

**UNITED NATIONS COMMISSION ON SCIENCE AND TECHNOLOGY  
FOR DEVELOPMENT (CSTD)**

**Contribution to the CSTD ten-year review of the implementation of WSIS  
outcomes**

Submitted by

**FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS**

**DISCLAIMER:** The views presented here are the contributors' and do not necessarily reflect the views and position of the United Nations or the United Nations Conference on Trade and Development.

**1. To what extent, in your experience, has the "people-centred, inclusive and development-oriented Information Society", envisaged in the opening paragraph of the WSIS Geneva Declaration of Principles, developed in the ten years since WSIS?**

E-agriculture is an area of application of Information and Communication Technologies (ICTs) under Action Line 7: ICT applications: benefits in all aspects of life, in the Geneva Plan of Action of WSIS;

- a) Ensure the systematic dissemination of information using ICTs on agriculture, animal husbandry, fisheries, forestry and food, in order to provide ready access to comprehensive, up-to-date and detailed knowledge and information, particularly in rural areas;
- b) Public-private partnerships should seek to maximize the use of ICTs as an instrument to improve production (quantity and quality).

The Food and Agriculture Organization of the United Nations (FAO) was assigned the responsibility of organizing activities related to e-agriculture. FAO conducted an extensive survey on the subject of this Action Line and launched the e-Agriculture Community of Practice in 2007 with the founding partners. The e-Agriculture Community is a global initiative to enhance sustainable agricultural development and food security by enhancing the use of ICT in the sector. The Community plays an active role in WSIS follow-up and WSIS stocktaking.

There has been significant progress in improving communication and decision making in rural areas through the application of new technologies. The use of ICTs such as mobile phones and Internet has increased significantly since the creation of the e-Agriculture community. It is estimated that there are almost 6.8 billion mobile connections for a world population of a little over 7 billion. It has been mentioned the latest 1 billion connections have been predominantly activated by the largest but poorest socio-economic group - people living on less than 2 USD a day. People involved in agriculture and allied fields form a majority of these rural poor. The opportunity that the increased availability of mobile connections provides in delivering information services to the people involved in agriculture is phenomenal.

Access to the right information at the right time helps make informed decisions. It especially has an enormous positive bearing on the livelihoods of smallholder resource-poor farmers.

**2. How far do you consider the implementation of specific WSIS outcomes to have been achieved?**

From the Action Line 7 perspective: The World Summit on the Information Society (WSIS), Geneva 2003 – Tunis 2005, Plan of Action includes **e-agriculture** as an area of application of information and communication technologies (ICTs) under Action Line 7. The Food and Agriculture Organization of the United Nations (FAO) was assigned the responsibility of organizing activities related to e-agriculture. FAO conducted an extensive survey on the subject of this Action Line and launched the e-Agriculture Community of Practice in 2007 with the founding partners. The e-Agriculture Community is a global initiative to enhance sustainable agricultural development and food security by enhancing the use of ICT in the sector. The Community plays an active role in WSIS follow-up and WSIS stocktaking.

The e-Agriculture Community of Practice, facilitated by FAO, acts as a catalyst for networking and knowledge sharing on the role of ICT in sustainable agriculture and rural development. It provides an international framework to facilitate the processes of capturing, managing, and disseminating the lessons learned, as well as the results and implications of multilateral processes related to the use of ICT in agriculture and rural development. The overall aim of the Community is to enable members to exchange knowledge related to e-agriculture, and to ensure that the knowledge created is effectively shared and used worldwide.

Additional outputs of the e-Agriculture community include: the development and strengthening of innovative mechanisms and processes for information exchange and communication, including normative guidelines and tools being formulated, tested and disseminated; empowering networks for exchange of new mechanisms and processes among key stakeholders; relevant content in digital format being developed, filtered, mobilized and exchanged; and other activities based on partnerships and collaborative lesson-learning.

Many topics prioritized during the years are issues identified in the **ICT in Agriculture Sourcebook** ([www.ictinagriculture.org](http://www.ictinagriculture.org)) developed by the World Bank with contributions from FAO. Critical issues continue to be addressed through discussion forums, policy briefs and case studies.

The global e-Agriculture community has over 12 000 registered members from over 170 countries. Since its launch in 2007, 23 online forums on topics identified by the Community have produced some 4 000 discussion posts, resulting in trilingual policy briefs for each forum. Online activities, which reach tens of thousands of individuals, are complemented with face-to-face events. Partnerships and collaborations are in place with private sector and development organizations.

### **3. How has the implementation of WSIS outcomes contributed towards the development of a "people-centred, inclusive and development-oriented Information Society"?**

The e-Agriculture community has provided an international framework to facilitate the processes of capturing, managing, and disseminating the lessons learned, as well as the results and implications of multilateral processes related to the use of ICT in agriculture and rural development. The overall aim of the community is to enable members to exchange knowledge related to e-Agriculture, and to ensure that the knowledge created is effectively shared and used worldwide. Additional outputs of the e-Agriculture community include: the development and strengthening of innovative mechanisms and processes for information exchange and communication, including normative guidelines and tools being formulated, tested and disseminated; empowering networks for exchange of new mechanisms and processes among key stakeholders; relevant content in digital format being developed, filtered, mobilized and exchanged; and other activities based on partnerships and collaborative lesson-learning.

#### **4. What are the challenges to the implementation of WSIS outcomes? What are the challenges that have inhibited the emergence of a "people-centred, inclusive and development-oriented Information Society"?**

While substantial progress has been made in making ICTs available and accessible for rural communities, challenges remain in respect to eight critical factors of success:

- 1. Content.** Adaptation of content to local needs, languages and contexts remains challenging. Appropriate information resources (i.e. content) and trusted intermediaries are necessary for 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 of the poor.

#### **2. Enabling environment.**

Scaling up pilot ICT projects to reach millions of smallholder farmers remains a challenge. Up-scaling and mainstreaming of projects is often not sufficiently supported by dialogues at organizational and national levels so as to create a policy environment that is conducive to the effective use of ICTs in agriculture.

An aspect often overlooked is the price of access to ICTs, which can be very high in some countries. Pricing of broadband or mobile services is an important barrier for most vulnerable groups, such as women, youth, older farmers and people living in most remote areas.

- 3. Capacity development.** Focus on access to agricultural information without including the ability to effectively use the information has not yet yielded the desired reduction of the rural digital divide. Illiteracy, limited skills in using complex devices and searching for information, cultural issues remain barriers to the effective reception and use of information delivered via ICTs. Models of capacity development need to be based on social characteristics, information needs and technology function in context. Capacities at the individual, organizational and institutional levels need to be strengthened.
- 4. Gender and diversity.** Access for women, youth, older farmers and people living in most remote areas is hindered by the price of access to ICTs (e.g. broadband or mobile services) and by persistent inequalities. Gender inequalities remain in the digital economy, as does the gap between urban and rural populations. Access and opportunities are not distributed equitably, creating asymmetries that must be addressed with specific policies targeting the source of inequalities.

The digital divide is not only concerned with technological infrastructure and connectivity, but rather is a multi-faceted problem of ineffective knowledge exchange and management of information content, as well as human resources, institutional capacity, and sensitivity to gender and the diverse needs of different groups. For example, less developed digital skills mean that illiterate and older farmers are usually less likely to adopt ICTs. Many of the factors that constrain

male farmers in adopting more sustainable and productive practices restrict women even more. Specific gender barriers further limit women farmers' capacity to innovate and become more productive.

Youth's access and familiarity with technologies as well as their role in the social dynamics of rural communities are not yet sufficiently leveraged.

- 5. Access and participation.** Access to ICTs is not yet equitable. A gender-based digital divide persists, and is more frequent in rural than urban areas. The digital divide between men and women is increasing, despite the growing number of Internet users. Improved access to ICTs alone will not resolve the gender digital divide so what needs to be done??.

Similar to the challenges reported in other key areas, proper design and implementation based on a bottom-up approach that involves the communities themselves can reduce the potential for information inequity that can be created when introducing new ICTs into a community.

- 6. Partnerships.** Public-private partnerships are recognized as a critical factor in sustainable business models at the community level, but these do not always have to be with large corporate firms: small, local private companies, local producer organizations and community-based NGOs have often the social capital to provide trusted information and good quality services. Diverse advisory and extension services provided by multiple types of providers are more likely to meet the different needs of different farmers, as there is no unique design of advisory services to fit all circumstances.

With a broader variety of potential partners comes a new challenge: the formal recognition of information and service quality, and consequently the partners' mutual agreement to be held accountable for information and service quality.

- 7. Technologies.** Identifying the right mix of technologies that are suitable to local needs and contexts is often a challenge, in spite of – or due to - the rapid increase in mobile telephone penetration in rural areas. While this offers great potential for increasing access to information, challenges remain in the area of effective use of mobile telephony that are related to access and capacity as described above.

Technologies should be suited to local contexts and needs, and their selection should increasingly take into account the influence 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 the youth and older community members, or between rural and urban/peri-urban communities.

- 8. Financial sustainability.** Scaling up pilot ICT projects to reach millions of smallholder farmers and identifying sustainable business models are still challenges. Pricing is critical to sustainable agri-business models at community level. Investments are needed to cover the cost of creating content and collecting data.

Measurements and data on the impact of mobile technologies on agriculture is 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. At the same time, these impacts are inherently difficult to measure because they may not be immediate, or may not be reported or recorded. Often success of ICT interventions in agriculture is case-by-case. Sustainability of ICT for agriculture initiatives may be at risk if development organizations, governments and the

private sector do not succeed in defining indicators and data that validate investments in ICT and the positive results these may have.

## **5. How are these challenges being addressed? What approaches have proved to be effective in your experience?**

The exchanges within the e-Agriculture community of practice allowed learning of valuable lessons learned in regard to successful initiatives. These often complement existing infrastructure, are low-risk in terms of time and monetary investment, are financially self-sustaining, and enable multi-way communication between stakeholders. Locally adapted content and context are essential. Successful projects often also enable multi-way discussion among peers and social groups that would otherwise be unable to connect, thus leading to knowledge sharing, rather than simply providing specific information to an isolated user.

Based on the current status of Action line C7 and the reflecting on the findings and dialogue of the platform e-agriculture.org, the following recommendations are suggested for the successful implementation of e-agriculture strategies:

### **1. Content**

- Content should be created and adapted from reliable and trusted sources, including in 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 so that it can be stored, retrieved, and exchanged with ease, taking into account issues of ownership and intellectual property.
- Information innovations coming directly from the rural communities themselves should be fostered and widely shared.

### **2. Enabling environment**

- As part of national ICT strategies, the development and implementation of national e-agriculture strategies should seek to provide reliable and affordable connectivity and integrating 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 the development of e-agriculture strategies.

### **3. Capacity development**

- 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 and youth, as well as people with disabilities, which will enhance individual and collective decision-making skills.
- The use of ICTs should be promoted so as to reinforce the resilience capacity of states, communities and individuals to adapt to shocks and natural disasters, food chain emergencies

and transboundary threats as well as socio-economic crises, violent conflicts and protracted crises.

#### **4. Gender and diversity**

- Gender, youth and diversity should be systematically addressed in the planning phase of project design. Women's and youth's access to technology and equipment, as well as potential consequences on social dynamics within communities should be assessed prior to project deployment so as 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 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.

#### **5. Access and participation**

- Digital inclusion policies with gender perspectives should be promoted to enable men and women to access and use ICTs on an equal base.
- Collaboration and knowledge sharing in agriculture should be fostered via communities of practice, including the e-Agriculture Community, in order to showcase and promote models, methodologies, good practices and the adoption of Open Access and interoperability standards, for effective and equitable use of ICTs for sustainable agriculture and rural development.

#### **6. Partnerships**

- Public-private partnerships with a wide range of non-state actors should be promoted for inclusive, efficient, affordable and sustainable ICT services and initiatives in agriculture and rural development which will promote the wide scale use of ICT and foster sustainable agri-business models.
- Partnership structures in which farmer or producer organizations, community-based NGOs are strengthened in their ability to adopt and integrate ICT into their daily operations and service provision to their members – smallholder producers – should be encouraged.

#### **7. Technologies**

- 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 efficiency of e-agriculture initiatives 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.

#### **8. Financial sustainability**

- Access to mobile telephony, Internet and information in general should be possible and within the price range of the poor.
- Open Access policies and initiatives should be encouraged so as to make quality information available and accessible to a broader potential user base.

## 6. What do you consider the most important emerging trends in technology and other aspects of ICTs which have affected implementation of WSIS outcomes since the Summit? What has been their impact?

An important area for follow up is the recent developments and emerging trends in the sector of ICTs for agriculture and rural development. The main recent developments and emerging trends are the following:

- **Mobile telephony:** The increase in mobile penetration in the past 10 years has led to an increase in mobile applications specifically designed for agricultural development. The number of mobile platforms developed and in use on the market to bridge the digital divide with smallholder farmers has also tremendously increased, bringing a more diverse range of information sources for farmers (Internet, radio, TV, newspaper and extension agents) than some years ago. Mobile-based information delivery holds great promise and is either being considered or is in use as an important channel for agricultural advisory services, financial services and other essential information in rural communities, especially in enhancing access to markets, information on market prices and demand.
- **From mobile phones to smartphones:** Five years ago, Short Message Service (SMS) dominated, now there are SMS, IVR (Interactive Voice Response), Smartphone apps, and integration with social media. Much of the drive in the development of mobile applications (apps) for agricultural development has been championed by young people. Apps alone may not cater for the needs of farmers, but are a huge step towards integrating agriculture and ICTs.
- **Mobile financial services:** Four kinds of financial services that farmers need to achieve their economic goals have been identified and are spreading: credit, savings, transfer and payment facilities, and insurance. ICT has created the potential to deliver a greater diversity of financial products to greater numbers of rural clients than conventional financial service providers have been able to reach. ICTs contribute to economic efficiency and improved service delivery, as they lower business and transaction costs.
- **Role of use of ICTs in agriculture:** ICT innovation has a key role in improving agricultural production and value chain. Food traceability systems using ICT have become very important risk-management tools that allow food business operators or authorities to contain food safety problems and promote consumer confidence. ICT-enabled marketing and access to markets has a major role, especially information on market prices and demand. ICT-enhanced marketing and certification also strengthens the capacity of small-scale producers to increase revenue by improving their position on local and international markets. GIS and agro-meteorological technologies have been introduced into programmes from the very beginning for various purposes including land use planning, crop forecasting and early warning system and other purposes. Space technology is also essential to monitor threats from the growing number of natural disasters. In addition, increasing use of mobile phones for information exchange such as disease surveillance and pest tracking has become common. There is also growing prevalence of ICT-solutions for the later stages of the agricultural value chain (e.g. post-harvest, transport, storage).



- **e-Agriculture strategies in ICT policies:** Even though in many countries there are no specific ICT for agriculture strategies, e-Agriculture strategy initiatives have been or are being put in place in a few countries such as Ghana, Mali, Côte d'Ivoire, Rwanda. Moreover, in most ICT policies developed with the support of organizations such as UNECA, IICD, ITU, and UNDP, there are provisions on sectoral strategies for agriculture. However, approaches differ in different regions and countries.

## **7. What should be the priorities for stakeholders seeking to achieve WSIS outcomes and progress towards the Information Society, taking into account emerging trends?**

As outlined in the vision for implementation of WSIS Action lines beyond 2015 (see [http://www.itu.int/wsis/implementation/2014/forum/agenda/session\\_docs/214/ITU-Session-eAgriculture.pdf](http://www.itu.int/wsis/implementation/2014/forum/agenda/session_docs/214/ITU-Session-eAgriculture.pdf) )

- As part of national ICT strategies, foster the development and implementation of national e-agriculture strategies focusing on providing reliable and affordable connectivity and integrating ICTs in rural development to support food security and hunger eradication.
- Foster collaboration and knowledge sharing in agriculture via electronic communities of practice, including the e-Agriculture Community, in order to showcase and promote models, methodologies, good practices and the adoption of Open Access and interoperability standards, for effective and equitable use of ICTs for sustainable agriculture and rural development.
- Promote the creation and adaptation of content including in local languages and contexts from reliable and trusted sources, including, to ensure equitable and timely access to agricultural knowledge by resource-poor men and women farmers, foresters and fisher folk in rural areas.
- Foster digital literacy of institutions and communities in rural and remote areas taking into consideration local needs and constraints by providing appropriate learning opportunities for all which will enhance individual and collective decision-making skills.
- Promote the use of ICTs to reinforce the resilience capacity of states, communities and individuals to mitigate and adapt to natural and man-made disasters, food chain challenges, socio-economic and other crises, conflicts and transboundary threats, diseases, and environmental damages.

## **8. What role should information and communications play in the implementation of the post-2015 development agenda?**

There is much scope for improvement concerning capacity development of people and institutions.

Equal access, resilience and empowerment need to be strengthened as do as partnerships and active participation of the beneficiaries. Costs of ICTs need to be reduced and the use of ICTs needs to be made financially sustainable, a goal in which public-private partnerships will play an important role.

The agricultural sector is confronted with many challenges posed by the negative impact of climate change, increased frequency of natural disasters, loss of biodiversity, rise in crude oil prices, and rapid expansion of bio-energy development, increasing food price volatility, inefficient supply chains and other challenges. The information needs of farmers will only increase as they have to make more and more complex decisions on the use of their land, selection of agricultural commodities they plant, choice of markets to sell their agricultural products and other necessary decisions that impact the livelihoods of their families and society. Indeed, agriculture is becoming increasingly knowledge intensive.

Statistics show that there are more than 6 billion mobile connections for the 7 billion people living on this planet. Mobile phones are a true enabler - we need to find new ways in which agricultural extension workers can deliver their information services to farmers. Linking knowledge to innovation is also crucial to addressing the information and knowledge gaps in the agricultural sector. Therefore, ICTs play a crucial role in bridging information gaps.

**9. Please add any other comments that you wish to make on the subject of the review that you believe would be helpful.**

E-Agriculture provides the basis for the global community to monitor development and validation of models and methodologies, and to package and disseminate them once tested. E-Agriculture will continue to play a role in collecting good practices on the use of ICTs in agriculture and rural development and their dissemination. E-Agriculture continues to examine emerging trends and the evolving role of ICTs, and the challenges faced in reaching scaled, sustainable information service models.

**10. We would also welcome any documents, reports, etc. that you can forward which you think will provide useful evidence for the review. Please send these to [cstd-wsis10@unctad.org](mailto:cstd-wsis10@unctad.org). It would be helpful if you could list these in this box, together with any URL which enables access to them on the World Wide Web.**

- 10-Year WSIS Action Line Facilitator's Reports on the Implementation of WSIS Outcomes. Executive Summary. WSIS+10/4/27
- [http://www.itu.int/wsis/review/inc/docs/ralfreports/WSIS10\\_ALF\\_Reporting-C7\\_E-Agriculture.Summary.pdf](http://www.itu.int/wsis/review/inc/docs/ralfreports/WSIS10_ALF_Reporting-C7_E-Agriculture.Summary.pdf)
- WSIS+10 High-Level Event. Forum Track OUTCOME DOCUMENT: Executive Summaries for Action Line Facilitation Meetings: "Moving forward building on 10 years of lessons learned in e-Agriculture"  
[http://www.itu.int/wsis/implementation/2014/forum/agenda/session\\_docs/214/ITU-Session-eAgriculture.pdf](http://www.itu.int/wsis/implementation/2014/forum/agenda/session_docs/214/ITU-Session-eAgriculture.pdf)

- Vision for implementation of WSIS Action lines beyond 2015 (see [http://www.itu.int/wsis/implementation/2014/forum/agenda/session\\_docs/214/ITU-Session-eAgriculture.pdf](http://www.itu.int/wsis/implementation/2014/forum/agenda/session_docs/214/ITU-Session-eAgriculture.pdf) )
- E-agriculture website: <http://www.e-agriculture.org/>