DIRECTORATE OF PULSES DEVELOPMENT, GOI, BHOPAL

STATE OF INDIAN AGRICULTURE: PULSE CROP MATERIAL-Reg.
(Ref. No.18-12/2015-CA.III)

1. INTRODUCTION

1.0 Pulses are an important commodity group of crops that provide high quality protein complementing cereal proteins for pre-dominantly substantial vegetarian population of the country. Although, being the largest pulse crop cultivating country in the World, pulses share to total foodgrain production is only 6-7% in the country. The cultivation of pulses builds-up a mechanism to fix atmospheric nitrogen in their root nodules and thus meet their nitrogen requirements to a great extent.

1.1 In India, pulses can be produced with a minimum use of resources and hence, it becomes less costly even than animal protein. In comparison to other vegetables, pulses are rich in protein which are less expensive and can be cultivated as inter-crop and mixed crop. Pulses are mostly cultivated under rainfed conditions and do not require intensive irrigation facility and this is the reason why pulses are grown in areas left after satisfying the demand for cereals/cash crops. Even in such conditions, pulses give better returns. Apart from this, pulses possess several other qualities such as they are rich in protein, improve soil fertility and physical structure, fit in mixed/inter-cropping system, crop rotations and dry farming and provide green pods for vegetable and nutritious fodder for cattle, as well.

1.2 Although important from the nutritional point of view, there has not been significant increase in area and production of pulses during 1950-51 to 2009-10. However,significant growth in area, production and yield has been recorded between 2010-2011 to 2014-15. Consequentupon the NFSM intervention with the increase in infrastructural and irrigation facilities/resources, the pulses get the marginalized treatment pushing them to another poor and marginal land piece. The productivity of pulses has increased about 68% at 764 kg/ha during 2013-14 from the level of 441 kg/ha during 1950-51. It is imperative to mention that the New Agriculture Technologies (NATs) introduced during mid-sixties has increased the production of food-grains from 50.82 million tonnes(1950-51) to 265.64 million tonnes(2013-14) with the increase in area from 97.32 million hectares to 125 million hectares. The productivity of food grains has also sharply increased to 2120 kg/ha during 2013-14 from the level of only 522 kg/ha during 1950-51.

1.3 The potential of pulses to help address future global food security, nutrition and environmental sustainability needs has been acknowledged through the UN declaration of the 2016-International Year of Pulses. Pulses are a Smart Food as these are critical for food basket (dal-roti, dal-chawal), important source of plant protein and help address obesity, diabetes etc. In addition pulses are

highly water efficient, can grow in drought-prone areas and help improve soil fertility by fixing soil nitrogen.

1.4 Pulses are grown in all three seasons. The three crop seasons for the commodity are:**Kharif** – Arhar (Tur), Urd (Blackgram), Moong (Greengram), Lobia(Cowpea), Kulthi(Horsegram) and Moth;**Rabi**– Gram, Lentil, Pea, Lathyrus and Rajmash; S**ummer** – Greengram, Blackgram and Cowpea.

1.5 Pulse's Share to Total Foodgrain Basket: Per cent share of pulses to totalfood-grain basket in the country in terms of area and production was 19.62, 16.55 respectively during 1950-51. This trend continued till 1960-61 and started deceleration from 1970-71.The pulse's share to total food grain is 7.13 per cent. Deceleration of per cent contribution of pulses to total foodgrains has prompted the Ministry of Agriculture& Farmer's Welfare to vigorously pursue the NFSM-Pulses sinceEleventh plan (2007-08 to 2011-12) onwards.

1.6 Growth Rate: From 1950-51 to 2013-14, the total acreage under pulses has almost been stagnated but for 2013-14 (25.21 million ha), however, the maximum growth rate in area was recorded between the period from 2002-03 to 2003-04 at 14.4% and 2009-10 to 2010-11 at 13.40%. Maximum production growth rate of 34.0% and 24.42% and maximum yield growth rate of 16.9% and 12.7% were also observed during the same period. The highest production (19.25 million tonnes) & yield (764kg/ha) was recorded during 2013-14. The production of pulses during 2015-16 is, however, estimated at 16.47 million tonnes according to the IVth Advance Estimate.

1.7 Per Capita Pulses Availability: As a result of stagnant production and continuous increase in population, the per capita availability of pulses in India has decreased considerably. The *per capita* per day availability of pulses in 1951 was 60 g that dwindled down to level of 35.4 g in the year 2010. The *per capita* per year availability shows the same decreasing trend from 22.1 kg in 1951 to 12.9 kg in the same period. However, since 2011 increasing trend of per capita per day availabilityis recorded. In the year 2014, provisionalper capita/year availability is17.2 kgwhich is 47.2 g per capita per day.

2.0 IMPORT/EXPORTAND AVAILABILITY: XIIth PLAN

The domestic production, imports/exports and total availability is given below.

Table. 1 Import/Export and Availability: XIIth Plan

(Quantity – Lakh Tonnes)

Year	Production	Import	Export	Total availability
2012-13	183.43	38.39	2.02	223.84
2013-14	192.53	36.44	3.46	232.42
2014-15	172.85	45.85	2.22	220.92
2015-16	164.70*	57.98	2.56	225.24

Source: *DGCI &S, Ministry of Commerce, Kolkata** 4th Advance Estimate

2.1 IMPORT: The import of pulses during April, 2014 to March, 2015 was 45.85 lakhtonnes worth Rs.17062.93 crore against the import value of Rs. 17196.91 crore for total foodgrains, Rs.115434.49 crore for total agricultural import and Rs.2733935.41 crore for total National import respectively during this period.

{Dry Peas contributes the single largest share in India's import basket of pulses 42.57% & 38.72% in the total pulses import during 2014-15& 2015-16 respectively}.

2.2 EXPORT: The export during April, 2014 to March, 2015 was 2.22 lakh tonnes worthRs.1218.10 crore against the export value of Rs. 59385.83 crore for total foodgrains, Rs.239453.23 crore for total agricultural export and Rs.1891644.67 crore for total National export respectively during this period.

{Chickpeas contribute the single largest share in India's export basket of pulsesregistering 85.64% and 84.87% share in the total pulses export during 2014-15 and 2015-16 respectively}.

Table 2. Pulse importing and exporting countries (2015-16)

Pulses	Top 5 Export Destinations	Top 5 Import Sources
Peas (*Pisumsativum*)	Shri Lanka DSR (81.07%), Nepal (12.56%), Ukrain (4.28%), USA (1.63%), Bangladesh PR (0.42%)	Canada (60.97%), Russia (14.82%), USA (6.96%), France (5.36%), Lithuania (4.15%)
Chickpeas (Garbanzos)	Pakistan (35.60%), Algeria (15.17%), Turkey (8.58%), Sri Lanka (8.07%),U Arab EMTS (4.97%)	Australia (74.40%), Russia (16.49%), Tanzania (2.79%), Myanmar (0.92%), USA (0.74%)
Moong/Urd	USA (39.96%), Sri Lanka (13.05%), UK (9.86%), Australia (7.77%), Malaysia (7.63%)	Myanmar (70.37%), Kenya (7.43%), Australia (6.32%), Tanzania (3.15%), Uzbekistan (2.60%)
Lentils (Masur)	Sri Lanka DSR (43.39%), Bangladesh (18.11%), U Arab EMTS (8.35%), Egypt (3.98%), USA (3.67%)	Canada (89.58%), USA (7.47%), Australia (2.88%), Turkey (0.03%), Mozambique (0.03%)
Pigeon Peas (Tur)	USA (40.79%), U Arab EMTS (18.28%), Canada (11.28%), UK (10.75%), Singapore (5.11%),	Myanmar (46.35%), Tanzania (18.71%), Mozambique (15.36%), Malawi (12.56%), Sudan (3.36%)

(%) figures in parenthesis indicates percentage share of global import/export

3.0 CROP SCENARIO

3.1 TOTAL PULSES

Global Scenario: World over the pulses are grown by 178 countries. Beans -126 countries, (35.93%), world area; Chickpea -59 countries (16.41%), Area; Peas (dry) - 99 countries (8.14%), world area) Pigeonpea 23 countries (8.26% area), Lentil 57 countries (5.31% world area). The share to World production of Beans was31.64% followed by Chickpea 17.72 %,Peas (dry)14.44 %,Pigeonpea 6.31% and Lentil 6.23 %.

Table. 3 Crop ranking

{A-lakh ha, P-lakh tonnes, Y-kg/ha}

Crop	Area	% to Total	Production	% to Total	Productivity
Chickpea	139.81	16.41	137.30	17.72	982
Lentil	45.24	5.31	48.27	6.23	1067
Pigeon pea	70.33	8.26	48.90	6.31	695
Pea	69.32	8.14	111.86	14.44	1614
Beans	306.13	35.93	245.16	31.64	867
Total Pulses	**851.91**		**774.73**		**909**

Source: *FAO Statistics 2014*

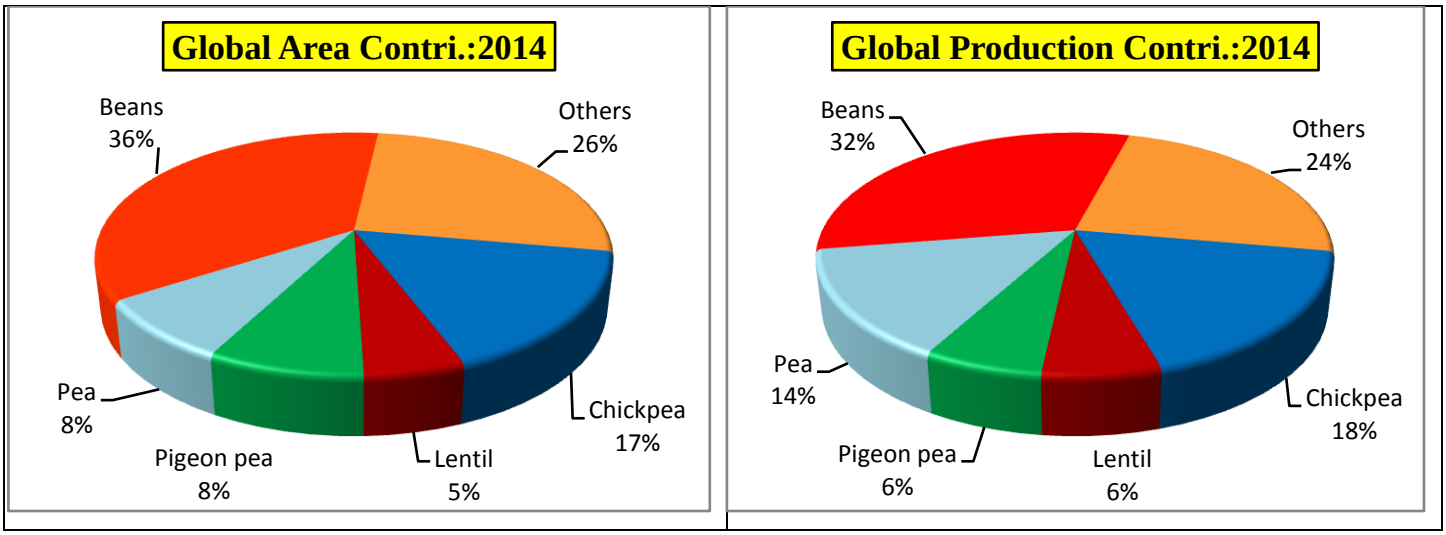
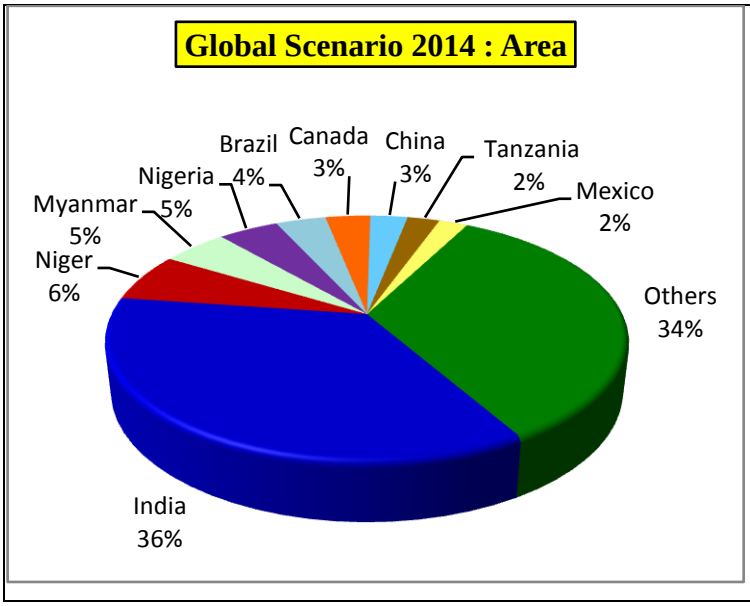


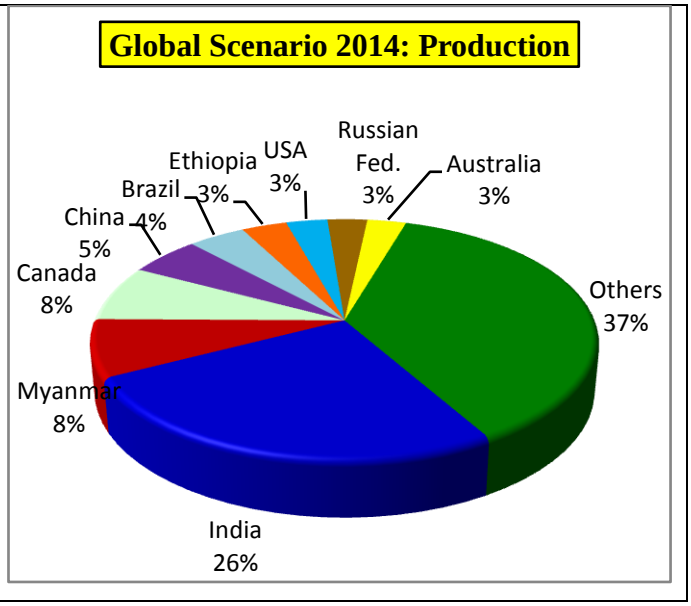
Table. 4 Global Ranking : Total Pulses

{A-lakh ha, P-lakh tonnes, Y-kg/ha}

Country	Area	% Contri.	Country	Production	% Contri.	Country	Yield
India	303.1	35.58	India	199.80	25.79	Bahrain	18485
Niger	54.7	6.42	Myanmar	59.77	7.72	Ireland	5886
Myanmar	42.0	4.93	Canada	58.28	7.52	Israel	5576
Nigeria	38.5	4.52	China	41.13	5.31	Belgium	4445
Brazil	32.1	3.77	China, mainland	41.01	5.29	Tajikistan	3985
Canada	28.7	3.37	Brazil	33.06	4.27	Denmark	3952
China	23.8	2.80	Ethiopia	26.13	3.37	Trinidad and Tobago	3919
China, mainland	23.8	2.79	United States of America	23.95	3.09	United Kingdom	3755
United Republic of Tanzania	20.7	2.43	Russian Federation	22.94	2.96	Netherlands	3639
Mexico	18.3	2.15	Australia	22.47	2.90	Switzerland	3638
						India	**660**
World	**851.91**		**World**	**774.73**		**World**	**909**

Source: *FAO Statistics 2014*





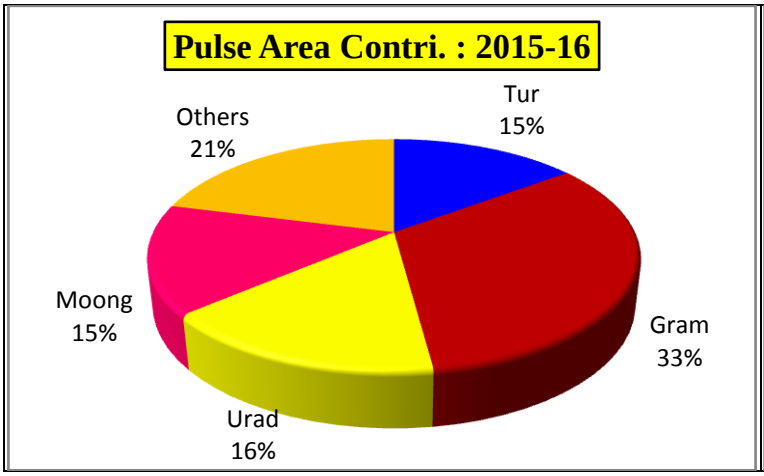
The total world acreage under pulses (FAO) is about 851.91 lakh ha with production at 774.73 lakh tonnes at 909 kg/ha, yield levels. India ranks first both in area and production with 36% and 26% respectively globally. Country's productivity at 660 kg/ha is far below the world average yield of 909 kg/ha.

National Scenario: The area, production and productivity during 2015-16 (IVth Advance Estimates) has been 252.59 lakh hectares and 164.68 lakh tonnes at 652 kg/ha yield levels. of the total coverage, 57.62 lakh hectares (22.81%) is confined to Madhya Pradesh alone at a production of 51.17 lakh tones (31.07%). Thus M.P. ranked at 1st both in area and production followed by Rajasthan 38.71 lakh hectares (15.33%), 19.53 lakh tonnes (11.86%); Maharashtra 33.56 lakh hectares (13.29%) and 14.10 lakh tonnes (8.56 %).

Table.5 Crop-wise Scenario (2015-16)

{A-lakh ha, P-lakh tonnes, Y-kg/ha}

Crop	Area	% Contri.	Production	% Contri.	Productivity
Tur	37.46	14.83	24.58	14.93	656
Gram	83.49	33.05	71.69	43.53	859
Urad	40.19	15.91	21.99	13.35	547
Moong	38.32	15.17	16.03	9.73	418
Kharif Pulses	113.61	44.98	55.35	33.61	487
Rabi Pulses	138.99	55.03	109.32	66.38	787
Total Pulses	**252.59**		**164.68**		**652**



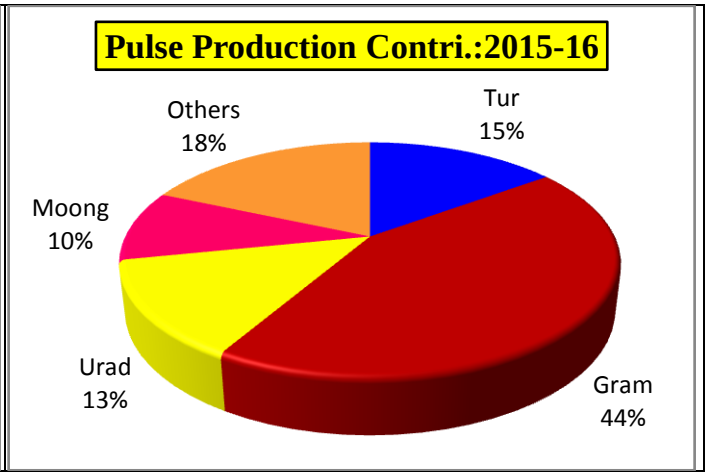
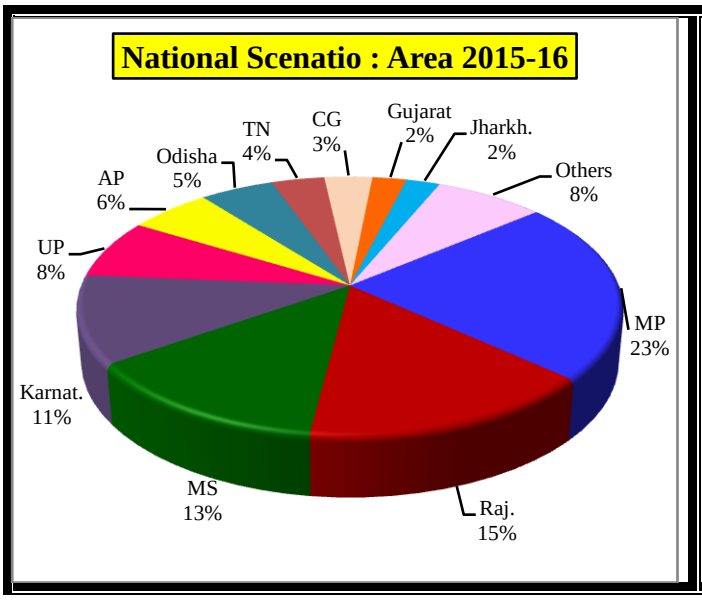


Table.6 State's Contribution in Area & Production (2015-16)

Rank	States	Area	% Contri.	States	Production	% Contri.
I	Madhya Pradesh	57.62	22.81	Madhya Pradesh	51.17	31.07
II	Rajasthan	38.71	15.33	Rajasthan	19.53	11.86
III	Maharashtra	33.56	13.29	Maharashtra	14.10	8.56
IV	Karnataka	27.80	11.01	Karnataka	13.89	8.43
V	Uttar Pradesh	18.65	7.38	Andhra Pradesh	12.28	7.46
VI	Andhra Pradesh	14.51	5.74	Uttar Pradesh	12.19	7.40
VII	Odisha	12.95	5.13	Tamilnadu	5.73	3.48
VIII	Tamilnadu	9.27	3.67	Orissa	5.54	3.37
IX	Chhattisgarh	8.41	3.33	Jharkhand	5.47	3.32
X	Gujarat	5.98	2.37	Gujarat	5.33	3.23
XI	Jharkhand	5.95	2.35	Chhattisgarh	5.12	3.11
	Others	19.24	7.62	Others	14.28	8.67
	All-India	**252.59**		**All-India**	**164.68**	



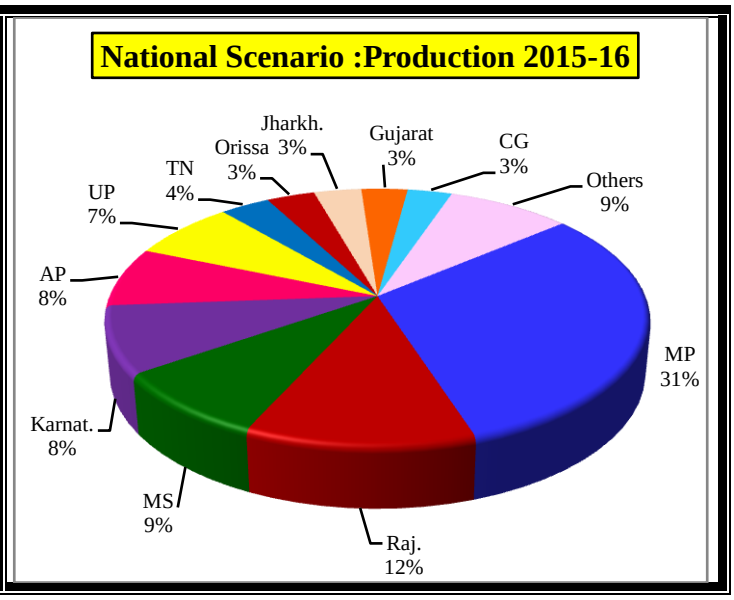
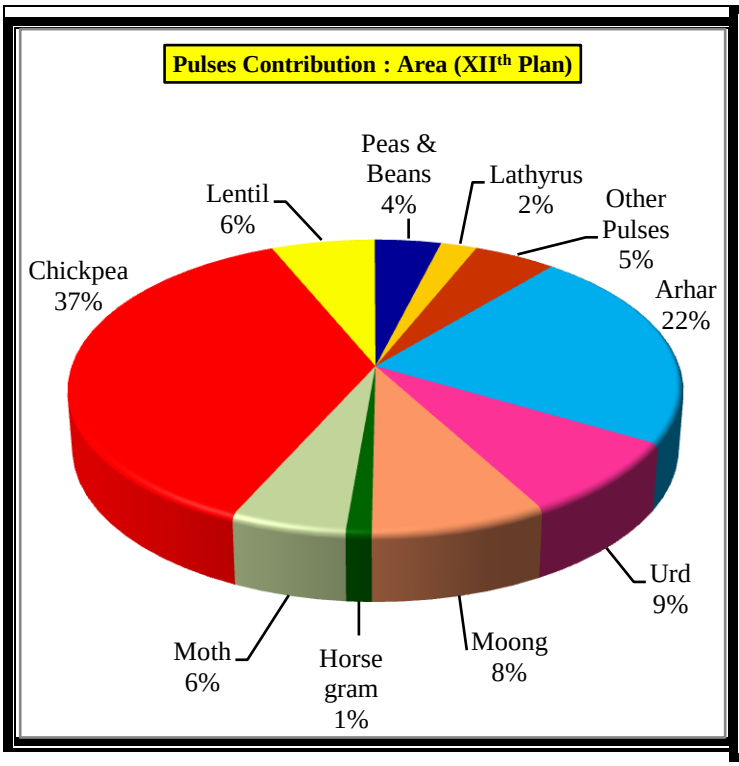


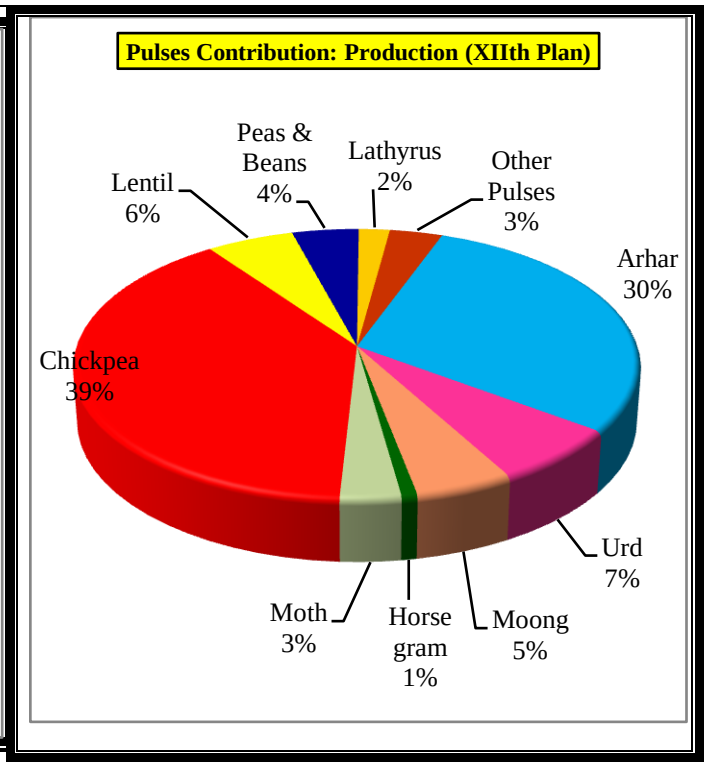
Table. 7 Area, Production & Productivity & their Contribution during XIIthPLAN

{A-lakh ha, P-lakh tonnes, Y-kg/ha}

Crop	Season	Area*	% Share	Production*	% Share	Productivity*
Arhar	Kharif	37.46	35.35	28.66	48.60	765
Urd	Kharif	25.49	24.06	13.31	22.58	522
	Rabi/Summer	8.21	5.76	5.66	5.09	690
	Total	**33.70**	**13.56**	**18.98**	**11.15**	**563**
Moong	Kharif	22.81	21.53	9.07	15.38	397
	Rabi/Summer	9.57	6.71	4.99	4.49	522
	Total	**32.38**	**13.03**	**14.06**	**8.26**	**434**
Horse gram**	Kharif	2.39	2.25	1.11	1.89	467
	Rabi/Summer	2.30	1.62	1.14	1.02	494
	Total	**4.69**	**1.89**	**2.25**	**1.32**	**480**
Moth**	Kharif	9.12	8.60	3.00	5.10	330
Chickpea	Rabi	83.49	58.56	71.69	64.45	859
Lentil**	Rabi	14.11	9.90	10.38	9.33	735
Peas & Beans**	Rabi	9.02	6.33	7.91	7.11	877
Lathyrus**	Rabi	4.93	3.46	3.69	3.31	747
Other Pulses	Kharif	8.68	8.19	3.81	6.46	439
	Rabi	10.94	7.67	5.77	5.19	528
	Total	**19.62**	**7.90**	**9.58**	**5.63**	**488**
Total	**Kharif**	**105.95**		**58.96**		**557**
	Rabi/Summer	**142.57**		**111.24**		**780**
	Total Pulses	**248.52**		**170.20**		**685**

*Avg. of (2012-13 to 2015-16 - 4th Adv. Est.) & ** Avg. of 2012-13 to 2014-15





3.1.1 The XIIth plan (Ave 2012-13 to 2015-16), recorded increasing trend analysis, however records an increasing Percentage Change over Previous Plan Periods (COPP) in respect of growth in area, production and productivity at 2.86%, 6.57% and 3.63% respectively.

3.1.2 The Twelfth plan (T.E 2012-2015) average area and production in the country has been 248.52 lakh ha and 170.20 lakh tonnes. MP with 54.95 lakh ha (22.59% of the total area) and 49.39 lakh tonnes (27.74% of total production) ranked 1st both in area and production followed by Maharashtra (22.34 lakh tonnes i.e.12.55%); Rajasthan (20.88 lakh tonnes i.e.11.73%); Uttar Pradesh (16.72 lakh tonnes i.e.9.39%).

3.1.3 The higest yield was recorded in Jharkhand (995 kg/ha) followed by Bihar (948 kg/ha) and Madhya Pradesh (899 kg/ha). The lowest yield was observed in the state of Odisha (493 kg/ha) followed by Rajasthan (569 kg/ha) and Karnataka (572 kg/ha).

The overall area, production and productivity increasing trend during the twelfth plan period as compared to previous plan.

3.2 Kharif Pulses: Twelfth plan ***(T.E.2012-2015):*** The total area coverage and production of Kharif Pulse in India has been105.95 lakh ha and 58.96 lakh tonnes, Rajasthan ranked Ist with 22.63lakh hectares (21.73%) of total area while in production Maharashtra ranked Ist with 11.16 lakh tonnes (19.27%) and ranked IInd in area accounting for 18.61% (19.37 lakh hectares) of the total area. Madhya Pradesh ranked IInd with15.83% (9.17 lakh tonnes) of the country's production and stands IIIrd in area with 13.72% (14.28 lakh hectares) and Rajasthanwith 14.84% (8.60 lakh tonnes) stood IIIrd in production.

The Twelfth plan recorded comparatively less kharif coverage (6.67 lakh ha less than XIth plan) owing to consecutive drought during 2014-15 and 2015-16. However,due to productivity increase about 8 % higher than the previous plan period.

In case of productivity, state of Bihar ranked first with (1178 kg/ha) followed by Jharkhand (910 kg/ha) and Gujarat (824 kg/ha). Lowest yield was observed in the state of Rajasthan (380 kg/ha).

Overall trend of area, production and productivity of twelfth paln periods has shown increasing trend in production and productivity over the previous plan.

3.3 Rabi /Summer Pulses: Twelfth plan ***(T.E. 2012-15):*** All India Rabi pulse acreage and production has been recorded at 142.57 lakh hectares and 111.24 lakh tonnes. Madhya Pradesh stood at Istin area and production, covering 40.67 lakh hectares (29.24%) with a production of 40.22 lakh tonnes (33.49%). Maharashtra ranked IInd with 15.61 lakh hectares of area (11.22 %), Rajasthan with IIIrd position which covered 14.07 lakh hectares of area (10.11%) and UP shared

the IVth rank having an area of 13.63 lakh hectare (9.80 %). However, Rajasthan stood IInd in terms of production contributing 12.28 lakh tonnes (10.23%), UP at IIIrd (11.51 lakh tonnes, 9.58%) and Maharashtra at IVth position 11.18 lakh tonnes (9.31%)**.**

The highest productivity states were Jharkhand (1115 kg/ha) followed by Gujarat (1049 kg/ha) and M.P. (989 kg/ha). The lowest yield was noticed in the state of Odisha (449 kg/ha).

Overall trend of area, production and yield of twelfth plan periods has shown increasing trend over previous plan.

3.4 Chickpea

Global Scenario: Globally, India ranked first in area and production, followed by Pakistan, Iran and Australia with respect to area and Australia, Myanmar with respect to production. The highest productivity of 3759 kg/ha is observed in China followed by Israel, Republic of Moldovaand Bosnia & Herzegovina. India's productivity was 995 kg/ha.

Table. 8 Global ranking: Major countries

{A=lakh ha, P=lakh tonnes, Y=kg/ha}

Rank	Country	Area		Country	Production		Country	Yield
		Area	% to World		Prod.	% to World		
I	**India**	99.27	71.00	**India**	98.80	71.95	China	3759
II	Pakistan	9.495	6.79	Australia	6.294	4.58	Israel	3559
III	Iran	5.945	4.25	Myanmar	5.62	4.09	Repbl. of Moldova	3556
IV	Australia	5.078	3.63	Ethiopia	4.59	3.34	Bosnia & Herzegovina	3204
V	Turkey	3.882	2.78	Turkey	4.50	3.28	Yemen	3093
							India	995
	World	**139.81**		**World**	**137.31**		**World**	**982**

Source: FAO Statistics- 2014

National scenario Twelfth Plan (T.E. 2012-15): The area and production of gram during twelfth Plan has been 87.62 lakh hectares and 82.15 lakh tonnes respectively. More than 90% gram production comes from 7 states of MP, Rajasthan, MS, Karnataka, AP, UP., and CG. MP ranked Ist in an area (34.69%) and production (40.60%). Maharashtra rank at IInd in area -16.57%) & IIIrd in production -13.07%. Whereas, Rajasthan stands IInd position in production -14.09%.

The highest yield was recorded in the state of A.P. (1522 kg/ha) followed by Punjab (1216 kg/ha) and Gujarat (1193 kg/ha). The lowest yield was recorded in Tamilnadu (648 kg/ha).

Chickpea is a major pulse in India which, contributed about 37% of area & 47% of pulse production. Overall trend of area, production and yield was shown significantly increased as compared to previous plan.

3.5 PIGEONPEA

Global Scenario: India ranked first in area and production in the world with 79.65 % and 67.28 % of world's area and production respectively. In productivity, Saint Vincent and the Grenadines ranked first with 7926 kg/ha followed by Trinidad and Tobago and Malawi. The productivity of India was 587 kg/ha.

Table. 9 Global ranking: Major countries

{A=lakh ha, P=lakh tonnes, Y=kg/ha}

Rank	Country	Area		Country	Production		Country	Yield
		Area	% to World		Prod.	% to World		
I	**India**	56.02	79.65	**India**	32.90	67.28	Saint Vincent & Grenadines	7926
II	Myanmar	6.12	8.70	Myanmar	5.75	11.76	Trinidad and Tobago	4103
III	Kenya	2.76	3.93	Malawi	3.35	6.85	Malawi	4100
IV	Uni.Rep. ofTanzania	2.51	3.56	Kenya	2.75	5.61	Bangladesh	2500
V	Haiti	1.11	1.57	Uni.Reb. ofTanzania	2.48	5.07	Philippines	1664
							India	587
	World	70.33		**World**	48.90		**World**	695

Source: FAO Statistics, 2014

National scenarioTwelfth Plan (T.E.2012-2015): The country's total area coverage and production of tur were 38.49 lakh hectares and 28.66 lakh tonnes respectively. More than 80% of tur production comes from 6 states of MS, MP, Karnataka, UP, Gujarat and Jharkhand. The state-wise trend shows that Maharashtra ranked Ist both area and production (29.68% and 27.86%). Karnataka stand IInd for area (18.58%) and IIIrd in production (14.75%). Madhya Pradesh rank IInd in production (15.87%). The highest yield has been recorded by Bihar (1695 kg/ha) followed by West Bengal (1450 kg/ha), Haryana (1100 kg/ha) and Gujrat (1082 kg/ha). The lowest yield has been observed in the state of A.P. (536 kg/ha) followed by C.G. (575 kg/ha) and Karnataka (591 kg/ha).

The overall trend of area, production and yield shows increasing trend during the Plan Period over the previous plan.

3.6 LENTIL

Global Scenario: India ranked first in area and second in the production with 39.79% and 22.79% of world area and production respectively.The highest productivity was recorded in

Croatia (2862 kg/ha) followed by New Zealand (2469 kg/ha). Canada rank first in production (41.16%) due to very high level of productivity (1633 kg/ha) as compared to India (611 kg/ha).

Table.10 Global Ranking: Major countries

{A-Lakh ha, P-Lakh Tonnes, Y-kg/ha}

Rank	Area			Production			Yield	
	Country	Area	% to World	Country	Prod.	% to World	Country	Yield
I	**India**	18.00	39.79	Canada	19.87	41.16	Croatia	2862
II	Canada	12.17	26.90	**India**	11.00	22.79	N.Zealand	2469
III	Turkey	2.43	5.38	Turkey	3.45	7.15	Armenia	2263
IV	Nepal	2.06	4.55	Australia	2.38	4.93	China	2083
V	Iran	1.68	3.71	Nepal	2.27	4.70	Egypt	2056
							India	**611**
	World	**45.24**		**World**	**48.27**		**World**	**1067**

Source: FAO statistics 2014

National Scenario: *Twelfth Plan (T.E. 2012-15)*: The country's area under Lentil was 13.90 lakh hectares with a production of 10.93 lakh tonnes. Madhya Pradesh ranks Ist in acerage i.e., 39.59% (5.50 lakh ha) followed by UP 33.95 % and Bihar 11.29%. While in terms of production UP ranks Ist at 34.36% (3.76 lakh tonnes) followed by Madhya Pradesh (30.73%) and Bihar (17.35%).The highest yield was recorded by the state of Bihar (1209 kg/ha) followed by Rajasthan (962 kg/ha) and W.B. (960 kg/ha). The National yield average was (786 kg/ha). The lowest yield was observed in the state of C.G. (327 kg/ha) followed by Maharashtra (400 kg/ha) and M.P. (610 kg/ha).

The overall trend of area, production and yield during the twelfth plan has shown increasing trend in production and productivity however, area has declined as compared to previous plan.

3.7 PEAS

Global Scenario: Canada rank Istin area (21.16 %) and production (30.80%) at Global level. China stands at IInd position in area (13.70 %) followed by Russian Federation (12.94%) respectively. India occupies IVth position in area (10.53%) and Vth position in production (6.96%). Highest productivity is recorded in Ireland (5000 kg/ha) followed by Netherland (4766 kg/ha) and Denmark (4048 kg/ha). While, India's productivity was only 822 kg/ha.

Table.11 Global ranking: Major countries

{A=lakh ha, P=lakh tonnes, Y=kg/ha}

Rank	Country	Area		Country	Production		Country	Yield
		Area	% to World		Prod.	% to World		
I	Canada	14.67	21.16	Canada	34.45	30.80	Ireland	5000
II	China	9.50	13.70	Russian Federation	15.03	13.44	Netherlands	4766
III	Russian Fed.	8.97	12.94	China	13.50	12.07	Denmark	4048
IV	**India**	7.30	10.53	USA	7.78	6.96	United Kingdom	4000
V	Iran	4.75	6.85	**India**	6.00	5.36	Belgium	3873
							India	822
	World	**69.32**		**World**	**111.86**		**World**	**1613**

Source: FAO statistics, 2014

National Scenario Twelfth Plan (T.E. 2012-2015):A total lentil area of 11.50 lakh hectares and a total production of 10.36 lakh tonnes were recorded. Uttar Pradesh ranked first both in area and production (45.80% and 48.72%) followed by Madhya Pradesh (25.57% and 23.64%) and Jharkhand (2.70 % and 4.46%). As regards of productivity, Rajasthan ranks Ist with 1762 kg/ha yield followed by Jharkhand (1491 kg/ha) and West Bengal (1157 kg/ha). The lowest yield was observed in C.G. (370 kg/ha) followed by Maharashtra (412 kg/ha) and Assam (745 kg/ha).

The area, production and yield significantly increased during the XIIth plan as compared to previous plan.

3.8 GREEN GRAM

National scenario: ***Twelfth Plan (T.E 2012-2015):*** The total area covered under moong in India was 30.41 lakh hectares with a total production of 14.24 lakh tonnes. The coverage of area and its production was maximum in Rajasthan (29.68 % & 25.51 %). Maharashtra ranked IInd in area coverage (12.98%) and IIIrdin production (11.92 %). Andhra Pradesh ranked IIIrdin area (8.74 %) and IIndin production (12.43 %). The highest yield was recorded by the state of Punjab (838 kg/ha) followed by Jharkhand (680 kg/ha)and Tamil nadu (675 kg/ha). The National yield average was 468 kg/ha. The lowest yield observed in the state of Karnataka (247 kg/ha) followed by C.G. (269 kg/ha) and Odisha (337 kg/ha).

During the twelfth Plan Period the area under mung has decreased however, production and productivity showed increasing trend as compared to previous plan.

3.9 BLACK GRAM

National scenarioTwelfth Plan (T.E.2012-2015*)*: The total production was 18.29 lakh tonnes on an area of 31.29 lakh hectares. As regards the total contribution from states, Madhya Pradesh standIst in respect of area (19.40%) followed by U.P. (17.88%) and Andhra Pradesh (11.69%), whereas in production U.P. stands first (16.98%) followed by Andhra Pradesh (16.75%) and Madhya Pradesh (15.07%). The highest yield was recorded by the state of Bihar (898 kg/ha) followed by Sikkim (895 kg/ha) and Jharkhand (890 kg/ha) the National yield average was (585 kg/ha).The lowest yield was recorded in the state of C.G. (309 kg/ha) followed by Odisha (326 kg/ha) and J&K (385 kg/ha).

The over all trend during plan period show increasing trend in Area, Production and Productivity as compared to previous plan.

3.10 MOTHBEAN

National ScenarioTwelfth Plan (T.E.2012-2015):A total of 9.26 lakh hectares and 2.77 lakh tonnes of Moth production was recorded in the country during the twelfth plan period. Area and production of mothbeanhas been highest in Rajasthan (96.75% and 94.49%) followed by Gujrat (2.38% and 3.6%). However, yield of Rajsthan (292 kg/ha) was below the National average yield of (299 kg/ha).

The overall area and production declined during* XIIth *plan period from previous plan. Emphasis needed to adopt the improved technology recommendations and varieties to increase the moth production in the country.

3.11 HORSE GRAM

National ScenarioTwelfth Plan (T.E.2012-2015): In India, the total area under Horsegram and its production during this plan was 2.32 lakh hectares and 1.05lakh tonnesrespectively.In terms of area and production, Karnataka is on the firstposition on all India basis contributing 26.72% and 25.71% followed by Odisha (19.46%& 15.48%)and Chhatisgarh (19.29% & 13.29%).The highest yield was recorded in the state of Bihar (959 kg/ha) followed by W.B. (796 kg/ha) and Jharkhand (603 kg/ha).

The trend of area and production during XIIth plan period showed a significant decrease as compared to previous plan.

4.0 POLICY INTERVENTION

NFSM-Pulses in pursuance of the resolution adopted in 53rd meeting of NDC a CSS on National Food Security Mission to enhance the production of rice, wheat and pulses by 10, 8 and 2 million tonnes, respectively by the end of XI Plan. NFSM scheme is continued since XIth plan.

The NFSM aimed at increasing production of rice, wheat and pulses through area expansion and productivity enhancement; restoring soil fertility and productivity; creating employment opportunities; and enhancing farm level economy to restore confidence of farmers. The basic strategies are implementation of interventions in a mission mode through all the stake holders at various levels. These interventions include promotion and extension of improved technologies i.e., Seed, INM, IPM and Resource Conservation Technologies (RCT) along with capacity building of farmers.

NFSM + Special initiatives (2010-11 to 2013-14): Accelerated Pulses Production Programme (A3P) (2010-11 to 2013-14)-cluster demonstration approach from; Special Initiatives for "pulses and oilseeds in dry land area(2010-11); Integrated development of 60000 Pulses villages in Rainfed Areas RKVY (2011-12) and "Special Plan To Achieve 19+ million tonnes of Pulses production during Kharif (2012-13)'' were also been implemented.

Strong Research and Development efforts during XI Plan had spectacular achievement realising more than 20% increase in the production of Pulses at the terminal year of XI Plan (2011-12).

The Twelfth Plan NFSM (2012-13 to 2016-17), revamped from 2014-15 and is under implementation with five components viz.i) NFSM- Rice, ii) NFSM-Wheat, iii) **NFSM-Pulses**, iv) NFSM-Coarse Cereals (millets) and v) NFSM-Commercial Crops (Jute, Cotton, Sugarcane).

NFSM-Pulses XII Plan: During 2014-15, with 100 percent central assistance NFSM was under implementation in 24 states viz. Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Chhattisgarh, Gujarat, Haryana, Jharkhand, Karnataka, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Mizoram, Nagaland, Odisha, Punjab, Rajasthan, Sikkim, Tamil Nadu, Telangana, Tripura, Uttar Pradesh and West Bengal with additional production target of 4 Million tonnes by the end of XII Plan (2016-17).

A target of an additional production of 25 million tonnes of food grains i.e. from 259.29 MT to 284.29 over the base year of XI Plan (i.e. 2011-12) comprising Rice-10 million tonnes, Wheat - 08 million tonnes, **Pulses - 04 million tonnes**& Coarse Cereals-03 million tonnes, is targeted to be achieved at the end of 12th Plan (2016-17).

During 2015-16 all CSS were rationalized as - (i) KrishiUnnatiYojana (ii) National Crop Insurance Programme (NCIP) and (iii) Pradhan MantriKrishiSinchaiYojana (PMKSY). NFSM-2015-16 is a part of KrishiUnnatiYojana (State Plan).

From 2016-17, the NFSM (KrishiUnnatiYojana State Plan) with interim sharing pattern of 60:40 (plains) and 90:10 (hill NE & states) under implementation in 29 states. A Central Share of Rs. 1700 Crores has been approved during 2016-17.

The basic strategy of the Mission is to focus on low productivity high potential districts, promotion of and extend improved technology package (CSBD-30% of total demonstrations), implementation of cropping system centric interventions on technological package, agro-climatic zone wise planning and cluster approach demonstrations, distribution of certified HYV seeds/Hybrid seeds, Resource Conservation Technology (RCT) tools, irrigation machineries/MIS, trainings and undertaking local initiatives to the tune of 9% of total budgetary allocation to improve productivity.

Special emphasis is targeting reclamation of problematic soils, water logging areas and mitigation of adverse effects of climate change for high productivity areas, value chain integration (FPOs), assistance to Custom Hiring Centre (CHCs). 30% of budgetary allocation has to be earmarked for women beneficiaries.

To ensure equity, of the total budgetary allocation to a district proportionate expenditure under Special Component Plan (SCP) for SCs, Tribal Sub Plan (TSP) – SMF and Women farmers at 16%, 8%, 33% and 30% respectively is mandatory.

Assistance for various interventions like cluster demonstrations on improved package of practices, demonstrations on cropping system, cropping system based training of farmers, seed distribution of HYVs , manual sprayer, power sprayer, tractor mounted sprayer, chiseller (deep ploughing), water carrying pipes, mobile raingun, sprinkler set, pump set (up to 10 HP), seed drill, zero till seed drill, multi crop planter, zero till multi crop planter, ridge furrow planter, rotavator, multi crop thresher, laser land leveller, plant protection chemical and bio pesticides, weedicides, gypsum / phospho-gypsum, bio-fertilizers, micro nutrients, local initiatives are provided under NFSM-Pulses programme.

Concerted efforts are being made for promotion of cultivation of pulses as inter-crop with cereals, oilseeds, commercial crops.At least 30% of the cluster demonstrations under NFSM and BGREI are being conducted by adopting cropping system approach to promote pulses as second crop in rice fallow areas.

Formation of Farmer-Producer Organizations (FPOs) is also being promoted particularly to support the small and marginal farmers to offer collective strength for seed production, procurement and access to improved technologies. Besides, for primary processing of pulses, assistance is provided for establishment of mini *dal* mills under NFSM. State Agriculture Universities/ Indian Council of Agricultural Research Institutes/ International Research Organizations are also involved to address various researchable issues of pulses and demonstrations of latest technologies for better yield realization at farmers' field.

Government of India has allocated Rs. 1700 crores for NFSM for 2016-17, out of which an amount of Rs. 1100 crores is earmarked for pulses.

4.1 ***Committee for Monitoring Actions/ Strategy for Increasing Pulses Production -2016-17***

To address, availability of quality seeds (SRR) of latest/promising varieties (VRR) and adoption of recommended technologies (TOT) has been viewed as a major bottleneck. The Committee headed by Dr. Ashok Dalwai, Additional Secretary, DAC&FW, reommended strategic interventions as a new initiative during 2016-17.

i) ***Enhancing Breeder Seed Production*** (*Rs. 2039.00 lakh* for *2016-17*,) 12 centres in 08 states

ii) ***Creation of Seed-Hubs***Rs. 225.31 Crores for *2016-17 to 2017-18)*at 150 locations in the country

iii) ***Cluster FLD on Pulses(minimum 10 ha each)*** by ATARI (*Rs. 2529.10 lakh* for *2016-17*) in 31000 ha area

iv)***FLD on Pulses by IIPR*** *(Rs. 97.50 lakh for 2016-17)* are being organized in 1300 ha area

v) **Seed production subsidy**: @ Rs. 2500 /- per quintal for new varieties;

vi)Establishment/Strenghtening of Biofertilizer and Bio-control Production Units (24 centres/Institutes) :Rs. 29.61 crores.

vii) FPOs: (111) Rs. 52.1084 crores.

viii) **Seed Minikit:**Total allocation Rs. 150 Crore.

ix) **Minimum Support Price:** The MSP of pulses has been significantly increasing for mostof the pulses. The MSP of arhar, moong &urd for kharif marketing season 2016-17hasbeen fixed at Rs. 4625, Rs. 4500 &Rs. 4575 per quintal. In order to give moreincentive to farmers, a bonus of Rs.425 per quintal over and above the MSP has beengiven. Similarly, for rabigram & lentil Rs.4000 & Rs.3950 per quintal respectively.

x) Price Stablization Fund (PSF) – A Provision of Rs. 500 Crore

Table.12 XIIth Plan (2012-13 to 2016-17)

Sr.No.	2012-13 to 2013-14	States Covered
1.	National Food Security Mission (NFSM)–Pulses	16
2.	Accelerated Pulses Production Programme (A3P)	16
3.	Special Plan to achieve 19+ million tonnes of Pulses production during *Kharif*2012-13	08
	2014-15 to 2016-17	
1.	National Food Security Mission (NFSM)–Pulses 2014-15	27
2.	National Food Security Mission (NFSM)–Pulses 2015-16	27
3.	National Food Security Mission (NFSM)–Pulses 2016-17	29
4.	Seed Hub-ICAR	150
5.	Breeder Seed Production Programme -ICAR	
6.	Seed Minikit	NFSM States
7.	Cluster FLDs through KVKs	31000 ha
8.	Establishment/strengthening of Bio-fertilizer and Bio-control Production Units	24 Nos.
9.	Farmer Producer Organization (FPOs)	111 Nos.

Table.13 INTERVENTIONSUNDER NFSM-PULSES:

Sr. No.	Head	Interventions
1.	Technology Demonstrations	• Cluster demonstrations • Cropping system based demonstrations • Front Line Demonstrations by ICAR/SAUs
2.	Seed	• Distribution of HYVs seed
3.	Integrated Nutrient Management (INM)	• Micro-nutrients • Lime/Gypsum/80% WG Sulphur • Lime • Bio-fertilizers
4.	Integrated Pest Management (IPM)	• Distribution of Plant Protection chemicals • Weedicides
5.	Resource Conservation Technologies/Tools	• Power Knap Sack Sprayers • Manual Sprayer • Zero Till Seed Drills • Multi Crop Planter • Seed Drills • Zero Till Multi Crop Planters • Ridge Furrow Planters • Rotavators • Chiseller • Laser Land Levelers • Tractor mounted sprayer • Multicrop Thresher
6.	Efficient Water Application Tools	• Sprinkler Sets • Pump Sets • Pipe for carrying water from source to the field.

		• Mobile Rain guns
7.	Cropping System based trainings	• Four Sessions in a crop season (One before Kharif and Rabi Season & one each during Kharif and Rabi Crops).
8.	Miscellaneous Expenses (Project Management Support & Monitoring)	• Project Management Team & other miscellaneous expenses at District and state level
9.	Local Initiatives	• On project basis, up to 9% of the total allocation to the state
10.	Other	• Specialized projects for high productivity areas • Support to institute/organizations including NGOs in remote areas. • Value chain integration of small producers • Assistance to Custom Hiring Centres • Marketing support for pulses

Table. 14 Ongoing Contractual Researches (NFSM)

(Amount in Lakhs)

S. No.	Project Title	Implementing Agency	Project Duration	Total Allocation	Alloc. for 2016-17	1st Release
1	Enhancing breeder seed production for increasing indigenous production of pulses in India	ICAR, New Delhi	2016-17 to 2018-19		2039.00	815.60 (40% of allocation)
2	Scaling up and popularization of high yielding pigeonpea hybrids for enchancing productivity of small and marginal farmers of Maharashtra,Karnataka& Odisha States of India	ICRISAT, Hyderabad, Telangana	2016-17	77.965	77.965	58.47
3	Creation of seed –hubs for increasing indigenous production of pulses in India	IIPR, Kanpur	2016-17 to 2017-18	15031.08 (incl. 7 additional hub)	8044.54	4022.27
4	Creation of seed –hubs for increasing indigenous production of pulses in India	IIPR, Kanpur	2016-17 to 2017-18	-	630.00	315.00 (50 % of add. allocat.)
5	Addressing phytophthora blight disease : An emerging threat of pigeonpea expansion and production	ICRISAT, Hyderabad	2013-14 to 2016-17	400.923 (Revised)	121.976	
6	Quality seed production for higher productivity of pulses through farmers participatory programme in Shiwalik foothills of Jammu region	SKUAST, Jammu	2014-15 to 2016-17	51.60 (Revised)	14.61	10.70

7	Enhancing mothbean and mungbean productivity through high yielding varieties, nutrient management and IPM practices in Western Rajasthan	SKRAU, Bikaner	2014-15 to 2016-17		11.51040	5.788
8	Generation advancement and development of new genotypes through pre-breeding in Lentil and Kabuli Chickpea"	ICARDA	2013-14 to 2016-17	320.196 (Revised)	81.536	
9	Identification of salt tolerant chickpea varieties for coastal regions of Gujarat.	NAU, Navsari (Dr. P.B. Patel)	2014-15 to 2016-17	32.123 (Revised)	11.216	
10	Investigation on the present pigeon pea pest complex and their management with emphasis on radiation technology as an integral component in IPM.	UAS, Raichur , Karnataka	2013-2014 to 2016-17	690.74 (Revised)	114.396	21.634
11	Enhancing productivity through introduction of new high yielding varieties, production technologies in chickpea, green gram, black gram & cowpea.	UAS, Dharwad , Karnataka			35.18	
12	Utilizing chickpea genome sequence for crop improvement.	ICRISAT, Hyderabad	2013-14 to 2016-17	1293.9984 (Revised)	220.50	165.375
13	Developing chickpea cultivars suited to mechanical harvesting and tolerant to herbicides.	ICRISAT, Hyderabad	2013-14 to 2016-17	795.47 (Revised)	218.776	210.35

5. Conclusion

During the course of implementation of NFSM throughout the XIth&XIIth plan (2012-13 to 2015-16), the country witnessed a significant increase in production of pulses i.e. 15.86 Million tones (XIth plan) and 17.02 Million tonnes (XIIthplan) respectively, the maximum ever achieved at high productivity levels of 656 kg/ha (XIth) and 685 kg/ha (XIIthplan) respectively, although, still below the world's average productivity of 909 kg/ha and the FLDs.

A productivity gap in chickpea-54%; lentil-59%; pigeonpea (early-37%, medium-100%, long duration >71%); Mungbean (*Kharif*-73, *Rabi*- >100%); urdbean (*Kharif*-68% and *Rabi*- rice fallow-51% and normal-104%), under total pulses between the FLDs and states' average is the existing potential and a challenge for both the research and development agencies to harness.

During the NFSM plan period, irrigation increased upto 19%, attributing the productivity enhancement i.e. about 685 kg/ha (Twelfth plan).

The demand for Pulses is projected to grow at about 2% per year on account of the increase in population and growth in direct demand. This growth rate is almost four times the growth rate experienced in the domestic production of the food grains including pulses during the last decade.

This has created serious imbalnces between domestic production and demand which for some time was met by liquidating stocks and cutting down on exports. If the growth rate of dometic production of pulses fails to rise to the required level, it would result in lead to increase dependence on imports to met the domestic demand.

If we want to meet the domestic demand of pulse requirement, we must increase production or depend on imports. As Agriculture growth is limited, imports will help improve the supply situation in the short term whereas, the long term, we will need to focus on productivity increase, through public capital formation in irrigation, Quality seeds of promising varieties and their availability at least 33% SRR, research and efficient use of water, plant nutrition and other necessary inputs.

Policy initiatives must lead for efficiency and help in maintaining balance between domestic production and demand. It we strive to achieve these potential yield levels, then the increasing demand requirement of the country can be met in future.

In order to give the much needed fillip to pulse production, the government has given emphasis on pulses through various developmental programmes and has been significantly increasing the MSP for most pulses. This has resulted in an above normal growth in pulses production in recent years.

In the past four years, there has been significant increase in pulse consumption averaging 50 grams due to somewhat higher production and larger imports.