

COMMISSION ON SCIENCE AND TECHNOLOGY FOR DEVELOPMENT (CSTD)

**Eighteenth Session
Geneva, 4 to 8 May 2015**

Submissions from entities in the United Nations system and elsewhere on their efforts in 2014 to implement the outcome of the WSIS

Submission by

The Food and Agriculture Organization of the United Nations (FAO)

This submission was prepared as an input to the report of the UN Secretary-General on "Progress made in the implementation of and follow-up to the outcomes of the World Summit on the Information Society at the regional and international levels" (to the 18th session of the CSTD), in response to the request by the Economic and Social Council, in its resolution 2006/46, to the UN Secretary-General to inform the Commission on Science and Technology for Development on the implementation of the outcomes of the WSIS as part of his annual reporting to the Commission.

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.

Part One: Executive Summary

E-agriculture is an area of application of Information and Communication Technologies (ICTs) under Action Line C7. ICT applications: benefits in all aspects of life, in the Geneva Plan of Action of WSIS;

- 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;
- 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.

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.

Activities relating to the e-agriculture component of Action Line C7 are underpinned by the global e-Agriculture community with 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.

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.

Critical issues continue to be addressed through discussion forums, policy briefs and case studies. 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 a serious issue in the digital economy, as does the gap between urban and rural populations. 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.

Part Two: A brief (1–2 pages) analytical overview of trends and experiences in implementation at the national, regional and international levels and by all stakeholders, highlighting achievements and obstacles since WSIS. This could include information on the facilitation process of implementation, monitoring and cooperation among stakeholders.

Recent developments and emerging trends

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 Smartphone: 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.

Part Three: A brief description (1–2 pages) of:

(a) Innovative policies, programmes and projects which have been undertaken by all stakeholders to implement the outcomes. Where specific targets or strategies have been set, progress in achieving those targets and strategies should be reported.

The exchanges within the e-Agriculture community of practice provided valuable lessons in regard to successful initiatives. These initiatives 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.

Current and future challenges include:

- **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.
- **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.

- **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. Capacities at the individual, organizational and institutional levels need to be strengthened.
- **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. Youth's access and familiarity with technologies as well as their role in the social dynamics of rural communities are not yet sufficiently leveraged. Gender inequalities remain a serious issue in the digital economy, as does the gap between urban and rural populations.
- **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. 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.
- **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.
- **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.
- **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.

(b) Future actions or initiatives to be taken, regionally and/or internationally, and by all stakeholders, to improve the facilitation and ensure full implementation in each of the action lines and themes, especially

with regard to overcoming those obstacles identified in Part Two above. You are encouraged to indicate any new commitments made to further implement the outcomes.

Future actions: Recommendations

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 is closely linked to inclusiveness and equity in the evolving sustainable development framework. 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.** Access may be viewed as an issue of connectivity, then to cost, then ability to use technology. 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.

However, 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.

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.