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FAO REGIONAL CONFERENCE FOR

ASIA AND THE PACIFIC

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1-4 September 2020[1]
The Digitalization of Food and Agriculture

Executive Summary

The global food system continues to face considerable challenges in being able to provide enough food of adequate quality to feed an ever-growing population. The world is also changing at a fast pace with the emergence of an array of technologies. Digital technologies offer unique opportunities for improving food production and trade, especially to smallholder farmers, and in helping to achieve the Sustainable Development Goals (SDGs). This paper discusses the potential of the digitalization of agriculture and documents FAO's initiatives to support countries in developing and implementing digital strategies and applications.

Suggested action by the Regional Conference

The Regional Conference is invited to:

- discuss the potential of digital technology applications for promoting sustainable agricultural productivity increases and achieving SDG2 and highlight different approaches that can be taken to develop national digital agriculture strategies;

- discuss the challenges and risks of the digitalization of agriculture and share suggestions on how to address economic, social and ethical concerns;

- taking note of the Global Forum for Food and Agriculture (GFFA)-approved concept note proposing an international digital council for food and agriculture at FAO, assess the potential value and share suggestions for establishing an inclusive, multistakeholder forum to engage governments, the private sector, farmer organizations, research institutions and International Organizations to exchange ideas on how to maximize the potential of digital technology to improve agri-food systems, and to identify and suggest measures to address shared concerns.

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Introduction

1.   In food and agriculture, digital technologies are rapidly transforming how people, businesses and governments work and already generate significant benefits by reducing the costs of information, transactions and supervision. Many countries have, or are in the process of developing digital agricultural strategies to design, develop and apply innovative ways to use digital technologies. Such strategies promote digital infrastructure improvements and the development and application of digital tools in agriculture and rural areas, and attempt to bridge the gap of the 'digital divide' between economies, sectors or individuals with differing abilities to adopt new technologies.

2.   This document discusses the potential of digital technology applications to improve the functioning of food and agriculture systems, FAO's activities to support member countries in leveraging digital applications for agricultural and food systems transformation, and the need for a multi-stakeholder forum, such as the proposed international digital council for food and agriculture recently approved by 75 ministers for agriculture participating in the 2020 Global Forum for Food and Agriculture (GFFA).

The potential of Digital Agriculture

3.   The challenges facing our global food and agricultural system are vast. In 2019, there were more than 820 million chronically undernourished people in the world, up from 811 million in the previous year. In addition to fighting hunger and all forms of malnutrition, agriculture will have to generate more jobs in rural areas, improve incomes and rural economic growth to contribute to poverty eradication. Agriculture and food systems also have a major role to play in the sustainable use of biodiversity and natural resources and in combating and responding to the impacts of climate change.

4.   Digital technologies can contribute significantly towards addressing these challenges. In agriculture, sensors, drones, satellites and robots are examples of digital technologies that have the potential to revolutionize farming, even at small-scale. Sensors and satellites provide information on soil moisture, temperature, crop growth and livestock feed levels, enabling farmers to achieve better yields by optimizing crop management and reducing the use of fertilizers, pesticides, feed and water.

5.   The Internet of Things, which connects vehicles, robots and drones to the Internet, makes labour-intensive tasks, such as monitoring plant health, sowing crops, or milking cows more cost-effective. These technologies also generate vast amounts of data that can be combined with other information, stored and analysed to support decision-making. Such "Big Data" is massive in terms of volume, it contains high-variety information assets and requires new forms of processing and analytics that can be used to interpret past events and predict future ones. Downstream, digital technologies, such as distributed ledger (such as blockchain) applications, offer many benefits, as they can provide a more transparent, distributed way to perform and record transactions among different untrusted parties. This is becoming a critical element in agriculture and food supply chains, where numerous actors are involved from farm to fork.

6.   Digital technologies can make a significant contribution towards sustainable development. For example, digital applications can transform and promote climate smart agriculture technologies which are information- and knowledge-intensive and manage multiple objectives in agricultural productivity under the specific constraints of climate change. The potential of Big Data can be safely and responsibly harnessed for sustainable development and humanitarian action. Blockchain has the potential to improve monitoring of social and environmental responsibility, improve traceability, and facilitate mobile payments, credit and financing in a secure and trustworthy way. In sum, digital technologies can trigger major changes or "disruptions" in the food system that not only improve efficiency and speed, but also redistribute information and power along the value chain. These technologies have enormous potential for levelling the playing field among value chain actors, but can also serve to concentrate power. They will be critical instruments for responding to global challenges and promoting sustainable development, but they can also complicate these efforts in unexpected ways. What is almost certain is that the pace of food systems change is being accelerated by these technologies, and serious efforts must be

undertaken to monitor their use and impacts in order to be able to suggest measures to maximize benefits and minimize downside systemic risks.

7.   At the same time, although digital technologies can bring significant benefits to society, they raise some concerns. The digital divide, particularly between modern and subsistence farming, is growing quickly. Privacy and data issues in digital agriculture can erode trust in technologies. As in all sectors of the economy, there is a need for transparency and clarity around issues such as data ownership, portability, privacy, trust and liability. The introduction of robotics and artificial intelligence could be beneficial in agricultural sectors that are characterized by a low supply of workers, but in other countries with abundant labour may cause workforce displacement unless workers adapt their know-how and specialize in new tasks. This can create significant problems in rural areas where food and agriculture remain the primary source of employment and the skills needed to exploit the positive potential of digitalization are lacking.

8.   Digital technologies may also have implications for the farm structure in the long term; today they are mostly used by larger farms and contribute to the advantages of scale efficiency; but there is mounting evidence that they can also be used to improve market access for small producers and can provide other benefits, such as better and more inclusive financial services. There is also research that suggests that Blockchain technology can have diverse effects: although it improves efficiency, promotes transparency infood value chains, and improves the traceability of food products, it may also limit competition and under certain conditions, encourage greater collusion among companies. The above issues cut across many economic sectors, activities, business and countries, and at the same time they are important to agriculture.

9.   Many countries have or are in the process of developing digital agricultural strategies, which aim to design, develop and apply innovative ways to use digital technologies. Such strategies promote digital infrastructure and literacy improvements, and the development and application of digital tools in agriculture and rural areas. Nevertheless, for agriculture, the transformational potential of a digital strategy lies both in the adoption and adaptation of digital technologies and their future development in ways that support systemic improvements and the broader objectives of the 2030 Agenda for Sustainable Development. The most important component of such a strategy is the enabling environment – policies, institutions, information, monitoring and other public goods – through which developers, purveyors and users of digital technologies can be induced to evolve technologies to make a crucial difference in the livelihoods of farmers, agribusinesses and consumers.

FAO Activities in Assessing and Promoting Digitalization

10.   FAO and the International Telecommunication Union (ITU) have developed the E-agriculture Strategy Guide to assist countries in designing and implementing digital agriculture strategies. Such strategies help rationalize resources (financial and human) and holistically address digital technology opportunities and challenges for the agricultural sector in a more efficient manner. The FAO E-agriculture Strategy Guide follows a three-pronged approach: (i) ensuring an enabling environment for e-agriculture to flourish; (ii) addressing the required national digital environment overall; and (iii) leveraging on the potential of digital technology adoption by other sectors. Adopting a cross-cutting approach that draws on the skills and contributions of a wide range of sectors and players will be critical to planning a successful digital agriculture strategy.

11.   FAO has developed applications, databases and platforms to support the work being carried out in countries around the world. These digital services increase access to useful data, information, maps and statistics. This FAO Digital Services Portfolio includes four apps that bring agricultural services closer to farmers, providing real-time information on weather and crop calendars, livestock care, markets, and nutrition-related aspects of food production.

12.   The need for an inclusive and multi-stakeholder forum to discuss the potential of digitalization of food has been reflected in January 2019, during the GFFA, where approximately 74 ministers for agriculture from around the world requested FAO "to draw up, in consultation with stakeholders: African Development Bank (AfDB), Technical Center for Agricultural and Rural Cooperation (CTA),

International Fund for Agricultural Development (IFAD), ITU, Organisation for Economic Co-operation and Development (OECD), World Organisation for Animal Health (OIE), World Bank (WB), World Food Programme (WFP) and World Trade Organization (WTO) a concept for considering the establishment of an International Digital Council for Food and Agriculture that will advise governments and other relevant actors, drive the exchange of ideas and experiences and consequently help everyone harness the opportunities presented by Digitalization".

13.   In January 2020, FAO and other International Organizations presented to the GFFA a concept note proposing a new 'International Council for Food and Agriculture,' a multi-stakeholder forum that will work closely with existing mechanisms to identify the benefits and risks of digitalization, facilitate dialogue between all stakeholders and propose measures to build trust and promote adoption of digital technologies that can help realize the objectives of the 2030 Agenda and the SDGs. The final communiqué of the GFFA stated: "[W]e, the agriculture ministers of 71 nations, hereby thank FAO and the other International Organisations for developing a concept for the establishment of an International Digital Council for Food and Agriculture, as we requested in the 2019 GFFA Final Communiqué [http://fao.org/digital-council]. We welcome the FAO's efforts on the concept and call upon FAO's governing bodies to support a process for its establishment."

14.   Members of the Regional Conference are invited to express their views on digitalization in food and agriculture systems and the measures that can be taken to maximize its potential for good in food and agriculture, and to consider the ways, including through an international forum hosted at FAO, in which the Organization can support global knowledge sharing and analysis to inform policy-makers and other food and agriculture stakeholders.