

Towards achieving the SDGs and strengthening the science of climate resilience*

The M.S. Swaminathan Research Foundation (MSSRF) organized a three-day conference in early August to mark its completion of 30 years. The deliberations of the conference centred on taking stock in the light of contemporary challenges and getting inputs for the way forward towards achieving the sustainable development goal (SDG) targets of 2030.

The conference attracted a cross-section of nearly 200 stakeholders from the scientific research community and academia, civil society organizations, donor agency representatives and senior level policy makers from the government of India. The three technical sessions were on (i) Climate change and coastal zone management, (ii) Science and technology to secure and sustain small holder farmers' livelihood and nutrition and health security and (iii) Biodiversity for food, nutrition, health, and climate resilience. Each session was chaired and co-chaired by two eminent experts; there was a presentation of MSSRF's work in the area, contextualizing its relevance in the prevailing global scenario, followed by a keynote address and remarks by six to seven panelists.

A major recommendation was the call for establishment of an 'International Centre of Excellence for Sustainable Development and Management of Coastal Ecosystems' on the lines of the Consultative Group on International Agricultural Research (CGIAR) institutions, led by MSSRF, for the benefit of vulnerable coastal zones and communities across the globe. There was overall consensus that nutrition-sensitive agriculture and livelihood security of small and marginal farmers have to be promoted to address the challenge of malnutrition in the face of the impacts of climate change and loss of biodiversity; and that sustainable development requires convergence and state support for wider adoption and scale-up.

The key recommendations from the three technical sessions are summarized below.

Research: Economic evaluation of different ecosystems is necessary to understand the value of the ecological services provided by each; need for coastal biodiversity information system and climate services (e.g. carbon cycle, ocean acidification), suitable models to understand sea level rise and its impact on coastal ecosystems at the decentralized level to develop appropriate strategies; systematic studies on the impact of rise in ocean temperatures on coral reef-associated fisheries at different depths and tourism; 3D modelling and vulnerability maps of the coast to help reach vulnerable areas faster and continuous mapping of shoreline to understand changes in erosion along sea coast; prediction models for pelagic fisheries; policy paper on coastal resource use, governance, livelihoods, research and management as well as sustainable use of resources for societal benefits based on meta analysis.

Development of short duration crop varieties to withstand abiotic stress; conservation agriculture and seasonal climate forecasting for effective risk management by small holder farmers; research on strategies for retention of soil moisture using renewable materials; eco-enterprise models for promotion at scale; qualitative research for better insights into issues of gender and social relations; studies on the appropriate balance between ecological, economic and social sustainability in a mutually reinforcing manner; mainstreaming the nutrition dimension in the farming system and location-specific models for different agro-ecological zones; models for sustaining collective action by small holder farmers.

Research for effective inclusion of neglected and underutilized crop species (NUS) in farming systems; innovation and development of value chain of NUS for ensuring nutritional security of vulnerable communities, climate resilience and sustainable development; research on nutrient value of different indigenous plants/foods.

Outreach: Revive traditional farming of rice and shrimp where feasible for better income to coastal communities; strengthen capacity of coastal communities for adaptation; harness ICT tools like use of mobile apps to facilitate decision making and disseminate locale-specific and demand-driven information; support for mixed farming and production diversity for diet diversity and value addition and decentralized processing for increased income of small holder farmers; promotion of nutrition gardens of fruits and vegetables; nutrition awareness strategies across the board on diet diversity and water, sanitation and hygiene (WASH) practices; use of learner-centric capacity building methods and processes in livelihood programmes; take into consideration multiple drivers of change and overall system sustainability in planning and implementation of community level programmes.

Networking and partnerships for effective utilization of biodiversity in the face of climate change; capacity building of women farmers on conservation linked value chains with appropriate technology development for supporting it; promote conservation and consumption of wild foods; generate awareness with respect to biodiversity conservation and its sustainable utilization and the national and international conventions/acts.

Advocacy: Policies to deal with impacts on coastal areas due to climate change; Farming system for nutrition (FSN) approach for household food and nutrition security of small holder farmers, including policy support for nutrient dense crops, nutrition awareness to improve diet diversity and decentralized processing to facilitate access for consumption; small farmer friendly technologies and necessary institutional support (e.g. credit, infrastructure support) for technology upgradation of small businesses.

Promotion of nutri-dense plant varieties, NUS and crop wild relatives in nutrition sensitive agriculture and climate adaptation strategies; conservation of functional biodiversity especially the microbial biodiversity in the farms to

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reduce the use of harmful agro-chemicals; strategies to conserve the wild relatives of cultivated plants both with *in-situ* and *ex-situ* measures; recognizing the role of custodian farmers in the context of climate change and ensuring food and nutritional security; support for community based initiatives on conservation.

The concluding session on 9 August had a cross-section of researchers, policy makers and international leaders sharing their thoughts on what they felt should be the focus areas of work, going forward. Bruce Alberts (Chancellor's Leadership Chair in Biochemistry and Biophysics for Science and Education, University of California) called for focus on education in order to harness and nurture talents and produce adults sensitized to build a sustainable world. Ashok Dalwai (National Rainfed Area Authority, Govt of India) called for science of delivery looking at agriculture in a wholesome manner, collaborative research and

action and accompanying policy support; Anura Kurpad (St John's Research Institute) came from the demand side of nutrition and called for attention to growth of children less than three years and emphasis on education and awareness around food-based approaches to address malnutrition. Ashish Chaturvedi (The German Agency for International Cooperation) called for upscaling and replication of successful pilots on adaptation to climate change, building institutional and human capacities, down scaling of state action plans on climate change management to the district level and mainstreaming adaptation strategies. He emphasized the need for more institutions like MSSRF that can play a transformative role. Madhura Swaminathan (MSSRF) emphasized that young researchers and youth have to be mentored to understand the importance of the SDGs and come forward and shoulder the mantle of realizing them. Pradnya Paithankar (UN World Food Programme)

emphasized on the need to work together focusing on agriculture diversification, strengthening safety nets and addressing issues around WASH and infant and young child feeding (IYCF) practices. Kenneth Quinn (World Food Prize Foundation) announced that, the Foundation would help establish an Indian Youth Institute on the lines of the already existing Global Youth Institute, to give high school students from India an opportunity to engage with students from across the globe on issues around sustainable development. M. S. Swaminathan, in his concluding remarks called for having a 'Nutrition Secure India' by 2030 as our goal; he emphasized the need for hard work using multidisciplinary approaches to realize the goal.

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