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Summary of the Expert Meeting on Agriculture and Food: 2-5 June 2026

Agrifood systems are at the center of climate change and food security challenges. Global progress toward ending hunger is off track, with more than 600 million people worldwide experiencing hunger. Climate change is increasingly affecting food production, livelihoods, ecosystems, and nutrition. At the same time, agrifood systems are a significant source of greenhouse gas (GHG) emissions, and addressing climate change would not be possible without significantly reduced food system emissions. Addressing these interconnected challenges requires integrated solutions that simultaneously strengthen food security, build resilience, and reduce emissions.

It is in this context that experts gathered to consider the latest science on agriculture and food systems under climate change, in order to provide targeted scientific and technical inputs to support the Intergovernmental Panel on Climate Change (IPCC) Seventh Assessment Report (AR7). The meeting examined the latest scientific evidence on climate change and agrifood systems, with a particular focus on: risks and impacts; interactions across mitigation, adaptation, and loss and damage; synergies and solutions; and implementation pathways.

A key theme throughout the meeting was the need to move beyond sectoral approaches and adopt an agrifood systems perspective. Participants stressed that climate responses must consider the entire food value chain, from production and processing to consumption and food loss and waste. Discussions also emphasized the complex interconnections between climate change, food security, biodiversity, health, equity, livelihoods, land use, water resources, and sustainable development.

Participants highlighted that climate risks are increasingly shaped by compounding and cascading impacts that affect multiple sectors and populations simultaneously. Experts also identified important knowledge gaps relating to climate data, local and Indigenous Peoples' knowledge systems, nutrition security, food safety, migration, adaptation effectiveness, and aquaculture emissions.

The meeting underscored that there can be no long-term food security without widespread and systemic adaptation to climate change. Participants emphasized the need to move beyond simply identifying adaptation options and focus also on adaptation effectiveness, residual risks, adaptation limits, and the cost of inaction. They stressed the importance of tailoring adaptation measures to local contexts, strengthening links between production systems and markets, and addressing fragmentation across sectors and policies. An important message related to the context-specific nature of solutions and the need to provide a synthesis of conditions under which specific solutions are more likely to perform well.

On mitigation, participants highlighted new scientific evidence relating to opportunities across agrifood systems, including sustainable intensification, improved nutrient management, methane reduction, agroforestry, agroecological

In This Issue

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approaches,restoration of degraded lands, reductions in food loss and waste, and dietary change. However, they cautioned that mitigation measures must be assessed in terms of their broader impacts on livelihoods, food security, biodiversity, and equity.

Experts also considered the enabling conditions for the needed transformation and successful implementation, including the role of governance, institutions, and finance. Discussions highlighted challenges related to fragmented governance, weak policy coherence, limited institutional capacity, and inadequate access to finance. Experts called for stronger coordination across sectors and governance levels, greater recognition of autonomous adaptation that is already being undertaken by communities, and innovative financing mechanisms that support locally led action.

Across the four days of the meeting, experts highlighted the importance of robust scientific evidence to support policy and decision makers in choosing the best solutions to address the complex issues surrounding agrifood systems and climate change.

The Expert Meeting on Agriculture and Food took place from 2-5 June 2026 in Rome, Italy. Jointly sponsored by the Food and Agriculture Organization of the UN (FAO) and the IPCC, the meeting was attended by over 100 multidisciplinary experts from around the world.

Brief History

In 2017, FAO and the IPCC co-sponsored an Expert Meeting on Climate Change, Land Use and Food Security in Rome, Italy. The meeting brought together scientists, economists, and policy experts to examine the interactions between climate change, land use, food security, adaptation, and mitigation, and helped inform the scoping of the IPCC Special Report on Climate Change and Land, which was adopted in 2019.

The IPCC Sixth Assessment Report (AR6) cycle, completed in 2023, also addressed the importance of agriculture and food systems. Across the three IPCC Working Group reports, AR6 highlighted agrifood systems as both contributors to climate change and critical components of adaptation, mitigation, and climate-resilient development pathways. The seventh assessment cycle commenced in 2023 and Working Groups I, II and III will address, in their reports, issues related to agriculture and food systems. This FAO-IPCC Expert Meeting on Agriculture and Food is designed to support the AR7 process.

Report of the FAO-IPCC Expert Meeting on Agriculture and Food

Welcome and Opening Session

On Tuesday morning, 2 June, Martial Bernoux, Co-Chair, Expert Meeting on Agriculture and Food Scientific Steering Committee, and Team Leader, Office of Climate Change, Biodiversity and Environment, FAO, welcomed participants, thanking the IPCC and FAO for co-sponsoring the expert meeting.

Kaveh Zahedi, Assistant-Director General and Director of the Office of Climate Change, Biodiversity and Environment, FAO, stressed the importance of agriculture and food systems to AR7.

Kaveh Zahedi, Assistant-Director General and Director, Office of Climate Change, Biodiversity and Environment, FAO

Noting the cross-cutting nature of agrifood systems, he called for stronger integration across scientific disciplines to better inform climate policy and action.

Jim Skea, IPCC Chair, in a pre-recorded message, outlined the strong record of collaboration between the IPCC and FAO, including for the IPCC Special Report on Climate Change and Land. He highlighted that this meeting is taking place at a critical stage of the seventh assessment cycle, with IPCC Working Groups II and III developing dedicated chapters on agriculture and food.

Sabine Miltner, Program Director, Gordon and Betty Moore Foundation, in a video message, underlined that while markets can be powerful agents of change, regulatory systems need to reinforce such change. She expressed hope that this meeting would contribute to evidence-based policy making and better investment decisions.

Bernoux highlighted the actual impacts of climate change on agrifood systems and its duality, noting agrifood systems contribute to the emissions that need to be tackled. Lamenting that millions still face hunger and that this number is increasing, he stressed that adaptation actions can reduce climate risks and often generate mitigation and development co-benefits.

Mark Howden, Emeritus Professor, Australian National University, Co-Chair, Expert Meeting on Agriculture and Food

Martial Bernoux, Co-Chair, Expert Meeting on Agriculture and Food Scientific Steering Committee, and Team Leader, Office of Climate Change, Biodiversity and Environment, FAO

Scientific Steering Committee, and Vice-Chair, IPCC Working Group II, shared the main objectives of the meeting, including: providing policy-relevant inputs for AR7; reviewing the latest evidence on climate change adaptation and mitigation and their interactions in agrifood systems; identifying key knowledge gaps and research priorities to inform future assessments and scientific collaboration; and exploring climate solutions across food systems and synergies.

Session 1: Scene Setting

On Tuesday, 2 June, Session Co-Chairs Aïda Diongue-Niang, Vice-Chair, IPCC Working Group I, and Carlos Eduardo Cerri, Director, Center for Tropical Agriculture Carbon Studies, University of São Paulo, highlighted the objectives of the session, including establishing the global scientific context, identifying key knowledge gaps, and enhancing the interconnection and inclusivity across the Working Groups and the Task Force on National Greenhouse Gas Inventories.

Jean-François Soussana, Emeritus Research Director, French National Research Institute for Agriculture, Food and Environment, highlighted the complementarity of the IPCC Working Groups, noted gaps in how agrifood systems are being addressed across the seventh assessment cycle, and pointed to integration as essential but challenging. He characterized this meeting as an opportunity to connect external knowledge and strengthen the AR7's cross-chapter framing on agrifood systems.

Marta Rivera Ferre, Research Professor, Spanish National Research Council, highlighted key scientific and conceptual gaps that should be addressed during the seventh assessment cycle. She argued that assessments should move beyond sector-specific approaches and adopt more integrated food systems perspectives that better capture interactions between climate change, adaptation, mitigation, biodiversity, health, water, poverty, and equity. She emphasized the need to better incorporate Indigenous and local communities' knowledge systems, account for justice and equity in modelling approaches, and improve the understanding of synergies, trade-offs, and compounding risks. Stressing that agriculture and food systems are not homogeneous, she also called for greater attention to the values underpinning food systems, including differing views of food as a commodity, a common good, or a human right. Eleanor Milne, Affiliate Scientist, Colorado State University, and Climate Change Mitigation Specialist, FAO, presented highlights from the FAO 2025 working paper titled Update on Scientific Findings on the Interactions between Agriculture, Food Systems and Climate Change. Underscoring the importance of food systems approaches, including agroecology, nexus thinking, and telecoupling, she emphasized the need to assess climate impacts and responses across the entire food chain. Milne discussed growing evidence on mitigation and adaptation opportunities, including soil carbon management, methane reduction, agroforestry, aquaculture innovations, remote sensing, and artificial intelligence, while also identifying persistent governance, finance, and research gaps. She underscored the significant role agrifood systems can play in achieving climate mitigation, adaptation, and sustainable development objectives.

Marta Rivera Ferre, Research Professor, Spanish National Research Council

Eleanor Milne, Affiliate Scientist, Colorado State University, and Climate Change Mitigation Specialist, FAO

In the ensuing discussion, some participants remarked on the complexity of the interactions between agrifood systems and climate change. One participant opined that outputs of this meeting should be less complex, to enable better policy uptake. Panelists responded that a key message for policymakers could lie in the need for whole-of-government approaches to break silos when dealing with intertwined problems, with one calling for "educating policymakers in complexity."

The group discussed the need to examine solutions for resilient food systems at local scales, the role of vested interests, how to redirect powerful actors towards prioritizing food security, and new paradigms for food systems. One participant highlighted the role of microorganisms and food safety, noting climate-resilient food systems also need to be safe, and proposed including this in AR7.

In concluding remarks, Co-Chair Diongue-Niang noted the need to address food systems in all IPCC Working Group reports and the importance of broadening the evidence base for AR7 by drawing on the FAO working paper and relevant assessments by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), as well as by improving data collection in regions where climate risks are high.

The dais during the session on risk profiles and vulnerability hotspots

Session 2: Risk Profiles and Vulnerability Hotspots

This session was co-chaired, on Tuesday, by Cromwel Lukorito, Senior Lecturer, Department of Earth and Climate Sciences, University of Nairobi, and Vice-Chair, IPCC Working Group II, and Jan Fuglestvedt, Research Director and Special Advisor, Center for International Climate Research, and Vice-Chair, IPCC Working Group III. It focused on assessing spatial and sectoral distribution of climate risks and identifying vulnerability hotspots and exposed populations.

Benjamin Sultan, French National Research Institute for Sustainable Development, delivered a keynote presentation on risk profiles and vulnerability hotspots, noting how complex risk profiles are, as they involve different exposure and vulnerability levels, as well as compounding and cascading risks. He pointed out main knowledge gaps, including:

- disproportionate concentration of international research and subsidies on global trade commodities;
- climate data gaps;
- the yield-centric paradigm; and
- the persistent under-representation of local knowledge.

In the subsequent discussion, one participant highlighted the need to acknowledge that the Global North also faces high risk and high vulnerability, in order to encourage continued action in this region. She noted, for example, that due to technological advancements in the Global North, the focus is increasingly on high value crops but these have higher water needs and, therefore, vulnerability is not being reduced.

One participant highlighted the need for analysis of aridity, and another underscored the importance of ecosystems, noting, for instance, that AR6 considered the role of forests and trees in providing cooling benefits.

Other knowledge gaps were identified, including on:

- impacts of geological hazards on vulnerability and risks, such as the impact of tsunamis on adaptation;
- changes in food systems vulnerability following climate-induced migration; and
- climate action as a vulnerability risk, such as afforestation that deprives Indigenous Peoples of their land.

Session 3: Climate Impact Implications for Agrifood Commodities and Value Chains

On Tuesday, 2 June, Session Co-Chairs Prajal Pradhan, Associate Professor, University of Groningen, and Uday Bhaskar Nidumolu, Principal Research Scientist, Commonwealth Scientific and Industrial Research Organization, Australia, outlined the session's objectives comprising: assessing climate change impacts across key agrifood commodities and production systems; exploring implications for food value chains, livelihoods, and resilience; and identifying emerging evidence and regional differences across sectors.

In a keynote presentation, Marta Alfaro, New Zealand Institute for Bioeconomy Science Limited, highlighted the complexity of agrifood chains and provided specific examples of climate impacts and drivers in agrifood systems. She summarized findings from existing research, including the role of technology for reducing vulnerability, variation in vulnerability of different food chains, the impacts of climate change on dairy systems, offsetting and insetting as drivers to induce change in food chains, and diets as drivers of food chain changes.

On knowledge gaps, she pointed to effects on nutrition security, impacts on food safety, effects on post-production activities, and regional considerations. Emphasizing the interrelated character of food, environment, and climate change, she concluded that research plays a key role in supporting decision-making.

In subsequent comments, participants noted the importance of additional nutritional indicators, with one pointing at the global nutrient conversion table for FAO supply utilization accounts.

Following the keynote presentation, participants then gathered in four breakout sessions on: livestock and pastoral systems; fisheries and aquaculture; crops and horticulture systems; and forests and multifunctional landscapes.

Livestock and Pastoral Systems: This breakout session was chaired by Carlos Gomez, Professor, Universidad Nacional Agraria La Molina. Key messages included: bridging science, policy, and practice in livestock systems; mitigation must go hand-in-hand with adaptation and vulnerability reduction; the need for strong measurement, reporting, and verification systems; and simpler and clearer policies.

A view of the room during the breakout session on livestock and pastoral systems

Other highlights during the discussions included that: livestock systems face multiple interacting risks, such as heat stress, water scarcity, and conflicts; these combined pressures are leading to declining productivity, higher mortality and disease, and loss of resilience, especially in pastoral and smallholder systems; and not all systems are impacted at the same level, drawing attention to the risk of maladaptation.

On synergies and trade-offs, participants detailed, among others: the limited field-based evidence and the need for living laboratories; the insufficiency of technical solutions requiring social acceptance; and the need to monitor real impacts across systems.

Regarding solutions and implementation pathways, participants stressed: the importance of co-creation with farmers and context-specific approaches, public investment, and strengthening data systems, and global accounting frameworks; and knowledge gaps, including insufficient system-level data and differentiated evidence, as well as system complexity, local knowledge, and the integration of policy needs.

The group recommended: integrating livestock into national climate and development policies with dedicated financing; promoting system-based, context-specific solutions co-developed with communities; and strengthening communication for evidence-based policy.

Fisheries and Aquaculture: Chaired by Fernanda Garcia Sampaio, Researcher, Office of International Relations, Brazilian Agricultural Research Corporation, participants discussed climate risks, adaptation options, knowledge gaps, and policy priorities for fisheries and aquaculture. They highlighted the need to distinguish between inland and marine fisheries, noting inland fisheries are relatively low-emission food systems that require continued investment to avoid replacement by more emissions-intensive alternatives. Participants identified climate-related shifts in species migration, sea-level rise, extreme weather events, and impacts on Indigenous Peoples and coastal communities as key risks.

Discussions on synergies and trade-offs emphasized the climate benefits of sustainable fisheries and aquatic foods, while also noting potential tensions between conservation measures, livelihoods, and competing uses of the blue economy, such as tourism, energy, and aquaculture.

On solutions and implementation pathways, participants stressed the need for improved data on fish stocks, as well as greater support for nature-based solutions (NbS) and stronger evidence on their effectiveness. Significant knowledge gaps were identified regarding aquaculture emissions, particularly the lack of consistent global data and understanding of key emission drivers.

Participants recommended strengthening long-term monitoring systems, investing in research and data collection, providing technical support to producers, and ensuring fisheries and aquaculture receive dedicated attention within AR7 rather than being treated solely as cross-cutting issues.

Key messages from the breakout group included:

- aquatic food systems should be treated as a core food-system issue in AR7, not as a marginal add-on;
- climate risks to aquatic food systems are multi-hazard, interconnected, and unevenly distributed;
- adaptation in fisheries and aquaculture is not only a technical matter; and
- aquatic foods are central to the low-emission, nutrition-sensitive food system transformation.

Crops and Horticulture Systems: Chair Saddam Hussain, Associate Professor, University of Agriculture Faisalabad, opened this breakout session, noting climate change is driving a triple crisis of degraded resources, lower food production, and poorer nutrition. He highlighted opportunities in crop improvement, yield-gap reduction, climate-resilient practices, and new technologies.

In the ensuing discussions, participants shared regional and national challenges and successes, and discussed, among others, how climate change affects food security and nutrition, what indicators could be useful to tackle multi-stress situations, and the interlinkage between crop diversification and food security.

Key messages and recommendations included the importance of: breeding and targeting multiple-stress indicators; focusing on a variety of crops and on the entire value chain; focusing on regional evidence; and considering national contexts and farmers' specific needs.

Forests and Multifunctional Landscapes: Chaired by Amy Duchelle, Senior Forestry Officer, FAO, this breakout session

Fernanda Garcia Sampaio, Researcher, Office of International Relations, Brazilian Agricultural Research Corporation

Makiko Taguchi, Agricultural Officer, FAO, and **Saddam Hussain**, Associate Professor, University of Agriculture Faisalabad, and Chair of the breakout session addressing crops and horticulture systems

focused on key messages on climate impacts and vulnerability, policy-relevant insights, and key knowledge gaps.

On key messages and insights, participants highlighted:

- overreliance on forests for climate mitigation and adaptation;
- the importance of including Indigenous Peoples' and forest-dependent communities' knowledge, with several urging serious engagement with their values and not just copying specific practices;
- the need to understand forests as multifunctional landscapes beyond mitigation and adaptation aspects; and
- expanding to synergies and trade-offs for livelihoods and broader sustainable development issues.

On knowledge gaps, participants noted the need for: additional research on the impacts of climate change on carbon stocks; additional data at local scales for better early warning signals; improved understanding of species migration in a warming climate, and cascading effects and telecoupling of food loss and waste reduction on forests; and species vulnerability to micro-climate changes.

Plenary Session – Reporting Back and Discussion: Participants then reconvened in plenary to hear reports back from the breakout groups, followed by a general discussion.

Participants highlighted gaps and concerns including:

- marginal and degraded lands are often proposed for mitigation and adaptation, but many are already used by pastoralists and other communities, and so local land users should be consulted before interventions are introduced;
- many of the solutions discussed are already known and so there is a need to focus not only on scientific evidence but also on implementation and policy action;
- interactions between different GHGs should be taken into consideration, for instance, measures to reduce carbon dioxide may increase methane emissions;
- monitoring and evaluating adaptation measures will improve understanding of what works and under what conditions;
- food systems are often dependent on fossil fuels, including for production, fertilizers, transportation, processing, and distribution, and there is a need to consider this for both emissions and resilience;
- that there are situations where adaptation may no longer be possible, particularly for small island developing states, pastoralist communities, and other highly vulnerable groups, and this scenario must also be considered; and
- multinational corporations play an important role and corporate incentives and governance structures are needed to ensure business decisions align with societal and environmental objectives.

Session 4: Mitigation – Adaptation

On Wednesday, 3 June, Session Chair Lisa Emberson, Professor, University of York, outlined the session's objectives to: examine the latest scientific evidence on mitigation, adaptation, and loss and damage in agrifood systems; explore integrated pathways to strengthen resilience, reduce emissions, and support sustainable development; and identify opportunities, limitations, synergies, and trade-offs.

Siyabusa Mkuhlani, Associate Scientist-Data Science, International Institute of Tropical Agriculture, recalled that climate change affects all sectors of the food chain, including production, processing, storage, distribution, consumption, and nutrition. He listed some options for mitigation, such as sustainable intensification, livestock efficiency, forest and land protection, reducing food loss and waste, dietary shifts, and low-carbon supply chains, to reduce the agrifoods climate footprint.

Regarding adaptation and how to build resilient agrifood systems, Mkuhlani highlighted the importance of policy and finance, and the need to re-examine adaptation from different perspectives. He recommended focusing on small farmers, especially on financial aspects and cost-efficiency issues, remembering that there is no one-size-fits-all solution and that it should be context-specific. After sharing some successful case studies in different countries, he concluded by listing some enablers that make agrifood systems transformation possible, including: financing; policy; science, including leveraging artificial intelligence, data exchanges, and partnerships between organizations such as the IPCC and FAO; and the key element of equity and justice, noting the need to respect local cultures and values.

Barbara Amon, Associate Professor, University of Zielona Góra, Poland, presented mitigation options in agrifood systems. She outlined challenges in agrifood systems beyond GHG emissions, such as antibiotic use and resistance, air pollution, and nitrate leaching. She called for broadening the role of agriculture

Participants listen to the reports from the breakout groups

Barbara Amon, Associate Professor, University of Zielona Góra, Poland

beyond the production of food, feed and biomaterials, toward multifunctional roles, including livelihood and rural development, biodiversity, and spiritual and cultural values.

On an integrated approach for sustainable food systems, Amon highlighted a combination of actions, including dietary changes in parts of the world where there is overconsumption, improvements to water and nutrient management, and avoidance of cropland expansion. Outlining a vision of the future of agriculture systems, she stressed "partnering with nature" and closing nutrient cycles. She provided specific examples of emission sources in agriculture, forestry and other land use and options for mitigation, including through livestock feeding techniques, manure management, and the help of digital technologies. In closing, Amon highlighted the importance of stakeholder interaction and policy support, calling for international cooperation.

Following the presentations, participants gathered in two parallel sessions, one on mitigation, and the other on adaptation, and loss and damage.

Mitigation in Agrifood Systems: Chaired by Lisa Emberson discussions were held in a world café format along three topics: agricultural GHG emissions and mitigation pathways; methane reduction in livestock and rice systems; and soil carbon, land management, and sequestration. Participants were invited to take into account technology, efficiency improvements, and mitigation co-benefits, as well as metrics and reporting and feasibility improvements as cross-cutting themes.

Participants proposed strengthening the focus on demand side measures, barriers to mitigation options, telecoupling, aquatic food production, and nitrogen and other emissions.

Following discussions in small groups, participants reported key messages on, *inter alia,* the need to:

- move beyond agriculture to the broader notion of agrifood systems;
- integrate mitigation and adaptation to encompass the full spectrum of agrifood systems;
- incorporate adaptation drivers beyond cost to enable technology adoption, especially for small-scale farmers;
- utilize existing resources to improve production while acknowledging the need for major transformation;
- address government and market incentives, including carbon prices and monitoring; and
- close literature and knowledge gaps, particularly in integrated assessment models and agroecology.

Adaptation/Loss and Damage: Systemic Implications and Solutions for Livelihoods and Development Pathways: Chaired by Siyabusa Mkuhlani, discussions in this breakout group were organized around three themes: livelihoods, vulnerability and adaptation limits; food systems and rural development pathways; and transformational solutions and future development pathways.

On livelihoods, vulnerability, and adaptation limits, participants emphasized the need to focus more on the effectiveness of adaptation measures and to tailor adaptation options to the specific needs and circumstances of affected communities. They also stressed the importance of considering the costs of inaction, compounding risks, and the combined effectiveness of adaptation measures. Rather than assessing adaptation options individually, they suggested evaluating how different measures can work together to enhance resilience.

On agrifood systems and rural development pathways, participants noted that adaptation efforts often remain fragmented across agrifood systems. They highlighted disconnections between production systems and markets, between rural and urban communities, and among different policy areas. Participants suggested that AR7 should place greater emphasis on understanding and addressing these linkages.

Discussions also highlighted the need to complement global indicators with local and regional indicators that better reflect specific contexts and vulnerabilities. Participants noted that rural communities that adopt adaptation practices may not benefit from them if market access and economic returns are not sufficient, while urban populations can also be vulnerable through dependence on imported food supplies. They identified greater policy coherence and stronger integration of adaptation considerations across sectors, as important priorities.

On transformational solutions and future development pathways, participants discussed potential response options, such as renewable fertilizers, agroforestry, diversified crops and livestock systems, dietary shifts, and more efficient water use. They emphasized that while many promising examples exist, a lot of the evidence is local and context-specific, and that this could create a challenge for inclusion in the AR7.

Lisa Emberson, Professor, University of York

Siyabusa Mkuhlani, Associate Scientist, International Institute of Tropical Agriculture

Plenary Session – Reporting Back and Discussion: Participants then reconvened in the plenary to hear reports back from the breakout groups, followed by a general discussion.

Participants discussed enabling conditions for the solutions identified, noting short-term policy making often outweighs long-term considerations, and pointed to a lack of research on how to incentivize solutions. Participants also highlighted the need to better capture social and cultural aspects leading to successful adaptation measures and take into account the cascading nature and transboundary aspects of risks.

Session 5: Interactions Across Mitigation, Adaptation, and Loss and Damage

On Wednesday, 3 June, Session Co-Chairs Andrea Schievano, University of Milan and Soulfood Forestfarms, Milan, Italy, and Yasna Rojas, Bureau Member, IPCC Task Force on National Greenhouse Gas Inventories, and Researcher at Instituto Forestal, Chile, introduced the session objectives to: explore interactions, synergies, and trade-offs across mitigation, adaptation, and loss and damage; strengthen integrated approaches for climate-resilient agrifood systems; and support cross-Working Group framing for AR7.

In a keynote, Alvin Chandra, Senior Climate Specialist, Asian Development Bank, and Lead Author, IPCC AR7 Responses to Losses and Damages, presented on interactions across mitigation, adaptation, and loss and damage. He highlighted the importance of integrating the three areas to address escalating climate risks, outlining how mitigation ambition shapes outcomes, and how losses and damages have gained relevance since AR6. Outlining factors distinguishing adaptation and losses and damages, such as reversibility, tolerability, and avoidability of impacts, he provided examples of limits to adaptation from Pacific Island nations. He called for value-based approaches and noted that mitigation, adaptation, and loss and damage are often addressed separately.

In the ensuing discussion, participants discussed overlaps of loss and damage with disaster response, inequity dimensions, and how adaptation and loss and damage relate.

Following the keynote, participants gathered in four breakout sessions on: strategic priorities and planning for mitigation and adaptation actions; loss and damage and limits to adaptation and implications for mitigation pathways; trade-offs and sustainability constraints; and metrics, evidence and cross-working group framing issues.

Strategic Priorities and Planning for Mitigation and Adaptation Actions: Chaired by Emre Alp, Associate Professor, Middle East Technical University, discussions focused on strategic priorities for implementing mitigation and adaptation actions across agrifood systems.

Participants noted that many existing challenges arise from unsustainable land-use practices, rather than climate change alone. They acknowledged that climate change provides additional urgency and may require additional measures but highlighted that many best practices would need to be implemented even in the absence of climate change.

One participant stressed that implementation challenges often arise from fragmented governance structures and weak institutional coordination. They called for stronger local-level governance and improved climate communication to improve coherence across policies and programmes.

Participants emphasized the value of cross-sectoral approaches, noting agriculture, land use, fisheries, water management, and biodiversity are closely interconnected. Some participants also called for a reassessment of existing agroecological zones in light of changing climatic conditions.

Participants discussed the role of, and challenges faced by, smallholder farmers. One highlighted that they tend to be risk averse and maintain familiar practices unless supportive policies, incentives, and institutional support are made available.

Participants further identified the imbalance between mitigation and adaptation knowledge and assessment frameworks, highlighting the lack of indicators to assess adaptation progress. One participant noted recent efforts under the UNFCCC process to develop adaptation indicators. Discussions also highlighted the importance of considering marginalized groups and power dynamics in policy processes to ensure vulnerable communities are not excluded from decision-making and implementation.

Alvin Chandra, Senior Climate Specialist, Asian Development Bank, and Lead Author, IPCC AR7 Responses to Losses and Damages

Sandro Federici, Head of Science, Technical Support Unit, IPCC Task Force on National GHG Inventories, and **Emre Alp**, Associate Professor, Middle East Technical University, and Chair of the breakout session on strategic priorities and planning for mitigation and adaptation actions

Ana Felicien, Technical Fellow, Ministry of Development and Social Assistance, Family and Fight Against Hunger, Brazil

A view of the room during the breakout session on trade-offs and sustainability constraints

The role of finance and investment was also highlighted, with participants noting the role of investors and financial institutions that support agriculture and agrifood systems.

Loss and Damage and Limits to Adaptation and Implications for Mitigation Pathways: Chaired by Ana Felicien, Technical Fellow, Ministry of Development and Social Assistance, Family and Fight Against Hunger, Brazil, this group's discussions focused on: characteristics of agrifood systems shaping loss and damage and adaptation limits; existing knowledge and gaps about losses and damages in agrifood systems; assessment options for non-economic losses; and governance, finance, and policy approaches simultaneously supporting mitigation, adaptation, and reduced loss and damage.

Participants identified relevant key messages, including the severity of adaptation limits in current agrifood systems, particularly low-lying island states, and the relationship between loss and damage and both extreme events and slow onset processes.

On knowledge gaps, participants noted a lack of knowledge about non-economic dimensions of losses and damages, cascading effects, risk multipliers, and response options to slow-onset processes. On policy recommendations, participants highlighted the need to maximize adaptation responses and for transformational adaptation, the lack of finance instruments working across agrifood systems, and the need for comprehensive risk management.

Trade-offs and Sustainability Constraints: Chair Yoshihide Wada, Professor, King Abdullah University of Science and Technology, opened the breakout session. Participants identified knowledge gaps and urged AR7 to better address the under-represented Sustainable Development Goals (SDGs), such as those on gender and health. Key trade-offs discussed included: fertilizers and inputs (yields versus emissions), breeding (short-term yield versus long-term resilience), livestock and cattle (herd size and sociocultural value versus emissions), overall productivity (higher emissions intensity in low-income countries), and the challenge of passing emission reduction costs to customers.

Participants emphasized that solutions must be tailored to context, noting trlow-income countries face unique challenges in closing productivity gaps while adopting low-carbon technologies. They emphasized the need to integrate local communities and technical knowledge into mitigation strategies, citing examples from Brazil, Nepal, and the Congo Basin, especially on carbon market misuses and non-native reforestation efforts. They highlighted the importance of co-benefits for local livelihoods and agreed that mitigation solutions should be combined with relevant technological information for producers and tailored to specific contexts. They suggested that the IPCC could provide guidance and principles for addressing trade-offs, rather than focusing on solutions.

Metrics, Evidence and Cross-Working Group Framing Issues: Discussions in this breakout group were chaired by Tania Guillen Bolanos, Researcher, Climate Service Center Germany. Participants highlighted key messages, including the need to: move beyond a two-dimensional view of mitigation versus adaptation metrics; connect different spatial scales; and utilize qualitative approaches besides quantitative ones.

On knowledge gaps, participants noted the incorporation of values, identities, and Indigenous Peoples and local communities' knowledges into metrics, integration of adaptation and mitigation scenarios at implementation-level granularity, and aggregation of information across different scales. On policy recommendations, they called for including transboundary and cascading risks in metrics and indicators and developing indicators describing the agrifoods system.

Plenary Session – Reporting Back and Discussion: Following the reports back from the breakout sessions, participants discussed the challenges and opportunities in agricultural adaptation and transformation. Key points included the need to: differentiate policy approaches for small-scale and commercial farmers; develop robust metrics for transformative adaptation; and integrate mitigation and adaptation strategies across sectors through aligned policies. One participant recommended producing more integrated reports to reduce fragmentation.

Participants also emphasized reframing transformation narratives, building an evidence base to prevent polarization, and addressing knowledge gaps at both farm and policy levels. The absence of large agribusiness actors was noted, given their influence on global markets and farmer decisions. Participants raised concerns about financing and highlighted the importance of incorporating adaptation solutions into development programmes. Some also stressed that solutions should be developed and implemented by local communities within their specific contexts.

Session 6: Agrifood Systems Perspectives – Identifying Synergies and Co-benefits Across Agrifood Systems

On Thursday, 4 June, Session Co-Chairs Joana Portugal-Pereira, Professor, Federal University of Rio de Janeiro and University of Lisbon, and Tek Sapkota, Principal Scientist/ Climate Change Lead, International Maize and Wheat Improvement Center, explained that the objective of this session was to identify opportunities, limitations, synergies, and trade-offs across climate actions in agrifood systems.

In a keynote presentation, Rachel Bezner Kerr, Professor, Cornell University, examined synergies and trade-offs between adaptation and mitigation in agrifood systems. She highlighted findings from AR6 showing that many food system responses simultaneously contribute to adaptation, mitigation, and broader development objectives, while also emphasizing the importance of considering equity, justice, and other social dimensions when evaluating climate responses. Bezner Kerr also reviewed findings from the recent IPBES Nexus Assessment, which examined interactions between biodiversity, food, water, health, and climate change.

Turning to recent scientific literature, Bezner Kerr presented examples of response options that demonstrate potential adaptation-mitigation synergies, including:

- biochar, which may improve soil fertility, water retention, microbial activity, and carbon storage while supporting adaptation and mitigation objectives;
- agroforestry, which can enhance livestock health, increase crop and livestock productivity, improve soil health, diversify incomes, and sequester carbon;
- community-based mangrove restoration, which can enhance biodiversity, strengthen livelihoods and food security, improve resilience to storms and flooding, and contribute to emission reductions;
- social protection programmes, such as cash transfers and public works schemes, which may support adaptation and mitigation objectives; and
- public procurement of diverse local and regional foods, including school feeding programmes, which may support nutrition, strengthen local food systems, and improve incomes for smallholders.

Bezner Kerr cautioned that evidence supporting claims of synergies and co-benefits remains uneven, and that greater scrutiny of the robustness of available evidence is needed. For each response option she discussed from the recent literature, Bezner Kerr also identified potential shortcomings and the need for careful design.

In the subsequent discussion, participants underscored the need to integrate the co-benefits of climate action, particularly around nutrition, health, and well-being, noting the need to adopt a people-centered approach. Some highlighted the need to adopt the One Health framework that encompasses human, plant, animal, ecosystem, soil, and water health, drawing on existing literature and referencing the Global Soil Partnership, hosted by FAO, and the Intergovernmental Technical Panel on Soil, which advises the Partnership, as key knowledge sources. Several called for the integration of natural resources, including land, soil, water, and biodiversity, into agrifood systems approaches to climate action, recognizing these as foundational elements for both adaptation and mitigation strategies.

On how the synergies and trade-offs of climate action in agri-food systems are distributed unevenly across actors, regions, and value chains, participants emphasized the need to identify who bears the burdens and who captures the benefits. They stressed that climate actions in agrifood systems often disproportionately burden marginalized communities, including Indigenous Peoples and small-scale farmers, while benefits accrue to larger actors. The case of reducing meat consumption was cited as an example of polarizing messaging that overlooks the livelihoods of pastoral communities.

On the implementation of context-specific strategies that turn trade-offs into opportunities, participants emphasized: the importance of prioritizing subsidies to sustainable food systems

Joana Portugal-Pereira, Professor, Federal University of Rio de Janeiro and University of Lisbon

Rachel Bezner Kerr, Professor, Cornell University

rather than unsustainable ones; integrating equity and justice lenses; the differences between accessibility and implementation capacity across actors; and reframing trade-offs as opportunities, citing agrivoltaics as an example of moving beyond binary choices between food and energy security.

Session 7: Enabling Environment and Governance and Co-benefits Across Agrifood Systems

On Thursday, 4 June, Session Co-Chairs Shinichiro Fujimori, Professor, Kyoto University, and Helen Onyeaka, Associate Professor, University of Birmingham, outlined the session's objectives to: examine policy, finance, and institutional conditions required to enable effective climate action in agrifood systems; identify governance arrangements and enabling mechanisms that support implementation across sectors and scales; and explore opportunities to strengthen policy coherence, investment, and institutional capacity. They highlighted expected outcomes, including the identification of enabling policy, governance, and financing conditions for agrifood systems transformation.

In a keynote, Claudia Ringler, Director, Agrifood Innovation and Resilience, International Food Policy Research Institute, presented a framework for climate action based on knowledge, motivation, and agency. She highlighted declining investments in knowledge generation for climate action in agrifood systems and the impacts of wars on agrifood systems. On motivation, she provided examples of external and internal factors, including regulation and economic incentives, highlighting recent climate litigation cases and carbon credits as relevant external factors, and noting a lack of literature on case studies on internal factors.

On agency, she emphasized constraints through existing power relations and highlighted key elements to improve agency in agrifood systems, including addressing inequality, better access to information and technology, and healthy foods. On application of the framework, she highlighted the identification of key actors with their existing knowledge, motivations, and agency.

Participants underscored: that climate litigation cases could provide relevant examples for AR7; difficulties in mobilizing funding; and the centrality of property rights as an enabling factor for climate action.

Following the keynote presentations, participants gathered in four breakout sessions, on: integrating agrifood systems into national climate policies; finance, investment, and economic feasibility; governance, institutions, and policy coherence; and food systems approaches across the Rio Conventions.

Integrating Agrifood Systems into National Climate Policies: Chair Andreea C. Nowak, Research Team Lead for Climate Action, Alliance of Bioversity International and CIAT, highlighted the growing interest in a nexus approach to climate policy, which seeks to address the interconnections between food systems, climate change, biodiversity, and sustainable development.

Participants emphasized that agrifood systems are increasingly reflected in climate strategies, but that integration across adaptation, mitigation, biodiversity, and food security objectives remains limited. Some participants provided examples of such integration, including Brazil's "ABC+ Plan" for adaptation and low-carbon development and China's national adaptation strategy, which includes adaptation measures for the agriculture sector. Some participants also highlighted that implementation challenges often remain significant even when integrated policies exist on paper.

Participants further highlighted that policy design is heavily influenced by national priorities and policy integration and therefore needs to be understood within specific political, economic, and social contexts. They highlighted the importance of institutional arrangements and governance structures, with effective integration requiring strong coordination across ministries, sectors, and governance levels.

Questions were also raised regarding existing emissions accounting frameworks. One participant gave an example of biofuel use, where emission reductions are attributed to the transport sector while the emissions associated with feedstock production are attributed to agriculture. Some suggested that a systems approach would require greater attention to lifecycle impacts and the distribution of costs and benefits across sectors.

Participants further noted that ambitious policies cannot be translated into practice without adequate and predictable financial support. Some highlighted the importance of recognizing autonomous adaptation already being undertaken by farmers and local communities and stressed that, in these cases, what is required is the removal of policy barriers and the creation of enabling conditions that support locally-driven adaptation efforts.

Claudia Ringler, Director, Agrifood Innovation and Resilience, International Food Policy Research Institute

A view of the room during the breakout session on integrating agrifood systems into national climate policies

Antoine Ducastel, Climate Finance Specialist, FAO, and **Viliamu Iese**, Senior Lecturer, University of Melbourne

A view of the room during the breakout session on governance, institutions and policy coherence

Finance, Investment and Economic Feasibility: Chair Viliamu Iese, Senior Lecturer, University of Melbourne, focused on solutions to enable effective financing for climate action in agrifood systems. Participants highlighted the significant funding gap and underscored challenges related to the availability, accessibility, timeliness, and equity dimensions of climate finance, with particular concern for the most vulnerable countries and communities, and the lack of continuity in policies, government staff, and projects.

Participants exchanged views on innovative financing mechanisms, noting effective implementation and quality of climate finance are key. One cited the Tropical Forest Forever Facility, launched in Brazil at UNFCCC COP 30, as a positive example of blended finance that combines public loans with private capital through bonds, while directing at least 30% of payments directly to Indigenous Peoples and local communities. Participants stressed that access to climate finance remains disproportionately difficult for African countries and other vulnerable regions, calling for decentralization of funds, capacity building at the local level, and better integration of climate finance. They also pointed out that intangible benefits, such as water efficiency, often lack market prices and therefore attract less private investment.

Participants listed various solutions, including repurposing subsidies from fossil fuels toward agroecology, building capacity for effective local participation and co-construction, simplifying access mechanisms, and developing indicators to assess the costs, benefits, and risks of inaction to attract private funding.

Governance, Institutions and Policy Coherence: Chair Shreya Some, Postdoctoral Researcher, Technical University of Denmark, presented existing evidence from AR6, including findings on inclusive governance, siloed institutions, and multi-level polycentric governance. She invited participants to provide their views on advances in the literature post-AR6.

Participants discussed emerging key scientific findings on overcoming institutional silos and policy coherence, evaluating and building institutional capacity, operationalizing property rights and Indigenous Peoples' and local communities' knowledge, and governing supply-demand interfaces to build social trust.

Discussions focused on the relevance of literature from disaster risk reduction and management, with participants outlining cross-institutional dialogue in the context of disaster responses, finance mechanisms for emergency responses, and decentralization and agency in disaster management. One participant highlighted how the food systems approach supports bridging institutional silos, noting governmental pushback to the concept is rooted in concerns over prescriptiveness, particularly in relation to meat consumption.

Food Systems Approaches Across the Rio Conventions: Discussions during this breakout group, which was chaired by Maria Vincenza Chiriacò, Senior Researcher, Centro Euro-Mediterraneo sui Cambiamenti Climatici, focused on how food systems approaches can support the objectives of the UNFCCC, the Convention on Biological Diversity, and the UN Convention to Combat Desertification, while contributing to food security and sustainable development.

One key message was that sustainable and resilient agrifood solutions are climate, biodiversity, and land solutions. Some participants called for climate scenarios to pay attention to the expansion of aridity, noting that while drought is widely recognized and assessed, expansion of dryland areas and increasing aridity need to be better assessed.

Participants further emphasized that strengthening synergies among the three Rio Conventions should remain a priority, such as by harmonizing the metrics and indicators used by them.

Participants also identified some knowledge gaps that require further attention, including:

- lack of comprehensive collaboration across the scientific bodies that support the Rio Conventions;
- lack of clear communication about the concepts of agrifood systems and food security; and
- the need to document existing methodologies and case studies of successful examples of synergies.

Plenary Session – Reporting Back and Discussion: Following the reports back from the breakout sessions, participants engaged in a general discussion. They emphasized the importance of assessing not only the availability of adaptation finance but also the effectiveness of adaptation measures.

Several noted that evaluations often focus on financial inputs and expenditures, with insufficient attention to whether adaptation interventions actually reduce vulnerability and strengthen resilience.

Participants discussed additional factors needed to create enabling environments for adaptation and mitigation, highlighting: the role of markets and value chains in supporting the uptake and scaling of climate-resilient practices; and the importance of partnerships and coordination. They noted that many of the barriers identified during the meeting cut across sectors and institutions.

The discussion also considered how AR7 could contribute to discussions on climate finance, with one suggesting that in addition to having a dedicated finance chapter, finance could also be addressed across multiple AR7 chapters in order to reflect its relevance to mitigation, adaptation, and loss and damage, among others. One participant highlighted the potential of increasing national and local ownership of climate finance, and of empowering local communities and encouraging investment by local financiers.

Session 8: Scalable and Sustainable Solutions for Low-emission, Climate-adapted and Resilient Agrifood Systems

On Thursday, 4 June, Session Co-Chairs Beata Madari, Researcher, Brazilian Agricultural Research Corporation, and Hanqin Tian, Director and Professor, Center for Earth System Science and Global Sustainability, Boston College, introduced the session's aims to: identify practical and scalable solutions supporting simultaneous adaptation and mitigation objectives; explore technological innovation and ecosystem-based approaches; and examine pathways for scaling implementation while overcoming adoption barriers.

Lini Wollenberg, Alliance of Bioversity International and CIAT, and Gund Institute, University of Vermont, highlighted advances in scientific understanding since AR6, such as gains in implementation experience, digital transformation, and expansion of institutions and financial mechanisms, while recognizing ongoing challenges such as geopolitical uncertainty and increasingly extreme events. She noted that credible co-benefits exist for established practices, such as agroforestry, crop diversification, soil nutrient management, and solar irrigation and agrivoltaics, but cautioned that solutions need to be tested and implemented at scale.

Wollenberg underscored that most synergy claims are based on evidence for either mitigation or adaptation alone, while studies rarely measure both outcomes simultaneously. She identified critical knowledge gaps for adaptation and mitigation solutions, including those related to: integrated system and frontier technology development and testing; measurement of adaptation and mitigation impacts; policy and institutional implementation design factors and impacts; and regional evidence asymmetries. She emphasized the need to move from the "science of possibility" toward the "science of practice."

Following this keynote, participants gathered in four breakout sessions, on: climate-smart production systems; landscape and ecosystem-based solutions; innovation and technological solutions; and innovation in policy and governance and enhancement in capacity.

Climate-smart Production Systems: Introducing this session, Chair Laure Tall, Executive Director, Initiative Prospective Agricole et Rurale, emphasized that the objective was to move beyond compiling lists of climate-smart agricultural practices and instead focus on their policy relevance and scalability.

Participants highlighted the importance of starting with local needs and challenges rather than promoting individual technologies in isolation. Some participants suggested that climate-smart agriculture should focus on strengthening resilience, maintaining productivity, and ensuring food security, while mitigation should be treated as an important co-benefit. Discussions highlighted the need to evaluate proposed interventions from the perspective of farmers, considering costs, benefits, labor requirements, and impacts on livelihoods.

Participants identified climate-smart systems with great potential, including:

- nutrient management, particularly nitrogen management;
- using appropriate fertilizer application rates, supported by soil testing and farmer education;
- adaptation-mitigation synergies through diversified and mixed land-use systems;

Lini Wollenberg, Alliance of Bioversity International and CIAT, and Gund Institute, University of Vermont

A view of the room during the breakout session on climate-smart production systems

- restoration of degraded pastoral lands; and
- Indigenous and traditional agricultural practices, including mulching, reduced tillage, and other forms of sustainable agricultural intensification.

One participant highlighted land tenure insecurity as a major barrier, with farmers being reluctant to invest in long-term improvements when they lack secure ownership or access rights. Participants further stressed the importance of supporting climate-smart intensification rather than simply promoting climate-smart practices. Climate services, including seasonal forecasts and advisory services, were identified as important tools for helping farmers make informed decisions about seeds, inputs, and investments.

Participants further highlighted that scaling climate-smart production systems will require restructuring market structures, including public procurement policies, incentives for sustainable production, and measures to discourage unsustainable practices. Finally, participants highlighted the importance of farmer-to-farmer learning, such as farmer climate clubs and "pioneer farmers," as well as feedback mechanisms.

Landscape and Ecosystem-based Solutions: Chaired by Buddhi Marambe, Senior Professor, University of Peradeniya, Sri Lanka, this session focused on new trends and emerging evidence since AR6 on addressing climate change through NbS and sustainable land management.

Participants highlighted the need to understand agroforestry systems as social-ecological systems, and for a more integrative perspective that accounts for social context. Concerns were raised around maladaptation risks, the role of Indigenous Peoples and local communities, especially in relation to land demarcation and carbon markets in Brazil, and the shifting paradigm requiring producers to deliver ecosystem services beyond agricultural products, while facing market constraints. Key messages underscored that changing ecosystems are entering a "new world," warning policymakers against the illusion that restoration can offset destruction, and the importance of recognizing ecosystems as connection points.

Participants raised the issue of ecosystem synergies and trade-offs, such as reintroducing livestock into the agricultural system. They identified knowledge gaps around soil functions and resilience, and the lack of data on the effectiveness of NbS and ecosystem-based solutions in addressing extreme events. Regarding solutions and implementation pathways, they emphasized integration, enabling governance environments, and cross-sectoral dialogue.

Innovation and Technological Solutions: Chair Hui Ju, Climate Change Lab, Institute of Environment and Sustainable Development in Agriculture, Chinese Academy of Agricultural Sciences, proposed topics for discussion, comprising frontier disruptive and innovation technologies, sustainable production methods, value chain and consumer side technologies, and policy-finance market enabling environments for innovation.

Participants discussed the potential of artificial intelligence for agricultural innovation, such as through seasonal forecasting, and shared knowledge on potential innovations, including: personal air-conditioning devices for workers to address heat stress; stratospheric atmospheric injections and its implications for food productivity; solar radiation management; vaccines; new feed additives; hydroponics; and yeast-based farming methods. Participants highlighted the availability of traditional approaches, including rainwater harvesting and opportunity crops that could be scaled up, and the need for making solutions available for agriculture-depended communities.

One participant called for a stronger focus on social innovations and for a critical perspective on technologies, noting their potential unintended consequences. Another pointed to the tensions between technologies for disruptive change and broad synergies, stating that highly effective disruptive technologies tailored to a specific problem potentially lack synergetic effects for other areas.

Innovation in Policy and Governance and Enhancement in Capacity: This breakout group was chaired by Shouro Dasgupta, Environmental Economist, Fondazione Centro Euro-Mediterraneo sui Cambiamenti Climatici. Participants identified key messages, including that:

- climate risks to food security are increasingly transboundary;
- adaptation plans lack funding and implementation; and

Thorunn Wolfram Petursdottir, Head, Global Soil Partnership, FAO, and **Buddhi Marambe**, Senior Professor, University of Peradeniya, Sri Lanka

A view of the room during the breakout session addressing innovation and technological solutions

- transferring ownership of planning tools to local contexts is beneficial.

On implementation pathways, participants highlighted the need for innovative financing mechanisms, called for increased focus on the demand side, such as dietary shifts, and underscored the role of multi-level governance approaches in closing implementation gaps.

Plenary Session – Reporting Back and Discussion: Following reports back from the breakout groups, participants engaged in a brief discussion. Participants pointed at increasing disparities between the Global North and South caused by access to technologies and data bias of artificial intelligence applications. One participant highlighted the barriers land rights pose to implementation in some cases. Another called for considering all sustainability dimensions when assessing solutions for future agrifood systems.

Session 9: Science-policy Interface and Decision Support

On Friday, 5 June, Session Co-Chairs Carol Franco Billini, Ecological Economist, Virginia Polytechnic University, and Noureddine Yassaa, Professor, University of Science and Technology Houari Boumediene, Algiers, and Vice-Chair, IPCC Working Group III, opened the session, noting the challenge of ensuring knowledge is useful, trustworthy, and accessible for decision making.

Sayed Azam-Ali, Chairperson of the High Level Panel of Experts on Food Security and Nutrition (HLPE-FSN), in his keynote presentation, explained why the actual food systems are so fragile and why looking at them through a scientific lens is important. He provided examples of how to develop antifragile food systems. Explaining that they are based on four crops feeding over 60% of the world's population and livestock, he stressed they are also unsustainable, vulnerable, and unhealthy. He called for "anti-fragile" food systems that go beyond the current model and is not just resilient.

Azam-Ali highlighted the need for an effective science-policy interface to develop anti-fragile food systems, which should focus on, among others, clarifying uncertainties, identifying trade-offs, building shared understanding for collective action, and ensuring independence, inclusivity, and transparency. Assessments need to be globally relevant but regionally sensitive, accessible to specialists and non-specialists, and action-oriented, he underscored. He mentioned the importance of the current work of the IPCC, the Committee on World Food Security, and the HLPE-FSN and their reports, and gave the example of the Bambara groundnut, which is climate-resilient, nutritious, and delivers desirable products for people. He said it could be used for diversification, and highlighted global knowledge systems for opportunity crops, such as CropBASE, SelectCROP, and the World Food Map.

Azam-Ali concluded by saying the future for anti-fragile food systems should be: radical, going beyond mainstream crops and challenging existing power structures; responsive, addressing interconnected crises quickly and supporting implementation at the local level; and collaborative among institutions and disciplines, with policies for implementation.

The ensuing discussion focused on the provision of actionable and timely knowledge to decision makers, approaches for improving accessibility and communication of climate information, key research gaps, the inclusion of diverse knowledge systems, and a reflection of different national circumstances and capacities.

Participants discussed how policy change and consumer behavior interact for changing diets, with one calling for the inclusion of behavioral science research and another highlighting the importance of investments for consumer awareness.

The group discussed path dependence on four main crops and options for diversification, including through changing the yield paradigm towards including nutrition and accessibility considerations, and the use of underutilized crops.

On research methods, participants highlighted the tension between the timely provision of knowledge for policymaking and data collection timelines, the importance of data availability and interoperability for connecting knowledge, challenges for including Indigenous Knowledge in AR7, and the use of artificial intelligence. One participant urged recognition of Indigenous Peoples' rights, values, and food sovereignty.

Sayed Azam-Ali, HLPE-FSN Chairperson

The dais during the session discussing the science-policy interface and decision support

Closing Session

On Friday afternoon, 5 June, Session Co-Chairs Martial Bernoux and Mark Howden opened the final session of the meeting. Andy Reisinger, Independent Consultant, presented a synthesis of discussions and the way forward, highlighting:

- the narrowing window for effective climate action, with current emissions trajectories suggesting that even the most ambitious pathways now exceed warming of 1.5°C;
- the non-optionality of action, highlighting there can be no long-term food security without widespread and systemic adaptation to climate change, and without keeping warming to well below 2°C and ideally to 1.5°C;
- the need to move beyond agriculture alone towards an agrifood systems approach;
- the importance of governance, institutions, and finance as critical priorities for future research and policy development; and
- the contextual nature of solutions and the need for a synthesis of conditions under which specific solutions are more likely to perform well.

Reisinger also provided some reflections on climate overshoot pathways. He noted that returning to 1.5°C after overshoot would leave the world more vulnerable and damaged than if there was no overshoot at all. However, he explained that a return to 1.5°C would reduce many risks and avoid further losses compared to a world that remains permanently above 1.5°C. Noting this area is under-studied, he asked if there is evidence of what damages in agrifood systems could be avoided if warming is brought back to 1.5°C after an overshoot and what agrifood systems could contribute to achieving this.

In closing, Reisinger identified several entry points for future work, namely: improving how complexity, interactions, and contingencies are communicated; documenting examples of successful action and early wins; understanding the lead times associated with climate interventions; and recognizing that if action is not taken, the outcome will be escalating losses and damages.

In the ensuing discussions, participants considered, among others:

- feasibility of the 1.5°C target and the likelihood of overshoot, stressing the importance of timing and the irreversibility of certain climate impacts;
- risks associated with the concept of scaling-up and its failure to account for power imbalances and marginalized groups, suggesting instead referring to "scaling-out;"
- the gap in mitigation models regarding food systems and land-based carbon sequestration; and
- the critically low levels of finance allocated to loss and damage.

Co-Chair Mark Howden subsequently recalled the objectives of the meeting, emphasizing the aim of providing targeted scientific and technical inputs to AR7, with a particular focus on integration and actionability, before presenting the planned AR7 products and their timeline.

Jan Sigurd Fuglestvedt, Vice-Chair, IPCC Working Group III, outlined opportunities for engagement with the IPCC process during the seventh assessment cycle, pointing to products planned and currently under production. He described IPCC report production procedures, highlighting the expert review phase for the first order drafts coming up later in 2026 for the three IPCC Working Group reports and encouraging participants to engage. He noted that literature cut-off dates for inclusion in AR7 are pending a final decision on AR7 publication dates.

On the way forward, Co-Chair Martial Bernoux noted an outcome report of the Expert Meeting will be prepared, comprising key messages and synthesizing discussions, with participants getting the opportunity for review and comments. He proposed the publication of FAO-led policy briefs, and a special issue in an academic journal with contributions from participants as additional outputs. He said a knowledge repository of relevant material for AR7 will be organized and invited participants to contribute input and engage in the IPCC review process.

One participant voiced concern about the reports delivered from breakout group discussions, noting the difficulty of reflecting the diversity of views and saying reports did not always reflect joint recommendations.

In closing remarks, Charles Spillane, Chief Scientist, FAO, thanked participants for their engagement in the expert meeting,

Andy Reisinger, Independent Consultant

Jan Sigurd Fuglestvedt, Vice-Chair, IPCC Working Group III

Bart van den Hurk, Co-Chair, IPCC Working Group II, delivers closing remarks remotely

noting the presented evidence "does not leave room for comfort." He underscored the interrelated character of decarbonizing food systems and ensuring food security, stating that progress toward SDG 2 on zero hunger is "not just off track, but going in reverse." Lauding the IPCC's role in placing the climate emergency on the international agenda, he said AR7 poses the opportunity to integrate agri-food systems across Working Groups and break down silos. He encouraged participants to carry forward the momentum following the week's discussions and expressed gratitude to the organizers.

Bart van den Hurk, Co-Chair, IPCC Working Group II, appearing via video, reflected on the productive collaboration between FAO and the IPCC throughout the co-sponsored Expert Meeting. He stressed that science alone is not a primary driver of action and called for shifting toward a more active role for scientific assessment—one that not only identifies risks but also points to solutions, identifies key actors, and clarifies their respective responsibilities. He emphasized the importance of embracing an integrated, inclusive approach to assessment, including broadening the diversity of authors and contributors in future reports.

Van den Hurk underscored the inevitability of trade-offs in climate-related decision-making, framing these as value-laden choices rather than purely technical questions. He cautioned against the tendency to delay action in pursuit of perfect solutions, arguing instead for making uncertainty and complexity manageable rather than eliminating them.

Co-Chairs Bernoux and Howden expressed their appreciation to FAO, the IPCC, and all participants, and closed the meeting at 1:10pm.

Upcoming Meetings

64th Sessions of the UNFCCC Subsidiary Bodies: The 64th sessions of the UNFCCC Subsidiary Body for Implementation (SBI) and Subsidiary Body for Scientific and Technological Advice (SBSTA) will consider a range of issues in preparation for the UN Climate Change Conference (COP 31) in Turkey in November 2026. **dates:** 8–18 June 2026 **location:** Bonn, Germany **www:** unfccc.int/sb64

London Climate Action Week: This event aims to demonstrate the whole-of-society engagement needed to deliver decarbonization and resilience as well as to encourage other global cities to host similar climate action weeks. **dates:** 20–28 June 2026 **location:** London, United Kingdom **www:** londonclimateactionweek.org/

UNCCD COP 17: COP 17 to the UN Convention to Combat Desertification (UNCCD COP17) will discuss the interconnected challenges of desertification, land degradation, and drought. **dates:** 17-28 August 2026 **location:** Ulaanbaatar, Mongolia **www:** www.unccd.int/events/governing-bodies-meetings/unccd-cop17

Regional Climate Week: Climate weeks provide a structured yet flexible space for dialogue, capacity building, and showcasing innovative solutions to support the intergovernmental process and urgent, inclusive, and coordinated climate action. **dates:** 7–11 September 2026 **location:** Baku, Azerbaijan **www:** unfccc.int/topics/climate-weeks

28th Session of the FAO Committee on Forestry (COFO): COFO guides FAO forest-related work and fosters international collaboration, policy dialogue, and technical guidance on forest-related issues. **dates:** 28 September – 2 October 2026 **location:** Rome, Italy **www**: fao.org/forestry/committee-on-forestry/en

IPCC-65: The 65th session of the IPCC will consider budget and the timeline for the contribution of the three Working Groups to AR7, among other issues. **dates:** 12–15 October 2026 (TBC) **location:** Addis Ababa, Ethiopia **www:** ipcc.ch

Türkiye/Australia Climate Change Conference: Türkiye will host COP 31 in Antalya, with Australia designated as the "President of Negotiations." **dates:** 9–20 November 2026 **location:** Antalya, Türkiye **www:** unfccc.int/cop31

For additional upcoming events, see: sdg.iisd.org/

Glossary

AR6	IPCC Sixth Assessment Report
AR7	IPCC Seventh Assessment Report
FAO	Food and Agriculture Organization of the UN
GHG	Greenhouse gas
IPBES	Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services
IPCC	Intergovernmental Panel on Climate Change
NbS	Nature-based solutions
SDGs	Sustainable Development Goals
UNFCCC	United Nations Framework Convention on Climate Change