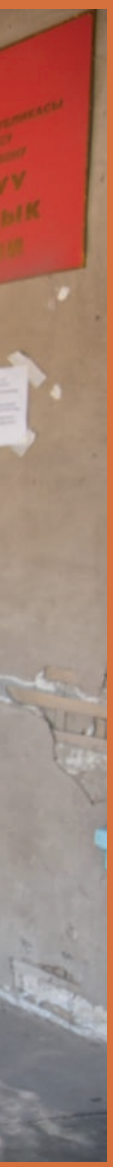

Chapter 4. How to better integrate gender in initiatives for ICT in agriculture

4

Chapter 4.
How to better integrate gender in initiatives for ICT in agriculture

4.1. Content: adapt it to the needs of men and women

Women and men take part in different production, processing and marketing activities, even when they are working in the same value chain. As a result, women and men farmers do not always have the same information needs. For ICT applications to improve the productivity of women and men farmers, it is necessary to ensure that appropriate content is developed for them in a language that they easily understand, and in a suitable format.

In addition, content should be created and adapted from reliable and trusted sources, including in local languages, and taking into account local contexts, to ensure equitable access to agricultural knowledge. Useful information should be repackaged and mobilized in formats that meet the different information needs and preferences of different groups of users. If an initiative aims at equal participation of men and women in a project, both should be able to express their information needs. If ICTs are used to share information that farmers do not really need, there will be little motivation to make use of the ICTs put at their disposal, or learn how to use them. Information needs may be different for women and men. However, it is important to avoid making assumptions about what information women or men need. It is also crucial to include participatory approaches in ICT initiatives, so as to identify potential users' needs correctly.

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Box 10. WOUGNET: Adapted content for women farmers in Uganda

Since 2000, the Women of Uganda Network (WOUGNET) has been running projects that aim to promote and support the use of ICTs by women and women's organizations, so that they can have access to information about best practices and technologies, but also about problems encountered, and ideas and solutions found, by other women's organizations working in similar domains. While the emphasis is on use of the Internet and mobile phones, WOUGNET promotes these alongside traditional means of information sharing, such as radio, television and print media. [39] [40]

WOUGNET has been working with women in Northern Uganda by integrating ICTs such as mobile phones to send and receive messages about their specific crops, alongside community radio to disseminate agricultural information. Both channels, old and new, reinforce each other and provide access to different types of information. The knowledge shared is specifically adapted to the needs of women, for example, information on specific crops that only women cultivate. The women are also trained to use computers and the Internet in Information Centres set up by WOUGNET, always with a focus on agricultural information and resources.

Female farmers are now more able to use better farming techniques and increase yields and production per unit area, as a result of having access to timely weather forecasts, information on the crops they grow, early warning and market opportunities. Regular short text messages are sent to the women farmers, reminding them about pest and disease control measures, or post-harvest strategies and loss mitigation.[41]

4.2. Capacity development: consider gender at individual level, organizational level and at the level of an enabling environment

Capacity development occurs at three different levels: the individual level, the organizational level and the level of an enabling environment.

Box 11. Three dimensions of capacity development

FAO defines capacity development as comprising "three dimensions: the individual's capacity, the organizational capacity and the enabling environment. Each of these three dimensions works interdependently with the others and influences the overall impact of a capacity development intervention. Capacities need to be strengthened at the individual level, the organizational level and at the level of the enabling environment."

At the individual level, capacity development leads to changes in skills, behaviours and attitudes.

39 CTA. 2013. **ITC4Ag: Making it happen, post-conference issue**, number 75, December 2013, http://ictupdate.cta.int/Regulars/ICT4Ag-Q-A/Changing-perceptions
40 WOUGNET. 2015. **About us**, http://wougnet.org/home/about_wougnet
41 WOUGNET. 2012. **Female farmers and the use of ICTs for agriculture in Uganda: experiences from WOUGNET**, http://www.e-agriculture.org/blog/female-farmers-and-use-icts-agriculture-uganda-experiences-wougnet

At the organizational level, capacity development consists of those measures taken to improve the overall functioning and performance of an organization, and is often noted in changes to organizational mandates, systems, processes or priorities.

The enabling environment is the context in which individuals and organizations put their capabilities into action, and where capacity development processes take place. Changes to the enabling environment influence how organizations and individuals behave and progress.[42]

At the individual level, it is important to adapt the capacity development initiatives to the needs of men and women.

Depending on the context of the initiative, it can be useful to offer learning opportunities for women and men separately, and at some point bring both groups together so they can exchange experiences. This allows men and women to have their own moments of learning, as well as common moments, which can improve participation and the opportunities for women and men to speak freely. It can also help them to articulate their concerns, which may be more difficult in mixed groups.

The organization of training sessions needs to take into account the daily timetables of women and men, and be realistic in order to encourage participation. Providing childcare during sessions can be a major incentive in persuading women to attend. A useful tool for planning capacity development activities is **the 24 hour activity calendar**.

Box 12. 24 hour activity calendar

The International Institute for Communication and Development (IICD) describes the 24 hour calendar as follows: "The 24 hour activity calendar is a method whereby men and women jointly reflect on how women and men, girls and boys allocate their time between different activities over a 24-hour period. Through joint analysis of the calendar, the men and women realize the unequal distribution of tasks, time and benefits and can decide to take action to change inequities. The 24 hour activity calendar also allows to plan for activities at a time that will suit men and women equally."[43]

It is a good idea to include literacy courses in any initiative, because the limitations faced by illiterate people go beyond the use of ICTs, and literacy courses can increase the overall impact of an initiative to a significant degree. Radio and use of mobile phones or even tablets

42 FAO. 2015. **Enhancing FAO's practices for supporting capacity development of member countries**, Learning Module 1, Rome, Italy, p27-29, http://www.fao.org/3/a-i1998e.pdf
43 IICD. 2015. **Case study: Promoting equal chances for men and women to use and benefit from ICT-enabled agricultural value chain development**, http://iicd.org/documents/promoting-equal-chances-for-women-and-men-to-use-and-benefit-from-ict-enabled-solutions/

can jumpstart access to information without literacy being needed as a prerequisite. Simple and effective applications have been developed and applied in the field to enable illiterate users to access information that is critical to their socio-economic welfare.

Groups that have less mobility, as is often the case for women, will benefit more from the new possibilities offered by e-learning, which is a potent tool to bring about gender mainstreaming. E-learning can also be integrated into existing organizational and educational structures, as a hybrid system that can be called 'ICT-supported learning'.[44]

Box 13. Songtaaba Women's Association sets up a women controlled telecentre in Burkina Faso

The Songtaaba (Solidarity in Moré) Women's Association is an organization that manufactures shea butter skincare products, an activity driven by women. The initiative changed drastically with the introduction of ICTs. Women did not only learn how to use a computer, but also how to maintain one and process data. The association also developed a website that enabled women members to improve their marketing and sales skills. The website has proved important in enabling women to reach out with their products beyond the local market. Within two years of introducing ICTs, orders increased by 70 percent, and have continued rising. The association has invested in telecentres in villages where they are active. Rural women trained by the Songtaaba Association manage these centres.

Here, women can use phones, computers and the Internet to access all the information they need to improve their businesses. Aimed specifically at rural women, and run by rural women, such centres have created a safe environment for women to access and share information and to attend training initiatives.[45]

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44 Tiwari, S.P. 2008. **Information and communication technology initiatives for knowledge sharing in agriculture**, Indian Journal of Agricultural Sciences, 79 (9)
45 CTA. 2012. **ICT Update 68: Raising awareness**, Wageningen, The Netherlands, p.5 and p.6

Box 14. Women farmers learn about best farming practices through video in India

Non-profit international organization Digital Green[46] and the M.S. Swaminathan Research foundation (MSSRF) are working together on a novel initiative to spread the use of clean technologies among women farmers in rural Maharastra, India. MSSRF rolled out the Digital Green model, which is based on demonstrations of good farm practices through videos. The programme currently reaches about 3 300 women farmers in some 60 villages in the region. The success of the videos is explained by the fact that women recognize themselves, seeing women farmers just like them demonstrate how to apply crop techniques, with the overall message that anyone can adopt best practices and benefit from them. The training videos are produced in a participatory way, using women farmers to reach other women farmers. They explain model farming techniques narrated through a story in a step-by-step manner in the local language Marathi, making it easier for the women to learn from the videos and to replicate the practices on their farms.[47]

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At organizational level, much can be done to improve gender equality. The capacities of all the organizations involved in an ICT for agriculture or rural development initiative should be developed to better take into account gender in their work and activities, whether these are farmer organizations or other development partners.

Regarding the importance of gender sensitive organizations, IICD concluded that "well-functioning and gender sensitive farmer organizations will understand the importance of equal participation and opportunities for men and women farmers. At the organizational level it is important to ensure gender responsive systems and structures. In order to design and implement gender responsive ICT projects, organizations need gender aware staff, monitoring and evaluation systems that capture well what is happening on the ground, cooperation among staff with different tasks, and learning mechanism to deal with gender gaps when and where they surface. This requires gender sensitive leadership in the organisation to take the right decisions on strategies, approaches and budgets".[48]

Regarding the enabling environment, ICT policies and e-agriculture strategies must take gender into account. When policies and strategies are developed, it is crucial to ensure that all stakeholders are represented, including women and men at all levels. If an initiative is

46 www.digitalgreen.org
47 Business Today. 2015. **Future of farming**, Retrieved from : http://www.businesstoday.in/magazine/features/second-green-revolution-likely-innovation-in-information-tech/story/222535.html
48 IICD. 2015. **Case study: Promoting equal chances for men and women to use and benefit from ICT-enabled agricultural value chain development**, http://iicd.org/documents/promoting-equal-chances-for-women-and-men-to-use-and-benefit-from-ict-enabled-solutions/

implemented at local level, it is important to seek ways of sharing the lessons learned on how to better take gender into account at the higher level. Also, information needs to be made more widely available on how the situation of women compares to that of men in their countries with regard to access to, use and impact of ICTs, in order to work towards a global equitable information society.

Accurate sex disaggregated data and indicators are essential to an understanding of trends in participation, so as to inform policy-makers of potential gaps and inequalities, and develop strategies to address them.

The gender dimensions of rural infrastructure and the enabling environment for ICTs are important considerations. ICTs can only impact women's lives if infrastructure reaches them, and if appropriate policies and programmes are in place to address poverty and gender issues in accessing and using ICTs.

Box 15. Using an online information system to analyse asset portfolios of rural women

The International Center for Tropical Agriculture (CIAT) developed a practical approach to collecting information on assets, actions and products for both women and their families by using household surveys. These surveys help to gather data that show the differences between men and women, leading to a better understanding of gender roles, responsibilities and differences in control over resources in a particular context. CIAT developed an online information system programmed with licence-free software to facilitate the data management. Data on land access and use, cropping and livestock management, income and wealth, access to credit, level of organization and perception of risks of rural women and their families have all proved useful in analysing the differences in asset portfolios of the families and the women, and sharing the results in real time with a wider audience.[49]

49 Guharay, F. 2015. **Using online information system to analyze asset portfolios of rural women**, http://dapa.ciat.cgiar.org/using-online-information-system-to-analyze-asset-portfolios-of-rural-women/

4.3. Gender and diversity: the global picture

Gender is defined by FAO as "the relations between men and women, both perceptual and material. Gender is not determined biologically, as a result of sexual characteristics of either women or men, but is constructed socially. It is a central organizing principle of societies, and often governs the processes of production and reproduction, consumption and distribution".[50] Despite this definition, gender is often misunderstood as referring to the promotion of women only. However, gender issues focus on both women and men, and on the relationship between men and women, their roles, access to and control over resources, division of labour, interests and needs. Throughout activities for ICT in agriculture, it is important to include women and men, and even their families, at all times, in order to address gender issues effectively.

When addressing gender, youth and diversity in a systematic way throughout the whole ICT landscape, it is important not to lose sight of **the bigger picture**. The ultimate objective of enhancing access and use of ICTs is to improve livelihoods for all, and to enhance the empowerment of rural women in particular. Women who are adopters of ICTs have shown themselves to enjoy better participation in decision-making and to have greater productivity. ICTs can play a crucial role in improving the status of rural women and increasing their economic welfare. Access to ICTs is a necessary condition, but not a sufficient one for harnessing the potential benefits of ICTs by itself. The complete picture must at all times be taken into account, as well as the potential consequences for social dynamics within communities, if there is to be real progress in addressing the gender divide and ensuring lasting solutions within communities.[51]

Box 16. Gender Evaluation Methodology for Internet and ICTs (GEM) The Gender Evaluation Methodology for Internet and ICTs provides a systematic method for evaluating whether ICTs are improving women's lives and gender power relations. Introducing ICTs alone is often insufficient to bring about positive social change. ICTs have the potential to contribute to change, but only if coupled with a critical reflection on gender during planning, implementing and evaluation. GEM offers a tool to help managers ensure that their programme remains adaptive and responsive to constantly changing contexts. It does not provide an easy response to development issues, but helps to set in place a mechanism that allows regular feedback, reflection and action. The methodology is based on the idea that users should at any time be ready to go back to their programme model and redesign, implement and continuously monitor their activities, if they are to obtain the changes that they want for their beneficiaries.[52]

50 FAO. 1997. **Gender, the key to sustainability and food security**, SD Dimensions, May 1997
51 Jain, R. et al. 2012. **ICTs and Farm Women: Access, Use and Impact**, p. 392 in Indian Journal of Agricultural Economics, Vol. 67, no. 3, July-Sept 2012
52 GEM, **Gender Evaluation Methodology for Internet and ICTs**, http://www.genderevaluation.net/?q=about-gem

4.4. Access and participation: be inclusive and ensure participation of men and women at all stages

Including beneficiaries at all stages of an initiative will make it more relevant to both men's and women's needs. Giving everyone a voice and a say in the formulation, implementation and evaluation is the first step towards an inclusive development initiative.

To ensure participation of both men and women, all activities should be adapted to their needs. It is important to plan activities taking into account the daily timetables of both men and women, and not to overburden them with extra activities. In order to ensure broad participation, activities need to be organized at a place that is both accessible and sociably acceptable for both men and women. The greater the extent to which account is taken of people's daily tasks, responsibilities and social environment, the higher the attendance is likely to be.

Equal participation and gender issues should not only be considered at user level. It is important that both men and women are well represented at all levels. This includes the level of the initiative itself, but also the design of the ICTs and their applications.

Box 17. M-Farm: Connecting with buyers and farmers to sell produce

In Kenya, rural households often face difficult negotiations with middlemen when they try to sell their crops. These households lack access to qualitative and timely information on crop prices, and middlemen take advantage of the situation to extract the maximum profit. Three young women, themselves from rural areas, decided to develop a software solution and an agribusiness company, in an effort to improve the revenues of rural households. They called their company M-Farm. The business model is a transparency tool for Kenyan farmers, who receive simple text messages on their mobile phones on the retail price of their products, as well as of farm inputs, enabling them to find buyers for their produce and buy fertilizer, equipment and seed directly from manufacturers at favourable prices. The rural households, comprising both men and women, are now better informed and can engage in more effective negotiations for crop prices. M-farm was launched after winning the IPO48 competition, a 48 hour boot camp event aimed at giving web or mobile start-ups a platform to launch their initiative.[53]

© M-Farm

53 M-Farm. 2013. **MFarm empowers Kenya's farmers with price transparency and market access**, Retrieved from: http://www.wired.co.uk/news/archive/2013-06/21/mfarm

When implementing an ICT initiative it is important to place people at the centre, not the technology. While this may seem obvious, all too often ICTs are introduced in communities, or applications are developed, without any input or participation by the intended users. Yet ICTs have characteristics and functions that can offer real solutions to a range of problems. Access to information and the creation of communication channels helps to remove populations from their isolation, and gives them a voice. ICTs are a relatively cheap means to that end, and can be highly effective, if they are designed and implemented according to people's real needs.

It is also important to gain the trust of men and women in the community, so as to create an enabling environment for implementation of a programme. It is crucial to establish a good relationship with the communities before introducing changes. One option is to team up with local extension workers, who are already well known and trusted by communities. A long-lasting relationship with a person or a local organization can add significant value to an initiative. Be sure to identify people who are trusted by women, as well as by men.

Box 18. Grameen Foundation Community Knowledge Workers in Uganda

The Community Knowledge workers initiative was launched in 2009 in Uganda, and has since been extended to Colombia and Ghana. The initiative serves farmers in remote communities through a network of peer advisors. It brings together human networks and mobile technology to help farmers obtain timely and accurate information. The Community Knowledge Workers, who are themselves farmers, are respected in their communities and chosen by their peers. When conducting a survey among farmers in Uganda, the Grameen Foundation discovered that female Community Knowledge Workers were more effective in reaching female farmers. Based on that knowledge, more female Community Knowledge Workers have been trained and included in the initiative.[54]

4.5. Partnerships: analyse gender issues regarding partners involved in the initiative

Partners involved in the ICT processes and the development of ICT applications for the initiative need to be aware of gender equality issues, and how to integrate them in the work they will be doing on this occasion. It is good to look into the gender awareness of every partner engaged in the initiative. Training in gender issues can be planned for the partner organizations to make sure that all parties are on the same wavelength. If the implementing partner is not gender sensitive, this can compromise the desired outcome of men and women benefiting equally from the initiatives.

When setting in place ICT initiatives at community level, it is often easier to work with partners who already have ongoing and long-lasting relationships with the men and women targeted by the initiative, and who are trusted by all members of the community. It is much more

54 Grameen Foundation. 2015. Community Knowledge Workers, http://www.grameenfoundation.org/what-we-do/agriculture/community-knowledge-worker and Grameen Foundation, (2014, Executive Summary: Lessons learned 2009-2014-Community Knowledge Worker Uganda Programme http://www.grameenfoundation.org/resources/publications

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efficient to build on existing and well-functioning relationships when introducing a new ICT or service in a community.

New public-private partnerships can help to improve the availability of mobile networks in rural areas, or mobile services such as financial services. These partnerships can help to increase the access of women and men to information or financial services in areas that were previously not covered, because they are considered less interesting for commercial operators.

Box 19. Grameen Foundation India: bringing savings accounts to ultra-poor female clients via mobile phone

Cashpor Microcredit offers a savings service through mobile phone. As a microfinancing institute acting as a banking correspondent, Cashpor is able to offer a zero-balance savings account, called Apna, to its poorest clients who previously did not have access to a safe place for their savings. The mobile phone is used as a delivery mechanism for the Apna savings services. Deposits and withdrawals are conducted on the mobile phone through an SMS service, which uses the mobile phone number as the account number. The Cashpor case study shows that mobile phone literacy among women is limited, even among those who own a phone. Clients clearly need help in using their mobile phones, particularly to check their savings balance. Mobile and financial literacy can address this gap. The women rely on a family member, particularly their husbands, to help them use the phone. Access to the services is even more limited for women who do not own a phone. Half of those who borrow phones report that there are times when it is unavailable to them. Access to mobile technology remains a barrier for women in using available services. Making it easier for women to access a phone, or find an alternative method to provide saving services, might help to include more women.[55]

55 Grameen Foundation. 2012. **Women, mobile phones, and savings: A Grameen Foundation case study**, USA

The private sector, such as mobile operators and the industry, should collaborate with other stakeholders such as governments and the development community to close the gender gap.

A 2015 report by GSMA, which represents the interests of mobile operators worldwide, outlines five ways that this can be done: accessibility, affordability, usability and skills, safety and relevance.

Accessibility: stakeholders need to address the fact that women are less likely than men to have access to quality network coverage, handsets, electricity, agents and identification documents.

Affordability: the cost of handsets, tariffs, data plans and transaction fees needs to be affordable for women as well as men.

Usability and skills: stakeholders need to improve the usability of handsets and services, and the ability and confidence of women to use them.

Safety: stakeholders need to ensure that women feel safe when using a mobile phone.

Relevant: government policies, and mobile products and services, need to meet women's needs as well as men's.

4.6. Technologies: the right mix for men and women

While the inclination may be to find ways of integrating the most cutting-edge technology into value chains, practitioners should recognize the infrastructure constraints, as well as gender-based restrictions, that can limit the effectiveness of the newest technologies. Programmes need to look at the array of technology available and determine which ICTs are most appropriate for overcoming specific constraints. Sometimes, tablets can have the same functionalities as computers and be more user-friendly. The purpose of using ICTs for agricultural development is not to introduce technologies, but to use these to find solutions to problems.

In Africa, Esoko has found that women repeatedly state that using a mobile phone to exchange information on farms and agricultural products can lead to marital problems, due to suspicions of infidelity by their husbands.

Box 20. ESOKO adapts its services to overcome gender barriers

Since 2005, ESOKO has been the leader in delivering market information to farmers across Africa, operating in 16 countries and employing more than 200 people. ESOKO is a mobile phone-based agricultural information system, which allows farmers to subscribe to information updates, or ask specific questions by SMS. In order to access ESOKO's information services, a farmer needs a basic mobile phone. To tackle the issue of mobile phone access and address problems linked to illiteracy, ESOKO has set up call centres that allow anyone to call and receive information on farm topics and markets in the local language. ESOKO has also ensured that the call centre has an equal amount of women and men answering the calls, to ensure that women who feel more comfortable discussing their farm issues with other women can be helped in a timely fashion. Nevertheless, the call centre reports show that only about 15 percent of the calls received are from women. To further strengthen the inclusion of men and women, ESOKO has introduced an automated voice call to bridge the literacy gap. Relevant and timely good agricultural practices customized to the local farmers' needs are regularly sent to subscribers. The messages are recorded in local languages, and sent to farmers as extension advisories. Farmers who do not pick up the phone are automatically called again three times. An impact evaluation in Ghana found that farmers using ESOKO services sold their yams at prices 11 percent higher than those not using the service.[56] [57]

https://esoko.com

Radio arguably remains one of the most effective means of reaching farmers in the field, because the infrastructure already exists. Radio is much more accessible to women, and they can listen to it in their own language, often while doing chores. Even if radio is a more traditional media, it still needs to be used with caution if it is to contribute to gender equality. Often, local radio stations are owned by men, the radio broadcasts are presented by men, and the topics are chosen by men. Rural radio stations could benefit from greater women's participation, to make the programmes more relevant to all. Radio programmes can also be combined with the use of mobile phones, encouraging listeners to call in to ask questions, or to intervene by sending an SMS. The Internet can make radio programmes available at all times, while also serving as a valuable resource for the radio producers.

© Pablo Coral Vega

56 Asare-Kyei D. & Pabby, M. 2015. **Esoko experiences with gender and ICTs for agriculture**
57 Nyarko, Y. et al. 2013. **Market information systems for rural farmers: evaluation of Esoko**

Box 21. Farm Radio International: Her Farm Radio

While all Farm Radio International (FRI) projects are designed to be accessible and relevant to both women and men, Her Farm Radio places a particular focus on giving a voice to women and the knowledge needs of women farmers across Africa. Her Farm Radio is not just about addressing women's needs, but also about promoting gender equality in radio initiatives for agriculture and health, affecting the quality of life of both women and men. Radio still remains a powerful ICT for small-scale farmers – one that does not require access to electricity or the Internet and has strong potential to include the voices and knowledge needs of women farmers. The initiative consists of various projects that engage women in audience research to ensure that the radio programmes meet their specific needs, focus on interventions with specific benefits for women, mother and children, share female voices and perspectives in each show, engage female broadcasters and guests, include episodes that explore gender relations and men's role in the family, air programmes at times when women are able to tune in, and establish women-only community listening groups. Her Farm Radio has also distributed mp3 radios to enhance access to radio for women. The project has dedicated phone-in lines for women, and ensures that women make up half of interviewees in project surveys, reviews and evaluations.[58]

Men and women farmers are already exchanging information. Often through word of mouth, farmers share farming practices, experiences with different inputs, preparation of different crops for consumption, and so on. Women especially rely on these familiar channels, because their time and mobility constraints often limit their exposure to new information providers.

ICTs can support and enhance traditional information channels by providing access to expertise and more up-to-date information. The Women of Uganda Network relies on the strength of locally developed information channels to increase the audience for its services. Women's groups are given a mobile phone and a radio cassette player to use as they listen to local agricultural radio shows, call extension officers, or share information between groups. Information is disseminated in the local language and the groups are encouraged to spread the word to other women farmers. Part of the programme's success is due to the fact that it works within channels that are familiar to women (GSMA Development Fund and Cherie Blair Foundation for Women 2010). In the same way, FAO's Dimitra Clubs use solar radios and mobile phones to connect listeners to rural radio, opening the way to questions and feedback on air, and facilitated discussions among listeners after the radio programme has ended.

58 Farm Radio International. 2014. **Brief Her Farm Radio**, http://farmradio.wpengine.netdna-cdn.com/wp-content/uploads/Her-Farm-Radio-General-Brief-FINAL-July-7-2014.pdf

4.7. Economic, social and environmental sustainability: consider what will happen later

To ensure **economic sustainability** and encourage active participation, providing income-generating opportunities and ideas that are immediately applicable can serve as a good incentive, alongside the introduction of an ICT. This will encourage both women and men to invest the time and resources to learn about the ICT, as they see their immediate relevance and the potentially long-term changes these could bring to their daily lives.

Box 22. Financial sustainability – ICTs for shea butter producers in Mali[59]

The Zantiébougou Women Shea butter producers cooperatives (Coprokazan) and the Malian Association for the Promotion of Youth (AMP) were jointly seeking solutions for the problems they encountered in marketing shea butter at national, regional and international levels. To generate higher sales, and improve women producers' livelihoods, promotional activities needed to be strengthened. The project, supported by the International Institute for Communication and Development (IICD), set out to install electricity and computers, train members in the use of software and office tools (e.g. presentations for training, bookkeeping and handling orders from abroad), create a website and advertise on radio and television. Picture animated presentations were organized in surrounding villages, sharing knowledge among women on how they could improve the quality of their shea butter. As a result, the quality and sales of shea butter have risen substantially, and Coprokazan and AMP were able to continue their work, using the additional revenue they made.

ICTs offer an opportunity to manage small farms in a more efficient way. Farmers with access to accurate information on the use of inputs, as well as on yield results for different crops, are better positioned to take decisions on what to plant the following year. Women who are in charge of farm management can be helped to improve the smallholding's economic sustainability by using simple software. In addition, weather stations, pest traps, suitable irrigation and sensors to measure soil moisture can all help to reduce the cost and use of agricultural inputs, achieving greater environmental sustainability as a result.

Box 23. ICTs prove a sound investment for woman farmer in the former Yugoslav Republic of Macedonia

Suzana Dimitrievska lives in the former Yugoslav Republic of Macedonia's Vardar Region. She comes from a long line of strong, well educated women, who have always played a prominent role in making decisions on the family farm. So when she decided to investigate using ICTs to streamline the management of her own organic farm, she had no hesitation in taking a step that might be viewed with misgivings by some of her neighbours.

59 IICD. Veldhuizen, J. 2009. **Gender and ICT: a good mix**, The Hague, The Netherlands, www.iicd.org/about/publications/icts-for-gender

Determined to find an ICT management programme that could help her to run her farm more efficiently, Dimitrievska identified a software package that would enable her to perform a range of planning and management functions, without leaving her farm office. Officials at the company that sold her the farm management software programme were themselves surprised to be approached by a woman, especially one so adamant about the kind of ICTs she wanted to use, and the benefits she expected to see.

Dimitrievska is convinced that her investment has more than paid off. By using this sophisticated tool on her growing farm she has managed to lower the cost of labour, and expenditure on gas and fertilizer. Some of the software functions that she uses on a regular basis include keeping records of the crops planted on each plot, to help with preparation and planning for the next season, keeping account of costs, managing the large number of seasonal workers, reporting and analysing the profitability of each crop and managing machinery.

The software has given this enterprising woman farmer the decision-making power she sought, helping her to pinpoint which crops are worth growing on her farm, and in which quantities. Conversely, after just 12 months, the ICT system has also shown her that some of the crops that have been cultivated there for years are not economical at all, and she is now investigating more profitable options.

In 2017, climate change took a heavy toll on some of Dimitrievska's organic grapes, apricots, watermelons, beans, chickpeas, sunflowers and luzern, with excessively high temperatures literally burning the leaves of her grapes. As a result, she is now considering investing in precision agriculture, as a way of reducing risks and further improving farm management, giving her precise information about when and how to irrigate to the greatest effect.

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To ensure **social sustainability,** ICT initiatives seeking to improve gender equality should not only target women, but also men, as well as the larger family unit and the community. In this way, all members of a family or a community are informed of the initiative, and can see the benefits it could bring for each member. A family-centred or community-centred approach to ICT initiatives enables these groups to recognize that it is important for women to have access to ICTs. Access by women to information and education can also make it more acceptable to send both daughters and sons to school, a factor that is likely to increase the chances of achieving an upward movement towards gender equality.

Box 24. Ensuring sustainability – the case of FAO's Dimitra Clubs

FAO-Dimitra[60] is a participatory information and communication project implemented in several countries of sub-Saharan Africa, aiming to highlight the role of women in agriculture. It also promotes leadership and the voice of the most vulnerable people in rural areas, particularly women and youth, in an effort to improve their livelihoods and food security. This is achieved through gender-sensitive participatory communication, and more specifically through the Dimitra Clubs. These are groups of rural women and men who meet regularly to discuss their needs, priorities and challenges, and take collective action to solve common problems using their own resources. One village may have several listeners' clubs for women or for men only, or for mixed groups. It is important that both women and men can express themselves freely, exchanging views and deciding which actions are needed at community level to solve concrete problems. The discussions are usually summarized and aired through partner community radios. Members of the Dimitra Clubs listen to the radio programmes together, discuss the issues further and engage in exchanges with the radio station and other clubs using their mobile phones. To facilitate access to information and better communicate with other clubs and the radio stations, each club receives a solar and hand-cranked radio set, sometimes coupled with a mobile phone. In 2018, some 2,000 Dimitra Clubs are active in Burundi, the Democratic Republic of Congo, Mali, Niger and Senegal, accounting for 60,000 members (of which 60 percent are women) and positively impacting 1.5 million rural people.

This approach contributes to gender equality and the empowerment of rural populations, especially women and youth. It promotes dialogue, self-confidence, collective action, social cohesion and behavioural changes, including in terms of gender roles and relations and improves access to markets and socio-economic opportunities. Impact has also been obtained in a variety of areas such as agriculture, nutrition, women's leadership, education and health.

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The FAO Dimitra Clubs are a community mobilization and people's empowerment approach based on a capacity development process in which communication is central. Even if they are used in this process, ICTs are not a development objective in itself but an enabler for empowerment of both women and men and for gender equality. The use of ICTs is also instrumental for facilitating networking, breaking isolation

60 FAO Dimitra, www.fao.org/dimitra

and sharing good practices. The discussions, radio broadcasts and interactions via mobile phone create a network between communities, and open a window to new information, opportunities and communication channels for remote rural populations and excluded people. This approach also serves as an efficient mechanism to bring information up from the grassroots level to the decision-makers and vice versa, thus improving community governance.

Interestingly, FAO-Dimitra Clubs bring together traditional information channels, such as discussion groups and village assemblies at community level and rural radios, with newer technologies such as solar panels and mobile phones. To address the lack of electricity in villages, Dimitra uses radio sets that are powered both by crank and solar energy. Mobile phones can also be recharged on these radio sets.

By making use of ICTs in support of a transformative process led by rural communities, the Dimitra Clubs ensure inclusive participation and ownership of the actions undertaken and thus, sustainability.

GENDER AND ICTs

Mainstreaming gender in the use of information and communication technologies (ICTs) for agriculture and rural development

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Chapter 5. Growing opportunities for closing the gender gap through ICT initiatives

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Growing opportunities for closing the gender gap through ICT initiatives

5.1. Mobile finance

In many parts of the world, women's access to business opportunities or finance institutions is still restricted. In some countries, women are not allowed to open a bank account, or only with the permission of their husband. Mobile phones can now be used for receiving money and making payments, and are not subject to these legal restrictions. The financial services offered through mobile phones can also include loans or insurance. Sending and receiving money through mobile phones has the added advantage of avoiding the need to visit the bank in person, saving valuable time in an already busy schedule, and can help women to overcome mobility restrictions.

The potential benefits to social relationships and quality of life of increased access to finance through mobile finance may include: empowerment of women, positive shifts in men-women relationships within communities, overcoming mobility restrictions and savings in time and transport costs.

Box 25. Mercy Corps Indonesia: increasing women's access to banking

Through the Agri-Fin Mobile programme, financial and rural advisory services have been made available to farmers via mobile phones. The starting point of the financial advisory services was the idea that when farmers' incomes improve, they will need financial literacy in order to handle their income. The programme focused its training on smallholder farmers' family members, who are responsible for handling income, especially women. In order to ensure that the programme would be suitable for both women and men, a gender assessment was conducted before the design of the programme and the training.

The most important findings of the study were the following:

- Women farmers' biggest agriculture related needs are financing, tools and training.
- Men and women farmers want to receive the same types of agricultural information, despite their different roles in agricultural production.
- Women farmers prefer face-to-face training and learning.
- Male youth can access agricultural information through male youth farmer groups, but very few of these groups have members below the age of 25. Female youth lack access to these information channels, because there are no female youth farmer groups.[61]

61 Mercy Corps. 2015. **Lessons learned on service delivery, Marketing and Capacity building on Agri-Fin Mobile**, EBOOK

During programme implementation, the team learned that trust was essential, and that it was necessary to work with extension workers as the human interface to transmit knowledge effectively. The women farmers also requested that the extension workers be women. While the programme targets farmers in general in the district – both men and women – specific activities were organized to answer the particular needs of women.

Mercy Corps and the District Agriculture Extension Office in the Karawang District of Indonesia delivered business and financial literacy training to 10 000 female farmers through blended learning methods, using both classroom activities and digital channels. Through the training of trainers, 71 women agricultural extension workers were trained, who in their turn trained women farmers. Since the local government – which is responsible for agricultural extension workers at decentralized level – did not have enough female extension workers on its payroll, an extra 24 female extension workers were trained. Another 1 000 women farmer entrepreneurs benefited from the training delivered by those extension workers. The women entrepreneurs also benefited from continuous coaching activities delivered through android phones. As a result of coaching, the women extension workers have noticed and documented changes in the business results of the women farmers. These are now able to open an account and have access to savings, loan and payment services through their mobile phones. During the programme, some adjustments were made. Regarding the training venue, the extension office did not seem suited to women, so the sessions were moved to locations closer to their homes. It is interesting to note that throughout the programme, the women farmers showed more interest in financial training than in agricultural technical training. The most important objective for them was to be able to save money, in order to buy agro-inputs.[62]

Lessons learned

- "Female farmers are more interested in receiving information about financial literacy than agricultural information. It is suspected that this is because the farming business activities are mainly the responsibility of their husbands, while the female farmers' primary responsibilities are managing the family financing and supporting the farming activities."

- "One constraint faced in conveying agricultural and financial literacy information was frequent changes of SIM cards. After changing the SIM cards participants forgot how to register with the information platform."

- "After conveying financial literacy material via SMS, the Agri-Fin Mobile programme sent quizzes each week to learn about what the women had learned from the material. For every right answer given the women would receive a small amount of phone credits, which was a strong incentive for the women to participate."

- "When conveying financial literacy material by mobile phone, it is important to confirm whether the mobile phones that the farmers use are their own or if they are shared with family members. Information may be missed under circumstances of shared mobile phones."[63]

62 Mercy Corps. 2015. **Lessons learned on service delivery, Marketing and Capacity building on Agri-Fin Mobile**, EBOOK
63 Ibid

When women gain access to mobile financial services, they benefit from a safer and more confidential way of handling their money, and this will result in better control over their finances, and increased economic empowerment.[64]

Mobile finance can offer many potential benefits such as:

- Increased access to an account for women
- Increased control over finance by women
- Increased saving: women are less likely to use money saved in a mobile account than if they keep the money at home
- Lower costs for both provider and client
- Increased remittances: the use of mobile money makes it easier for women to solicit funds from their husbands and other contacts in the city
- Improved women-owned businesses and better access to credit: due to mobile accounts, a history of financial transactions is created, which helps to establish creditworthiness when applying for a loan
- Increased participation of women in the labour force, including more opportunities for women to work remotely from home

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64 World Bank Group. 2015. Digital financial solutions to advance women's economic participation, Washington, D.C., https://www.betterthancash.org/tools-research/reports/digital-financial-solutions-to-advance-women-s-economic-participation

Box 26. M-Pesa

M-Pesa (M for mobile and pesa for money in Swahili) is probably the best known mobile finance application. Highly successful in Kenya, it has become the flagship service of its provider Safaricom Ltd. M-Pesa allows people from all around the country, even in the most remote areas, to transfer money directly, saving considerable amounts of time and money. The service is now used by about 70 percent of the adult population of Kenya. Research[65] within fishing communities in Migori County, located on the Kenyan side of Lake Victoria, shows that M-Pesa has brought significant positive changes for women, such as the possibility to save their money in a safe place and to build up resources for costly activities and purchases, including helping their families in times of need and sending their children to school. Women confirmed that they were less likely to spend the money when it was saved through M-Pesa, then when they keep it in cash at home, since their husbands no longer have access to it. Transport costs and time have also declined significantly, allowing women to invest more money and time in their businesses. As a result, they now process and sell more fish. In addition, M-Pesa has changed relationships between men and women. Since women are able to save more money using M-Pesa, they no longer need to ask for credit when buying fish from men. The direct payments have increased trust within communities.[66]

However, separate research warns about the other side of the coin – the market dominance of services such as M-Pesa. With two-thirds of the adult population in Kenya using the service, M-Pesa accounts for 20 percent of Safaricom Ltd.'s total revenue, earnings that come largely from transaction fees. Safaricom Ltd. uses mechanisms to make M-Pesa the standard way of sending money in Kenya by charging higher transaction fees to users wanting to send money to non-Safari subscribers. This market dominance could contribute to amplifying existing social inequalities, as the provider can decide on the fees that will apply.[67]

The study also reveals a mismatch between the design of M-Pesa and the capabilities to use the service. Rural women often forget the steps required to withdraw or send money, and those who only use the service sporadically may forget the crucial PIN-code. To retrieve a PIN-code, they would need to travel long distances to a Safaricom store and pay a fee, resulting in money loss for the rural women and benefits for Safaricom Ltd.[68]

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65 White, D. 2012. **The Social and Economic Impact of M-Pesa on the Lives of Women in the Fishing Industry on the Lake Victoria**
66 Ndiaye, O. K. 2015. **Is the success of M-Pesa 'empowering' Kenyan rural women?**, Open Democracy, https://www.opendemocracy.net/5050/oumy-khairy-ndiaye/is-success-of-mpesa-%E2%80%98empowering%E2%80%99-kenyan-rural-women
67 Wyche, S., Simiyu,N. & Othieno, M. E. 2016. **Mobile phones as amplifiers of social inequality among rural Kenyan women**, Journal ACM Transactions on Computer-Human Interaction, Volume 23, Issue 3, July 2016, New York, USA, http://dl.acm.org/citation.cfm?doid=2952594.2911982
68 Wyche, S., Simiyu, N. & Othieno, M. E. 2016. **Mobile phones as amplifiers of social inequality among rural Kenyan women**, Journal ACM Transactions on Computer-Human Interaction, Volume 23, Issue 3, July 2016, New York, USA, http://dl.acm.org/citation.cfm?doid=2952594.2911982

Box 27. FAO designs mobile finance products for women

FAO Zimbabwe's Livelihoods and Food Security Programme conducted a gender analysis, including an inquiry into women's access to finance and financial needs. Based on this, the initiative developed appropriate and affordable financial products for rural households. In the rural areas of Zimbabwe targeted, women mainly save and obtain small loans through rural savings groups that do not have access to formal financial services. Aligning with this traditional model, Steward Bank, the project's partner, has developed the Eco Cash Savings Club (a savings account for groups) and Eco Cash Savings Club Loans (offering loans to groups for onward lending to group members). The loans will be guaranteed by club members to mitigate credit risk. These products have the potential to benefit a large number of women, since they dominate the membership of rural savings groups.[69]

5.2. Mobile learning and e-learning

Mobile learning and e-learning offer a major opportunity for women and girls to overcome many obstacles to education, such as time, reduced mobility, cost and sociocultural norms. Women and girls' increased access to mobile phones, smartphones, tablets and the Internet are an important step towards accessible and better education. Education empowers women and girls by providing them with the ability and knowledge needed to direct their own lives. Girls who receive an education will marry later, have smaller and healthier families, gain skills needed for the labour market, know their rights and gain confidence to fight for them.

A number of barriers continue to prevent mobile learning from attaining its full potential. Mobile devices are often viewed as offering entertainment rather than education, and as a result this technology can be dismissed as distractive or disruptive. The costs related to owning a mobile phone and mobile learning also remain a barrier to accessibility. Sharing mobile devices can reduce costs and increase cooperative learning.

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69 SNV. 2015. **Rural finance outreach strategy in Zimbabwe**, Harare, Zimbabwe, Project Document

Box 28. Farmerline: Education for women farmers through mobile phone messages

Farmerline, a start-up based in Kumasi, Ghana, developed a mobile learning solution for women that builds upon the specialized agricultural communications work already done by the organization. Farmerline develops web platforms and mobile applications that can convey vital information to smallholder farmers in isolated rural areas. Each week, Farmerline sends voice messages to farmers' mobile phones, informing them about best farming practices, weather forecasts and regional market prices. The messages are sent in local languages in a convenient 30-second phone call. Women Advancing Agriculture is a new initiative, specifically targeting women, and delivers educational voice messages about financial literacy, maternal health, and family planning, alongside the regular stream of tips and forecasts. The goal is to help women farmers boost their productivity, but also to advocate for their rights to equal access to information.[70]

Box 29. Tigo Biashara: Mobile educational service designed for women entrepreneurs in Tanzania

Using a grant from GSMA Connected Women, Tanzanian private telecom operator Tigo developed Tigo Biashara. This is a mobile educational service, which offers business skills training aimed at low-income female entrepreneurs, delivered through voice and SMS platforms. The Tigo educational materials have been developed specifically for female learners – something that mobile operators or NGOs often find challenging.[71]

The initiative was analysed and the following lessons shared:

1. "You need to understand and know your target audience and what they want to learn. Consumer insights research is a way to do this."
2. "Make it relevant. All too often, there is limited existing data on female market segments, and so there is a danger that mobile services are not relevant, and adoption will be low."
3. "Understand how your female users have learned in the past. Low-income women and girls are less likely to have completed, or even attended, school, and so their (limited) experience of learning may be negative, or they may have particular expectations or perceptions of what learning is, and they may not equate mobile learning with learning."
4. "Choose appropriate mobile platforms. Low-income women are much more likely to own basic handsets, and so mobile educational materials will need to be developed for platforms that can be accessed from low-end phones, and this is often voice and SMS."

70 Kaisaris, J. **Education for women farmers through mobile phone messages**, http://www.empowerwomen.org/en/blog/2015/05/14/20/04/education-for-women-through-mobile-phone-messages
71 GSMA. 2015. **Mobile learning for women: getting it right**, http://www.gsma.com/mobilefordevelopment/mobile-learning-for-women-getting-it-right

5. "Use female characters and a storyline or scenario that users recognize."
6. "Consider having a teacher figure. If female users are learning through mobile for the first time, it can be challenging for them to recognize that they are learning, particularly if education is usually perceived as a serious thing that someone does in a classroom."
7. "Use certification and quizzes to motivate your participants."
8. "User testing is a crucial part of getting a product right and understanding what female learners need and want from a mobile education service."[72]

The **Globe Community of Digital Learning** (quality4digitallearning.org) offers free material on digital and mobile learning. Topics covered include digital learning, quality in digital learning, new digital learning scenarios, augmented learning, blended learning, gamified solutions, mobile learning, massive open online courses, scenario-based learning, self-paced learning and the peer-reviewing process.

FAO e-learning centre also offers e-learning courses covering a wealth of topics in the areas of food and nutrition security, social and economic development and sustainable management of natural resources (www.fao.org/elearning/). All the courses are designed for self-paced learning, and offered free of charge. In addition to the e-learning materials, there are links to online resources, recommended reading, self-study tutorials, checklists and wide-range of job aids to get started in applying what has been learned.

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72 GSMA. 2015. **Mobile learning for women: getting it right**. http://www.gsma.com/mobilefordevelopment/mobile-learning-for-women-getting-it-right

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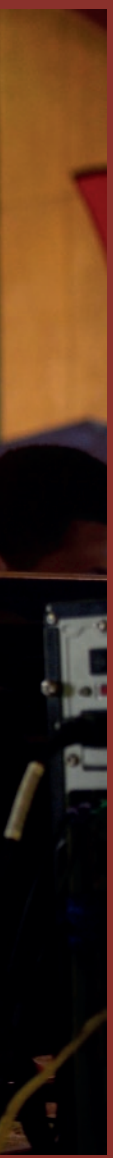

Chapter 6.
Conclusion

6

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The digital revolution has changed the way we work, access information and connect with each other. It offers opportunities to those who can access and use the new technologies, but also presents new challenges for those who are left behind, increasing divides as a result. Although this revolution is reaching rural areas in many developing countries, the rural digital divide is still an issue, and disparities are growing with the introduction of fast-changing technologies. The challenges are especially acute for women, who face a triple divide: digital, rural and gender.

Women's access to, use and control of ICTs is currently limited due to a range of reasons, including cultural and social factors, time and mobility constraints, heavy workloads, inadequate financial resources and low levels of literacy and education. Yet in many cases, ICTs can make significant contributions to overcoming these obstacles – a fact that underscores the importance of ensuring that women have opportunities to unlock the benefits of ICT tools.

ICTs offer valuable opportunities for agricultural and rural development, increasing sustainable output, farm and agribusiness efficiency and revenues for a wide range of players. Used with a gender sensitive approach, they can help to improve gender equality in rural areas, with a subsequent impact on poverty alleviation, through increased agricultural production, more effective marketing, and the development of other income generating activities, especially those managed by women.

Yet despite the clear advantages of using ICTs to increase and extend agricultural innovation, two common errors reduce the potential for ICT applications to contribute to gender equitable agricultural development. First, ICTs are considered gender neutral – in other words, the assumption is that men and women have the same ability to access, use and control these technologies, when this is often far from being the case. For this reason, practitioners should conduct a gender analysis to identify opportunities for using ICTs to enhance current practices. The analysis should describe where and how men and women participate in the specific value chain or agricultural activity. It should capture what information and services men and women farmers need, and how they are currently meeting those needs. It should also assess which ICTs are already in use, and the type of access men and women have to them (direct or mediated).

Second, smallholder farmers are often mistakenly considered an undifferentiated group of beneficiaries. But smallholder farmers are made up of men and women who have specific needs, face different challenges and do not have the same opportunities.

It is critical that ICT initiatives seeking to improve gender equality should not exclusively target women. They should also target men, as well as the larger family unit and the community. A family-centred or community-centred approach to ICT initiatives will help to generate widespread recognition that it is important for women to be able to use ICTs. Access of women

to information and education can also increase acceptance for sending both daughters and sons to school, which will have a greater impact, and increase the chances of achieving an upward movement towards gender equality. ICTs can bring education to remote villages, but it is important that digital literacy be part of children's and adults' education.

Women and men need to be involved in the decision-making processes and policy development, as well as in the development of the ICTs and their applications, and programming and planning at all levels and stages.

To close the gender gap, it is important that the seven critical factors of success are taken into consideration: content, capacity development, gender and diversity, access and participation, partnerships, technologies, and finally, economic, social, and environmental sustainability. They should be linked to the principles of digital development (design with the users, understand the existing ecosystem, design for scale, build for sustainability, be data driven, use open data, open standards, open sources, open innovation, reuse and improve, address privacy and security and be collaborative). Furthermore the technologies should be accessible, affordable, easily usable, safe and relevant.

To support gender mainstreaming in ICT initiatives, further research and analysis are needed to ensure that women really benefit from the programmes, and that ICT programmes do not widen the existing gender gap in access to ICTs. For this reason, the collection of sex disaggregated data on women's participation in the information society at local, national and international levels is also crucial. Sex disaggregated data on education and income, as well as on attitudes towards technology use, should be collected to help identify the most appropriate ICT applications.

Since many of the Sustainable Development Goals mention new technologies in their targets and indicators, these should be used to break down information on access to ICTs by gender, network coverage and a number of other factors.

FAO is advocating for national e-agriculture strategies to be drawn up that take into account all stakeholders, and it is critical that any digital strategy should be gender sensitive and participatory. Governments must establish policies and mechanisms to ensure men and women's effective access to and participation in the information society. This should include access to information and the use of ICTs at a reasonable cost for all. The involvement of women in ICT policy-making and implementation at national, regional and international levels needs to be reinforced. Non-state actors, such as the private sector and civil society, will play an important role in any strategy for the sustainable and equitable use of ICTs for agriculture.

Such national strategies will contribute to bridging the triple divide. They will help to develop a regulatory environment and standards such as those for interoperability, open access, security, and data ownership and sovereignty. Finally, they will enable the agricultural sector to innovate through ICTs by maximizing the benefits and mitigating the challenges for both men and women.

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