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FAO REGIONAL CONFERENCE FOR ASIA AND THE PACIFIC

Thirty-sixth Session

Dhaka, Bangladesh, 8-11 March 2022

The outline and roadmap of the “FAO Science and Innovation Strategy”

Executive Summary

Recent sessions of FAO Governing Bodies have underlined the importance of science and innovation. The 42nd Session of the FAO Conference emphasized the importance of science and innovation in all of FAO's work. The 166th Session of the FAO Council approved the Terms of Reference for the International Platform for Digital Food and Agriculture. All Regional Conferences in 2020 included agenda items on innovation. The 27th Session of the Committee on Agriculture (2020) encouraged FAO to include smallholder farmers in a strategy for innovation.

To rise to the challenge of harnessing the benefits of science and innovation, FAO's Director-General requested the development of a targeted Strategy to provide guidance, coherence and alignment for impact at country level through better use of science and innovation. An informal consultation with Members was organized on 21 September 2021.

This document presents the proposed outline and roadmap of the FAO Science and Innovation Strategy.

Suggested action by the Programme Committee and the Council

The Programme Committee and the Council are invited to consider the outline and roadmap of the FAO Science and Innovation Strategy and to provide guidance, as deemed appropriate.

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I. Introduction

1. The challenges facing sustainable agri-food systems are considerable and interlinked. A wide range of approaches, technologies and practices exist to tackle agri-food systems challenges (though they are not adequately harnessed). Science and innovation – including indigenous and local knowledge – underpin them all. Science and innovation are an essential part of finding solutions to complex problems and can be best harnessed for impact when risks and trade-offs are identified and mitigated.

2. Both within and beyond agri-food systems, the landscape of science and innovation is changing rapidly. There has been an explosion in biotechnologies, digital tools, nanotechnology, big data, and artificial intelligence. Recognition of the role of various actors is also changing. Public-private partnerships are on the rise in public research and academia. The importance of the participation of a range of actors in agricultural innovation systems is increasingly recognized to co-create knowledge and strengthen capacities to adapt and innovate throughout agri-food systems. Unprecedented market concentration (in technologies, products, and intellectual property) has raised concerns about gaps between countries and social groups. Awareness of the unintended consequences of science and innovation has led to increased public mistrust in the institutions that govern science and innovation. At the same time, demands to strengthen science-policy interfaces to ensure the development of evidence-based policies are amplified. Finally, there is increasing acknowledgement for the role of inter- and trans-disciplinary research to address systemic challenges in a holistic manner.

3. Science, technology and innovation are at the heart of the 2030 Agenda for Sustainable Development and appear in numerous Sustainable Development Goals (SDGs) targets: several agri-food systems-related SDG targets address technology; innovation is included in relation to economic productivity, decent job creation, industrial development and capacities of developing countries; and science (along with technology and innovation) is recognized as a key means of implementation of SDGs. The 2030 Agenda's Technology Facilitation Mechanism (TFM) and its UN Interagency Task Team on Science, Technology and Innovation (IATT), in which FAO is an active member, provides a multi-stakeholder cooperation mechanism to promote coordination within the UN system.

4. The FAO Strategic Framework 2022-31 identifies science, technology and innovation (STI) as having enormous transformative potential (particularly emerging technologies), while also recognizing that STI presents risks. Science underpins all four accelerators (technology, innovation, data, and complements [governance, human capital, and institutions]) of the Strategic Framework and will be integrated into the 20 Programme Priority Areas (PPAs) to maximize FAO's efforts in meeting the SDGs and realizing the four betters. The Strategic Framework considers innovation a central driving force for achieving a world free from hunger and malnutrition. It includes social, policy, institutional, financial and technological innovations both in the programmatic and operational sense, highlighting the importance of a shift in FAO's working paradigm and partnerships to ensure transformational change.

II. FAO's role in science and innovation

5. As the lead UN specialized agency for food and agriculture, FAO is called to be at the forefront of facilitating solutions that support the transformation to MORE efficient, inclusive, resilient and sustainable agri-food systems for better production, better nutrition, a better environment and a better life, leaving no one behind. Science and innovation are foundation stones for solutions to agri-food systems challenges – solutions that include, but are not limited to, technologies.

6. FAO's core functions – access to data, normative standard setting, capacity development, partnerships, knowledge sharing, advocacy and communication, and policy dialogue – require a strong use of science and innovation. FAO is not a research organization, but does contribute to strengthening

the link between science, research and development and does contribute to science (for example, through its work on data) and develop innovations (for example, institutional innovations such as Codex Alimentarius, social innovations such as Farmer Field Schools and technological innovations such as the geospatial platform of the Hand-in-Hand Initiative). More importantly, it is mandated to translate the science and innovation that is developed by other actors into practical tools and policy guidance for development.

7. FAO provides support to countries on innovative practices, approaches, methodologies and tools. It also supports science-driven innovative processes, platforms, and multi-stakeholder mechanisms. Due to its unique position as a specialized agency of the UN and facilitator of inter-governmental processes, FAO is well-positioned to connect technical, development and financial partners, policymakers, producers, scientists and innovators, in all sectors of agri-food systems through a shared global agenda. FAO's Governing and Statutory Bodies provide an interface for science and policy. FAO is uniquely placed to convene all agri-food systems actors to discuss and debate contentious scientific issues, including prevailing power asymmetries and socioeconomic inequalities. FAO is also uniquely placed to support its Members in strengthening national policy frameworks for enhanced science and innovation and identifying research priorities at regional and global levels and communicate them to the major research institutions.

III. Governing Body outcomes

8. The Strategy will build on guidance from FAO Governing Bodies. Recent sessions have put a strong focus on innovation, technology and science – particularly the promotion of new technologies and digital innovations. Key among the outcomes, the 42nd Session of the FAO Conference emphasized the importance of science and innovation in all FAO's work, particularly the accelerators; the 166th Session of the FAO Council approved the Terms of Reference for the International Platform for Digital Food and Agriculture; all Regional Conferences in 2020 included agenda items on innovation, especially digitalization; and the 27th Session of the Committee on Agriculture (2020) encouraged FAO to include smallholder farmers in a strategy for innovation. Requests by Members for FAO's support to harness science and innovation more forcefully are growing.

IV. Rationale for FAO Science and Innovation Strategy

9. FAO has undertaken important steps to strengthen its work on science and innovation. Some prominent examples include the State of Food and Agriculture 2014, which focused on innovation in family farming and the International Symposium on Agricultural Innovation for Family Farmers (2018). In 2020, new positions for the Chief Scientist and the Director of Office of Innovation (OIN) were created, and FAO established the International Platform for Digital Food and Agriculture as an inclusive multi-stakeholder forum to promote dialogue on the digitalization of the food, agricultural, fisheries and forestry sectors. As mentioned above, in 2020, sessions of the Regional Conferences and Technical Committees highlighted the importance of innovation and technology. Regional and Country Offices are already moving forward with tailored programmes and globally coordinated programmes, such as the Hand-in-Hand Initiative and 1000 Digital Villages are in progress at country level.

10. To rise to the challenge of harnessing the benefits of science and innovation, FAO must transform itself into a more innovative organization, an organization that is capable of assisting countries to scale up the most appropriate innovations for their contexts, based on science. Therefore, to hone FAO's vision and strategy on science and innovation, FAO's Director-General requested the development of a targeted Strategy to provide guidance, coherence and alignment for impact at country level through better use of science and innovation. The Strategy will strengthen the use of science and innovation in FAO's technical/programmatic interventions and normative guidance and will be a key tool for the implementation of the Strategic Framework 2022-31.

V. Outline of the Strategy

11. The FAO Science and Innovation Strategy will be a living document, regularly monitored and periodically updated to reflect important developments. The Strategy will be informed by science and evidence and build on the foundations of the FAO Strategic Framework 2022-31 and the 2030 Agenda for Sustainable Development.

A. Introduction

12. The introduction will recap the importance of science and innovation for agri-food systems, as well as recalling FAO's role. It will include a brief presentation of major issues in the current global context that are relevant to science and innovation for MORE efficient, inclusive, resilient and sustainable agri-food systems. The main challenges to harnessing science and innovation in agri-food systems will be highlighted. Relevant global frameworks – foremost among them the 2030 Agenda for Sustainable Development – will be included and their relevance to science and innovation described. The need for a more coherent approach for making use of science and innovation for achieving SDGs will be stressed. Key concepts, including science and innovation, will be clarified.

B. Vision

13. With the aim of strengthening FAO's capacities to deliver the Strategic Framework and the SDGs through science and innovation, the Strategy has a natural focus inwards towards FAO, but with the ultimate aim of higher impact for the countries and people that FAO serves. The vision will be inspired by FAO's comparative advantages and will support FAO's leadership role in providing guidance to countries on science and innovation for agri-food systems through effective communication – both internally and with external partners. The vision will guide the development of the Strategy and help focus its implementation.

C. Objectives

14. Addressing FAO's core functions (access to data, normative standard setting, capacity development, partnerships, knowledge sharing, advocacy and policy dialogue), the following objectives are tentatively proposed:

- a. To enhance FAO's technical interventions and normative guidance by translating science and innovation into tools for development, thereby supporting the implementation of the Strategic Framework 2022-31;
- b. To strengthen the science- and evidence-base of FAO's technical interventions and normative guidance;
- c. To provide guidance, coherence and Organization-wide alignment on science and innovation, cutting across all sectors and components of agri-food systems;
- d. To promote access to, affordability and uptake of innovation (including indigenous and local knowledge) in a way that leaves no one behind and ensures the inclusion and participation of marginalized groups, including women, youth, small-scale producers and Indigenous Peoples, in decision making to ensure impacts that benefit them; and
- e. To ensure that FAO contributes to relevant regionally and internationally agreed frameworks and that it informs research priorities and agri-food systems policies at country, regional, and global levels.

D. Scope

15. The FAO Science and Innovation Strategy will provide a framework for strengthening the Organization's capacities to support countries in harnessing science and innovation for MORE efficient, inclusive, resilient and sustainable agri-food systems.

16. The Strategy will underline science and innovation as foundation stones for solutions to agri-food systems challenges – solutions which include, but are not limited to, technologies. It will include

indigenous and local knowledge as important sources of innovation for inclusive, resilient and sustainable agri-food systems.

17. The Strategy will consider all types of innovations, i.e., technological, social, policy, financial and institutional. It will also consider operational innovations insofar as they are relevant to the Strategic Framework 2022-31.

18. The full range of scientific disciplines (for example biological, social, behavioural and economic), as well as the importance of inter-disciplinary and trans-disciplinary research to address systemic challenges in a holistic manner, will be promoted.

E. Theory of change

19. The Strategy will include a theory of change which recognizes that countries are at different levels of harnessing science and innovation and have different needs. The theory of change will briefly outline existing challenges and opportunities, provide a vision of the ultimate desired outcomes, and briefly describe the pathways to achieving them while maximizing the impacts and minimizing the trade-offs.

F. Guiding principles

20. A focused number of clear and well-considered guiding principles will ground the Strategy in globally accepted principles, including the five basic principles that underscore the 2030 Agenda for Sustainable Development: the ‘five Ps’: People, Planet, Prosperity, Peace, and Partnership. The 2030 Agenda underlines the interdependent nature of these principles: “Sustainable development recognizes that eradicating poverty in all its forms and dimensions, combating inequality within and among countries, preserving the planet, creating sustained, inclusive and sustainable economic growth and fostering social inclusion are linked to each other and are interdependent”.¹

21. The guiding principles will address issues related to the importance of the scientific and evidence base, effective governance, adaptation to local, country and regional contexts, partnerships, equity and the progressive realization of the right to adequate food. They will support the Organization in guiding all FAO programmatic and normative work which involves science and innovation, particularly on complex issues such as identifying and managing risks and trade offs linked to science and innovation, and will be mainstreamed in the Action Plan.

G. Pillars

22. The Strategy will be based on pillars that define its thematic priorities. The pillars will be operationalized through the Action Plan and will focus on fulfilling needs and gaps by reviewing the science and innovation needs for FAO’s priorities, which have been identified through the Organization’s planning processes, thus avoiding duplication of efforts. They have been defined in the Strategic Framework 2022-31 (including the Programme Priority Areas, accelerators and cross-cutting themes), the regional priorities (including regional science and innovation frameworks or strategies), country priorities, normative priorities and other FAO strategies (e.g., on climate change, nutrition, biodiversity mainstreaming, private sector). New and emerging issues will be incorporated through foresight exercises. The pillars will cover key issues such as strengthening the evidence base, assessing innovation impacts, assessing and mitigating risks, increasing uptake (adaptation and scaling), identifying and addressing trade-offs, internal (FAO) capacity building, coordination, resource mobilization and partnerships.

23. Key priorities for strengthening FAO’s capacities could include engaging in strategic foresight, horizon scanning and scenario-building exercises; assisting countries in increasing local adaptation and uptake of innovations through a more rigorous approach to the prioritization of innovations and technologies and reinforcing agricultural innovation systems (including forestry,

¹ United Nations General Assembly (UNGA), 2015. Transforming our world: the 2030 Agenda for Sustainable Development. UN Doc A/RES/70/1

fisheries and all components of agri-food systems); strengthening systemic approaches to programmes, policies and investments; and strengthening FAO's place as a source of reliable scientific information and a neutral platform at the heart of important debate.

H. Action Plan

24. The Strategy will be complemented by an Action Plan which will be informed by the guiding principles, objectives and pillars. The Action Plan will be aligned with the Mid-Term Plan and the Programme of Work and Budget, giving it the flexibility to align with revised versions of the Strategy, which is a living document. It will include concrete outputs, such as tools and frameworks to support countries. The Action Plan will include a communication plan for both specialized and general public audiences. It will include harmonized objectives, targets, indicators, timing, responsibilities, risks, monitoring and reporting, as well as quality assurance and learning mechanisms. Effective implementation of the Action Plan will require capacity development, coordination and collaboration mechanisms, effective gathering and sharing of information, and effective resource mobilization. Development of the Action Plan will be initiated following the endorsement of the Strategy.

I. Accountability framework

25. Accountability, monitoring and reporting mechanisms will ensure the success of the Strategy. Effective knowledge management will play a key role in ensuring that lessons are learned to inform future improvements of FAO's use of science and innovation. The accountability framework will ensure that the Strategy contributes directly to FAO Strategic Framework 2022-31, linking its monitoring to the Key Performance Indicators (KPIs) for the four accelerators of the 20 Programme Priority Areas. In addition, linkages will be made with relevant SDG targets and indicators.² FAO Country Programming Frameworks will indicate country-level results that are related to science and innovation and link them to specific SDG targets and indicators.

VI. Roadmap

26. The Chief Scientist, supported by the Director of Office of Innovation, will facilitate an inclusive process of engagement for the development of the Strategy, observing the timeline proposed in the Annex below.

27. Internal engagement will include all relevant FAO streams and divisions, centres and offices at headquarters and Decentralized Offices through a high-level Advisory Board, a Review Task Force and a Drafting Team. All FAO personnel have been engaged in an early sharing of expertise and views through the FAO Innovation Survey.³

28. Consultations with Members will be organized as needed to respond to Members' queries about the Strategy under the guidance of the Programme Committee and the Council and through FAO regional consultations on science and innovation. A first informal consultation with FAO Members was held on 21 September 2021 and a second one is planned for March 2022. It is proposed that, following feedback on the outline and roadmap from the 132nd Session of the Programme Committee in November 2021 and from the 168th Session of the Council in December 2021, a draft Strategy will be presented to the 133rd Session of the Programme Committee in May 2022. Development of the Action Plan will be initiated following endorsement of the Strategy.

29. Regional consultations will be held with regional and country offices to ensure that the Strategy responds to the needs at country and regional level to ensure impact on the ground. A group of external experts, which will be balanced by region, gender and discipline, will review the draft Strategy before its finalization.

² These include SDG 2a, SDG 6a and SDG 14a (related to technology use for agriculture and rural infrastructure, water use, and marine issues, respectively); SDG 14.4 on science-based management plans for fisheries; and SDG 17 on means of implementation.

³ The FAO Innovation Survey was sent to all staff in May-June 2021 and received a high response rate. Its purpose was to engage all staff and understand the diversity of views about innovation and about FAO's needs and priorities.

Annex: Timeline for the FAO Science and Innovation Strategy

	Actions	Date
1.	Establishment of the FAO Science and Innovation Strategy Advisory Group, Review Task Force and Drafting Team	August 2021
2.	Informal consultation with Members to present main elements of the outline and roadmap of the FAO Science and Innovation Strategy	21 September 2021
3.	Regional consultations on science and innovation priorities (organized by Regional Offices)	October – December 2021
4.	Outline and roadmap of the FAO Science and Innovation Strategy considered by the 132nd Session of the Programme Committee	8 – 12 November 2021
5.	Outline and roadmap of the FAO Science and Innovation Strategy considered by the 168th Session of the Council	29 November – 3 December 2021
6.	Review of the draft FAO Science and Innovation Strategy by external experts	17 – 28 January 2022
7.	Outline and roadmap of the FAO Science and Innovation Strategy submitted to Regional Conferences for discussion: 36th NERC (7-11 February 2022), 32nd ARC (21-25 February 2022), 37th LARC (7-11 March 2022), 36th APRC (4-8 April 2022) and 33rd ERC (2-6 May 2022)	February – May 2022
8.	Informal consultation with Members to receive input for the FAO Science and Innovation Strategy	March 2022
9.	FAO Science and Innovation Strategy considered by the 133rd Session of the Programme Committee	16 – 20 May 2022
10.	FAO Science and Innovation Strategy considered by the 169th Session of the Council	13 – 17 June 2022