



Pulses Production in India: Constraints and Opportunities

(*Neha Khardia, Surendra Dhayal, Sonal Sharma, Hansa Kumawat and Hemraj Nagar)

Rajasthan College of Agriculture, MPUAT, Udaipur – 313001, Rajasthan

*khardia.neha1997@gmail.com

Pulses constitute a significant component of food legumes, are cultivated in 173 countries and they play an important nutritional role in the diet of millions of people worldwide. Pulses complement cereals in both production and consumption. They contain 22-24% protein, which is almost twice the protein in wheat and thrice that of rice. Pulses play an important role in crop rotation, mixed and inter-cropping, maintaining soil fertility through nitrogen fixation, release of soil-bound phosphorus, and thus contribute significantly to sustainability of the farming systems (Singh 2017; Mohanty and Satyasai, 2015). Pulses are identified as future smart food (FSFs) by the FAO for achieving the sustainable development goal 2 (SDG 2) of zero hunger. India is largest producer and consumer of pulses in world. In India, 25.23 Mt of pulses were produced during 2017-18 from over 29.99 Mha area with productivity of 841 kg ha⁻¹ (DAC&FW, 2018). To meet the protein demand for growing population India needs to produce 33 Mt of pulses by 2024 which will require a annual growth rate of 3.62% (NITI Aayog, 2016).

Constraints in production or low production of pulses in India:

There are different reason for low production, coverage and productivity in pulses and theses are follow:

1. Decline in area of pulses in Indo-Gangetic plains (IGP)

The Indo-Gangetic plain which used to be the major areas of pulses are now witnessing reduced area under pulse cultivation due to following reasons:

- Creation of extensive irrigation network, leading to cultivation of cereals and cash crops
- Epidemics of *Ascochyta* blight in chickpea
- Incentive for rice-wheat production
- Less economic viability of pulses than cereals

2. Low genetic yield potential

The harvest index in pulses is relatively low due to following reasons:

Narrow genetic base, inefficient plant types, little scope of heterosis breeding due to self-pollinating nature, genetic erosion and linkage drag.

3. Low realized yield

Pulses are consistently being grown in harsher environments and resource limited conditions on account of comparatively low farmer's preference and less remuneration than the cereals.

The major points explaining low realized yield are as follows:

- Relegation of pulses from high productivity zone to low productivity zone
- Largely grown in rainfed areas (87%)

- Poor crop management

4. Instability in production

Variation in pulses production and productivity over the years indicated the large instability of the production system and the major reasons are outlined below:

- Highly sensitive to environmental fluctuations
- Being rainfed crop, pulses experience drought at critical growth stages
- Highly sensitive to abiotic stresses (temperature extremities, excessive moisture & salinity)
- Vulnerable to a large number of diseases and emergence of new races of pathogens
- Prone to attack by insect-pests
- Unpredictable nature of host-pest relationship due to dynamic changes in the pest behaviour under changing climates

5. Poor availability of critical inputs

- Non availability of HYV seeds at time of sowing.
- Non availability of plant protection chemicals in market
- Non availability of fertilizers (DAP)
- Lack of irrigation facility at critical stages
- High cost of inputs and labour

6. Constraints related to marketing

- Distress sale
- Lower minimum support prices compared to cost of production,
- Unfavourable exim policy
- Non-accessibility to market
- Post harvest losses
- Lack of regulated market

7. Constraints related to extension and their interventions

- Lack of guidance in respect of certified seed production/variety identification, insect pest/diseases identification and management phases, importance and procedure of seed treatment/rhizobium inoculation.
- Lack of information/knowledge on current advances in production.
- Lack of management technology.
- Less and negligible processing facility.
- Poor or no knowledge about organizing seed production and its protection for succeeding crop.
- Weak research- extension farmer linkage.
- Preference of consumer to such pulses which are low productive.
- Poor knowledge of nutrient use efficiency (NUE), IPM, method of preparation of spray solutions and multiplicity of extension system on IPM, esp., pesticide dealers.

Opportunities in pulse production:

1. To meet food demand for increasing population:

- Today we have great challenges is Eradicating hunger and malnutrition, one in three suffer from some form of malnutrition so by increasing production we get food security, improve nutrition with an aim Goal-2-Zero Hunger- pledges to end hunger

2. To meet nutrition demand :

The current population (2018) of the country is 1.36 billion which is expected to be 1.51 billion by 2030.

- As per the Indian Council of Medical Research (ICMR), the recommended dietary allowance (RDA), the protein requirement for a working male and female is 60 g and 55 g per capita per day respectively.
- Today we have a production of 23 M tons which only meet protein requirement of $52\text{g}^{-1}\text{capita}^{-1}\text{day}$. So projected demand of pulses by 2030 is likely to be 35 million tons. This requires a annual growth rate of 3.57 per cent.

1. Approach to crop diversification and intensification

- Pulses adaptability to low-input management conditions makes opportunities for crop diversification and intensification especially in area where Green revolution left various problems related to sustainability.

2. Towards self sufficiency and great exporter :

- Today India is self sufficient in cereals and has achieved quite balanced, almost self-sufficient in pulse production during 2017-18. In 2017-18 India has production and productivity of 23m tons and 835kg ha^{-1} respectively and our vision for 2030 is to increase production and productivity by 35 M tons and 1030kg ha^{-1} respectively which bring additional coverage of pulses in a area of 5-6 M ha over the existing normal area.
- So to become self sufficient as well as great exporter of pulses to meet the global demad we have to be ensured the per annum average growth in area and productivity at 1.7 per cent and 1.95 per cent respectively.

3. Social upliftment of farmers

- Pulses have a greater significance in the economy of rainfed regions *i.e.* 73 Mha area of the country which require continuing investments in human resource development, pulses research and development, improved information and extension, market, roads and related infrastructure development, efficient small-scale, farmer-controlled irrigation technologies, and custom hiring services for costlier mechanical inputs.
- Such investments would give small farmers the options and flexibility to adjust and respond to market conditions and it bring prosperity of the youth, small and marginal farmers.

4. Resilient to climate changes

- Pulse crop is important component of production system that are resilient to climate change.
- Pulses are able to convert nitrogen in atmosphere into plant available compounds in the soil. This process is known nitrogen fixation.
- This nitrogen fixation ability reduces the need for synthetic fertilizer and pesticide while at the same time improving yield as well as health of soil.

5. Enhancing the mutual production

- Major pulses are largely cultivated rainfed where soil moisture is the critical factor determining the productivity, Hence the production trends keep fluctuating every year depending on rainfall.
- The major constrain to realization of potential yield of pulses include biotic and abiotic stress prevalent in the pulse growing area.
- So inculsion of pulse in cereal based cropping system in intercropping viz., short duration thermo insensitive varieties of mungbean/urbean with spring sugarcane;

pre-rabi chickpea with barley/ mustard/linseed; pigeonpea with groundnut/soybean/millets, etc.; enhance the sustainability of the system by improving soil health.

6. Raise farmer income:

- The rainfed eco system with more than 40 % of total population and 2/3rd or 66 per cent of livestock of the country is a targeted group for the government.
- The DAC&FW, in its resolve to double the farmers' income by 2022, envisions to sustain self sufficiency in pulse production, improve competitiveness through knowledge based technological interventions for improving nutritional security and sustainability of the production system.

Conclusion:

Global supply of pulse is limited, as India happens to be the largest producer and consumer of pulses. Hence, the investment on pulses research in India need to be enhanced, commensurate with their significance in nutritional security and in promoting sustainable climate-smart agriculture.

References:

1. DAC&FW (Directorate of Economics & Statistics). 2018. Agriculture Statistics at a Glance.
2. Mohanty, S. and Satyasai, K.J. 2015. Feeling the pulse, Indian pulses sector. NABARD Rural Pulse 10, National Bank for Agriculture and Rural Development: Mumbai. <http://www.im4change.org/siteadmin/tinymce//uploaded/feeling%20the%20pulse.pdf>. (accessed 16 Oct. 2018).
3. NITI Aayog. 2016. Working Group Report.
4. Singh, N. 2017. Pulses: an overview. *Journal of Food Science and Technology*, 54(4): 853–857.

