

Pulses – productivity and profitability*

The United Nations General Assembly declared 2016 as the ‘International Year of Pulses’ to raise awareness about pulses for health and nutrition, promote utilization of pulses for soil fertility and as a suitable crop in the context of climate change. It also aimed to encourage research, production and address challenges in the trade of pulses.

Pulses are important for nutrition and alleviating protein hunger in a country like India, which has the largest number of people with malnutrition in the world. It is also an important source of protein, especially for vegetarians. However, the increase of over 60% in the price of pulses in 2015 is a cause for deep concern. India is the largest producer and consumer of pulses. There is still a shortfall of several million tonnes and the Government of India has been taking efforts to bridge the gap with imports as also by encouraging farmers to cultivate pulses.

In the context of this UN Declaration on pulses, a meeting was organized recently bringing together researchers, academicians, policy makers and development practitioners from across the world and farmers from India.

The aim of the meeting was to provide an overview of the challenges and make recommendations for long-term solutions to increase the production of pulses.

The meeting focused on the following themes:

- Global and regional priorities, issues and challenges.
- Understanding diversity and conservation strategies.
- Bridging the yield gap–technology options.
- Enhancing production and productivity of pulses.
- Pulses for addressing malnutrition.
- Adding value and marketing for commercialization.
- Policy issues, recommendations and the way forward.

*A report on the ‘Consultation on Enhancing Productivity and Profitability of Pulses for Addressing Food and Nutrition Security’ organized by the M.S. Swaminathan Research Foundation, Chennai during 7–9 August 2016.

The programme was integrated with the Foundation Day of the M. S. Swaminathan Research Foundation (MSSRF), Chennai that happened to coincide with M. S. Swaminathan’s birthday. The Foundation’s Annual Report 2015–16 was released on the occasion along with three other publications. Releases included a book on *Family Farming – Meeting the Zero Hunger Challenge*, a book titled *Prof. M. S. Swaminathan in Conversation with Nitya Rao – A Farmer-led Approach to Achieving a Malnutrition-free India*, and a booklet *Pulses in Meeting the Zero Hunger Challenge and Promoting South–South Partnerships* on the Indian scenario and the work of MSSRF on pulses.

In his opening address to the consultation Swaminathan (MSSRF) emphasized on the need for ‘scientific skill, political will and farmer’s participation’ in enhancing pulses production to achieve ‘zero hunger’. This was echoed by speakers and experts from across the globe as they voiced concerns on malnutrition in India and the relevance of pulses in this context.

David Bergvinson (International Crop Research Institute for the Semi-Arid Tropics, Hyderabad) called for the need to live within ecological boundaries of the planet and the importance of a farmer-led approach for malnutrition-free India. He also mentioned that it was really about economics of pulses production and that pulses could be a powerful vehicle in India’s aim to double farmers’ incomes by the year 2022.

Mahmoud Solh (International Centre for Agricultural Research in Dry Areas, Beirut) emphasized the need for an ‘evergreen revolution’. He said that with malnutrition affecting over 850 million people, pulses were a good crop to promote and that collaboration across institutions and countries was needed to overcome challenges.

Xuan Li (Food and Agriculture Organization, Rome) spoke about the need to look for sustainable solution to address malnutrition through pulses. Placing four points for consideration she said a favourable environment, legal support, food safety schemes and awareness

through different activities were needed to overcome malnutrition.

V. Selvam (MSSRF) presented highlights of the key initiatives taken up by the MSSRF through 2015–2016. N. Ram (Kasturi and Sons) emphasized on the importance of awareness to address protein hunger and the need to communicate to all sections of society.

Meena Kumari (National Biodiversity Authority, Government of India) spoke of the significance of consuming a balanced and diverse diet for alleviating all types of hunger. S. A. Patil (MSSRF) said policy inputs for pulses cultivation have to be provided to the Government, while V. Mashar (NABARD) said that Farmer Producer Organizations should expand their markets and engage in selling their produce on-line.

The consultation also featured a session with progressive farmers from different states of India and a policy session where recommendations from the consultation were discussed for sharing with the Government and other stakeholders.

Based on the deliberations over eight panel discussions, ranging from malnutrition to profitability, technology options to field-level operations, the three-day consultation came out with recommendations, i.e. ‘Chennai Declaration on Pulses’. Selvam presented the Declaration and said the institution would facilitate sharing them with stakeholders for action.

The gist of these recommendations from this consultation is as follows:

Scientific recommendations

- High priority for research on pulses, with emphasis on varietal development to suit location and end use-specific conditions.
- Crop improvement programme to identify pulse grain with desired quality traits, including high protein content, resilience to climate change and biotic stresses.
- Encourage R&D for early maturity varieties amenable to mechanical harvesting, biotic and abiotic stresses with processor and consumer seed traits.

- Develop efficient *in situ* soil moisture conservation and water management strategies to enhance pulse productivity in dryland conditions
- Genotyping, phenotyping, marker-assisted breeding, molecular breeding and gene editing methods to enhance productivity of major pulse crops on priority basis to develop disease and pest-resistant varieties.

Socio-economic recommendations

- Establish 'Seed Villages' and 'Pulse Panchayats' to address concerns related to quality seed production and availability.
- Value chain management from farm-level production to post-harvest process, packaging, transportation and marketing to improve incomes of smallholders.

Agronomic recommendations

- Encourage inter-cropping, relay cropping and mixed cropping for pulses and short-duration, photo- and thermo-insensitive varieties to improve productivity and yield.
- Diversify rice-wheat cropping systems with high-yielding pulse varieties as early *kharif* or summer crop in rice fallows.
- Harvest rainwater and adopt effective water management strategies since pulses suffer from long, dry spells in their growth.
- Impart knowledge on hermetic and inert gas storage systems to reduce losses from stored grain pests in pulses.

Farmers' perspective

- Adequate knowledge and skill empowerment in cultivation, pre- and post-production, and management of pulses at

field level. Establish 'Pulse Farm Schools' to encourage farmer to farmer and farmer to processor interaction and learning.

- Establish farmer-led institutions such as Farmer Producer Organizations to manage pulses cultivation, from seed to market, for full benefit of technology and market price, including by-products of pulse processing industries.
- Involve public-funded institutions, NGOs, seed companies, farmers' associations and private entrepreneurs in quality seed production, technology transfer, processing, value-addition, capacity building and supply of critical inputs by establishing 'Pulse Bioparks'.
- Encourage farmers to adopt pulse cultivation and bridge the demand-supply gap; link minimum support price to market prices with procurement similar to rice and wheat.

Awareness

- Build capacities of farmers with use of information communication technologies and mobile applications through educated youth, men and women.
- Increase public awareness of health and nutritional benefits of pulses; deploy on-farm, participatory adaptive research and developmental approaches for technology adoption.
- Improved agronomic practices awareness to bridge yield gap, minimize pre- and post-harvest losses and enhance income of smallholders who mostly cultivate pulses.

Gender perspective

Keeping in view the significance of gender, pulse production and nutrition linkage, women's role in pulse production

should be recognized and strengthened through appropriate socio-economic, technological and policy interventions.

Policy recommendations

- Integrate locally consumed and preferred pulses in the Public Distribution System and also include in midday meals programme, 'Anganwadi' dietary systems, pregnant and lactating women, and children below 5 years of age.
- Expand pulse cultivation areas with mission approach to bring in part of 12 million rice fallow areas and rainy season fallows with holistic and integrated approach.
- Include vegetable legumes like dolichos bean, winged bean, cluster bean, yard long bean and velvet bean, which are underexploited legumes. The National Academy of Sciences, USA called winged bean the legume of the 20th century,

Discussions were focused on reducing malnutrition in India and on the importance of pulses in removing protein hunger. Swaminathan emphasized that a country with malnourished children needed reasonable pricing so that people could consume pulses.

The final set of recommendations will be shared with the Government departments, NGOs, academic institutions, Central and State Governments as well as with International agencies for action and policy inputs.

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