



PONTIFICIA ACADEMIA
SCIENTIARVM



The Scientific Group for the UN Food Systems Summit
<https://sc-fss2021.org/>

**Workshop on Science and Innovations for a Sustainable Food System –
Preparing for the UN Food Systems Summit 2021**

**The Scientific Group for the UN Food Systems Summit in cooperation with the
Pontifical Academy of Sciences (PAS) Vatican City
21st - 22nd of April 2021**



Photo credit: Gabriella Clare Marino

“It is a matter of adopting innovative solutions that can transform the way we produce and consume food for the wellbeing of our communities and of our planet, thus strengthening the capacity to recover and long term sustainability... We are conscious that there is a need to respond to this challenge in an epoch that is full of contradictions: on the one hand we are witnesses of unprecedented progress in various scientific fields; on the other hand the world is facing several humanitarian crises. Unfortunately we see that according to FAO’s most recent statistics, despite the efforts undertaken in the last decades, the number of people fighting against hunger and food insecurity is growing, and the current pandemic will even further worsen these numbers. Hunger is not only a tragedy for humanity, but also a shame.”

*From MESSAGE OF HIS HOLINESS POPE FRANCIS FOR THE
WORLD FOOD DAY 2020 FAO, 16 October 2020.*

Background

The ***aim of the UN Food Systems Summit***¹ is to help Member States and stakeholders maximize the co-benefits of a food systems approach across the entire 2030 SDG Agenda and meet the challenges of climate change. As a key contribution to the Decade of Action, the objectives of the Summit are to generate momentum, expand the knowledge base, and share experiences and approaches to unleash the benefits of sustainable food systems for all people. The Summit will also offer a catalytic moment for global public mobilization and actionable commitments to invest in diverse ways to make food systems inclusive, climate adapted and resilient, and support sustainable peace.

The ***Scientific Group for the Summit*** is responsible for ensuring the Summit brings to bear the foremost scientific evidence and helps expand the base of shared knowledge about experiences, approaches, and tools for driving sustainable food systems that will inform the future. The work of the Scientific Group ensures the robustness and independence of the science underpinning dialogue of food system policy and investment decisions. The Scientific Group will inform the Summit's content, recommended outcomes, clarify the level of ambition and commitments that will emerge from the Summit. It is expected to engage with various research constituencies and coalitions around the world to bring them into the effort, and to give feedback and input on Summit evidence document, recommendations, and distilled declaration.

Content and Objectives of the Workshop

The objective of the workshop is to facilitate the review of options of evidence-based actions with a focus on science, technological and institutional innovations that can facilitate transformation toward a sustainable food, nutrition and agricultural system. The focus of the workshop shall be on challenges in the food system that science and innovations might address, and on a set of relevant but controversially discussed potential strategies and actions for solving food systems problems, which sciences – natural sciences and social sciences – may assist to resolve. These include for instance

- the lack of action to end hunger; unhealthy diets and obesity;
- biotechnologies, digitalization, agro-ecology;
- food and agriculture's role in climate change and biodiversity;
- trade policy; subsidies and food pricing; food waste;
- reforms of organizations, institutions, and governance, incl. the interface among science and policy of food system.

Opportunities, constraints and risks of innovations as well as their ethical aspects shall be considered and discussed. As the workshop shall contribute to the emerging agenda of the UN Food Systems Summit from scientific perspectives, issues of implementation actions, priorities, and sense of urgency shall also drive the workshop deliberations.

¹ The text is based upon the invitation to the Scientific Group and the established TOR from the Office of the UN Secretary General.

Format

The workshop will be held virtually, possibly with live presence by local Rome-based participants in the PAS headquarters at Casina Pio IV in the Vatican, if the public health situation permits it. The workshop participants interact based on brief impulse statements stimulating discussions. No comprehensive presentations are envisioned, but the focus is on interactions. The time schedule is very tight. Speakers are asked to stick to the specific time allocated to their interventions. Interventions in Q&A sessions are limited to two minutes each.

Participants

Invited are the members of the Scientific Group, as well as members of the Pontifical Academy of Sciences who in broad terms relate to science incl. basic science of relevance for the future of food systems, such as biosciences, Anthropocene, climate, ecosystems, health, agriculture, water, and science policy. In addition, invited as guest speakers are:

Paul Richard Gallagher, Archbishop and Secretary for Relations with States of the Holy See

Dr. QU Dongyu, the Director General of FAO, and

Dr. Agnes Kalibata, the Special Envoy for the UN Food Systems Summit.

Workshop materials

- Scientific Group's papers on Food Systems concept and five Action Tracks papers as well as the note on defining Healthy Diets, as well as

- Food Systems Summit Briefs prepared by partners of the Scientific Group.

See all at <https://sc-fss2021.org/>

- Emerging proposals for actions to be considered by the Food Systems Summit shall be discussed.

Recent publications by the Pontifical Academy broadly relating to the theme also serve as a background.²

² For instance:

- **Science and Survival. A focus on SARS-CoV-2** and connections between large-scale risks for life on this planet and opportunities of science to address them. Acta 26. Proceedings of the Plenary Session 7-9 October 2020 <http://www.casinapioiv.va/content/accademia/en/publications/acta/acta26.html>

- **Transformative Roles of Science in Society:** From Emerging Basic Science Toward Solutions for People's Wellbeing. Proceedings of the Plenary Session 12-14 November 2018 [pas_acta25.pdf \(casinapioiv.va\)](http://www.casinapioiv.va/content/accademia/en/publications/acta/acta25.pdf)

- **Food Loss and Waste Reduction.** Proceedings of a joint workshop of PAS with Rockefeller Foundation, Scripta Varia 147, Vatican City, 2020 http://www.pas.va/content/dam/accademia/pdf/pas_sv147.pdf

- **Food Safety and Healthy Diets,** Proceedings of a joint Workshop of PAS with Global Alliance for Improved Nutrition, 12-13 September 2018, Scripta Varia 141, Vatican City, 2018 <http://www.pas.va/content/accademia/en/publications/scriptavaria/food.html>

- **Science and Sustainability.** Impacts of Scientific Knowledge and Technology on Human Society and its Environment. Proceedings of the Plenary Session 25-29 November 2016, www.casinapioiv.va/content/dam/accademia/pdf/pas_acta24.pdf

Day 1: Wednesday April 21, 2021 14:00 – 16:00

Session 1: 14:00 – 15:00

Welcome by Joachim von Braun Scientific Group and President of PAS
and **Marcelo Sánchez Sorondo** Bishop Chancellor of PAS

Perspectives on Emerging Science Opportunities and Challenges

Chair: Joachim von Braun, Scientific Group

- Werner Arber, PAS Academician and Nobel Laureate on “The impact of bio-sciences on the human health and principles of global food systems” (10 minutes)
- Frances Arnold, PAS Academician and Nobel Laureate on “Replacing toxic pesticides, a natural approach” (10 minutes)

Global and Regional perspectives (each on the 1-2 most important current or emerging science opportunities and 1-2 most important science controversies, 5 minutes each):

- Volker ter Meulen, President of InterAcademy Partnership (IAP) on “Global Perspective”
 - Ousmane Badiane, ScGroup: Africa
 - Morakot Tanticharoen, ScGroup: Asia
 - Elizabeth Hodson de Jaramillo, ScGroup and IAP: Americas
 - Robin Fears, IAP and EASAC: Europe
- Discussion by participants (15 minutes)

Session 2: 15:00 – 16:00

Chair: Mohamed Hassan, Member of Scientific Group and PAS Academician

Science and actions for the Food Systems Summit and implications for a conducive Science – Society – Policy interface (10 minutes each)

15:00 – 15:10 Key note by Archbishop Paul Gallagher, Secretary for Relations with States within the Holy See's Secretariat of State

15:10 – 15:20 Key note by FAO Director General, Dr QU Dongyu on “The role of science and innovation for the transformation of agri-food systems”

15:20 – 15:30 Key note by UN Special Envoy for the Food Systems Summit, Dr. Agnes Kalibata “Using Science, Policy and Innovation to end hunger and improve livelihoods in the food system”

15:30 – 15:40 Key note by Cardinal Turkson, Prefect of the Dicastery for the Promotion of Integral Human Development, Member of the group of Champions for the Food Systems Summit

15:40 – 16:00 discussion with participants

Day 2: Thursday April 22, 2021 14:00-16:30

14:00 – 15:00

Session 3: Agenda for the Food Systems Summit from a Science and Innovation Perspective - considering propositions for technological and institutional innovations

Chair: Louise Fresco, Scientific Group

Emerging science and policy related propositions for the Food Systems Summit

(5 minutes each)

- Sheryl Hendricks: innovations to incentivize production of healthy diets, to repurpose subsidies towards greater support to producing safe foods; measures to ensure food prices reflect true costs
- Mario Herrero Acosta: innovations to develop new technologies and tools, e.g. genomics, plant nutrition, sustainable animal production
- Urs Niggli: innovations for food systems related environmental approaches, agro-ecology, and technologies, for climate neutral and climate positive food systems

Presentations and commentaries by PAS Academicians (5 minutes each)

- Ingo Potrykus (PAS) – the science and policy experience with “Golden Rice”
- Vanderlei Bagnato (PAS) – on science for food safety
- David Baulcombe (PAS) – on biosciences and biodiversity
- **Discussion by participants**

15:00 – 16:00

Session 3 (cont.): Agenda for the Food Systems Summit from a Science and Innovation Perspective - considering proposals for technological and institutional innovations

Chair: Kaosar Afsana, Scientific Group

Emerging science related propositions for the Food Systems Summit from Scientific Group (5 minutes each)

- Lynette Neufeld: innovations to facilitate improved nutrition, behavioral change towards healthy diets and empowerment of women;
- Thomas W. Hertel: innovations to de-risk food systems; opportunities of trade and market policy reforms; social protection

Presentations and commentaries by PAS Academicians (5 minutes each)

- Veerabhadran Ramanathan (PAS) on climate change and health
- José Onuchic (PAS) on basic science for innovations related to health and food systems
- **Discussion by participants**

16:00 – 16:30

Session 4: Long term perspectives and Conclusions

Chair: Joachim von Braun, PAS and Scientific Group

Martin Rees (PAS), **Evolution of science and implications for humanity** (10 minutes)

Summarized conclusions for the Food Systems Summit

Discussion by participants

Closing: H.E. Msgr. Marcelo Sánchez Sorondo and Joachim von Braun

Participants

Members of Scientific Group for the UN Food Systems Summit

Joachim von Braun (Germany) Chair of the Scientific Group. Director of the Center for Development Research (ZEF), Bonn University, and Professor for economic and technological change.

Kaosar Afsana (Bangladesh) Vice Chair of the Scientific Group. Professor Public Health, BRAC University.

Louise Fresco (Netherlands) Vice Chair of the Scientific Group. President of the Executive Board, Wageningen University & Research.

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

Mario Herrero Acosta (Costa Rica) Chief Research Scientist of Agriculture and Food, The Commonwealth Scientific and Industrial Research Organisation (CSIRO).

Ousmane Badiane (Senegal) Chairperson of Akademiya2063, former Africa Director for the International Food Policy Research Institute (IFPRI).

Patrick Caron (France) Vice President of the University of Montpellier, President of Agropolis International and Director of the Montpellier Advanced Knowledge Institute on Transitions

Martin Cole (Australia) is Professor for Agriculture and Food within the Commonwealth Science and Industrial Research Organisation (CSIRO). Chairperson of the HLPE Steering Committee of CFS.

Ismahane Elouafi (Morocco) Chief Scientist, Food and Agriculture Organization of the United Nations (FAO).

Frank A. Ewert (Germany) Scientific Director, Leibniz Centre for Agricultural Landscape Research (ZALF).

Sheryl L. Hendriks (South Africa) Professor of Food Security & Director, Institute for Food, Nutrition and Well-being, University of Pretoria.

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

Jikun Huang (China) Professor at School of Advanced Agricultural Sciences and Director of China Center for Agricultural Policy (CCAP), Peking University.

Marta Hugas (Spain) Chief Scientist at European Food Safety Authority (EFSA).

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

Andrew Kambugu (Uganda) Executive Director Infectious Diseases Institute (IDI), College of Health Sciences, Makerere University. Co-founder of the Researchers for Global Health (R4GH) initiative.

Kaoru Kitajima (Japan) Professor at Kyoto University Graduate School of Agriculture; a forest ecologist, especially in tropical America and Asia.

Rattan Lal (India) Professor of Soil Science, Director of the Carbon Management and Sequestration Center at Ohio State University. World Food Prize Laureate 2020.

Hoesung Lee (South Korea) Chair, Intergovernmental Panel on Climate Change (IPCC), Professor at Korea University Graduate School of Energy and Environment, Seoul.

Uma Lele (India) is President of the International Association of Agricultural Economists (IAAE).

Lynnette M. Neufeld (Canada) incoming President of the International Union of Nutrition Scientists (IUNS), Director Knowledge Leadership, Global Alliance for Improved Nutrition (GAIN).

Urs Niggli (Switzerland) Scientist focusing on sustainable farming systems, from 1990 to 2020 he led the Research Institute of Organic Agriculture (FiBL)

Claudia Sadoff (USA) Executive Management Team Convener and Managing Director, Research Delivery and Impact, of the Consultative Group on International Agricultural Research

Lisa Sennerby Forsse (Sweden) past President, Royal Swedish Academy of Agriculture and Forestry (KSLA) and was the vice-chancellor of the Swedish University of Agricultural Sciences 2006-2015.

Jean-François Soussana (France) is Vice-President of International Policy at the Institute national de la recherche agronomique (INRAE).

Morakot Tanticharoen (Thailand) Professor and Senior Advisor to the President of the National Science and Technology Development Agency (NSTDA), research in microbiology and biotechnology.

Maximo Torero (Peru) ex-officio Member Chief Economist, Food and Agriculture Organization of the United Nations (FAO).

Aman Wirakartakusumah (Indonesia) Professor Em. at Department of Food Science and Technology and Senior Scientist at SEAFast Center, Bogor Agricultural University (IPB), President-Elect, International Union of Food Science and Technology.

David Zilbermann (Israel, USA) Professor in the Department of Agricultural and Resource Economics, University of California at Berkeley. One of the Founders of the International Consortium of Applied Bio-economy Research (ICABR).

Guest Speakers and Guest Participants

Archbishop Paul Richard Gallagher, Secretary for Relations with States of the Holy See

Cardinal Peter Turkson, The Vatican (member of Food Systems Summit Champions)

Dr QU Dongyu, FAO Director General,

Dr. Agnes Kalibata, UN Special Envoy for the Food Systems Summit,

Prof. Volker ter Meulen, President of InterAcademy Partnership (IAP)

Dr. Robin Fears, Director, Biosciences Programme of European Academies' Science Advisory Council (EASAC)

Academicians of the Pontifical Academy of Sciences

Werner Arber, Microbiology, Biological Evolution, Nobel laureate in Physiology or Medicine, 1978

Frances Hamilton Arnold, Chemical Engineering, Bioengineering, Biochemistry, Nobel laureate in Chemistry, 2018

Vanderlei S. Bagnato, Physics and Material Science Engineering

Antonio Battro, Neuro-developmental Study of Cognition

David Baulcombe, Genetics, Botany, Virology

Joachim von Braun, Food and Agriculture

Edward De Robertis, Biology, Genetics

Mohamed H.A. Hassan, Mathematics, Physics

Pierre Léna, Astrophysics; Climate Education

Salvador Moncada, Biology, Medicine

José Nelson Onuchic, Biological Physics

William Phillips, Physics, Nobel laureate in Physics, 1997

Ingo Potrykus, Plant Science

Veerabhadran Ramanathan, Atmospheric Sciences

Peter Raven, Biology, Plant Systematics and Evolution

Martin Rees, Cosmologist and Astrophysicist; The fifteenth Astronomer Royal, UK

Marcelo Sánchez Sorondo, Bishop-Chancellor of PAS, History of Philosophy