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Steps towards self-sufficiency in pulse production in India

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Abstract
Pulses are major source of dietary protein in Indian diets especially for the majority of low-income households. Pulses are rich in carbohydrates, proteins, vitamins, essential minerals, micronutrients and fibre and low in fat which manage cholesterol levels, improve digestive health and regulate energy levels. Due to an increasingly nutrition-conscious urban population in India, the demand for pulses is growing rapidly. India is a proud nation enjoying self-sufficiency in foodgrain production and sustainable food security despite burgeoning population and various climatic stresses. But, the production of pulses has lagged far behind the consumption needs during the past decade and country is still facing severe challenges in pulse sector. India facing the problem of stagnant pulses production and rising costly imports. To meet the domestic demand and to fulfil the nutritional requirement of increasing population, India importing 2–6 million tons pulses annually from different countries. Keeping in view the high strategic importance of pulses in food and nutritional security of the majority of the population in India, it is essential to strategize boosted and sustained domestic production of pulses to attain self-sufficiency, especially at the household level.

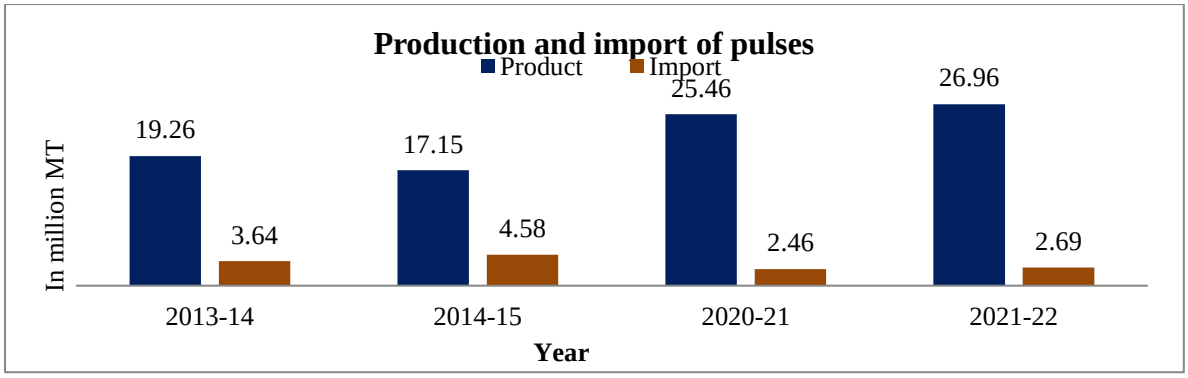
Key words: Pulses, Production, Self sufficiency

Introduction

India is the largest producer, consumer, and importer of Pulses in the world. In recent years, the Government of India has initiated a number of measures for boosting pulses production in the country with the aim of reducing the dependence on imports. As a result, the pulses production is steadily growing and the production during 2013 to 2015 was in the range of around 17-19 Million Metric Tonnes (MMT) and increased remarkably to 25-27 MMT during the last two years an increase of about 48 percent. In contrary to the pulse production the import of pulses are declining during the last few years. During 2010 to 2015, the pulse import was in the range of 2-5 MMT valuing Rs. 7500- 17,000 crores per annum. During the last five years, an overall declining trend in the import of pulses has been recorded. The pulse imports fell to the lowest level of around 2.46 MMT in 2020-21, which is the lowest in the last ten years. During 2021-22 (April-March) also, import is well within 2.7 MMT.

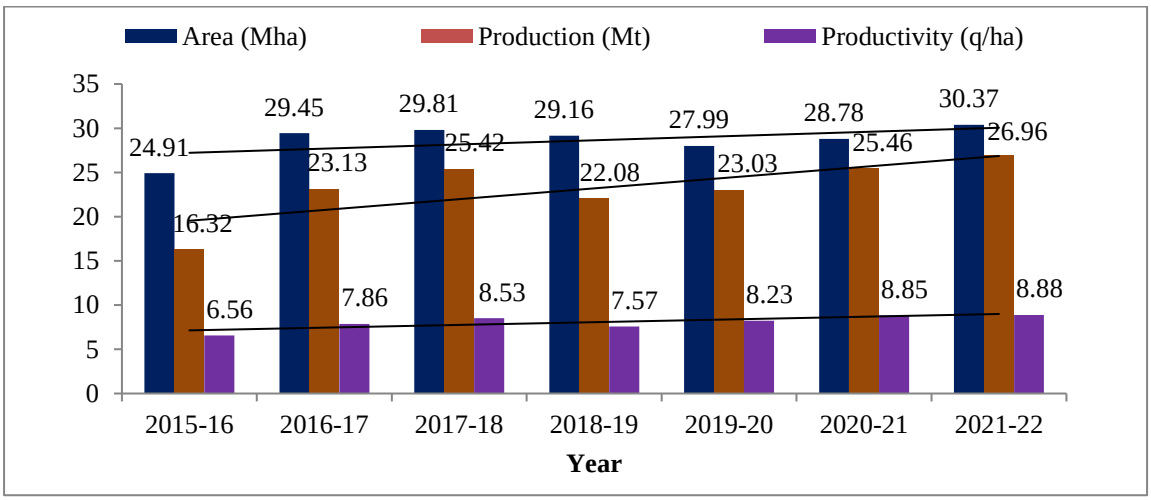
Trends of area, production and productivity of Pulses in India from 2015-16 to 2021-22

Area, production and productivity of pulses have increased exponentially from 2015-16 to 2021-22.



Source of Production data: *2nd Advance Estimates of production of food grains for 2021-22* ***Source of Import data:*** *DGCIS*

During 2015-16, area under pulses was 24.91 Mha and production was16.32 mt with an average yield of 6.56 q/ha. However, area, production and productivity have increased in 2021-22 as compared to previous years. Pulses was sown in an area of 30.37 Mha area with total production of 26.96 mt and average yield of 8.88 q/ha in 2021-22.



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Government's efforts to increase production of Pulses

To increase the production of pulses the National Food Security Mission-Pulses programme is being implemented in 644 districts of 28 States and Union Territories (UTs) of Jammu & Kashmir and Ladakh. Under NFSM-Pulses, incentives are given to the farmer for cluster demonstration, seeds distribution & production of certified seeds of High Yielding Varieties (HYVs), farm machineries/tools, efficient water saving devices, plant protection chemicals, nutrient management, soil ameliorants and training to the farmers.

Initiatives taken under NFSM (Pulses)

- Support for breeder seed production of pulses.
- 150 Seed Hubs created at ICAR institutes, State Agriculture Universities (SAUs) and Krishi
  Vigyan Kendras (KVKs) for increasing certified seeds production of pulses.

- Distribution of seed mini-kits of pulses free of cost to the farmers of the varieties notified within 10 years.
- ICAR/KVKs/SAUs conduct the demonstrations on improved latest package of practices.
- Assistance is provided to Central Seed Agencies to produce certified seed of latest varieties of pulses.
- A new scheme "Intercropping of pulses with sugarcane" was implemented in 12 States namely- Bihar, Gujarat, Haryana, Karnataka, Madhya Pradesh, Maharashtra, Odisha, Punjab, Tamil Nadu, Telangana, Uttar Pradesh and Uttarakhand during 2018- 19 and 2019-20.
- Special Action Plan for increasing pulses productivity was implemented during 2019- 20.
- Launched Targeting Rice fallow Area (TRFA) programme under NFSM in 11 states.

Government's effort for price stabilization of pulses

The Government has taken several measures to augment domestic availability and stabilize prices of essential food commodities. As per the official statistics of the Department of Consumer Affairs (DoCA), the Average Wholesale Price of Tur/Arhar Dal as reported on 22.02.2022 was Rs. 9255.88 per quintal, which was Rs. 9529.79 per quintal on 22.02.2021, a drop of 2.87%. Similarly, the Average Wholesale Price of Tur/Arhar Dal as reported on 21.02.2022 was Rs. 9252.17 per quintal, which was Rs. 9580.17 per quintal on 21.02.2021, a drop of 3.42%. In May 2021, advisories were issued to States/UTs to monitor prices of essential food commodities and to ensure disclosure of pulses stocks held by millers, importers and traders under the Essential Commodities Act, 1955. To improve availability and stabilise prices of pulses, the Government has allowed the import of Tur, Urad and Moong under 'Free category' w.e.f May 15, 2021 till October 31, 2021 in order to ensure smooth and seamless imports. The import policy measures have resulted in substantial increase in import of Tur, Urad and Moong as compared to the corresponding period for the past two years.

Major gaps and challenges in pulse production

- Pulses have low genetic yield potential, crop failure and yield instability due to biotic and abiotic stresses including blue bull menace and lack of institutional support are major challenges in the pulses sector.
- Huge yield gaps, yield stagnating and low total factor productivity (TFP) growth.
- Huge post-harvest losses, negligible value addition.
- Poor adoption of complete packages of practices viz. latest improved high yielding varieties, IPM, IPNS, water management, conservation agriculture and mechanization etc. in a holistic way.
- Poor monitoring and lack of impact pathway analyses, and accountability along the value chain.
- Highly volatile pulses prices, market instabilities, and generally un-incentivized farmers.

Strategies for achieving self-sufficiency in pulse production

Besides continuously increasing the prices of pulses, the government has launched several schemes and programmes for promoting pulses production. These government's initiatives have not been sufficient to trigger required interest among pulse growers. Due to geographical location and transportation problems smallholder pulse growers do not have easy access to regulated markets and distress sales of produce immediately after the harvest at prices lower than minimum support price (MSP) are

quite common. Therefore, keeping in view its rising demand and spiralling of domestic as well as international prices of pulses in case of crop failure in the country, policy strategies need to be devised for short, medium and long terms for achieving self-sufficiency in pulses in India.

A) Short-term Strategies

1. **Inclusion of Pulse Crops in cropping system:** Farmers should adopt pulse based cropping systems. Cultivation of pulse crop should be must once in a year for every farmer for maintaining soil fertility, betterment of their livelihood, increased farm income and also enhancing nutritional security. After harvest of cereal crops farmers should grow pulses such as gram, red gram, green gram and lentil. Small and marginal farmers can also increase their income and soil fertility by growing short duration pulse crops. Farmers could be motivated to think about inclusion of pulse crop in crop rotation for achieving a sustainable and prosperous harvest.
2. **Skilling of pulse growers:** Skill development of pulse growers on modern production practices from sowing to harvesting by different extension agencies can be very useful in reducing pulse production losses. Through different information and communication tools, crop production and protection technologies, improved varieties, risk mitigation (crop insurance) techniques etc. can be brought to the farmer's doorstep. Besides different extension agencies, India has more than 600 Krishi Vigyan Kendras (KVKs) spread across all the districts. The KVKs in potential pulses growing districts may select few progressive farmers from each taluka/block/mandal, who in turn can act as master trainers for other pulse growers. Extension workers, KVKs and other agriculture technology information centres should work more towards development and dissemination of newer and innovative technologie**s**
3. **Efficient crop insurance mechanism:** To provide financial support to the farmers in the event of crops failure due to natural calamities, a comprehensive crop insurance scheme was introduced in the country in *Kharif*, 1985. Even after more than three decades of implementation of crop insurance schemes in India, only 20 per cent of farmers subscribe crop insurance. It is essential to bring maximum number of pulse growers under insurance cover. This would give sufficient confidence to these farmers to combat the situation of crop failure due to natural calamities. In January 2016, the new crop insurance scheme was launched by the Prime Minister of India; it aims to provide a more efficient insurance support to the farmers. However, implementation of the scheme is a major challenge as technology for estimation of crop losses at individual farm levels is not in practice. Without that, even genuine farmers are unable to get compensation for crop losses.
4. **Strengthening seed delivery system:** The accessibility of small holding farmers to quality seed of improved pulse varieties due to both inadequate demand creation and limited supply. Hence, the seed replacement rate in pulses is considerably low. Strategic and planned framework to improve seed replacement rate in pulses would play an important role in improving the productivity of pulses. Even though seed production in India has increased in recent years but, there is a shortage of quality pulses seeds in the country. ICAR-Indian Institute of Pulses Research is acting as model agency with responsibility of co-ordination, monitoring and technical support for seed production. Availability of quality seeds of improved varieties would increase the pulses

production by at least 15–20 per cent. Pigeon pea hybrids have been developed that offer huge potential for enhancing yield. Concerted efforts are needed by both government agencies and research organisations for the production of quality seeds and promotion of its cultivation across pulse growing states. In addition to public seed corporations, seed societies and private companies should be involved in seed production of pulses. In humid areas, good storage facilities available for potatoes in India may be explored. Availability of quality seeds to farmers at affordable prices will certainly help increase area and productivity of pulses.

5. **Ensuring remunerative prices:** Even the latest move to raise the MSPs of all the crops by a hefty margin and offering a bonus on top may fall flat, unless assured arrangements can be put in place to ensure that the farmers actually get these prices. Hence, Government has substantially increased Minimum Support Prices (MSP) of pulses and enhanced imports to meet rising domestic demand. The MSP for pulses should be fixed considering not only the cost of its cultivation and parity with the competing crops, but also considering the yield variability in pulses and externalities it brings to the system in terms of nitrogen saving and subsidy saved on fertiliser and irrigation (Subramanian, 2016).
6. **Effective procurement:** In India, most of the pulse growers are currently unable to reach to regulated markets to sell their produce. They sell their produce in local markets and village traders are their main buyers. To ensure the remunerative prices for these growers particularly during harvest season, it is very important to bring the procurement centres at the doorstep of the growers. Prices and procurement should be standardise by using mobile vans or regulating the village traders to make public all the information related to the transactions may reduce the ambiguities and exploitation of the smallholders. The procurement of pulses after harvest needs to be strengthened immediately. It can be facilitated by forming farmer producer organisation (FPO) and linking it with National Agricultural Market though e-platforms.

B) Medium-term Strategies

1. **Expansion of area under pulses:** Pulses are generally grown on marginal lands. Area of pulses under cultivation should be expanded. Fallow lands or reclaimed waste lands can be identified and targeted in each state to bring it under pulse crops. In Eastern India about 11.7 million ha area in rice production system remains fallow during the succeeding winter season due to several limitations. Efficient utilization of these fallow lands may improve productivity and sustainability of the regions. Bringing additional area under pulses in rice fallows of eastern India is another potential area. Focus on both *kharif* (pigeon pea) and *rabi* (chickpea) pulses targeting low productive and high potential region would offer huge potential in jacking up the production of these crops. Several studies have shown that there is large tract of about 6–8 million hectares, which are rice fallow. Even if 10 per cent of this area is targeted every year, within 5 years, we may have an additional 5.5 million hectares of land under pulses.
2. **Farmer's producer organisation (FPO) on pulses:** Farmers producer organization is a legal entity formed by primary producer i.e. farmer with the aim to ensure better income for the farmer through an organization of their own. This can be a game changer in the pulses sector. Identifying the pulses-growing clusters and bringing on a single platform to integrate with the backward and

forward linkages will help the farmers in reducing the cost of production substantially. Through FPO, the value chain of pulses can be easily shortened. It can also add a lot of value in the hand of pulse growers. The shortening of value chain will help the consumers in accessing the produce at reasonable price. If the processing mills are set up near these farmers, the by-products of processed pulses can also be used as nutritious feed for livestock. This will also help in capturing additional value by undertaking processing of pulse grains and delivering the product directly to the urban consumers through organised retailers.

3. **Development of farm equipment:** Labour is the most costly input for agriculture in India. Development of cost effective farm machines and other small farm equipment for plant protection through collaborative approach can be of great help for the producers in reducing labour cost. New age app-based custom hiring services for farm equipment can be quite useful particularly for smallholders in doing the basic farm operations timely and economically. Private tractor company, like Mahindra and Mahindra, has started on pilot basis 'on-demand farm equipment' rental start-up, Trringo in Karnataka state, through which farmers can book tractors by the hour via a phone call (Peermohamed, 2016). Such innovation in farm equipment services has a lot of potential in revolutionising the pulses production.
4. **Setting up of storage and warehousing in rural areas:** Storage is an important marketing function, which involves holding and preserving goods from the time they are produced until they are needed for consumption. It helps in the stabilization of prices by adjusting demand and supply. Developing the multipurpose storage and warehousing structures in the rural areas is essentially required to ensures a continuous flow of goods in the market and realise better prices by the farmers by timing the market for selling of the produce. This should also be seamlessly integrated with the financing provisions on collateral basis, so that the farmers who wish to sell the produce, when the price is right, can meet the financial obligations.

C) Long-term Strategies

1. **Developing shorter duration and biotic and abiotic stress resistant varieties:** Heavy Infestation of insects-pests and diseases and variation in rainfall and temperature bring huge risks to pulses cultivation and are the main reason for low yield of pulses. Development of suitable cultivars for specific regions will be very important to break the yield barrier. Efforts should be initiated for new and innovative research instead of conducting routine research and material evaluation to achieve a breakthrough in the productivity of pulses. Scientists should work for development of shorter duration, widely adaptable and biotic and abiotic stress resistant varieties to boost the production of pulses. Modernization of pulse breeding programme, supporting genetic gains through transgenic technology, enhancing biological nitrogen fixation through development of super nodulating plant types and breeding short duration varieties for achieving self sufficiency in pulses. Several research institutes of ICAR working on this line.
2. **Integrating pulses into public distribution system:** Malnutrition is most common in women and children in India. It is necessary to provide pulses to all the poor households at affordable price to achieve the target of zero hunger and

good health. Although this would further increase the demand of pulses. It can be managed if sufficient steps for enhancing the domestic production are already taken. Therefore, compulsory inclusion of pulses in the existing schemes such as mid-day meal scheme or public distribution system (PDS) shall be ensured, so that the minimum pulses consumption by poor households are maintained even during the scarcity in pulses production.

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