

## Science for contemporary challenges\*

The COVID-19 pandemic has been estimated to result in over 140 million people falling into extreme poverty<sup>1</sup>. Higher food insecurity could also increase negative health effects and migration<sup>2</sup>. The pandemic has also disrupted access to fresh and nutritious food at affordable prices, made worse by weak infrastructure and poor institutional support<sup>3</sup>. Urgent reconfiguring of food, nutrition, health, and social protection systems is required for food and nutrition security for all<sup>4</sup>.

In the context of these disruptions and need to relook at solutions, a conference was organized to focus on insights to overcome these concerns. The three-day virtual conference included sessions on agrobiodiversity, gender, climate change, value chains and policy with eminent speakers from across the globe. The conference included two special lectures and five technical sessions.

The conference comprised an inaugural session, two special lectures, four technical sessions and a concluding policy-focused session with eminent experts from India and abroad. The conference saluted India's farmers for record food grain production in spite of distress and a pandemic while emphasizing on need urgency and concerted action on nutrition. Key speakers also addressed the need to learn lessons from the pandemic with sustainable development on natural resources and biodiversity while increasing quality of life.

The need for policy measures to encourage farmers to increase soil organic carbon (SOC) by recognizing and rewarding farmers who maintain SOC and for technologies to increase nutrient use efficiency with the concept of 'Rights of Soils' was propounded during the special lecture on 'Soil-centric approach to realize India's evergreen revolution'. Another special lecture emphasized importance of

science communication including need for honesty, generosity, demand for evidence, openness to ideas and opinions irrespective of source.

The existence of a pandemic and related lockdown while affecting both men and women, has also changed the way women's work, home and care burdens as well as their health, nutrition and economic needs have been disrupted. The differential needs of women, particularly poor women, and their unrecognized burdens or increased vulnerabilities were major points of discussion. The availability of limited sex-disaggregated data, increased partner and domestic violence, disrupted health services and increasing inequities were discussed. The impact of women not accessing anti-natal services due to COVID and its implications on population and reproductive health were also discussed.

The role of agrobiodiversity in strengthening resilience and sustainable food security was presented during the conference with speakers emphasizing need for commitment to evidence-based interventions and robust policy levers to restore the agroecosystem health and diversity of diets. The need to conserve local landraces, vital agrobiodiversity resources, and mainstream into food production as local landraces with superior traits with a farmer-centred approach was discussed. Strengthening of food seed systems and the network between national/international gene banks, community seed banks and seed cooperatives at the local or regional level, besides examples of empowering farmers to cope with climate change were shared. The need for a gender lens in biodiversity conservation and food production, besides on rights to access and control over resources by women, was presented.

A technical panel focusing on climate change and resilience of the state of Tamil Nadu, deliberated on climate variability impact on crop production, recommending further varietal development for abiotic stress management, improvement in soil health with investment and efforts to rationalize input. The panel also suggested that the Protected Special Agriculture Zone in the state, required

water management, tailor-made approaches for sub-regions, integration with tourism and scaling up of proven ecosystem-based methods.

The session on post-harvest markets had experts sharing the need for addressing nutrition-related issues like recommended salt, sugar quantity in packaged foods and making nutrition-related quality standards mandatory. With markets inherently unequal, smallholders face higher risks making it important to support them in increasing negotiating skills, with support to build the institution and right sizing to build sustainable models. The need for a shift from production-centric to income-centric and kinds of strategies for inclusiveness of small holders and women farmers were deliberated upon. Especially, promotion of women fishers in the value chain through appropriate technologies and recognition of their role was emphasized.

The need to focus on anticipatory research and enhance funding and attention, especially on the food systems was emphasized by the session with policy makers. The speakers also discussed the importance of meeting the needs of women and children, especially most marginalized, while using science and technology to build up a world beyond COVID-19 and how it was more urgent than ever to focus on future food systems for sustainable, resilient, people-centric, nutritious and climate-adapted agriculture. The need for science, technology and innovation, with technology disruptions and adoption, to connect better to farmers was deliberated upon by speakers. Models such as 'nutri-gardens' that emphasize on providing a variety of planting material for farming with a nutrition approach, should be scaled up with clearer policy interventions. Collaboration to solve the world's biggest problems similar to what happened when Norman Borlaug and M. S. Swaminathan collaborated beyond borders for the green revolution to resolve huge hunger and malnutrition issues, was needed said experts.

The following are the recommendations of the conference across sessions on agrobiodiversity, gender, climate

\*A report on the virtual conference on 'Science for resilient food, nutrition and livelihoods: Contemporary challenges' organized by the M. S. Swaminathan Research Foundation held in Chennai, India during 7-10 August 2020.

change, value additions and special lectures.

- Need for science, technology, evidence-based and diversity-based sustainable food system approach for restoration of agroecosystem health and diversity of diets.
- Need to conserve local landraces, vital agrobiodiversity resources, and mainstream into food production along with need-based farmer-centred approach in plant breeding.
- A sustainable breeding approach that is farmer and ecosystem specific and strengthens network between gene banks, community seed banks and cooperatives needed.
- Farmers empowerment to cope with climate change through biodiversity in agriculture and local knowledge systems to strengthen health of ecosystems.

- Integrating agrobiodiversity with an interdisciplinary approach for greater integration of biodiversity and traditional/local knowledge into production.
- Applying gender lens in policies on conservation, food production, fish processing, women's participation and control over resources to resolve gender inequality.
- Making nutrition-related quality standards mandatory in processed foods.
- Ensuring environmentally sustainable industrial functioning including circular value-chain based planning for using agro-wastes.
- Support small holders in increasing negotiating skills, access to resources, support for building institutions and right sizing to make them a sustainable model to smallholders.
- Study context and design of Farmer-Producer Organizations embedding

organizational and financial sustainability dimensions.

1. Laborde, D., Martin, W., Swinnen, J. and Vos, R., *Science*, 2020, **369**(6503), 500–502.
2. Michael, D. S. and Wesselbaum, D., *J. Nutr.*, 2020; doi:<https://doi.org/10.1093/jn/nxaa270>.
3. Lal, R., *Food Security*, 2020, **12**, 871–876.
4. Pérez-Escamilla, R., Cunningham, K. and Moran, V. H., *Matern. Child Health*, 2020; <https://doi.org/10.1111/mcn.13036>

**B. Jayashree\***, **N. Anil Kumar**, **R. V. Bhavani**, **E. D. I. Oliver King**, **G. N. Hariharan** and **R. Rengalakshmi**, M. S. Swaminathan Research Foundation, Chennai 600 113, India; **B. Jayashree** is with Reliance Foundation, lives at C2 Sucharita Apartments, No. 71, Chamiers Road, R A Puram, Chennai 600 028, India. \*e-mail: [jayashree.author@gmail.com](mailto:jayashree.author@gmail.com)