



United Nations Food Systems Summit 2021  
Scientific Group  
<https://sc-fss2021.org/>

Report of the Scientific Group Session at the Pre-Summit of the UNFSS

# Science and Innovation for Food Systems Serving People and Planet | July 26, 2021

## Session

The session focused on the role of science, innovations, and technology in the transformation of the food systems into more sustainable, efficient, and equitable food systems. The session was divided into three blocks; **1. Bioscience, Digital Sciences and Agronomy Innovations** **2. Science Serving End Hunger and Safe and Nutritious Food for All** and **3. Science and Institutional Innovations for Food Systems Sustainability**. The session was moderated by **Joachim von Braun**, the Chairperson of the Scientific Group for the UNFSS (ScGroup) and **Magdalena Skipper** the Editor in Chief of Nature.

The session presented the science, including social sciences and natural sciences, for food systems transformation that supports objectives of the UN Food Systems Summit.

Advanced and emerging sciences as well as traditional knowledge were considered. The panellists scrutinized propositions, drew attention to conflicting agendas, and sought synergies based on the best peer-reviewed science, successful examples at national and local levels, and quantitative model findings at global levels.

Magdalena Skipper stressed on the importance of science and innovation for a successful transformation of global food systems and noted that its salience for such a transformation has been recognized and acknowledged by the UN leadership.

*“For Science and Innovation to be effective, to make a genuine contribution for the necessary food system transformation they need to play out in a context and on a local and global scale. And the best, the most effective implementation will come from co-creation, collaboration, knowledge exchange and*

*continued dialogues between scientists, innovators, politicians, policymakers, indigenous people, businesses, farmers and fishing communities and consumers. It is an opportunity for each of these stakeholder communities to learn for a better collective outcome.”* **Magdalena Skipper**

## **Block 1: Bioscience, Digital Sciences and Agronomy Innovations**

The first block discussed innovations at the frontiers of science for food systems in the areas of bio-, digital and agronomy sciences. *“We have to look at biological sciences, digitization and other branches of science and restrike balances between production and keep in mind the social, economic and environmental objectives of societies in our times.”* **Manuel Otero**

Important new and emerging innovations in these fields and ways of operationalizing innovations to transform food system were highlighted. The speakers also reflected on the potential risks and unintended consequences of scientific innovations and new technologies and discussed mechanisms to ensure minimizing these risks. They cautioned against the potential negative impacts of technology; there have been instances where inappropriate use of science has harmed nature, animals or plants, e.g., too much application of chemical fertilizers.

In the discussion on potentially game-changing scientific breakthroughs, the panel saw combinations of advances in **genetics and digital technologies** as having the greatest potential for food systems transformation. *“The greatest potential is in the combination of advances in genetics with digital (technologies)...The use of better genomic information, not so much to create genetically modified organisms but to better characterize the genes so that we know what types of*

*resistance are possible in plants and animals and the types of requirements for human health. Creating big databases for that will really change the world in many ways”* **Louise O. Fresco**

Biotechnology, digital farming and health of soils were highlighted as priority areas of policies. Including these are biofertilizers from algae and soil microbiomes as major game changer for sustainable agriculture and circular bioeconomy. For example, using engineering and digital for electrically powered small-scale irrigations. *“The name of the game if **bioeconomy and digital technology** convergence for improving peoples’ health, enhancing systems productivity and restoring ecological wellbeing, this is agriculture 4.0, combining bioscience, digital innovation, social and cognitive science.”* **Elizabeth Hodson de Jaramillo**

Among the other game-changers, genetic engineering, biofortification, plant-based protein, plant nutrition technologies and aquatic food technologies were mentioned. Importance of precision for producing more from less was stressed including precise food chains and precise targeting for need of consumers. Innovations such as cultured meat need to be scaled for ensuring affordable access. *“While it is important for the meat sector to adopt sustainable practices for meat production, a gap remains between the productivity of this sector and the growing global demand for meat; cultivated meat can be a solution to fill that gap. This is however, with other types of innovations, in policy and also together with responsible education and consumption behavior of consumers of not only meat but in general of a healthy diet”,* **Lee Recht**

Food systems must also be made **inclusive**; producers need to be heard and need to be at the center of discussions. The need for **sharing knowledge equitably** and

**translation of scientific knowledge for end-users and policymakers was emphasized;** for science and innovation to be effective in the transformation of food systems, it is necessary for dialogue and collaboration with between scientists, policymakers, businesses, indigenous people, farmers, corporations, and other key players.

## Block 2: Science Serving End Hunger and Safe and Nutritious Food for All

In the second block, panellists focussed on on technological, institutional and policy innovations to eliminate hunger, malnutrition and poverty and to ensure availability, affordability, and uptake of nutritious foods.

Innovations from the frontiers of natural, applied, economic and the social sciences holding the promise for improving productivity, reducing inefficiencies in resource distribution and empowering marginalized and excluded communities and groups were shared. *“For the African continent, the focus of is on the use of science to promote how to increase crop and animal yields in the continent; address nutrition deficiencies and biofortification of staple food. Increasing investment in agricultural research to sustain agricultural intensification in the continent. Increasing investment in digital infrastructure and capacities”* **Godfrey Bahigwa**

The speakers noted that despite progress in food production and availability of diverse foods, affordability of food had decreased in parts of the world among certain segments. *“Indigenous people and indigenous knowledge is an important partner for finding solutions, and for decision making to resolve the issue of hunger and for ensuring full and secure supply of food. This knowledge can also be the basis for the ways to protect ecosystems an protect biodiversity. Indigenous knowledge*

*is adaptive in nature and resilient to change including the change brought by climate change.”* **Polina Shulbaeva**

In addition to technology and innovations, there is a need to make food systems more inclusive, **women particularly are important players in the food system** and their education and empowerment can be instrumental for food desirable food systems transformation. *“Women’s education has been noted to be associated with improved food behavior and practices and hence better health and nutrition outcomes. Existing social norms and rules lead to girls getting married and dropping out of school; the role of science here is identify effective ways of removing social barriers and creating opportunities for women in labor markets and skill-based jobs. For women’s empowerment and gender equality, more institutional innovations are needed, especially on how to enhance women’s education, how to keep them school, how to give them financial knowledge.”* **Kaosar Afsana**

Scalable solutions based on science are needed in three key areas: genetic innovations; focused on preservation of genetic resources for better breeding, productivity and resilience. There are synergies in the solutions for big global challenges and these must be utilized. *“Radical realignment is needed of our food systems in order to end hunger and malnutrition all over the world, in all its forms. Food systems are embedded in the solutions base for climate mitigation and climate adaptation as well as for environment and biodiversity (protection). Food systems transformation provides an opportunity to create integrated solutions that cut across key global challenges that we face”* **Claudia Sadoff**

Second, integrated approaches are needed for resilient and sustainable agro-food systems. *“It is not possible anymore to just look at one part of food system in research and it is important for research to dive into the consequences of other parts of it. We have*

*funding and investment available for research, it is a pity that we cannot make that research (lessons) binding for policy makers and businesses. We must really look into how we can organize science in an international arrangement.”* **Paul van de Logt**

### **Block 3: Science and Institutional Innovations for Food Systems Sustainability**

The last segment focused on the scientific, policy and institutional innovations for effectively delivery of sustainable food systems that are climate-neutral or climate-positive, regenerative, and protect biodiversity and the environment.

Universities in the global north and those in the global south should have collaboration and Universities also collaborate with farmers to develop programs. *“Institutional innovations are very much needed to transform food systems research and education institutions and especially universities and research institutions in the low- and middle-income countries by modernizing their curriculums and their research facilities to include frontier innovations in science and technologies genetic engineering, AI, drip irrigations etc.”* **Mohamed Hassan**

The institutional, policy and technological innovations for sustainable harvesting of natural resources, sustainable agricultural practices, and sustainable consumption patterns were highlighted. There are synergies between ending hunger with other SDGs, these synergies need to be tapped. *“Ending hunger and ensuring food for all are synergistic with many other SDGs, however, achievement of SDG2 also poses challenges most notably when it comes to environmental impacts. It is therefore necessary to increase interactions of food system scientists and other*

*disciplines. It underscores a need for an IPCC for food systems transformation.”* **Thomas W. Hertel**

It is necessary to strengthen the relations between food scientists & other sciences. Support academies or science for stronger science policy interaction. *“Scientists have to take the role of translating science and to present priorities for decision makers; the links between scientists and politics has to be strengthened.”* **Patrick Caron**

Examine options for global science policy interface, establish multidisciplinary platforms and develop innovative finance models. *“There is a need for re-thinking extension models and using digital technologies has a great potential here.”* **Su Kahumbu Stephanou**

### **Closing Remarks**

The moderator, Joachim von Braun noted at the closing of the session that the perception that research and innovation is costly for low-income countries needs to be dispelled, **the cost-benefit ratio of research and investment in low-income countries is very low.** The ScGroup asks all countries that spend less than **1 percent of their food systems related GDP on research and innovation.** Global and international organizations should be put to task for sharing and transferring innovation and knowledge to low- and middle-income countries.

### **Session Moderators:**

**Joachim von Braun**, Chairperson of the Scientific Group for the UNFSS  
**Magdalena Skipper**, Editor in Chief, *Nature*

### **Session Speakers**

#### **Block 1: Block 1: Bioscience, Digital Sciences and Agronomy Innovations**

**Louise O. Fresco**, Vice Chair of the Scientific Group, President of the Executive Board, Wageningen University & Research

**Elizabeth Hodson de Jaramillo**, Professor Emeritus School of Sciences of the Pontificia Universidad Javeriana, and member of Inter American Network of Academies of Sciences (IANAS)

**Lee Recht**, Aleph Farms Head of Sustainability, Aleph Farms

**Manuel Otero Director-General**, Inter-American Institute for Cooperation on Agriculture (IICA).

#### **Block 2: Science Serving End Hunger and Safe and Nutritious Food for All**

**Kaosar Afsana**, Vice Chair of the Scientific Group, Professor Public Health, BRAC University

**Claudia Sadoff**, Managing Director, Research Delivery and Impact of the CGIAR System Organization (CGIAR)

**Paul van de Logt**, Head Food and Nutrition Security team in the Dutch Ministry of Foreign Affairs

**Godfrey Bahigwa**, Director, Department of Rural Economy and Agriculture, African Union Commission

**Polina Shulbaeva**, Coordinator for IIFB, CBD process.

#### **Block 3: Science and Institutional Innovations for Food Systems Sustainability**

**Mohamed Hassan**, Vice Chair of the Scientific Group, President of The World Academy of Sciences for the advancement of science in developing countries (TWAS)

**Thomas W. Hertel**, Professor of Agricultural Economics at Purdue University and Executive Director of the Global Trade Analysis Project (GTAP)

**Patrick Caron**, Vice President for International Affairs, University of Montpellier, France

**Su Kahumbu Stephanou**, Founder and CEO, iCow

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