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Production, demand and import of pulses in India

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ABSTRACT

Pulses, supplemented with cereals, provide a perfect mix of vegetarian protein of high biological value. India is the largest producer, importer and consumer of pulses, accounting for 25% of global production from 35% of global area under pulses. The productivity of pulses in India is less than half of the productivity levels in the USA and Canada, as the pulses are mainly grown under rainfed condition in India in the areas with high rainfall variability.The persistent and growing demand–supply gap is putting pressure on prices and this good source of vegetarian protein is turning inaccessible to the poor. The production of pulses in India has caught in the vicious cycle of low and uncertain yields, poor per hectare returns resulting in farmers' least preference to grow pulses on irrigated and fertile parcel of land, thereby leading to unstable and low yields. Inadequate adoption of production technology, higher price volatility, production risk and low level of irrigation are the important influencing factors responsible for stagnation in the productivity of these crops. The country would require 39 million tonnes of total pulses by 2050, which will require pulses production to grow at an annual rate of 2.2%. To fulfil the growing requirement, the country has to produce enough pulses as well as remain competitive to protect the domestic production. It is imperative to develop and adopt more efficient crop-production technologies along with favourable policies and market support to encourage farmers to bring more area under pulses. In order to provide the nutritional security to the poor masses relying on vegetarian diet, making pulses affordable through boosting domestic production of pulses is the best alternative. In order to augment the supply of pulses to poor masses, under the current scenario supply through public distribution system will not only distribute pulses to poor at affordable prices and enhance nutritional security, but will also lead to stabilize prices and provide boost to the farmers through assured procurement. The lack of an assured market is one of the major issues in the poor performance of pulses. Government procurement would provide adequate marketing support to growers. Alternative marketing arrangements through contract farming, farmer producer company model, needs to be promoted.

Key words : Demand, Marketing, Nutritional Security, Production, Pulses

INTRODUCTION

Pulses continued to be an integral component of sustainable crop-production system, as these crops have ability of biological nitrogen fixation, low water requirement and capacity to withstand abnormal weather conditions. Pulses, as an important source of protein, constitute a basic ingredient in the diet of vast majority of poor and vegetarian population in India. Supplemented with cereals, pulses provide a perfect mix of vegetarian protein of high biological value. The results from household consumption surveys indicate decline in the consumption of pulses leading to increase in malnutrition and decline in protein intake (Shalendra *et al*., 2013). India is still a home to about 24% of undernourished people in the world (Sharma *et al*., 2016). About 15.2% of people in India are undernourished. This signifies the importance of pulses in food and nutrition security for Indian population.

Production of pulses is largely restricted to Asian countries and particularly in the Indian sub-continent. Various pulse crops are grown in India under a wide range of agro-climatic conditions, hence it is a major player in pulses globally. India is the largest producer, importer and consumer of pulses, accounting for 25% of global production from 35% of global area under pulses. Currently (4th advance estimate) pulse production in India is 16.47 million tonnes (2015–16) which is shortfall by 3.58 million tonnes as against the target of 20.05 million tonnes. Global pulses production was 73 million tonnes during 2013–14 from an area of 80.8 million ha, which has increased from 40.78 million tonnes and 68.03 million ha in the year 1961 (FAO, 2016). Our country is the largest producer of chickpea (*Cicer arietinum* L.) and pigeonpea [*Cajanus cajan* (L.) Millsp.] with 67.5 and 63.7% of share in global production respectively. The productivity of pulses in

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India is 755 kg/ha, whereas in the USA and Canada it is as high as 1,900 kg/ha. The pulses in India are grown in semi-arid areas which face high rainfall variability adding to high instability and low productivity. Best parcel of lands with irrigation facility is usually reserved for other crops by farmers.

Even being the largest producer of pulses, the persistent and growing demand–supply gap has been an issue of concern leading to spike in prices further resulting in this good source of vegetarian protein inaccessible to the poor. The demand–supply gap is expected to grow further if the level of production of pulses in India is not increased. The per capita availability of pulses declined steadily on account of sluggish growth in the production of pulses. To fulfil the growing demand of pulses in the country, dependence on imports is rising. Even with recent enhancement in production of pulses in the country, imports had sharply increased in recent past.

The sluggish performance of pulses production in the country has resulted in increasing deficit, on the one hand and depletion of foreign-currency reserves by soaring import bills, unpredictable price rise and lower net profit compared to competing crops, on the other hand (Joshi and Saxena, 2002; Srivastava *et al.*, 2010). The production of pulses in India has been caught in the vicious cycle of low and uncertain yields, low per hectare returns resulting in farmers' least preference to grow pulses on irrigated and fertile parcel of land (farmers preferred to grow pulses on marginal lands with no use of production inputs), thereby leading to unstable and low yields (Joshi and Saxena, 2002; Lingareddy, 2015). The technological progress in these crops is slow compared to cereals and other cash crops due to hosts of factors. These crops have to compete with the superior cereals and cash crops for resources, research and infrastructure (Ramasamy and Selvraj, 2002). Under this backdrop, the present paper tried to take stock of production, demand of pulses and their imports in India.

GROWTH AND INSTABILITY IN AREA, PRODUCTION AND YIELD OF PULSES IN INDIA

The highest area under pulses was recorded at 26.28 million ha during 2010–11, and the highest production at 19.78 million tonnes during 2013–14. The productivity of pulses in the country has increased from 441 kg/ha in the year 1950–51 to 789 kg/ha in the year 2012–13 (GoI, 2015). The share of different states in area and production of pulses for triennium average ending (TE) 2013–14 indicates that states such as Madhya Pradesh, Maharashtra, Rajasthan, Uttar Pradesh, Andhra Pradesh and Karnataka accounted for nearly 80% of total area under pulses, contributing 80% to total production. Thus, production of pulses is concentrated in a few states, and similarly few states dominated the production pattern of individual pulse crops (Srivastava *et al.*, 2010).

The area under pulses is almost stagnant in the country with marginal increment from 21.87 million ha during TE 1972–73 to 24.42 million ha during TE 2013–14, an increase of 11.6% (Table 1). However, the production of pulses has increased from 10.94 million tonnes to 18.44 million tonnes during the corresponding period, an increase of about 69%, mainly owing to productivity increase of 51% from 500 kg/ha to 755 kg/ha. The compound annual growth in area under pulses was negative during the decades of 1980s and 1990s, which improved and reached 1.3% per annum in the recent decade, although for overall period, area under pulses in India remains stagnant. Production of pulses in India witnessed negative growth rate during the decade of 1970s which turned positive in the following decade and reached 3.35% per annum in the recent decade, mainly owing to positive growth in productivity (Table 2). Looking at growth rate in production and productivity for overall period, pulses may be treated as slow growth crops. Inadequate adoption of production technology, higher price volatility, production risk and low level of irrigation are the important influenc-

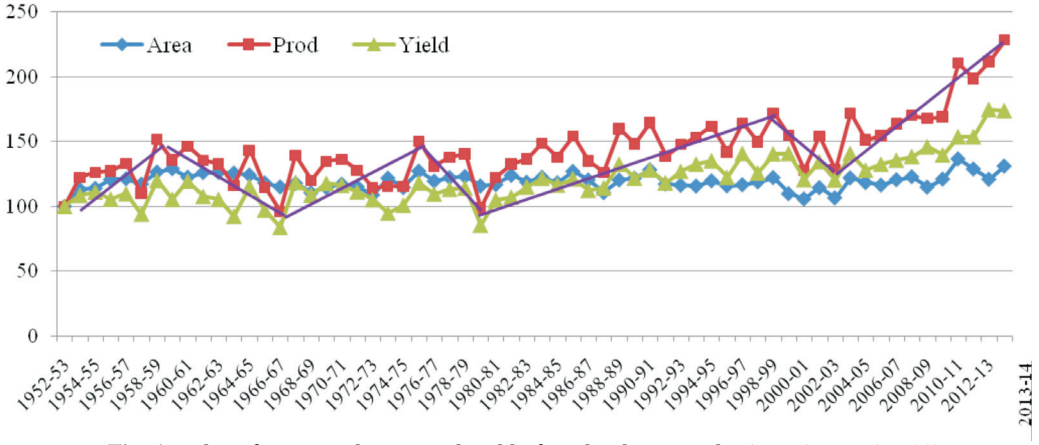

Fig. 1. Index of area, production and yield of total pulses in India (TE 19552–53=100)

ing factors responsible for stagnation in the productivity of these crops (Ramasamy and Selvraj, 2002).

It is evident from the Fig. 1 that index of area under pulses (base TE 1952–53=100) has merely reached 131 in the year 2013–14, while index of pulses production has reached 228 mainly because of change in productivity index to 174. The improvement in productivity of pulses in India was mainly on account of higher adoption of improved varieties by farmers, production of breeder seed, demonstration of pulses production technology, and policy support (Gowda *et al*., 2013). There has been significant shift in area under pulses during the post-green revolution period. The area under pulses has declined in north India, while it has expanded in central and south India (Ali and Gupta, 2012; Gowda *et al*., 2013). The regional area shift is more conspicuous in case of chickpea.

Chickpea and pigeonpea are the major pulses cultivated in India, together accounting for about 53% of total area under pulses and contributing to 63% of the total pulses production. Area under chickpea in India witnessed a marginal increase of about 18% over the last 44 years and has increased from 7.57 million ha during TE 1972–73 to 8.92 million ha during TE 2013–14. Production of chickpea was 4.94 million tonnes during TE 1972–73, which has increased to 8.69 million tonnes during TE 2013–14, an increase of nearly 76%, mainly on account of about 50% increase in yield (Table 1). Also, there is wide variation in the yield of chickpea among various states which varies from 558 kg/ha (Jammu and Kashmir) to 1,281 kg/ha (Bihar). Although the area under chickpea has declined during 1980s and 1990s and witnessed negative growth rate in area, with the impressive growth in yield, the area and production of chickpea in the country has increased rapidly in the recent decade. The growth rate in area and production of chickpea started picking up from 1990s. The growth in production of chickpea in the recent decade was 5.5% per annum. For the overall period the growth in area under chickpea remained stagnant and growth in production and yield was around 1% per annum (Table 2), showing a sluggish growth. The slow growth in area, production and yield of pulses has also been reported by Sharma and Prakash (2002) and Srivastava *et al.* (2010).

The area under chickpea witnessed an increment during 1950s, whereas during 1960s to 1990s the area was even lower than 1950s (Fig. 2). The decline in area under chickpea was mainly due to substitution with high-yielding varieties of cereals particularly in Punjab, Haryana, Rajasthan, Uttar Pradesh, Bihar and West Bengal (Kumar, 1978; Sadasivan, 1989; Lingareddy, 2015). Area under chickpea started increasing only from 2006–07, mainly on account of higher adoption of improved short-duration and wilt-resistant varieties in central and South India, particularly in Andhra Pradesh and Karnataka (Gowda *et al*.,

Table 1. Area, production and yield of pulses in India

Crop	A/P/Y	TE 1972–73	TE 1982–83	TE 1992–93	TE 2002–03	TE 2013–14	% change over 1972–73
Chickpea	Area (m ha)	7.57	7.28	6.52	5.84	8.92	17.73
	Production (m t)	4.94	4.75	4.63	4.52	8.69	75.85
	Yield (kg/ha)	652	653	711	775	974	49.37
Pigeonpea	Area (m ha)	2.48	2.92	3.60	3.44	3.91	58.03
	Production (m t)	1.83	2.06	2.29	2.23	2.95	61.22
	Yield (kg/ha)	739	706	636	649	754	2.02
Lentil	Area (m ha)	0.74	0.96	1.19	1.44	1.44	95.23
	Production (m t)	0.35	0.48	0.81	0.92	1.07	205.88
	Yield (kg/ha)	474	504	683	637	742	56.68
Urdbean	Area (m ha)	1.97	2.77	3.31	3.29	3.18	61.86
	Production (m t)	0.60	0.98	1.56	1.42	1.79	198.33
	Yield (kg/ha)	305	352	472	432	562	84.31
Mungbean	Area (m ha)	1.96	2.77	3.28	3.04	3.19	62.86
	Production (m t)	0.59	1.03	1.36	1.00	1.48	148.88
	Yield (kg/ha)	303	373	414	330	463	52.81
Peas	Area (m ha)	0.87	0.43	0.58	0.66	0.83	-5.15
	Production (m t)	0.63	0.31	0.57	0.58	0.82	30.15
	Yield (kg/ha)	725	708	977	879	995	37.22
Total pulses	Area (m ha)	21.87	23.04	23.19	20.95	24.42	11.64
	Production (m t)	10.94	11.33	13.03	11.86	18.44	68.59
	Yield (kg/ha)	500	492	562	566	755	51.00

m, million; t, tonnes

2013). It is evident from Fig. 2 that index of chickpea production in India has increased to 254 in the year 2013–14 over the base TE 1952–53 as 100. This was mainly owing to increase in the productivity index to nearly 200 in the year 2012–13.

In case of pigeonpea, the increase in production was 61% since TE 1972–73 period, which was mainly on account of increase in area (58%) and the productivity was stagnant at around 740–750 kg/ha.

There was a continuous decline in productivity of pigeonpea which, however, showed increase in the recent decade. The productivity changes of about 57% in case of lentil (*Lens culinaris* Medikus) and the area change of about 95% has led to nearly 206% increase in production of lentil in the country during TE 2013–14 over TE 1972–73.

Compound annual growth rate

Similarly, the increase in production of urdbean [*Vigna mungo* (L.) Hepper] (198%) and mungbean [*Vigna radiata* (L.) R. Wilczek] (149%) was higher owing to increase in area as well as in yield. In case of pigeonpea, the growth rate in area and production has picked up during 1980s, but could not sustain the tempo in the following decades. The marginal negative growth in productivity of pigeonpea was recorded in the country for the period 1970–2013. In case of lentil and urdbean, rate of growth in production was positive (more than 2% per annum), while growth in productivity of these pulses was low.

As is evident from the Fig. 3 that the index of area and production of pigeonpea in India has increased to 167 and 181, respectively, in the year 2013–14 over the base TE 1952–53 as 100. Whereas the index of productivity of

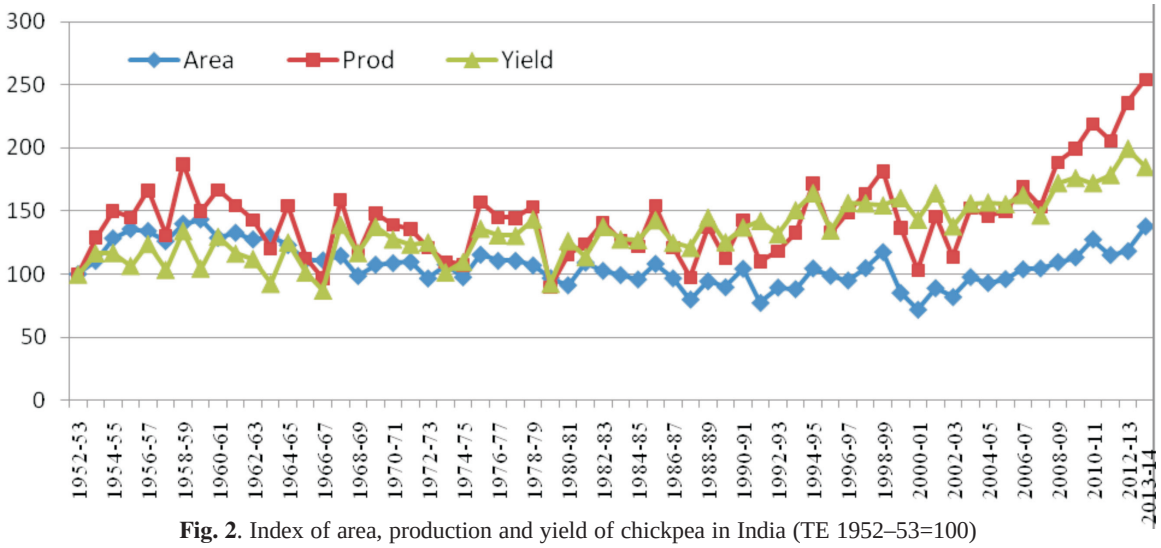

Fig. 2. Index of area, production and yield of chickpea in India (TE 1952–53=100)

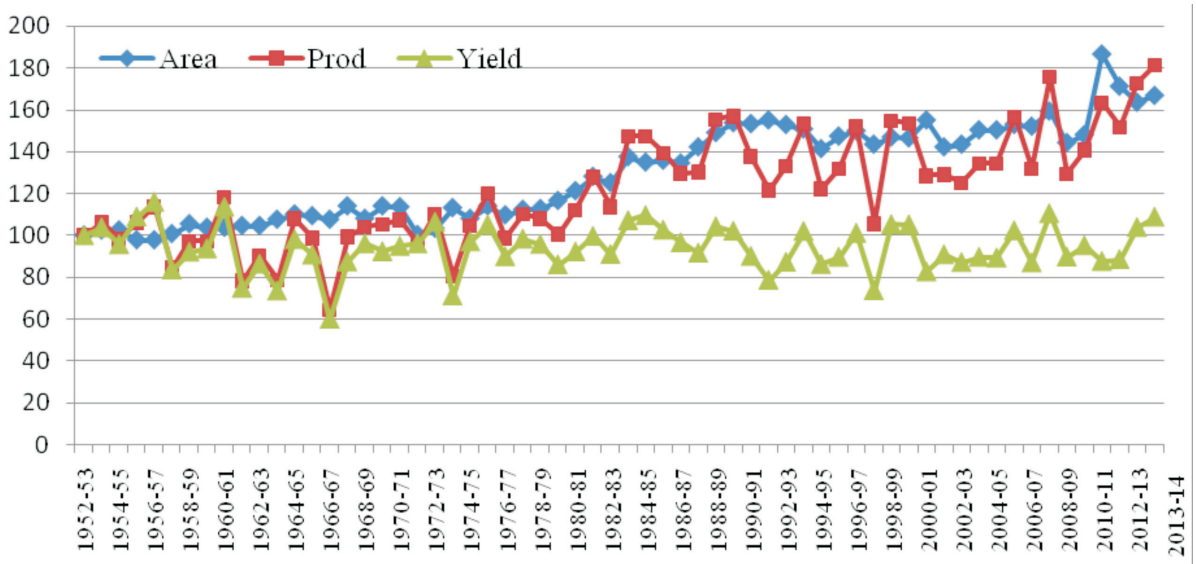

Fig. 3. Index of area, production and yield of pigeonpea in India (TE 1952–53=100)

pigeonpea was almost stagnant, even lower than the base period for most of the time. The growth in production of pigeonpea was extremely slow because of the factors such as: crop is less preferred by farmers due to its long duration in nature, weather variations at critical crop-growth stages adversely affects the yield realization, higher price and yield risk, non-availability of short-duration varieties, etc. (Bantilan and Joshi, 1996; Rao *et al*., 2010).

Since pulses are mainly grown under rainfed conditions, only 8–10% of area under pulses in the country is irrigated, yields of these crops are often subjected to moderate to severe losses mainly due to low or erratic rainfall leading to moisture stress at critical growth stages and high/ low temperature. Instability in yield of all the pulse crops is more (Table 2) implying that yields continued to remain unstable and volatile, as these crops have been grown under rainfed conditions and on marginal lands. Further, pulse crops are highly susceptible to pests and disease infestation. The year-to-year fluctuation in area, production of lentil has declined, however for the overall period, the instability was found to be high. Instability in area and production has increased over the time in case of chickpea, pigeonpea and total pulses.

Though, pulse being most important crops for sustainability of cropping systems owing to their soil enriching properties, farmers tend to allocate their best parcel of land for crops other than pulses, due to low and uncertain yields (Gowda *et al*., 2013). Also these crops are grown with sub-optimal input applications (Reddy, 2009). These crops are caught in vicious cycle, as farmers do not follow recommended production practices, grow them on marginal lands even without protective irrigation at critical stages leading to low and uncertain productivity, which further compel farmers to grow pulses under sub-optimal conditions. There exists a wide yield gap in all the pulse crops. The sluggish growth in pulses production in India is leading to lower net availability.

DECLINING AVAILABILITY AND RISING DEMAND

Since the growth in production of pulses in India has not kept pace with the growth in population leading to declining availability. The per capita net availability of pulses in the country was 70.3 g/day/capita in 1956, which has reduced to 37.5 g/day/capita in the year 1981 and further dropped to 29.1 g/day/capita in the year 2003 (Fig. 4). However, with the increase in production of pulses particularly in the recent decade mainly owing to yield increase supported with the policy and programmes to boost domestic production and increased imports, availability of pulses in the country has started improving and presently reached 47.2 g/day/capita (GoI, 2016) (Fig. 4). A study by the NCEAR (2014) also reported that growth in pulses production (less than 1% annual growth) was less than half of the growth rate in Indian human population during the past 40 years, resulting in sharp decline in per capita production and availability of pulses in the country.

Table 2. Growth in area, production and productivity of pulses in India (CAGR in %)

Crop	A/P/Y	1970–80	1980–90	1990–2000	2000–13	1970–2013
Chickpea	Area	–0.18 (6.2)	–1.42 (9.1)	1.26 (12.2)	3.72 (17.2)	0.09 (12.8)
	Production	–0.59(17.1)	–0.79 (12.9)	2.96 (15.9)	5.51 (25.7)	1.10 (24.6)
	Yield	–0.40(13.0)	0.64 (7.6)	1.69 (7.7)	1.72 (10.0)	1.01 (15.54)
Pigeonpea	Area	0.87 (4.6)	2.31 (7.4)	–0.65 (3.0)	1.12 (7.8)	1.01 (14.1)
	Production	0.60 (10.2)	2.86 (11.8)	0.95 (12.4)	1.80 (13.0)	1.00 (17.3)
	Yield	–0.31(10.7)	0.54 (6.7)	1.60 (12.1)	0.63 (9.6)	–0.02 (9.9)
Lentil	Area	2.71 (12.7)	1.99 (6.8)	2.33 (8.3)	–0.01 (5.5)	1.64 (21.2)
	Production	0.85 (13.8)	5.49 (16.7)	2.44 (13.3)	0.46 (8.6)	2.79 (33.8)
	Yield	–1.82 (7.8)	3.43 (10.9)	0.09 (7.4)	0.50 (8.9)	1.13 (17.0)
Urdbean	Area	2.61 (11.1)	2.19 (7.4)	–1.29 (7.4)	–0.15 (7.0)	0.93 (15.3)
	Production	2.74 (10.9)	5.86 (18.7)	–1.89 (10.0)	1.80 (15.1)	2.15 (29.0)
	Yield	0.13 (6.9)	3.59 (11.8)	–0.65 (6.6)	1.98 (12.8)	1.20 (18.0)
Mungbean	Area	3.40 (11.3)	1.91 (7.3)	–1.29 (7.5)	0.40 (9.0)	0.91 (14.6)
	Production	3.67 (17.0)	2.95 (13.0)	–2.99 (16.4)	2.26 (27.8)	1.35 (28.0)
	Yield	0.17 (10.2)	1.02 (8.5)	–1.72 (13.3)	1.97 (22.0)	0.45 (17.5)
Peas	Area	–4.74(25.7)	1.26 (6.9)	4.67 (14.5)	1.14 (10.8)	0.81 (23.4)
	Production	–7.74(42.3)	4.79 (15.5)	3.52 (12.2)	1.19 (17.6)	1.86 (32.4)
	Yield	–3.07(21.0)	3.53 (11.2)	–0.78 (8.7)	0.11 (10.1)	1.05 (18.3)
Total pulses	Area	0.59 (4.5)	–0.10 (3.7)	–0.60 (4.1)	1.29 (7.2)	0.06 (5.1)
	Production	–0.39(12.3)	1.49 (8.6)	0.67 (6.9)	3.35 (17.3)	1.01 (17.5)
	Yield	–0.98 (9.8)	1.59 (6.9)	1.27 (6.2)	2.04 (11.8)	0.95 (14.6)

Figures in parentheses indicate instability (%)

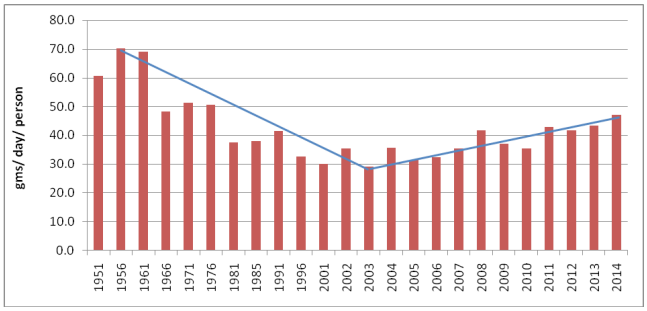

Fig. 4. Availability of pulses in India (g/day/person)

About 89% of the population in India consumes pulses at least once a week (as per national family health survey, 2005–06). Since then the consumption of pulses has increased further. However, production of pulses, over the years, has failed to catch up with demand. While the output has grown at 1.01% per year since 1970–71, the acreage was mostly stagnant and has risen merely by 0.06% per year. The yield per hectare has grown only by 0.95%. All this has led to higher dependence on imports, which has increased by 9.8% per annum since 1980–81.

A number of studies related to demand projections for pulses in India revealed that, although there was considerable difference in projections due to methodology and assumptions followed in the studies, the country would require around 19–23 million tonnes of pulses by 2020–21 and nearly 39 million tonnes by 2050 (Table 3). Narayanmoorthy (2000) projected that the total demand of pulses will be at 27.45 million tonnes in the year 2030. The Indian Institute of Pulses Research, Kanpur, has projected the country's demand of pulses at 39 million tonnes by 2050, which will require pulses production to grow at an annual rate of 2.2% (IIPR, 2015). To fulfil the growing requirement, the country has to produce enough pulses as well as remain competitive to protect the domestic production. To achieve this, it is imperative to develop and adopt more efficient crop-production technologies along with favourable policies and market support to encourage farmers to bring more area under pulses.

Table 3. Projected demand of pulses in India by different studies

Study by	Projections for the year	Demand (million tonnes)
Kumar (1998)	2010	23.0
	2020	30.9
Narayanmoorthy (2000)	2030	27.45
Planning Commission (2006)	2011–12	20.0
Planning Commission (2010)	2016–17	21.68
Chand (2007)	2011	16.1
	2021	19.1
Mittal (2008)	2011	24.1
	2021	42.5
	2026	57.7
Kumar *et al.* (2009)	2011	15.5
	2016	17.5
	2021	19.5
Singh (2013)	2015	18.30
	2020	23.21
Ganeshkumar *et al.* (2012)	2016	16.3
	2021	18.4
	2026	20.8
IIPR (2015)	2050	39.0

Pulse demand is price elastic among low-income consumers. They will tend to consume less pulses (and protein) and more grains or vegetables when pulse prices are relatively high. Many consumers substitute readily between different pulses based on price. Consumers in India demand a wide range of pulses, and are regular and substantial consumers of *desi* chickpea, *kabuli* chickpea, pigeonpea, lentils, mungbean, urdbean, horse- gram [*Macrotyloma uniflorum* (Lam.) Verdc.], mothbeans [*Vigna aconitifolia* (Jacq.) Marechal], yellow peas (*Pisum sativum* L.), cowpea or black-eyed peas or beans [*Vigna unguiculata* (L.) Walp.], kidney beans (*Phaseolus vulgaris* L.) and other minor pulses.

STEEP RISE IN IMPORTS

The increasing mismatch between production and consumption of pulses has resulted in larger imports of pulses in recent years. The country was importing merely 0.17 million tonnes of pulses during 1980–81, which has increased fast to 4.585 million tonnes in the year 2014–15. The import of pulses has grown at compound annual rate of 9.8% per annum since 1980–81, while the production has merely increased at 0.47% per annum during the corresponding period (Table 4). Total pulses imports were just 1.6% of total pulses production in India during 1980–81, which has presently rose to about 32%.

The price trend in pulses clearly reflects the demand pressure on the pulses. Steep rise in the price of pulses was seen in 2009–10 which continued for next 3 years. Further, there was escalation in prices of pulses in 2015–16 due to supply woes. Thus, even with the higher imports and production, prices have remained high, indicating fairly steady consumption demand supported by population and income growth. The supply-side constraints of pulses include: these crops compete with other more remunerative crops, the supplies in the international markets have also been limited to a few countries.

India imports dry peas and lentils mainly from Canada and the United States of America (Table 5). Australia and Russia are the major suppliers of chickpeas to India. Large share of pulses, including urdbean, mungbean, pigeonpeas is imported from Myanmar. Importers favour Myanmar because it offers varied pulses with qualities similar to

Table 4. Export import of pulses in India

Year	Import ('000 t)	Export ('000 t)	Production ('000 t)	Total availability ('000 t)	Imports as % of production
1980–81	172.96	1.09	10,623.7	10,795.6	1.63
1985–86	431.44	0.57	13,415.2	13,846.1	3.22
1990–91	1,273.43	15.11	20,368.1	21,626.4	6.25
1995–96	485.65	61.36	17,009.6	17,433.9	2.86
2000–01	350.57	244.26	11,060.9	11,167.2	3.17
2005–06	1,695.65	447.44	13,354.1	14,602.3	12.70
2010–11	2,698.66	208.02	18,240.9	20,731.6	14.79
2011–12	3,364.8	174.2	17,088.9	20,279.5	19.69
2012–13	3,839.3	201.7	18,342.5	21,980.1	20.93
2013–14	3,643.7	345.6	19,252.9	22,551.1	18.93
2014–15	4,584.9	222.1	17,150.0	21,512.7	26.73
2015–16*	5,507.7	217.8	17,330.0[a]	22,619.9	31.78
Growth	9.82	17.24	0.47	1.08	

Notes: [a]Second advance estimates, *for the period April 2015 to February 2016
Source: DGCA and Ministry of Agriculture and Farmers Welfare, GoI

Table 5. Trade destinations of major Indian pulses

S. No.	Pulses	Top 5 import sources
1	Peas	Canada (78.80%), USA (10.07%), Australia (4.05%), Russia (3.78%), Ukraine (2.86%)
2	Chickpeas	Australia (45.63%), Russia (38.93%), Tanzania (4.71%), Myanmar (3.23%), USA (2.40%)
3	Mungbean/ Urdbean	Myanmar (85.65%), Tanzania (5.60%), Uzbekistan (2.00%), Mozambique (1.45%), Kenya (1.44%)
4	Lentils	Canada (79.87%), USA (12.78%), Australia (7.03%), Nepal (0.13%), Myanmar (0.09%)
5	Pigeonpeas	Myanmar (51.76%), Tanzania (20.68%), Mozambique (15.28%), Malawi (7.99%), Sudan (2.97%)

Source: Calculated from data obtained from DGCA, Government of India

those domestically produced, low freight rates, and relatively fast delivery (Gowda *et al*., 2013).

In order to provide the nutritional security to the poor masses relying on vegetarian diet, making pulses affordable through boosting domestic production of pulses is the best alternative. Earlier studies have reported that there are certain constraints in pulses production in India. These constraints include: biotic and abiotic stresses–increasing problem of pests and diseases, early or terminal moisture stress for rainy season (*kharif*) crops, low temperature stress in winter season (*rabi*) crops, timely non-availability of quality seeds and other inputs, inadequate knowledge and adoption of improved pulses production technology, less use of productive and protective inputs, preference to other more remunerative crops on fertile parcel of lands by farmers, not providing irrigation by farmers at critical stages in case of moisture stress, high production and price risk, inadequate marketing and procurement support, etc. (Pant, 1995; Gupta, 2008; Reddy, 2009; Dutta and Kapadia, 2011; Roy *et al*., 2011; Grower and Singh, 2012; Gowda *et al*., 2013).

To augment the supply of pulses to poor masses under the current scenario, supply through public distribution system will not only distribute pulses to poor at affordable prices and enhance nutritional security, but will also lead to stabilize prices and provide boost to the farmers through assured procurement. The dependence on imports needs to be reduced gradually over time through stepping up the domestic production of pulses supported with appropriate long-term strategies.

CONCLUSION

India has the world's largest pulses sector, producing and consuming diversity of pulses. Since majority of the consumers in India have low incomes, their reliance on pulses as a key source of protein is high. Slow growth in production of pulses in India (mere 1% per annuum for the period 1970 to 2013 compared to population growth (2% per annuum) resulted in increasing demand-supply gap and in turn rising prices and declining per capita consumption in spite of growing pulse imports. Pulse production remains unattractive to Indian farmers because of the relatively low productivity of pulses coupled with preference and policy support to cereals particularly to wheat and rice.

It is imperative that pulses are made both affordable

and accessible to the general population for providing nutritional security. Government schemes and programmes to boost the production of pulses in India yielded good results recently. The idea of crop diversification towards legumes, that offer abundant benefit of nitrogen fixation has to be moved forward. The lack of an assured market is one of the major issues in the poor performance of pulses. Government procurement for supply through public distribution system and as part of mid-day meal schemes and welfare programmes would provide adequate marketing support to growers. An improvement in production technology of pulses aiming towards yield improvement and resource conservation can certainly reduce cost of production and in turn prices may lead to balancing nutritional intake by reducing disproportionate use of cereals in the consumption basket.

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