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# REALIZING THE POTENTIAL OF DIGITALIZATION TO IMPROVE THE AGRI-FOOD SYSTEM

## PROPOSING A NEW INTERNATIONAL DIGITAL COUNCIL FOR FOOD AND AGRICULTURE

## A CONCEPT NOTE

# CONTENTS

## EXECUTIVE SUMMARY

The global agri-food system continues to face considerable challenges in being able to provide enough food of adequate quality to feed an ever-growing, aging, and migrating 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.

This concept note has been produced in response to a request by 74 agriculture ministers and high level representatives from international organisations in January 2019 during the Global Forum on Food and Agriculture (GFFA). It proposes the creation of a new body, an International Digital Council for Food and Agriculture, to enhance international cooperation and the exchange of ideas and experiences across borders, creating synergies and avoiding duplication of efforts. It will strive to keep pace with rapid developments in digitalization, working with new digital tools and the highest expertise available. In line with this, it will help to tackle challenges of food security, hunger, health, inclusiveness and sustainability in the agri-food system at national, regional and international levels.

With this approach, the Digital Council would provide structured and strategic agricultural policy recommendations on digitalization to governmental and non-governmental actors, and strengthen international cooperation in agri-food systems to identify the challenges and possible solutions. Examples of activities include the organization of international fora to share best policy practices, and promoting interaction among farmers associations from different countries and between national- and international-level stakeholders.

The scope and function of the proposed Digital Council are summarized herein for consideration by government ministers, international organization members, donors and other stakeholders. It was noted among all stakeholders involved in the process of producing this concept note that the proposed Digital Council would have significant impacts on increasing the positive benefits of digitalization in the food and agriculture sector, contributing to improving rural livelihoods and local economies.

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# 1- INTRODUCTION

## 1.1 Background and rationale

The world is facing changes that are profoundly impacting the environment and every aspect of human life. Currently, out of the 7.7 billion people in the world, 588 million live in extreme poverty (World Data Lab, 2019), 820 million suffer from hunger, and 2.5 billion suffer some form of micronutrient deficiency (FAO, IFAD, UNICEF, WFP and WHO, 2019). The population is also growing, aging and migrating to cities, affecting agricultural production and the demand for food. This is reshaping the way that market chains work, but is also reshaping the world around us because of the overexploitation of natural resources and a potentially catastrophic degradation of land, alongside the effects of climate change on the world's food security. Furthermore, inequalities, discrimination, and violations of human rights, including the right to adequate and safe nutrition, add to the impacts, especially on smallholder farmers.

Against this backdrop, the agri-food system is in dire need for innovative solutions, and one identified approach is through digitalization. The agri-food system has undergone changes that have increased efficiency and profitability to levels previously unattainable. Still it lags in terms of digitalization that could play an increasingly important role in achieving the global goal of improving food security and rural livelihoods. Digitalization boosts connectivity in the agri-food system and reduces inefficiencies, with the Internet providing access to technical information, and stimulating cooperation and connection across the value chain. 'Big data' offers insights for improving productivity and decision making through real-time alerts, such as when coping with natural disasters. Open sharing of information also helps to increase transparency and trust between otherwise disparate stakeholder groups in the global agri-food system.

But, digitalization can also have important drawbacks. It may increase digital divides across the system and cause workforce displacement, which are important issues, especially where agriculture is the primary source of employment. Misuse of digitalization is an added threat in terms of data protection, data ownership, privacy rights and cybersecurity. Digitalization can also make it harder for smallholder farmers as they struggle to compete with new technologies that can even cause price rises by increasing market concentration.

With regards to digitalization and the agri-food system, multiple issues need to be examined including requirements for policymaking and regulation, limited access to finance and digital skills among some actors, and the need to overcome existing digital divides which are limiting access to infrastructure and information. In line with this, a new element in the international landscape is considered essential to work on these issues, to support nations on their digital and policy pathways as they strive to adapt and use digital solutions that target farmer needs and facilitate stakeholder collaboration.

In January 2019, 74 agriculture ministers and high-level representatives from international organizations assembled for the 11th Berlin Agriculture Ministers' Conference, on the occasion of the Global Forum for Food and Agriculture (GFFA), which had a specific focus: 'Agriculture goes digital – Smart solutions for future farming'. One conclusion of the event was a request to the Food and Agriculture Organization of the United Nations (FAO): "to draw up, in consultation with stakeholders (AfDB, CTA, IFAD, ITU, OECD, OIE, WB, WFP and 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" (GFFA, 2019, p. 6).

In response, FAO reviewed existing global digital agriculture governance architecture, mapped existing institutions and strategies, and undertook a gap analysis and needs assessment concerning the establishment of an international framework for digitalization. Results indicated that there is currently no existing framework specifically mandated to focus on the identified gaps and able to complement existing initiatives. Given the significant challenges faced and the opportunities that

innovation and digitalization offer, creating such a framework appears to be vital for supporting the development of a more efficient and equitable global agri-food system that would help in achieving the Sustainable Development Goals (SDGs).

The review and assessment resulted in this concept note for a proposed International Digital Council for Food and Agriculture (called hereafter the 'Digital Council') that could support agri-food system stakeholders to maximize their potential through digitalization. The concept note explains the importance of fostering digitalization in the agri-food system to respond to current and future challenges at the global level. It also proposes roles and pillars of action to ensure that the Digital Council will be inclusive, equitable and effective. It would involve and engage with agents and stakeholders from diverse industries and stages along agri-food value chains, with two defined roles. First, it would advise on policy and best practices through recommendations and guidelines, to support governments as they create new policy frameworks, ensuring coordination and consistency of initiatives among countries. Second, it would act as a coordination hub to strengthen linkages between all stakeholders and carry their voices in international processes.

The proposed Digital Council would have a dynamic and adaptable structure to maximize effectiveness, inclusivity and efficiency by bringing together diverse perspectives from different actors in the system. Five units are proposed:

1. Inter-governmental Representatives' Group – government-nominated representatives with experience in the agri-food system, to set the Digital Council's priority agenda and monitor progress.

2. Advisory Committee – experienced representatives of international organizations and scientific/technical organizations (to be agreed), to provide strategic consensus-based advice.

3. Working Groups – established by the Advisory Committee on an ad hoc basis to solve specific technical problems and produce recommendations for the Inter-governmental Representatives' Group.

4. Online Multistakeholder Forum – professionally experienced stakeholders from the private sector, civil society, government, academia, farmer associations, small enterprises and others, to participate and contribute to Digital Council activities.

5. Coordination Unit – managed by a supporting agency to provide operational, administrative, technical and communications support and advocacy within its programme budgets.

In January 2020, it is expected that participating agriculture ministers at the next Global Forum for Food and Agriculture will make a decision on whether to endorse this concept note. If so, FAO and partners will immediately initiate the process to establish the Digital Council, including finalizing the operating mechanisms with which it will function, and staffing. Subject to approval, the Digital Council will be formalized, and a first meeting of the Inter-governmental Representatives' Group will determine the Digital Council's initial agenda. Its mission and objectives are complementary to those of FAO, which has the infrastructure, networks (e.g., the e-Agriculture Community of Practice) and global reach that could effectively contribute to the activities of the Digital Council.

## 1.2 Digitalization as part of the solution to global agri-food challenges

Digital technologies, services, products, and skills are transforming modern economies and entire systems of production, management, and governance (Brennan and Kreiss, 2014). The endless possibilities of such technologies will only multiply by breakthroughs such as blockchain, AI, robotics, IoT, 3D printing, biotechnology, immerse reality and quantum computing, fuelled by lowering costs and the increased ability to generate, collect and analyse data. Digitalization also opens up new opportunities for entrepreneurs through access to global markets (UNCTAD, 2017).

- **Digitalization – the use of digital technologies and data as well as their interconnection which results in new or changes to existing activities (OECD, 2018).**

- **Digital transformation – (i) an ongoing process affecting society on a global scale, and (ii) the way in which society has changed since the emergence of ICT (Matt, Hess and Benlian, 2015).**

The private sector is providing the digital tools for this transformation, while developing and rapidly deploying new or modified business services. But different industries are not responding in a homogenous way and speed to digitalization, due their culture, dynamics and available skills. As sectors face different needs, they adopt a variety of market forces to drive digital transformation, and many are only just embarking on their own complex digital transformation journeys. Industries with the highest technological maturity, such as the telecommunication and technology sectors, have benefited most from a high level of available skills, making them today's frontrunners, with a score of 50 out of 100 in 2018. With the worldwide adoption of mobile devices and the growth of the Internet, telecom companies in particular are changing rapidly, providing other sectors and society as a whole with an enabling environment that can support larger-scale digitalization across sectors.

However, the success of digital transformation requires the active involvement and collaboration of many different stakeholders. While it is predominantly used in a business context by large international companies, it also impacts governments, public sector agencies and other organizations involved in tackling societal challenges such as rural livelihoods, youth employment and women's empowerment, by leveraging existing and emerging digital technologies. In particular, public–private partnerships can spark a cultural shift towards an environment of joint action and broader inclusive change where technology acts as an enabler and accelerator for digital transformation.

The agri-food system has undergone a series of revolutions. The first agricultural revolution started around 10 000 BCE, leading to the world's first settled societies and civilizations. As the nineteenth century came to an end, mechanization sparked 'the Green Revolution', where from the 1960s the development and widespread adoption of more resistant crop varieties and use of agrochemicals led to massive increases in the production of the main global staple crops. The new 'digital agricultural revolution'[1] offers new opportunities through the availability of highly interconnected and data-intensive computational technologies (Schwab, 2016), from increasing productivity through data-driven support to decision making and reducing transaction costs across agricultural production and distribution chains.

However, the agri-food system lags other sectors in adopting digitalization. One reason is individual and often smaller farms are more reluctant to adopt new digital technologies than large farms. Yet, smallholder farmers play a vital role as they account for 80 percent of global food production (FAO, 2014). Investing in digital technologies tends to be expensive and comes with risks that are often too great for smallholder farmers, but within reach for producer association, cooperatives or other consortiums.

Venture capital funds are investing in the digital agriculture revolution, facilitating its diffusion, but the agri-food system is still attracting less than other industries. Between 2010 and 2015, investments in financial technology grew at 65 percent annually, reaching a value of USD 22 billion, while investments in digital agriculture grew much less and reached only USD 4.6 billion. Moreover, considering assets, usage and labour in digital fields, agriculture is the worst-performing industry (Gandhi, Khanna and Ramaswamy, 2016).

Digitalization in the agri-food system clearly has the potential to play an increasingly important role in achieving global food security and improving livelihoods especially in rural areas. The Digital Council could help unleash the potential that digitalization has, to transform the people's lives and enable them to escape

[1] "Digitalisation for agriculture (D4Ag) is the use of digital technologies, innovations, and data to transform business models and practices across the agriculture value chain..." (Tsan *et al.*, 2019, p. 5).

the poverty they have faced for generations.

## 1.3 Opportunities, risks and challenges for digital food and agriculture

Digitalization can boost the connectivity of all the actors in the agri-food system, and reduce inefficiencies and barriers in different ways. With stable access to the Internet, farmers can receive and share technical information even internationally, improving productivity, resilience and access to markets. In this sense, digitalization can allow different actors along the agri-food value chain to cooperate in a sustainable agro- ecosystem. Mobile technologies and web-based devices also connect farmers to supply chains, giving access to higher quality seeds and fertilizers that can boost production and quality (Townsend *et al*., 2019 ), and also enable them to sell directly to consumers, maximizing profitability by avoiding intermediates.

Big data analytics, IoT and sensors for example, can help to collect real-time data and perform advanced analytics on crops to provide farmers and other value chain actors with insights and access to data to inform decision-making and improve productivity with real-time alerts and weather forecasts to better adapt and be resilient to the effects of climate change.

Technologies such as blockchain can improve the traceability of food, reducing food waste and increasing transparency and trust across the value chain. Deep learning, machine learning and artificial intelligence (AI) can help with advanced crop management, disease detection, species recognition, and water, soil and forestry management that can improve food security. Digital solutions may also become indispensable to improving the accuracy of monitoring, reporting and validation of climate mitigation measures in agriculture and land use.

Digitalization can also play an important role in educating farmers on how to utilize the opportunities these innovations bring. Such accessible technologies can support smallholder farms in improving their resource management and contribute to them becoming more competitive. In addition, this can lead to a stronger inclusion of youth by creating more appealing digital jobs in rural areas, and preventing the migration of rural youth to cities.

However, digitalization can also create risks. The first is the digital divide across the agri-food system and particularly between modern and subsistence farming that is growing quickly as a result of innovation. Although the cost of implementing digital technologies has fallen greatly over time, subsistence farming in developing and emerging economies remains unable to take full advantage of the opportunities due to a weak infrastructure, inequitable access, high cost, lack of skills and limited capital. In addition, the introduction of robotics and AI could cause workforce displacement unless workers adapt their know-how and specialize in new tasks. This can create significant problems in rural areas where the agri-food system remains the primary source of employment and the skills needed to exploit the positive potential of digitalization are lacking.

The protection of personal and private data and how data are shared remains an element of concern, and it must be recognized as a potential threat for all stakeholders. Digitalization often implies large use of data, which requires adequate protection with privacy standards and security barriers to safeguard users. Advancements such as precision agriculture use connected devices which may be exposed to cyber threats, as third parties could access sensitive data, steal resources and destroy equipment if cybersecurity shields are not properly implemented (CISA, 2018).

Big data and applications of AI may have a significant impact on farm management and could result in shifts in agricultural output and input markets in terms of concentration and potential market power. Wider uptake of big data and analytics could potentially have an impact of farm structures in currently unexplored ways (Wolfert *et al*., 2017).

To maximize opportunities and minimize risks, the agri-food system should address four key gaps: policymaking and regulation, the economic and gender gap, the skill gap, and reducing the 'digital divide'. *Policymaking and regulation.* Governments and policymakers play a primary role in creating the enabling environment needed for digitalization, ensuring transparency, security, equality and efficiency of financing systems. Some existing policy instruments have a broader scope that does not specifically promote digital agriculture. Similarly, there are policies linked to technology development of value to rural and urban areas, but that do have a rural agri-food perspective. Nevertheless, data management, standardization and regulations are challenges that should be proactively addressed at policy level by governments. Additionally, today's digital tools are often based on the availability of big data. To translate the information into valuable insights, actors are often required to share a large amount of data with third-party providers, raising risks of data ownership and privacy, especially for those less able to defend their interests such as smallholder farmers. In general, the lack of transparency and trustworthiness around issues such as data ownership, privacy and liability are contributors to the range of challenges, mainly a lack of trust on digital technology applications, currently experienced in many sectors (Wiseman *et al*., 2019). Therefore, the need emerges for a strong regulatory policy framework adhered to by all, but led by governments to create a safe and level playing field for the sector.

*The economic and gender gap.* The cost of implementing digital technology for farming has fallen over time, but subsistence farming still remains far from benefiting from this trend due to limited availability of capital, which limits the affordability of new technologies. This is creating a potential economic gap, also between high-income countries with a mobile and Internet network coverage of more than 90 percent of the population, when in low-income countries it is only around 50 percent (World Bank Group, 2019a), and women and other disadvantaged groups have even lower access.

*The skill gap.* This affects the diffusion of digital solutions, which must ensure the inclusion of everyone in the digital revolution, particularly rural communities. Data literacy is one of the main barriers the sector faces, so even when connected, farmers may not be sufficiently educated or empowered to take advantage of the new wealth of information. Therefore, education remains the key to access the new digital jobs that technology will bring, especially in rural areas.

*Reducing the 'digital divide'.* Assuring equitable access to digital infrastructure is essential, and adopting available technologies must be a priority as the gap between modern and subsistence farming is growing. Smallholder farmers in developing countries have limited access to skills, information and open data, that is slowing the development of agricultural entrepreneurship and a sustainable digital ecosystem. This is also opening up digital shortfalls such as a lack of localized content for new digital services, and limited access to local information and services in terms of availability, affordability, awareness, ability and agency (Roberts and Hernandez, 2019).

Consequently, the need for a new element in the landscape of international initiatives emerges, one able to tackle the above-mentioned gaps and address the most pressing needs of the agri-food system through digitalization.

## 1.4 A glance at international fora where digital technologies and their governance are debated

As with the inception of the Internet, digital technologies have developed around a culture of cooperation, involving the private sector, international institutions, academia, and governments. Governance issues involving digital infrastructure development, connectivity and inclusion, data ownership, privacy and ethics, but also the emphasis on specific sectors, including agriculture, are being shaped by multistakeholder approaches, including through international processes.

Being increasingly interconnected in an expanding digital web, such an approach reflects the need for enhanced cooperation – based both on multilateralism and multistakeholderism – that involves governments and a diverse spectrum of other stakeholders such as civil society, technologists, academics and the private sector (Secretary-General's High-level Panel on Digital Cooperation, 2019).

Within this approach, stakeholders should address the social, ethical, legal and economic impact of digital technologies and develop governance instruments, such as formal and informal rules, guidelines, standards and norms, to maximize the benefits and minimize the negative impacts of digital technologies across sectors, thus ensuring that they can contribute towards sustainable development globally.

Such governance instruments are discussed, debated and developed in fora convened by the UN and other international organizations and, in this way, reflect the collective view and consensus of their membership on the issue at hand. These processes facilitate debate, convergence of views and coordination of actions at the global level. International organizations often initiated such collective processes by producing voluntary guidelines that were later considered for broader endorsement.[2]

For example, the World Summit on the Information Society (WSIS) was initiated in 2003 by the UN to create an evolving multistakeholder platform to discuss ICT issues and achieve a common vision for an inclusive and development-oriented global information society. WSIS included governments, international organizations, Internet and technical communities, non-profit organizations, the private sector and civil society.

In 2003, WSIS developed the Geneva Declaration of Principles that emphasized the importance of the ethical dimensions of the information society, viewing ICTs as an avenue of progress with respect to the realization of human rights and fundamental freedoms (WSIS, 2003a). The Geneva Plan of Action identified 18 areas of activity (or Action Lines), including agriculture (Action Line C7 ICT Applications: e-Agriculture), on which governments, civil society, businesses and international organizations could work together to achieve the potential of ICTs for development (WSIS, 2003b).

In 2005, WSIS set out a working definition of Internet governance as the development and application by governments, the private sector and civil society, in their respective roles, of shared principles, norms, rules, decision-making procedures, and programmes (WSIS, 2005). WSIS also mandated the establishment of the Internet Governance Forum (IGF) under the auspices of the UN, and initiated the process towards enhanced cooperation and the implementation of the Geneva Plan of Action.[3]

Since 2005, a series of WSIS-related events have been held on an annual basis, rebranded as the WSIS Forum hosted by the ITU. This global multistakeholder platform facilitates the implementation of the WSIS Action Lines for advancing sustainable development, represents the world's largest annual gathering of the 'ICT for development' community and provides a mechanism for coordination, information and knowledge exchange, and sharing of best practices.[4] In follow up to the outcomes of the UN General

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[2] For example, the Principles for Responsible Agricultural Investment developed in 2010 (UNCTAD *et al*, no date) provided the basis for the debate, and endorsement in 2014, of the Principles for Responsible Investment in Agriculture and Food Systems (CFS, no date).

[3] The WSIS+10 High Level Event in 2014 provided an opportunity for a 10-year review of progress on the implementation of the Geneva and Tunis outcomes. The High Level Event reiterated the commitment on the Geneva Plan of Action of 2003 and the Tunis Agenda of 2005 (WSIS, 2003b, 2005) and recognized significant progress, but also underlined challenges. The Action Lines of the Geneva Plan of Action were enhanced (including the Action Line related to agriculture) in order to reflect technological progress in ICTs and the rapid growth of Internet. In terms of governance, WSIS+10 called for encouraging people-centred and inclusive governance models, the development of national ICT policies, e-strategies and regulatory frameworks that enable sustainable development. WSIS+10 Statement on Implementation of WSIS Outcomes and the WSIS+10 Vision for WSIS Beyond 2015 (WSIS, 2014). See also the overall review of the implementation of the WSIS outcomes (UNGA Resolution 70/125; UN General Assembly, 2016), which recognized the necessity of holding this Forum on an annual basis and called for a close alignment between WSIS and the SDGs.

[4] The Forum is co-organized by ITU, UNESCO, UNCTAD and UNDP, in close collaboration with all WSIS Action Line co-/facilitators and other UN organizations (UNDESA, FAO, UNEP, WHO, UN Women, WIPO, WFP, ILO, WMO, ITC, UPU, UNODC, UNICEF, UNIDO, UNITAR, UNHCR and UN Regional Commissions). See, for example, Council Working Group on the WSIS (2016).

Assembly Overall Review of the Implementation of WSIS Outcomes (Res. A/70/125) and with the adoption of the 2030 Agenda for Sustainable Development (Res. A/70/1), the WSIS Forum is constantly evolving and strengthening the alignment between the Geneva Plan of Action and its Action Lines and the SDGs.

With Internet governance being such a controversial issue, WSIS in 2005 requested the UN Secretary-General to convene a new forum for multistakeholder policy dialogue. As a platform for discussions, the IGF brings various stakeholder groups to the table to exchange information and share good practices. While the IGF may not have decision-making mandates, it informs and inspires those who do. It facilitates a common understanding of how to maximize Internet opportunities and address risks and challenges (IGF, no date). For example, IGF has provided a working framework on how human rights should be interpreted to apply to the Internet environment, and the Internet policy principles that must be upheld in order to create an environment that supports human rights to the maximum extent possible.[5]

The International Telecommunication Union (ITU) is the leading United Nations agency for information and communication technologies. As the global focal point for governments and the private sector, ITU's role in helping the world communicate spans three core sectors: radiocommunication, standardization[6] and development. Within its mandate on ICT development, ITU was the lead organizing agency of the WSIS in 2003 and 2005 and organizes the annual WSIS Forum. ITU plays a significant role in implementing the relevant parts of the WSIS outcomes and the 2030 Agenda for Sustainable Development. It provides support to policymakers and regulators through sharing best practices in digital transformation, and discussing recommendations for standards and regulations that can shape fair, transparent and non-discriminatory digital economy environments worldwide (ITU, 2017).

For example, since 2000 the ITU Global Symposium for Regulators (GSR) has brought together heads of national telecom/ICT regulatory authorities from around the world to share their views and experiences on the most pressing regulatory issues, and discuss and adopt regulatory best practice guidelines (ITU, no date b). Such collaborative recommendations for regulatory approaches respond to the changing technology environment and address the continuing need for secure and reliable ICT infrastructure, affordable access to and delivery of digital services, maintaining trust in ICTs, thus promoting digital transformation. In 2014, the GSR adopted regulatory best practice guidelines to protect consumer interests while ensuring a level- laying field for all players (ITU, 2014). In 2019, the GSR discussed best practice guidelines to fast forward digital connectivity to allow all to participate in the digital economy and benefit from digital transformation (ITU, 2019).

ITU also provides a neutral platform for government, industry and academia to build a common understanding of the capabilities of emerging digital technologies such as AI and the need for technical standardization and policy guidance. For example, the AI for Good Global Summit discusses and formulates strategies to ensure trusted, safe and inclusive development of AI technologies and equitable access to their benefits. AI technologies will be central to the achievement of the SDGs by capitalizing on the unprecedented quantities of data now being generated on many aspects of human behaviour (ITU, 2020).

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[5] The Charter of Human Rights and Principles for the Internet covers the whole spectrum of human rights drawing on the Universal Declaration of Human Rights and other covenants that make up the International Bill of Human Rights at the United Nations. See Internet Rights and Principles Dynamic Coalition and IGF (2014).

[6] The ITU Telecommunication Standardization Sector develops international technical standards (known as ITU-T Recommendations) that act as defining elements in the global infrastructure of ICTs. ITU follows a contribution-led, consensus- based approach in which countries and companies are afforded equal rights to influence the development of technical standards. For example, ITU Standardization Study Group 20 (SG20) focuses on Internet of Things technologies (IoT). The deployment of IoT technologies is expected to connect an estimated 50 billion devices to the network by year 2020, impacting nearly every aspect of our daily lives. SG20 develops international standards to enable the coordinated development of IoT technologies, including machine-to-machine communications and ubiquitous sensor networks. See ITU (no date a).

UNESCO provides a space where norms and values related to AI are debated in international conferences that explore the linkages between these technologies and education, gender and livelihoods. The conferences include high-level representatives from UNESCO Member States, and they consider the benefits and challenges of AI within the context of inequity in access to knowledge and research and in representation of the full diversity of cultural expression. Discussions focus on the universal aspects of AI, its ethical dimensions, and ways to ensure that the human-centred and ethical design of AI principles and frameworks is rooted in international cooperation.[7]

In addition to direct financial assistance and analytical work, the World Bank leverages its convening power to pool knowledge and resources from a vast array of public agencies, experts, innovators, private companies, and investors. The World Bank's Digital Development Partnership (DDP) brings together public and private sector partners to foster the creation and implementation of digital development strategies. For example, DDP supports the ICT Africa Regulatory Watch Initiative (ARWI) in West Africa to assist ECOWAS member states to undertake regulatory and policy reforms and address some of the main market failures (World Bank Group, 2019b).

A challenge for privacy is the expanding use of big data – data that are subject to complex automated discriminatory technologies, and that can classify users and customers into categories according to their preferences, income, ethnicity, political views and other sensitive characteristics. The UN Global Working Group on Big Data for Official Statistics (UNGWG**)** was created in 2014, as an outcome of the 45th meeting of the UN Statistical Commission. UNGWG provides strategic vision, direction and coordination of a global programme on big data for official statistics, including indicators for the 2030 Agenda for Sustainable Development. The UNGWG also fosters practical use of big data sources for policy implementation, and offers advice in building public trust in their use by the private sector (UN GWG for Big Data, 2020). The United Nations Development Group (UNDG) has set out general guidance on data privacy, data protection and data ethics on big data for achievement of the 2030 Agenda.[8]

Since 1998 the OECD has had a substantive work programme on the digital economy, with particular emphasis on data privacy, digital security, and the structural change wrought by these technologies across the economy and society. This policy work is supported by the development of international statistical standards and corresponding databases. The OECD has convoked a series of ministerial meetings on the digital economy – in Ottawa in 1998, Seoul in 2008, and Cancun in 2016 – that have led to important Declarations on Authentication for E-Commerce, the Protection of Privacy on Global Networks, and the Future of the Internet Economy. Most recently the OECD Going Digital project analysed the impact of the digital transformation across a range of policy domains including trade, taxation, energy, education, health, agriculture, and transportation. Going Digital established an integrated policy framework for the digital transformation, based on the seven pillars of access, use, innovation, labour, trust, society and markets. This work recognized the importance of data as a new resource that would affect virtually all sectors of the economy.

OECD recommendations on the digital economy also provide important policy guidance. The OECD Principles on Artificial Intelligence (AI) promote AI that is innovative, trustworthy, and respects human rights and democratic values. They were adopted in May 2019 by OECD members and are the first such principles signed up to by governments. Beyond OECD members, Argentina, Brazil, Colombia, Costa Rica, Malta, Peru, Romania and Ukraine have also adhered to the AI Principles, with further adherents welcomed. In June 2019, the G20 adopted human-centred AI Principles that draw from the OECD AI Principles.

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[7] For an overview of UNESCO's ROAM principles (of human Rights, Openness, Accessibility and Multi-stakeholder participation, assessed by the Internet Universality Indicators) as applied to AI, see UNESCO (2019).

[8] UNDG entities include FAO, IFAD, ILO, IOM, ITU, OHCHR, UNAIDS, UNCTAD, UNDESA, UNDP, UNECA, UNECE, UNECLAC, UNEP, UNESCAP, UNESCO, UNESCWA, UNICEF, UNIDO, UNFPA, UNHABITAT, UNHCR, UNODC, UN OHRLLS, UNOPS, UN OSAA, SRSG/CAC, UN Women, UNWTO, WFP, WHO and WMO.

## 1.5 The need for focusing on agriculture and digital technology in the context of governance

The e-Agriculture Community of Practice (CoP) was established in 2007 as a response to recommendations by the 2003 World Summit on the Information Society and its Geneva Plan of Action (Action Line C7 ICT Applications: e-Agriculture). FAO, the UN Agency assigned to lead the development and subsequent facilitation of ICT activities on agriculture, engaged various stakeholders at all levels leading to this global CoP, where people from all over the world exchange information, ideas, and resources related to the use of ICTs for sustainable agriculture and rural development.[9] The objective of e-Agriculture is to serve as a catalyst for institutions and individuals in agriculture and rural development, to share knowledge, learn from others, and increase awareness about the vital role of ICTs in empowering rural communities, improving rural livelihoods, and building sustainable agriculture and food security.

The e-Agriculture CoP focuses on knowledge exchange between UN agencies, governments, universities, research organizations, NGOs, farmers' organizations, the private sector, and the wider community. This exchange is based on the collection and dissemination of best practices in digital agriculture, a constructive dialogue facilitated by a forum series, and capacity development through webinars and short paced learning courses (FAO, no date a).

Since 2005, FAO and the e-Agriculture CoP participate in the WSIS Forum that provides a platform to track the achievements of the WSIS Geneva Plan of Action and related Action Lines. In 2014, on the basis of a report provided by FAO, the WSIS+10 High Level Event reviewed progress on the C7 Action Line e-Agriculture, underlining a number of future challenges, including ICT application content, capacity development, gender and diversity (Kolshus *et al.*, 2015).

Within the WSIS Forum, agriculture and digital technology is discussed in special sessions co-organized by FAO, ITU and other organizations. However, the scope is very broad with discussions reflecting the collective will of the global community to use ICTs as a means to implement the SDGs and targets. This focus on agriculture will highlight the innovative use of digital technologies in the sector and how they can contribute to improving livelihoods of farmers, increase nutrition and food security, reduce poverty, and provide solutions to better adapt and mitigate the effects of climate change. Issues related to the governance of digital technologies cut across many economic sectors, activities, business and countries, and at the same time they are important to agriculture. Indeed, digital technologies cut across areas in which policies are shaped by different institutions. Global collaboration is central to harnessing digital technologies for growth and development and multistakeholder platforms, such as the World Summit on the Information Society and the Internet Governance Forum that have been established to address digital governance issues through a structured and inclusive approach.

For addressing the impact of digital technologies that are specific to agriculture, a mechanism is needed to facilitate dialogue between all stakeholders in the food system on the economic, social, environmental and ethical effects that digital technologies could have on the sector; on farms, business, consumers, the environment and the society as a whole. Such a multistakeholder discussion would create a common understanding on these impacts but would also result in the development of general principles and guidelines that can support governments to maximize the benefits and minimize the negative impacts of digital technologies on the sector. Currently, there is no such inclusive and multistakeholder process in which issues in the area of digital technology and agriculture are discussed and possible solutions and governance instruments are debated.

[9] The CoP counts over 13 000 members from 170 countries and territories. This membership is made up by several organizations, and government departments, but also by individual stakeholders such as information and communication specialists, researchers, farmers, students, policy makers, business people, development practitioners and others.

This discussion should also be carried to appropriate digital technology governance fora where voluntary guidelines and norms are developed to enhance awareness on issues specific to agriculture and include related solutions regarding guidelines, standards and norms. For example, discussions on the impact of AI on agriculture and related voluntary principles that can ensure sustainable agricultural development through AI applications could be presented in ITU's AI for Good Global Summit. This would ensure that agriculture is reflected in the discussions and the consensus on AI general guidelines, standards and norms. The proposed International Digital Council for Food and Agriculture could fulfil the above roles, and could significantly contribute to the challenges facing the agri-food system in line with the proposals of the UN Secretary-General's High-level Panel on Digital Cooperation.

# 2 -THE DIGITAL COUNCIL – PROPOSED SCOPE AND FUNCTION

## 2.1 Vision, mission and principles

### VISION

The International Digital Council for Food and Agriculture aims to become a key actor to support governments and other stakeholders in the agri-food system to maximize their potential in using digitalization to increase production, productivity and sustainability in an inclusive and equitable manner and to help achieve the SDGs.

### MISSION

The Digital Council will engage actors in the agri- food system across sectors and competences, to consolidate, enhance and promote digitalization in the sector, leveraging on the advantages while focusing on closing socio-economic divides. As a multistakeholder mechanism, the Digital Council will drive the exchange of ideas and deliver to its stakeholders knowledge and inputs to improve livelihoods, boost the quality and safety of agricultural products, increase employment, entrepreneurial opportunities, digital literacy and skills, support sustainable and animal welfare-oriented production, facilitate trade, and mitigate the effects of climate change. In particular, depending on the need, it will work on specific topics in support of national governments in four different ways.

- Identify the potential of digitalization for making agriculture more efficient, sustainable and better able to improve rural livelihoods, but also its unintended economic, social, environmental and ethical negative impacts.

- Work closely with existing mechanisms such as the e-Agriculture Community of Practice on issues related to farmer access to digital technologies, enabling stakeholders but especially smallholder farmers, women and youth, to access and benefit from digital technologies.

- Facilitate dialogue between all stakeholders and build trust on digital technologies through discussing appropriate voluntary guidelines and other principles to maximize the benefits and minimize the negative impacts of digital technologies on agriculture.

- Effectively link with existing international fora where digital technology issues are discussed, and strengthen the awareness of the international community on issues related to agriculture.

### PRINCIPLES

The Digital Council will respect key principles that were developed in compliance with the Sustainable Development Agenda by gathering the inputs of different stakeholders from within the UN system. The Digital Council will work in a fully inclusive and transparent way, embracing diversity, balancing representation from stakeholder groups active in the agri-food system, with a particular focus on rural communities, indigenous peoples, marginalized groups, women, youth and the very poor.

It will also make digital food and agriculture solutions available and affordable, especially for farmers, women and youth in rural communities, and ensure that technology is used in fair and ethical ways that consider the rights of the most vulnerable. This means being impartial to geography and technological solution areas when setting the agenda, and prioritizing efforts that offer the greatest potential acceleration in the adoption of digital food and agriculture. Activities will build on broader normative and operative commitments at national and international levels, such as the SDGs and the principles for digital development. But the Digital Council's operating mechanism will also have the autonomy to make strategic decisions free from political or donor pressure. The Digital Council will ensure that all acts are legally compliant, standardized and transparent, and ensure that staff are adequate, accountable and transparent.

A flexible, efficient and practical organization will achieve results within the shortest time and the lowest effort, exploiting digital technologies to the greatest extent, avoiding excessive physical meetings, and digitalizing decision-making processes. Additionally, initiatives will work toward solutions that have the broadest reach and applicability to target beneficiaries, are rooted in market principles and based on end-user needs, and that have the greatest potential for scaling out.

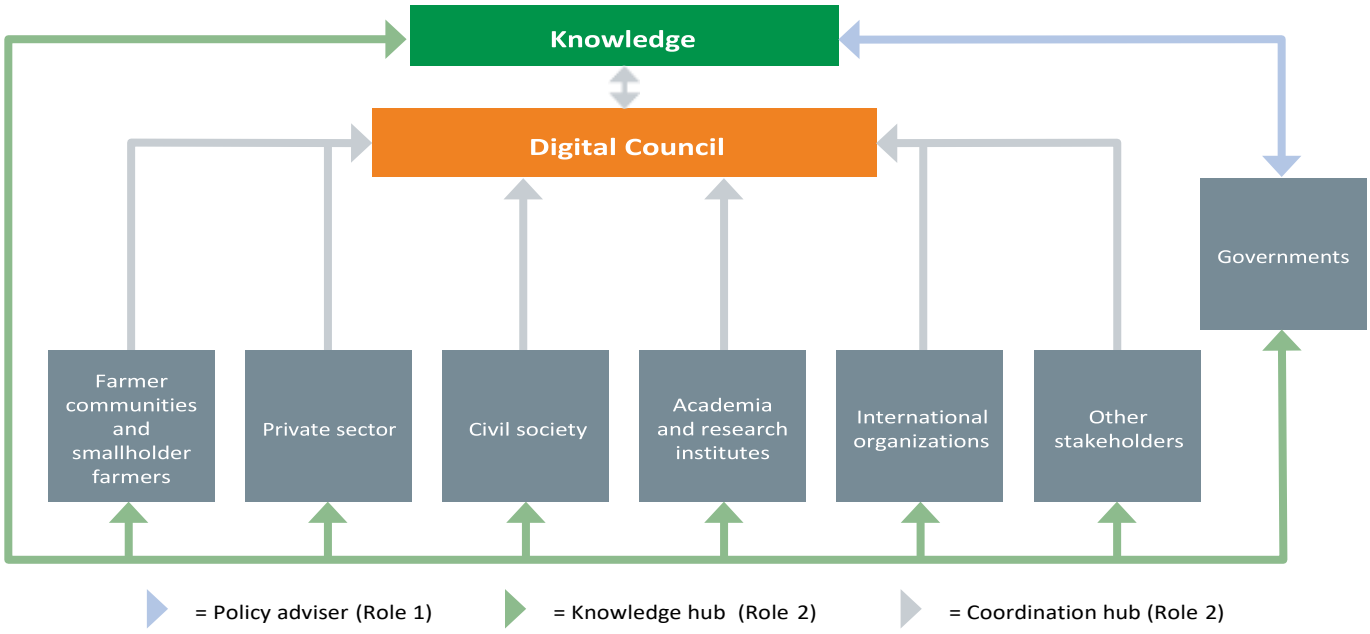
## 2.2 Roles and activities

To support governments and drive the exchange of ideas and experiences to harness the opportunities presented by digitalization, as requested by the Global Forum for Food and Agriculture 2019 Communiqué, the Digital Council will focus on two main roles. These are, first as a policy adviser to produce research-based guidelines, recommendations and best practices for governments regarding policy frameworks, and ensuring coordination and consistency of initiatives among countries. The second role would be as a central knowledge and coordination hub, to collate, validate and disseminate information and skills throughout the sector. The Digital Council will also pay special attention to avoid duplication of efforts with existing initiatives. It will focus on specific topics and regions and deal with individual mandates as circumstances require, focusing on where international cooperation is most urgent. In doing so, benefits are expected in the short term by providing solutions to farmers, and in the medium to long term by contributing to policy alignment at international and regional level. Depending on financial support and the success achieved, the Digital Council may progressively expand its activities.

### POLICY ADVISER

The Digital Council will identify the potential of digital technology in agriculture and will support governments and international processes in developing guidelines, principles and regulatory frameworks that take digitalization into consideration. Regarding the technical, social and political challenges the sector is facing, the Digital Council will offer an agenda-setting mindset. It will analyse the potential impacts, risks and benefits of developments and make recommendations at international level, noting specific contexts and existing gaps. By providing consistent and tailored inputs, activities will contribute to harmonizing policies and common approaches to setting guidelines and standards. Policy advice will also cover employment, youth opportunities and skill development in educational curricula related to agri-food systems as they become more digital. Additionally, it could provide benchmarks about successful policies that promote investments in rural infrastructure and technologies, especially for smallholder farmers.

**Figure 1:** Proposed roles of the Digital Council in the agri-food system




**KNOWLEDGE COORDINATION HUB**

The Digital Council will facilitate dialogue, based both on multilateralism and multistakeholderism that involves governments and a diverse spectrum of other stakeholders such as civil society, academics, and the private sector. In doing this, the Digital Council will be built on existing structures such as the e-Agriculture Community of Practice and will further strengthen the linkages between international organizations that focus on food, agriculture, and rural development with those organizations and processes that work on digital technology, such as ITU and WSIS. The Digital Council will be mindful of its goal to close digital, geographical and gender divides, and to benefit those who lag behind due to a lack of digital infrastructure, financial capabilities or digital literacy. Perhaps the greatest effort of the Digital Council in terms of knowledge can be through providing access to basic digital technologies and solutions to rural communities.

# 3- NATURE, COMPOSITION AND OPERATING MECHANISMS

## 3.1 Nature

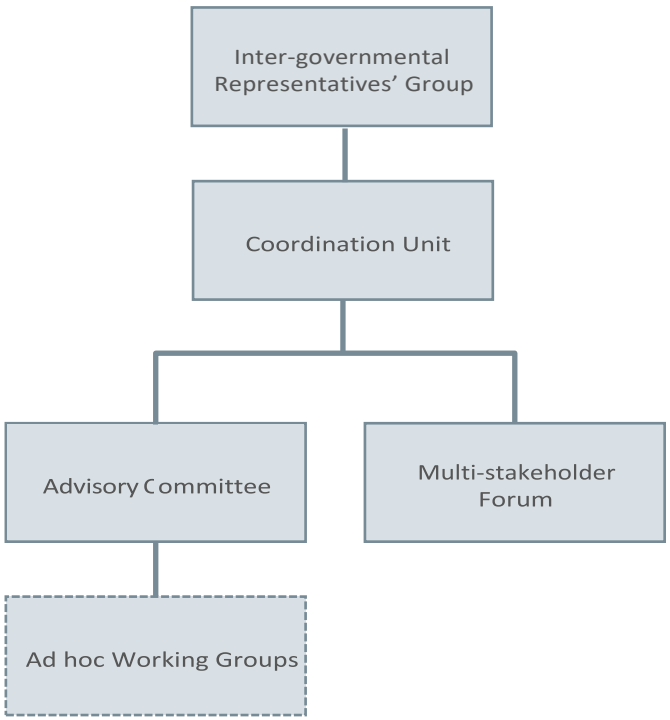
FAO is an optimal candidate to become the supporting organization for the Digital Council. In fact, the mission and objectives of the Digital Council and FAO are complementary and will mutually contribute to their respective effectiveness. Also, compared to other international organizations, it is considered that FAO would provide the best workforce expertise with the required knowledge to support this project. Moreover, FAO has relevant infrastructures and networks (such as the e-Agriculture network) that could contribute to the activities of the Digital Council. Finally, FAO has a wide international reach, relying on a strong network of governments, international organizations and other partners.

To maximize effectiveness and inclusion, the Digital Council will have a flexible, consensual and voluntary coordination mechanism supported by a United Nations agency, though it would not be an autonomous legal entity. It will operate as an open and neutral platform that brings together the views from different actors, with all decisions guided by the principle of consensus. The operating mechanism would provide the Digital Council with a framework that maximizes efficiency and avoids duplication, while considering its key principles, to be inclusive, neutral, accessible, autonomous, accretive, efficient, ethical and scalable. The Digital Council will seek alignment and knowledge sharing with other digitalization initiatives within the

United Nations Innovation Network (UNIN) and agencies with a significant track record of digital innovations. Also, the operating mechanism will guarantee transparency to ensure the full adhesion and participation of member countries.

The operating mechanism is designed to enhance collaboration among organizations and national and international initiatives actively working on agri-food issues and development, as identified through a mapping analysis. The Digital Council could also add value through involvement in ad hoc Working Groups, where organizations can contribute and share. In addition, the knowledge hub will rely on a website platform, such as the e-Agriculture platform coordinated by FAO, to gather information and contributions of all actors, enhancing their mutual knowledge and collaboration. This website will focus exclusively on individual topics covered by the agenda of the Digital Council to avoid duplication. The participation of non-state actors will be subject to the requirements laid down in the Guidelines on Cooperation between the United Nations and the Business Community, and the supporting agency's policies and guidelines for collaboration with the private sector, academia and the civil society.

**Figure 2:** Proposed operating mechanism of the Digital Council




## 3.2 Composition and operating mechanisms

All five proposed units will be staffed according to the rules and procedures of the respective United Nations agency, to ensure a fair geographical distribution of members, adequate qualifications, gender-balance and appropriate duration.

1. **Inter-governmental Representative's Group** – composed of government officials nominated by member governments, selection to follow three principles. The Group will ensure that all regions of the world are represented, will be based on the proven expertise of its members, and will be gender balanced. There will be 12 members/delegates plus one Chair and one Vice Chair: two from Africa, two from Asia, two from Europe, two from Latin America and the Caribbean, two from the Near East, and two from North America and the Southwest Pacific region (FAO, no date b). The Group will set the Digital Council's priority agenda, and will have the responsibility to create, review, amend, and approve policies, budgets, and strategies. It will also assess the overall effectiveness and performance of the Digital Council, recommend improvements to the initiative, and maintain financial and legal accountability within the hosting entity's existing frameworks.

2 . **Advisory Committee** – This unit guarantees the involvement of international organizations and relevant scientific/technical entities and will help to avoid the duplication of efforts and strategies within the broader digital agri-food development ecosystem. Members will be nominated by the Inter-governmental Representative's Group, being some 25 experienced stakeholders representing international organizations and scientific or technical entities divided approximately as follows: 10–12 from international organizations, 10–12 recognized technical, social and political experts in digital food and agriculture, and 3–6 other stakeholders, with 1–2 each from agriculture, the private sector and civil society. Further stakeholders will be also involved via the online Multistakeholder Forum. The following international organizations will have permanent seats in the Advisory committee: Food and Agriculture Organization of the United Nations (FAO), World Bank Group (WBG), African Development Bank (AfDB), International Fund for Agricultural Development (IFAD), Organisation for Economic Co-operation and Development (OECD), World Trade Organization (WTO), International Telecommunication Union (ITU), World Organisation for Animal Health (OIE), World Food Programme (WFP), and Technical Centre for Agricultural and Rural Cooperation (CTA). The Advisory Committee will serve as the key conduit between the Digital Council and the broader ecosystem, with an overarching objective of ensuring that activities are both consistent and complementary to existing international efforts. The Advisory Committee will support the Inter-governmental Representatives' Group by suggesting the agenda, assessing the impacts of digitalization, and developing recommendations and guidelines.

3 . **Ad hoc Working Groups** – These will identify and solve technical problems on specific topics and help the Advisory Committee in formulating technical recommendations for the Inter-governmental Representatives' Group. Each Working Group will be composed of experts on the specific focus area. Each Group must have representation from the private sector (e.g. mobile operators, digital food and agriculture service providers, etc.), academic and research institutes, and farmer associations, among others. The numbers involved can vary but will not exceed 10 members. Members of the Advisory Committee will also be involved in Working Groups, bringing skills and guidance on Digital Council topics. In addition to team members, each Working Group is expected to have a leader with relevant experience and significant knowledge of the United Nations, to avoid duplications of efforts and to leverage on existing activities and projects, and a co-leader with similar knowledge and experience from the same organization as the leader especially when a Working Group topic is very specific, or can also be from another organization. Specific roles will be decided by the Inter-governmental Representative's Group, and roles of a Working Group could include the gathering of evidence about the problems and needs the Group was created for, and to design and propose a solution based on high-quality evidence and that is scalable to the greatest extent allowed by the specific situation. Working Group operations will be run through digital platforms and digital collaborative tool. Meetings will be virtual, and members will work through a collaboration platform to edit documents and prepare reports.

4 . **Online Multistakeholder Forum** – open to everyone based on a subscription, with at its heart, professionally experienced stakeholders from the private sector, civil society, governments, academia, farmer associations and other non-state actors, who will participate in, and contribute to, the activities of Digital Council. Donor organizations can also send observers. It will ensure inclusivity, effectiveness and provide a bottom-up information flow, and members will be involved at various levels to provide suggestions and advice electronically and remotely. Youth organizations are especially welcome to participate, as they can provide important perspectives in addressing the needs of the future generation of farmers and actors throughout the whole agri-food system. Main activities and tasks of the Multistakeholder Forum include submitting information, delivering opinions on the Advisory Committee's recommendations, and responding to questions raised by the Advisory Committee.

5 . **Coordination Unit** – This will provide day-to- day operational and administrative support to the Digital Council's activities, in addition to technical support. It will be entirely managed by the supporting UN agency under its mandate and institutional framework, and within its programme

of work and budget. Accordingly, the day-to-day activities supporting the Digital Council will be undertaken in line with the supporting UN agency's rules, procedures and policies. The Coordination Unit would be strictly technical in nature, leaving all political decision-making to be cleared through the Council.

The United Nations supporting agency will play a facilitative and coordinating role, supporting the implementation of activities under the umbrella of the Digital Council, organizing relevant meetings and undertaking activities to advance the mission and objectives of the Digital Council. It will provide a full time administrator for the Coordination Unit and managerial and executive leadership and experience in the field, along with personnel who would work for the Digital Council. The supporting agency would also provide training and support; office space, meeting rooms and a dedicated website; IT, financial, legal and administrative services such as procurement, management of financial contributions, conclusion of personnel arrangements, etc.; and mobilization and management of funds in accordance with financial regulations, rules and procedures.

The four main work areas of the Coordination Unit would be coordination, operation, engagement and monitoring. **Coordination:** to facilitate the coordination of the Digital Council, e.g. by facilitating meetings. **Operation:** to be responsible for the website platform and the implementation of policy and technical coordination functions, adding reliable and trustworthy data sources, and making the platform user friendly and accessible, especially to smallholder farmers. **Engagement:** to engage stakeholders using the Knowledge and Coordination Hub Engagement Platform, to facilitate, coordinate and engage with communities for better co- creation, co-designing and knowledge sharing to make all Digital Council activities transparent, inclusive and sustainable. **Monitoring:** to evaluate and monitor all activities, and to produce and publish projects reports.

## 3.3 Work flows and methods

The governance of the Digital Council will have a flexible and regionally balanced operating mechanism structure, enhancing international cooperation, avoiding duplication, creating synergies, and allowing swift decisions to keep pace with the rapid development of digitalization. The Digital Council will invite input from a large variety of stakeholders, assuring a wide inclusion in terms of contribution and participation in all activities, and member countries can propose specific themes to be analysed and further developed when relevant. Decision-making processes can also be shared between different Coordination Units. The Inter-governmental Representatives' Group is the operating mechanism, but decisions will rely strongly on inputs from the Multistakeholder Forum and the Advisory Committee, with the Coordination Unit facilitating processes as follows.

1. The Inter-governmental Representatives' Group takes decisions on a given topic according to the agenda (e.g. securing data governance for agriculture).

2. The Coordination Unit provides the Multistakeholder Forum the possibility of presenting existing studies, empirical reports and other information on the chosen topic, and will publish them on the Digital Council website e.g., best practices on data governance, studies that highlight major risks for smallholder farmers on data property, or suggestions on best technology solutions for data sharing.

3. The topic then passes to the Advisory Committee, who after an impact assessment, proposes recommendations, establishes Working Groups as appropriate, draws on additional information, or requests another international organization to add their expertise.

4. The Advisory Committee presents the draft (e.g. of guidelines).

5. The Coordination Unit organizes an online consultation in the Multistakeholder Forum, and analyses the outcome.

6. The Advisory Committee prepares a final draft, incorporating views from the Multistakeholder Forum.

7. The final draft is submitted to the Inter-governmental Representatives' Group for adoption, which makes amendments as required, and formally adopts a final version.

8 . The Coordination Unit shares the final version on the website and via other digital tools.

Meetings, information exchange and discussions will be conducted digitally as much as possible, adopting more advanced practices such as online collaboration over time. This will include **virtual and physical meetings** and **collaborative platforms** to exchange experiences and collaborative on project related issues, with a key element being the Multistakeholder Forum, an online platform to crowdsource contributions and knowledge from a broad participation of users. In addition, the Digital Council website will be based on strong user experience and usability to assure inclusiveness for all. The Digital Council will post all publications online, and its annual reports will summarize the strategic objectives and activities undertaken to achieve them.

## 3.4 Funding strategy

The financial arrangements supporting the operations of the Digital Council still need to be developed. As far as the costs of a proposed FAO Coordination Unit are concerned, it is hereby suggested that FAO would cover such costs based on available resources, with additional costs to rely on voluntary contributions. Following adoption of the concept note, a more comprehensive funding strategy will be agreed, and that may include a multidonor trust fund or other mechanisms. All funds will be administered in accordance with FAO's financial regulations, rules and procedures.

## 3.5 Monitoring and evaluation

The Digital Council will be subject to the scrutiny of established internal and external oversight bodies of the supporting organization. A thorough monitoring mechanism will be put in place and lessons-learned exercises will be regularly undertaken. The Council's operations, effectiveness, and results will be evaluated five years after its official launch.