Seed Systems - paving the way for food, nutrition and health security in Odisha

MSSRF's National Consultation at Jeypore lays the foundation for a sustainable and inclusive seed system in the Koraput GIAHS

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On February 27 and 28, MSSRF hosted a National Consultation titled 'Building Climate Resilient, Sustainable, and Inclusive Seed Systems' at the Tribal Agrobiodiversity Centre (TAbC) in in Jeypore, Odisha. Koraput, which is recognised by the Food and Agriculture Organization of the United Nations as a 'Globally Important Agricultural Heritage System' (GIAHS), is well-known for its rich crop and ethnic diversity. The region presents unique challenges and opportunities for strengthening seed systems, particularly in the tribal belts. Thus, in collaboration with the Government of Odisha and FAO, MSSRF led the consultation focusing on integrating formal and informal seed systems. Over the two days, sessions aimed to empower rural farmers, particularly women and tribal communities, while exploring policy interventions for sustainable seed conservation and utilisation.

The National Consultation is part of the MSS100 centenary year-long celebrations in 2025 to honour the life and enduring legacy of Dr M S Swaminathan. It also marks the 30-year milestone of successful work by the MSSRF's Tribal Agrobiodiversity Centre in Odisha.

The objectives of the Consultation were:

1. To explore the changes and challenges of the current formal, semi-formal and informal seed systems in the context of socio-economic transformations and climate change, particularly in rural and tribal areas;
2. To examine the role of formal, semi-formal and informal seed systems in ensuring food, nutrition, and livelihood security, with a special focus on the KORAPUT-GIAHS;
3. To assess scope and identify strategies for integrating informal seed systems and traditional agricultural knowledge with formal seed systems to enhance resilience and promote sustainable agricultural practices;
4. To discuss the scope in operationalising the legal provisions of Farmer's Rights and Access and Benefit Sharing (ABS) policies; and
5. To create actionable recommendations for policy interventions leading to sustainable and gender equitable seed system development at the local, national and regional levels.

The above objectives helped to emphasise that seed security is vital for nutrition security. Seeds are diverse and resilient, and it is essential to ensure that farmers have access to quality seeds, at the right time, and for a good price. This leads to an increase in agricultural productivity, resilience to extreme climate change, and enhanced livelihood opportunities.

Representatives from FAO, Bioversity International, CIAT, ICRISAT, IRRI, IIMR, and many others focused on food security and agricultural sustainability. Participants included

experts in seed systems, conservation, and climate adaptation, and representatives from NGOs and CBOs as well. Several community leader -- particularly from tribal areas -- engaged in discussions on developing resilient and sustainable seed systems.

On **DAY 1**, the inaugural programme set the context for the Consultation. Dr GN Hariharan, Executive Director (R&D) at MSSRF, emphasised that empowering rural communities with suitable mechanisms for sustainable development is imperative. In her address to the gathering, Dr Soumya Swaminathan, Chairperson MSSRF, reflected on the thirty years of work in Odisha undertaken by the Foundation, adding: “There is still a long way to go to address nutrition security and economic well-being, and seed system in the context of climate change is important for the sustainable farming and farmer incomes.”

Dr Konda Reddy Chavva, Assistant Food and Agriculture Organization Representative (Programme), FAO India spoke next and stressed on the importance of registering farmer varieties to achieve sustainable agro-biodiversity. He honoured *Padma Shri* Kamala Pujari and Dr Raimati Ghiuria, while highlighting the Odisha’s *Shree Anna Abhijan* initiative that has helped conserve millets and protect genetic diversity.

Dr Kuldeep Singh, Head, Gene Bank - ICRISAT, Hyderabad, talked about the global seed conservation movement and the excellence of farmer-led seed systems. He also iterated that the vital role of farmers, especially women, in conserving natural resources.

Dr C Tara Satyavathi, Director - IIMR, Hyderabad, highlighted the tremendous role of tribal farmers in conserving traditional seeds. She stressed the need to build their capacity for continued preservation and appreciated that the Consultation has taken the right direction towards bringing the spotlight on seed systems.

Dr Raimati Ghiuria brought attention to the future value of local landraces, adding that she was grateful for the exposure MSSRF had given. “I was able to establish a farm school and seed bank in my village to sustain seed conservation because of the trainings.”

The dignitaries inaugurated the Koraput Seed Fest exhibition with stalls displayed a huge variety of seeds from the region.

Session 1 on Community Managed Seed Systems – Status, Challenges and Opportunities was chaired by Dr Tara Satyavathi, Director - IIMR, Hyderabad. The session was designed to highlight the role of tribal farmers in conserving traditional seeds. Dr Tara stressed the need to build capacity for continued preservation and appreciated that the Consultation for driving discussion in the right direction. “Tribal farmers deserve recognition!” she shared, “They've produced tons of quality millet seeds, proving their skills and commitment.” She emphasised that strengthening community seed banks would help preserve local landraces, and integrating formal and informal seed systems through seed village programmes and participatory breeding is key to building resilient seed systems that are vital for climate adaptation.

Other panellists continued to draw attention to the topic. Dr ED Israel Oliver King, Director - Biodiversity, MSSRF, iterated that community-managed seed systems are crucial for conserving traditional seeds, biodiversity and food security. “Strengthening local seed systems and financial sustainability is key to tackling market challenges,” he added.

Dr Vetriventhan Mani, Senior Scientist (Genetic Resources) - ICRISAT, Hyderabad, spoke about the vital role of germplasm conservation in food security and crop resilience. He said that preserving diverse genetic resources is key to sustaining biodiversity will help towards adapting to future agricultural challenges.

Dr Bhaskar Chandra Patra, Principal Scientist, Head Crop Improvement - NRRI, Cuttack, highlighted about the role of rice biodiversity in achieving food security and resilience, adding that advocating for traditional knowledge and science is essential to empower farmers.

Koraput community members also spoke during the session. Mr Padam Pradhani is a dedicated conserver of local landraces, and had honed his seed production skills with MSSRF’s support. He explained how this exposure helped to boost his yield and income, particularly for groundnut seed production. At present, Padam leads a farmer producer organisation that links the local farmers to markets.

Session 2 dealt with Seed System Transformation Functions and Stakeholders – National and International Perspectives, and was chaired by Dr Konda Reddy Chavva. The idea was to understand the roles of various actors involved in seed production, exchange, participatory plant breeding and governance. It looked at the position of farmers, community organisations, researchers, and policymakers with special attention to key actors involved in the informal community-managed seed systems. Dr Chavva put the spotlight on the global food demand, which he predicated is likely to rise by 70% by mid-century. He also stressed on the need for diverse, nutrient-rich foods to achieve nutritional security.

Dr KS Varaprasad, Advisor - APAARI, Thailand, stated: "Change the seed, change the culture" to emphasise seed system transformation for resilient, sustainable, and inclusive agriculture in Asia. Traditional landraces need science and tech for conservation, improvement and sustainable use, he added, "If you want to change the agri system, you must change the seed system too."

Dr Kuldeep Singh, Head, Gene Bank - ICRISAT, Hyderabad, He emphasised that “true transformation is needed to tackle challenges,” adding that gene banks and plant genetic resources are essential to address major agricultural and environmental issues, especially as global systems destabilise. He said: “CGIAR's Genetic Innovation Initiatives aim to conserve genetic resources, advance precision breeding, strengthen seed systems, and promote adoption through global networks.” The Plant Treaty protects genetic resources through a multilateral system to ensure access and benefit-sharing, farmers' rights, and sustainable use. He explained that farmers receive germplasm through this system, making fair access and benefit-sharing essential for agricultural sustainability.

Dr Costanza Conti, Policy Research Lead at MSSRF spoke about the importance of transforming traditional seed systems. She compared traditional and high-yielding seeds, highlighting their role in biodiversity, climate resilience, cultural heritage and food security. “In the last 80 years, 93% of seed varieties have disappeared due to hybrid dominance, mechanisation, monocropping and loss of traditional knowledge,” she observed, adding that a connected approach among stakeholders is crucial to reviving seed systems.

Representatives from the community – Ms Rukmani Khilo and Mr Laichan Sukia spoke their mind on the topic. Ms Rukmani is a custodian farmer and proudly conserves traditional millet, rice, vegetable and pulse varieties. She said: “While saving seeds have always been an ancestral practice for us, learning new conservation techniques from MSSRF has made it more effective.”

Mr Laichan expressed his gratitude to MSSRF for having extended scientific cultivation methods to various members of his community. “I used to sow using the broadcasting method, but later I learned about line transplanting, how to use a cycle-weeder and also how to select good quality seeds.” He is now a seed producer and earns more by supplying seeds to OSSC Ltd.

Session 3 covered the Scope and opportunities in Operationalising Farmers Rights and Access and Benefit sharing Policies, which was chaired by Dr GN Hariharan, Executive Director (R&D), MSSRF. Discussions were around the potential areas of Farmers Rights in the Article 9 of the International Treaty as well as PPV&FR Act 2001 and ABS policies linking the context to the GIAHS region and farming communities. Dr Hariharan said that traditional knowledge is the backbone of sustainable agriculture. “Strengthening farmers and communities with location-specific research, while encouraging them to conserve seeds with improved technologies is crucial” he stressed.

The first speaker - Shri Dipal Roy Choudhury, Joint Registrar - PPV&FR Authority, emphasised on the need for a global understanding of seed system revival. “Both breeders' rights and farmers' rights play a crucial role in ensuring a quality seed system,” he observed, “and fair benefit-sharing and post-access equity are required.” He shared that the National Gene Fund, established by the Government of India, supports seed variety registration and seed system strengthening as well.

Ms Shalini Bhutani, Senior Legal Researcher, Policy Analyst, FAO, New Delhi, stressed on the need for strong legal policies, administration and capacity building at all levels. She said that fair and equitable benefit-sharing of genetic resources as well as traditional knowledge depends on these measures.

Mr. Dinesh Balam, Associate Director, WASSAN, Hyderabad, expressed: “Preserving landraces is about more than seeds - it's about protecting traditions, biodiversity and food security for future generations.” He observed that the demand for local landraces is growing, and it is vital to identify economically and nutritionally valuable cropping systems, empower

communities with the right processes, and adopt appropriate technologies. “Beyond laws, practical action is crucial to promote landraces and ensure sustainable agriculture," he noted.

Ms Sunamani Paroja and Mr Budura Pradhan spoke up on behalf of the community members gathered. Ms Sunamani a dedicated farmer who has conserved the *Bati Mandia* finger millet for 30 years. Her contribution led to its release as ‘Kundra Bati Mandia’ by the Government of Odisha, and she credited MSSRF for the recognition she received.

Mr Budura has been a community resource person with MSSRF for over a decade, has been a guardian of millet landraces, preserving biodiversity and empowering farmers. He had also participated in Participatory Varietal Selection (PVS), and plays a key role in participatory varietal trials of millet landraces. “During Kharif season in 2024, I collaborated with IIMR and MSSRF researchers to host trials on my farmland because I want to encourage millet conservation in my village.”

DAY 2 of National Consultation began at 9.30 am with the technical **Session 4** on Seed Systems linkages and synergy enhancing Food, Nutrition, Health and Climate Resilience Building chaired by Dr Jai Rana, Country Representative, Biodiversity International and CIAT, New Delhi. The session aimed to exploring the relationship between seed systems and local dietary diversity, nutrition and health, and environment. Discussions were around how seed systems can be designed to help farming communities adapt to changing climatic conditions while preserving local agricultural practices and traditions. Dr Jai Rana observed that real agri-progress empowers 86% small farmers, not just the 0.6% large ones, adding that diversified pure seeds boost yield, income and sustainability, and so making community seed systems are vital for the future.

Dr R Rengalakshmi, Executive Director (Area Operations), MSSRF, spoke about seed security as key to food security, and said that empowering small farmers, especially women, will ensure resilience. “MSSRF strengthens community seed banks—mapping, bridging gaps and equipping them with tools for self-reliance,” she noted, adding that strengthening such seed banks will ensure resilient farming and food security. She concluded by saying that balancing *ex situ* conservation with on-farm management is crucial for future food security, preserving and adapting locally suited seed varieties.

Dr R Ananthan, Scientist-E, ICMR-National Institute of Nutrition (NIN) presented about how monocultures, climate change and sedentary lifestyles are fuelling an unhealthy future. “A balanced food system is vital, and food-based strategies are key to tackling global hunger and malnutrition, she noted. Given that a diverse food system is key to a sustainable future, she iterated that the nutritive profile bridges food availability and nutrition security for better health.

Dr A Nirmalakumari, Professor and Breeder (Millets) from TNAU, Tamil Nadu, was the next speaker and she made clear that seed linkages between gene banks, breeders and farmers ensure diversity, resilience and sustainability. “With small farmers producing 70% of our

food, strengthening them and farming systems is crucial," she said. She also emphasised that cooking and processing are crucial, even if a variety has a good nutritional profile.
Mr Ekadashi Nandi, Chief Former Seed Certification Officer, Government of Odisha, Bhubaneswar, stated that seed is the first link in the food chain and is vital for survival. "Yet, profit-driven monopolies and chemical farming endanger indigenous crops, soil health and nutrition security," he observed, urging those gathered to take swift action ensure resilience across generations.

Ms Ghosamani Dalei and Mr. Dama Jani were the community members who spoke as part of the panel. Ms Ghosamani is a Community Hunger Fighter who empowers rural communities by promoting balanced diets, local nutrition and sustainable farming. She trains SHGs on kitchen gardening and millet-based nutrition, improving health and well-being. Mr Dama is a leading farmer, and said: "Earlier we used indigenous seeds and traditional farming, and low yields were always a problem, but after learning scientific methods from MSSRF, we treated the seeds and adopted organic farming for better yield and income."

Session 5 on Strengthening role of women and youth in advancing local seed systems in Koraput dealt with identifying specific interventions for women and youth to promote seed security in globally important agricultural heritage systems (GIAHS) regions like Koraput, which have unique agricultural practices and crop varieties, while also addressing the socioeconomic needs of the rural and tribal communities. Dr Lavanya Cherukupalli, National Expert-Participatory Plant Breeding, FAO India, was the Chair, and she said that genetically diverse landraces are the backbone of resilient agriculture, evolving to adapt to local conditions and culinary traditions. "They are key to ensuring food security for future generations," she added, and concluded that genetic erosion threatens diverse landraces, endangering farmer-preferred traits and traditional farming.

Dr Swati Nayak, Lead for Seed System and Product Management, IRRI, Bhubaneswar, highlighted the vital role of women and youth in strengthening local seed systems. "Women, as traditional seed custodians, manage selection and storage, while youth play a key role in sustaining and advancing these systems," she noted, adding that strengthening local seed systems mean empowering farmers with access to basic seeds, quality production and processing, certification/quality assurance, and market scale.

Dr Veenita Kumari, Deputy Director, Gender Studies, MANAGE, Hyderabad, said that women are vital in seed selection, processing and storage, preserving pest-resistant and climate-resilient seeds. "Yet, challenges like land rights and financial access persist, calling for policy support and recognition, she observed, further stating that empowering youth in seed conservation means tackling financial and institutional barriers.

Mr Prashant Parida, Director, TABC, Odisha, spoke about empowering custodian women as Millet Farm Facilitators boosts seed banks, processing, marketing and sustainability. "They bridge knowledge, resources and community efforts, driving resilient millet farming and

empowerment," he acknowledged, adding that the Alternative Seed system Model has been successful in this respect.

Ms Dana Bhoi is a trailblazer farmer from Koraput and shared how MSSRF's technology reduced labour and boosted yields. "Through seed production I earned ₹50/kg instead of ₹20/kg for regular crops, and this increased income strengthened how I managed seeds."
Ms Muni Madkami sis a determined Kaya girl from Malkangiri, and has become a successful farmer and community mobiliser. She has received training in advanced pulse production from MSSRF and Government Odisha. "I have been able to transform 40 acres of fallow land into productive black gram fields because of my exposure, thanks to MSSRF, and I am now inspiring many local farmers," she confirmed.

The **Final Session** of the Consultation was the 'Plenary Session: Science, Policy and Governance' chaired by Dr Jai Rana, Country Representative, Bioversity International and CIAT, New Delhi. He highlighted that carbon awareness is a duty of industrialised societies and high emitters, not rural communities, who have long lived sustainably with nature.

Ms Shalini Bhutani, Senior Legal Researcher, Policy Analyst, FAO, New Delhi, spoke next and said that the GIAHS site symbol should brand local products, help grassroots institutions, especially women-led groups, and ensure access better markets and sustain livelihoods.

Dr KS Varaprasad, Advisor, APAARI, Thailand, iterated that landraces and natural farming are key to a healthy life. He said that out of 10,000 FPOs, only 200 are running successfully, and training and capacity building is essential to revive them.

Dr Kuldeep Singh, Head, Gene Bank, ICRISAT, Hyderabad, remarked that MSSRF's Community Seed Bank is an ideal model for farmers, and that integrating Odisha's model and global practices can create a location-specific framework for sustainable seed systems.

Mr V Keerthi Vasan, IAS, District Collector, Koraput, thanked MSSRF for hosting a valuable Consultation in GIAHS-designated Koraput, and for uniting experts and farmers to strengthen climate-resilient seed systems.

Dr Arabinda Kumar Padhee, IAS, Principal Secretary, DA&FE, Govt. of Odisha, honoured *Bharat Ratna* Dr M S Swaminathan and *Padma Shri* Kamala Pujari for their contributions. He praised MSSRF's efforts in seed systems, highlighting how farmers' traditional varieties often out-perform when compared to scientific varieties. He called for a more transparent, research-driven and farmer-inclusive approach is key to sustainable seed security. "The public seed system will continue, but strengthening the community seed system requires collaboration among all stakeholders," he concluded.

The final session aimed to review the science, policies, regulations, and frameworks that support or hinder the development of resilient seed systems, especially in tribal and

biodiversity-rich regions. It also helped identify challenges and opportunities to enhance community involvement in the seed systems policy framework.

In **conclusion**, MSSRF's significant contributions to food and nutrition security -- particularly its work on seed systems and the recognition of farmers' traditional varieties often outperforming scientific ones -- were widely acknowledged. This consultation served as a platform to reaffirm the critical role of sustainable seed security in achieving broader food and nutrition goals.

Some key outcomes from the session included:

1. A comprehensive understanding of the challenges and opportunities in building resilient seed systems, especially in tribal areas and the GIAHS region (Koraput).
2. Practical recommendations to strengthen both formal and informal seed systems in the face of climate change.
3. Strengthened collaboration among stakeholders to develop community-driven, climate-resilient seed initiatives.
4. Policy proposals for governments and NGOs to support the sustainable development of seed systems at national and regional levels.

Overall, this consultation laid the groundwork for more resilient seed systems and highlighted its importance. So that we can achieve nutrition and food security.