

Highlights and outcome

of MACS G20 countries meet at Varanasi

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The G20-Meeting of Agricultural Chief Scientists (MACS) is a unique platform to discuss knowledge, science and technologies based solutions for food and nutrition security and strengthening cooperation among the member nations. The ICAR-DARE was assigned responsibility to take lead in organization of 12th Meeting of Agricultural Chief Scientists (MACS) at Varanasi from 17–19th April 2023, with theme of Sustainable Agriculture and Food Systems for Healthy People and Planet. About 80 delegates from G20 Member States participated to discuss various issues of agriculture research and development including food security and nutrition, climate smart agriculture, digital agriculture and public private partnership. The Millets and Other Ancient Grains International Research Initiative (MAHARISHI) was proposed from India for deliberations as G20 initiative.

Keywords: Digitalization, Food security, MACS, Sustainable agriculture

THE Meeting of Agricultural Chief Scientists (MACS) in G20 is instrumental in promoting joint action to put science-based solutions for achieving sustainable, resilient and profitable agri-food systems. It provides a good platform for discussion, deliberations and exchange of knowledge, science and technologies. In consonance with India's G20 Presidency theme "One Earth, One Family, One Future", the 12th Meeting of Agricultural Chief Scientists (MACS) identified the theme of Sustainable Agriculture and Food Systems for Healthy People and Planet. There are four priority areas on which focused discussion took place. The areas are, Food Security and Nutrition—the role of frontiers in science and technology; Building resilience and sustainable agriculture through approaches of climate resilient agriculture and One Health; Digitalization for agricultural transformation; and Public-Private Partnerships for research and development.

G20 Meeting of Agricultural Chief Scientists (MACS) was organized at Varanasi during 17–19th April 2023 by the Department of Agricultural Research and Education (DARE), Ministry of Agriculture and Farmers Welfare. About 80 delegates from G20 Member States i.e., Australia, Argentina, Brazil, Canada, China, France, Germany, Indonesia, Italy, Japan, Mexico, Republic of Korea, Russia, Saudi Arabia, South Africa, Türkiye, United Kingdom, USA and European Union; Invited

Guest Countries, viz. Bangladesh, Egypt, Mauritius, Netherlands, Nigeria, Oman, Singapore, Spain UAE, Vietnam and International Organizations such as United Nations, International Monetary Fund, World Bank, World Health Organization, World Trade Organization, International Labor Organization, FSB, OECD, Chairs of Regional Organizations AU, AUDA-NEPAD, ASEAN and special invitees by India i.e. International Solar Alliance, CDR and Asian Development Bank, participated in the 3 days meeting. Senior officials from the Ministry of Agriculture and other Ministries including Ministry of External Affairs also attended the meeting.

The various issues of agriculture research and development including food security and nutrition, climate smart agriculture, digital agriculture, public private partnership etc. were discussed. The "Millets and Other Ancient Grains International Research Initiative (MAHARISHI)" was proposed for deliberations as G20 initiative during India's Presidency. MAHARISHI aims at advancing research collaborations and generating awareness about millets and other ancient grains on agrobiodiversity, food security and nutrition aligning with the International Year of Millets 2023 and after. In these areas, options were explored of G20 countries coming together to help sharing science-based technological and innovative solutions. The event will provide new

opportunities of collaboration in research, education and extension in the field of agriculture and strengthen the G20 forum for international economic cooperation.

The Government of India made arrangements to give a taste of the unique experience of India's rich cultural and spiritual heritage to the foreign delegates arriving at Varanasi. The traditional welcome was arranged at the Airport.



Traditional welcome of delegates at airport

The Theme of the G20 Indian Presidency is One Earth, One Family and One Future, which celebrates the spirit of togetherness and harmony amongst us to ensure a bright future for the world.

The delegates were taken on a cruise ride to witness the scintillating view of *Ganga Aarti* on 17th April 2023. Thereafter, a welcome dinner and cultural programmes were organized at Taj Ganges in the honor of visiting G20 delegates.



Delegates at Namoh Ghat Varanasi



Cultural programme scene

The delegates were taken to Sarnath on 18th April 2023. They experienced a guided tour of ASI Museum and Buddha Stupa, and also witnessed the Light and Sound show. Subsequently, the cultural performance and gala dinner for delegates was arranged at the serene surroundings of the Buddha Theme Park.



Visit to ASI Museum Sarnath and Buddha Stupa

The delegates visited Trade Facilitation Centre (TFC) on 19th April 2023 and took the glimpse of textile history of the city along with live demonstrations of the local artisans making their products. A small exhibition of leading institutions of Indian Council of Agricultural Research (ICAR) and State Agriculture Department was organized at TFC. The delegates were served with shown live prepared millets dishes at the venue. Thereafter, farewell dinner and cultural performances were organized at the Hotel Taj Ganges.

The inaugural session was graced by General (Retd) V. K. Singh, Minister of State for Road Transport and Highways and Civil Aviation, Government of India.



Delegates at Trade Facilitation Centre



Visit of delegates to ICAR exhibition



Inauguration by General (Retd) V. K. Singh, Minister of State for Road Transport & Highways and Civil Aviation, Government of India

Excerpts of inaugural address by General (Dr.) V K Singh (Retd.), Hon'ble Minister are given as:

- Dr Himanshu Pathak, Secretary DARE & DG, ICAR and Chair MACS 2023, distinguished delegates from different G20 Member States, Invited Guests, Ladies and Gentleman. Greetings to you all. Namaskar!
- It is my pleasure to be with you in the ancient and holy city of Varanasi for this very important meeting of top scientists of the developed and developing countries and international organizations, MACS. This is an attractive opportunity to take stock of our progress on critical issues of food security and nutrition, climate change adaptation solutions, digital agriculture, public-private investment in agriculture. G20 as a group, shares about 85% of the GDP of the world and hence has greater responsibility towards the wellbeing of global humanity.
- During India's Presidency, the theme 'One Earth, One Family, One Future' signifies our collective efforts for achieving SDGs. The theme of MACS' Sustainable Agriculture and food System for healthy people and plant resonates the emphasis put forth in the theme.
- As two-thirds of the world population lives in G20 nations and 60% of all agricultural land and 80% of world trade in agricultural products is accounted by these countries, our onus on food security and nutrition, livelihood support to the people is crucial. We must utilize our collective strengths for responsible and responsive R&D in agriculture and promoting cooperation for faster transition towards sustainable agriculture and food systems.
- In India, as the food supply improved, we moved towards the goals of sustainability, efficiency, equity, affordable and healthy safe food as also farmer's income and competitiveness in food value chain. Our efforts to deal with global food price shock of 2007-2011 and during COVID -19 pandemic offers useful lessons. We have put the world's largest rural employment programme under National Rural Employment Guarantee Act since 2005. The scheme provides constitutional right to every rural household to get work for 100 days in a year on voluntary basis. We have the world's largest food-based safety net programs, reaching out to about 800 million people in 2020, including ~ 120 million school children through the Mid-Day Meal (MDM) scheme.
- The political will and policy support in agricultural research gave us results through different research based revolutions, viz. Green, White, Yellow, Blue, Golden, Silver and evergreen revolutions. India is the lead producer of pulses, milk, jute, spices, poultry and livestock population of buffalo and goats. We were able to increase our agricultural production from 135 MT in 1950s to over 1300 MT in 2022. This sector engages around 47% of the workforce and contributes for about 17% in India's GDP.
- We are moving towards biofortified crop varieties for quicker solution to improve health and address nutrition issues of women and children. Over 5 m ha area in India is under biofortified varieties of different crops.
- India recognizes and appreciates the renewed efforts made by G20 and other nations and organizations for the digitalization of agriculture. India has one of the largest digital connect in the form of over 1.2 billion mobile connections and 1.20 billion + Unique ID-AADHAR holders. We have provided 120 million soil health cards to farmers.
- Our strength is pan-India presence of ICAR institutes and KVKs with domain expertise for crops, horticulture, livestock, fisheries, soil and water expertise/farm machineries, and farmers outreach. This unique strength is being utilized to provide ICT interface with plants, animals, man and machine.
- Recently, India has embarked upon *Prakritik Kheti* i.e. chemical free natural farming, which offer greater opportunity to push and pull the local seed systems and utilization of agro-biodiversity for the benefit of the masses.

- As demand for food is set to increase significantly in the coming decades with the rise in population, countries should harness each other's strengths and improve trade relations not just open new business opportunities for sustainable agriculture but also stabilize food availability across regions and help small farmers as part of the agricultural value chain.
- The G20 countries should look into diverse areas of sustainable practices that promote diversification of crop production systems, efficient utilization of water resources and fertilizers, assimilation of horticulture practices, soil, health management, and post-harvest management of crops, among others. We should utilize the emerging digital technologies to usher in ease of farming across the G20 countries and the world. India would be happy to share its expertise in this regard with other countries, especially developing and least developed countries.
- The UN General Assembly, based on India's proposal has declared 2023 as International Year of the Millets. This will help highlight the benefits of Millets to the world. Millets are grown in over 130 countries across the world and the maximum production is in Africa. They are climate resilient and nutrition rich, highlighting their need in this difficult times of climate change and post pandemic recovery. We have made it a people's movement and appeal to all the G20 countries to support the move.
- Today, much of India's development agenda is mirrored in the Sustainable Development Goals. The country is working towards the localization of SDGs to deliver on its global commitments. At G20, it will accelerate progress on SDGs across all its thematic areas.
- I look forward to a concrete outcome at G20 MACS 2023. Before I conclude, I would again like to thank all Member countries for this important scientific meeting.
- Global food security concerns have been aggravated by the COVID-19 pandemic and climate change. This requires multi-layered solutions in the spirit of "One Earth, One Family, One Future". We intend to safeguard the global food security and nutrition by strengthening our efforts towards sustainable agriculture and food systems by leveraging science, technology and innovations.
- Call was for increased coordinated R&D efforts to provide nutrient rich varieties of food crops for the benefit of farmers and consumers.
- Recalling the 2030 Agenda of the Sustainable Development Goals (SDGs) and G20 declarations, we recognize the importance of research and innovation and call for sharing knowledge, experience and best practices voluntarily with agreeable terms in sustainable agriculture and food systems. We endeavour to intensify research and its implementation in agriculture and related sciences to improve the capacity of stakeholders, including local communities; indigenous people as applicable; women; youth; smallholder; family and marginal farmers. We intend to deepen effective collaborations between national and international research organizations for sustainable agricultural development.
- We recognize the need for enhancing R&D collaborations between the public and private sector to build resilient agriculture and food systems, find solutions for climate change adaptation and mitigation without adverse effects on food security, protect and enhance biodiversity, and help improve productivity and profitability sustainably in global agri-food value chains. We recognize the potential of crop and livestock breeding innovations to improve environmental health and productivity outcomes. Effective investments in agricultural research and innovations will enhance the capacity to build resilience to climate change. Success of public and private sector collaboration in R&D depends on scaling up of innovations and information sharing.
- We recognize the importance of digital transformation of agriculture and food systems in improving sustainability and outcomes for farmers. We encourage increased public-private investments and partnerships for improving communication and adoption of innovative tools, agricultural practices and technologies that meet the needs of stakeholders.
- We call for cooperation in research and extension to improve responsible, sustainable and inclusive use and application of digital technologies for food production and safety, climate resilience, circular economy principles, and for preventing food loss and waste.
- We highlight the importance of locally adapted crops for the transition towards resilient agriculture and food systems, enhancing agricultural diversity and improving food security, and nutrition. Recognizing the achievements of the Wheat Initiative, we intend

Thank you and Jai Hind.

The subsequent technical sessions included presentations by the experts on various sub-themes related to food security and nutrition, resilient agri-food systems, digital agriculture and sustainable agri-food value chain and public-private participation for agricultural R&D followed by discussion and intervention by the participants. A dedicated session was planned on MAHARISHI which included presentations by experts and interventions by all G20 member states, guest countries and international organizations. On the second day, the discussion on MACS communique also started as post-lunch session and the same continued and concluded on the third day. The highlights of discussions and Chair's summary and Outcome document related to food security and R&D are given as:

- The G20 member states, invited countries and international organizations participated in the MACS to discuss and identify the Research and Development (R&D) priorities in agriculture to foster transformation towards diverse, resilient and sustainable agriculture and food systems.

to continue the R&D efforts to provide inclusive solutions for climate-resilient, nutritious, locally adapted, indigenous and underutilized grains. To strengthen the research collaboration and public awareness of these grain crops, we support the launch of the “Millets and Other Ancient Grains International Research Initiative (MAHARISHI)” with voluntary membership from G20 member countries, non-member countries, international organizations and the private sector.

- We support India’s proposal to organize a workshop on climate change, sustainable and climate-resilient agricultural practices and actions to make agriculture a part of the solution to the climate crisis. We also recognize the enhanced need of cooperation and research on transboundary diseases, antimicrobial resistance and prevention of zoonotic disease emergence among One Health issues. We support the proposal to organize an experts meeting on the ‘One Health’ approach for identifying opportunities to undertake research through collaborations, without duplicating the efforts of existing international organizations.

Millets and other Ancient Grains International Research Initiative: (MAHARISHI)

- We, under the auspices of a G20 MACS Global Research Collaboration Priority (GRCP), support the launch of the “Millets and Other Ancient Grains International Research Initiative (MAHARISHI)” to facilitate research collaboration on climate resilient and nutritious grains including Millets and other underutilized grains. This will supplement the efforts undertaken under the International Year of Millets 2023 (IYoM 2023) program initiated by the United Nations General Assembly (UNGA).
- Achieving impact across multiple grains is difficult due to dispersed efforts. To address this problem, a framework must be developed that can be applied to the grains under this initiative.
- We underscore that any G20 member may voluntarily contribute funds, scientific expertise, and/or other resources to the initiative. The MAHARISHI intends to cooperate with public and

private organizations, making efforts to advance research on these grains. In alignment with the G20 MACS guiding principles, this GRCP will be limited to two years, and a written report will be provided during the 2025 G20 MACS.

- The activities of this effort may continue after 2025, but at this point, the activity should no longer be discussed, presented, or reported at the G20 MACS, except for any future stocktaking report.
- Drawing upon the learnings from the Wheat Initiative, the MAHARISHI intends to pursue the cost-effective activities, while striving to avoid duplication of existing efforts.

There is a need to establish mechanisms to connect researchers and institutions working on identified grain crops to enhance the dissemination of research findings and identify research gaps, and needs. This will also include supporting open access publication of research results. Apart from this, establishing web platforms to connect researchers, exchange data, share communication products and thematic briefs to encourage research and information sharing in an open and accessible manner. It was decided to organize knowledge transfer, on voluntary and mutually agreed terms, capacity-building activities and international research workshops and conferences. These activities would endeavour to encourage researchers to work on these grains. In order to support and promote the research interests, the scientists should be recognized through research and innovation prizes and/or awards. It is a matter of pride for us that the MAHARISHI secretariat will be based in the ICAR-Indian Institute of Millets Research (IIMR), Hyderabad with technical support from International Crops Research Institute for semi-arid tropics (ICRISAT), One CGIAR, International organizations (IOs) and research institutions.

SUMMARY

The common issues in agriculture research and development including food security and nutrition, climate smart agriculture, digital agriculture, public private partnership etc. were discussed during this meet. In these areas, options were explored of G20 countries coming together to help sharing science-based technological and innovative solutions. This event provided new opportunities of collaboration in research, education and extension in the field of agriculture and strengthens the G20 forum for international economic cooperation. The proposal from India on “Millets and Other Ancient Grains International Research Initiative (MAHARISHI)” was deliberated and accepted unanimously as G20 initiative which aims at advancing research collaborations and generating awareness about millets and other ancient grains on agro-biodiversity, food security and nutrition aligning with the International Year of Millets 2023 and after.

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ICAR stall on coarse cereals and millets