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Submissions from entities in the United Nations system, international organizations and other stakeholders on their efforts in 2022 to implement the outcomes of the WSIS

Submission by

Food and Agriculture Organization

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 26th 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.

The Food and Agriculture Organization of the United Nations

Report[1] on activities facilitated, implemented and/or coordinated by FAO with regard to the action line(s) and main themes of WSIS outcomes

1.0 Executive Summary

The world is facing economic and social shocks due to the impacts of climate change, the after/effects of the COVID-19 pandemic, and geopolitical conflicts. These have impacted agrifood systems, igniting and fueling a global food crisis and risk derailing the gains obtained in fighting hunger. The Food and Agriculture Organization continues to place data, digitalization, Science-Technology-and-Innovation (STI)[2] at the core of its work in supporting the agrifood systems transformation. FAO continues to promote the adoption and use of digital technologies to facilitate the transformation towards inclusive and sustainable agrifood systems. The FAO Strategic focus (as enunciated in the FAO Strategic Framework 2022-31) recognizes the importance of the digital transformation of the agrifood systems by placing digital agriculture as one of the programme priority area. Furthermore, in 2022 the organization took an emphasis on Digital for Impact as the forefront of developing new digital capabilities and partnerships towards accelerating the four betters in the digital economy era.

The Organization continued to advance activities related to the WSIS in line with the UN Res. A/70/125, Res. A/70/1 and as reaffirmed by the ECOSOC Res. 2021/12. The following normative products and services in line with WSIS actions were maintained - the e-Agriculture Community of Practice[3] and the e-Agriculture Strategy Guide and its toolkit. This aligns with the World Summit on the Information Society (WSIS) and particularly the *e-Agriculture Action Line C7 ICT Applications: E-Agriculture*, which FAO is a facilitator. In April 2022, FAO facilitated the WSIS Action Line C7 session focused on "ICTs for Well-Being, Inclusion and Resilience: through digital skills for youth and women in agriculture"[4] with a panel discussion from UNICEF, WFP, GSMA and FAO.

2.0 Overview of trends and experiences in implementation at the national, regional and international levels and by all stakeholders

Globally, FAO continued to work with other UN agencies to advance the implementation of the WSIS actions, this work includes the Broadband Commission, working closely with the UN Secretary-General

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[1] *This submission is 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 24th session of the CSTD). This is 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*

[2] *FAO sees science, technology and innovation as a powerful engine to transform the agrifood systems and end hunger and malnutrition. The recently approved FAO Science and Innovation Strategy focuses on three Pillars: i) Strengthening science and evidence-based decision-making; ii) Supporting innovation and technology at regional and country level; iii) Serving Members better by reinforcing FAO's capacities.*

[3] *E-Agriculture is a global community of practice that facilitates dialogue, information exchange and sharing of ideas related to the use of information and communication technologies (ICTs) for sustainable agriculture and rural development. The CoP has more than 20,000 members from over 180 countries.*

[4] *ICTs for Well-Being, Inclusion and Resilience: through digital skills for youth and women in agriculture https://www.fao.org/e-agriculture/wsis-action-line-c7-e-agriculture-icts-well-being-inclusion-and-resilience-through-digital-skills*

Envoy on Technology, and the [ITU Partner2Connect Digital Coalition](#) initiative of the International Telecommunications Union (ITU).

Internally, FAO continued to mainstream ICTs or digital technologies within its regions – for example in Regional Office for Europe (REU) presented its strategic priorities for digital agriculture as defined in its "Digital REU 2022-2030" strategy. In the Regional Office for Africa, rolled out its [Digital innovation strategy for agrifood systems in Africa](#) – key outputs being the support to the (i) digital agriculture strategy by the African Union, (ii) Digital Village Implementations in countries, (iii) and various market linkages, digital commerce development and digital finance projects. In the Regional Office for Asia, continued with efforts of digitalization actions, for example held the virtual 'FAO Digital Village Knowledge Sharing and Dialogue,' which rolled out the [Digital Village Initiative](#) in the region.

2.1 Some issues related to the implementation of the WSIS Actions Lines

- FAO and ITU published the [Status of Digital Agriculture in 47 Sub-Saharan African countries](#) which highlighted some challenges (experienced also in other regions) in implementing ICTs in agriculture. The study revealed that the potential for digital technologies in agriculture is immense, yet countries across the region are in varying stages of digital agriculture transformation and digital maturity.
- For example, key challenges that sub-Saharan African countries have faced to achieve the WSIS Outcomes on e-Agriculture still include *poor telecommunications accessibility in rural areas*, *weak access to on and off-grid electricity, weak awareness of digital agriculture potential* and the structural weaknesses of the sector. An important concern is the *poor public financial investment* in the agricultural sector (and subsequently in digitalization services). As per a new assessment made, only 4 countries in Africa have met the African Union Malabo Commitments in terms of financial investment in the agri-food sector.
- In Europe and Central Asia, challenges and problems regarding digital agriculture can narrow down to four main groups: (1) Technological difficulties; (2) Policy issues; (3) Commercialization and (4) Human factors. Connectivity and insufficient network coverage remain a main issue. Rural areas lack the reliable connection which further contributes to the urban-rural divide. The infrastructural development remains high on agenda for rural areas in both Europe and Central Asia, but there is an identified lack of policy support in the means of funding programmes, interoperability regulations and comprehensive open data policies.

2.2 *Some issues for consideration regarding investments in ICTs and emerging technologies*

- Without an **inclusive process**, there is a risk of alienating marginalized groups, such as youth and women, and countries in special situations, including Least Developed Countries (LDCs), Landlocked Developing Countries (LLDCs), and Small Island Developing States (SIDS).
- **Barriers for digital technologies** adoption in agriculture include: limited infrastructure in rural areas, insufficient funding for agriculture, inadequate investment in research and development, and low investment in agro-innovation and agricultural entrepreneurship, which are essential drivers for digital agriculture transformation.
- The growth of emerging technologies such as Artificial Intelligence (AI) **also risks widening further the divides,** with marginalized groups and the poor deeply affected. For example, algorithmic tools using AI should be guided by human rights and animal health principles as well as considerations regarding the environment, biodiversity, and food safety.

- **Weak governance systems** in countries can hinder the adoption of technologies in agriculture and lead to low investments in Science, Technology and Innovation (STI), which are key to the promotion of digital technologies in agriculture.

3.0 Innovative policies, programmes and projects which have been undertaken by all stakeholders to implement the outcomes

3.1 Selected tools in support to digital agriculture in FAO

- dlocust – The potential of drones for locust early warning and preventive control
- Event Mobile Application (EMA-i)
- FAMEWS – Fall Armyworm monitoring and early warning system
- FAO Agricultural Stress Index System (ASIS)
- FAO Survey Technology (FAST) platform
- Food Price Monitoring and Analysis (FPMA) tool
- Information Network on Post-harvest Operations (INPhO)
- Open Foris and SEPAL (System for Earth observation data access, Processing and Analysis for Land monitoring)
- Water Productivity through Open access of Remotely sensed derived data portal (WaPOR)

3.2 Innovative Policies Developed

- FAO Science Technology and Innovation Strategy
- FAO Digital innovation strategy for agrifood systems in Africa

3.3 Selected Programmes and Projects

- A **Land Degradation Neutrality Decision Support System** (LDN DSS) was developed in the REU region to integrate meaningful information and facilitate the identification of target areas for different types of interventions in the landscape, to eventually balance the gains and losses of natural capital and achieve land degradation neutrality. Based on a Google Earth Engine (GEE), the Regional LDN DSS allows to easily visualize and compare spatially explicit indicators. It also allows any user to select a particular area of interest (e.g. a water catchment, and obtain summary statistics, charts and tables) integrating the available data. One of its key functionalities is the possibility to query and to show areas that meet certain criteria (Multi-Criteria Analysis toolbox) or are undergoing land cover transitions.
- Digital excellence in agriculture in Europe and Central Asia: The joint FAO-ITU review on the Status of Digital Agriculture in 18 countries of Europe and Central Asia (ITU-FAO, 2020)1 and provides evidence on how Information and Communication Technologies (ICTs) play an emerging role in the agriculture landscapes of the regions, acting as an engine for agricultural development.
- Digital Village Initiative: An initiative to expand digital innovations in rural villages for inclusive rural and agrifood systems transformation and promote digital innovations to

support inclusive, gender-sensitive rural development and sustainable agri-food transformation to meet Agenda 2030 goals.

- **DVI Readiness Assessment tool**. To identify and select candidate villages to be revitalized through DVI, FAO Regional Office for Europe developed a **DVI Readiness Assessment tool**, which was piloted in Albania, Kosovo [under SCR 1244], Bosnia and Herzegovina, Turkey, Uzbekistan and Kyrgyzstan.

- FAO and ITU launched its **Digital Excellence in Agriculture** context to collect, review, showcase, analyze and celebrate digital solutions transforming the agricultural and food sector from Europe and Central Asia.

- **FAO Digital Portfolio** – The FAO Digital Portfolio was released in May 2020 to scale digital technology adoption in the field to achieve greater digital impact. It originally comprised of 169 digital products that are used in support of FAO's delivery at global, regional, and country levels. The FDP allows FAO to take stock of various digital products - a combination of software, hardware and related services –that supports the digital IT in FAO global field delivery.

- FAO supported **Azerbaijan with the development of a GIS-based forest resources** information management system providing detailed, up-to-date information for improved forest management in Azerbaijan to allow local foresters to apply modern approaches to sustainable forest management (SFM). A similar undertaking is underway in the territory of Kosovo [under SCR 1244].

- **Georgia's National Animal Identification and Traceability System (NAITS)** is now fully operational as a result of a major five-year project led by FAO REU. NAITS is an IT system for collecting and recording information on animal production, which incorporates about 900 users (veterinarians and inspectors) and more than 250 000 animal holdings, documents the full path of the animals (including more than 1 million bovines) from farm to plate, making the system an important part of the food safety chain puzzle.

- In 2022, FAO finalized the development of the **Damage and Loss tool**, a web-based software that allows Governments to assess damages and losses in crops, livestock, fisheries, forestry, and aquaculture. While the software was developed for the national authorities, it has the potential to be scaled-up on the regional level.

- International Platform for Digital Food and Agriculture (IPDFA): An inclusive multi-stakeholder forum to promote dialogue on the digitalization of food and agriculture and facilitate the exchange of knowledge and experiences on best practices and policy approaches amongst all stakeholders.

- ITU/FAO Workshop on "Digital Agriculture at Scale: Sustainable Food Systems with IoT and AI: The workshop explored the prevailing discourse on the use of Artificial Intelligence (AI), Internet of Things (IoT), Unmanned Aerial Vehicles (UAVs) and other emerging technologies to support functions such as harvesting, weed detection, irrigation, and pest identification. It also covered how these technologies can be leveraged to foster real-time analysis of agricultural parameters including soil characteristics, weather patterns, topography to support decision-making and establish efficient and robust food production and supply chains.

- [Rome Call for Artificial Intelligence Ethics](): An ethical approach to artificial intelligence and to promote a sense of shared responsibility among international organizations, governments, institutions and the private sector in an effort to create a future in which digital innovation and technological progress grant mankind its centrality.
- **Support the development of National E-Agriculture Strategies** - FAO continued to support the development of National E-Agriculture (or Digital Agriculture) Strategies in the following countries: Afghanistan, Albania, Armenia (finalized pending government sign-off), Benin (finalized pending government sign-off), Bhutan (completed), Bosnia and Herzegovina, Cambodia, Fiji, Indonesia, Kazakhstan, Kyrgyzstan, Moldova, Mongolia, Myanmar (on hold), Niger, Pakistan, Philippines, PNG, Rwanda, Sri Lanka, Tajikistan, Turkey, and Uzbekistan. FAO is currently exploring the means to improve a policy toolkit to support countries
- **TAPipedia** is an information sharing system, developed within the context of the G20 initiative Tropical Agriculture Platform, which Secretariat is hosted by FAO. It is designed to enhance knowledge exchange in support of Capacity Development for Agricultural Innovation Systems, including digital innovation. Offered in three UN languages, TAPipedia mainly targets researchers and practitioners in the field of development and cooperation and is a global information system for capacity development practices, innovation systems analysis, success stories, participatory and multi-stakeholder approaches, policy analysis and lesson learned in the context of agricultural innovation.
- **Technologies and practices for smallholder agricultural producers** (TECA) – the FAO platform gathers successful agricultural technologies and practices to facilitate knowledge exchange and help smallholder farmers in the field. TECA platform responds to the need for a systematic and user-friendly online archive of technologies, practices and innovations, including success stories and case studies on family farming.
- **[The Global Network of Digital Agriculture Innovation Hubs]()** is a network of in-country innovation hubs established by Office of Innovation (OIN) in conjunction with country institutions to accelerate the development and uptake of digital innovations and support farmers and value chain actors, especially youth and women, to be more competitive. The programme seeks to support countries designing respective national digital agriculture innovation hub models meeting national agriculture, forestry, and fisheries priorities while involving local partners, including public-private partnerships. The sub-programme has implementations currently ongoing in the following four countries Dominica, Ethiopia, Grenada and Morocco.
- **The hand-in-hand initiative (HIH)** – This is FAO's evidence-based, country-led and country-owned initiative to accelerate agricultural transformation and sustainable rural development to eradicate poverty (SDG 1) and end hunger and all forms of malnutrition (SDG2