

M.S. Swaminathan Centenary International
Conference 2025

EVERGREEN REVOLUTION THE PATHWAY TO BIOHAPPINESS

August 7 - 9, 2025

| NASC, New Delhi, India



ORGANISERS



कृषि एवं किसान कल्याण विभाग
DEPARTMENT OF
AGRICULTURE & FARMERS WELFARE

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INTRODUCTION

An icon of science, development, and policy, Professor M.S. Swaminathan was a globally recognized leader in agricultural science and a champion of food security. To mark his birth centenary on August 7 2025, the M.S. Swaminathan Research Foundation (MSSRF) organised a series of key events to commemorate this momentous occasion. This includes hosting an international conference, Evergreen Revolution: The Pathway to Biohappiness (Prof. M.S. Swaminathan's Vision for Sustainable and Equitable Development). This conference aims to serve as a platform to celebrate his legacy, in an era marked by existential challenges - climate change, energy crises, and deepening inequalities. His life's work underscores an urgency to transform global systems through the fusion of scientific innovation and social justice. Celebrating his centenary is not merely a tribute to his monumental achievements but a call to action, reaffirming a global commitment to sustainable agriculture, food and nutrition, and a hunger-free world. His vision of cooperation among individuals, institutions, and nations continues to guide us in addressing the complex challenges of our time and to reflect on the current state of global food security, and chart a

course for a sustainable and equitable food future – an era of Biohappiness.

ABOUT THE CONFERENCE

The conference theme, Evergreen Revolution- The Pathway to Biohappiness - reflects Professor Swaminathan's lifelong dedication to ensuring food for all. The conference focused on exploring cutting-edge solutions and fostering collaboration to address the complex challenges of global food systems.

The objective of this conference is to pay tribute to Prof. M.S. Swaminathan's legacy by fostering discussions and collaborations that advance the principles of an Evergreen Revolution, by investing more on conservation and sustainable management of biodiversity and natural resources, sustainable agriculture for food and nutrition security, strengthening climate resilience by adapting to climate change, utilising appropriate technologies for sustainable and equitable livelihoods and engaging youth, women and marginalized communities in developmental discourses.

THE GLOBAL CALL TO ACTION: TEN TRANSFORMATIVE PRIORITIES

Over 1,000 delegates from across the globe endorsed the Delhi declaration draft, establishing Biohappiness as “the joy and well-being that emerges when biodiversity is conserved and wisely used for human development.” The framework outlines ten critical action areas.



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- 01 Rethinking Food and Farming**
Prioritising biodiversity, neglected crops like millets, and regenerative practices that rebuild soil health and strengthen climate resilience.
 - 02 Strengthening Farmer-Managed Seed Systems**
Protecting farmers' rights and traditional varieties while developing quality protocols for climate-resilient agriculture.
 - 03 Technology and Innovation with Equity**
Harnessing AI and digital tools for smallholder farmers while ensuring affordable, accessible technology deployment.
 - 04 Democratising Knowledge Management**
Aligning research with real-world challenges, supporting farmer-led research, and creating open-access knowledge platforms.
 - 05 Policy and Governance for Change**
Adopting cross-sectoral policy coherence that integrates agriculture, nutrition, health, biodiversity, and climate goals.
 - 06 Advancing Social Equity and Gender Justice**
Guaranteeing women's land rights, leadership roles, and creating inclusive platforms for youth entrepreneurship.
 - 07 Responsible Private-Sector Engagement**
Investing in inclusive value chains, fair markets, and nature-positive business practices.
 - 08 Rethinking Global Development**
Promoting South-South collaboration and integrating the Biohappiness framework into climate finance mechanisms.
 - 09 Research and Communication**
Combating misinformation, facilitating technology transfer, and elevating grassroots voices.
 - 10 One Health Approach**
Addressing interconnected threats to human, animal, and planetary health through community-based surveillance systems.





The M.S. Swaminathan Centenary International Conference 2025, themed “Evergreen Revolution: The Pathway to Biohappiness,” convened over 1,000 eminent participants, including globally and nationally renowned scientists, policymakers, researchers, value-chain specialists, students, scholars, and farmers from across India. The conference also garnered significant virtual engagement, with approximately 7,000 attendees joining the sessions online.

Watch all live sessions here

<https://tinyurl.com/MSSRF-100>



For media coverage of the event visit

<https://www.mssrf.org/mssrf-media>





GLIMPSES FROM INAUGURAL







INAUGURAL SESSION

“ Welcome

DR. SOUMYA SWAMINATHAN, CHAIRPERSON, M.S. SWAMINATHAN RESEARCH FOUNDATION

Dr. Soumya Swaminathan warmly welcomed dignitaries, scientists, farmers, students, policymakers, and partners to the centenary of Prof. M.S. Swaminathan, expressing gratitude to Prime Minister Shri Narendra Modi for his presence, which underlined the critical role of science, particularly agricultural research, in India's development. She recalled Prof. Swaminathan's lifelong commitment to eliminating hunger, his foresight on the risks of chemical overuse, groundwater depletion, climate change, and erosion of traditional crops, and his respect for indigenous knowledge, especially of women farmers.

As Chairperson of the MS Swaminathan Research Foundation, she emphasized its role as a living laboratory of innovation and inclusion, carrying forward his vision. She called the centenary not only a moment of remembrance but also a call to action for an evergreen revolution (Satat Harit Kranti), ensuring zero hunger, biodiversity conservation, and community-led transformation with women and youth at the forefront.



“ Presidential Address



SHRI. SHIVRAJ SINGH CHOUHAN, HON'BLE MINISTER OF AGRICULTURE & FARMERS WELFARE, GOVERNMENT OF INDIA

Shri. Shivraj Singh Chouhan, Hon'ble Minister of Agriculture & Farmers Welfare, Government of India paid tribute to Prof. M.S. Swaminathan, recalling how the Bengal famine inspired him to dedicate his life to agriculture and hunger eradication, leading to the Green Revolution and India's transformation in wheat production. He highlighted the Prime Minister's guidance to connect "lab to land," which has inspired campaigns such as Adhuri Krishi Chaupal and Viksit Krishi Sankalp Abhiyan, reaching over one crore farmers.

He noted India's self-reliance in rice and wheat, with free rations provided to 800 million people, while stressing the need to improve per-hectare yields of pulses and oilseeds. Emphasizing Dr. Swaminathan's global vision of Vasudhaiva Kutumbakam, he pledged to follow his path ensuring food security today while protecting resources for future generations. Swaminathan ji, he said, created history by eradicating hunger, for which he offered his deepest respects.





SHRI. NARENDRA MODI
HON'BLE PRIME MINISTER, GOVERNMENT OF INDIA

“ Inaugural Address

The Prime Minister paid respectful greetings to the family of Prof. M.S. Swaminathan and all dignitaries present. He described Prof. Swaminathan as a scientist whose contributions transcended time and geography, making science a medium of public service and dedicating his life to food security. His vision, the Prime Minister said, would continue to guide India's policies for centuries.

Shri Modi recalled his personal association with Prof. Swaminathan, citing his guidance during the Soil Health Card initiative in Gujarat, his visit to the Swaminathan Research Foundation, and interactions during the release of his book and the inauguration of the International Rice Research Institute in Varanasi. Prof. Swaminathan's belief that “science is not just about discovery, but delivery” was highlighted as his guiding principle.

Conferring the Bharat Ratna on him, the Prime Minister said, was a privilege for the nation. He lauded Prof. Swaminathan's pioneering role in food self-reliance while also cautioning against environmental risks. His concepts of the Evergreen Revolution, Bio-Villages, Community Seed Banks, and focus on neglected crops, millets, and climate-resilient varieties were noted as visionary. The idea of Biohappiness, linking biodiversity with livelihood opportunities, was emphasized as a transformative approach.

Shri Modi expressed satisfaction at the launch of the MS Swaminathan Award for Food and Peace, underlining the inseparable link between food security and peace. He congratulated the first recipient, Nigerian scientist Prof. Prof Ademola A. Adenle.

The Prime Minister detailed India's recent agricultural achievements, noting record food grain and oilseed production, and leading global positions in milk, pulses, jute, rice, wheat, fruits, vegetables, and fisheries. He reaffirmed the government's commitment to farmer welfare, citing initiatives such as PM-Kisan Samman Nidhi, PM Fasal Bima Yojana, PM Krishi Sinchai Yojana, creation of 10,000 FPOs, promotion of cooperatives and SHGs, e-NAM, PM Kisan Sampada Yojana, and the recently launched PM Dhan Dhanya Yojana.

Looking ahead, Shri Narendra Modi called for a shift from food security to nutritional security through bio-fortified crops, natural farming, and reduced chemical use. He stressed the need for climate-resilient crop varieties, precision irrigation, solar power, and integration of satellite data, AI, and machine learning for real-time decision support in farming. He urged scientists to guide agri-tech startups and to help farmers blend traditional knowledge with modern methods.

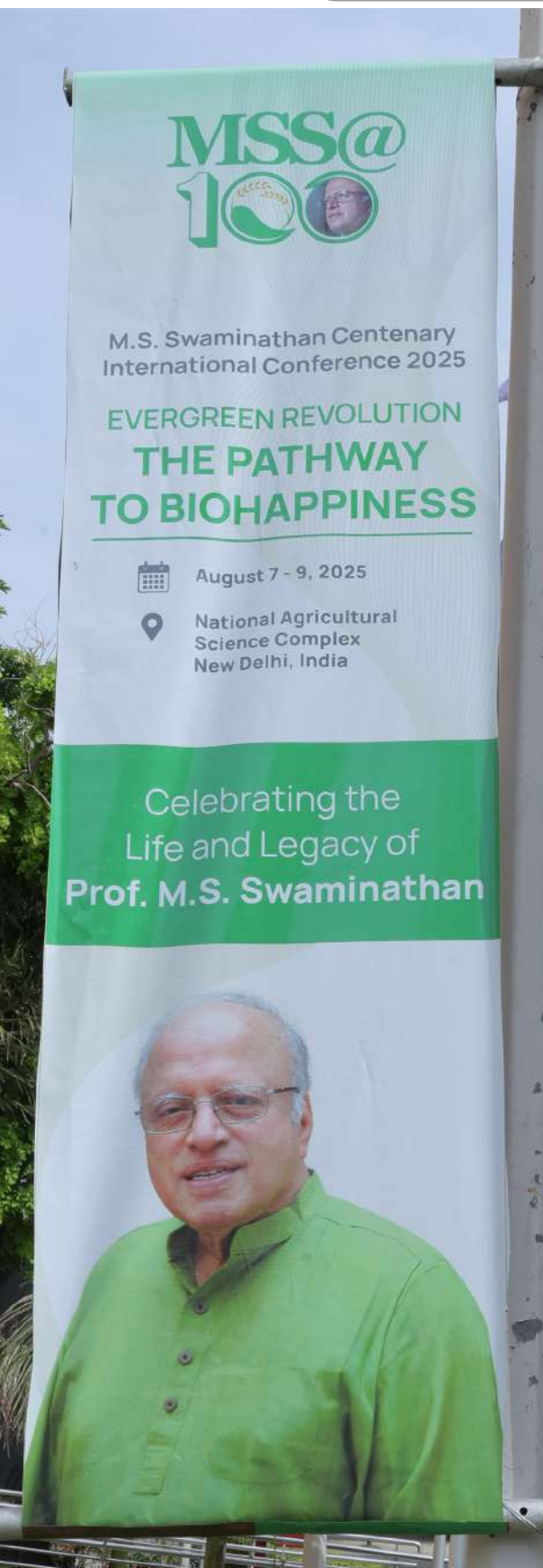
He noted the success of the Viksit Krishi Sankalp Abhiyan, which mobilized 2,200 scientist teams in over 100 districts, directly engaging 12.5 million farmers.

Concluding his speech, the Prime Minister affirmed that agriculture is not just about crops, but about people's dignity, prosperity, and environmental sustainability. He urged all to carry forward Prof. Swaminathan's vision by connecting science and society, prioritizing small farmers, and empowering women in agriculture.





Session Key Points





PLENARY SESSION 1: ACHIEVING AN EVERGREEN REVOLUTION – VISION FROM LEADERS

This special session brings together to pay tribute to the legacy of Prof. M. S. Swaminathan, the architect of India's Green Revolution. His visionary work laid the foundation for a self-reliant and food-secure nation. The session focused on advancing Prof. Swaminathan's enduring vision—empowering smallholder farmers, promoting ecological sustainability, and ensuring food and nutrition security for all. Panelists shared insights and policy perspectives aimed at realizing an “Evergreen Revolution” across India, one that harmonizes productivity with environmental and social equity.

Moderator: Prof. Ramesh Chand, Member, Niti Aayog, Government of India

Speakers

- Hon'ble Thiru. Thangam Thennarasu, Minister for Finance and Environment & Climate Change, Government of Tamil Nadu
- Prof. Ademola A. Adenle, Senior Special Adviser on Agricultural Innovation, Federal Ministry of Agriculture and Food Security, Nigeria
- Dr. Kent Nnadozie, Secretary, International Treaty on Plant Genetic Resources
- Mr. Toko Tatung, Member of the Legislative Assembly, Government of Arunachal Pradesh
- Hon'ble Dattatray Vithoba Bharne, Minister of Agriculture, Government of Maharashtra

“ Opening remarks

PROF. RAMESH CHAND, MEMBER, NITI AAYOG, GOVERNMENT OF INDIA

Emphasized MSS foresight in recognizing second-generation challenges of the Green Revolution—soil degradation, water depletion, biodiversity loss—and his advocacy for an Evergreen Revolution. Highlighted Swaminathan’s lifelong commitment to farmers’ rights, gender equity, and nutrition security, and his call to measure “Gross Nature Product” alongside GDP. Noted India’s record 4.5% annual agricultural growth (2015–2024), surpassing China, attributing this to policies inspired by his vision.



“ Speakers



HON'BLE THIRU. THANGAM THENNARASU, MINISTER FOR FINANCE AND ENVIRONMENT & CLIMATE CHANGE, GOVERNMENT OF TAMIL NADU

- Celebrated Professor principle: “Science must serve the poorest, protect the planet, and empower the vulnerable.”
- Recalled his role in Protection of Plant Varieties & Farmers’ Rights Act and association with Tamil Nadu leadership.
- Showcased Tamil Nadu’s achievements:
- Gross cropped area increase (146.77 → 151 lakh acres, 2019–24).
- Women’s Biotechnology Park and biotechnology policy inspired by MSSRF.
- Expansion of double-cropped area (29.74 → 33.6 lakh acres), micro-irrigation, organic farming, and electrification (81,000 new agri connections).
- Highlighted Tamil Nadu’s emergence as a leader in maize, oilseeds, sugarcane productivity, and climate-resilient agriculture.

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HON'BLE DAT'TATRAY VITHOBA BHARNE, MINISTER OF AGRICULTURE, GOVERNMENT OF MAHARASHTRA

- Recognized Swaminathan’s role in ensuring India’s food security and guiding policy reforms.
- Emphasized climate-resilient agriculture in Maharashtra’s drought-prone regions through technology, mobile-based extension, and Pokra climate-resilient villages.
- Praised policies for farmer support—MSP reforms, crop insurance, and horticulture diversification.
- Linked state efforts to the Evergreen Revolution framework envisioned by Swaminathan.



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MR. TOKO TATUNG, MEMBER OF THE LEGISLATIVE ASSEMBLY, GOVERNMENT OF ARUNACHAL PRADESH

- Read CM’s message praising Swaminathan’s inclusive and sustainable vision.
- Spoke of Arunachal as a “land of stewardship,” where leadership means caring for forests, knowledge, and future generations.
- Highlighted Swaminathan’s belief in blending indigenous knowledge with modern science as the foundation of biohappiness.
- Called for urgent support for smallholders (86% of farmers) and women farmers (70% of agri labor, but only 11% land ownership).
- Positioned Arunachal as a biodiversity hub (5,000+ plant species, 220 languages, 25 lakh ha cultivable land) with potential to lead regenerative agriculture and proposed a National Centre for Biohappiness in partnership with MSSRF.
- Urged a new generation of leaders who are “seed savers, water warriors, and peacemakers,” not just degree holders.

PROF. ADEMOLA A. ADENLE, SENIOR SPECIAL ADVISER ON AGRICULTURAL INNOVATION FEDERAL MINISTRY OF AGRICULTURE AND FOOD SECURITY, NIGERIA

- Expressed gratitude for receiving the inaugural M.S. Swaminathan Award for Food & Peace.
- Reflected on Swaminathan’s influence in shaping farmer-centric policies across the Global South.
- Stressed the importance of engaging farmers as co-creators of technology to ensure local relevance and adoption.
- Called for cross-border, multi-stakeholder collaboration to build climate-resilient, inclusive food systems.
- Reaffirmed commitment to science serving humanity as Swaminathan envisioned.



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DR. KENT NNADOZIE, SECRETARY, INTERNATIONAL TREATY ON PLANT GENETIC RESOURCES

- Acknowledged Swaminathan’s lasting global legacy beyond India, particularly his advocacy for farmers’ rights at the international level.
- Credited him with shaping the only international treaty that embeds farmers’ rights.
- Called for a shift from extractive to regenerative agriculture, integrated with ecosystems and local communities.
- Urged global action to empower women, indigenous communities, and smallholders.
- Concluded: “The best tribute to Prof. Swaminathan is action—agriculture that not only feeds the world but heals it.”

“ Final remarks

A vision for sustainable agriculture and rural well-being calls for blending indigenous knowledge with modern science, advancing regenerative and inclusive farming, and establishing “Centers of Biohappiness” as living models of agroecology. Leadership must be redefined as stewardship, cultivating storytellers, seed savers, and water warriors. Technology should be localized, engaging farmers, especially women, youth, and tribal communities in innovation and entrepreneurship. Farmer-centric policies must ensure fair prices, protection, and access to resources, while climate-resilient models like red rice farming and dryland horticulture should be scaled up. Ground-level action, backed by Global South collaboration, can translate Dr. Swaminathan’s Evergreen Revolution into lasting change.





KEYNOTE LECTURE I

Chair: Dr Madhura Swaminathan, Professor, Indian Statistical Institute, Bengaluru
 Dr. Shivakumar Kalyanaraman, CEO, Anusandhan National Research Foundation

Speakers

- Prof. Lindiwe Sibanda, Co- Chair, Curt Bergfors Food Planet Prize & Extra-Ordinary Professor, University of Pretoria, South Africa
- Dr. Quarraisha Abdool Karim, President, The World Academy of Sciences, Italy

“ Opening remarks

DR MADHURA SWAMINATHAN, PROFESSOR, INDIAN STATISTICAL INSTITUTE, BENGALURU

We must recognize the need for a new revolution, one that advances from food security to “bio-happiness,” ensuring that science, sustainability, and human well-being go hand in hand. The success of this vision depends on continued commitment; governments and institutions must sustain investments in science, technology, and innovation, as these remain the most transformative tools for progress. We must remember the inseparable link between food and peace. Building resilient, equitable food systems is not only about ending hunger but also about fostering harmony and stability in our societies.



“ Speakers



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PROF. LINDIWE SIBANDA, CO- CHAIR, CURT BERGFORS FOOD PLANET PRIZE & EXTRA-ORDINARY PROFESSOR, UNIVERSITY OF PRETORIA, SOUTH AFRICA

- The world must feed a growing population while protecting environmental health and ecological balance.
- Evergreen Revolution concept coined by Dr. M.S. Swaminathan, emphasizes sustainable agricultural practices that regenerate natural resources, in contrast to the yield-centric Green Revolution.
- Linking sustainable agriculture to “biohappiness”, a state of human well-being grounded in biological health, environmental harmony, and social equity.
- Empowering Smallholders and Biodiversity: The Evergreen model supports smallholder farmers, biodiversity conservation, and food and nutrition security as pillars of sustainability.
- Holistic Transformation of Food Systems: The vision integrates ethical consumption, mental and physical health, and resilient communities into food system reforms.
- Multi-stakeholder and Multidisciplinary Approach which advocates inclusive, scalable innovations, climate-smart practitioners, and global knowledge exchange platforms.
- It urges policymakers, researchers, and practitioners to align food system transformations with human and planetary well-being — cultivating shared value and sustainable futures.

DR. QUARRAISHA ABDOOL KARIM, PRESIDENT, THE WORLD ACADEMY OF SCIENCES, ITALY

- Science is crucial to address today’s complex global challenges, including pandemics, climate change, conflicts, and rising inequalities.
- There is a need for science that fosters unity, global solidarity, and partnerships rather than division.
- Science must be guided by purpose, rooted in local contexts, and focused on improving lives—reflecting the founding vision of TWAS.
- Cross-border and intra-country collaborations are essential to solving interconnected global problems and recognizing our shared vulnerabilities.
- Effective partnerships are built on mutual respect and trust, enabling transformative and mutually beneficial scientific outcomes.
- Strong partnerships should acknowledge global disparities, while promoting transparent governance, shared resources, and capacity building.
- Science plays a pivotal role in driving social change and building a lasting legacy for future generations.



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“ Final remarks

The true happiness cannot thrive amid conflict, but rather through peace, security, and shared progress. India's sovereignty and global standing have been deeply rooted in its ability to ensure food security. The connection between food, freedom, and dignity is a powerful reminder that our work in science, agriculture, and innovation must continue to strengthen both national resilience and human well-being.





PLENARY SESSION II: TRANSFORMING AGRI - FOOD SYSTEM FOR BETTER NUTRITION: EVERGREEN REVOLUTION 2.0

The Green Revolution enhanced crop yields using modern technologies such as high-yielding varieties, fertilisers, and irrigation. However, in the face of climate change, there is an urgent need to shift from yield maximisation to sustainable productivity without compromising ecological integrity. Professor M.S. Swaminathan's concept of the 'Evergreen Revolution' embraces ecology, economics, and equity—both social and gender—moving from a commodity-centred approach to a holistic, systems-based model. This includes conserving biodiversity, promoting locally adapted crops such as millets, pulses, and oilseeds, improving soil health, harvesting rainwater, using renewable energy, and reducing greenhouse gas emissions. This panel explored strategies for transforming agri-food systems to ensure a climate resilient, nutrition-secure future for all.

Chair: Dr. Mangi Lal Jat, Director General, Indian Council of Agricultural Research & Secretary, DARE, Government of India, Dr. Shobha Shetty, Global Director, Agriculture and Food, World Bank

Speakers

- Dr. Rajiv Bahl, Secretary, Department of Health Research & Director General, DHR & ICMR, New Delhi
- Dr. Simeon Kacou Ehui, Regional Director, Continental Africa, CGIAR, and DG (IITA), Nigeria
- Dr. Purnima Menon, Senior Director, Food and Nutrition Policy Acting, Senior Director, Transformation Strategies, IFPRI, USA
- Mr. Ajay Vir Jakhar, Chairman, Bharat Krishak Samaj, New Delhi
- Dr. George Smith, Director of AgBio Research and Senior Associate Dean of Research College of Agriculture and Natural Resources, Michigan State University, MI, USA
- Dr. Shalander Kumar, Deputy Global Research Programme Director, Enabling Systems Transformation Program, ICRSAT
- Mr. Sudarshan Suchi, Chief Development Officer, Reliance Foundation, Mumbai

“ Opening remarks

DR. SHOBHA SHETTY, GLOBAL DIRECTOR, AGRICULTURE AND FOOD, WORLD BANK

Agriculture must coexist with nature, as food systems produce enough calories yet hunger persists, 300 million face acute food insecurity, 2.8 billion cannot afford healthy diets, and 150 million children are stunted. At the same time, agriculture drives one-third of global emissions, two-thirds of deforestation and freshwater use, and severe soil and water degradation. The Evergreen Revolution 2.0 envisions not just higher yields but nutritional, ecological, and economic gains for smallholders, balancing ecology, economics, and equity. Transformation requires innovation and technology, repurposing harmful subsidies, and mobilizing private financing. Coordinated global action can secure health, prosperity, and sustainability for future generations.

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“ Speakers



DR. SIMEON KACOU EHUI, REGIONAL DIRECTOR, CONTINENTAL AFRICA, CGIAR, AND DG (IITA), NIGERIA

- Broader Purpose of Agriculture should focus not just on food production, but on nourishing people, regenerating ecosystems, and securing livelihoods.
- Evergreen Revolution 2.0 shift from extractive farming to regenerative agroecology, valuing nutrition, resilience, equity, biodiversity, and farmers' dignity over narrow yield metrics.
- Reviving Underutilized Crops, Promote climate-resilient crops like millets, pulses, sorghum, oilseeds, chickpea, and indigenous vegetables, crucial for India and Africa.
- Nutrition-Sensitive Agriculture; Move beyond calories to ensure diverse, affordable, culturally relevant foods that are healthy for people and sustainable for the planet.
- Sustainable practices, restore soil health, adopt renewable energy, conserve water, use ecological methods, promote community nutrition gardens, youth-led agri-business hubs, and soil health hubs.
- Scale up Green Technologies like solar irrigation, cold storage, bioenergy, composting, waste-to-fertilizer models, and water-efficient irrigation systems.
- Global Call to Action – Foster collaboration across regions, sectors, and generations to build agrifood systems that nourish all, restore the earth, and bring “bio-happiness” to communities.

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**DR. RAJIV BAHL, SECRETARY, DEPARTMENT OF HEALTH
RESEARCH & DIRECTOR GENERAL, DHR & ICMR, NEW DELHI**

- Tackle the dual burden of malnutrition, address undernutrition (stunting, wasting, anemia) while preventing overnutrition and related NCDs (obesity, diabetes, hypertension).
- While food security has improved, rising intake of ultra-processed, unhealthy foods is a growing concern.
- Nutritious foods (fruits, vegetables, pulses, millets) are often costlier than calorie-dense, less healthy options.
- Strengthen agriculture–nutrition linkages. Align farming and food systems to prioritize production and accessibility of nutrient-rich, culturally relevant foods.
- Encourage healthier food options, regulate ultra-processed foods, and promote millets and traditional crops at affordable prices.
- Ensure policies address both persistent undernutrition among vulnerable groups and rising lifestyle-related health risks.



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**DR. PURNIMA MENON, SENIOR DIRECTOR, FOOD
AND NUTRITION POLICY ACTING SENIOR DIRECTOR,
TRANSFORMATION STRATEGIES, IFPRI, USA**

- Every food choice is shaped by policies across the food system, making it crucial to study dietary patterns and their drivers to find effective policy entry points.
- Immediate opportunities include stronger food labeling, stricter marketing regulations for ultra-processed foods, and public awareness campaigns on healthy diets.
- These quick, low-cost, high-impact measures can be implemented by governments without major delays.
- More evidence is needed on the impact of taxing ultra-processed foods, making the PDS more nutrition-sensitive, and diversifying food safety nets within fiscal and legal limits.
- Subsidy policies have a powerful influence on food systems, and redeploying them is a sensitive but critical reform area.
- A forward-looking approach requires moving fast on “no-regret” policies while simultaneously investing in research to guide more complex reforms.
- Emphasis should shift from focusing only on challenges to seizing actionable opportunities that promote healthier diets.

**MR. AJAY VIR JAKHAR, CHAIRMAN, BHARAT KRISHAK SAMAJ,
NEW DELHI**

- India has achieved high crop production, but true progress needs higher productivity per unit for an “evergreen revolution.”
- Current agricultural policies are outdated (50–60 years old). The goal should be strategic autonomy in nutrition production, growing what we are best at and trading for the rest instead of blanket self-sufficiency.
- Lack of integrated food systems thinking is pushing agriculture into deeper problems; achieving transformation requires this approach.



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- Agricultural universities must focus on building human resources over infrastructure, and farmers need to unlearn outdated practices.
- Farmers (and other program recipients) should directly assess government programs to give an accurate picture and enable improvements.
- Research is missing in critical areas like kitchen gardens, backyard poultry, and closed food loops, despite their potential for nutrition security.
- For schemes like Mid-Day Meals, source items (e.g., eggs) from local villages to ensure freshness, support local economies, and strengthen systems thinking.



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DR. GEORGE SMITH, DIRECTOR OF AGBIO RESEARCH AND SENIOR ASSOCIATE DEAN OF RESEARCH COLLEGE OF AGRICULTURE AND NATURAL RESOURCES, MICHIGAN STATE UNIVERSITY, MI, USA

- Michigan State University reaffirms its commitment to collaborate with India and global partners to strengthen food and nutrition security despite political challenges.
- Climate change, extreme weather, yield losses, and threats to farmer livelihoods are shared global challenges.
- Climate-resilient solutions include crop selection for stress tolerance and adoption of regenerative agriculture to enhance sustainability, water retention, biodiversity, and reduce inputs.
- Farmers face barriers to adopting new practices, requiring support systems that reduce their risks.
- Credit, markets, and policies must incentivize resilience, going beyond crop insurance to reward sustainable practices.
- Building acceptance among farmers, consumers, policymakers, and lenders is vital to drive meaningful change.
- With over 40% of the U.S. population facing metabolic disease, investing in agricultural research, healthy food production, and consumer education is more cost-effective than relying on medical treatment.
- Research should be farmer-driven, focusing on simple, practical, and relevant solutions alongside technology.
- Global collaboration is essential to achieve Dr. M.S. Swaminathan's vision of sustainable, nutrition-secure agrifood systems.

DR. SHALANDER KUMAR, DEPUTY GLOBAL RESEARCH PROGRAMME DIRECTOR, ENABLING SYSTEMS TRANSFORMATION PROGRAM, ICRSAT

- India faces ongoing challenges of resource degradation, malnutrition, nutrition deficiencies, climate change, and rural–urban income disparities, despite food surplus and production success.
- The focus must shift from Green Revolution strategies to sustainable agri-food systems that balance economic viability, human health through diverse diets, and environmental sustainability.



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- Research should emphasize integrated systems thinking, nutrition-sensitive and regenerative practices, resource efficiency, digital innovations, local food systems, and waste-to-wealth approaches.
- Policies need to be repurposed by redirecting subsidies toward sustainable and nutritious food production, protecting farmer incomes, applying true cost accounting for energy/water, and promoting eco-labeling and green credit.
- Institutional innovations should strengthen FPOs, women's SHGs, corporates, and agri-tech start-ups, with support from the National Agricultural Research System and decentralized governance through district-level task forces.
- Achieving sustainable food systems requires systems thinking, inter-ministerial coordination, public-private partnerships, digital tools, policy reforms, and farmer income protection.



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**MR. SUDARSHAN SUCHI, CHIEF DEVELOPMENT OFFICER,
RELIANCE FOUNDATION, MUMBAI**

- Rural marginal farming communities often face undernutrition despite producing enough food to feed many, highlighting the paradox of nutrition-deficient producers.
- Inspirational examples like farmer Gajendra Behra in Odisha show the value of knowledge, with a vision that by 2047 nutrition challenges should be history.
- Nutrition must be addressed within a broader social development context, blending tradition with technology rather than treating them as opposites.
- The private sector's role lies in locally led designs, capacity building, long-term community engagement, scalable processes, and market/value chain interventions, working collaboratively with humility.
- Farmers' unrecognized environmental services, like water conservation, soil protection, ecosystem care should be valued, reframing the agenda from food security to nutrition security to holistic wellbeing.
- Strategic priorities include strengthening value chains, fostering corporate R&D and innovation, and building local capacities.

“ **Final remarks of the chair**

**DR. MANGI LAL JAT, DIRECTOR GENERAL, INDIAN COUNCIL
OF AGRICULTURAL RESEARCH & SECRETARY, DARE,
GOVERNMENT OF INDIA**

The panel brought together diverse perspectives from agriculture, health, nutrition, farmers, and the private sector, stressing the importance of systems thinking rooted in people, planet, and profit. Reviving local food systems and diverse traditional diets was highlighted as essential, with farmers recognized as health providers. Building trans-disciplinary human capital is critical to rebuild agri-food systems beyond commodity focus. Integrated, cross-sector approaches with ministry coordination are needed, while existing investments should be repurposed and prioritized for agriculture-health research. Sustainable systems must operate from village to global levels, supported by trade, with research and innovation demand-driven and delivery-focused.







PARALLEL SESSION I: WORKSHOP ON FARMERS' VOICES: MOVING TOWARDS BIOHAPPINESS

Prof. M.S. Swaminathan envisioned a future where science and social equity empower farmers, especially women and indigenous communities —as stewards of biodiversity and innovation. Rooted in biodiversity-based development, biohappiness promotes well-being through the sustainable and equitable use of biological resources. This session aimed to provide a platform for farmers across India to share experiences and explore pathways for blending traditional knowledge with modern technologies. Emphasising farmer-to-farmer learning, the workshop will celebrate Prof. Swaminathan's legacy and advocate a shift from resource exploitation to resilience and sustainability ensuring productivity without ecological harm, and livelihoods grounded in bio-cultural heritage.

Chair: Dr. Rajbir Singh, DDG (Agricultural Extension), ICAR, New delhi, ICAR, Dr. Sukanta Kumar Sarangi, Head, Division of Agricultural Technologies for Women, Indian Council of Agricultural Research -CIWA, Bhubaneswar, Dr. Rabindra Nath Padaria, JD (Agrl Ext.), Division of Agricultural Extension, Dr. R. Rengalakshmi, Executive Director, Area Operations, MSSRF, Chennai

Farmer representatives: Ms. Angel Isabella Rani, Tamil Nadu, Mr. Sridhar, Andhra Pradesh, Mr. Sooraj Purushottam, Kerala, Ms. Rukmani Khilo, Odisha, Mr. Vijay Jawandhiya, Maharashtra, Mr. Patel Motibai Joitabhai, Gujarat, Mr. Kanwal Singh Chauhan and Dr Neelam Tyagi, Uttara Pradesh

“ How biodiversity/agrobiodiversity contributes to happiness

KEY CONTRIBUTIONS TO BIOHAPPINESS

- Nutrition: Local and traditional crop varieties are nutrient-rich, naturally bio-fortified, and essential for food and nutrition security.
- Livelihoods: Value addition of traditional crops, fisheries (with technology adoption), and livestock integration boosts farmer income.
- Cultural identity: Agricultural festivals and seed conservation practices strengthen community bonds and indigenous identity.
- Reduced dependency: Conservation of local seeds reduces reliance on commercial seed companies, promoting self-reliance.

Existing Policy and Support Systems for Biohappiness

SUPPORTIVE POLICIES AND ACTS

- Farmers' Rights under PPV&FR Act: Recognition of farmer breeders and seed conservators, registration of farmer varieties
- Forest Rights Act: Ensures resource access and tenure security.
- **Public Schemes:**
 - PMMSY, Blue Revolution: Promote sustainable fisheries through technology (ice boxes, GPS, insulated vehicles).
 - Inclusion of Nutri-rich crops in PDS, Mid-day Meals, Anganwadi schemes (notably in Odisha).
 - Abhinava Krishi Yantrapati Samman Yojana: Incentivizes agricultural innovation (in Odisha).
 - Mo Upkari Bageecha (Odisha): Promotes nutrition-sensitive gardening.

INSTITUTIONAL SUPPORT

- FPOs, SHGs, and women-led federations play a role in marketing and risk-sharing.
- Seed bank programs (e.g., NSC–IARI collaboration) strengthen community seed production.

“ Enabling Environment and Factors for Achieving Biohappiness

KEY ENABLERS

- Education and Awareness:
 - Need for awareness about agrobiodiversity conservation, seed banks, pest management, and natural farming.
 - Agricultural science should be integrated into school curricula.
- Participatory & Nutrition-Sensitive Agriculture:
 - Community-driven initiatives like kitchen gardens and community seed banks.
 - Participatory research and awareness
- Market Support & Value Addition:
 - Direct farmer-to-consumer mandis (e.g., Kisan Haat).

- Branding of produce based on climate resilience, nutritional value, and GI tagging.
- Technology Adoption:
 - Fisherfolk use GPS, insulated vehicles, echo sounders – showing relevance of tech for marginal producers.
- Gender inclusion

Challenges Hindering Biohappiness



KEY CHALLENGES IDENTIFIED:

- Climate change and biodiversity loss
- Market failures:
 - Lack of premium pricing.
 - Exploitative middlemen.
 - Weak forward-backward linkages.
- Gaps in farm mechanization - Lack of infrastructure: Machinery support for DSR, compost subsidy delays.
- Youth uninterest and decline of traditional knowledge.
- Gender & Land Issues: Limited to no recognition of women as farmers/landowners.
- Knowledge Gaps: Poor awareness on using fertilizers & pesticides (overuse or incorrect use)
- Gaps in farm mechanization and weak lab to land linkages

Solutions and Successful Practices

PROPOSED SOLUTIONS:

- Climate-Resilient Strategies:
 - Development of location-specific resilient varieties.
 - Reduction in multi-day fishing and promotion of hook-line fishing.
- Community-Based Innovations:
 - Seed villages, kitchen & nutrition gardens, bio-fortified crops.
 - Check dams, artificial reefs for ecosystem restoration.
- Market and Value Chain Strengthening:
 - Premium pricing mechanisms (MSP for organic/nutri-rich produce).
 - Farmer training in business and marketing.
- Policy Actions:
 - Ensure integration of biodiversity in mainstream schemes.
 - Recognize and incentivize local knowledge and women's contributions.
 - Expand co-management and participatory governance structures.

Solutions and Action Points or policy makers

- Mainstream agrobiodiversity into national policies and schemes related to food, health, and education.
- Guarantee Minimum Support Prices (MSP) and develop premium markets for traditional/organic and climate-resilient crops.
- Promote branding and certification (e.g., GI tags, climate-resilient, nutri-rich) to enhance the value of

biodiversity-based products.

- Reintroduce agriculture education in schools, emphasizing location-specific, nutrition-sensitive farming to engage youth.
- Strengthen community seed systems through seed banks, seed villages, and local custodianship models.
- Institutionalize community-led models such as SHGs, FPOs, and grassroots innovation networks to preserve and scale biodiversity efforts.
- Invest in farmer-friendly technologies and improve marketing infrastructure like Kisan Haats for direct farmer-consumer linkages.
- Support organic and natural farming through targeted subsidies, awareness campaigns, and extension services.
- Recognize and reward women and youth through inclusive policies, training, leadership opportunities, and incentives.
- Provide legal and monetary incentives to custodian and tribal farmers for conserving agrobiodiversity.
- Bridge the research–practice gap through participatory research, local planning, and knowledge co-creation.





PARALLEL SESSION II: NEW TECHNOLOGIES FOR AGRICULTURE

This session highlighted how emerging technologies are revolutionising agriculture. Advances in genomics and modern plant breeding are accelerating the development of crops with improved resilience and nutritional quality. Genome editing provides precise and efficient tools to create climate-resilient crops with traits such as drought and heat tolerance, and better nutrient-use efficiency—essential for adapting to climate change. These innovations, when integrated with precision agriculture practices, enable more sustainable, resource-efficient farming. Such technologies not only boost productivity but also contribute to long-term ecological balance. As agriculture faces increasing pressures from climate and population growth, these tools offer promising pathways to achieve global food and nutrition security while safeguarding natural resources.

Chair: Dr. Krishna Ella, Executive Chairman, Bharat Biotech, Dr. K.K. Narayanan, Managing Director, Methelix Life Sciences

Speakers

- Dr. Rajeev Varshney, Professor, Food Futures Institute, Murdoch University
- Prof. K.C. Bansal, Trustee, MSSRF, & Former Director, ICAR – NBPGR, New Delhi
- Dr. B.M. Prasanna, Managing Director, Distinguished Scientist & Regional Director for Asia, CIMMYT – BISA, New Delhi
- Dr. Gayatri Venkataraman, Principal Scientist, Biotechnology, MSSRF, Chennai

“ Opening remarks

DR. KRISHNA ELLA, EXECUTIVE CHAIRMAN, BHARAT BIOTECH AND DR. K.K. NARAYANAN, MANAGING DIRECTOR, METHELIX LIFE SCIENCES

Global integration of scientific departments is emphasized to promote cross-disciplinary collaboration. Genome editing, precision farming and AI are revolutionizing agriculture. Minimal use of genetics and computational biology to rapid advances in structural biology. Next 5 years will be transformative in science, there is urgent need to participate or risk falling behind. Policy makers should align with technological evolution.

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“ Speakers



DR. RAJEEV VARSHNEY, PROFESSOR, FOOD FUTURES INSTITUTE, MURDOCH UNIVERSITY

- Global agriculture faces major challenges: climate change, resource scarcity, and food insecurity.
- Genomics, digital agriculture, and data technologies offer new pathways for sustainable crop improvement.
- Genome sequencing of 15+ crops and genomics-assisted breeding led to 20+ climate-resilient, high-yielding varieties.
- These innovations are benefiting millions of smallholder farmers across Asia, Africa, and beyond.
- Advances in pangenomics, haplotype-based breeding, and gene discovery accelerate trait improvement.
- Chickpea example: QTL hotspot introgression led to 20–24% yield increase.
- AI-integrated multi-omics and speed breeding are shaping future-ready crops for harsh environments.
- The talk emphasizes global collaboration, inclusive innovation, and Prof. M.S. Swaminathan's legacy for resilient agri-food systems.

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PROF. K.C. BANSAL, TRUSTEE, MSSRF, & FORMER DIRECTOR, ICAR – NBPGR, NEW DELHI

- Plant genetic resources (PGRs) in gene banks hold untapped genetic diversity (only 20%) for crop resilience and nutrition.
- A paradigm shift is needed to utilize PGRs effectively for sustainable crop improvement.
- CRISPR-based genome editing is transforming how genetic diversity is accessed and used.
- Unlike traditional breeding, genome editing allows precise gene modifications without linkage drag.
- Integration with pangenomes and super-pangenomes enables targeted trait



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improvement at high precision.

- Key traits enhanced through genome editing include drought tolerance, nutrient efficiency, and climate resilience.
- Features needed in new crops to achieve evergreen revolution: Climate resilience, Compatibility with sustainable farming practices, Resource-use efficiency, Enhanced Genetic diversity
- Genome editing empowers a new era of crop improvement, advancing the vision of an Evergreen Revolution. Move research focus from wheat and rice to pulses and oilseeds



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DR. B.M. PRASANNA, MANAGING DIRECTOR, DISTINGUISHED SCIENTIST & REGIONAL DIRECTOR FOR ASIA, CIMMYT – BISA, NEW DELHI

- Building climate resilience in smallholder farming needs a multidisciplinary, multi-institutional strategy combining genetics and agronomy.
- CIMMYT has shown that accelerated breeding of climate-resilient maize is feasible through targeted product profiles and field-based phenotyping.
- Use of advanced tools like doubled haploidy, genomic selection, and trait-linked markers boosts genetic gains.
- On-farm testing and farmer feedback play a vital role in refining and validating pipeline maize varieties.
- Over 300 climate-resilient maize varieties have been released in sub-Saharan Africa and South Asia in the past 15 years.
- In Eastern and Southern Africa, CIMMYT-related maize covers 6.3 million ha, reaching 7.5 million farmers and 45 million people.
- Strengthening seed system is important
- Public-private partnerships and innovative delivery models are key to scaling adoption and maximizing impact of improved varieties.

DR. GAYATRI VENKATARAMAN, PRINCIPAL SCIENTIST, BIOTECHNOLOGY, MSSRF, CHENNAI

- Salinity stress affects crop productivity, with plants relying on osmotic stress tolerance, sodium exclusion, and tissue tolerance.
- Sodium exclusion and tissue tolerance act additively to enhance salinity tolerance in cereals.
- In C3 cereals like wheat, rice, and barley, sodium exclusion via the HKT1;5 transporter is the dominant strategy.
- The Saltol/SKC1 QTL in rice, carrying HKT1;5, has been effectively used in breeding for salt tolerance.
- In halophytic wild rice (*Oryza coarctata*), HKT1;5 also aids sodium tolerance via accumulation in leaf and rhizome tissues.
- C4 grasses in the PACMAD clade show greater salt tolerance than C3 grasses due to efficient sodium regulation in shoots.
- MSSRF studies confirm that C4 species restrict sodium delivery to leaves better than C3 crops, maintaining photosynthesis under salinity.



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“ Final remarks

A policy is needed to provide premium pricing and compensate yield penalties for farmers cultivating low-yielding genome-edited-biofortified or nutritionally improved varieties. Technology should support organic farming proponents who assume genome editing to be not environment friendly due to lack of awareness. Importance of bio-fortification, policy integration, and technology for food security.





PARALLEL SESSION III: ENABLING ENVIRONMENT FOR EVERGREEN REVOLUTION: GLOBAL AND NATIONAL POLICIES

This session examined the essential policy frameworks and governance mechanisms required to support an Evergreen Revolution. It will explore how global and national policies can be harmonised to promote sustainable, inclusive, and climate-resilient agricultural systems. Emphasis was placed on creating enabling environments that support smallholder farmers, protect natural resources, and encourage the adoption of agroecological and innovative practices. The discussion highlighted the role of public investment, institutional reforms, research, and multi-stakeholder engagement in shaping resilient food systems. By aligning environmental sustainability with economic viability, the session aimed to offer insights into how long-term food and nutrition security can be achieved through coherent and forward-looking policy action.

Chair: Dr. Andrew Goodland, Program Leader, Africa, AFR, World Bank, Prof. Rudy Rabbinge, Professor- Emeritus, Wageningen University & Research, Wageningen University (Online)

Speakers

- Prof. Pratap Singh Birthal, Director, Indian Council of Agricultural Research - National Institute of Agricultural Economics and Policy Research (NIAP), New Delhi
- Dr. Arabinda Kumar Padhee, IAS, Principal Secretary, Department of Agriculture & Farmers' Empowerment, Government of Odisha
- Dr. Shambu Prasad, Professor, Strategic Management, IRMA, Anand, Gujarat
- Dr. Jiju P. Alex, Trustee, MSSRF & Member, Kerala State Planning Board
- Dr. Shubhada Deshmukh, Mahila Kisan Adhikaar Manch (Forum For Women Farmers' Rights) – MAKAAAM, New Delhi
- Ms. Nabam Piju, Zill Parishan, Chuliyu Village, Arunachal Pradesh

“ Opening remarks

- **DR. ANDREW GOODLAND, PROGRAM LEADER, AFRICA, AFR, WORLD BANK**
- **PROF. RUDY RABBINGE, PROFESSOR EMERITUS, WAGENINGEN UNIVERSITY & RESEARCH, WAGENINGEN UNIVERSITY**

Green revolution is beyond science. It was also about policy revolution and institution strengthening to get something done at such a speed and at such a scale. However, the Green revolution objectives have evolved over time from food security to nutrition security. Today there is talk about conservation and we also talk about stakeholders beyond farmers. There is therefore a need for policy frameworks to evolve over time just as technology does.



“ Speakers



PROF. PRATAP SINGH BIRTHAL, DIRECTOR, INDIAN COUNCIL OF AGRICULTURAL RESEARCH - NATIONAL INSTITUTE OF AGRICULTURAL ECONOMICS AND POLICY RESEARCH (NIAP), NEW DELHI

- Crop diversification focussing on resource use planning, revenue compensation and with focus on value chain strengthening for the new crops
- Investment and innovation in the irrigation system (3 Is), rejuvenate canal irrigation, focus on micro irrigation and automation
- Power sector reforms- tiered system of electricity tariffs, repurposing subsidies for renewable energy, price electricity and direct transfer of subsidies
- Fertilizer sector reforms- Linking fertilizer subsidies to SHGS and directly transferred to farmers. Subsidies should be targeted towards sustainable practices, payment for ecosystem services (PES)
- Market reforms – Price deficiency payment, Decentralized procurement and interstate trade, targeted procurement, involvement of FPOs, community based institutions and private sector in procurement.
- Investment in Research and development as well as refining the research agenda

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DR ARABINDA KUMAR PADHEE, IAS PRINCIPAL SECRETARY, DEPT OF AGRICULTURE AND FARMER'S EMPOWERMENT GOVT OF ODISHA

- Policies around agriculture should factor in climate preparedness that includes disaster preparedness as well as climate resilience in agriculture
- Policies when translated into schemes that are implemented often lose the spirit behind the original policy. It is important therefore to keep that in focus at all times.
- Most policies focus on the farmer but there is need to look at land -water and soil. Soil in particular requires attention in policy making



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- Policies should today focus on small and marginal farmers and their households because they are the most vulnerable
- Private sector potential to be leveraged in areas such as post-harvest
- Need for robust data base for effective targeting for technology adoption
- Focus on resource use efficiency especially around top soil conservation



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DR SHAMBHU PRASAD, PROFESSOR STRATEGIC MANAGEMENT, IRMA, ANAND, GUJARAT

- Agroecological systems should move beyond input substitution to systemic transformation with emphasis on agroecology as a socio-technical transition.
- More scientific work required on agroecology. Since natural farming is prioritised currently baseline data challenges needs to be addressed.
- Women and small marginal farmers play a crucial role in agroecology and therefore there is a need to address challenges like linkages, support systems, land management processes, role of forests and commons.
- Institutional innovations can be strengthened through collective actions such as FPOs work as transition intermediaries, encouraging institutional design and providing capacity Building in creating enabling environments for transitions
- Encourage territorial and landscape approaches, by shifting focus from plot level interventions to landscape scale change.

DR. JIJU P. ALEX, TRUSTEE, MSSRF & MEMBER, KERALA STATE PLANNING BOARD

- Need to focus on short comings and gaps that have come in due to liberalization. Farmers and the agriculture sector were not prepared for it and they are still coming to terms with dealing with the challenges
- There has been no comprehensive land reforms in India other than in 4 states . Agriculture policies need to be rooted in land reforms.
- Weakened public sector and overall capital weakening in agriculture with no assets being created.
- Stagnation in output prices with input prices going up leading to reducing incomes in the farm sector



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DR. SHUBHADA DESHMUKH, MAHILA KISAN ADHIKAAR MANCH (FORUM FOR WOMEN FARMERS' RIGHTS) – MAKAAAM, NEW DELHI

- Increase women's ownership over resources- land, financial and natural resources and control over their own labour
- Need to recognize women as farmers and not as labourers. Need for legal recognition of women through joint titles under FRA and landownership schemes.
- Kitchen gardens to be included under NREGA and Poshan Abhiyan with dedicated budgets
- Promote women-led enterprises, cooperatives, group farming initiatives organizations etc. Especially women run community seed banks and compost

units

- Support women led FPOS and forest enterprises
- Frontline workers to engage women farmers
- Agriculture policies to be gender sensitive understanding the discrimination faced by women in farming systems

MS. NABAM PIJU, ZILL PARISHAN, CHULIYU VILLAGE, ARUNACHAL PRADESH

- The linkage between Forests, land, water is important and needs to be recognized
- Villages in the area need infrastructure and technology. She spoke about the need for cold storage facilities for the horticulture crops.
- The traditional knowledge systems of the north east as also their role in natural resource conservation needs to be acknowledged during policy formulations



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“ Final remarks

Agriculture must transition from mono-cropping of paddy and wheat to diversified systems supported by resource planning, revenue compensation, and stronger value chains. Irrigation investment should focus on canal rejuvenation, micro-irrigation, and automation, while reforms in power, fertilizer, and markets are vital. Power reforms should tier tariffs and repurpose subsidies, fertilizer subsidies must be linked to SHGs and sustainability, and market reforms should enable decentralized procurement, interstate trade, and FPO participation. Priorities include agro-ecological farming, landscape-scale policies, land reforms, decentralized planning, and climate preparedness. Ensuring women's land, finance, and technology access and linking kitchen gardens with MNREGA and Poshan Abhiyan are essential.





PARALLEL SESSION IV: BUILDING THE NEXT GENERATION OF LEADERS

This session focused on empowering the next generation of scientific and agricultural leaders to drive the transition towards sustainable and resilient food systems. By fostering education, mentorship, and inclusive opportunities, young professionals can champion innovations that balance productivity with environmental sustainability and social equity. The session explored strategies to nurture youth leadership in research, policy, and practice, ensuring they are equipped to address the complex challenges of climate change, nutrition, and livelihoods. It also highlighted the importance of creating enabling ecosystems that attract and retain youth in agriculture—through supportive policies, access to resources, and recognition of their role as change-makers in shaping a food-secure and equitable future.

Chair: Shri. K. V. Shaji, Chairman, NABARD, Mumbai, Dr. Joykrushna Jena, DDG (Agricultural Education), ICAR

Speakers

- Dr. Eric Danquah, Professor, Plant Genetics, University of Ghana, ACCRA, Ghana
- Prof. Karim Maredia, Professor and Director of International Programs, College of Agriculture and Natural Resources, Michigan State University, USA
- Dr. Bidyut Chandan Deka, Vice Chancellor, Assam Agricultural University, Assam
- Dr. C. Tara Satyavathy, Director, ICAR-IIMR, Hyderabad
- Ms. Mekala Muthu, Former Panchayat Union Chairman, Arimalam Panchayat Union, Pudukkottai District, Tamil Nadu
- Dr. A.K. Singh, VC, Central Agricultural University, Jhansi

“ Opening remarks

SHRI. K. V. SHAJI, CHAIRMAN, NABARD, MUMBAI

Highlighted NABARD's efforts in providing subsidized loans to accelerate FPO programs and proposals to link land access with credit through Agri-Stack. Stressing the importance of technology and knowledge transfer, he called for blending traditional wisdom with modern science, mechanization, and digital innovations. With over 45,000 youth-led FPOs lacking structured guidance, support is needed to build business plans and scale operations. He emphasized ecosystem support in finance, land access, and agribusiness management training, while urging policies to focus on youth development, climate-resilient villages, and rewarding agripreneurs. NABARD is ready to subsidize young entrepreneurs, linking science, soil, and strong networks.

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“ Speakers



DR. ERIC DANQUAH, PROFESSOR, PLANT GENETICS, UNIVERSITY OF GHANA, ACCRA, GHANA

- He shared his interaction with Prof. M. S. Swaminathan, emphasizing serious investment in science and technology.
- Highlighted Africa's demographic shift—by 2050, 1 in 4 people will be African, making food security urgent.
- Low R&D investment is a major constraint to agricultural transformation.
- Called for a new “Green Revolution in Africa” with quality programs in plant breeding, supported by the World Bank.
- Stressed the importance of promoting youth as leaders and change-makers in agriculture.
- WACCI, established with Cornell and AGRA, trains African plant breeders, now moving into WACCI 3.0 to integrate modern science.
- Partnerships with over 40 institutions, CGIAR, and the private sector aim to strengthen innovation for food security and Agenda 2063.

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PROF. KARIM MAREDA, PROFESSOR AND DIRECTOR OF INTERNATIONAL PROGRAMS, COLLEGE OF AGRICULTURE AND NATURAL RESOURCES, MICHIGAN STATE UNIVERSITY, USA

- Michigan State University's mission is transforming lives through research, teaching, and extension, with a global presence in 88 countries.
- Its College of Agriculture, with 13 departments, engages in strong global collaborations including CIMMYT and WFP.
- The university emphasizes skill-building beyond degrees, technical training, public-private partnerships, south-south cooperation, and farmer engagement.
- Programs serve students, farmers, and industry through problem-solving, field visits (e.g., rice and tea fields), and national education initiatives across 51,000



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schools.

- Offers specialized courses such as agricultural biotechnology, online plant breeding programs, and entrepreneurship training.
- Strong “lab to land” extension model, in partnership with MANAGE, supports applied research and farmer outreach.
- Global scholar and leadership programs nurture future leaders, with alumni like Dr. Kurien exemplifying its impact.



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DR. BIDYUT CHANDAN DEKA, VICE CHANCELLOR, ASSAM AGRICULTURAL UNIVERSITY, ASSAM

- Youth empowerment requires strong mentorship, networking platforms, and institutionalized participation in decision-making.
- Adoption of digitalization, mechanization, and science-based solutions is key to transforming agriculture.
- Ecosystem support through land, finance, infrastructure, and recognition is vital for youth engagement.
- Climate-resilient and sustainable farming practices must be promoted for long-term resilience.
- Academic leaders should foster collaboration, academic freedom, and leadership laboratories to build future leaders.
- Education systems need to provide an enabling ambience where students, teachers, and leaders thrive together.
- Student hubs, agri-business incubation, technology upscaling, and earn-and-learn models can nurture youth as agri-business leaders while ensuring mental well-being.

DR. (MRS). C. TARA SATYAVATHI, DIRECTOR, ICAR-IIMR HYDERABAD

- IIMR positioned India as a global leader in millets – National Year of Millets (2018), Nutri-cereals (2020), and International Year of Millets (2023).
- Established Nutri-Hub; promoted 470 entrepreneurs and 39 FPOs (with NABARD as CBBO) on millet processing and value addition.
- Millet market projected to grow from \$5.05 billion (2022) to \$13.7 billion (2029).
- Millets recognized as nutrient powerhouses (calcium-rich finger millet, iron-rich pearl millet); biofortification as pathway to food and nutrition security.
- Processing challenges addressed through machinery development and farmer access.
- Government introduced national and international policy support and incentives for millets; possible South–South collaboration and a global millet centre.
- Shift from yield-centric to nutrition-centric growth — silent green revolution, climate-smart crop, promoting “biohappiness” and future nutrition security.



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MS. MEKALA MUTHU, FORMER PANCHAYAT UNION CHAIRMAN, ARIMALAM PANCHAYAT, UNION, PUDUKKOTTAI DISTRICT, TAMIL NADU

- Arivolui program (2021) – served as block coordinator, empowering women through training and knowledge sharing.
- Pothugai Pooviyar Mandram formed to strengthen women’s livelihoods and address challenges.
- As Panchayat President (2006, 2011–2015), implemented several programs; Mandram won Nirmal Gram Puraskar.
- Village Knowledge Centre (VKC) initiated by Prof. M. S. Swaminathan (2007) – provided farmers training on soil, seeds, schemes, and nutrition.
- Recognized with several awards; later elected as Union Chairman, focused on community upliftment and literacy.
- Her Mandram promotes leadership building, Balar Sabha for children, climate change awareness, biodiversity, SHG livelihood enhancement, and traditional food for a healthy India.

DR. ASHOK KUMAR SINGH VICE-CHANCELLOR OF RANI LAKSHMI BAI CENTRAL AGRICULTURAL UNIVERSITY, JHANSI, UTTAR PRADESH

- The institute, established in 2014 with Colleges of Horticulture, Forestry, and others, emphasizes research, innovation, and curriculum reform to transform education and human behavior.
- Research and extension should prioritize experiential learning, climate-smart agriculture, and digital integration.
- Agricultural research in India, mainly concentrated in ICAR’s AICRPs, needs more practical, field-oriented approaches.
- Faculty development, industry partnerships, and public–private collaboration are essential to strengthen the system.
- Extension is critical to ensure scientific knowledge reaches farmers and to bridge the 1:4 outreach gap.
- Smart agriculture tools and gadgets can enhance research-extension effectiveness.
- Tribute to Prof. M. S. Swaminathan for his vision: “research with farmers, find solutions, and take them back to farmers.”



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“ **Final remarks**

Young generation are invited to take up the ordinance from prof. M.S. Swaminathan and Transfer the technology lab to land, she has demonstrated field level leadership and has own lot of We have come together the celebrations of MS Swaminathan who has been farsighted in terms of proposing the evergreen revolution and Biohappiness.





PARALLEL SESSION V: SUSTAINING DEVELOPMENT IN A WARMING WORLD

This session focussed on the over-riding significance of climate adaptation to the global South, home to 85 per cent of the world's population, for whom the impact of warming can erode the development gains achieved and are an emerging barrier to achieving sustainable development. It aims to take note of both global and national initiatives for climate adaptation while emphasizing the need to link these with the living concerns of the grassroots, vulnerable groups and communities and the small producers of the global South.

Chair: Ms. Supriya Sahu , IAS, Additional Chief Secretary to Government, Department of Environment, Climate Change & Forests, Government of Tamil Nadu, Dr. Jagdish Krishnaswamy, Trustee, MSSRF, Dean – School of Environment and Sustainability, IIHS, Bengaluru

Speakers

- Dr. Kirit Parikh, Chairman, Integrated Research and Action for Development, New Delhi
- Dr. A.K. Nayak, DDG, Natural Resource Management, ICAR, New Delhi
- Dr. T. Jayaraman, Senior Fellow, MSSRF, Chennai
- Mr. Harjeet Singh, Founding Director, Satat Sampada Climate Foundation, Uttar Pradesh
- Dr. S. Naresh Kumar, Head, Division of Environment Science, ICAR-IARI, New Delhi
- Ms. Ruchika Drall, Deputy Secretary, MoEFCC, GoI

“ Opening remarks

- **MS. SUPRIYA SAHU, IAS, ADDITIONAL CHIEF SECRETARY TO GOVERNMENT, DEPARTMENT OF ENVIRONMENT, CLIMATE CHANGE & FORESTS, GOVERNMENT OF TAMIL NADU,**
- **DR. JAGDISH KRISHNASWAMY, TRUSTEE, MSSRF, DEAN – SCHOOL OF ENVIRONMENT AND SUSTAINABILITY, IIHS, BENGALURU**

Preparedness and adaptation are essential strategies for the future risk posed by climate change, and achieving sustainable growth is not possible without tackling environmental issues through strong policy-driven administrative action on solutions like afforestation, mangrove restoration and pollution control.

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“ Speakers



DR. T. JAYARAMAN, SENIOR FELLOW, MSSRF, CHENNAI

- Climate adaptation, particularly for the Global South, presents a complex scientific challenge because it intersects directly with development needs.
- Fulfilling the Global Goal on Adaptation (GGA) requires significant public finance.
- Need to redefine our existing understanding of resilience, maladaptation, and transformational adaptation.

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DR. KIRIT PARIKH, CHAIRMAN, INTEGRATED RESEARCH AND ACTION FOR DEVELOPMENT, NEW DELHI

- Estimating the economic cost of agricultural adaptation is a major challenge but essential for managing climate impacts on farmers, production, and national GDP.
- Robust economic models are needed to generate accurate cost estimates. Based on these estimates, concrete financing strategies should be developed.
- Financing strategies may include adjustments to domestic support prices and trade policies.



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MR. HARJEET SINGH, FOUNDING DIRECTOR, SATAT SAMPADA CLIMATE FOUNDATION, UTTAR PRADESH

- The massive gap in climate finance represents a critical issue of global inequity and climate justice.
- Since adaptation is a public good often ignored by the private sector, it requires dedicated public investment.
- However, current funding from developed countries amounts to barely 10% of what is actually needed, leaving Global South to face the climate crisis with inadequate resources.
- There is an urgent need to significantly increase public funding to close this adaptation gap.

MS. RUCHIKA DRALL, DEPUTY SECRETARY, MOEFCC, GOI

- India's climate strategy integrates adaptation into the core of public planning to manage the dual challenge of achieving development goals while reducing emissions.
- This approach will be central to the upcoming National Adaptation Plan (NAP), which employs a science-led and locally-driven approach to build resilience in agriculture and other key sectors, guided by principles of social equity, inclusion, and sustainability.



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DR. A.K. NAYAK, DDG, NATURAL RESOURCE MANAGEMENT, ICAR, NEW DELHI

- Building climate resilience depends on strengthening human and social capital, improving ecosystem resilience
- Strategizing equitable resource allocation that links scientific risk analysis with integrated policy and funding mechanisms to directly support livelihoods and vulnerable communities.
- Priority focus areas should include ecosystem services, farmer-level adaptation, coastal ecosystem management, as well as managing future climate risks, hazards, and vulnerabilities.

DR. S. NARESH KUMAR, HEAD, DIVISION OF ENVIRONMENT SCIENCE, ICAR-IARI, NEW DELHI

- Climate change poses a significant threat to agriculture in tropical countries, imposing high adaptation costs, particularly on small and marginal farmers.
- While technological interventions can lead to substantial adaptation gains, they also require significant upfront investment and ongoing costs.
- Simple adaptation measures in agriculture have the potential to improve crop production by 1.3 to 1.6 times current levels.
- Without proactive adaptation, climate change is projected to negatively affect the productivity of all major crops, making investment in adaptation not just beneficial but essential.



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“ Final remarks

Building true climate resilience requires a coordinated focus on public financing, science-led policies, and deep integration of adaptation into development planning. This session has demonstrated that adaptation cannot be viewed as a technical add-on to development processes, but must be fundamental to how we conceive of sustainable growth in a warming world.

The role of adaptation in shaping our future is critically linked to financing mechanisms for climate resilience. Both adaptation strategies and their associated costs must become central to the discourse, bridging scientific research with policy-relevant implementation.

Key outcomes from this session are that current adaptation funding must increase to meet actual needs, adaptation must be embedded in all development planning processes, scientific research on adaptation costs must inform policy decisions, and attention must be given to supporting vulnerable communities and countries.





KEYNOTE LECTURES II

Chair: Dr. Purvi Mehta, Senior Advisor and Head of Agriculture for Asia, Bill and Melinda Gates Foundation, Dr. D.K. Yadava, DDG (Crop Science), ICAR

Speakers

- Mr. Ranveer Chandra, Managing Director, Research for Industry, Microsoft, USA

“ Opening remarks

- **DR. PURVI MEHTA, SENIOR ADVISOR AND HEAD OF AGRICULTURE FOR ASIA, BILL AND MELINDA GATES FOUNDATION**
- **DR. D.K. YADAVA, DDG (CROP SCIENCE), ICAR**
- Agriculture must transition from the Green Revolution to an “evergreen revolution,” expanding across commodities, sectors, farmers, and regions.
- Digital tools such as weather prediction systems, mobile phones, AI, IoT, and precision agriculture are transforming decision-making and farming practices.
- Key requirements for scaling impact include affordability, access, and efficient use of resources like soil and water.
- Technologies should ensure higher productivity, improved profitability, and stronger market linkages for farmers.



- Digitalization, including predictive breeding and AI/ML applications, is essential for boosting productivity, addressing climate change, and meeting future challenges.

“ Speakers



MR. RANVEER CHANDRA, MANAGING DIRECTOR, RESEARCH FOR INDUSTRY, MICROSOFT, USA

- By 2050, food production must increase by 50%, while soils degrade, water tables fall, and arable land stagnates — creating a major global challenge.
- A data- and AI-driven agri-food system is needed, with shared data across the value chain to ensure efficiency, traceability, and sustainability.
- Precision agriculture (soil/nutrient/moisture mapping) can optimize inputs, cut costs, boost yields, and protect the environment, but adoption is low due to high equipment/sensor costs.
- Connectivity is a major barrier; solutions like TV White Space, low-cost satellites, and balloon-mounted smartphones are being tested to connect remote farms.
- FarmVibes.AI, an open-source multimodal platform, supports farm mapping, weather forecasting, and “what-if” analyses, integrating sensors, drones, tractors, and datasets.
- Generative AI can serve as a 24/7 “second opinion” for farmers, assisting in weather prediction, pest control, nutrient mapping, and harvest optimization.
- Active deployments include Baramati (India) and Nelson Farms (U.S.), showing global scalability through the cloud.
- AI/IoT innovations include precision nutrient/moisture/carbon maps, tractor co-pilots, and low-cost Wi-Fi soil sensors.
- Farm data is expected to grow eightfold in 10 years, but 30% of inputs are wasted due to poor tools.
- Cost remains the biggest barrier (47% of farmers), making affordability, accessibility, and scalability critical to ensure productivity, profitability, and sustainability.







KEYNOTE LECTURES III

Chair: Chair: Dr. Balakrishna Pisupati, Country Director, United Nations Environment Programme, India, Mr. S. Mahalingam, Trustee, MSSRF

Speakers

- Dr. Ismail Serageldin, Co-Chair of the Board of Nizami Ganjavi International Center, Emeritus Librarian of Alexandria, Alexandria, Egypt
- Dr. Mahendra Dev, Chairman, Economic Advisory Council to the Prime Minister, Government of India, New Delhi
- Dr. Sheila Obim, Executive Director, Alliance for Science, Nairobi, Kenya

“ Opening remarks

- **DR. BALAKRISHNA PISUPATI, COUNTRY DIRECTOR, UNITED NATIONS ENVIRONMENT PROGRAMME, INDIA**
- **MR. S. MAHALINGAM, TRUSTEE, MSSRF**

Evergreen Revolution remains the critical pathway for future agriculture. He stressed that enhancing crop production, when aligned with sustainability, is the only viable way to ensure food and nutritional security for the growing population.



“ Speakers



DR. ISMAIL SERAGELDIN, CO-CHAIR OF THE BOARD OF NIZAMI GANJAVI INTERNATIONAL CENTER, EMERITUS LIBRARIAN OF ALEXANDRIA, ALEXANDRIA, EGYPT

- Reflected on his long association with Prof. M.S. Swaminathan and outlined today's interlinked global challenges: climate change, water scarcity, poverty, hunger, inequalities, and displacement.
- Emphasized that agriculture, while contributing to greenhouse gas emissions and water withdrawal, is also central to solutions through climate-smart, science-based interventions.
- Stressed reducing post-harvest losses, enhancing nutrition, and lowering food costs while raising smallholder productivity faster than price drops.
- Highlighted new frontiers of technology including AI-driven extension, remote sensing, vertical farming, engineered microbes, lab-grown meat, and protein folding for resilient food systems.
- Called for mobilizing science and technology to empower smallholders, reduce poverty, and build gender-sensitive, climate-resilient agriculture.

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DR. MAHENDRA DEV, CHAIRMAN, ECONOMIC ADVISORY COUNCIL TO THE PRIME MINISTER, GOVERNMENT OF INDIA, NEW DELHI

- Argued for changing the agricultural narrative from production-centric to income-centric, with diversification, inclusivity (women, youth, small farmers), nutrition-sensitivity, and climate resilience as the new goals.
- Introduced the HERS framework (Healthy, Equitable, Resilient, Sustainable agriculture) as guiding principles for future strategies.
- Emphasized public policy reforms, including remunerative MSP, procurement systems, and ecological practices such as IPM, INM, and conservation agriculture.
- Identified hunger and malnutrition challenges—calorie deprivation, protein hunger, hidden hunger, and obesity—calling for biofortification, dietary diversity in PDS, and multisectoral approaches involving health, sanitation, education, and social protection.
- Recommended repurposing agricultural support, redirecting R&D toward green innovation to achieve higher productivity, lower emissions, and healthier diets.



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DR. SHEILA OBIM, EXECUTIVE DIRECTOR, ALLIANCE FOR SCIENCE, NAIROBI, KENYA

- Focused on science communication as a pathway to biohappiness, stressing that innovation must be socially accepted, equitably owned, and co-created with communities.
- Called for training farmers, scientists, policymakers, and community leaders in technology adoption and science communication to combat misinformation.
- Stressed that innovations must be designed for resilience, ecological restoration, agro-biodiversity, and gender equality, not just yield enhancement.
- Emphasized storytelling, grassroots voices, and pluralistic approaches to innovation that integrate indigenous knowledge, youth, women, and farmers.
- Proposed establishing a global science communication platform where youth are trained to create, curate, and verify science content, amplifying marginalized voices and ensuring equitable participation.

“ Final remarks

The session concluded by emphasizing that achieving biohappiness requires more than technological innovation; it necessitates integrating ecological sustainability, gender equality, farmer incomes, and effective science communication. The Session Chair summarized the discussions under three key themes: just transition in agriculture with performance measurement, defining circularity in agriculture, and the role of behavioral and cognitive sciences in addressing current challenges. Guided by Prof. Swaminathan's vision, the keynote reinforced that agricultural progress must prioritize inclusivity, resilience, and sustainability, ensuring that scientific advancements serve society and contribute to a hunger-free, dignified world.





PARALLEL SESSION VI: WOMEN IN AGRICULTURE AND FOOD SECURITY

Women play an essential role in agriculture, contributing across the entire value chain—from planting and harvesting to post-harvest processing and marketing. However, their access to resources, knowledge, and decision-making remains limited. Strengthening women’s roles in agriculture enhances food availability, access, and utilisation, while also contributing to household nutrition and social stability. Empowering women is therefore vital for achieving sustainable food and nutrition security. This session explored the critical contributions of women in agriculture and highlight the need for inclusive policies and practices that recognise and support their central role in building resilient food systems.

Chair: Dr. Nitya Rao, Trustee, MSSRF & Professor, Gender and Development, University of East Anglia, UK

Speakers

- H.E. AMB. Nosipho Nausca-Jean Jezile, Chairperson, of the Committee on World Food Security for the Biennium 2023-2025
- Dr. Renu Swarup, Former Secretary, DBT, Government of India, New Delhi
- Ms. Irish P. Baguilat, Asian Farmers’ Association for Sustainable Rural Development, Philippines
- Dr. R. Rengalakshmi, Executive Director, Area Operations, MSSRF, Chennai
- Dr Anupama Singh, Joint Director (Education) and Dean, PG School, ICARIARI, New Delhi
- Ms. Elisabeth Faure, Representative & Country Director, World Food Programme, India
- Dr. Rahma Adams, Gender Impact Lead Scientist at WorldFish

“ Opening remarks

DR. NITYA RAO, TRUSTEE, MSSRF & PROFESSOR, GENDER AND DEVELOPMENT, UNIVERSITY OF EAST ANGLIA, UK

The diverse roles women play across food systems from production and processing to preparing food and feeding young children. It emphasized the challenges they face and the need for inclusive policies that recognize and support their contributions. Strengthening women's roles in agriculture enhances food availability, access, and utilization, while improving household nutrition and social stability. Achieving gender justice in agriculture requires recognition of women as farmers, redistribution of resources, and their representation in decision-making and leadership roles. Empowering women is essential for building resilient food systems and achieving sustainable food and nutrition security.



“ Speakers



H.E. AMB. NOSIPHO NAUSCA-JEAN JEZILE , CHAIRPERSON OF THE COMMITTEE ON WORLD FOOD SECURITY FOR THE BIENNIUM 2023-2025

- Prof. M. S. Swaminathan served as the first chairperson of the High-Level Panel of Experts on Food Security and Nutrition (HLPE-FSN) from 2010 to 2013, shaping its mission and vision within the Committee on World Food Security (CFS).
- Following his principles of sustainability, equity, and biohappiness, the CFS developed the Voluntary Guidelines on Gender Equality and Women's and Girls' Empowerment (GEWGE) in the context of food security and nutrition.
- The guidelines emphasize that lasting food security and improved nutrition require the economic, social, and political empowerment of women and girls.
- GEWGE is endorsed globally as a crosscutting tool, adaptable to national contexts to address gender inequalities in agri-food systems.
- The guidelines align strategically with SDG 2 (Zero Hunger) and SDG 5 (Gender Equality), linking women's and girls' rights to broader goals of ending hunger and realizing the right to adequate food.

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DR. RENU SWARUP, FORMER SECRETARY TO GOVERNMENT OF INDIA DEPARTMENT OF BIOTECHNOLOGY, MINISTRY OF SCIENCE & TECHNOLOGY

- Despite emphasis on gender equality and equity, progress remains insufficient, highlighting the need for urgent action.
- The UN declared 2026 as the International Year of Women Farmers to recognize their role in agriculture and drive policy and empowerment measures.
- Key challenges for women in agriculture include limited access to resources, land, and technology; exclusion from decision-making; lack of targeted



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training; unrecognized contributions to biodiversity and conservation; poor representation in leadership; and inadequate gender-sensitive investment practices.

- Women's participation in science and technology is low (30–35% in agriculture, much lower in leadership), with pilot hubs showing <10% engagement.
- Technology must move from lab to market with women's needs in mind, supported by capacity building for adoption.
- Three steps to empower women in science and agriculture: provide access to education, build ecosystems for upskilling and leadership, and ensure financial and social empowerment through inclusive policies.
- Scaling gender-focused programs, such as biohappiness centers, is crucial to make technology and innovation accessible to women at all levels.



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MS. IRISH P. BAGUILAT, ASIAN FARMERS' ASSOCIATION FOR SUSTAINABLE RURAL DEVELOPMENT, PHILIPPINES

- Spoke on behalf of 11 million small-scale farmers (women, men, and youth) across 16 Asian countries in crops, fisheries, and pastoralism.
- Challenges for Women Rural Farmers carry multiple burdens (fuelwood collection, food prep, vegetable farming, family care) and lack access to time-saving technologies and women-friendly equipment.
- Digitalization (e.g., for cooperative finance) empowers women, but more investment is needed in social enterprises producing women-focused agricultural tools.
- Women-led farmers' organizations and committees within cooperatives are vital for policy representation, decision-making, and access to markets.
- The upcoming International Year of Women Farmers should be used to amplify voices, secure investment and social protection, and advance research partnerships for evidence-based policymaking.

DR. R. RENGALAKSHMI, EXECUTIVE DIRECTOR, AREA OPERATIONS, MSSRF, CHENNAI

- Women farmers face intertwined time and income poverty due to heavy workloads and restrictive social norms.
- Feminisation of agriculture takes two forms: feminisation of labour and feminisation of managerial roles, often linked to male migration.
- Women's agricultural work must be understood at the intersection of gender, geography, and social identity.
- Time use studies in India show women perform 56% of all work, with 75–80% in agriculture during peak seasons and 95% of domestic/care work.
- Seasonal peaks (planting/harvesting) increase women's workload, causing time deficits in self-care and childcare, reflected in poorer nutrition for women and children.
- There is a need for gender-sensitive Custom Hiring Centres to make agricultural machinery more accessible to women.
- Advocated the “3R approach” – Recognise, Reduce, and Redistribute women's workload.



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DR ANUPAMA SINGH, JOINT DIRECTOR (EDUCATION) AND DEAN, PG SCHOOL, ICAR - IARI, NEW DELHI

- Start orientation and skilling efforts for girls at the school level to build aspirations for leadership and participation in agriculture and allied sectors, and underline the need for integrated education-extension frameworks and scalable impact monitoring
- Argued for mission-mode orientation and policy integration to empower women from early education stages
- Stressed skilling and awareness at the school level, aligning education and extension with agricultural needs
- Called for scalable, ground-level strategies and monitoring frameworks for impact

MS. ELISABETH FAURE, REPRESENTATIVE & COUNTRY DIRECTOR, WORLD FOOD PROGRAMME, INDIA

- Provided global context on climate change and food security emphasizing that women are disproportionately affected by environmental crisis
- Provided global WFP statistics, such as 864 million people facing food insecurity, 44% of 1.99 million supported smallholder farmers being women, and land/credit disparities for women in India (55% of labor, 13% land owned, less than 5% credit)
- Shared examples of women benefitting from World Food Program's market access and climate resilience programs and highlighted projects like the participatory climate services in India
- Stressed integration of traditional knowledge, gender responsive climate strategies and the need to empower women as leaders



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DR. RAHMA ADAMS, GENDER IMPACT LEAD SCIENTIST AT WORLDFISH

- Gender inequalities in fisheries and aquaculture exist at both macro (policy) and micro (customs, norms, data practices) levels, often rendering women's contributions invisible.
- National systems frequently classify women only as “helpers,” reflecting gender-blind approaches in agriculture and fisheries.
- Women face double marginalization from climate shocks and entrenched social/institutional barriers, limiting access to credit, technology, and resources.
- Four pathways to gender justice:
 - Technological innovation: providing suitable tools for post-harvest activities to improve storage, income, and market access.
 - Inclusive livelihoods: training and diversification linking women and youth to higher-value markets.
 - Gender-transformative approaches: leadership empowerment and NGO/relief initiatives to break barriers.
 - Inclusive governance: involving women in water and fisheries

management, finance, and digital skills for resilience.

- Way forward: scale successful pilots, expand digital, technological, and financial inclusion solutions, strengthen gender-disaggregated data, and shift policies and social norms via participatory, evidence-based advocacy.

“ Final remarks

Close gender wage gaps, include paid leave for women farmers, create gender-sensitive social climates, strengthen women-led extension models, and monitor benefit flows from schemes to women farmers for real-world impact. Each speaker emphasized the importance of moving beyond symbolic policy and toward large-scale, institutionalized action for women's empowerment and gender equality in agriculture and food systems.





PARALLEL SESSION VII: REGENERATIVE AGRICULTURE, CHALLENGES & OPPORTUNITIES

Achieving net-zero emissions in agriculture is vital in the face of escalating land and water degradation. Regenerative agriculture offers a pathway to restore ecosystem health through sustainable practices that reduce greenhouse gas emissions, improve soil fertility, and enhance water conservation. This session explored the challenges in adopting regenerative approaches, including limited awareness, policy support, and resource access. It also highlighted key opportunities and innovations in farming techniques and resource management that can drive the transition towards a more climate-resilient, productive, and sustainable agricultural future, while also supporting rural livelihoods and environmental restoration.

Chair: Mr. Takayuki Hagiwara, FAO Representative in India, New Delhi, Dr. Dennis Garrity, Chair of the Board, Global EverGreening Alliance, Kenya (Online)

Speakers

- Dr. Himanshu Pathak, President, NAAS & Director General, ICRISAT, Hyderabad
- Prof. Chittaranjan Ray, Director, Nebraska Water Center, University of Nebraska, USA
- Dr. Ch. Srinivasa Rao, Director & Vice Chancellor, ICAR-IARI, New Delhi
- Dr. V. R. Prabavathy, Former Director, Biotechnology, MSSRF, Chennai
- Dr. Carlo Fadda, Director, Agrobiodiversity, Alliance Bioversity International & CIAT, Kenya

“ Opening remarks

• **DR TAKAYUKI HAGIWARA, FAO REPRESENTATIVE IN INDIA, NEW DELHI**

Prof. M.S. Swaminathan's visionary leadership in promoting sustainable agriculture was recognized and highlighted FAO's initiatives in Punjab and Haryana to address degraded soils, residue burning, and water scarcity. Emphasizing FAO's commitment to soil health, water management, and collaboration with the Government of India, he also discussed Japan's challenges with climate change affecting rice yields due to extreme heat waves. Stressing the need to view agriculture broadly, including poultry and animal husbandry where India has major strengths, he shared his dedication to regenerative agriculture, underscored climate change as a critical global challenge, warned of heat impacts on food production, and called for innovative, sustainable solutions.



“ Speakers



DR HIMANSHU PATHAK, DIRECTOR GENERAL, ICRISAT, HYDERABAD

- Air, water, and soil can naturally regenerate, but overuse is causing degeneration despite India's high food grain production.
- ICRISAT Interventions include promoting resilient crops, INM, conservation agriculture, water harvesting, IPM, soil health, IFS, and mechanization; successful pilots exist but scaling is difficult due to landscape diversity.
- Watershed rejuvenation, degraded land restoration in Odisha, groundnut augmentation in Maharashtra (10,000 ha), and rangeland greening in Ethiopia.
- Agriculture contributes to greenhouse gases; regenerative practices could cut emissions by 150 million tonnes CO₂ equivalent.
- Constraints & Challenges – Sectoral approaches, weak landscape linkages, limited community involvement, knowledge and skill gaps hinder progress.
- Adopt a holistic farming systems approach, strengthen partnerships (national & global), integrate ecosystems, aspirations, and technology to transform agriculture.

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DR CHITTARANJAN RAY, DIRECTOR NEBRASKA WATER CENTRE, UNIVERSITY OF NEBRASKA, USA

- Water & Health Concerns – Declining water levels (e.g., in Nebraska) are linked to rising health issues like pediatric brain cancer and non-Hodgkin's lymphoma.
- Value of Regenerative Agriculture – ROI must be measured beyond yield, including soil health, water sustainability, and environmental conservation.
- Challenges & Constraints – Declining agricultural employment (India: 63%



→ 43.8%; U.S.: ~2%), limited credit, and unfair prices hinder adoption of regenerative practices.

- Environmental Pressures – Depletion of water in highland regions and rising nitrates in groundwater pose long-term risks.
- Way Forward – Avoid one-size-fits-all models; adopt a holistic approach using advanced technologies: Crop simulation modeling, yield estimation, and gap analysis, Nitrogen monitoring & split applications, Soil moisture & evapotranspiration tracking, IoT-enabled tools, biologics, nitrification inhibitors and GHG monitoring, modeling, and carbon intensity tracking

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**DR. CH. SRINIVASA RAO, DIRECTOR & VICE CHANCELLOR,
ICAR-IARI, NEW DELHI**

- Definition & Paradigm Shift – Regenerative Agriculture is a holistic approach that actively improves land, soil, and water, healing both landscapes and livelihoods beyond mere sustainability.
- Agroforestry & Soil Health – Agroforestry restores soil carbon; residue burning harms soil microbes and long-term fertility.
- High-Impact Zones – Focus on drylands, degraded lands, and low-fertilizer districts for scalable transformation.
- Policy & Research Support – Success requires strong policy frameworks, research roadmaps, and coordination among institutions, farmers, and communities.
- Climate & Collective Action – Regenerative agriculture contributes to India's net-zero 2070 goal; achieving resilience and environmental restoration requires shared responsibility between government and public.

**DR CARLO FADDA, DIRECTOR, ALLIANCE BIODIVERSITY
INTERNATIONAL & CIAT, KENYA**

- Nature-Positive Farming & Biohappiness – Advocates “cultivating with nature” to advance human well-being alongside ecological health.
- Environmental Crises – Urgent challenges include deforestation, soil erosion, biodiversity loss, and the mounting costs of global overspending.
- Integrating Knowledge & Innovation – Combine traditional practices with modern research and technologies (drones, sensors) for resilient and efficient farming.
- Soil & Agroforestry – Emphasizes soil microbial diversity for soil health and nutrient cycling; promotes agroforestry to restore lands, enhance biodiversity, and support livelihoods.
- Inspiring Principle – Supporting nature sustains both ecosystems and human communities: “Nature doesn't owe us anything, but by supporting nature, we support ourselves.”



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DR V.R. PRABAVATHY, FORMER DIRECTOR, BIOTECHNOLOGY, MSSRF, CHENNAI

- SDGs & Soil Functions – Regenerative agriculture strengthens soil microbiomes, nutrient dynamics, and rhizosphere health, supporting multiple Sustainable Development Goals.
- Use of Biostimulants & Bio-inputs – Reduces chemical dependency; improves nitrogen and phosphorus availability and enhances yields in crops like millet, tomato, and spices.
- Innovations & Awareness – Bio-capsules and awareness camps (especially for tribal communities) demonstrate benefits and build farmer confidence.
- Benefits of Regenerative Agriculture – Climate change mitigation, lower input dependency, stable productivity, enhanced biodiversity, and improved soil health.
- Challenges & Capacity Building – Transition requires addressing infrastructure gaps, yield variability, new skills, and advancing scientific understanding; MSSRF plays a key role in training and empowering smallholder farmers.

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“ Final remarks

Regenerative Agriculture offers a transformative approach to address soil degradation, water scarcity, and climate change while enhancing long-term productivity. Scaling remains a critical challenge due to diverse landscapes, limited community participation, and inadequate technical skills. Policy support, financial incentives, and technology adoption are essential for mainstreaming RA practices. Partnerships between governments, research organizations, private sector, and local communities must be strengthened. Focus should be placed on holistic outcomes—productivity, profitability, resilience, and environmental restoration rather than yield alone.





PARALLEL SESSION VIII: INNOVATION, VALUE CHAIN AND THE PRIVATE SECTOR

This session explored the transformative role of start-ups, farmers, Farmer Producer Organisations, and the private sector in reshaping agriculture. It examined the innovations across the agri-value chain, focusing on agri-tech solutions, climate-smart practices, and improved market linkages. The session also aims to address key challenges and the importance of collaboration among stakeholders to foster inclusive and sustainable growth. By bringing together diverse voices, it aims to identify practical strategies that enhance productivity, strengthen value chains, and build a resilient, future-ready agricultural ecosystem capable of meeting the evolving demands of climate, markets, and nutrition.

Chair: Dr. C. Chandramouli, IAS (Retd.), Trustee, MSSRF, Prof. Pravat Kumar Roul, Vice Chancellor, Orissa University of Agriculture and Technology, Odisha

Speakers

- Mr. S. Sivakumar, Head, Agri & IT Business, ITC, Hyderabad
- Dr. Meenesh Shah, Chairman & Managing Director, National Dairy Development Board, Anand, Gujarat
- Mr. Manoj Kumar, Social Alpha, Bengaluru
- Dr. C. Anandharamakrishnan, Director, Council of Scientific & Industrial Research - National Institute for Interdisciplinary Science and Technology
- Dr. Shyam Narayan Jha, DDG, (Agricultural Engineering), Indian Council of Agricultural Research

“ Opening remarks

- **DR. C. CHANDRAMOULI, IAS (RETD.), TRUSTEE, MSSRF**
- **PROF. PRAVAT KUMAR ROUL, VICE CHANCELLOR, ORISSA, UNIVERSITY OF AGRICULTURE AND TECHNOLOGY, ODISHA**

Prof. M.S. Swaminathan's contributions to poverty eradication, ecological balance, and farmer empowerment, and introduced Biohappiness as an agricultural vision beyond yield, emphasizing sustainability, resilience, and gender inclusivity. He called for bridging science and society through last-mile innovation, farmer training, and public-private partnerships, stressing the private sector's role in building farmer capacity in GAP, digital literacy, and financial inclusion. Biohappiness was defined as harmony among people, ecosystems, and resources, with an integrated approach to production, processing, and innovation. He highlighted the private sector as a catalyst for transforming value chains and urged climate-smart, technology-driven solutions for smallholders.



“ Speakers



MR. S. SIVAKUMAR, HEAD, AGRI & IT BUSINESS, ITC, HYDERABAD

- Traditional value chains disadvantage farmers due to fragmentation and inefficiency.
- ITC's e-Choupal showcases digital platforms that improve farmer incomes and market access.
- Innovations must target smallholders to avoid rural inequality.
- Supports National Digital Platform for FPOs and Public Digital Infrastructure.
- Advocated mainstreaming climate-smart practices, including carbon markets.
- Urged co-creation of solutions with farmers.

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DR. MEENESH SHAH, CHAIRMAN & MANAGING DIRECTOR, NATIONAL DAIRY DEVELOPMENT BOARD, ANAND, GUJARAT

- Operation Flood's success highlights the power of cooperative, farmer-owned institutions.
- Technology and institutional trust must go hand-in-hand for sustainable impact.
- Dairy's lessons can be applied to other value chains through traceability, local infrastructure, and fairness.
- Aligns with Equitable Value Distribution and Private Sector Co-Investment.
- Emphasised climate-resilient dairying.
- Stressed women's central role in agri-value chains.



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MR. MANOJ KUMAR, SOCIAL ALPHA, BENGALURU

- Startups face a “valley of death” between lab innovations and real-world adoption.
- Patient capital, field validation, and last-mile networks are critical for scale.
- Showcased impact-driven innovations (cold chain, soil diagnostics, solar processing).
- Endorsed Multidisciplinary Research Hubs and 4Ps (Public-Private-People Partnerships).
- Advocated for “impact-corns” delivering social value.
- Urged ecosystem-level collaboration for scaling innovation.

DR. C. ANANDHARAMAKRISHNAN, DIRECTOR, COUNCIL OF SCIENTIFIC & INDUSTRIAL RESEARCH - NATIONAL INSTITUTE FOR INTERDISCIPLINARY SCIENCE AND TECHNOLOGY

- Post-harvest losses undermine farmer incomes and national food security.
- Advanced processing, preservation, and waste-to-wealth technologies create new opportunities.
- Need to shift from “produce more” to “process better.”
- Supports Private Sector Co-Investment and Unlocking Traditional Knowledge.
- Highlighted consumer-driven markets for functional, sustainable foods.
- Called for interdisciplinary collaboration to scale innovations.



DR. SHYAM NARAYAN JHA, DDG, (AGRICULTURAL ENGINEERING), INDIAN COUNCIL OF AGRICULTURAL RESEARCH

- ICAR’s innovations include smart irrigation, AI pest detection, and context-specific mechanisation.
- Technologies must be adapted to local contexts for adoption success.
- KVKs crucial in taking research to farmers but require enhanced reach.
- Urged Bridging Science-Society Gaps and Localised Governance through village councils.
- Stressed PPPs to move research to field-level adoption.
- Science’s success lies in transforming farmer livelihoods

“ Final remarks

The session emphasized that farmer-centric innovation must guide all interventions, with collaboration among cooperatives, startups, corporates, and public research as essential. The 10-Point Call for Action for Biohappiness outlines a roadmap: bridging the science–society gap via shared labs and community innovation hubs; building a national digital platform for FPOs linking markets, finance, and advisory services; investing in climate-smart agri-education, especially for women and youth; unlocking traditional knowledge systems; localizing governance through village councils; incentivizing private sector co-investment; ensuring equitable value distribution; establishing multidisciplinary research hubs; developing public digital infrastructure; and fostering long-term public–private–people partnerships to ensure innovation delivers dignity, justice, and resilience for farmers.



Chair: Mr. Anand Raghavan, Trustee, MSSRF, Chennai, Dr. Himanshu Pathak, President, National Academy of Agricultural Sciences, India & Director General, ICRISAT

Speakers

- Mr. Maximo Torero, Chief Economist, Food and Agriculture Organisation, Rome (Online)
- Prof. Nitya Rao, Trustee, MSSRF & Professor, Gender and Development, University of East Anglia, UK

“ Opening remarks

- **MR. ANAND RAGHAVAN, TRUSTEE, MSSRF, CHENNAI**
- **DR. HIMANSHU PATHAK, PRESIDENT, NATIONAL ACADEMY OF AGRICULTURAL SCIENCES, INDIA & DIRECTOR GENERAL, ICRISAT**

He begins with a humorous anecdote featuring world leaders and “God,” stressing the long-term challenges in achieving political and social transformations. He then pivots to a positive outlook for India’s transition from the “green” to the “evergreen revolution,” emphasizing action over concepts for biohappiness and agricultural sustainability.



“ Speakers



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MR. MAXIMO TORERO, CHIEF ECONOMIST, FOOD AND AGRICULTURE ORGANISATION, ROME

- Global agri-food trade has grown rapidly from \$400 billion in 2000 to \$2.1 trillion in 2023, with structural changes integrating low-income countries more than ever.
- Global calorie trade per person has doubled, improving diet variety but increasing overweight risks in some regions; major wheat and maize exporters include Russia, EU, Australia, US, and Canada, while major importers are Egypt, Indonesia, Turkey, China, and Nigeria.
- India has emerged as a significant player in global agricultural commodity markets, expanding its trade volumes.
- Circular economy strategies in agriculture involve reducing waste, recycling by-products, and using digital innovations like AI and block chain to create closed-loop, regenerative systems.
- Challenges in circularity include export of agri-waste to countries lacking processing facilities, trade imbalances, and environmental risks, necessitating robust monitoring frameworks.
- Policy and institutional development requires science-based standards, regulatory capacity, and traceability; tools like the Food Loss & Waste Measurement Tool and Opt app help track and reduce losses.
- Strong governance, institutional capacity, and holistic approaches are essential to achieve circular economies, an evergreen agricultural revolution, sustainable food systems, and reduced environmental impact.

PROF. NITYA RAO, TRUSTEE, MSSRF & PROFESSOR, GENDER AND DEVELOPMENT, UNIVERSITY OF EAST ANGLIA, UK

- Justice and equity are foundational for achieving biohappiness and sustainable development.
- Food and opportunities must be accessible to all, regardless of social position, with high inequality linked to greater food insecurity (Global Hunger Index 2024).
- Gender inequality increases vulnerability, particularly for women and children, necessitating a human rights-based approach ensuring access, opportunity, and dignity.
- Systems thinking across environment, energy, employment, knowledge, and governance is essential to address policy inadequacies and promote regeneration.
- Employment generation, skill development, and inclusive policies for youth and women in agriculture and allied sectors are critical.
- Transdisciplinary collaboration among scientists, farmers, and policymakers, and bottom-up, community-centered learning systems are vital.
- Governance should be participatory, empowering local voices, especially women and marginalized groups, with finance, training, and capacity-building,



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linking food, water, energy, and public welfare holistically.

- Greater investment in institutions supporting women and farmers is necessary to build resilient, equitable, and sustainable development systems.

“ Final remarks

The relevance of Dr. Torero’s insights on global trade, circular economy, and the role of strong institutions and policy frameworks for sustainable agricultural transformation. He stressed the importance of translating ideas into action, echoing the “concept-to-action” approach, and highlighted the value of international collaboration, technology adoption, and traceability in supply chains as central to India’s evergreen revolution. Reflecting on Dr. Rao’s focus on justice, equity, and gender-sensitive approaches, he underscored the need for inclusive, participatory frameworks, robust governance, and representation for youth and marginalized groups. He encouraged a holistic approach integrating science, policy, incentives, and employment to address food, water, energy, health, and social inequalities.





PARALLEL SESSION IX: DIGITAL TECHNOLOGIES AND ARTIFICIAL INTELLIGENCE IN AGRICULTURE

Digital technologies and Artificial Intelligence (AI) are revolutionising agriculture by enabling more efficient, sustainable, and productive farming systems. From real-time monitoring to data-driven decision-making and automation, these innovations enhance precision and resource use across the agricultural value chain. This session explored the potential of digital and AI-based solutions in the Indian context, addressing both opportunities and challenges. It will examine how such technologies can support smallholder farmers, improve climate resilience, and foster inclusive, longterm sustainability—ultimately contributing to a more equitable and future-ready agricultural sector.

Chair: Dr. Abhay Karandikar, Secretary, Department of Science and Technology, New Delhi, Shri. Abhishek Singh, IAS, Additional Secretary, Ministry of Electronics and Information Technology, Government of India, New Delhi

Speakers

- Mr. Shiv Sharma, Transformative Engineering Lead, India Development Centre (IDC), Microsoft
- Dr. Nidhi Bhasin, CEO, Digital Green Trust, New Delhi
- Dr. S. Velvizhi, Area Director, Coastal Resources and Fisheries, MSSRF, Poompuhar
- Dr. Pushpendra P. Singh, Associate Professor, Department of Physics, Indian Institute of Technology Ropar
- Ms. N. Deepthi Reddy, Chief Women Empowerment, Reliance Foundation, Mumbai
- Dr. Rabi Narayan Sahoo, Principal Scientist, Division of Agricultural Physics, ICAR-Indian Agricultural Research Institute, New Delhi
- Mr. Swapnil Laxman Bhosale, Farmer, Agriculture Development Trust

“ Opening remarks

- **DR. ABHAY KARANDIKAR, SECRETARY, DEPARTMENT OF SCIENCE AND TECHNOLOGY, GOVERNMENT OF INDIA**
- **SHRI. ABHISHEK SINGH, IAS, ADDITIONAL SECRETARY, MINISTRY OF ELECTRONICS AND INFORMATION TECHNOLOGY**

Highlighted the transformative role of digital and AI-based solutions, including cyber-physical frameworks, in making agriculture more efficient and sustainable. They emphasized the use of local data and digital tools for optimizing water use, crop management, and post-harvest processes, with direct benefits for smallholder farmers and rural communities. Allowing support from government-led mega-projects, the chairs stressed the need for collaboration among scientists, technologists, and farmers to enhance productivity, reduce wastage, and strengthen market linkages for national agricultural development.



“ Speakers



MR. SHIV SHARMA, TRANSFORMATIVE ENGINEERING LEAD, INDIA DEVELOPMENT CENTRE (IDC), MICROSOFT

- Ensure equitable AI access for farmers and rural communities while empowering school children to become AI-literate agricultural professionals.
- Build strong collaborations among start-ups, research institutions, NGOs, and government bodies, and replicate successful models to scale adoption.
- Use AI-powered advisory services, unified data platforms, IoT, drones, and satellite tools to support sustainable and localized farming decisions.

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DR. NIDHI BHASIN – CEO, DIGITAL GREEN TRUST, NEW DELHI

- Mrs. Sunitha used Farmer Chat AI to adopt natural farming, cut costs, and improve income during drought.
- Expanding digital access and AI tools can deliver climate-smart, gender-inclusive, and localized farming advice.
- Farmer Chat has already benefited 200,000+ farmers while reducing advisory costs drastically.
- Scaling hybrid AI-human advisory models with peer learning can replicate success across the Global South.



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DR. S. VELVIZHI, AREA DIRECTOR, COASTAL RESOURCES AND FISHERIES, MSSRF, POOMPUHAR

- Expand ICT tools for localized advisories and empower women fishers through digital access and markets.
- Promote community ownership, blend traditional knowledge with modern tech, and enhance marine safety.
- Digitize the fisheries value chain and strengthen VKCs as digital hubs.
- Build fisher capacity, foster multi-stakeholder collaboration, and integrate digital tools into policies.



DR. PUSHPENDRA P. SINGH, ASSOCIATE PROFESSOR, IIT ROPAR

- India achieves only ~50% of crop yield potential; precision agriculture and AI tools are needed to bridge this gap while ensuring sustainability.
- Deploy AI and CPS across the farm cycle, supported by sensors, plant health scanners, VR, and local weather stations for smarter decisions.
- Build a connected AI ecosystem with advisory, diagnostics, and centralized platforms for soil, crop, weather, and market insights.
- Ensure inclusivity, accessibility, and respect for traditional knowledge while boosting productivity and farmer income.



MS. N. DEEPTHI REDDY, CHIEF, WOMEN EMPOWERMENT, RELIANCE FOUNDATION, MUMBAI

- Equip women with mobile tools and digital platforms for farming knowledge, services, and market access.
- Use digital solutions to support fisheries, livestock, and livelihoods through scalable, community-based models.
- WCC India has reached 5.91 lakh women and community members, expanding access to digital tools.
- Examples include SeSTA in Assam (smartphone advisories for tribal women) and DEF in Dausa (digital hubs for schemes, weather, and farming support).



DR. RABI NARAYAN SAHOO, PRINCIPAL SCIENTIST, ICAR-IARI, NEW DELHI

- Precision agriculture uses smart farming, intelligent sensing, IoT, and remote sensing to boost productivity and sustainability.
- Transitioning from the Green Revolution to the Gene Revolution, supported by ICAR's NEPPA program for precision farming innovations.
- Tools like soil fertility mapping, digital monitoring, and AIMS enable accurate, field-scale decision-making.
- Precision aquaculture applies similar technologies for efficient and sustainable fish farming.





MR. SWAPNIL LAXMAN BHOSALE, FARMER, AGRICULTURE DEVELOPMENT TRUST

- Swapnil, a farmer from Maharashtra, shared his experience of establishing an Agricultural Development Trust about a year ago. Over this period, he has been using Microsoft's Agri Plot AI tool, which, according to him, has proven highly beneficial.
- The tool provides crop-based data and supports pest management by identifying the type of pest, the areas at risk, and the appropriate locations for pesticide application. It also offers guidance on water management, advising when to irrigate and how much water is required for efficient irrigation. In addition, the tool assists in land preparation and other field activities.
- Swapnil emphasized that the use of this AI tool has been extremely helpful in improving agricultural practices.

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“ Final remarks

The session concluded with remarks from the chairs, who commended the interdisciplinary collaboration among scientists, technologists, and farmers. They stressed the importance of leveraging digital technologies and adopting a “whole-of-sector” approach to ensure that Indian agriculture becomes more climate-resilient, resource-efficient, and equitable. The chairs encouraged continued dialogue, multi-stakeholder cooperation, and the scaling of proven innovations to achieve the vision of Biohappiness for all.





PARALLEL SESSION X: HARNESSING BIODIVERSITY FOR NUTRITION

This session explored the vital link between biodiversity and nutrition, emphasising the role of agrobiodiversity in creating resilient, sustainable, and nutritious food systems. It highlights the importance of conserving plant genetic resources and protecting farmers' rights as foundations of food security and cultural heritage. Particular focus will be given to smallholder farmers—the primary custodians of biodiversity—whose empowerment through inclusive policies, access to resources, and supportive institutions is essential. The session aims to promote sustainable agriculture that enhances dietary diversity and ensures improved nutrition for both current and future generations.

Chair: Dr. Ramesh V. Sonti, Director, International Centre for Genetic Engineering and Biotechnology, New Delhi

Speakers

- Dr. Firoz Hossain, Principal Scientist, ICAR - IARI, New Delhi
- Dr. V.B. Patel, Assistant Director General (F&PC), Horticultural Science, ICAR, New Delhi
- Dr. Dindo Campilan, Regional Director for Asia, International Union for Conservation of Nature, Thailand
- Dr. E.D. Israel Oliver King, Director, Biodiversity, MSSRF
- Mr. Pius Ranee, Executive Director – North East Slow Food & Agrobiodiversity Society, Meghalaya
- Dr. J.C. Rana, Senior Scientist and Country Representative for India, Alliance Bioversity & Center for Tropical Agriculture, CGIAR

“ Speakers



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DR. FIROZ HOSSAIN, PRINCIPAL SCIENTIST, ICAR - IARI, NEW DELHI

- Global and Indian malnutrition remains high, negatively impacting GDP; every \$1 invested in nutrition yields \$16 in benefits (IFPRI, 2016).
- Conventional approaches—food fortification, dietary diversification, and supplementation—are limited by cost, seasonality, and outreach.
- Biofortification through agro-biodiversity is a cost-effective, sustainable approach providing nutrients in natural form without extra infrastructure or cost.
- India has released 190 biofortified cultivars, including nutrient-enriched rice, provitamin-A maize, biofortified pearl millet, Indian canola, and low-antinutrient soybean.
- Molecular breeding advances target enhanced nutritional traits in maize, soybean, groundnut, rice, and maize hybrids.
- Biodiversity and intellectual property: 9,437 plant varieties registered under PPVFRA (2005–2025), with contributions from farmers (52%), private sector (27%), and public institutions (21%).
- Challenges include precise nutrient analysis, nutrient degradation, pre-breeding, gene/QTL mapping, yield trade-offs, and market incentives.
- Policy recognition: In 2020, 17 ICAR-bred biofortified crop varieties across eight crops were dedicated to the nation on World Food Day.

DR. V.B. PATEL, ASSISTANT DIRECTOR GENERAL (F&PC), HORTICULTURAL SCIENCE, ICAR, NEW DELHI

- Promoting intake to avoid malnutrition and improving health of population
- Adoption of healthy eating habits
- Capacity building for obtaining healthy and safe produce and products
- Increasing exploitation of fruits and vegetables for antioxidants, pigments, healthy oils, phytochemical, bio-fortification, nutraceuticals and pharmaceuticals.
- Improving emphasis on Urban and Peri-Urban Horticulture (UPH) and fruits and vegetables preservations
- Strengthening collaborations amongst scientist in nutrition - health, education and agriculture sectors
- Horticultural diversity is key to a healthy, resilient food system
- Reflecting food needs of population by including availability and consumption of fruits and vegetables must be conserved, utilized, and promoted.
- A call for collaborative global action



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**DR. DINDO CAMPILAN, REGIONAL DIRECTOR FOR ASIA,
INTERNATIONAL UNION FOR CONSERVATION OF NATURE,
THAILAND**

- Adopt Nature-Based Solutions (NbS) to address climate change, food security, water scarcity, and disasters by restoring, protecting, and managing ecosystems, ensuring solutions are adaptive, inclusive, and locally relevant.
- Link biodiversity with human well-being, recognizing its role in balanced diets, climate resilience, soil and water health, natural disease control (OneHealth), cultural value, and crop genetic resources.
- Advance the Kunming-Montreal Global Biodiversity Framework by aligning national and regional biodiversity initiatives and promoting on-farm and wild biodiversity.
- Foster traditional and local knowledge by integrating ecological practices and supporting community-led sustainable approaches.
- Engage multi-sectoral partnerships across health, wildlife, sports, funding bodies, and humanitarian agencies.
- Promote sustainable and healthy lifestyles to reduce ecological footprints and enhance community well-being.

**DR. E.D. ISRAEL OLIVER KING, DIRECTOR, BIODIVERSITY,
MSSRF**

- Mainstream Neglected and Underutilized Species (NUS) into national policies, agricultural strategies, climate adaptation plans, and biodiversity frameworks, with increased R&D support.
- Strengthen farmer-managed seed systems through community seed banks, local germplasm conservation, and participatory breeding to enhance adaptation and nutrition.
- Develop pro-poor value chains supporting smallholder enterprises with fair market access, branding, certification, and ensure women and youth participation.
- Enhance awareness and demand via nutrition campaigns, culinary innovation, school feeding programs, and public procurement of NUS-based foods.
- Foster co-creation and multi-stakeholder collaboration by linking farmers, researchers, private sector, and governments, and creating platforms for indigenous knowledge exchange.



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**MR. PIUS RANEE, EXECUTIVE DIRECTOR – NORTH EAST SLOW
FOOD & AGROBIODIVERSITY SOCIETY, MEGHALAYA**

- Promote dietary diversity by encouraging consumption of at least five food groups daily and integrating indigenous and seasonal foods into diets, school meals, and public nutrition programs.
- Strengthen community-led agroecology through farmer-led biodiversity management, seed exchanges, preservation of local knowledge, sustainable farming, improved soil health, reduced chemical inputs, and protection of traditional crop varieties.

- Empower youth and women by providing skills for biodiversity advocacy, entrepreneurship, and nutrition education, and include them in local food system decision-making.
- Integrate nutrition with climate resilience by aligning programs with climate adaptation strategies and promoting nature-based livelihoods.
- Scale green livelihood opportunities by expanding nature-based enterprises such as organic produce, wild edibles, and eco-tourism to improve indigenous communities' incomes.

DR. J.C. RANA, SENIOR SCIENTIST AND COUNTRY REPRESENTATIVE FOR INDIA, ALLIANCE BIOVERSITY & CENTER FOR TROPICAL AGRICULTURE, CGIAR

- Promote an Evergreen Revolution that is sustainable, biodiversity-based, and nutrition-sensitive.
- Shift from monocropping to diverse agri-food systems for food, nutrition, and ecological security.
- Mainstream neglected and underutilized species (NUS) like millets, pseudocereals, and indigenous fruits into food systems and value chains.
- Encourage the use of traditional varieties and landraces for their nutrition, resilience, and cultural value.
- Expand home and urban gardening, and scale up integrated farming systems to enhance household nutrition and farmer incomes.
- Promote nutrient-dense crops and varieties, short food chains, and value addition for minor crops and tree-borne oilseeds.
- Strengthen capacity building, community conservation, and participatory breeding with farmers, SHGs, and custodian communities.
- Foster research, multi-stakeholder platforms, and global knowledge tools to promote agrobiodiversity and policy advocacy.
- Support family farming as the foundation of sustainable nutrition and food security.



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PARALLEL SESSION XI: SCIENCE-LED PATHWAYS TO SUSTAINABLE RICE AND WHEAT PRODUCTION

Rice and wheat remain central to India's food security and rural livelihoods. However, traditional cultivation methods face growing challenges from water scarcity, soil degradation, and climate change. This session explores science-led solutions to enhance sustainability in rice and wheat systems, including Direct Seeded Rice, zero-tillage wheat, and precision technologies such as dual-purpose seed drills and laser levelling. Emphasis was placed on crop nutrition, digital tools for farmer outreach, and stronger market linkages. Experts from diverse fields share initiatives that support resilient, resource-efficient, and climate-smart cultivation of India's two most critical staple crops.

Chair: Dr. Usha Barwale, MAHYCO, Jalna, Dr. P.K. Singh, Agriculture Commissioner, Ministry of Agriculture & Farmers Welfare, Government of India, New Delhi

Speakers

- Dr. D. K. Yadava, DDG (Crop Science), Indian Council of Agricultural Research
- Dr. A.K. Singh, Former Director and Vice-Chancellor, ICAR - IARI
- Dr. Sudhanshu Singh, Director – IRRI South Asia Regional Centre, Varanasi
- Dr. Bharat Char, Team Lead – Mahyco, Jalna
- Mr. Ajai Rana, Chairman, Federation of Seed Industry of India

“ Opening remarks

DR. USHA BARWALE, MAHYCO, JALNA

Global partnerships are key to driving the next Green Revolution. Prioritize long lasting, sustainable mitigation measures (e.g., improved irrigation systems) alongside adaptation strategies such as developing climate-resilient crop varieties.



“ Speakers



DR. D.K. YADAVA, DDG (CROP SCIENCE), INDIAN COUNCIL OF AGRICULTURAL RESEARCH

- India achieved its highest-ever food grain output in 2024–25 at 353.96 mt (44% higher than 2014–15), with record yields in rice, wheat, maize, oilseeds, and soybean.
- Over 563 extreme stress-tolerant varieties and 125 marker-assisted varieties released; genome editing initiated in 2024 for 24 field crops, producing the first two genome-edited rice varieties in 2025.
- Rs. 500 crore projects target drought tolerance, low water use, and climate resilience across crops, horticulture, livestock, fish, insects, and microbes.
- Farmer awareness, seed storage, breeder seed indents, and public sector share in quality seed have declined, affecting timely and wide-scale dissemination.
- Emerging challenges – Climate change, shrinking arable land, water scarcity, and biotic/abiotic stresses threaten future productivity.
- Double genetic gain to 2.4% by 2050 using advanced tools (Genome editing, speed breeding, doubled haploids, genomic selection, AI, robotics, big data) to develop climate-resilient, biofortified, short-duration, and mechanization-friendly varieties.
- Enhance seed infrastructure, enforce quality regulations, and boost cooperation between national, international, and private sector stakeholders.

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**DR. A.K. SINGH, FORMER DIRECTOR AND VICE-CHANCELLOR,
ICAR - IARI**

- Minus 5 Plus 10 formula approach: Reduce rice cultivation area by 5% (from 46 to 41 million hectares) while increasing production by 10%, requiring a 3% annual productivity growth to reach 6.5 t/ha by 2030, with strong funding and government support.
- Risk of overdependence on the Consultative Group (CG) system for breeding; need stronger domestic capabilities.
- Biofortified multi-nutrient crops already cultivated on over 16 million hectares.
- Farmer adoption of new varieties requires awareness programs and training on benefits.
- Hybrid rice cultivation must be promoted and supported by non-restrictive policies.
- Direct-Seeded Rice (DSR) with micro-irrigation can lower carbon emissions; potential to link with carbon credit schemes.
- Biofortified zinc rice (18 mg/kg) released; commercialization needs domestic IP and solutions to emerging disease challenges.



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**DR. SUDHANSHU SINGH, DIRECTOR – IRRI SOUTH ASIA
REGIONAL CENTRE, VARANASI**

- The Rice–Wheat system contributes over 75% of India’s food grain production, but (EIGP the Eastern Indo-Gangetic Plains) yields (7 t/ha) remain far below NWIGP (the North-Western Indo-Gangetic Plains) levels (12 t/ha) due to delayed sowing and harvesting.
- Over 60% of wheat in EIGP is sown after the optimal Nov 1–20 window, leading to yield losses of 40–50 kg/ha/day.
- Direct Seeded Rice (DSR) and Zero Tillage (ZT) wheat can advance sowing, shorten crop duration, improve turnaround by 7–10 days, and raise wheat yields by up to 0.4 t/ha.
- Medium-duration, high-yielding rice varieties and heat-tolerant wheat cultivars boost productivity and resilience.
- Nursery entrepreneurship ensures timely, quality seedlings and helps manage monsoon variability.
- Mechanization accelerates crop transitions, improves timeliness, and reduces costs.
- Adoption barriers include low mechanization access, lack of suitable DSR/ZT varieties, high weed pressure, and socio-economic challenges.

DR. BHARAT CHAR, TEAM LEAD – MAHYCO, JALNA

- Weed infestation is a major biotic constraint reducing wheat yields.
- Conventional weed control methods (crop rotation, manual weeding, hoeing, tractor cultivators) are costly and time-consuming.
- Herbicide use has become popular among Indian farmers for effective weed management.
- Non-GM Herbicide-Tolerant (HT) wheat varieties tolerate Imidazolinone-class herbicides.
- HT wheat contains a mutated acetolactate synthase (ALS) gene, enabling effective weed control.
- Benefits include higher productivity, increased farmer income, and improved sustainability via zero-tillage cultivation.



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MR. AJAI RANA, CHAIRMAN, FEDERATION OF SEED INDUSTRY OF INDIA

- Rice significance – Grown on ~45 million ha by small/marginal farmers, rice is vital for India's food security and exports.
- Emerging challenges – Climate change, groundwater depletion, GHG emissions, labour shortages, and rising input costs threaten sustainability.
- Shift to Direct Seeded Rice (DSR) – Offers resource efficiency over conventional transplanted rice; adoption hindered mainly by weed control issues.
- FullPage® solution – Integrates smart genetics, SQUAD seed treatment, and IMI herbicide tolerance for broad-spectrum weed control, including weedy rice.
- Water and energy savings – ~30% reduction in irrigation water use and electricity/fuel costs.
- Environmental benefits – Cuts GHG emissions and creates potential income from carbon trading.
- Farmer profitability – Adds ₹8,000–₹12,000/acre through lower costs and sustainable practices, as proven in multi-state trials (2022–2024).

“ Final remarks

Yield improvement initiative has been taken for targeting the 100 lowest-yielding crop varieties for productivity enhancement. Maize cultivation has strong potential for ethanol production. Bridging the knowledge gap in Direct Seeded Rice (DSR) through field-level support and farmer training is essential for productivity. Sustained funding for oilseeds and pulses is required, alongside rice and wheat. Seed systems modernization: Updating the Seed Act with a registry of 10,000 released varieties and integrating it with the SATHI portal, including private sector participation. Rice and wheat requirements should be estimated based on consumption patterns, not just production trends. The priority crop for cultivation should be decided based on its production levels in the specific area. Traditional rice varieties should be linked with the Natural Farming Mission for global market value. Stewardship and technology gaps must be addressed to ensure effective use of innovations.



FARMERS' EVENING FORUM

In this session, the farmers reflect and showcase their leadership on the following themes and their impacts are intricately connected with Biohappiness. They share their achievements, contribution to the sustainable production practices, biodiversity conservation, and promote peer learning and farmers' networks.

Chair: Dr. T. Mohapatra, Chairperson, Protection of Plant Varieties and Farmers' Rights Authority, New Delhi, Dr. Shubhada Deshmukh, Mahila Kisan Adhikaar Manch (Forum for Women Farmers' Rights) – MAKAAAM, New Delhi

Speakers

- Mr Sunil Kumar, Kerala
- Ms Vennila, Tamil Nadu
- Ms Rukmini Khillo, Odisha
- Ms Asmathi Pujari, Odisha
- Ms Sharmila, Tamil Nadu
- Mr Swapnil Laxman Bhosale
- Ms Muthulakshmi, Tamil Nadu
- Mr Kanmal Singh Chauhan
- Mr Sukjeet Singh

“ Speakers

MR. SUNIL KUMAR, KERALA

A progressive farmer cultivating ginger, coffee, pepper, and more than 200 varieties of rice, integrating livestock rearing and value addition.

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- Strong advocate for conservation as its crucial to conserve our traditional varieties while implementing quality seed production for long term agricultural sustainability
- He actively shares seeds and knowledge with other farmers and encourages the use of bio-inputs, which he prepares and supplies himself.
- Various awards especially the 2020-21 Genome Saviour award and State Farmer Award keep him motivated to engage in conservation efforts and he wishes to inspire other farmers through seed sharing

MS. VENNILA, TAMIL NADU

- Ms. Vennila from Kolli Hills, Tamil Nadu, founded the Kolli Hills Agri Bio Research FPO in 2006 with 83 members, now grown to 1,043 members, 30% being women
- The FPO adds value to coffee and millets, selling them through a cooperative society earning ₹1.8 crore annual turnover reflecting FPO's strong economic impact.
- Recently, they partnered with ICAR-IIMR to identify farmers as millet farm facilitators to improve millet production & productivity by value addition and income generation activities, steadily improving their revenue and socio-economic impact.
- She also received the Farmers' Fellow Award in 2023

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MS. RUKMINI KHILLO, ODISHA

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- A tribal woman farmer, Ms. Rukmini Khillo adopted scientific conservation and farming practices after MSSRF's training and exposure programs.
- Inspired by Professor Swaminathan during his visit to her village, she has now conserved 30 varieties of paddy and 30 varieties of millet.
- She advocates for organic farming for soil health and nutritional benefits and mentioned the key role of Community Seed banks for conservation
- As a Board Director of the Bamandeip Producer Company, she helps procure and supply millet to the PDS system and generate income through value addition, thereby improving women's livelihoods.

MS. ASMATHI PUJARI, ODISHA

- Ms. Asmathi Pujari was inspired to adopt scientific farming after joining MSSRF, where she gained training, exposure, and an understanding of the vital link between agriculture, health, and nutrition.
- She began with developing her own nutrition garden and moving toward promoting nutrition gardens to strengthen community health through nutrition

sensitive agriculture

- She focused on cultivating diverse short-duration varieties to overcome water scarcity and resource constraints, ensuring year-round availability of vegetables and reducing dependence on external markets, saving about ₹1,500 annually, and selling surplus produce for extra income.

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MS. SHARMILA, TAMIL NADU

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- Ms. Sharmila, a member of a Farmers Producer Company and Federation, is a fisher and dry fish producer who from being a trainee has now trained 300 farmers.
- Earlier, she lacked knowledge of scientific and hygienic preservation methods, but after MSSRF's training, she is producing 20 varieties of value-added dry fish products.
- She is now learning digital marketing through the Women Connect Challenge (WCC) app which has helped her market her products effectively & increased her income, improving her socio-economic well-being.

MR. SWAPNIL LAXMAN BHOSALE

- Mr. Swapnil Bhosale describes himself as a “lay farmer” adapting to a technological world, farming is not just tradition but it is linked with science & technology.
- AI helps farming become more aligned and beneficial for the farmers by giving right information at the right time on soil moisture, irrigation requirement and pest & disease management, timely application of fertilizers and pesticides in various crops.
- He sees AI and drones as transformative, helping farmers increase income by making informed decisions.
- He considers himself not just as a farmer alone but as a representative who is using digital technologies and AI to reach new heights of agriculture.

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MS. MUTHULAKSHMI, TAMIL NADU

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- Ms. Muthulakshmi, a woman farmer, once thought clinics were only for humans until she discovered “plant clinics” offering pest management advice.
- Enrolling in a plant clinic helped her reduce input cost due to timely advisory, this knowledge reduced her pest control costs for brinjal from ₹4,000 to ₹600–700.
- She also owns dairy animals and manages veterinary advice through a helpline that connects farmers with experts.
- She prepares organic inputs like Panchagavya and leads a 20-member SHG engaged in livelihood activities, earning a good income from 10 milk centres

MR. KANMAL SINGH CHAUHAN

- Initiated a baby corn agri-startup in 1998, overcoming initial marketing challenges, and subsequently established four processing factories that have significantly increased farmer incomes and benefits around 10,000 farmers, including 500 women.
- For his contribution to agricultural entrepreneurship and farmer empowerment, he was honored with the Padma Shri Award in 2019
- Advocates the concept of “bio-happiness” by promoting reduced reliance on chemical fertilizers, biodiversity conservation, and the production of nutritious and healthy food for both human well-being and environmental sustainability.
- Urges greater government support for global marketing of perishable crops such as tomatoes through Farmer Producer Organizations (FPOs) to prevent post-harvest losses and highlights the importance of schemes like “One District, One Product”
- Stresses the need to reduce dependence on imported fertilizers by utilizing locally available resources such as gaushalas for composting, while promoting farmer-led production of bio-fertilizers and bio-pesticides.

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MR. SUKHJEET SINGH

- He emphasizes the role of quality seed production as a foundation for achieving “bio-happiness,” linking improved yields with agricultural sustainability.
- Highlights that good quality seeds can increase yields by 2–4 quintals per acre while reducing pest incidence, thereby improving profitability and resilience for farmers.
- Recommends the adoption of short-duration varieties to save irrigation water, enhance soil health, and enable multiple cropping cycles under climate change conditions.
- Points out the financial difficulties farmers face due to long crop cycles and storage needs, calling for government schemes to provide credit and policy support
- Stresses the need to support small and medium seed companies to improve breeder seed quality and ensure wider farmer access to improved varieties.

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“ Q&A – Key Points

- Need for large-scale replication of pro-women initiatives, with specific policy measures to recognize women as farmers.
- Integrate solar energy for gaushalas and promote bio-CNG schemes as a pathway towards self-sufficiency, climate change mitigation, and farm sustainability
- Making agriculture more attractive and financially rewarding to retain youth interest, ensuring generational continuity in farming.
- Incentives to be provided to conservator farmers and forums at regional, state, and national levels be established to enable dialogue between farmers and traders
- Artificial intelligence should be leveraged not only for improving productivity but also for assessing and mitigating the harmful impacts of current farming practices.

- Importance of assistance in marketing, value addition, and processing, along with stronger institutional handholding by government and NGOs for capacity building

“ Final remarks

MS. SHUBHADA DESHMUKH

- Highlighted that despite their substantial contributions, only 30% of women are legally recognized as farmers, underscoring a major gap in gender equity.
- Reiterated Professor M.S. Swaminathan's call for women's rights in agriculture, emphasizing the need for legal recognition and equal opportunities.
- Stressed that skill development, access to modern knowledge, and technological empowerment are essential for women farmers to overcome systemic challenges.
- Underlined the importance of dignity and respect for women in rural communities as a foundation for inclusive agricultural growth.

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DR. T. MOHAPATRA

- Reflected on Professor Swaminathan's centenary vision, which was pro-poor, pro-women, pro-nature, and rooted in ecological sustainability.
- Acknowledged persistent challenges in processing, value addition, and marketing, but argued that collective action and institutional capacity building are vital to raising farmer incomes.
- Stressed the importance of ensuring farming provides adequate income to sustain families and attract the younger generation to agriculture and also motivate them toward conservation efforts.
- Called for the integration of AI tools, quality seed systems, FPO development, agri-startups, skill building, and strong policy frameworks to build resilient farming communities.
- Urged organizations like MSSRF to continue playing a catalytic role in empowering farmers and advancing sustainable agricultural transformation.

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The chairs concluded that while farmers continue to face multi-dimensional challenges, the solutions lie in inclusive growth strategies that enhance incomes, provide institutional and technological support, and ensure equal recognition of women as farmers. Upholding the spirit of Professor M.S. Swaminathan's vision, future agricultural transformation must remain pro-poor, pro-women, and pro-nature.







KEYNOTE LECTURES V

Chair: Dr. Kezevino Aram, President, Shanti Ashram, Coimbatore, Dr. Ashok Dalwai IAS (Retd.), Chairman, Institute for Social and Economic Change, Bengaluru & Chairman, Karnataka Agriculture Price Commission, Government of Karnataka, Bengaluru

Speakers

- Dr. Dennis Garrity, Chair of the Board, Global EverGreening Alliance, Kenya (Online)
- Dr. Arunabha Ghosh, Chief Executive Officer, Council on Energy, Environment and Water, New Delhi

“ Opening remarks

- **DR. KEZEVINO ARAM, PRESIDENT, SHANTI ASHRAM, COIMBATORE**
- **DR. ASHOK DALWAI IAS (RETD.), CHAIRMAN, INSTITUTE FOR SOCIAL AND ECONOMIC CHANGE, BENGALURU & CHAIRMAN, KARNATAKA AGRICULTURE PRICE COMMISSION, GOVERNMENT OF KARNATAKA, BENGALURU**

Prof. M.S. Swaminathan's centenary is not only a tribute to his monumental achievements but also a call to action for sustainable agriculture, food and nutrition security, and a hunger-free world. India's significant global responsibility, noting that one in five children and one in four young people worldwide are Indian, meaning national actions have far-reaching global consequences. Emphasizing Prof. Swaminathan's vision of cooperation among individuals and institutions, she stressed its importance for addressing today's complex challenges with commitment and compassion. Agriculture has the unique potential to generate outputs exceeding inputs, and achieving biohappiness and sustainability requires a shift from fossil resources to bio-resources, laying the foundation for a bio-economy that supports both humanity and the planet.



“ Speakers



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DR. DENNIS GARRITY, CHAIR OF THE BOARD, GLOBAL EVERGREENING ALLIANCE, KENYA

- Climate Crisis Acceleration – Global heating is now rising at an unprecedented rate of 0.5°C per decade, with temperatures having already passed the 1.5°C threshold. Without urgent intervention, we are heading towards over 2°C warming by the late 2030s, with severe impacts on food security, vulnerable populations, and ecosystems.
- Need for an Evergreen Revolution in Climate Action – Just as the Green Revolution transformed food production, today’s crisis requires a novel, science-driven global movement to slow planetary heating, combining emissions reduction, carbon removal, and direct cooling interventions.
- Sunlight Reflection Technologies – Two relatively mature, feasible, and cost-effective methods were highlighted:
- Stratospheric Aerosol Injection – dispersing particles in the stratosphere to reflect sunlight.
- Marine Cloud Brightening – spraying sea salt particles to enhance low-lying cloud reflectivity, increasing sunlight reflection back into space.
- Addressing Risks and Side Effects – All technologies have side effects, but research indicates these are relatively minor compared to the catastrophic impacts of unchecked 2°C+ warming. Potential impacts include slight reductions in global precipitation, with minimal effect on monsoons and ocean rainfall if applied correctly.
- Communication & Mainstreaming – A major challenge is public awareness and communication of the urgency and science behind climate restoration. Building global consensus, especially among climate-vulnerable and food-deficit nations, is essential to integrate these interventions into a comprehensive climate restoration plan for future generations.

DR. ARUNABHA GHOSH, CHIEF EXECUTIVE OFFICER, COUNCIL ON ENERGY, ENVIRONMENT AND WATER, NEW DELHI

- Global Hydrological Interdependence & Cost of Inaction – Water flows across borders via atmospheric moisture, with some countries as net importers and others as exporters. Disruption from deforestation, land-use change, and poor management can severely affect rainfall patterns, agriculture, and economies. By 2050, water stress could cost India USD 2,520 billion, hitting the poorest hardest.
- Five Mission Areas for a Water-Secure Future – The Global Commission on the Economics of Water recommends:
 - Launch a new revolution in food systems (climate-resilient crops, regenerative agriculture).
 - Conserve and restore natural habitats to safeguard “green water” (soil moisture and vegetation-linked water flows).



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- Establish a circular water economy (wastewater reuse, leakage reduction, resource recovery).
 - Enable clean energy with lower water intensity.
 - Ensure no child dies from unsafe water by 2030.
- Circular Water Economy Potential – Globally, 40% of water is lost through leakage, with only 11% of treated wastewater reused. In India, used water could represent a USD 27–36 billion opportunities by 2047, creating over 1 lakh jobs. However, most urban local bodies require stronger governance, investment, efficiency measures, and accessible data.
 - Governance, Finance, and Data as Enablers – Achieving these goals requires rethinking governance (global cooperation, equitable distribution, just water partnerships), closing the USD 476 billion annual investment gap for SDG 6, valuing blue and green water as natural capital, and building a robust global water data infrastructure to inform decisions.
 - Q&A Insight – Role of Cooperatives & SHGs – On making the circular water economy multidimensional, he stressed scientific aptitude and institutionalisation at both government and community levels. Climate data should be made accessible beyond academic journals to be practical. Regenerative agriculture needs more cooperative research, guided by equity and climate justice principles.

“ Final remarks

The Green Revolution of the 1960s addressed severe food shortages, but with basic food security largely achieved today, there is an opportunity to transform agriculture into a regenerative system. Despite this progress, agricultural production challenges remain, as it relies on shared natural resources such as soil, water, and air, which transcend political boundaries. True wealth in agriculture comes from sustainably managing these resources through circular and renewable approaches. Dr. Aram emphasized that the speakers fostered important discussions and collaborations, highlighting the role of emerging technologies and the urgent need for increased investment in collective thinking to tackle future agricultural challenges.





PARALLEL SESSION XIII A: CLIMATE AND HEALTH: THE POWER OF DATA

This session explores the transformative potential of data in addressing the intricate and growing link between climate change and human health. It highlights how data-driven tools—ranging from early warning systems and climate-health surveillance to AI-powered analytics—can inform timely and effective responses. Emphasis was placed on integrating scientific data with community-level insights to build resilience, guide public health strategies, and support vulnerable populations. The session underscores the urgent need for coordinated, data-informed action to tackle the dual crises of climate and health in a rapidly changing world.

Chair: Mr. Krishna S. Vatsa, National Disaster Management Authority, Government of India, New Delhi, Dr. Sanghamitra Pati, Additional Director General, ICMR

Speakers

- Dr. Vijay Chandru, Executive Advisor ARTPARK-Indian Institute of Science, Bengaluru
- Ms. Marina Romanello, Institute for Global Health, University College London, London (online)
- Dr. Roxy Mathew Koll, Climate Scientist, Indian Institute of Tropical Meteorology, Pune
- Dr. Sagnik Dey, Centre for Atmospheric Sciences, Indian Institute of Technology, New Delhi

“ Opening remarks

MR. KRISHNA S. VATSA, NATIONAL DISASTER MANAGEMENT AUTHORITY, GOVERNMENT OF INDIA, NEW DELHI

High-quality, timely, and standardised health and climate data are essential. Early warning systems can save lives by predicting climate-sensitive health risks and cross-sector partnerships enhance modelling, data sharing, and interventions. Clear communication of risk and uncertainty builds public trust. Urgent political and societal action is needed to leverage data for health resilience.

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“ Speakers



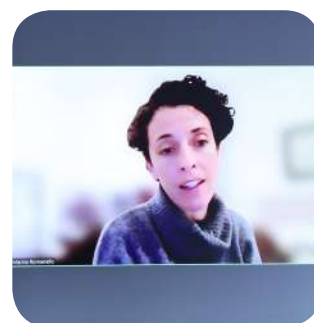
DR. VIJAY CHANDRU, EXECUTIVE ADVISOR ARTPARK-INDIAN INSTITUTE OF SCIENCE, BENGALURU

- Health prediction today mirrors weather forecasting in the 1960s, fragmented data, inconsistent models, and skepticism, but meteorology's transformation through global data exchange, standardized modeling, and transparent uncertainty communication provides a proven blueprint.
- By adopting meteorology's cooperative infrastructure, ensemble modeling approaches, and scenario-based risk communication, health systems can shift from reactive to predictive capabilities.
- This climate science-inspired approach transforms fragmented health data into actionable early warning systems, enabling proactive disease prevention and resilient public health responses to climate-amplified health threats.

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MS. MARINA ROMANELLO, INSTITUTE FOR GLOBAL HEALTH, UNIVERSITY COLLEGE LONDON, LONDON

- The Lancet Countdown's global tracking reveals 10 of 15 climate-health indicators reached record levels in 2023, including a 167% increase in heat-related deaths since the 1990s, 46% rise in dengue transmission potential, and 151 million more people facing food insecurity from extreme weather.
- With projections showing these impacts could triple at 2°C warming while fossil fuel emissions hit all-time highs.
- Current and future rise in temperature requires tailored adaptation measures to address the health risk from climate change.



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DR. ROXY MATHEW KOLL, CLIMATE SCIENTIST, INDIAN INSTITUTE OF TROPICAL METEOROLOGY, PUNE

- Climate change is fundamentally transforming disease patterns and health burdens. Integrating climate science with health data using AI/ML models enables cities to anticipate disease outbreaks months in advance and prepare targeted interventions, transforming raw environmental data into actionable public health intelligence.
- This convergence of technology, meteorology, and epidemiology is essential for building climate-resilient health systems that can protect vulnerable populations in an era of accelerating environmental change.

DR. SAGNIK DEY, CENTRE FOR ATMOSPHERIC SCIENCES, INDIAN INSTITUTE OF TECHNOLOGY, NEW DELHI

- Critical gaps exist between climate services and health sector needs including fragmented data at different scales, inaccessible information, generalized evidence that lacks local context, and absence of compound extreme event analysis.
- The path forward requires harmonizing climate and health data through dedicated portals, conducting location-specific epidemiological studies, translating weather forecasts into health-based early warnings, and building interdisciplinary capacity.
- Bridging these gaps transforms isolated climate projections and health surveillance into integrated, actionable intelligence that enables evidence-based public health responses to climate impacts at local scales where interventions matter most.



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“ **Final remarks**

High-quality, standardised climate–health data and early warning systems are vital to move from reactive to predictive public health responses. The growing evidence of climate-sensitive health risks highlights the urgency of both tailored adaptation measures and accelerated mitigation efforts. Bridging gaps in data, accessibility, and local relevance requires harmonised platforms, interdisciplinary collaboration, and capacity-building. Strong political commitment and clear risk communication are essential to translate data-driven insights into resilient health systems and communities.



PARALLEL SESSION XIIB: CLIMATE AND HEALTH: PREPARING HEALTH SYSTEMS AND COMMUNITIES FOR CLIMATE STRESSORS

As the impacts of climate change intensify, it is vital to enhance the capacity of health systems and communities to manage climate-related risks. This session explores community-led adaptation efforts, policy and governance innovations, and financing mechanisms that promote resilience. Drawing on global research and local experiences, the discussion emphasises inclusive, multisectoral approaches to protect vulnerable populations and support frontline health workers. The session highlights actionable strategies for building climate-resilient health systems and fostering equitable, sustainable responses to climate stressors in an increasingly unpredictable and challenging environment.

Chair: Dr. Vinod Paul, Member, NITI Aayog, Government of India, New Delhi,
Ms. Nitya Khemka, Trustee, Nand and Jeet Khemka Foundation, New Delhi

Speakers

- Mr. Sampath Kumar, Principal Secretary for Health & Family Welfare in the Government of Meghalaya
- Prof. T. Sundararaman, Independent Consultant, Puducherry
- Dr. Dileep Mavalankar, Honorary Distinguished Professor, Indian Institute of Public Health, Gandhinagar
- Ms. Megha Desai, Self Employed Women's Association, Gujarat
- Dr. Ragavendra Bhatta, DDG, (Animal Science), Indian Council of Agricultural Research

“ Opening remarks

- **DR. VINOD PAUL, MEMBER, NITI AAYOG, GOVERNMENT OF INDIA, NEW DELHI**
- **MS. NITYA KHEMKA, TRUSTEE, NAND AND JEET KHEMKA FOUNDATION, NEW DELHI**

Proactive preparedness is essential, focusing on resilient systems through human resources, community participation, technology, emergency response, and disease detection. Heat is identified as a priority climate-related risk. Climate change disproportionately impacts vulnerable communities and stresses health systems. Practical, scalable, and equitable solutions must be grounded in community realities. Strong governance is critical to support effective climate adaptation and resilience strategies.

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“ Speakers



MR. SAMPATH KUMAR, PRINCIPAL SECRETARY FOR HEALTH & FAMILY WELFARE IN THE GOVERNMENT OF MEGHALAYA

- He outlined Meghalaya's integrated approach to building climate-adaptive health systems. Th
- Meghalaya State Council on Climate Change and Sustainable Development, chaired by the Chief Minister, coordinates cross-sectoral action.
- Key initiatives include rejuvenating water storage, restoring land, sustainable management plans for training 14,000 Village Community Facilitators, climate-resilient value chains for 100,000+ farmers and women's economic empowerment through Integrated Village Cooperative Societies
- Since 2022, 6,900 Village Health Councils (≥50% women) have been formed to identify service gaps and co-create solutions, exemplified by Wahlyngdoh's ecological water purification using selected fish species to address a diarrhoea outbreak.

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DR. RAGAVENDRA BHATTA, DDG, (ANIMAL SCIENCE), INDIAN COUNCIL OF AGRICULTURAL RESEARCH

- Underscored the centrality of livestock production to the livelihoods of over 750 million of the world's poorest people, making it a priority sector for climate resilience in developing countries.
- Outlined the dual pathways through which climate change impacts animal health and its direct effects which arise from environmental fluctuations and indirect effects which include altered incidence, spread, and predictability of infectious diseases.
- Extensive rearing systems, livestock are often exposed to multiple stressors— These biological stresses have cascading public health consequences through increased disease burdens from bacteria, parasites, and vectors, and through impacts on food safety.



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- Advocated for resilience strategies anchored in One Health models, cross-sectoral collaboration, and adaptive infrastructure, particularly targeting smallholders and women livestock keepers, to safeguard both livelihoods and food systems from climate-related shocks



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DR. DILEEP MAVALANKAR, HONORARY DISTINGUISHED PROFESSOR, INDIAN INSTITUTE OF PUBLIC HEALTH, GANDHINAGAR

- The session highlighted the Ahmedabad Heat Action Plan (HAP) as a pioneering model for climate-resilient health systems in India,
- Launched in 2013, the Ahmedabad HAP integrated four core interventions: (1) Early Warning and Inter-Agency Emergency Response, using India Meteorological Department forecasts sent to nodal officers for timely action; (2) Public Awareness and Community Outreach through posters, leaflets, and meetings with slum leaders; (3) Capacity Building of health staff and facilities to manage heat-related illnesses; and (4) Reducing Heat Exposure and Promoting Adaptive Measures, including behavioural changes and protective infrastructure.
- Emphasised that early warning systems are the most critical component, requiring strong collaboration between health and weather services for data sharing and local threshold setting.
- Stressed that HAPs must be simple, locally adapted, and reviewed annually to incorporate new knowledge, align with available resources, and reflect ground realities.
- Key lessons learned included the necessity of multisectoral engagement—from municipal authorities to NGOs and academia—the importance of measuring impact after 3–5 years to verify mortality reduction, and the value of sustained advocacy at state and national levels to secure scale-up and policy integration.

MS. MEGHA DESAI, SELF EMPLOYED WOMEN’S ASSOCIATION, GUJARAT

- The shot film underscored SEWA’s “Swachha Aakash Campaign” launched in April 2022 to address climate shocks, framing climate action as both urgent and community led.
- Underscores that climate change acts as a “risk multiplier” for existing gender inequalities in rural India and the impacts are often not gender-neutral; rather, they exacerbate the economic, social, and health vulnerabilities that women already face.
- Emphasis on collective bargaining power—whether for fair prices in agricultural markets, equitable access to government schemes, or representation in climate governance bodies.
- Call to integrate climate resilience with social protection measures—such as maternity benefits, childcare services, and community health outreach—to address the holistic needs of women and their families. Gender justice should be embedded into climate policy



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**PROF. T. SUNDARARAMAN, INDEPENDENT CONSULTANT,
PUDUCHERRY**

- In the context of developing countries, the health system's role in climate change is far more critical
- Stressed the urgency of accelerating progress toward universal access, with expanded public financing and public provisioning as non-negotiable foundations
- Reiterated that the climate resilience as a societal and governance choice to meet 21st-century challenges, with climate change as the most overarching driver
- Drawing parallels with the COVID-19 response, he highlighted the need for adaptable, equity-focused health system models that prioritise vulnerable groups and integrate systemic change into climate adaptation strategies

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“ Final remarks

The diverse and unequal vulnerabilities to climate change across geographies and populations, highlighting the need for tailored; one Health-oriented action. Key insights included adopting systematic, scalable approaches—exemplified by Ahmedabad's Heat Action Plan and Meghalaya's integrated governance model—and embedding resilience into health infrastructure, childcare centres, and education systems. The panel stressed establishing SOPs and preparedness measures to ensure health facilities remain operational during shocks, alongside robust emergency and trauma systems. Priorities identified were universal health coverage, public financing, identity-free care, cross-sector collaboration, resilient infrastructure, community empowerment, and expanded research, particularly on livestock adaptation, reproductive health, and disease control.





PARALLEL SESSION XIV: NAAS-YUVA YOUTH SESSION

“ Opening remarks

On the eve of the M. S. Swaminathan Centenary International Conference, NAAS -YUVA with M.S. Swaminathan Foundation organized a vibrant Youth Parliament Session and Agri-idea pitching to engage young minds in policy-oriented discussions and innovative thinking. The event drew over 100 applications from across the country, from which 25 participants were selected for youth parliament to enact the roles of Government and Opposition members in a simulated parliamentary debate. The agenda, “Strengthening Indian Agricultural Research and Policy for Food and Nutritional Security and Doubling Farmers’ Income,” addressed national priorities aligned with the Sustainable Development Goals, climate resilience, and inclusive growth in the agri-food sector. For Agri-idea pitching, 15 students were selected, of which 14 participated in the session.

- Dr. Haritha Bollinedi, Convenor of NAAS -YUVA, opened the proceedings by briefing the jury and distinguished guests on the programme’s objectives, structure, and expected outcomes. She highlighted its role in developing critical thinking, evidence-based policymaking skills, and leadership capacity among young agricultural professionals.

The distinguished jury comprised:

Dr. Himanshu Pathak, President, NAAS

Dr. A. K. Singh, Secretary, NAAS

Dr. Karim M. Maredia, Foreign secretary, NAAS

Dr. George Smith, Associate Dean, Michigan State University, USA

Dr. B. M. Prasanna, Director, BISA & CGIAR Maize Programme

Dr. Himanshu Pathak, President of NAAS and Chair of the Evaluation Committee,

commended the initiative as a forward-looking platform for youth engagement in agricultural policy formulation. He emphasized that the Academy would be strengthened through greater participation from young professionals and urged NAAS making such activities a regular feature. He also emphasized that such initiatives honored Prof. M. S. Swaminathan’s visionary legacy while empowering youth to contribute to transforming Indian agriculture

through research and policy innovation.

The NAAS YUVA Youth Parliament Session unfolded with a dynamic and theatrical simulation of parliamentary proceedings, bringing agricultural policy debates to life.

“ Speakers

Youth Parliamentary Proceedings

Speaker of the House: Mr. Sandeep Nalla, ensured fair debate, time discipline, and constructive exchange of ideas.

Government Benches- Policy Vision & Initiatives

Prime Minister: Ms. Souraja Mitra: Outlined a vision for inclusive growth, technological innovation, and institutional strengthening for farmers' empowerment.

Minister of Agriculture & Farmers' Welfare: Mr. Bhavnesh Dhiman: Highlighted e-NAM, precision farming, and agri-startup support.

Minister of Rural Development: Ms. Fatima Nazish Khan: Spoke on MGNREGA, water conservation, NaMo Drone Didi Yojana, and rural entrepreneurship.

Minister of Finance: Mr. Kartikey Pandey: Stressed budgetary allocations for rural infrastructure, cold chains, and agri-research.

Minister of Women & Child Development: Mr. Abhinav Kumar Mishra: Discussed Poshan Vatika and nutrition-focused community interventions.

Supporting MPs: Abhishek Arya, Bharath G, Hema Shree S, Jijnasha Bal, Pushpendra, Shaik Nasreen, and Suddamalla Manoj Kumar Reddy – reinforced the Government's stand with region-specific insights: flood-drought mitigation, climate-resilient varieties, enhanced irrigation, stronger market linkages, and farmer skill development. They cited gene-edited crops as an example of policy-backed science to tackle climate challenges and boost yields with reduced inputs.

Opposition Benches: Critical Review & Regional Concerns

Leader of the Opposition: Mr. Abhinav Tiwari: Questioned MSP adequacy, rural internet access, and targeted support for vulnerable farmers. Proposed rural student exchange programmes and stronger measures to curb rural-urban migration.

Opposition MPs: Afshar Ajmeri, Arshdeep Singh, Athira Raveendran, Bhamini Pande, Bipasha Sarkar, Gokulakrishnan Moorthy, Naveena, Oinam Bobochand Singh, Piyush Kumar Kesharwani, Vaishnavi Rajgure raised diverse concerns like

Bihar: Green Revolution gains bypassed, poor ICAR presence, inadequate market access.

Maharashtra: Farmer suicides due to economic distress.

Punjab: Stubble burning, virtual water export through paddy.

Nationwide: Low agri-research budget, underfunded KVKs, limited agri-skill programmes, weak cold-chain

infrastructure.

Chhattisgarh: Lack of comprehensive GM crop legislation despite imports.

They called for tribal-farmer-centric schemes, local seed hubs, stronger contract farming frameworks, and crop diversification incentives.

Government's Rebuttal – Science-Driven Policy

The ruling side assured that its farmer-first approach is backed by science and targeted investments. Key initiatives highlighted:

Paramparagat Krishi Vikas Yojana- scaling up organic farming.

MSP Regulation- ensuring fair, predictable prices.

Marketing Infrastructure - rural haats, mandis, cold chains.

Digital Agriculture Mission- drones, AI, and precision farming.

The Government stressed that these programmes are already operational, designed to boost farmer incomes while ensuring sustainability and resilience.

Agri-Idea Pitching

A total of 14 participants from seven institutions presented their innovative ideas, covering diverse themes such as molecular biology and cognitive agriculture, future crops, value addition and agro-processing innovations, digital platforms, and AI-based farming models.

List of Participants:

S.N. Full Name Organization Name

1 Pradipta Kundu ICAR–Indian Agricultural Research Institute, New Delhi

2 Souraja Mitra Stella Maris College, Chennai

3 Marwan Reddy Chinnam Vivekananda Global University

4 Vikash Meena RLBCAU, Jhansi, Uttar Pradesh

5 Rashmi Chhabra ICAR–Indian Agricultural Research Institute, New Delhi

6 A. Sivakumar ICAR–Indian Agricultural Research Institute, New Delhi

7 Tushar Sinha SHUATS, Prayagraj

8 Gokulakrishnan Moorthy ICAR–Indian Institute of Agricultural Biotechnology, Ranchi, Jharkhand

9 Maga Vishnu T ICAR–Indian Agricultural Research Institute, New Delhi

10 Monika Singh ICAR–Indian Agricultural Research Institute, New Delhi

11 Shaiknasreen ICAR–Indian Agricultural Research Institute, New Delhi

12 Kartikey Pandey Jawaharlal Nehru Krishi Vishwa Vidyalaya, Jabalpur

13 Divyanshu Kumar Singh & Team IAS, BHU, Varanasi

14 Anika

Each individual participant was given 3 minutes, and each team 5 minutes, for an extempore presentation, followed by an interaction with the jury panel comprising Dr. B.M. Prasanna, Regional Director, CIMMYT, and Dr. A.K. Singh, Secretary, NAAS. The jury evaluated the ideas based on potential efficacy, accessibility, affordability, scalability, and presentation skills.

Winners:

Awardees of Youth Parliament

Based on policy articulation, factual depth, regional awareness, and presentation skills, the jury declared:

1st Place – Suddamalla Manoj Kumar Reddy, 2nd Place – Hema Shree S , 3rd Place – Afshar Ajmeri

Awardees of Agri-idea pitching

First Prize: Divyanshu Kumar Singh & Team – Kisan Bandhu: Smart Animal Detection & Deterrent System for Crop Protection, Second Prize: Maga Vishnu T – Project Annapoorna–AI: Hyperlocal Agri-Nutrition for a Healthier India, Third Prize: Tushar Sinha – Harnessing Cannabis: A Green Gold Revolution for Indian Agriculture and Farmer Prosperity

“ Final remarks

Dr. B. M. Prasanna and Dr. A. K. Singh congratulated the winners and all the candidate for their heartfelt participation, urging participants to remain engaged with agricultural science and policy. Dr. Prabina Kumar Meher, Co-Convenor, NAAS-YUVA, delivered the vote of thanks, acknowledging the jury, organizing team, and participants for making the event an excellent exercise in youth-led policy innovation. This Youth Parliament demonstrated how informed, passionate, and science-aware young leaders can address India's agricultural challenges with vision, and evidence-based strategies, bridging the gap between research, policy, and grassroots veracities.





PARALLEL SESSION XV: SCHOOL CORNER

“ Remarks

The Session was comprising of a Debate Competition among the higher secondary students of NCR Delhi and an Address by an eminent personality. The topic of the debate was “Genetically modified crops are essential for food security”.

As managed by Dr. Akshay Talukdar, the Executive Trustee of the Genetics Congress Trust, the program was started with the Introductory remarks from Dr. R P Sharma, the founder member of the Trust. He mentioned how keen was Prof Swaminathan in motivating the young students towards the science of Genetics. Dr. Rajiv Varshney, Professor, Murdoch University, Australia also graced the students and urged them to enjoy science and use it for welfare of the human being. Dr. Trilochan Mohapatra, Chairperson, Protection of Plant Varieties and Farmers Right Authority, Govt. of India and Vice-President of the Genetics Trust attended the program and interacted with the students. Dr. K. C. Bansal, former Director, National Bureau of Plant Genetic Resources, New Delhi delivered a talk on “Genome editing and its benefits”. He also interacted with the students and clarified the doubts of the students on genetically modified crops and encouraged all to follow the path of science.

In total 50 students joined the program out of which 29 participated in the debate- 17 for the motion and 12 against the motion. The participants presented their views very nicely and everyone felt the hard works done by the students. Out of the participants, Ms. Yakshita Khaitri, Ms. Anvesha Mishra and Ms. Pratika Gupta was awarded the 1st, 2nd and 3rd Prizes, respectively. Three more students viz., Ms. Gargi Singh, Ms. Shradha Tripathi and Ms. Gunisha Kapoor was given consolation prizes. The awards and the certificates were presented in the Valedictory Function by Shri M Venkaiah Naidu, Hon’ble former Vice President of India. Besides students, teachers from various schools and parents of the participating students also took part in the program. All the teachers and students were given participation certificate from the organizer.

Out and out, it was a hugely successful program. All the participants enjoyed it and felt happy to be part of it. They also interacted with Dr. Soumya Swaminathan, the Chairperson, MSSRF, Chennai. It was felt by all that such events are required to be organized to spread awareness and develop scientific temper among students. The rapporteurs of the session were Dr. Akshay Talukdar from ICAR-IARI, New Delhi and Meher Gadekar from MSSRF, Chennai.





PLENARY SESSION III: EVERGREEN REVOLUTION – THE PATHWAY TO BIOHAPPINESS: GLOBAL CALL TO ACTION

This session synthesises key insights from across the conference, with session coordinators presenting highlights from their respective discussions. A distinguished panel of experts deliberate on the various dimensions of the Evergreen Revolution and its role in advancing Biohappiness—a state of well-being rooted in ecological sustainability, social equity, and food and nutrition security. The session culminates in a set of actionable recommendations, reflecting the collective wisdom of the conference, which was formally presented during the valedictory session as a ‘Global Call to Action’ for a more sustainable and inclusive future.

Chair: Prof. Nitya Rao, Trustee, MSSRF & Professor, Gender and Development, University of East Anglia, UK, Dr. Angela Lusigi, Resident Representative, UNDP, New Delhi

Speakers

- Dr. Himanshu Pathak, President, National Academy of Agricultural Sciences, India & Director General, ICRISAT
- Prof. Lindiwe Sibanda, Co- Chair, Curt Bergfors Food Planet Prize & Extra-Ordinary Professor, University of Pretoria, South Africa
- Dr. Kent Nnadozie, Secretary, International Treaty on Plant Genetic Resource, FAO
- Mr. Ashok Dalwai IAS (Retd.)
- Dr. Sunita Narain, Director General, Centre for Science and Environment, New Delhi
- Dr. Narayan G Hegde, Trustee, Bharatiya Agro Industries Foundation, Pune

“ Opening remarks

- **PROF. NITYA RAO, TRUSTEE, MSSRF & PROFESSOR, GENDER AND DEVELOPMENT, UNIVERSITY OF EAST ANGLIA, UK,**
- **DR. ANGELA LUSIGI, RESIDENT REPRESENTATIVE, UNDP, NEW DELHI**

The vision for rural transformation goes beyond the Green Revolution and productivity gains, reflecting Dr. Swaminathan's advocacy for ecological sustainability, nutrition security, gender justice, and institution building through democratized markets and producer organizations. It emphasizes the connection between inclusive growth, biohappiness, environmental well-being, and community dignity, aligning closely with the Sustainable Development Goals. This approach calls for achieving food and nutrition security through biofortified crops, reducing chemical fertilizer use, and promoting natural farming. By shifting the focus from productivity to biohappiness, it seeks to link ecological well-being with human happiness, ensuring every family thrives, every child is nourished, and every ecosystem is restored.



“ Speakers



DR. HIMANSHU PATHAK, PRESIDENT, NATIONAL ACADEMY OF AGRICULTURAL SCIENCES, INDIA & DIRECTOR GENERAL, ICRISAT

- Green Revolution relied on four Ps: path-breaking science, political will, progressive farmers, and national/international partnerships.
- Evergreen Revolution expands this framework with additional Ps: private sector involvement and broad public participation at landscape/community level.
- Emphasis on integrated Resource Management: Genetic Resource Management (climate-resilient and biofortified varieties), Natural Resource Management, and Social Resource Management to ensure inclusivity and sustainability.
- Science remains foundational, particularly soil health, linked to the One Health approach.
- Key success factors: Investment in research, innovation, education, extension; and Innovation to drive adoption.
- South-South Cooperation is critical; ICRISAT has established a Centre of Excellence for this purpose.

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PROF. LINDIWE SIBANDA, CO- CHAIR, CURT BERGFORS FOOD PLANET PRIZE & EXTRA-ORDINARY PROFESSOR, UNIVERSITY OF PRETORIA, SOUTH AFRICA

- Measure Progress & Happiness – Create quantifiable indices to track well-being and agricultural progress.
- Market- & Demand-led Production – Shift from supply-driven farming to market intelligence-based, demand-driven, and diversified production.
- Ecosystem & Nutrition Approach – Agriculture must ensure food and nutrition



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security, farmer income, and ecological sustainability.

- Value Chains & Jobs – Strengthen value chains, link research to farms, promote post-harvest management, and generate rural employment.
- Evergreen Agriculture & Farmers' Livelihoods – Focus on soil health, biodiversity, low-input sustainable practices, and putting more money in farmers' hands.



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DR. KENT NNADOZIE, SECRETARY, INTERNATIONAL TREATY ON PLANT GENETIC RESOURCE, FAO

- Protecting Biodiversity, or especially seeds is protecting culture and dignity of people and the communities.
- Protecting Farmers' rights is much important
- Evergreen Revolution is not just a slogan, it's perpetuity of people with nature – living in harmony with nature
- International cooperation is also important – no countries are independent – Most of the threats to humanity like climate change, pollution, socio-geo-political issues etc can be resolved through cooperation
- As Professor used to say, conservation and sustainable use of biodiversity must include and acknowledge the traditions and culture of rural and tribal communities.
- Let's carry forward Professor MSS's vision, where productivity is balanced, equity and sustainability are ensured.

MR. ASHOK DALWAI IAS (RETD.)

- Treat agriculture as an enterprise using an integrated agro-system approach, addressing both production and post-production to reduce food loss, safeguard ecology, and optimize farmer opportunities.
- Adopt an ecosystem-based perspective for supply and demand: ensure food and nutrition security for all, income security for farmers, and ecological health; promote resource efficiency, benign technologies, biodiversity-based production, inclusion of livestock and fisheries, and nutrition-led, market-integrated agriculture.
- Value chain development should start with R&D, not just farmers, to ensure effective adoption, appropriate varieties, and evidence-based practices; address crop and subsector imbalances, and rebrand agriculture to emphasize primary and secondary production for youth employment.
- Advance integrated circular and bioeconomy approaches linking food and non-food systems, and foster regional and global cooperation.



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DR. SUNITA NARAIN, DIRECTOR GENERAL, CENTRE FOR SCIENCE AND ENVIRONMENT, NEW DELHI

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- Institutionalizing Action & Accountability – Proposal for an Annual Bio-Happiness Conference (ABC) to track commitments, actions, and progress by stakeholders each year.
- Equity & Rights – Concerns over access and benefit-sharing (ABS) in genetic resources; need for fair policies that protect the interests of the Global South and local communities.
- Women & Vulnerable Groups – Emphasis on the role of women farmers, landless laborers, and marginalized groups; need for climate-resilient, women-led farming models ensuring safety, dignity, and nutrition.
- Technology, Policy & Investment – Combine modern tech (AI, innovations) with traditional knowledge; adaptive policies, land reforms, collectives, and both public–private investment are essential for inclusive growth.
- Community, Resilience & Well-being – Focus on nutrition security, ecological sustainability, value chains, and rural jobs; integrate happiness, dignity, and resilience into agricultural transformation (linking to the idea of a happiness index).

DR. NARAYAN G HEGDE, TRUSTEE, BHARATIYA AGRO INDUSTRIES FOUNDATION, PUNE

- We have so many technologies including AI. However, we have and the technologies should be tailored so that it can be used by the 85% farmers marginal
- We need to take up the validation of practices like use of organic/natural farming inputs, because the farmers seem confused of different inputs from different sources
- Agricultural extension – the present system needs to be extended with champion farmers, importantly women farmers as resource persons
- Farmers are also getting different planning materials from different sources. Can we do something to help famers to protect his/her interests and choices? Scientists need to have a Doctor-Patient relationship with the farmers.



“

“ **Final remarks**

Innovative policy and adaptive institutions are essential, since ecology and sustainability are evolving agendas. Harnessing technology with traditional knowledge is critical, ensuring AI and modern tools complement indigenous practices. Empowering women and traditional communities is central—not just as beneficiaries but as decision-makers in land reforms, farmer collectives, and natural resource management. Paradigm shift in investment is needed, balancing public and private investment while integrating value chains to create jobs and engage youth. Building community dignity and resilience enhances “biohappiness,” linking well-being with sustainable livelihoods for smallholders and women. Operationalizing biohappiness requires rethinking metrics, moving beyond the Global Happiness Index to alternate, context-relevant measures (e.g., Bhutan’s Gross National Happiness model). Recognition of contributions such as the book on Prof. M.S. Swaminathan, underscoring his legacy as the “Father of the Green Revolution and Farmer’s Friend.”





GLIMPSES FROM VALEDICTORY







VALEDICTORY SESSION - EVERGREEN REVOLUTION – THE PATHWAY: TO BIOHAPPINESS GLOBAL CALL TO ACTION

“ Welcome

DR. SOUMYA SWAMINATHAN, CHAIRPERSON, M.S. SWAMINATHAN RESEARCH FOUNDATION

Dr. Soumya Swaminathan highlighted the uniqueness of the conference, which brought together scientists, students, farmers, international delegates, and policymakers. Unlike conventional scientific meetings, this gathering encouraged diverse and challenging voices, fostering fresh ideas and solutions.

Quoting the Prime Minister’s inaugural address, she reiterated the distinction between food security already achieved and the urgent challenge of nutrition security. She also noted his emphasis on climate change, geopolitical tensions, and Prof. Swaminathan’s belief that true national security rests on food security: “A nation with grains, not guns, will progress.”

Dr. Swaminathan stressed the centrality of farmers, fishers, livestock keepers, and aquaculture communities in achieving nutrition security, underscoring the importance of ensuring their welfare, access to resources, and recognition of women farmers’ rights.

She appreciated the cultural dimension of the conference, with farmers presenting folk performances that celebrated biodiversity, farming, and nature. Linking this to the theme of bio-happiness, she recalled Gandhiji’s words that “nature provides for our needs, but not for our greed”, noting that humanity must correct its overexploitation of natural resources.

In conclusion, she pointed to the forthcoming Call to Action being prepared from the conference deliberations, aimed at charting a collective path forward.



She expressed confidence that with the guidance of dignitaries, India could set an example for the world by leading an era of bio-happiness.

“ Global Call to Action



DR. E.D. ISRAEL OLIVER KING, DIRECTOR, BIODIVERSITY, MSSRF

Dignitaries across the country and globally have joined and have prepared this global call to action on bio-happiness.

As we commemorate the centenary of Prof. M. S. Swaminathan, the father of India's Green Revolution and global champion of sustainable development, we unite in a moment of profound reflection and renewed resolve. The International Conference on Evergreen Revolution, the pathways to bio-happiness held in New Delhi brought together over thousands of delegates from India and across the world, scientists, farmers, policy makers, youth, civil society leaders and international organisations working in these domains. This historic gathering reaffirms that Prof. Swaminathan's vision of a world where science serves the vulnerable, the pro-poor, pro-nature and pro-women, the philosophy of Prof. Swaminathan, where ecological balance and food security coexist in harmony, where innovation uplifts human dignity, equity and well-being, remains more relevant than ever.

In the face of unprecedented global challenges, climate crisis, biodiversity loss, pandemics, growing demands on the world's natural resources, the growing inequality, we call for a transformative shift, a new contract between people and nature, grounded in the principles of evergreen revolution and inspired by the ethos of bio-happiness. The vision, bio-happiness for all, this talks about bio-happiness, the joy and well-being that emerges when the biodiversity is conserved and wisely used by human development, for human development, livelihoods and health. It represents a future where every human being is nourished and healthy, every farmer is empowered and respected, every ecosystem thrives and regenerates.

This vision builds on Prof. Swaminathan's lifelong efforts to harmonise ecology, economics and equity in the face of the climate crisis and financing gap and calls for resilient systems that deliver productivity and sustainability, innovation and inclusion, integrity and resilience, and the science and solidarity. It's based on principles of social justice, dignity and the right to food, land and livelihoods for all. The global call to action on bio-happiness that has 10 priorities, rethinking food and farming, strengthening farmers' managed seed systems, technology innovation with equity, democratising knowledge management systems, policy and governance pathway for transformative challenge, advancing social equity and gender justice, responsible private sector engagements, rethinking global development, research and communication, mainstreaming One Health approach and pandemic preparedness. The global call for action on bio-happiness 2025. We, the participants of MSS 100

International Conference, declare the following. We reaffirm our commitment to zero hunger, zero poverty and zero biodiversity loss.

We declare bio-happiness as a new framework for development rooted in biodiversity, equity and ecological well-being. It blends traditional and ecological wisdom with modern science and redefines leadership as stewardship. We call for a decade of action on forgotten foods, promoting neglected species for nutrition, livelihoods and resilience, including wild plants and aquatic foods to ensure dietary diversity rooted in diverse cultural and social and agro-ecological context.

We are committed to advancing gender and social justice within agri-food systems and commit to enabling youth and women as the engine of transformation. We urge the adoption of data-driven and science-based and people-centric strategies to address the climate, health, agriculture, livelihood and equity nexus. We commit to harmonising and scaling relevant indigenous practises, traditional ecological knowledge and farmer innovation.

We call for creation of global coalition on bio-happiness, linking policy, research and action across the countries. We will work to mainstream nature-positive, community-led and future-ready food system into all national agendas for human health and well-being. We commit to strengthening public and private engagements for win-win solution that fosters sustainable development.

We commit to the adoption of One Health approach at different scales to protect planetary health. Let this be our moment of change. Let this call to action ignite a global movement towards social justice, sustainability and collective prosperity.

We, the farmers, scientists, civil society, government, international and business organisations honour Professor Swaminathan not only by remembering his legacy but renewing our pledge to carry it forward boldly, inclusively and urgently. Professor Swaminathan said, if agriculture goes wrong, nothing else will have a chance to go right. Let every nation, every village, every individual, including every child be part of this resolution.

A resolution that brings food, income, dignity and joy not just to the fortunate few but to all. This is endorsed by MS Swaminathan Foundation, Indian Council of Agriculture Research, Indian Agriculture Research Institute, National Academy of Sciences, Ministry of Agriculture and Farmers' Welfare Government of India, partner organisations, farmers' networks, international agencies, youth and women collectives, speakers of this conference, delegates including farmers, researchers, practitioners and private sector. And I would like to say that this particular call to action will be on website for next 15 days and we are requesting each and every one of you and scientific and development practitioners across the country to contribute, amend, make changes and after that we will finalise it for public use.

“ Remarks



DR. RAIMATI GHIURIA, ‘QUEEN OF MILLET’, A TRIBAL FARMER FROM ODISHA

Dr. Raimati Ghiuria, ‘Queen of Millet’, a tribal farmer from Odisha shared her journey of learning traditional cultivation practices of millet and paddy from her elders, which she continues to follow through organic methods. She recalled with pride how Professor M.S. Swaminathan once visited her village, chose to sit on the floor with the farmers, and discussed agricultural practices directly with them. He encouraged the adoption of improved methods, particularly the creation of community seed and grain banks. Acting on this advice, the farmers established such banks, freeing themselves from dependence on landlords.

Today, she and her group have organized over 500 women farmers into a Producer Organisation (PO), with a special focus on millet cultivation. She also runs a farm school, where she has personally trained more than 2,000 farmers. Despite challenges such as the absence of a dedicated district mandi for millet, she reported that the collective has been able to achieve significant benefits. Expressing her gratitude, she credited Prof. Swaminathan’s guidance as the inspiration for their progress and empowerment.

“ Special Remarks



DR. HIMANSHU PATHAK, PRESIDENT, NATIONAL ACADEMY OF AGRICULTURAL SCIENCES, INDIA & DIRECTOR GENERAL, ICRISAT

Dr. Himanshu Pathak, President, National Academy of Agricultural Sciences, India & Director General, ICRISAT, in his address, the speaker emphasized that the vision of evergreen revolution and bio-happiness must go beyond food production to include economy, ecology, empowerment, equity, equality, and empath, particularly empathy for nature and all living beings. True farmer happiness comes when the land not only provides food and income but also ensures security while protecting the environment, bringing prakriti (nature) and pragati (progress) together in harmony. Reflecting on the deliberations of the three-day conference, he noted the lessons from the Green Revolution: path-breaking science, strong political will, progressive farmers, and robust partnerships. To make agriculture evergreen, these elements must now be strengthened and broadened. The future requires science-driven approaches, integrating new tools such as artificial intelligence and genome editing, with traditional knowledge systems. He stressed that agriculture must be soil- and nature-centric, based on the holistic One Health concept linking soil, water, forests, animals, air, and people.

Partnerships between national, regional, and international were underlined as

essential, including the role of CGIAR centres and the recently established ICRISAT Centre of Excellence for South-South Cooperation in Agriculture. Such platforms can help the global South share knowledge, technologies, and innovations.

Concluding, he called on all stakeholders to join hands as in the past, reaffirm commitments, and translate the vision of evergreen, sustainable, and ecologically sound agriculture into practice. He congratulated participants for their contributions and positive engagement, and expressed confidence that this vision could be made a reality.

“ Special Remarks



MR. DEVESH CHATURVEDI, SECRETARY, AGRICULTURE, GOVERNMENT OF INDIA

Mr. Devesh Chaturvedi, Secretary, Agriculture, Government of India emphasized that Professor M.S. Swaminathan was not only the architect of India's Green Revolution but also a catalyst for transforming governance. He recalled how the Green Revolution of the 1960s reoriented the Indian Administrative Service from a primarily regulatory system toward a development-focused framework. Under Dr. Swaminathan's leadership, administrative units such as blocks and tehsils became central to agricultural progress, district collectors took on the role of development officers, and village-level workers became active agents of change. This alignment of science with governance, he noted, remains one of Dr. Swaminathan's enduring legacies.

Reflecting on India's agricultural progress, Mr. Chaturvedi acknowledged achievements in wheat, rice, and pulses, while highlighting continuing challenges in oilseeds. He underlined the importance of moving beyond food security to encompass nutritional security and sustainable agriculture, especially given that nearly half of India's workforce—and over 58% of rural workers—depend on agriculture. With 86% of farmers being small and marginal, policies must remain sensitive to their realities. He outlined farmer-centric initiatives such as PM-Kisan, crop insurance schemes, low-interest loans, and the promotion of Farmer Producer Organizations (FPOs) to strengthen collective resilience and market power.

Mr. Chaturvedi cautioned against a purely utilitarian focus on productivity, stressing the need to combine it with a deontological perspective—ensuring that gains are achieved sustainably, without overuse of fertilizers, pesticides, or groundwater depletion. He reiterated that policies must balance productivity with environmental protection and long-term viability. Commending the global call to action emerging from the conference, he expressed confidence that it would provide valuable guidance for shaping agricultural policy and practice in the years ahead.

“ Special Remarks



DR. MANGI LAL JAT, DIRECTOR GENERAL, INDIAN COUNCIL OF AGRICULTURAL RESEARCH & SECRETARY, DARE, GOVERNMENT OF INDIA

Dr. Mangi Lal Jat, Director General, ICAR & Secretary, DARE, Government of India, underlined that the Call to Action presented during the conference provides a clear roadmap for advancing the evergreen revolution, sustainable agri-food systems, and the vision of bio-happiness. To translate this vision into practice, he highlighted a framework of 15 Cs as guiding principles.

The first one is context, and context matters. I think we have to contextualise what we do, how we do, where we do.

The second one is the customer. I think we need to consider our customers, just not the farmers, but the larger customers. What we design in terms of bio-happiness, evergreen revolution, or agri-food system, the customer's consideration is very, very important.

The third one is consumption. What are we consuming? How are we consuming? Where are we consuming? And I think designing of the agri-food system towards bio-happiness depends on the consumption pattern, and which is changing, and changing rapidly. The fourth one is cost.

And I think we need to think about cost of action, cost of inaction, cost of wrong action, which will determine our future, and it's very, very important. So the cost consideration is important. Once we do that, then the fifth comes co-creation.

We have to co-create the agri-food system towards the bio-happiness. The sixth comes, we have to transition from commodity to system. I think that transition is something very, very important. We can't afford to still live in the commodity mode, when we had green revolution, rice, wheat, this and that. I think we need a system, and system includes everything. Then the seventh comes, not only the cultivators, but we need to think about the community. So the community comes into the picture, it's not only the cultivators. I think focussing just on cultivators is not going to help us, until we have the community inclusiveness. So that is the seventh one.

The eighth one is collaboration. Dr. Patak mentioned about South-South. I think collaboration, collaboration, and collaboration is the name of the game. We have to work together. So that togetherness is important. The ninth one is convergence, we can't afford to work in silos.

The bringing convergence is very, very important. So that's the ninth C. The tenth one is whatever we do, we do towards climate action. So the climate is very, very important, I think we have to protect our environment, and I think climate action

is important. And under climate, the eleventh comes carbon, carbon is the foundation, the basis of life. So I think we do our actions towards carbon. Twelve comes credit, without money nothing will move.

So I think that's important, we have to consider that in our actions. The thirteenth comes competence. I think competence is very, very critical, without competence we can't translate all those. So the competence is very, very critical. The fourteenth comes our commitment. So commitment, we all have to commit, until we have the commitment, we can't translate.

And finally, we have to communicate. So that's the fifteenth C. And I think those fifteenth C are very, very important for this call for action. And we at Indian Council of Agriculture Research are committed to deliver, to do this, and in that context, I request you all, for your guidance, for your support, for that call for action.



**HON'BLE SHRI VENKAIAH NAIDU,
FORMER VICE PRESIDENT OF INDIA**

“ Valedictory Address

The conference, aptly titled “Evergreen Revolution: The Pathway to Bio-Happiness,” commemorates the life, vision, and legacy of one of India's greatest agricultural scientists and Padma Vibhushan awardee, Professor Swaminathan, whose contributions transformed the nation's agricultural landscape and ensured food self-sufficiency during critical periods of shortage. Drawing on decades of close association with him, it is evident that Professor Swaminathan was not only a planner, scientist, and researcher, but also a humanitarian and visionary, committed to the welfare and dignity of farmers. He laid the scientific foundation for the Green Revolution, ensuring that India moved from a ship-to-mouth existence to self-reliance in wheat, rice, and other essential crops, and his emphasis on nutrition, environmental stewardship, and inclusivity shaped the concept of the Evergreen Revolution.

Professor Swaminathan's work emphasized the integration of technology with ecology, promoting sustainable

agricultural practices that safeguard natural resources for future generations. Through his leadership in ICAR, as Principal Secretary, and as Chair of the National Commission on Farmers, he championed farmer-centric research, region-specific technologies, and strengthened extension systems such as Krishi Vigyan Kendras to ensure that innovations reached the grassroots. His commission laid out comprehensive recommendations on land reforms, credit access, insurance, technology dissemination, market access, and the recognition of women in agriculture, which remain crucial for advancing agricultural sustainability and farmer welfare. Swaminathan also introduced the concept of Bio-Happiness, linking biological resources with livelihood security, nutrition, and dignity, underscoring that research and policy must serve society and prioritize farmer welfare.

In addition to his national contributions, Professor Swaminathan made significant global impacts, advocating sustainable agriculture, ethical use of biodiversity, and equitable access to agricultural knowledge. His vision inspires India's continued commitment to inclusive, sustainable, and future-focused agricultural policies. Reflecting on India's current economic progress and global standing, it is clear that the nation's growth is underpinned by its farmers, researchers, and youth. Despite global challenges, India remains a sovereign, resilient, and vibrant democracy, guided by the principles of Vasudhaiva Kutumbakam and "share and care." In conclusion, paying tribute to Professor Swaminathan entails implementing his vision and recommendations, fostering the next generation of agricultural leaders, and upholding agriculture as a central element of India's culture, economy, and sustainable development. The M.S. Swaminathan Research Foundation is commended for continuing this mission, guiding and educating youth, and promoting the values of innovation, sustainability, and farmer welfare.





Evergreen Revolution: The Pathway to Biohappiness

On the Occasion of the Birth Centenary of Professor M.S. Swaminathan New Delhi, India | August 7–9, 2025

Preamble

As we commemorate the centenary of Professor M.S. Swaminathan—father of India’s Green Revolution and a global champion of sustainable development—we unite in a moment of profound reflection and renewed resolve. The International Conference on Evergreen Revolution – The Pathway to Biohappiness, held in New Delhi, brought together over a thousand delegates from across the world—scientists, policymakers, farmers, youth, civil society leaders, and international organisations.

This historic gathering reaffirms that Professor Swaminathan’s vision—of a world where science serves the vulnerable (pro-poor, nature and women), where ecological balance and food security coexist in harmony and where innovation uplifts human dignity, equity and well-being —remains more relevant than ever.

In the face of unprecedented global challenges, climate crises, biodiversity loss, pandemics, growing demands on the world’s natural resources, and growing inequality, we call for a transformative shift: a new contract between people and nature, grounded in the principles of an Evergreen Revolution and inspired by the ethos of Biohappiness.

The Vision: Biohappiness for All

Biohappiness is the joy and well-being that emerges when biodiversity is conserved and wisely used for human development, livelihoods, and health. It represents a future where:

- Every human being is nourished and healthy,
- Every farmer is empowered and respected,
- Every ecosystem thrives and regenerates.

This vision builds on Professor Swaminathan's lifelong efforts to harmonize ecology, economics, and equity in the face of the climate crisis and financing gap and calls for resilient systems that deliver productivity and sustainability, innovation and inclusion, integrity and resilience and science and solidarity. It is based on principles of social justice, dignity, and the right to food, land, and livelihoods for all.

Global Call to Action- Ten Priorities

1. Rethinking Food and Farming

Transition to an integrated vision that promotes a food systems-based approach that

- Prioritizes Biodiversity, with a special focus on neglected and underutilized species (NUS) and varieties of crops such as millets, grain legumes, oilseeds, vegetables and fruits, local and domesticated breeds of livestock, fish and other aquatic resources
- Promotes nutrition-sensitive, regenerative and agroecological farming practices to ensure food and nutrition security that build resilience through improving soil health, sequestering carbon, restoring ecosystems, balancing water use and strengthening the positive climate-health-agriculture-livelihood nexus.
- Ensures the availability of sufficient and diverse foods for a healthy life to all people throughout the course of their lives.
- Climate preparedness including early warning systems to be strengthen to ensure both immediate responses and longer term adaptations

2. Strengthening Farmer-Managed Seed Systems

We recognise that localised farmer-managed seed systems have an essential contribution to building climate-resilient, biodiverse and just agri-food systems. To achieve this, we need to,

- Protect farmers' rights and gendered knowledge systems around
- seed diversity and their use,
- Mainstream traditional varieties, landraces, by developing standard operating protocols to ensure quality and seed rolling plans,
- Invest in co-developing crop-improvement strategies of traditional varieties/landraces with farmers and ensuring access to crop genetic resources and institutions.

3. Technology and Innovation with Equity

We call for ethical, inclusive innovation that

- Harnesses AI, digital tools, and advanced breeding tools to enhance climate resilience and promote livelihoods and nutrition, in particular of small-holder farmers, without ecological harm.
- Supports open-source science and participatory research and technology development that advances gender equality and social inclusion.
- Ensures equitable access to technology, services and infrastructure for
- smallholders and young entrepreneurs.
- Develops farmer-first innovation ecosystems where new technologies become enablers of trust, transparency and transformation.
- Ensures costs of appropriate technology deployment are affordable and supported by public finance
- Bridge the gap between rapid advances in science and technology with policy frameworks while ensuring flexibility for local adaptations.

4. Democratising Knowledge Management Systems

We call on the scientific community to

- Enhance the alignment of research priorities with real-world challenges and farmers' needs, including climate risks, malnutrition, biodiversity loss, food loss and waste, and social and economic inequity.
- Support interdisciplinary and farmer-led research, bridging traditional knowledge with scientific rigour.
- Facilitate participatory learning, farmer-to-farmer exchanges, and youth mentorship.
- Institute Transdisciplinary Chairs in Biodiversity and Biohappiness in Agriculture, Animal Science, Veterinary, Fishery and Food Science Universities and research institutes, to seed long-term innovations.
- Promote open-access platforms for knowledge management, dissemination and upscaling.
- Co-create solutions with civil society organisations, farmer collectives, and grassroots knowledge networks.

5. Policy and Governance Pathways for Transformative Change

Governments should aim to

- Adopt the Evergreen Revolution principle in agricultural and rural development policies by integrating agriculture, nutrition, health, biodiversity, climate, livelihood, and equity goals through cross-sectoral policy coherence.
- Adaptation is not possible without strong political leadership and action based on scientific and field evidence at different scales, from local to global.
- Promote diversification in agriculture and integrated resource planning to include a cross-section of sectors, such as livestock, agroforestry, and fisheries, to ensure better risk management and improved ecological health diversified diets for improved nutrition outcomes.
- Scale policies that incentivize context specific, climate resilient sustainable farming practices, strengthen policies that ensure farmer's rights, fair process, access to credit, insurance, infrastructure and appropriate social protection.
- Decentralise program design and monitoring, engaging farmers in co-development and shared governance, leveraging the strength of grassroot institutes and farmer collectives based on principles of fairness, transparency and capacity strengthening.
- Existing schemes to include women and community focussed initiatives like nutrition garden, seed banks, composting yards, agritourism and so on.
- Prioritise public investment in agricultural research, rural infrastructure, extension service, and inter-departmental coordination.
- Prioritise public investment in agricultural research, rural infrastructure, extension services, and adopt convergence and inter- departmental coordination.

6. Advancing Social Equity and Gender Justice

All stakeholders

- Recognise and value the contribution of women to agriculture, food production, and biodiversity conservation by guaranteeing entitlement including land rights, access to credit, better wages, frontier technologies, knowledge, skills, and equity in access to markets and income opportunities for farmers
- Recognise and value women's contributions to food security and nutrition by creating an enabling social environment, including the provision of essential services such as childcare, health, water and sanitation, and nurturing women leaders/champions.
- Create inclusive platforms for youth to research, innovation, and agri-enterprises to create livelihoods rooted in dignity through initiatives such as NAAS-YUVA.
- Empower small holders through inclusive innovations ethical consumption and resilience building initiatives

- Recognise farmers and tribal communities as stewards of knowledge and biodiversity, and centre their voices in decision-making through formalized local national and international mechanisms.
- Strengthen entrepreneurial skill development programs for youth including focus on digital and frontier technology integration, access to subsidized finance and rural innovation hubs for climate resilient development.

7. Responsible Private-Sector Engagements

Private sector organisations must

- Invest in inclusive value chains, fair markets, in particular, local territorial markets, timely, adequate and fair credit ethical sourcing and green practices.
- Strengthen innovative social finance and labour market policies to improve youth employability and livelihood outcomes.
- Develop technologies that are accessible, affordable, and context- specific with backward and forward linkages for their adoption.
- Collaborate with public institutions to scale climate-resilient innovations and social enterprises.
- Adopt nature-positive business principles that prioritise planetary health.

8. Rethinking Global Development

We call on international development and funding partners to

- Promote the integration of the Biohappiness framework into global food systems and climate finance mechanisms.
- Support South-South collaboration and knowledge transfer among countries with shared agroecological and socio-cultural challenges emphasizing solidarity, equity and sustainability.
- Champion biodiversity-based development as a pathway to the SDGs, NDCs and LDN commitments and beyond
- Translate the vision of biohappiness to action through synergy between science policy and practice.
- Build trust based global scientific partnership to address climate change, pandemics, inequalities and other interconnected global challenges.

9. Research & Communication

- Misinformation on science needs to be corrected with public awareness through effective communication strategies
- Invest in foresight tools and training to ensure public investments align with scientific insights.
- Elevate grassroots voices, especially women, youth and small holder farmers.
- Facilitate technology transfer from leading research institutions like IITs to farmers ensuring real world issues.

10. Mainstreaming One Health Approach and Pandemic Preparedness

Local, National and International One Health Missions must strive to,

- Reframe agri-food system policies to address threats from pests and diseases in crops, animals, aquatic life and forests that affect human health, threaten livelihoods and endanger planetary health.
- Promote community-based systems of surveillance, diagnostic infrastructure and services to meet the challenges posed by recurring epidemics and pandemics.
- Shift focus from treatment of metabolic diseases to prevention via nutrition awareness and access to healthy diets.

Global Call for Action on Biohappiness 2025

We, the participants of the MSS100 International Conference, declare the following

- We reaffirm our commitment to zero hunger, zero poverty, and zero biodiversity loss.
- We declare Biohappiness as a new framework for development—rooted in biodiversity, equity, and ecological well-being. It blends traditional and ecological wisdom with modern science and redefines leadership as stewardship.
- We call for a Decade of Action on Forgotten Foods, promoting neglected species for nutrition, livelihoods and resilience, including wild plants and aquatic foods, to ensure dietary diversity rooted in diverse cultural, social and agro-ecological contexts.
- We are committed to advancing gender and social justice within agri- food systems and commit to enabling youth and women as the engines of transformation.
- We urge the adoption of data-driven, science-based, people- centered strategies to address the climate-health-agriculture- livelihoods-equity nexus.
- We commit to harmonising and scaling relevant indigenous practices, traditional ecological knowledge, and farmer innovations.
- We call for the creation of a Global Coalition on Biohappiness, linking policy, research, and action across countries.
- We will work to mainstream nature-positive, community-led, and future-ready food systems into all national agendas for human health and well-being.
- We commit to the adoption of the One Health Approach at different scales to protect planetary health. We commit to strengthening public-private engagements for win-win solutions that foster sustainable development.

A Call to Humanity and Future Generations

Let This Be Our Moment of Change

Let this Call to Action ignite a global movement—towards social justice, sustainability, and collective prosperity. We, the farmers, scientists, civil society, government, international and business organisations honour Professor M.S. Swaminathan not only by remembering his legacy but by renewing our pledge to carry it forward— boldly, inclusively, and urgently.

**“If agriculture goes wrong, nothing else will have a chance to go right”
— Prof. M.S. Swaminathan**

Let every nation, every village, every individual including every child, be a part of this revolution—a revolution that brings food, income, dignity, and joy not just to the fortunate few, but to all.

Endorsed by

- M.S. Swaminathan Research Foundation (MSSRF)
- National Academy of Agricultural Sciences (NAAS)
- Indian Council of Agricultural Research (ICAR)
- Ministry of Agriculture & Farmers’ Welfare, Government of India
- Partner Organisations, Farmer Networks, International Agencies, Youth and Women’s Collectives



GLIMPSES





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Prof. M.S. Swaminathan Centenary International Conference: Evergreen Revolution: The Pathway to Biohappiness

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