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**Submissions from entities in the United Nations system and elsewhere on  
their efforts in 2018 to implement the outcome of the WSIS**

**Submission by**

Food and Agriculture Organization of the United Nations

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 22<sup>nd</sup> 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.

## ***FAO Report on Flow of Information for the follow-up to the World Summit on the Information Society***

### ***Part One: Executive Summary***

FAO, along with a number of its partners, has made great strides in implementing a number of activities related to **Action Line C7 ICT Applications: E-Agriculture<sup>1</sup> from the World Summit on the Information Society (WSIS)** in the past year. Many of its most relevant activities can be categorized according to the e-Agriculture.org community of practice, progress related to the e-Agriculture Strategy Guide, and the work of the newly established Digital Innovation Team, which was given the mandate to "lead, coordinate and promote digital innovation across geographical locations in support of FAO's Strategic Framework... [to] stimulate the use of innovative digital and IT technologies in all areas of work".

The Digital Innovation Team, established in 2017, has been partnering both within and outside of FAO to leverage the power of ICTs to: provide capacity-building through innovative approaches to e-learning, optimize the effectiveness of extension agents; provide real-time, actionable information to communities and governments related to disaster prevention and mitigation; facilitate market access for essential inputs; deliver more efficient and reliable data on food to comply with international traceability standards and enhance food security; increase access to financial services for rural communities; and assist with implementing regulatory policies, frameworks and ways to monitor progress. Given FAO's mandate, nearly all of the work of this Team can be considered as related to this Action Line.

In addition, the mission of the e-Agriculture.org Community of Practice is to facilitate the discussion on the adoption and use of ICTs and digital innovations in agriculture, forestry, fisheries, natural resource management and rural development. By fostering collaboration in the Community of Practice, e-Agriculture.org allows for the sharing of knowledge, sharing of digital solutions, developing capacities of agricultural communities and advocating for ICTs to empower rural communities.

The e-Agriculture.org CoP achieves its mission through:

- collecting and publishing Agriculture and ICT related news;
- holding periodic online fora (e-forums) discussions on ICTs and digital innovative solutions within agriculture, forestry, fisheries, natural resources and rural development;
- capacity development through webinars, short paced learning courses that can be accessed through the e-Agriculture platform in conjunction with partners.

Finally, the FAO-ITU E-agriculture Strategy Framework has been used as a tool to assist countries to identify, design and develop sustainable ICT solutions/services to overcome challenges faced in agriculture, and to accelerate achieving agricultural goals.

### ***Part Two: Trends and Experiences in the implementation of e-Agriculture***

#### ***Digital Innovation Team***

1. Digital Innovation Ecosystem - The Digital Innovation Team at FAO seeks to create a "Digital Innovation Ecosystem", bringing together UN experts, young entrepreneurs, public sectors, researchers and civil societies to find innovative joint solutions that address the global challenges in the food and agriculture sector. Activities that would fall within this ecosystem include opportunities to engage young innovators to develop innovative digital services, development of mobile and web

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<sup>1</sup> The Action Line entails the following for E-agriculture:

- 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).

applications, and use of artificial intelligence, blockchain and algorithms, based on FAO datasets. Two successes to highlight in this area include the following hackathons:

- a. Future of Sustainable Agriculture and Food, Geneva 2018: 73 participants, 14 teams across 4 continents.
  - b. Youth Employment through Digital Innovation in Africa, Kigali 2018: 24 participants, 8 teams across 7 countries in Africa.
2. Developed successful partnerships with private sector and local governments to implement pilots to improve Crop Production and Water Efficiency using IoT in agriculture, the use of Big Data and Analytics as well as developing capacity to ensure sustainability of the projects. Pilots in South American countries used specialized hardware installations to capture data and information. This combined with cloud storage and analytical processing will facilitate farmers' decision-making related to irrigation, while capturing Big Data on climate variables.
  3. Designed and implemented a number of digital technologies to enable increased access to high-quality localized data and information transformed into real-time advisory services and early warning alerts, empowering rural smallholders to make informed decisions to increase productivity, reduce losses, adapt to changing climate variables, and manage risks.
    - a. Several "smart" solutions were piloted in Rwanda and Senegal in 2017-2018 and ready to be replicated in other countries, including: 1) Cure and Feed your livestock: an application providing real time information on animal diseases control and animal feeding strategies; 2) Weather and Crop Calendar: An application combining information on weather forecasts, crop calendars and alert systems; 3) AgriMarketplace: an application to connect producers, traders and consumers to facilitate trade and access to inputs; and 4) E-Nutrifood: an application providing information on consumption of nutritious foods.
    - b. Additionally FAMEWS, an application monitoring Fall Armyworm in Africa and providing early warning, response, and risk assessment was piloted in Madagascar and Zambia and ready is to be replicated in other Sub-Saharan African countries.
    - c. FAO is also in the early-stage development using advanced algorithms to identify species and provide real-time information and advice, as can be seen with FishID, an application using machine learning and image recognition to identify species and provide advice from nutrition to diseases.

#### E-Agriculture Knowledge and Information Management Activities

##### 1. Regional Trainings

- FAO-ITU-GIC (AIT) training on the use of drones, satellite imagery and GIS from agriculture, 4-8 June 2018, AIT, Thailand;
- FAO-ITU Training of Trainers on "E-agriculture Strategy Development", 1-2 September 2016, Bangkok, Thailand;
- FAO-ITU-CTA E-agriculture Stakeholders Consultation, 3-5 March 2016, Bangkok, Thailand.

##### 2. Capacity Development on ICTs, aimed at improving women entrepreneurs in agriculture and to encourage girls in STEM

- AgriTech Training for Jiwaka Women and Youth in Agriculture, 7-9 August 2018, Jiwaka Province, Papua New Guinea;
- AgriTech Using ICTs, 9-10 July 2018, FAO Regional Office for Asia and the Pacific, Bangkok. Participants: 75, 51 young women/girls;
- FAO-RIMES-ESCAP-DAL-NWS Agro-Meteorological Advisory Services for Papua New Guinea, 22-24 May 2018, RIMES Subregional Hub, Port Moresby, Papua New Guinea;
- FAO-ITU-MDES-UNESCO-CISCO-MICROSOFT Girls in ICT Day 2018, Bangkok, Thailand, 26 April 2018, UNESCO, Bangkok, Thailand. Participants: 70 participants, 40 young girls/students;

- FAO-ITU-TRCSL-DOA Training on Innovations and Application Development for E-agriculture, 11-15 December 2017, Peradiniya, Sri Lanka;
  - Agritech Using ICTs, 15-17 December 2017, Rajaprajanugroh 45 School, Kanjanaburi, Thailand. Participants: 75 young women/girl students.
3. **Information Dissemination to Encourage Increased use of ICTs for food and agriculture**
- October 2017, FAO was invited by DG AGRI to address a keynote speech on e-agriculture at the Eastern Partnership Panel on Agricultural research and innovation;
  - November 2017, FAO organized the [Regional forum on e-agriculture for Central and South East Europe](#) in Novi Sad, Serbia;
  - April 2018, FAO together with the Bulgarian Presidency of the Council of the European Union, the Bulgarian Ministry of Agriculture, and the Institute for Agrostrategies and Innovations in Bulgaria is organizing the “[2gether 4 Strong Digital Agriculture](#)” - a high-level forum on digital agriculture;
  - April 2018, FAO participated in AgroForum Mare Balticum – Digital Future of the Global Agriculture in Tartu, Estonia during REU Deputy Regional Representative made a [presentation](#) on E-agriculture for sustainable food systems: the FAO approach;
  - May 2018, one of the [topic notes](#) of the regional Conference for Europe (ERC) 41st session Voronezh, Russian Federation was dedicated to e-agriculture;
  - May 2018 – During the Women and digitization event in Budapest, Hungary, FAO presented their publication on gender and ICTs;
  - July 2018 – FAO presented on e-agriculture at the ITU workshop on “[Multimedia applications and the future of digital society](#)” held in Ljubljana, Slovenia;
  - In September 2018, FAO organized a [regional expert consultation](#) on knowledge sharing for agricultural innovations applicable for smallholders and family farmers in Europe and Central Asia;
  - “[Gender and ICTs](#)”, launched in Rome at the occasion of International women Day in IFAD;
  - FAO published the e-agri Index, “[Status of implementation of e-agriculture in central and eastern Europe and central Asia](#)”;
  - FAO published the E-agriculture national strategy guide” in Russian ([www.fao.org/3/I9515RU/i9515ru.pdf](http://www.fao.org/3/I9515RU/i9515ru.pdf));
  - FAO-ITU published the guide, “E-Agriculture in Action: Blockchain for Agriculture” (2018);
  - FAO-ITU published the guide, “E-Agriculture in Action: Drones for Agriculture” (2018).

#### *e-Agriculture.org Community of Practice*

1. **e-Agriculture.org Platform and Infrastructure** – The [new e-Agriculture Website](#) and platform was migrated to the new FAO Corporate template complying with FAO’s requirements in April/May 2018.
2. **Publication of News** – Continued in 2018 with news published from FAO and also within the agricultural domain in the [thematic areas](#) of e-Agriculture. As of 31 October 2018, 222 news items have been published.
3. **Publication of Newsletters**- Monthly thematic newsletters have been published and these are increasingly popular, with target readership reaching nearly 13 000 persons. The themes for 2018 included: e-Agriculture 2018 in Perspective, [#HackAgainstHunger, Rural Women, Girls and ICTs, WSIS Forum 2018, New e-Agriculture Website, Fall Armyworm Monitoring and Early Warning System \(FAMEWS\), e-Consultation on Youth Employment in Agriculture... through ICTs, #HackAgainstHunger/Africa, and FAO's Committee on Agriculture \(COAG\) Innovation - Speaker's Corner.](#)
4. **e-Agriculture.org Forum Discussions** – e-Agriculture was involved in 2 e-Forum Discussions, one was held on the e-Agriculture platform and the other organized on the FSN Forum.

- a. **E-consultation on ethical, legal and policy aspects of data sharing affecting farmers** – this was hosted on behalf of the following partners, The Global Forum on Agricultural Research and Innovation (GFAR), the Global Open Data for Agriculture and Nutrition initiative (GODAN), the Technical Center for Agricultural and Rural Cooperation (CTA) and the Kuratorium für Technik und Bauwesen in der Landwirtschaft (KTBL).
    - i. The E-Consultation was held from 4 to 8 June 2018;
    - ii. The results of the consultation were used for the expert consultation.
  - b. **E-Consultation on ‘Youth Employment in Agriculture as a Solid Solution to ending Hunger and Poverty in Africa’**. This consultation was organized as a pre-conference event to the regional conference entitled the same. The organizers were there Food and Agriculture Organization of the United Nations, the Government of Rwanda and the African Union.
    - i. The E-Consultation was held from 16 to 10 August 2018;
    - ii. The [results](#) were incorporated into the final Regional Conference for Africa.
5. **Participation in conferences and ICT4Ag meetings.** E-Agriculture.org was represented in following meetings
- a. **Tenth ICT4D Conference** which focused on the Impact on ICT for the Development Sector. 8 to 10 May. Lusaka, Zambia.
  - b. **FAO Regional Conference on Youth Employment in Agriculture as a Solid Solution** to ending Hunger and Poverty in Africa, 20-21 August, Kigali Rwanda.
  - c. Remote participation in FAO (LOW) Blockchain Presentation.
  - d. Remote participation in Expert Consultation of Innovations – Gödöllő, Hungary 10-13 September.
6. **Webinars and online activities** – The e-Agriculture.org CoP organizes with partner webinars and other online activities. As of 31 October 2018, 651 participants received the recordings of the webinars as shown below. The summary of webinars is below:

Webinar	Partner	Participants
FarmerLink in the Philippines: Digital Innovation for Agriculture	Grameen Foundation	183 (48)
e-Agriculture Webinar on Talking Books for Audio-Based Agriculture Extension	AMPLIO	87 (15)
e-Agriculture webinar on Transformative Digital Extension delivery and smallholder farm marketing in Zimbabwe through the Kurima Mari Mobile app	Welthungerhilfe & MoA-Zimbabwe	
Driving Financial Inclusion for Smallholder Farmers by Leveraging Satellite Data and Machine Learning	Harvest	234 (63)
e-Agriculture webinar on PestSmart Diagnostics e-Learning course	CABI	147 (36)
e-Agriculture Webinar on status of drones for Agriculture	CTA	Pending

- a. In order to invigorate and dynamize the e-Agriculture twitter account, a Tweeter chat on Blockchains was held under the hashtag **#AgBlockchain** and the chat strings can be accessed here <https://twitter.com/search?q=%23AgBlockchain&src=typd>.
7. **e-Agriculture.org CoP Statistics**  
The following are some of the statistics achieved in 2018:
- a. **Registered users of e-Agriculture.org CoP.**  
The total registered users of the platform increased to 14 241 in by 4 November 2018.
  - b. **e-Agriculture Social media accounts**  
**@FAOeagriculture** Twitter activity increased from 45 000 to 47 400 between January-November 2018.  
Linkedin Membership rose from 9 800 in January to 10 400 in September.

Overall, FAO can claim real impacts with respect to Action Line C7 ICT Applications: eAgriculture, as seen above, but we continue to face a number of constraints, including:

- information and communication technologies can offer significant benefits to increase production, efficiency and competitiveness and to leverage the Sustainable Food Systems. However, not everyone can benefit equally from the technologies: enabling environment, strong institutions (such as advisory services) and enhanced digital capacities at all levels are needed, coupled with detailed socio-economic analysis, for example, on the effect on employment;
- smallholders and family farms are part of the solution to improve sustainability of the food systems but they require support in terms of access to proper infrastructure, technologies, policy incentives and delivery systems, such as advisory services;
- a structured and participatory approach for national e-agriculture strategy formulation and implementation is necessary to maximize benefits and minimize technological risks;
- some countries, regions or territories in Europe are moving from the stage of e-agriculture initiatives towards national deployment of e-agriculture using the FAO approach, or similar approaches;
- still, some policies and visions on e-agriculture are limited to precision agriculture and further thoughts should be given in respect to mechanisms for closing the triple divide (digital, rural and engender) in order to “leaving no one behind” as per the Agenda 2030 promise;
- further knowledge exchange and cooperation is necessary among countries, regions or territories in Europe to close the digital divide and facilitate trade integration processes.

### ***Part Three: Innovative Policies, Programmes, and Projects and Future Actions and Initiatives***

Digital Innovation Team: This team is still relatively new within FAO (less than two years old), and continues to provide new pathways to innovate. Among the ongoing and future projects and initiatives, the team is focusing on:

- building a “**FAO Digital Services Portfolio**”, which now comprises four progressive web-based applications to make information and advisory services more accessible in rural areas, as well as supporting, warning, advising and anticipating the daily decisions concerning agricultural activities, markets and food systems;
- strengthening capacity of providing **Digital Agro-Meteo Services** in Rwanda and Senegal through mobile technologies and capacity development for Meteo Agencies, in partnership with WMO;
- exploring the potential of innovative technologies, such as: **Machine Learning** – through the mobile application, FishID, which uses image recognition to identify species and provide nutritional information is being developed - and **Blockchain** to track land-usage and improve food traceability and security;
- linking digital innovation and youth entrepreneurship through **Hackathons and Challenges** to incubate and accelerate innovative solutions for food and agriculture;
- leading **innovative partnerships** with United Nation Innovation Network and other UN agencies such as WMO and ITU, and with private partners such as Google Earth Engine to leverage geospatial data and with Telefonica using Internet of Things and Big Data for increased crop productivity through resource management.

### E-Agriculture Strategy

Countries continue to request and be provided with assistance in developing the national E-agriculture Strategy:

- Afghanistan, Fiji, Papua New Guinea and Philippines are in the final stages;
- Pakistan is under development.