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Trends and growth rate analysis of pulses in Haryana vis-à-vis India

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Abstract

An attempt has been made in the paper to find out the growth and trends of area, production and productivity of pulses in Haryana vis-à-vis India. The secondary data for a period from 1970-71 to 2016-17 was taken for study. This shows that the growth trends of area in Haryana was negative. Maximum area under pulses was covered in 1971-72 while lowest area under pulses was in 2015-16. In case of production growth trends was also negative in Haryana. Maximum production under pulses was found in 2012-13 while lowest production was found in 2015-16. Compound growth rate or area and production during this period was -5.56 and -4.51 per cent, respectively i.e. declining in trend in pulses. Productivity growth trends was positive in Haryana. Compound growth rate (CGR) of productivity during this period was 0.64 per cent. But in case of India, the area, production and productivity trends are positive. CGR of production and productivity was 1.09 and 0.97 per cent in India. Similarly, in productivity, CGR was 0.97 per cent which show positive trends. In this study we also found that the daily intake of pulses was low as per requirement of institute of nutrition. In case of export and import compound, growth trend was positive. Export of pulses was increase from last few years while import was decline.

Keywords: Area, export, growth rates, import, production, productivity and pulses

Introduction

Pulses are the edible seeds of plants belongs to the leguminous family. Legumes are broadly appropriated as the third- biggest land plant family as far as number of species, behind only the *Orchidaceae* and *Asteraceae*. Pulses are healthy, nutritious and easy to cook. Pulses are the highly nutritive sources of proteins, vitamins and minerals and these are commonly known as "Poor man's meat". In pulses fat content is low but it is rich in soluble fibre, which can help to lower cholesterol and also help in the control of blood sugar. Pulses also promotes sustainable agriculture, it helps to decreases greenhouse gases, increase soil health and also use less water than other crops. Pulses helps farmers to maintain household food security and creates economic stability. Pulses are harvested solely for the dry seed, it's don't include crops which are harvested green. Major pulses are chickpeas (gram), pigeon pea (tur or arhar), moong beans, urad (black matpe), masur (lentil), peas and various kinds of beans. Lots of varieties of pulses are grown in all around the world.

As per UN Food & Agriculture Organization, in 2016 India is the world's biggest producer just as consumer of pulses. So as to take care of its vast residential demand of pulses, India needs to import the produce from different nations to its large production. At world level, total area of pulses in 2016 was 54.23 million hectares. Production of pulses was 39.66 million tonnes with 731 kg/hectare yield. In 2016-17 production of total pulses in India was 29280 thousand hectares with 22950 thousand tonne productions (Anonymous, 2017) ^[1]. In this year India achieve maximum production in pulses. According to APEDA (Agricultural & Processed Food Products Export Development Authority) the main regions of pulses with high yield are Punjab, Haryana, Western Uttar Pradesh, West Bengal delta region, coastal Andhra Pradesh, Tamil Nadu, Kerala, coastal and eastern Karnataka and some parts of Maharashtra. The country has exported 1.34 lakh tonnes of pulses to the world during the year 2016-17. Major Export Destinations in 2016-17 are Pakistan, Sri Lanka, United Arab Emirates, Algeria and Saudi Arabia. The percent contribution of area and production of pulses by Haryana state is very less (Jaslam *et al.*, 2018) ^[5]. In Haryana the area under pulses is decreasing but at country level its increase. The present study aims at examining the growth and trends in area, production, and yield of pulses in the Haryana vis-à-vis India.

Material and methods

The study on growth in area, production and productivity of pulses was purposively taken up in Haryana vis-à-vis India.

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The secondary time series data for a period from 1970-71 to 2016-17 was taken for study from Directorate of Pulses Development, Ministry of agriculture & Farmers Welfare, Government of India. Time series data pertaining to area, production, productivity of pulses was collected from different published sources. To measure the growth of area, production and productivity of pulses, compound growth rates were evaluated by fitting to the time-series data in exponential function of the following form:

$$Y = ab^t \quad \text{--- (1)}$$

Where,
 Y = Index number of area, production, productivity as the dependent variable
 t = Time variable (year) as independent variable
 a = Intercept
 b = Regression coefficient
 Equation (1) can be expressed in logarithmic form as follows:

$$\log y = \log a + t \log b \quad \text{--- (2)}$$

$$\log y = A + B t \quad \text{--- (3)}$$

Where,
 A = log a
 B = log b
 The compound growth rate "r" was computed as:
 $r = (\text{Antilog of } b - 1) \times 100 \quad \text{--- (4)}$

Secondary data related to import, export and per capita availability of pulses was also for the study from different published sources.

Results and discussion

Growth trends in Haryana

To estimate the growth performance of area, production and productivity of pulses in the Haryana vis-à-vis India during the period 1970-71 to 2016-17, time series data were analysed.

Table 1: Growth in area, production, and productivity of pulses in Haryana vis-à-vis (1970-71 to 2016-17)

Particulars	Area ('000 ha)			Production ('000 tonnes)			Productivity (Kg/ha)		
	CV (%)	CGR (%)	R ²	CV (%)	CGR (%)	R ²	CV (%)	CGR (%)	R ²
Haryana	71.16	-5.56	0.87	75.62	-4.51	0.55	22.50	0.64	0.13
India	6.45	0.14	0.08	20.18	1.09	0.62	15.33	0.97	0.76

CV = coefficient of variation, CGR = compound growth rate, R² = coefficient of determination

In Haryana, mostly area under pulses has been cultivated in south-western districts of Haryana like Bhiwani, Hisar, Mahendragarh etc. It is evident from the table 1 that in Haryana, compound growth rate during this period was -5.56 per cent i.e. declining in trend of area of pulses. Kumar *et al.* (2017) [4] also reported that area under pulses in Haryana decreases. Coefficient of variation of pulses in Haryana was 71.16 per cent during this period. In Haryana maximum area under pulses was covered in 1971-72 which was 1208.4 thousand hectares while lowest area under pulses was in 2015-16 i.e. 70 thousand hectares. In Haryana the area under pulses was declined over the period which is shown in figure 1. Possible reason of declining area under pulses was lack of improved varieties, low market price and no assured market.

As area decrease in Haryana, production is also decrease because its directly proportional to area which is shown in figure 2. Compound growth rate during this period was -4.51 per cent i.e. declining in trend of production of pulses. Maximum production under pulses was found in 2012-13 i.e. 1130.4 thousand tonnes while lowest production was found in 2015-16 i.e. 50 thousand tonnes. Some possible reason of declining production was lower yield, high pest incidence also. Coefficient of variation of pulses production in Haryana was 75.62 per cent. In case of productivity positive growth trend was found. Compound growth rate during this period was 0.64 per cent. Coefficient of variation in productivity was 22.50 per cent.

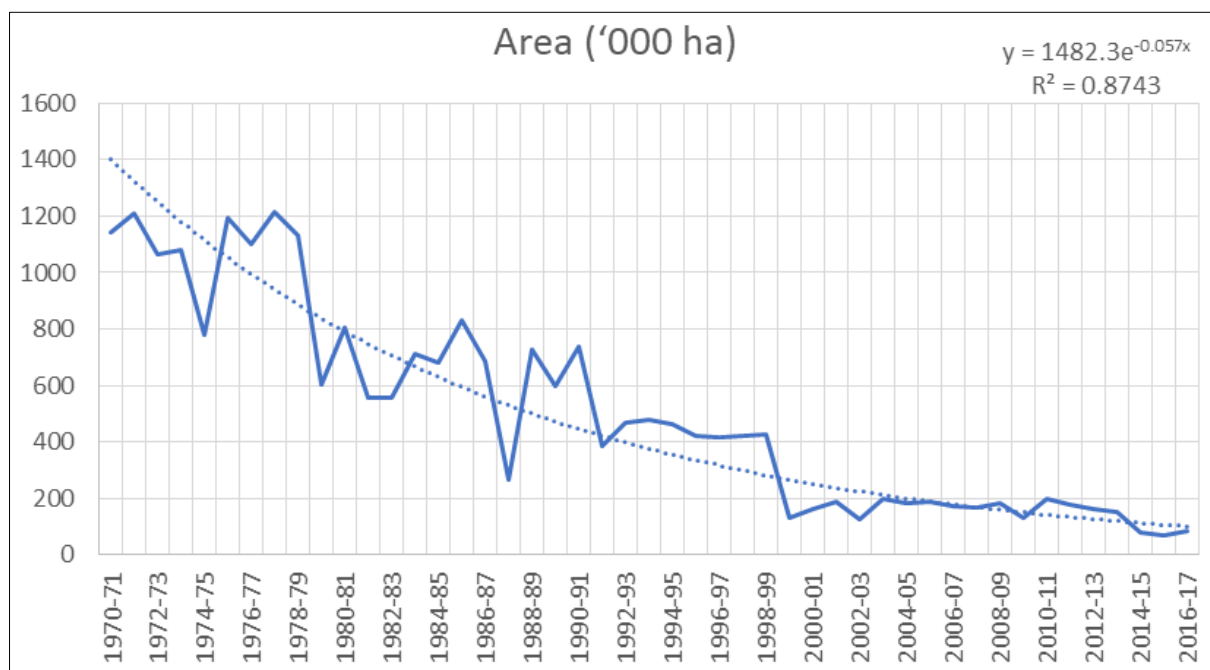


Fig 1: Trends of area in pulses in Haryana

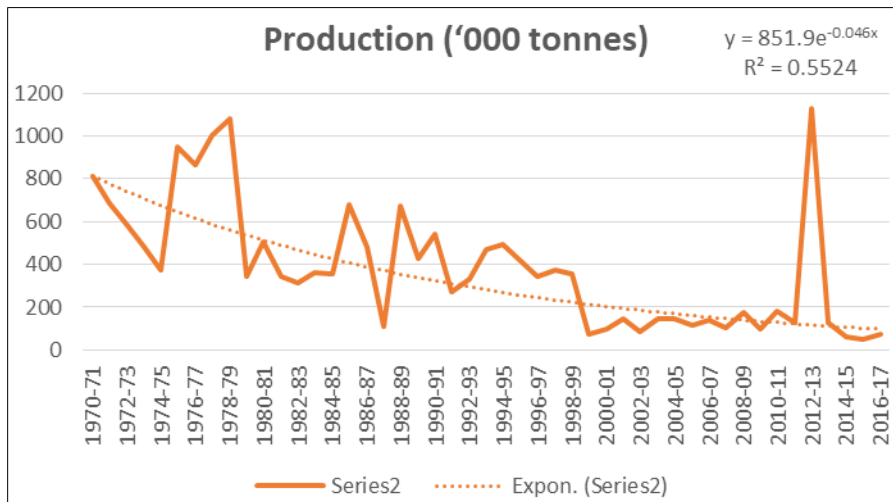


Fig 2: Trends of production in pulses in Haryana

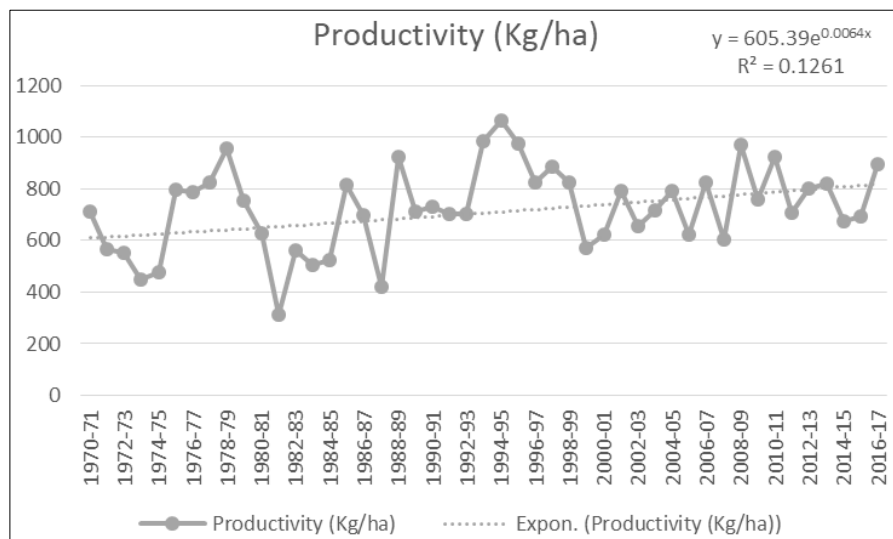


Fig 3: Trends in Pulse productivity in Haryana

Growth trends in India

In India, area under pulses production was showing increasing trend. CGR of pulses in India was 0.14 per cent. In India maximum area under pulses was cultivated in 2016-17 i.e. 29277 thousand hectares while minimum area was cultivated in 2000-01 i.e. 20348 thousand hectares. In 2016-17 maximum area under pulses was cultivated in Madhya Pradesh followed by Rajasthan, Maharashtra and Uttar

Pradesh while minimum area under pulses was Kerala. Coefficient of variation of pulses area in India was 71.16 per cent in this period. With increase in area under pulses, production was also increase. CGR of production was 1.09 per cent in India. Coefficient of variation of pulses production in India was 20.18 per cent. Similarly, in productivity, CGR was 0.97 per cent which show positive trends. Coefficient of variation was 15.33 per cent.

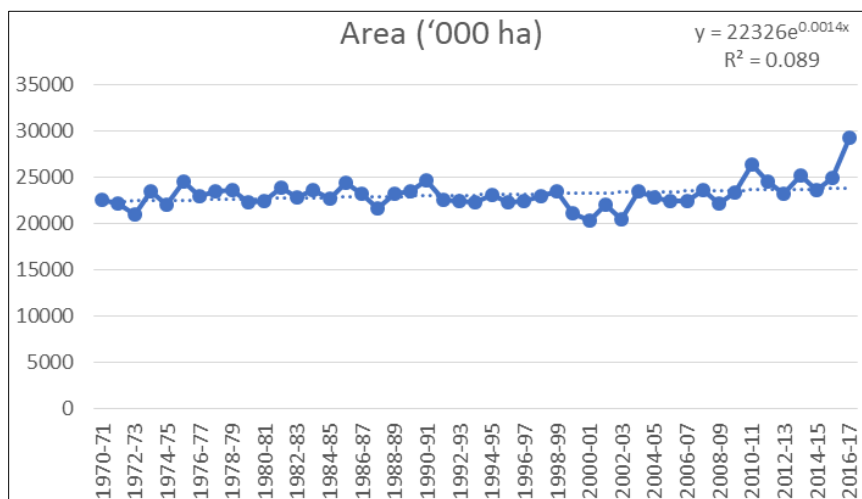


Fig 4: Trends of production in pulses in India

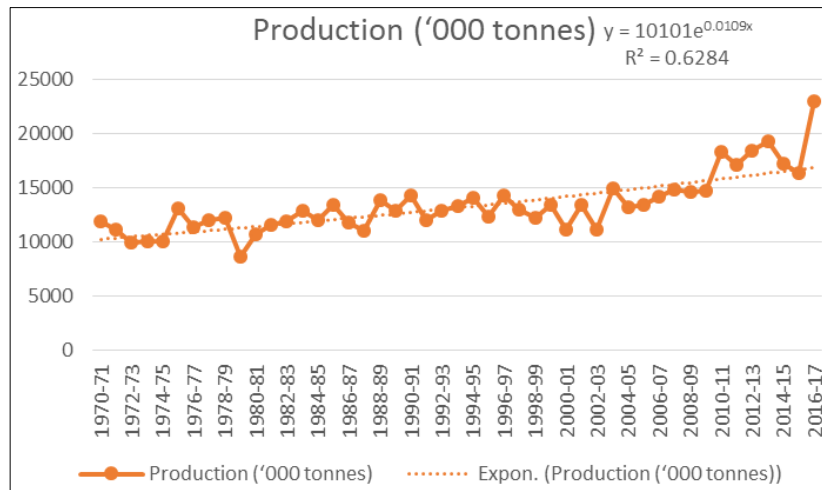


Fig 5: Trends of production in pulses in India

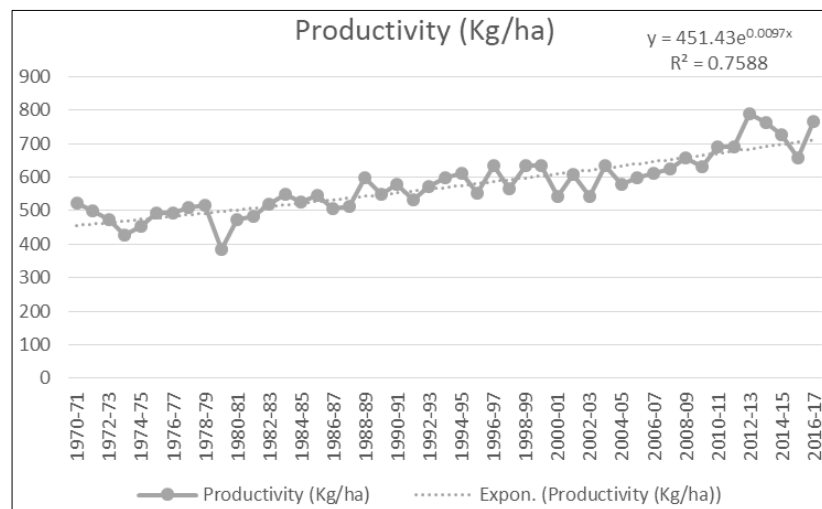


Fig 6: Trends in Pulse Productivity in India

Availability of pulses

Pulses is the very important part of human diet because of rich in protein and other nutrients. As the population of India is increasing day by day, the need of pulses also increases. As the National Institute of Nutrition, the minimum requirement of pulses is 90 grams for man and 75 grams fir women per day. Table 2 shows the pulse availability and grams per capita

of pulses per day. In this table we see that maximum grams per capita per day was observed in 2014 i.e. 46.4 grams per day while minimum was observed in 2001 which 30 grams per day per capita. Till now we can't attain the minimum requirement of pulses which was recommended by National Institute of Nutrition.

Table 2: Pulse availability in India (1991 to 2016).

Year	Pulses Availability (grams per capita per day)
1991	41.6
1992	34.3
1993	36.2
1994	37.2
1995	37.8
1996	32.7
1997	37.1
1998	32.8
1999	36.5
2000	31.8
2001	30
2002	35.4
2003	29.1
2004	35.8
2005	31.5
2006	32.5
2007	35.5
2008	41.8

2009	37
2010	35.4
2011	43
2012	41.6
2013	43.3
2014	46.4
2015	43.8
2016	43
CGR	0.80

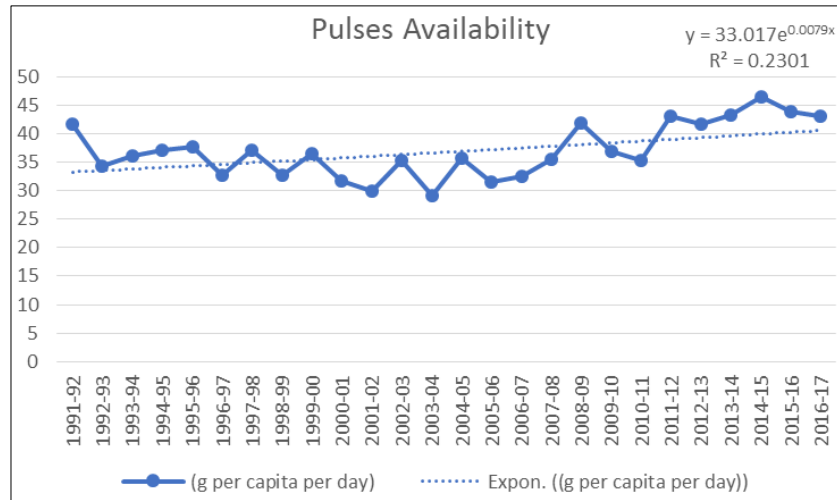


Fig 7: Trends in Pulse availability in India

Export and import of pulses

It is revealed from the table 3 that the export of the pulses from the India increase in time period of 1992-93 to 2016-17. Till 2000-2001 up-down of pulse export are seen in trend but after 2001-02 continuously increasing trend seen. Compound growth rate in this period was positive i.e. 12.25 per cent. Maximum export of pulses was reported in 2019-17 which

was 66.09 lakh tonnes. Minimum export from India was seen in 1999-2000 which was 2.50 lakh tonnes because area under pulses was less at that time period. Due to this production was less in that time period. In case of import of pulses, positive trends shown in this. Compound growth rate in this period was 6.16 per cent. Maximum import of pulses was in 2005-06 while minimum import in 1992-93.

Table 3: Export and import of pulses

Year	Import (lakh tonnes)	Export (lakh tonnes)
1992-93	3.83	0.34
1993-94	6.28	0.44
1994-95	5.54	0.51
1995-96	4.91	0.61
1996-97	6.54	0.55
1997-98	10.08	1.68
1998-99	5.63	1.04
1999-2000	2.50	1.94
2000-01	3.50	2.44
2001-02	22.18	1.61
2002-03	19.92	1.48
2003-04	17.23	1.54
2004-05	13.39	2.71
2005-06	16.96	4.47
2006-07	22.56	2.47
2007-08	28.35	1.64
2008-09	24.74	1.36
2009-10	35.10	1.00
2010-11	26.99	2.08
2011-12	33.65	1.74
2012-13	38.39	2.02
2013-14	30.49	3.43
2014-15	45.85	2.22
2015-16	57.98	2.56
2016-17	66.09	1.37
CGR (%)	12.25	6.16

Source: DGCI&S, Ministry of Commerce, Kolkata.

Annual Report 2016-17, Directorate of Pulses Development, Ministry of agriculture & Farmers Welfare.

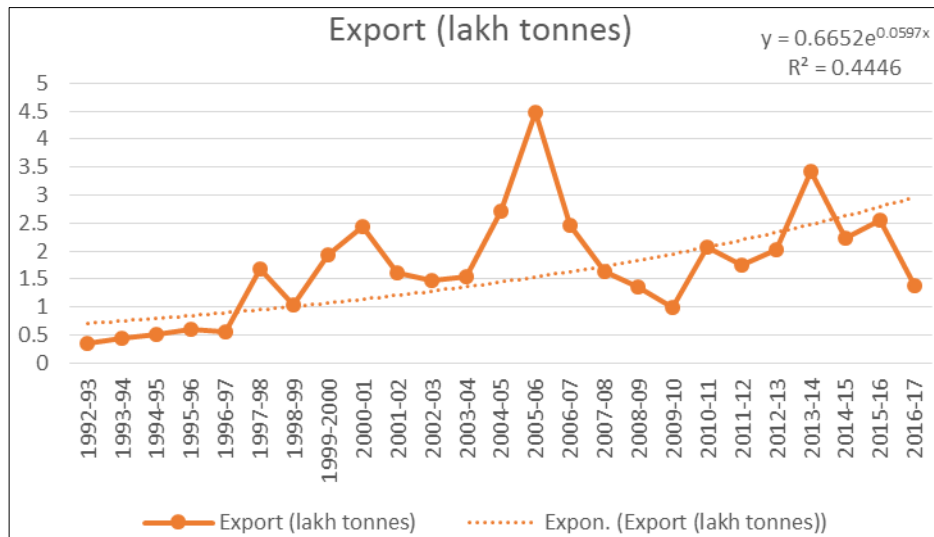


Fig 8: Trends in Pulse Export from India

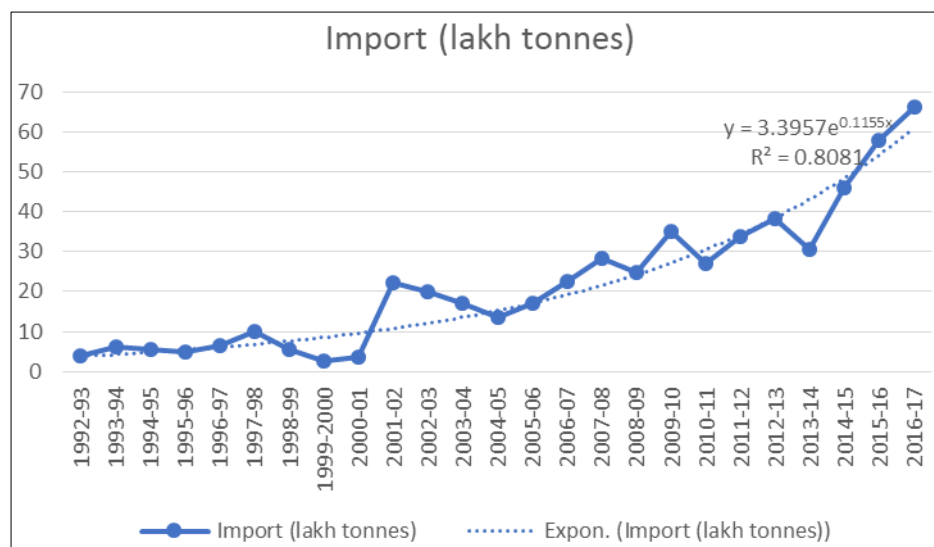


Fig 9: Trends in Pulse import in India

Conclusion

This study was attempted to find out the growth and trends of area, production and productivity of pulses in Haryana vis-à-vis India from the secondary data for a period from 1970-71 to 2016-17. This shows that the area and production growth trends in Haryana was negative while in productivity growth trends was positive. But in case of India, the area, production and productivity trends are positive. In this study we also found that the daily intake of pulses was low as per requirement of institute of nutrition. In case of export and import compound, growth trend was positive. Export of pulses was increase from last few years while import was decline.

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