



Feeling the Pulse Indian Pulses Sector

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Pulses are an integral part of many diets across the globe and they have great potential to improve human health, conserve our soils, protect the environment and contribute to global food security. The United Nations, declared 2016 as “International Year of Pulses” (IYP) to heighten public awareness of the nutritional benefits of pulses as part of sustainable food production aimed at food security and nutrition. India is the largest producer, consumer and importer of the pulses in the world. The present Issue of Rural Pulse attempts to give a bird’s eye view of the Indian Pulses Sector in the backdrop of the IYP.

Pulses have been in focus in recent times due to the continuous upswing in their prices. Stagnant productivity coupled with declining availability has created substantial demand supply gap, forcing heavy import bill on the exchequer and affecting nutritional security of majority of the population for whom pulses are the one of the cheapest sources of protein.

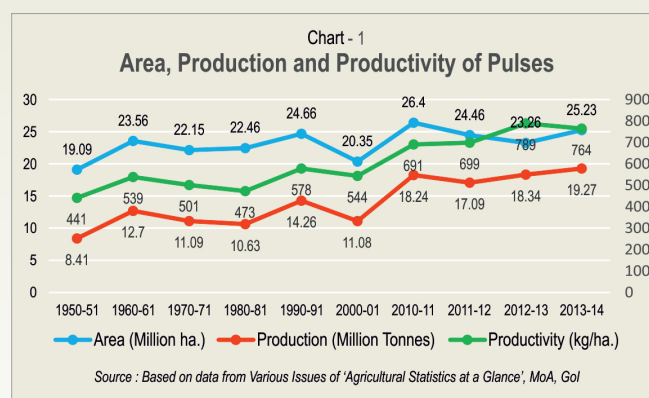
Pulses are annual leguminous crops yielding between one and 12 grains or seeds of variable size, shape and colour within a pod, used for both food and feed. The term “pulses” is limited to crops harvested solely for dry grain, thereby excluding crops harvested green for food, which are classified as vegetable crops, as well as those crops used mainly for oil extraction and leguminous crops that are used exclusively for sowing purposes. Besides serving as an important source of protein for a large portion of the global population, pulses contribute to healthy soils and climate change mitigation through their nitrogen-fixing properties. Bengal Gram (Desi Chick Pea / Desi Chana), Pigeon Peas (Arhar / Toor / Red Gram), Green Beans (Moong Beans), Chick Peas (Kabuli Chana), Black Matpe (Urad / Mah / Black Gram), Red Kidney Beans (Rajma), Black Eyed Peas (Lobiya), Lentils (Masoor), White Peas (Matar) are major pulses grown and consumed in India.

Area, Production and Productivity

India is the largest producer (25% of global production), consumer (27% of world consumption) and importer (14%) of pulses in the world. Pulses account for around 20 per cent of the area under foodgrains and contribute around 7-10 per cent of the total foodgrains production in the country. Though pulses are grown in both Kharif and Rabi seasons, Rabi pulses contribute more than 60 per cent of the total production. The area under pulses has increased from 19 million ha. in 1950-51 to 25 million ha. in 2013-14, indicating an increase of 31 per cent whereas the production of pulses during the same period has increased from 8.41 million tonnes to 19.27 million tonnes, an increase of over 100 per cent. Gram is the most dominant pulse having a share of around 40 per cent in the total production followed by Tur/Arhar at 15 to 20 per cent and Urad/Black Matpe and Moong at around 8-10 per cent each. Madhya Pradesh, Maharashtra, Rajasthan, Uttar Pradesh and Karnataka are the top five pulses producing States. Productivity of pulses has improved by 46 per cent, from 441 kg/ha. to 764 kg/ha. during the same period (Chart-1). The compound annual growth rate (CAGR) in productivity for the entire period however, shows a dismal picture at 0.64 per cent. The CAGR of pulses for the five decades (1950 to 2000) of the Five Year Plans was 0.5 per cent. The situation improved during the present

millennium (2000-01 to 2013-14) when CAGR in productivity improved to 2.4 per cent.

A comparison of area, production and productivity of pulses vis-a-vis foodgrains as a whole, rice, wheat and oilseeds puts a question mark on the priority accorded to the pulses. During the period from 1950-51 to 2013-14, the CAGR in area under total pulses at 0.08 per cent was much lower than the total foodgrains (0.21%), rice (0.58%), wheat (1.7%) and oilseeds (1.4%). The significant fall in pulses cultivation in the 1960s and in the early 1970s was primarily due to the substitution of pulses cultivation with high yielding varieties (HYV) of cereals, especially wheat, following the introduction of Green Revolution technologies, especially in Punjab, Haryana and Western Uttar Pradesh. The Bengal Gram or chana was the largest sufferer in terms of reduced area. However, rain fed kharif pulses like Tur/Arhar did not face problem of diversion of area to cereals¹. The picture is not encouraging from the point of view of productivity of pulses vis-à-vis foodgrains, especially wheat and rice. As against 0.64 per cent growth in productivity of pulses, the CAGR of foodgrains was 2.23 per cent, rice 1.9 per cent, wheat 2.75 per cent and oilseeds 1.53 per cent. Thus, low productivity coupled with loss of area has affected the production of pulses.



Since ages, pulses have been well integrated into the farming system of our country as the farmers could produce them by using their own seeds and family labour without depending much on external inputs. With the advent of Green Revolution, which promoted rice and wheat using external inputs and modern varieties of seeds, pulses were pushed to the marginal lands. This resulted in decline in productivity and land degradation. The narrow focus on a couple of crops is

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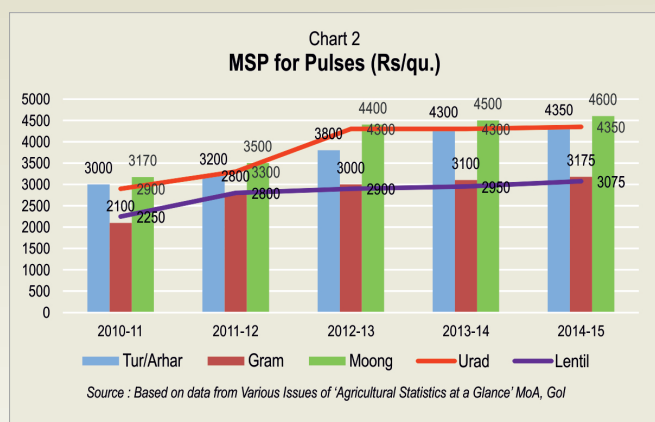




reflected in the fact that the percentage of area under irrigation has increased from 38 per cent in 1966-67 to 59 per cent in 2012-13 in case of rice and 48 per cent to 93 per cent in case of wheat whereas the same for pulses has increased from 9 per cent to 16 per cent during the corresponding period. Thus, pulses are still cultivated on the marginal and sub marginal land, predominantly under unirrigated conditions. The trend of commercialisation of agriculture has further aggravated the status of pulses in the farming system.

Price Support

The policy prescription for ensuring reasonable price to the farmers largely centres around procuring the pulses by providing Minimum Support Prices (MSP) to the farmers through National Agricultural Cooperative Marketing Federation of India (NAFED) and more recently through Small Farmers Agri Consortium (SFAC). The movement of MSP for major pulses in the last five years has exhibited a continuous increase (Chart-2). The CAGR in the MSP of all the pulses have been higher than that of paddy and wheat. For instance, it was 11 per cent each for Tur/Arhar and Urad, 10 per cent each for Gram and Moong and 7 per cent for Lentil whereas the growth in MSP for paddy of both common variety and Grade A was 8 per cent and wheat was 5 per cent during the same period. However, the procurement has been negligible at about 1 to 4 per cent of production of pulses compared to 28 to 30 per cent of cereals during 2012-13 to 2014-15 (CACP 2015). Procurement by NAFED and SFAC has been very limited i.e. around 6.56 lakh metric tonnes during 2013-14 (July to June), hence, does not have any dent on the price movement.

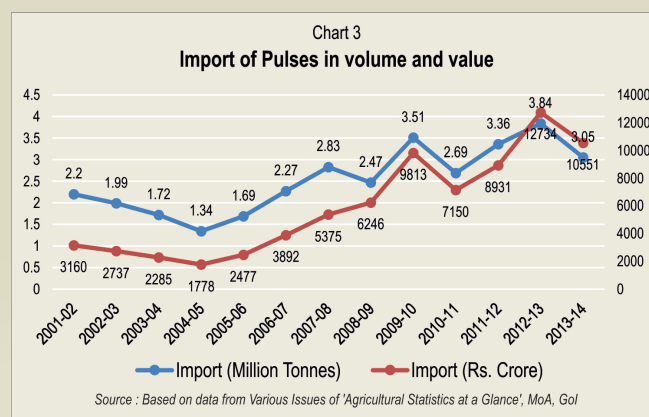


Further, majority of the pulse growers are small and marginal farmers having lower marketable surplus and limited holding capacity. In the absence of proper procurement facilities, they are in many cases forced to resort to distress sale. This forces them to leave their land fallow in most of the cases. As pointed out by Santakumar Committee Report "though MSPs are announced for 23 commodities, but effectively price support operates primarily in wheat and rice and that too in selected states. This creates highly skewed incentive structures in favour of wheat and rice. While country is short of pulses and oilseeds (edible oils), their prices often go below MSP without any effective price support. Further, trade policy works independently of MSP policy, and many a times, imports of pulses come at prices much below their MSP. This hampers diversification². The absence of an efficient marketing arrangement and production constraints have created a huge gap between the demand and supply of pulses forcing the country to resort to import pulses.

Import of pulses

Despite increase in production, India has been the largest importer of pulses since the beginning of the present millennium. The import has increased to more than 20 per cent of the domestic production during 2009-10 and 2012-13. In the remaining years, it has been in the range of 15-20 per cent of the domestic production, except during 2003-04 to 2005-06 where it varied in the range of 11 to 12 per cent of the domestic production.

The import bill for pulses also soared from Rs. 3160 crore during 2001-02 to Rs. 10551 crore during 2013-14 (Chart-3), indicating a CAGR of 16 per cent. The share of pulses in total agricultural commodities however has remained below 15 per cent since 2010-11 eventhough



it had shown tendency to go beyond 15 per cent in most of the years prior to that. Though the major pulses are imported from across 30 countries, Canada, Myanmar, USA, Russia and Australia have been the major sources of imports. Peas, lentils, gram, chickpeas and pigeon peas constitute to bulk of the imports. The chickpeas and peas serves as besan which forms a core ingredient of sweets and snacks in most part of the country. India normally exports pulses (Peas, lentils, gram, chickpeas and pigeon peas) to the Asian and African countries i.e. Pakistan, Algeria, Turkey, UAE and Sri Lanka, etc. and the total exports was around 0.30 million tonnes during 2013-14.

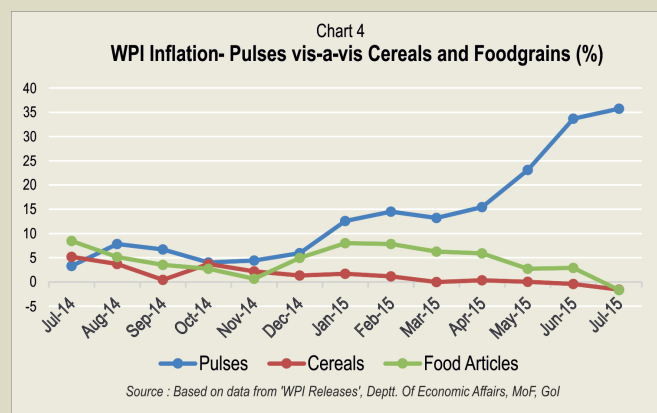
Price movement

In the backdrop of wide mismatch between demand and supply, large scale imports, it is necessary to look at the price movement of pulses. The prices of pulses have shown an upward trend in most of the period in the recent years. During the period from April 2012 to July 2015, price for Gram/chickpeas were higher (from August 2012 to Dec 2014) in the wholesale domestic market than that of the international market after which it synchronized with the latter. The domestic prices for Tur/Arhar have been higher than that of international prices for over last two years upto February 2015. The price fluctuations in the international markets were higher than that of the domestic market for lentils. International prices for Moong have been higher than domestic prices since September 2012. The international prices for Urad were higher than that of domestic prices during April to August 2014 and November 2014 to June, 2015³. The impact of this rising prices is reflected in the inflation data.

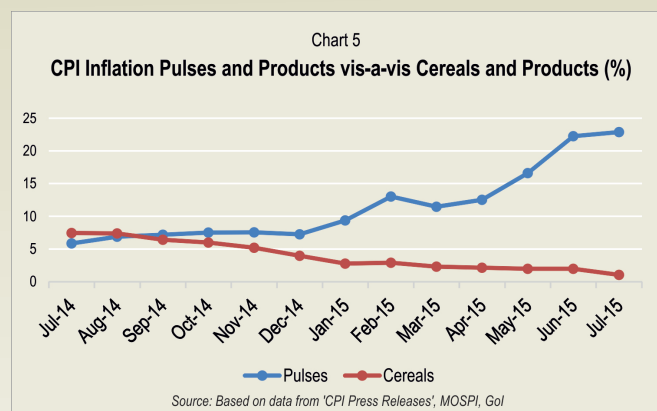
WPI inflation of pulses vis-à-vis cereals and food articles indicates the steep rise in prices of pulses, especially post January 2015 exhibiting persistent double digit trend, crossing 30 per cent during June and July 2015. The rate of inflation of cereals has been very low



and of food articles moderate in comparison to that of pulses during the corresponding period (Chart-4). The CPI inflation for pulses and products though almost showing similar trend from June 2014 to December 2014 as the cereals and products has continuously outpaced



the latter since January 2015 onwards (Chart-5). This gives credence to the 'Protein inflation' for which pulses alongwith fish, meat and milk are the major triggers. Since pulses have a very negligible weight (less than 1 per cent) in WPI, the rise in pulses do not cast much impact on the



overall WPI. But the common consumer faces the brunt when he shells out higher prices for the staple food item like pulses which is an integral part of his daily diet.

Availability vis-à-vis nutritional and sustainability aspects

Per capita net availability of pulses in India, however, has reduced from 51.1 gm/day (1971) to 41.9 gm/day (2013) as against WHO recommendation of 80gm/day. This raises question about the nutritional aspect as pulses are considered to be 'poor man's protein'. It is estimated that pulses contain 20-25 per cent of protein by weight and have twice the protein available in wheat and thrice that is present in rice⁴ Alarm bells have already started ringing for this "calorie catastrophe"⁵ as India is competing with China for the notorious crown of "the diabetic capital of the world" because of its higher intake of carbohydrates and lesser intake of pulses. In addition to its nutritional advantage, pulses have low carbon and water footprints which make them an integral part of the sustainable farming system. As per estimates, water footprints for producing one kilogram of meat is five times higher than that of pulses. Further, one kilogram of legume emits 0.5 kilogram in CO₂ equivalent

whereas one kilogram of meat produce 9.5 kilogram in CO₂ equivalent⁶. As per Indian Institute of Pulses Research (IIPR), India's population is expected to touch 1.68 billion by 2030 and pulses requirement for the year 2030 is projected at 32 million tonnes. To meet this requirement, additional 3-5 million ha. to be brought under cultivation and productivity has to be increased to 1361 kg/ha. Further, as per VISION 2050 of IIPR, the projected demand for pulses by 2050 at 50 million tonnes necessitates annual growth rate of 4.2 per cent which additional area of 3- 5 million under cultivation and augmenting productivity to 1500 kg/ha besides drastically reducing post harvest losses⁷.

Research and Extension

Noticing the continuous decline in pulses productivity, an All India Coordinated Pulses Research Project (AICRP) was initiated in 1965 to undertake a nation-wide research effort on pulses. Subsequently, launching of Intensive Pulse Development Programme (IPDP) during 4th FYP (1969-74), Centrally Sponsored National Pulses Development Programme (NPDP) during 7th FYP (1985-90), Integrated Scheme of Oil Seeds, Pulses and Maize (ISOPOM) during 10th FYP (2002-07) and National Food Security Mission (NFSM) during 11th FYP (2007-12) have been milestones in improving the pulses production in the country. But still a lot needs to be done in research and extension.

Processing and value addition

There is very little value addition for pulses. Pulses are mostly consumed whole or split, apart from desi chickpea which is usually consumed in the form of flour/besan and has growing demand. Most of the processing units are production regions mainly to minimise the transportation cost for procuring raw materials and use traditional technology. However, the growing health consciousness, preference for quality packaged products and shortage of labour drives the processors to use modern technology. Due to inconsistent policies and lacklustre support, the players in the value chain of pulses are hesitant to come forward to make investment decisions including those related to R&D, marketing and input supplies.

Issues to ponder

In this scenario the question arises whether the pulses will lose their place in the production system and if yes, what will be the alternative to enhance the nutritional security of the millions of people, who have adapted to the production and consumption of pulses. A number of questions need to be answered in this context.

Dietary diversification: The first issue is to strike a balance between consumption of carbohydrates as source of dietary energy and nutritional diversification of diets by including nutritious food like pulses. Though there has been a perceptible change towards the diversification of food basket in the wake of urbanisation and increase in per capita income, the unduly heavy tilt towards carbohydrates still persists among large majority of population.

Small holder centric farming system: Pulses being rain-fed and protein rich crops are more susceptible to abiotic and biotic stresses. Risk-averse resource poor farmers are unwilling to upgrade their farming with investment in modern technological tools. Hence, it is necessary to strategically place pulses in the farming system of the smallholders against the backdrop of competition arising out of the commoditisation of agriculture which has bias towards high value crops.



Sustainability issues: The relentless quest for higher yield though important to meet the higher demand for food affects the long term sustainability. With the threat of adverse impact of climate change looming large on the horizon, the need of the hour is to enhance crop yields without causing further damage to the ecosystem.

Way Forward

Renewed emphasis on research and broad basing Extension: High priority needs to be accorded to research in pulses, with emphasis on varietal development to suit the local specific conditions, collection and characterisation of pulse germplasm to identify climate resilient ones, development of short duration variety to facilitate inter cropping and mixed cropping without affecting the yield of cereals and other crops. The public sector extension services though having widespread network has not been able to reach the smallholders whereas the private sector is yet to rise upto the mark in case of pulses which are less remunerative. The awareness about correct improved agronomic practices, such as timely sowing, regular mechanical weeding, timely harvesting, post harvest handling could go a long way in bridging yield gap and also enhancing income of small holders. Thus, there is a need to involve public institutions (ICAR, SAUs), NGOs, seed companies, farmers' associations and private entrepreneurs in quality seed production, transfer of technology, processing and value addition and supply of critical inputs.

Area expansion : Pulses have tremendous scope for area expansion. As per estimation, about 2.5 million ha. additional area can be brought under different pulses through cropping system improvisation like mung bean and urad bean as catch crop in summer/spring under cereal-based cropping systems, intercropping short-duration pulses (mung bean, urad bean, cowpea) in sugarcane, millets, cotton, etc. advocating new cropping systems such as pigeon pea-wheat in the north, rice-lentil in the east and urad bean-rice in the southern peninsula.

Efficient marketing system: One crucial missing link that can incentivise smallholders and address the price fluctuation in the pulses is the efficient marketing system. In order to facilitate better price discovery and transparency, facilities have been created for the electronic trading of pulses. A few APMCs in Karnataka, Andhra Pradesh and Telangana have been modernised and facilitated trading of pulses. In the backdrop of the move towards National Common Market for agricultural commodities, a lot of such initiatives to taken to build an efficient marketing system for pulses.

Value chain approach: Value chain approach starting from the production at farm level and encompassing post harvest processing, packaging, transportation and marketing has the potential to link the smallholders with the market and improve their incomes. Though are instances of successful value chains in other commercial crops they

are yet to be developed in case of pulses. At present, post-harvest processing of pulses is mainly handled by the private sector. Installation of efficient, small dal mills /processing units in villages will reduce the cost of processing and ensure their ready availability at cheaper rates. Distribution of seed-storage bins to the farmers and mass awareness campaign for adoption of scientific methods of storage of pulses at the village level are likely to reduce losses from stored grain pests in pulses.

Product diversification : Research on creating novel innovative products using pulses as ingredients need to be emphasized. In countries like Canada, research is already at advanced levels to explore opportunities in blending pulses protein with other flour such as wheat flour. But in India, the private and the public sector R&D are yet to fully explore these opportunities and others such as fortification and/or blending pulses with other ingredients that may accelerate consumer demand.

Pulses have captured the attention of the United Nations and General Assembly of the UN has voted to declare 2016 as the 'International Year of Pulses'. The Food and Agriculture Organization of the United Nations (FAO) has been nominated to facilitate the implementation of the Year in collaboration with Governments, relevant organizations, non-governmental organizations and all other relevant stakeholders. The Year provides an unique opportunity to encourage connections throughout the food chain that would better utilize pulse-based proteins, further global production of pulses, better utilize crop rotations and address the challenges in the trade of pulses.

The need of the hour is to forge a holistic understanding of the issues affecting the pulses value chain, major reforms in agri-food policies, increased need for more R&D on the input side and food processing innovations, increase awareness as well as interest of consumers, policy makers, food industry and NGOs in pulses and their health, nutrition and environmentally sustainable benefits.

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