Food and Agriculture Organization of the United Nations

Global Forum on Food Security and Nutrition • FSN Forum

CALL FOR SUBMISSIONS:

From Foresight to Field: Exploring regional and multistakeholder perspectives to implement a foresight on emerging technologies and innovations in agrifood systems

In 2023, FAO published the report "Harvesting change: Harnessing emerging technologies and innovations for agrifood system transformation". The report explores the critical role of technology and innovation in transforming agrifood systems to address future challenges in the attempt to shorten the time lag between research and investment innovation phases and the uptake of technology and innovation, thus creating preparedness an ensuring inclusive, resilient, and sustainable agrifood systems transformation.

Since the global foresight synthesis report is published only in English, the OIN team has prepared **the background document** that is available in the six UN languages (Arabic, Chinese, English, French, Russian and Spanish). This document can serve as a reference for completing the template for submissions.

Please use this **submission template** to share your experience and views on the potential pathways of the agrifood system transformation at regional level.

The call for submissions is open until 03 June 2024.

For the necessary background and guidance, please refer to the topic note and the background document available at this call webpage**.** You can upload the completed form upon login to your account with the FSN Forum or, alternatively, send it to fsn-moderator@fao.org**.**

Template for submissions

Contact person	Name: Anna Rosales, RD Organization: Institute of Food Technologists Country: United States Email address: arosales@ift.org
What region are you from?	☐ Europe and Central Asia ☐ Latin America ☐ North Africa and Near East ☐ Sub-Saharan Africa ☐ Asia and Pacific ☒ North America
Affiliation	☐ Farmers and producer organizations ☐ Research and academia ☐ Government ☐ Private Sector ☐ Civil Society Organization ☒ International Organization ☐ Other (please specify)

1. In the foresight synthesis report "Harvesting change: Harnessing emerging technologies and innovations for agrifood system transformation" (FAO and CIRAD, 2023), 20 emerging or pre-emerging technologies and innovations have been identified with highest potential to impact the agrifood systems from now to 2100. From those 20 innovations, select the three key technologies and innovations that have the potential to accelerate each of the following: a) inclusion; b) sustainability; and c) resilience.

1) Internet of Food – Improvements in real-time global traceability of food in the supply chain has great potential for improving sustainability to ensure food gets to where it is needed more efficiently with less waste and improving resilience by enabling rapid shifts that may be needed in the event of global conflicts and natural disasters. This technology can also enable better tracking of consumption patterns globally to help determine nutritional needs for populations around the globe.

2) Ensuring access to science-based information on sustainability matters – This technology is essential as technology advances rapidly and information is just as rapidly available. This can ensure that science-based standards are implemented at the policy level and serve to empower consumers with greater transparency of food-based standards.

3) New methods for controlling gene expression – The precision of this technology allows for extensive opportunities to fine-tune food and agriculture development to optimize sustainability and resilience. Access to this technology needs to be expanded and

communications of risks should be clear and science-based to ensure inclusiveness for those with greatest need.

2. In applying those emergent technologies and innovations, what would be the trade-offs and for whom if we advance: a) inclusion; b) sustainability; and c) resilience? How to minimize them while maximizing the benefits?

1) Internet of Food – The trade-off for this technology would be potential cybersecurity threats and unethical use of the food related data. Enhanced protection of information and greater enforcement for unethical use would be necessary to maximize benefit. There may also be a sustainability trade-off as considerable computing power would be needed to implement traceability at this level.

2) Ensuring access to science-based information on sustainability matters – The primary trade-off in this area is potential bias, misinformation, and maintenance of up-to-date data availability. Peer review processes and multi-stakeholder input would be necessary to ensure integrity of the data included.

3) New methods for controlling gene expression – The trade-off with this technology is the need for accurate and transparent communication on the benefits and risks of the technology and avoiding misinformation that could lead to consumer and policy maker fear that shuts down innovation. Ensuring clarity in communications, transparency and inclusion of consumer and policy maker voices early in the development process can help prevent misinformation and fear of new technology.

3. What are the capacities needed, including at enabling environment level, and related gaps in generating, adopting and transferring new technologies and knowledge in the low and low middle income countries (LMICs)? What should be the role of organizations like FAO?

The key capacities needed to adopt these new technologies in low and low-middle income countries include:

- Facilitating relationships between food and agriculture actors in the global north and south. This includes scientists, policymakers, farmers, and manufacturers of all sizes to enable the exchange of knowledge and technology.
- Enhancement of public-private partnerships that can accelerate scientific research and innovation into development and commercialization in LMICs.
- Increasing engagement with member state regulatory bodies to ensure an enabling regulatory environment that accelerates progress and acceptance of new technologies.

4. In what area of application do you see major breakthroughs in the next 10-20 years in your region/country? (Production systems; Energy and transportation; Value chains and services; One health and nutrition; Governance and trade; New materials, proteins and circular economy; and Inclusion)

5. What are the 3 most important triggers of change (hypothetical future events, positive or negative), which could potentially enable rapid development of emerging technologies and innovations in your region? Please consider the following:

- Advancement of other technologies. Which ones?
- Societal consensus and higher ethical standards
- <u>Removed barriers for adoption</u> – many emerging technologies and innovations are ready to be implemented, but barriers, such as regulatory restrictions, economic restrictions (lack of resources or funding), and lack of consumer acceptance and understanding all restrict the ability of some of these technologies to be implemented at a broader scale.
- <u>Governance and business environment</u> – An enabling environment for entrepreneurship and innovation development is necessary to ensure new technologies are implemented at scale. Business development also drives economic growth, and particularly in LMICs, more efforts to derisk and incentivize small, medium and large enterprise development can help accelerate innovation.
- <u>Rapid acquiring of skills/human capital</u> – Enhanced training and education for the next generation of agrifood leaders is essential to accelerate innovations around the globe. In LMICs a greater investment in education, training, and particularly business mentorship is necessary. Similarly, in developed nations investment in training and education of future agrifood scientists and leaders has stagnated for many years and many youth pursue alternative careers disengaged from food and agriculture.
- Open and trustworthy communication
- Other

6. From the five global scenarios, identified in the report, which future scenario is the most plausible in your region/country and why? Please, mention the name of the country in your response.

7. What does this foresight synthesis report and its recommendations mean for your country and your region? How to implement them? What actions diverse stakeholder groups have to take (policy makers, farmers, researchers, private sector, civil society etc.)?

The foresight synthesis report should serve as a forward-looking tool for policy makers, scientists, farmers, innovators, and business leaders to understand the opportunities and challenges in developing, adopting, and scaling new technologies and innovations. This should also help inform potential risks and trade offs that need to be addressed now to enable food and nutrition security into the future. Diverse stakeholders need to work together to accelerate implementation of new technologies with a goal of benefiting the greater good. This may come with trade offs, as has been identified, but the presence of trade offs should not prevent advances in implementation of technology. Rather the trade offs must be balanced with the benefits to be achieved with innovative technologies and potential mitigation strategies should be implemented over time.

8. What will be the technologies and innovations the most likely to bring about gender equality in the agrifood systems? Can social norms be tackled to merge the gender divide and how?

Each of these technologies and innovations have the ability to bring about gender equality in agrifood systems. The key will be ensuring women have to these new technologies, including training, education, and financial assistance. Similarly, training and development of future agrifood leaders should ensure women have ample opportunity. Additionally, enhancement of partnerships and mentorships between women agrifood leaders in the global north and south could enhance empowerment of women in LMICs where the gender divide is most pronounced.

9. How do you envision the role of women in innovation in the next 10, 20 and 50 years?

The role of women in agrifood innovation will continue to grow in the next 10 – 50 years with enhanced training and increasing access to information and technology. However, this will require a greater emphasis on providing education, training and mentorship opportunities to women in the global south and increasing financial support for entrepreneurial endeavors to commercialize innovations.

Link(s) to specific references	*Please include attachment(s) or add here link(s) to documents with specific references.*