



United Nations Food Systems Summit 2021
Scientific Group Scientific Group
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Engaging Science for National and International Level Implementation of the Action Agenda of the United Nations Food Systems Summit

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1. Background and Purpose

The Secretary-General's "**Chair Summary and Statement of Action on the UN Food Systems Summit**" strongly emphasizes the role of science for transformation of the food systems. It states, for instance:

- "Progress will require local and global communities of practice and stakeholders coming together with national governments... In particular, support to enhance implementation through financing, data, science and innovation, governance and trade."
- "Global initiatives to reinforce the ambition of science-based solutions will be key to deliver on the 2030 Agenda."
- "Collaborating with the High-level Panel of Experts (HLPE) of the CFS at global level, support strengthening the science-policy capacities and interfacing at local and national levels."

¹ Chair of the Scientific Group for the UNFSS, Professor at ZEF, Bonn University. Helpful comments on an earlier draft by members of the Scientific Group and research support by Sundus Saleemi and Heike Baumüller (both at ZEF) are gratefully acknowledged.

The purpose of this paper is to outline a concept for constructive contributions of science to provide evidence-based insights for national, regional, and global level implementation of the UNFSS Action agenda.²

The “Science ecosystem of support” is part of the envisioned support structures for the “FS Follow-up Coordination Hub” and “Country Level Platforms led by the Government” (see figure 1). Science ecosystem of support is understood to be the community of science and knowledge organizations of relevance for food systems. Its support functions include providing evidence for setting coherent national targets of food systems transformation; supporting through science the translation of targets into action, understood as implementation research; and strengthening related capacity building for national systems when needed. While we note the terminology of “Science ecosystem of support”, in this paper we refer simply to the **Food Systems-relevant Science Landscape (FSSL)**.

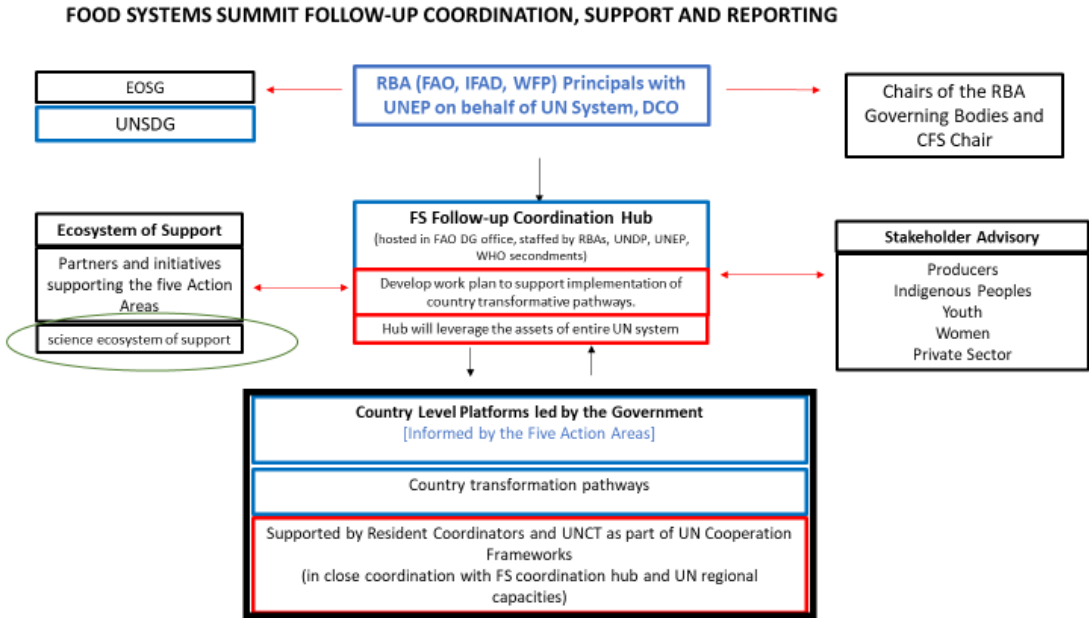


Figure 1: The Deputy Secretary General’s Presentation to UNFSS Advisory Group, Oct. 2021 on Summit Follow up

Food systems embrace the entire range of actors and their interlinked value-adding activities involved in the production, aggregation, processing, distribution, consumption, and disposal (loss or waste) of food products that originate from agriculture (incl. livestock), forestry, fisheries, and food industries, and the broader economic, societal, and natural environments in which they are embedded (building on definitions by FAO (2018), HLPE (2014) and others).³

² The implementation of the UNFSS agenda can draw on the rich material developed by the Scientific Group and its partners compiled in the “Science Reader” for the UNFSS https://sc-fss2021.org/wp-content/uploads/2021/09/ScGroup_Reader_UNFSS2021.pdf

³ Joachim von Braun, Kaosar Afsana, Louise Fresco, Mohamed Hassan and Maximo Torero (2021) Food system concepts and definitions for science and political action. Nature Food. Sept 2021. <https://rdcu.be/cxPxJ> and https://sc-fss2021.org/wp-content/uploads/2021/06/Food_Systems_Definition.pdf)

Production includes, of course, farming communities but also pre-production actors, for example input industries producing fertilizers or seeds. The range of actors importantly includes science, technology, data, and innovation actors. They are partly integral to the food systems, and partly outside but of great influence, for instance, embedded in life science and health systems research. In food industries' processing, foods and non-foods result from interlinked value chains. Other relevant food systems actors include, for example, public and private quality and safety control organisations.

2. Mobilizing Science and Knowledge Community for Implementation of UNFSS Actions

The Scientific Group has developed a set of seven science-driven priorities of innovations to support the transformation of food systems to achieve the Food Systems Summit goals⁴:

1. Innovations to end hunger and increase the availability and affordability of healthy diets and nutritious foods: this bundle partly draws on the six science and innovation actions below.
2. Innovations to de-risk food systems and strengthen resilience, in particular for negative emission farming and drawing on both advanced science as well as traditional food system knowledge.
3. Innovations to overcome inefficient and unfair land, credit, labor, and natural resource use arrangements, and facilitate the inclusion, empowerment and rights of women and youth, and Indigenous Peoples.
4. Bio-science and digital innovations for improving people's health, enhancing systems' productivity, and restoring ecological well-being.
5. Innovations to keep – and where needed, regenerate – productive soils, water and landscapes, and protect diversity of the agricultural genetic base and biodiversity.
6. Innovations for sustainable fisheries, aquaculture, and protection of coastal areas and oceans.
7. Engineering and digital innovations for the efficiency and inclusiveness of food systems and the empowerment of youth and rural communities.

Furthermore, the Science Group and its Partners have published the set of **strategic papers of relevance for national and global level UNFSS actions**, assembled in the “Science Reader for the UNFSS”.⁵ All these together provide insights on the actions required to enable food systems transformation to achieve the UNFSS goals.

⁴ Joachim von Braun, Kaosar Afsana, Louise Fresco, and Mohamed Hassan (2021) **Food systems: seven priorities to end hunger and protect the planet**, *Nature*. Sept 2021. <https://www.nature.com/articles/d41586-021-02331-x> and Science for transformation of Food Systems: Opportunities for the UN Food Systems Summit https://sc-fss2021.org/wp-content/uploads/2021/07/Scientific-Group-Strategic-Paper-Science-for-Transformation-of-Food-Systems_August-2.pdf

⁵ See Scientific Group https://sc-fss2021.org/wp-content/uploads/2021/09/ScGroup_Reader_UNFSS2021.pdf

Science – policy interfaces that serve national, regional and global implementation activities to enable food systems transformation should be further explored⁶. A round table format with representatives of main sets of organizations from the science landscapes could initiate this exploration.

Merely mobilizing science and pushing supply of science findings will not be sufficient for science to play its conducive role in the design of food systems transformations and implementation research for managing related transition pathways. The policy and stakeholder communities need to articulate **demand for science-based insights** and respect uncomfortable findings that may contradict conventional wisdom. It is greatly helped when government departments cooperate with each other in policy making for food systems innovations, and when them and stakeholders from private sector and civil society agree to be guided by factual information. Taking the time and effort to consider complex analyses and findings from modelling is part of mutual constructive engagement among policy and science.

1) Mobilizing the science and knowledge communities at country levels

We applaud the active participation of UN member states in the Summit – 165 countries participated with almost 100 of these represented by heads of state. Furthermore, 69 member-states noted the salience of science and innovation in the transformation of food systems. About 230 commitments were registered on action areas, made by a diverse group of players ranging from small NGOs to multinational institutions to member states. A number of coalitions have emerged from the Action Tracks, and member states have the opportunity to engage with coalitions.

The science and knowledge communities must continue to mobilize in each country for national-level implementation of the UNFSS action proposals⁷. In this context, the fields of science and the science and innovation priorities that are critical for shaping sustainable food systems are important to consider. Accordingly, the landscape would consist of, among others:

- Universities' related institutes
- Academies of Sciences
- Agricultural, forestry, land, water, and climate research institutions,
- Health and nutrition research centers,
- Indigenous and traditional knowledge carriers,
- Others (incl. Corporate and start-up research and innovation communities, National think-tanks, private sector research institutions etc.)

⁶ Joachim von Braun, Kaosar Afsana, Louise Fresco and Mohamed Hassan. 2021. Food systems: seven priorities to end hunger and protect the planet. *Nature* 597, 28-30 (2021) <https://doi.org/10.1038/d41586-021-02331-x> and Hainzlin, Etienne; Caron, Patrick; Place, Frank; Alpha, Arlène; Dury, Sandrine; Echeverria, Ruben; Harding, Amanda: How could science-policy interfaces boost food system transformation? *Food Systems Summit Brief Prepared by Research Partners of the Scientific Group for the Food Systems Summit*. doi.org/10.48565/scfss2021-4y32

⁷ Webb, Patrick; Flynn, Derek J.; Kelly, Niamh M.; Thomas, Sandy M.: The Transition Steps Needed to Transform Our Food Systems: *Food Systems Summit Brief Prepared by Research Partners of the Scientific Group for the Food Systems Summit*. doi.org/10.48565/scfss2021-hz63

The national level science landscape would engage in national level implementation under the leadership of national governments and the UN where applicable (in some countries possibly augmented by regional science organizations), and in consultation with other stakeholders (corporate, civil society, farmer and consumer orgs). Figure 1 below depicts this science support framework in national contexts.

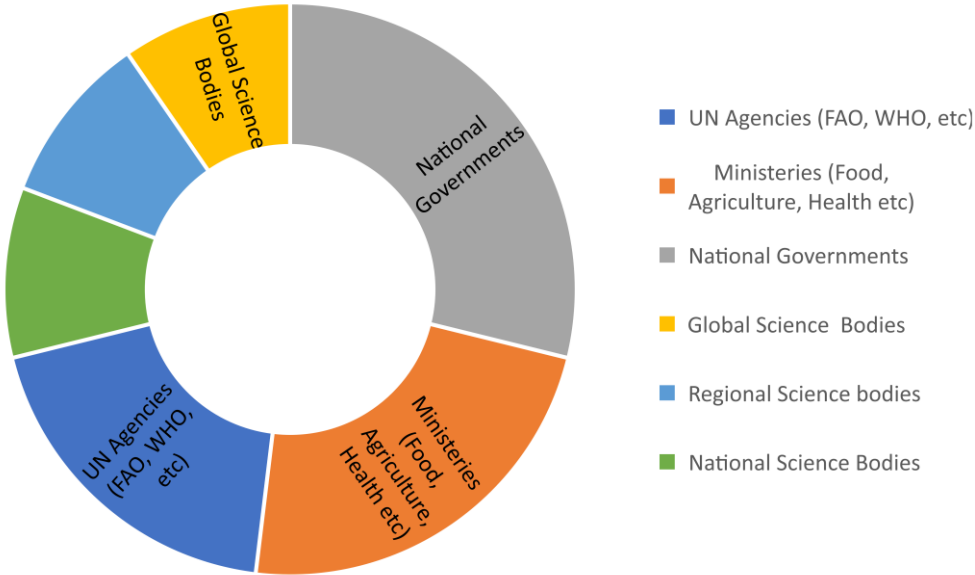


Figure 1: Science support framework in National Governance Contexts

The key initial task would be to **design details and typologies for countries’ science landscapes and science-policy interfaces**. This would entail mapping the FSSL in all countries, consider its regional and international linkages, and communicate it to national implementation actors. Such a mapping exercise mandates action from both the government and the scientific communities who should jointly map out this landscape (see Figure 1).

The annex table 1a can serve as a guideline in this regard. As examples, the table identifies FSSL in three countries: Kenya, Ghana and Pakistan. The list of stakeholders and players in the FSSL in these countries is not meant to be comprehensive but serves as guideline of this mapping exercise.

As a service, mapping all the materials from the Scientific Group and Partners that may be of relevance for national concerns can be considered (i.e. relate all the Papers and Briefs from the Scientific Group’s website to countries’ and regional contexts). An important early task could be **modelling national issues in a regional and global context**: thematic areas of focus could include trade, hunger, healthy diets, ecology, climate, food safety and health, innovations, etc.

In cases where the science and knowledge community may not have critical mass at the country level, systems of science support can be considered at a sub-regional level.

2) Mobilizing the science and knowledge communities at regional levels

To operationalize the task, national UNFSS focal points need to be made aware of related regional and international organization science bodies that could serve their purpose with information and analyses as input for options on implementation of UNFSS Action Agenda. Thus, at **regional levels** the food system related organizations of sciences that could be mobilized to address trans-national issues could include, among others:

- Regional Academies of Sciences
- Regional research and innovation institutes
- Regional think-tanks
- Regional science bodies and forums
- Regional private research organizations

A tabulated presentation is presented in Annex 1b.

3) Mobilizing the science and knowledge communities at global level

Similarly, the international science and knowledge communities spanning all the sciences relevant for food systems transformation need to continue to mobilize and engage in international public goods issues that impact the implementation of the UNFSS actions, such as trade, food safety, climate resilience, peace and security, trans-boundary water, equity and inclusion, science and knowledge transfers and much more. Food system related organizations of sciences that could be mobilized at the global level could include, among others:

- Academies (InterAcademy Partnership, IAP)
- International food, agricultural, health and food Systems related research institutes (Incl. CGIAR, HLPE of CFS, Science and research entities in food-system related UN agencies, etc)
- Think tanks
- Science associations (incl. associations related to soil science, agronomy, food technology, agricultural economics, etc. International Advisory Council on Global Bioeconomy (IACGB) Inter-American institute for Cooperation on Agriculture (IICA),
- Others (Incl. Private sector research institutions, civil society organizations, Indigenous peoples / traditional knowledge carriers, etc.)

A tabulated presentation is presented in Annex 1c.

We acknowledge the InterAcademy Partnership that further consideration be given to options for strengthening the science-policy interface⁸, and in particular we suggest that an exploration be undertaken for options for an **inclusive global Science-Policy Interface**, serving a sustainable food system and evidence-based follow up to the Summit⁹. This exploration can draw on experiences with comparable national and international science processes, e.g. the IPCC Science Policy Interface model or the IPBES, and related considerations about an “IPFood” as discussed in various fora, such as InterAcademy Partnership (IAP) and the Science Days of the Scientific Group with FAO in 2021.

3. Pathways for broadly engaging networks of the science and knowledge communities

Science systems in many countries are weak, and particular attention will need to be paid to **strengthening local research capacities** as well as improving data, methods, models and tools. Modalities for expanding research collaboration among public and private research and indigenous systems will need to be explored along with modalities for building or sharing research infrastructure¹⁰. Beyond investing in capacities to undertake research, it will be important to also invest in the capacities of policymakers and practitioners to demand, use, and act upon research.

Networking between national and regional and global science bodies will be critical for this task. The current level of such networking capacities is deficient. Investing in that capacity at national levels will be of tremendous benefit for many countries’ efforts to build their evidence-based priority setting tools and mechanisms, considering synergies and trade-offs of actions and implementation. This would help to achieve two goals:

- 1) **raise the engagement** of science and knowledge communities at national, regional and global levels for food systems transformation in the 5 action areas as identified by the UN SG in his UNFSS statement
- 2) **connect national science and knowledge communities with regional and global communities** in order to address also the above-mentioned international public goods issues that are critical for food systems functioning.

To fully tap the potentials of science, **funding mechanisms**¹¹ for the science ecosystems of support at national, regional and global levels should be developed. The public funding of food systems science in particular needs to expand, and we reiterate our **call for governments to allocate at least 1% of their food systems-related GDP to food systems science and**

⁸ Letter from InterAcademy Partnership Co-Presidents to UN Secretary General, November 4 2021 (https://www.interacademies.org/sites/default/files/2021-11/Letter%20to%20Secretary%20General%20of%20the%20UN_final.pdf)

⁹ Fears, Robin; Canales, Claudia: The Role of Science, Technology and Innovation for Transforming Food Systems Globally: *Food Systems Summit Brief Prepared by Research Partners of the Scientific Group for the Food Systems Summit April 2021*: <https://doi.org/10.48565/scfss2021-q703>

¹⁰ FAO. 2021. *The White/Wiphala Paper on Indigenous Peoples’ food systems*. Rome. <https://doi.org/10.4060/cb4932en>

¹¹ Díaz-Bonilla, Eugenio: *Financing SGD2 and Ending Hunger: Food Systems Summit Brief Prepared by Research Partners of the Scientific Group for the Food Systems Summit*. doi.org/10.48565/scfss2021-ba75

innovation. Private sector science also has important new opportunities to scale up its engagement, particularly in partnership with the public sector, to address public goods in food systems innovations. There must be room to develop innovative finance approaches to not only support science at scale but to contribute to an overall sustainable financing of the food systems transformation

4. Concluding Remarks

The Scientific Group for the UN FSS completes its mandate by the end of 2021. Thereafter the Hub will handle any follow-up tasks with mechanisms to be defined. Consideration may be given to holding a series of consultations, under the auspices of the Hub, with and among the science and knowledge institutions mentioned above with regard to fostering science-policy interfaces at national, regional, and global levels to develop effective science-policy interfaces.

Consideration may also be given to **continuing with Science Days for follow up.** It will be important to continue to include diverse food systems related science and knowledge communities at the country, regional and global levels in science discourses informing the evidence base for implementation of actions to achieve the FSS goals. Science Days should remain in the format of the independent science community partnering with FAO, which has shown its value in the Food Systems Summit processes. This format may be considered for future follow up activities to the UNFSS 2021, possibly before the assessment that the UN Secretary General envisages in two years.

Science has an important role to play in the appropriate and effective implementation of the action agenda of the UNFSS at national, regional, and global levels, and it is important to continue to invest in undertaking and using science and knowledge at all these levels.

Annex 1a: National Level Framework for Identification of Science Ecosystem of Support (with some indications for 3 country examples)

Category of Science Stakeholder						
Country	Universities (Related institutes)	Academies of Sciences	Agricultural, Forestry, Water, Land and Climate Science Research Institutions	Health and Nutrition Research Institutions	Indigenous & Traditional Knowledge carriers	Other (Corporate & Start-up Research & Innovation Groups, Think-tanks, Private Research Organizations)
Northern Africa						
Sub-Saharan Africa						
KENYA	Jomo Kenyatta University of Agriculture and Technology (JKUAT) College of Agriculture & Natural Resources (COANRE) - School of Agriculture and Environmental Sciences (SOAES) - School of Food and Nutrition Sciences (SOFNUS) - School of Natural Resources and Animal Sciences (SONRAS)	Kenya National Academy of Sciences (KNAS)	Kenya Agricultural and Livestock Research Organization (KALRO)	Kenya medical research institute (KEMRI)		East Africa Research Fund (EARF)

	<p>University of Nairobi College of Agriculture and Veterinary Sciences - Faculty of Agriculture - The Wangari Maathai Institute for Peace and Environmental Studies - African Drylands Institute for Sustainability - Center for Agriculture Networking Information Sharing</p>		<p>Kenya Water Institute (KEWI)</p>	<p>Ministry of Health - Food Security and Emergency Nutrition - The Nutrition in Agriculture</p>	<p>Intergovernmental Committee on Intellectual Property, Genetic Resources, Traditional Knowledge and Folklore (IGC)</p>	<p>The Kenyan Route to Food Initiative (RTFI)</p>
	<p>Jaramogi Oginga Odinga University for Science and Technology- School of Agricultural and Food Sciences- Africa Center of Excellence in Sustainable Use of Insects as Food and Feeds (INSEFOODS)</p>		<p>Kenya Forestry Research Institute (KEFRI)</p>	<p>Africa College of Social Work - Diploma in Nutrition and Dietetics Management - Diploma in Poverty, Relief and Sustainable Development</p>		<p>Research Hub Africa</p>

	<p>Gretsa University School of Hospitality and Tourism Management - Diploma in Food Production - Diploma in Food and Beverage Management - Diploma in Food Security and Livelihoods School of Business - Diploma in Agricultural Enterprise and Project Management</p>		<p>Water Research and Resource Center (Jomo Kenyatta University of Agriculture and Technology)</p>	<p>Gretsa University School of Health Science (Certificate in Nutrition and Dietetics)</p>		<p>Innovation Platforms: - Sorghum Value-Chain Development Consortium (SVCDC) - Electronic Regional Agricultural Information and Learning Systems 2 (eRAILS2) - Busia IPTA - Bungoma IPTA - Mumias IPTA - Ugunja IPTA - Kirinyaga - Maragua - Embu - Karurumo - Kathonzwani - Kilifi</p>
KENYA	<p>Egerton University</p>		<p>World Agroforestry (ICRAF) - headquartered in Nairobi 1. The World Agroforestry Centre (ICRAF) 2. The International Centre of Insect Physiology and Ecology (ICIPE) 3. International Livestock Research Institution (ILRI) 4. Regional Centre for Mapping of Resources for Development</p>			<p>Africa College of Social Work - Diploma in Food Security and Livelihoods</p>
	<p>Kenyatta University</p>		<p><u>Kenya Marine and Fisheries Research Institute</u></p>			<p>Cefored Institute of Relief and Development details - Diploma in Food Security and Livelihoods</p>

	Moi University		<u>Tegemeo Institute of Agricultural Policy and Development</u>			Africa Institute for Capacity Development; Academic Model Providing Access to Healthcare (AMPATH); Mpala Research Centre
						African Economic Research Consortium (AERC); Kenya Institute for Public Policy Research and Analysis (KIPPRA); Institute of Economic Affairs (IEA); Centre for Research and Technology Development (RESTECH) Centre; African Technology Policy Studies Network (ATPS); Rift Valley Institute

<p>Ghana</p>	<p>University of Ghana College of Basic and Applied Sciences</p> <p>School of Agriculture - Livestock and Poultry Research Centre (LIPREC), Legon - Soil and Irrigation Research Centre (SIREC),Kpong - Forest and Horticultural Crops Research Centre (FOHCREC), Kade - West Africa Centre for Crop Improvement - Center for Climate Change and Sustainability Studies (C3SS)</p>	<p>Council for Scientific and Industrial Research - Animal Research Institute (ARI); - Crops Research Institute (CRI); - Country Dossier Ghana - Forestry Research Institute of Ghana; - Food Research Institute (FRI); - Oil Palm Research Institute; - Plant Genetic Resources Research Institute; - Savanna Agricultural Research Institute (SARI); - Soil Research Institute (SRI).</p>	<p>Forestry Research Institute of Ghana Ghanastry Research Institute of Ghana</p>	<p>University of Ghana: - The Nutrition Research and Training Centre - Micronutrient Research Laboratory at the University of Ghana - The Food Safety and Nutrition Centre - Sensory Evaluation Laboratory (Dairy Technology Centre - Food Microbiology Research Laboratory (Dairy Technology Centre)</p>	<p>Food Systems Caravan West Africa (Ghana)</p>	<p>Climate Innovation Centre (Ghana)</p>
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	<p>University of Development Studies Faculty of Agriculture, Food and Consumer Studies</p> <ul style="list-style-type: none"> - Department of Agriculture and Food Economics - Department of Agriculture Innovation Communication - Department of Food Science and Technology - Department of Food Security and Climate Change <p>Faculty of Natural Resources and Environment-</p> <ul style="list-style-type: none"> Department of Environment and Sustainability Sciences - Department of Forestry and Forest Resources Management - West African Centre for Water, Irrigation and Sustainable Agriculture (WACWISA) 	<p>Ghana Academy of Arts and Sciences (website NA)</p>	<p>Water Research Institute (WRI) Ghana</p>	<p>Food & Drugs Board</p>		
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	University of Cape Coast School of Agriculture - Department of Agricultural Economics and Extension - Department of Agricultural Engineering - Department of Animal Science - Department of Crop Science - Department of Soil Science		University of Ghana: - Center for Climate Change and Sustainability Studies(C3SS)	Africa Health Research Organization Ghana (website NA)		
			Water Resources Commission of Ghana			
Latin America and the Caribbean						
Northern America						
Central Asia						
Eastern Asia						
South-eastern Asia						
Southern Asia						

Pakistan	<p>University of Agriculture Faisalabad (UAF)</p> <ul style="list-style-type: none"> - Department of Plant Breeding and Genetics -US Pakistan Center for Advanced Studies in Agriculture and Food Security -Faculty of Agricultural Engineering and Technology -National Institute of Food Science and Technology -Faculty of Food Nutrition and Home Sciences -Department of Irrigation and Drainage -Water Management Research Center 	<p>Pakistan Society of Development Economics (PSDE)</p>	<p>National Agricultural Research Center (NARC)</p> <ul style="list-style-type: none"> -Agricultural Engineering Institute (AEI) -Agricultural Economics Research Institute (AERI) -Agriculture Poly Technique Institute (API) -Animal Sciences Institute (ASI) -Bio Resources Conservation Institute (BCI) -Crop Diseases Research Institute (CDRI) -Crop Sciences Institute (CSI) -Food Science Research Institute (FSRI) -Horticultural Research Institute (HRI) -Honeybee Research Institute (HBRI) -Institute of Plant & Environmental Protection (IPEP) -Institute of Microbial Culture Collection of Pakistan (IMCCP) -Land Resources Research Institute (LRRI) -National Institute of Genomics & Advance Biotechnology (NIGAB) -Rangeland Research Institute (RRI) 	<p>National Institute of Health, Islamabad</p> <ul style="list-style-type: none"> - Public Health Laboratories Division (PHLD) - Biological Production Division - Field Epidemiology & Disease Surveillance Division - Nutrition Division 	<p>Patent Support Programme-HEC, Pakistan</p>	<p>National Incubation Center, Pakistan</p>
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	<p>PMAS Arid Agriculture University, Rawalpindi -Dept. of Land and Water Conservation Engineering -Dept. of Farm Machinery and Precision Engineering -Institute of Food and Nutrition Sciences</p>		<p>Nuclear Institute for Agriculture and Biology, Punjab</p>		<p>Intellectual Property Office Pakistan</p>	<p>Business Incubation Center in Public Center Universities-Initiative of Higher Education Commission Pakistan</p>
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	<p>Bahauddin Zakariya University, Multan -Department of Agricultural Engineering -Department of Food Nutrition and Sciences -Dept. of Agriculture Sciences and Technology</p>		<p>Ayub Agriculture Research Institute -Agricultural Biotechnology Research Institute, Faisalabad Agronomic Research Institute, Faisalabad Agricultural Economics Section, Faisalabad -Arid Zone Research Institute, Bhakkar -Barani Agricultural Research Institute, Chakwal-Citrus Research Institute, Sargodha-Cotton Research Institute, Multan-Horticultural Research Institute, Faisalabad-Maize & Millets Research Institute, Yusafwala, Sahiwal-Mango Research Institute, Multan-Oilseeds Research Institute, Faisalabad-Plant Pathology Research Institute, Faisalabad-Post Harvest Research Centre, Faisalabad-Potato Research Institute, Sahiwal-Pulses Research Institute, Faisalabad</p>			<p>Pakistan Institute of Development Economics (PIDE)</p>
	<p>Sindh Agriculture University, Tandojam -Faculty of Agricultural Engineering - Faculty of crop sciences -Institute of Food Science and Technology</p>		<p>National Agricultural Research Center (NARC) - Climate, Energy & Water Research Institute (CEWRI)</p>			<p>Sustainable Development Policy Institute (SDPI)</p>

	Khawaja Farid University of Engineering and Information Technology -Dept. of Agricultural Engineering and Technology, -Dept. of Food Sciences and Technology		Pakistan Council of Research in Water Resources (PCRWR)			Planning Commission of Pakistan
	Lasbela University of Agriculture, Water and Marine Sciences -Faculty of Agriculture -Department of Water Resources Management		Punjab Forestry Research Institute Gatwala, Faisalabad Forestry, Wildlife and Fisheries Department			
	University of Agriculture, Peshawar		Pakistan Agricultural Research Center (PARC), Islamabad - PARC Institute of Advanced Studies in Agriculture -Water Resources Research Institute, PARC			
Pakistan	Comsats University -Center for Climate Research and Development		US Pakistan Center for Advanced Studies in Water, Mehran University			
	-Center of Excellence in Water Resources Engineering, UET-Lahore,		On Farm Water Management, Punjab Agriculture Department			
Central Asia						

Western Asia						
Europe						
Oceania						

Annex 1b: Regional Level Framework for Identification of Science Ecosystem of Support

Region	Regional Academies of Sciences Regional Research & Innovation Institutions Regional Think-Tanks Regional Science bodies and Forums Regional Private Research Organizations
Northern Africa	
Sub-Saharan Africa	
Latin America and the Caribbean	
Northern America	
Central Asia	
Eastern Asia	
South-eastern Asia	
Southern Asia	
Western Asia	
Europe	
Oceania	

Annex 1c: Global Level Framework for Identification of Science Ecosystem of Support

	Global Academies of Sciences	Food, Agricultural, Health and Food Systems Related Research Institutes	Think-tanks & Policy Advisory Institutes	Science Associations	Others (Private sector research institutes, Civil Society, Traditional Knowledge Carriers, etc)
	Inter-Academy Partnership (IAP)	CGIAR	World Resource Institute (WRI)	International Advisory Council on Bioeconomy	Global Alliance for Improved Nutrition (GAIN)
		CFS-HLPE	Chatham House		
		Science in Food and Agricultural Organization of the UN (FAO)	Center for Development Research (ZEF)	Inter-American institute for Cooperation on Agriculture (IICA)	
		Science in World Health Organization (WHO)	Global Panel on Food, Agriculture for Nutrition		
		Research unit in UNICEF			
		Global Crop Trust			

Papers like this one from the Scientific Group for the UN Food Systems Summit are shared with the aim of providing information and facilitating discussion for transparent and evidence-based Summit preparations. This paper was revised by the author after inputs and comments from the Scientific Group. It remains under the responsibility of the author.
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