13th Meeting of Agricultural Chief Scientists (MACS)

Chair Summary and Outcome Document

1. Under the presidency of Brazil's G20, we held the 13th Meeting of G20 Agricultural Chief Scientists (G20-MACS) on May 15-17, 2024, in the city of Brasília, Brazil. G20 members and guest countries were present to discuss research and innovation priorities in agriculture, agroforestry, aquaculture and other forms of food production and to reinforce research cooperation among countries to reduce malnutrition, hunger, to improve food security and nutrition and address the consequences of climate change and biodiversity loss, its impacts, and opportunities for climate change adaptation and mitigation.

2. We emphasize that global climate change challenges such as extreme weather events, water scarcity, desertification, rising sea levels, ocean warming, health emergencies and hunger, all of which recognize no borders, require active international cooperation in science, technology, innovation, training and capacity building, investment environments and public policies and sharing of sustainable practices. Thus, we believe that promoting responses to climate emergencies must be an immediate global effort.

3. We also recognize that addressing inequalities within and between regions as well as socioeconomic disparities in food security and nutrition, are critical to eradicate hunger and reduce malnutrition for all.

4. We recognize the interdependence between climate change, water security, ecosystems, biodiversity, bioeconomies, food security and nutrition. We jointly stress the need to foster scientific and technological development that harnesses traditional knowledge, science and evidence-based practices. These can conserve and promote the sustainable use of ecosystems and natural resources, decrease greenhouse gas emissions, increase climate resilience and contribute to eradicating hunger and promoting food security and nutrition, through practical application and scaling up of these developments and practices across countries.

5. We recognize the critical role of protecting, conserving and restoring water systems and water-related ecosystems in delivering climate change adaptation benefits and mitigation co-benefits, while ensuring social, economic, technological and environmental safeguards.

6. We also recognize the crucial role of soil as a foundation of agriculture, food systems and home for a large part of Earth’s biodiversity. We acknowledge the

nexus between soil, water, organisms and climate and the need to safeguard soil health for biodiversity and sustainable food production for current and future generations.

7. We recognize the urgent need to support the development and the implementation of adaptation measures to maintain or enhance productivity with particular attention to populations that are particularly vulnerable to the adverse effects of climate change. We therefore encourage agriculture research institutions in the G20 countries and beyond to work as knowledge partners in support of the knowledge pillar of the Global Alliance against Poverty and Hunger to fight against hunger and poverty and ensure food security and nutrition in the national implementation of policies and programs geared at increasing the resilience to climate change.

8. We note the vulnerability of agriculture and food systems to the adverse impacts of climate change and biodiversity loss and highlight the need for new and innovative approaches to improve our preparedness and to promote diversification and disaster risk management in sustainable food production systems.

9. The One Health approach, which brings sectors together to co-develop mutually beneficial solutions can be useful for addressing complex, multisectoral challenges. Antimicrobial resistance and zoonotic diseases are important examples where sharing scientific understanding of animal, plant, human and environmental health can lead to positive outcomes through the One Health approach.

10. Conserving and improving the sustainable use of genetic resources as well as breeding of new crop varieties and livestock breeds resistant to biotic and abiotic stresses will continue to be critical to address climate, biodiversity and food security challenges. We recognize the potential for new breeding innovations to improve environmental outcomes and food systems resilience. We support research to assess the opportunities and any potential risks of these technologies and we emphasize the need to work together on research to allow science and evidence based approaches that make best use of genetic diversity.

11. We highlight the fact that each agriculture and food production system has its own challenges and that solutions must be context-specific, outcomes focused, science and evidence based and take into account each country’s production conditions. We recall that investment in science, sustainable and broadly accessible technologies, as well as sustainable intensification, regenerative and agroecological approaches are critical to build capacities for adaptation and mitigation in agriculture, aquaculture and an important driver for meeting the 2030 Agenda for Sustainable Development, and internationally agreed climate and biodiversity goals.

12. We recognize the urgent need to further mobilize and increase resources from all sources for implementing research and development into sustainable farming actions at the local, national, regional and international levels.

13. We believe it is necessary to support the development of and access to digital solutions in agriculture to optimize input usage and production in response to climate change risks and impacts. To deliver results on the ground, we strive to involve multiple actors in research and development facilitating the exchange of knowledge,

the creation of innovations and the adoption of technologies, placing farmers and other stakeholders at the center of activities from design to implementation.

14. 2023 was marked by a record historical average increase in temperature by 1.45 ± 0.12°C, compared to 1865, according to the World Meteorological Organization. Mean state changes in temperature and rainfall are creating stress on agricultural systems. Extreme climate events have also become more severe and frequent as the global temperature rises. Yields of key staple crops are projected to decrease as increasing water scarcity, droughts and flooding events interact with warming temperatures. Socioeconomic impacts could be even more severe, threatening to backtrack our collective effort for the elimination of hunger and malnutrition which points to the need to further scientific efforts on emissions reduction, adaptation and preparedness.

15. We understand that current and future challenges posed by climate change and food insecurity demand continuous scientific and technological developments, knowledge exchange and social innovation that require long-term strategies and can benefit from international cooperation and financing. We highlight, therefore, the need to support the process of global dissemination and diffusion of environmentally sound technologies on voluntary and mutually agreed terms and capacity building to broaden and facilitate access to and adoption of science and evidence-based practices.

16. We welcome reports and presentations during the meeting demonstrating the role of science and innovation and recognize the importance of their contents to address the challenges of science and innovation to promote food security and nutrition.

17. We look forward to the next G20 MACS, to be hosted by South Africa in 2025.