

ANNUAL REPORT

2016-17



सत्यमेव जयते

GOVERNMENT OF INDIA

MINISTRY OF AGRICULTURE & FARMERS WELFARE

(DEPARTMENT OF AGRICULTURE, COOPERATION & FARMERS WELFARE)

DIRECTORATE OF PULSES DEVELOPMENT

VINDHYACHAL BHAVAN

PREFACE

Pulses are an important source of stable protein food for the poor and the vegetarians which constitute a major population of the country. The Recommended Dietary Allowances (RDA) for adult male and female is 60 g and 55 g per day respectively. The per capita availability of pulses is @ 42 g per day. Its production is characterized by diversity of crops and their regional specificity based on adaptation to prevailing agro climatic conditions. This group of crops can utilize limited soil moisture and nutrients more efficiently than cereals and well suited to contingent and climate resilient crops under highly adverse conditions.

Major developmental interventions in pulses were initiated with the inclusion of pulses (NPDP) in the TMOP during VIIIth plan (1992-97). NPDP was followed by ISOPOM since 2007-08, the NFSM-Pulses is a major scheme and today is under implementation in 29 states in 638 districts of the country during 2017-18. Production capacity is expected to remain behind the projected demand creating wide gap and causing deficiency in protein intake through pulses. Shortage of pulses will thus continue to be a cause of concern in the near future. A diagnosis of the magnitude and dimensions of the problems inhibiting production and productivity of pulses is thus essential for devising appropriate policy directions.

India's outstanding contribution towards total global acreage and production of pulses at 35% & 25 % respectively is credited to our strength. The intervention of NFSM-Pulses has realized the positive impact during XIIth plan over the previous five year plan. During XIIth plan and approximately increased in pulses have been to the tune of 5.28% area, 34% production and 27% under yield compared to XIth plan.

The Annual Report is an effort towards a brief summary of activities performed by this directorate for the development of pulses, global & national scenario strategies, Progress of NFSM-Pulses, State's Profile of the assigned states viz., Madhya Pradesh & Chhattisgarh various participation/workshop/training/meeting/Kishan mela, conduct of NLMT, IMCT, Field visit, Studies, Surveys & varietal profile etc.

I acknowledge the sincere efforts of Technical Officers Dr. A.K. Shivhare, Sarju Pallear, Statistical Investigator and Smt. Ashwini Bhoware of this Directorate in their contribution to this publication.

Dr. Shivhare, Assistant Director & Smt. Ashwini Bhoware, Technical Assistant (NFSM) deserve special mention for the extra-ordinary input, analysis and compilation.

December, 2017

(A.K. Tiwari)

INDEX

S. No.	Particulars	Page No.
1	About the Directorates	1-3
2	Objectives	3-4
3	Functions	4-5
4	Pulses Overview	6-20
4.1	Introduction	6
4.2	Pulses Share to total Food grain Basket	6-10
4.3	Growth Rate of total pulses	11-14
4.4	Per Capita Availability of Pulses in India	15
4.5	Demand and Supply Status ó Production & Import/Export	16
4.6	Pulse Importing and Exporting Countries of Major Pulses for 2013-14	17-19
4.7	Projected Demand (Eleventh Plan)	19-20
4.8	Crop/Season-Wise Share	20
5	Production Trends	21-42
5.1	Global Scenario : All Pulses	21
5.1.1	Global Scenario : Total Pulses	22
5.1.2	Global Scenario : Chickpea	23
5.1.3	Global Scenario : Pigeonpea	24
5.1.4	Global Scenario : Fieldpea	25
5.1.5	Global Scenario : Lentil	26
5.2	National Scenario	
5.2.1	Total Pulses - Plan Periods	27-29
5.3	States Scenario	
5.3.1	Plan-Wise(X-XII) : Total Pulses	30-31
5.3.2	Plan-Wise(X-XII) : Pigeonpea	32-33
5.3.3	Plan-Wise(X-XII) : Chickpea	34-35
5.3.4	Plan-Wise(X-XII) : Mungbean	36-37
5.3.5	Plan-Wise (X-XII) : Urdbean	38-39
5.3.6	Plan-Wise (X-XII) : Lentil	40-41
5.3.7	Plan-Wise(X-XII) : Fieldpeas	42-43
6.0	Policy for increasing Doubling Pulse Production by 2022	44-112
6.1	Target	44
6.1.1	Crop diversification through diverting additional area of 25 lakh hectares under focussed crops	44
6.2	Additional potential area proposed to be brought under different pulse crops.	44-45
6.2.1	Utilization of potential area of rice-fallow lands	46-47
6.2.2	Existing scheme: Targeting Rice Fallows for Pulses Production (TRFA)	47
6.2.3	Recommendations for improving pulses productivity under rice fallow	47-48
6.2.4	Recommendations based on Performance/ Experience	48-50
6.2.5	Diversification: Replacement of less remunerative crops with pulses	50
6.2.6	Cultivation of spring/summer pulses	50
6.2.7	Promotion of intercropping and Utera cultivation	50
6.2.8	Scope of area expansion for increasing pulses production through intercropping	51
6.2.9	Cultivation of pigeonpea on rice bunds/transplanting	52
6.3	Strategy: Vertical Expansion	52
6.3.1	Vertical Expansion (Increasing Productivity)	53-75
6.3.2	Yield Gap Analysis: FLD (Crop-Wise)	75-81

S. No.	Particulars	Page No.
6.4	Emphasis on improvement in total factor productivity	82
6.4.1	Precision Agriculture	82
6.4.2	Importance of Precision Farm Machineries	82
6.4.3	Effects of protective irrigation on yield of various crops	82
6.5	Policy for improving terms of trade for farmers	83
6.5.1	Comparative statement of MSP & cost of production	83-85
6.5.2	Economics of processing of pulses	86
6.5.3	Household consumption of Pulses in India	86
6.6	Increasing SRR of Improved/Recommended Varieties	87-93
6.7	Bridging the yield gaps- by planting improved/recommended Varieties	94-104
6.7.1	Technological Interventions	105-106
6.7.2	Integrated Nutrient Management	107
6.7.3	Critical Irrigation	108
6.7.4	Weed Management	108
6.7.5	Integrated Pest Management	109-110
6.7.6	Cropping System approach	110-111
6.7.7	Varieties with special traits	112
7	Brief Strategy for Sustainability of pulses production	113
8	Assigned States Profile	114-136
8.1	Madhya Pradesh	114-115
8.1.1	Crop-wise area under Irrigation	116
8.1.2	Production Scenario: Plan Analysis (XI th - XII th Plan)	117-120
8.1.2.1	Kharif Pulses	117-118
8.1.2.2	Rabi Pulses	119-120
8.1.3	Crop Scenario (Kharif& Rabi): 2016-17	124
8.1.4	Financial Progress	125
8.2	Chhattisgarh	126-127
8.2.1	Production Scenario: Plan Analysis (XI th - XII th Plan)	128-131
8.2.1.1	Kharif Pulses	128-129
8.2.1.2	Rabi Pulses	130-131
8.2.2	Crop Scenario (Kharif& Rabi): 2016-2017	135
8.2.3	Financial Progress	136
9	National Level Monitoring Team-NFSM - 2016-17	137-173
9.1	NLMT-NFSM: Madhya Pradesh	138-157
	Kharif	138-145
	Rabi	146-157
9.2	NLMT-NFSM: Chhattisgarh	158-173
	Kharif	158-165
	Rabi	166-171
9.3	NLMT-BGERI: Chhattisgarh (Kharif)	172-173
10	Workshop/Training/Conference/Meeting Participation.	174-175
11	Monitoring of Crop Develop. Schemes/Field visit by Officer/Officials of DPD.	176-178
12	Technical Reports submitted to Ministry	179
13	Administration & Accounts	180
13.1	Final Expenditure of DPD, Bhopal	180
13.2	Fund Requirement of Honorarium, Conveyance Allowance & Tour for TAs	180
13.3	Hindi Workshop & International Yoga Day	181

TABLES

Table No.	Particulars	Page No.
1	Contribution of Pulses To Total Food Grains In India	7
1.0	Season-Wise Pulse Contribution to Total Pulses	8
1.1	Area, Production And Productivity Of Pulses	9
1.2	Percentage Share To Total Pulses	10
2	Growth Rate of Total Pulses	11
2.1	Growth Rate of Pigeonpea & Chickpea	12
2.2	Growth Rate of Mungbean&Urdbean	13
2.3	Growth Rate of Lentil &Fieldpea	14
3	Per Capita Availability of Pulses In India	15
4	Availability Status of Pulses Production, Import And Export	16
5	Top 5 Exporting & Importing Countries 2016-17	17
5.1	Exporting Countries : Pigeonpea & Chickpea	17
5.2	Exporting Countries : Mungbean, Urdbean, Lentil &Fieldpea	18
5.3	Importing Countries : Pigeonpea & Chickpea	18
5.4	Importing Countries : Mungbean, Urdbean, Lentil &Fieldpea	19
6	Tentative Demand/Production And Projected Target	19
7	Normal Area, Production And Yield (Crop-Wise)	20
8	Global Ranking: Crop-Wise Total Area, Production And Yield	21
8.1	Total Pulses	22
8.2	Chickpea	23
8.3	Pigeonpea	24
8.4	Fieldpea	25
8.5	Lentil	26
9	Plan-Wise Scenario (APY) – All India	27
9.1	Pigeonpea	28
9.2	Chickpea	28
9.3	Total Mungbean	28
9.4	Total Urdbean	28
9.5	Lentil	29
9.6	Field pea	29
10	Plan-Wise States' Scenario – Total Pulses	31
10.1	Pigeonpea	33
10.2	Chickpea	35
10.3	Mungbean	37
10.4	Urdbean	39
10.5	Lentil	41
10.6	Fieldpea	43

Table No.	Particulars	Page No.
11	Crop-Wise Targeted Production & Productivity	44
12 (a)	Distribution of Rice Fallows	46
12 (b)	Rice Fallow Area	46
12 (c)	Potential pulses area under rice fallows	47
13 (a)	Major technological interventions	49
13 (b)	Performance based recommendation	50
14	Prominent intercropping systems	51
15	Scope of area expansion through intercropping system manipulation	51
16	Yield gap: National and Inter-state	53
17	Yield gap Intra - State (<i>District-wise</i>)	51-74
18	Crop-wise Yield Gap and Additional Return	76
18 (a)	State-Wise Yield Gap and Additional Return: Pigeonpea	77
18 (b)	State-wise Yield Gap and additional return: Chickpea	78
18 (c)	State-wise Yield Gap and additional return: Mungbean	79
18 (d)	State-wise Yield Gap and additional return: Urdbean	80
18 (e)	State-wise Yield Gap and additional return: Lentil	81
18 (f)	State-wise Yield Gap and additional return: Field pea	81
19	Comparative statement of MSP & cost of production	83
19 (a)	Arhar	83
19 (b)	Mung	84
19 (c)	Urd	84
19 (d)	Gram	85
19 (e)	Lentil	85
20	Details of Consumption of Selected Pulses and Pulse Products, All India	86
21	Requirement of seed under different categories (2018-19 to 2021-22)	87
21 (a)	Gram	88
21 (b)	Lentil	89
21 (c)	Field pea	89
21 (d)	Rabi urd	90
21 (e)	Rabi mung	90
21 (f)	Others Rabi including Lathyrus and Kulthi	91
21 (g)	Arhar	91
21 (h)	Kharif Urd	92
21 (i)	Kharif Mung	92
21 (j)	Others Kharif Pulses Including Kulthi	93
22	Varieties for Normal and Rice Fallow Areas	94-104
23	Flood and Drought Tolerant Varieties/ hybrids	112
24	State Specific Strategy	112

ANNEXURES

S. No.	Particulars
I	All India: Crop Coverage Kharif Pulses 2016
II	All India: Crop Coverage Rabi Pulses 2016-17
III	MP: Crop Coverage Kharif Crops 2016
IV	MP: Crop Coverage Rabi Crops 2016-17
V	CG: Crop Coverage Kharif Crops 2016
VI	CG: Crop Coverage Rabi Crops 2016-17
VII	All India: State-wise Crop Coverage Spring/Summer Pulses 2016
VIII	All India: Crop-wise Crop Coverage Spring/Summer Pulses 2016

ABOUT THE DIRECTORATES

Directorate of Pulses Development, one of the eight Commodity Development Directorates (Jute, Cotton, Wheat, Millets, Rice, Sugarcane and Oilseeds) under the Ministry of Agriculture & Farmers Welfare, Department of Agriculture, Cooperation & Farmers Welfare was established at Lucknow in 1971 with the merger of Regional Extension Units at Ahmadabad (Gujarat). On the recommendation of "Commodity Development Directorates Re-organization Committee", the National Head Quarter of the Pulses Development was subsequently shifted to Bhopal (M.P.) in 1996. The Directorate of Pulses Development with its HQ in Bhopal (M.P.) is responsible for coordination and monitoring of the implementation of pulses development scheme under National Food Security Mission (NFSM) - Pulses in 638 districts of 29 States in the Country during 12th five year plan (2012-13 to 2016-17). With the bi-focal responsibilities for the assigned states, this Directorate is responsible for coordination and monitoring of all the crop related Centrally Sponsored Schemes and Missions like NFSM (Wheat, Pulses, Rice, Commercial Crops, Coarse Cereals), BGREI, Cluster FLD on Pulses under NFSM, FLD on Rice, Wheat, Pulses & Coarse Cereals under NFSM, Cluster Demonstration on Oilseed under NMOOP, Seed-Hub project, Breeder Seed Programme, Seed Minikit Programme on Pulses under NFSM, NMSA, NMAET, NMOOP, & RKVY etc.

With the unabated population increase in the Country, Pulses Production also have to be paralleled with this rise in population as they are the main source of balanced diet particularly for the rural mass. Keeping in view this necessity, various programmes were launched during various Plan periods. A Centrally Sponsored Pulses Development Scheme was initiated from the IVth Plan (1969-70 to 1973-74) with the introduction of production technologies and improved varieties amongst the farmers.

The National Pulses Development Project (NPDP) which merged with the earlier Centrally Sponsored Scheme on pulses has been a boon for the farming communities when the Ministry of Agriculture & FW, Government of India launched it from the VIIth Plan onwards. In order to supplement the efforts under NPDP, a Special Food Grain Production Program (SFPP) on Pulses was also implemented during 1988-89 on a 100% Central assistance basis.

It is worth mentioning that under the Government of India-UNDP Co-operation (1997-2003), Pulses Sector was identified as Priority Sector to be strengthened. After Pulses were brought within the ambit of Technology Mission, Pulses Production markedly increased. This considerable increase has been attributed to TMOP Division of the Ministry as seen from the difference of Pulses Production during the Pre and during TMOP Scenario.

Keeping in view the spectacular achievement in Oilseeds Sector, during 2004-05, pulses along with Oilseeds, Oilpalm and Maize were brought under one scheme namely Integrated Scheme of Oilseeds, Pulses, Oilpalm and Maize (ISOPOM). The new technologies, timely supply of inputs, extension supports, remunerative price, marketing infrastructure and post-harvest technologies were the focused area to increasing pulses production with the Mission Mode approach.

Beginning of XI Plan (2007-08 (Rabi)), in pursuance of the resolution adopted in 53rd meeting of National Development Council (NDC), a Centrally Sponsored Scheme on National Food Security Mission was launched. It was resolved to enhance the production of rice, wheat and pulses by 10, 8 and 2 million tonnes, respectively by the end of XI Plan. The Mission is being continued during 12th five year Plan with new target of additional production of 25 million tonnes of food grains comprising of 10 million tonnes of rice, 8 million tonnes of wheat, 4 million tonnes of Pulses and 3 million tonnes of Coarse Cereals by the end of XII Plan (2012-13 to 2016-17).

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 of targeted districts. The basic strategies were implementation of interventions in a mission mode through active engagement of all the stake holders at various levels. These interventions include promotion and extension of improved technologies i.e., Seed, Integrated Nutrient Management (micro-nutrient, soil amendments), IPM and resource conservation technologies (RCTs) along with capacity building of farmers. Flow of fund closely monitored to ensure that intervention reach the target beneficiaries on time, Interventions proposed were integrated with the district plan and target for each identified district was fixed. Constant monitoring and concurrent evaluation were done for assessing the impact of the interventions for a result oriented approach by the implementing agencies.

To further supplement the efforts accelerate the pulses production, during XI Plan a centrally sponsored Accelerated Pulses Production Programme (A3P) (2010-11 to 2013-14)-as cluster demonstration approach; Special initiatives for pulses and oilseeds in dry land area (2010-11); and Integrated development of 60000 Pulses villages in Rainfed Areas (2011-12) both under RKVY and Special plan to achieve 19+ million tonnes of Pulses production during Kharif (2012-13) were also implemented, in addition to NFSM-Pulses.

During the XII five year Plan (2012-13 to 2016-17), the Pulses development scheme under NFSM is under implementation in 29 states viz. Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Chhattisgarh, Goa, Gujarat, Haryana, Himachal Pradesh, Jammu & Kashmir, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Mizoram, Nagaland, Odisha, Punjab, Rajasthan, Sikkim, Tamil Nadu, Telangana, Tripura, Uttar Pradesh, Uttarakhand and West Bengal with additional production target of 4 Million tonnes by the end of XII Plan (2016-17).

2. OBJECTIVES

- Analysis of Area Production and Productivity trends/impact of Developmental Programmes on Pulses research areas and Identification of Bottlenecks and suggest measures for their rectification and also feedback to the Indian Institute of Pulses Research (ICAR) through institutionalized mechanism of National Conference/Group Meets on Chickpea, Pigeonpea, MULLaRP, Arid Legumes and DAC-ICAR Interface. Interface with national and International Research Organizations and Stake holders on area of crop Research.
- Preparation of Weekly Weather Watch Report (WWWR), close monitoring of weather/rainfall pattern/temp/coverage/market arrivals and prices of pulses at national level and for all agricultural crops in the state of M.P. & Chhattisgarh and weekly feedback to the Ministry for review of the Crop Tracking Committee meeting held under the Chairmanship of the Special Secretary, Government of India.
- Formulation of Annual and Five year National plan, coordination in execution and monitoring of crop production programmes of pulses at national level.
- Assisting states (M.P. & Chhattisgarh) in planning the Programme convergence and monitoring thereof.
- Critical monitoring of the NFSM-Pulses, all Central Sector/Centrally Sponsored Schemes in the states of Madhya Pradesh and Chhattisgarh (the assigned states).

•

- Assisting states/UTs in initiation, planning, formulation and intensification of crop development programmes in consonance with the ongoing states programme/Contingency Planning/Crop diversification aspects.
- To assess the crop loss/damage to agricultural sector during Natural Calamities as Member Inter-Ministerial Central Team (IMCT) representing the Crops Division of Department of Agriculture & Cooperation.
- To act as nodal agency for Technology Transfer/Technology Dissemination/Extension for Pulses Development across the country and to work out Human Resource Development needs at all clientele level.
- Crop Tracking during growing season and production estimate forecast.

3. FUNCTIONS

- To plan, Coordinate and monitor nodal commodity (crops) development programmes i.e. NFSM- Pulses at the National level and coordinating the efforts to formulate and implement Crop Development programme for other states/UTs and recommend measure to improve them;
- To monitor CSS viz. National Food Security Mission (NFSM) Rice, Pulses, Wheat, Commercial Crops, Coarse Cereals) and Front Line Demonstration Programmes.
- To monitor other CSS on Bringing Green Revolution for Eastern India (BGREI) programme under Rashtriya Krishi Vikas Yojana (RKVY) in Chhattisgarh state, and analyse progress report.
- To monitor CSS on MM-I on oilseeds and MM III on Tree Borne Oilseeds (TBOs) in Madhya Pradesh and Chhattisgarh states, Mini Mission-II on Oilpalm in Chhattisgarh state under National Mission on Oilseeds and Oilpalm (NMOOP).
- To monitor Dry Land development activities, extension reforms (ATMA), mechanization etc. under NMSA, NMAE&T and RKVY interventions in the state of Madhya Pradesh and Chhattisgarh.
- To act as Convenor/Team Leader, National Level Monitoring Team (NLMT) for Madhya Pradesh and Chhattisgarh under NFSM (Rice, Pulses, Wheat, Commercial Crops, Coarse Cereals) and Bringing Green Revolution in Eastern India (BGREI).
- To liaise with the other Central Ministries ICAR institutes, SAUs, International Research Organizations, NGOs and other stake holders in the field of Agri. and allied sectors for better Research-Development interface. Also represent Department of Agriculture and Cooperation on their Committee/ events with a view to have direct interface for onward benefits to formulate farmer friendly schemes at national level with a unified approach for the overall development of agriculture sector as a whole;
- To have closer interaction/coordination with the Project Directorates/Institutes/SAUs/KVKs and other Research Centers of the ICAR and represent.
- Built data base and maintain the flow of information and ideas between research and development.
- To participate in the State Level Crop Training Programmes; Developing leaflets/ Literatures on training manuals.

- xi) To provide crop specific advisories technical inputs to extension agencies and to Extension Division of the Ministry of Agriculture for skill development, national policies and for the Plan year.
- xii) To represent the Varietal Identification Committee (VIC) on pulses and evaluate the performance of the newly evolved/ released pulses varieties.
- xiii) To study and analyze trends in weather, crop area, production and productivity.
- xiv) Preparing weekly weather and crop prospect reports in respect of kharif and Rabi pulses in all states and all crops in nodal states for review at the national level i.e. to Department of Agriculture and Cooperation.
- xv) Build up state wise & district wise area, production & productivity data on Pulses.
- xvi) To assist Department of Agriculture and Cooperation in fixing targets of production and suggest measures to achieve them.
- xvii) To help states in formulation of specific contingent plan.
- xviii) To represent Central team in the event of natural disaster.
- xix) To co-ordinate in programmatic review of all Centrally Sponsored/ Central Sector Schemes in agriculture (RKVY, NFSM, NMOOP etc.) special package (eg. Bundelkhand Package).
- xx) To organize and coordinate Seminar/Workshop/Conference /Review Meetings at state and national level.

PULSES OVERVIEW

4.1 INTRODUCTION

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, India's production of pulses is relatively were in comparison to total cereal crops productions. 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.

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 an inter-crop and also as 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.

Pulses are grown in all three seasons. The three crop seasons for the commodity are:

- i) **Kharif** – Arhar (Tur), Urd (Blackgram), Moong (Greengram), Lobia (Cowpea), Kulthi (Horsegram) and Moth.
- ii) **Rabi** – Gram, Lentil, Pea, Lathyrus and Rajmash
- iii) **Summer** – Greengram, Blackgram and Cowpea.

4.2 PULSE'S SHARE TO TOTAL FOODGRAIN BASKET

Per cent share of pulses to total food-grain basket in the country in terms of area and production was 19.62 and 16.55 per cent respectively during 1950-51. This trend continued till 1960-61 and started declination from 1970-71 (after green revolution) due to no breakthrough in production technology of pulses in comparison to other commodities of food grains. At present, except the area stabilization, the production during 2012-13 has gone down to 7.13 per cent due to stagnation in productivity of pulses as compared to other commodities of food grains. Deceleration of Per cent contribution of pulses to total food grains has prompted the Ministry of Agriculture to vigorously pursue the NFSM-Pulses during the Twelfth Plan (2012-13 to 2016-17), a Centrally Sponsored scheme, in addition to ongoing ISOPOM scheme for all 14 pulse potential states.

Food grains cover almost 62% of total gross cropped area comprising cereals 51% and pulses in about 11% in India. Further, among total pulses, the area under gram is 4%, arhar 2% and the other pulses in about 5% of gross cropped area.

The net irrigated area in the country is 47% while the remaining falls under rainfed ecology. The pulses under irrigation are cultivated in about 37% of the area while 63% of pulses are grown under *rainfed* conditions.

TABLE 1: CONTRIBUTION OF PULSES TO TOTAL FOOD GRAINS IN INDIA*(A= Million ha, P= Million Tonnes, Y= kg/ha)*

Year	Pulses			Foodgrains			Pulses % to Foodgrains		
	A	P	Y	A	P	Y	A	P	Y
1950-51	19.09	8.41	441	97.32	50.82	522	20	17	84
1960-61	23.56	12.70	539	115.58	82.02	710	20	15	76
1970-71	22.54	11.82	524	124.32	108.42	872	18	11	60
1980-81	22.46	10.63	473	126.67	129.59	1023	18	8	46
1990-91	24.66	14.26	578	127.84	176.39	1380	19	8	42
1995-96	22.28	12.31	552	121.01	180.42	1491	18	7	37
2000-01	20.35	11.08	544	121.05	196.81	1626	17	6	33
2001-02	22.01	13.37	607	122.78	212.85	1734	18	6	35
2002-03	20.50	11.13	543	113.86	174.77	1535	18	6	35
2003-04	23.46	14.91	635	123.45	213.19	1727	19	7	37
2004-05	22.76	13.13	577	120.00	198.36	1652	19	7	35
2005-06	23.39	13.39	598	121.60	208.60	1715	18	6	35
2006-07	23.76	14.11	594	124.07	211.78	1707	19	7	35
2007-08	23.63	14.76	625	124.07	230.78	1860	19	6	34
2008-09	22.09	14.57	660	122.83	234.47	1909	18	6	35
2009-10	23.28	14.66	630	121.33	218.11	1798	19	7	35
2010-11	26.40	18.24	691	126.67	244.49	1930	21	7	36
2011-12	24.46	17.09	699	124.76	259.32	2079	20	7	34
2012-13	23.25	18.34	789	120.77	257.12	2129	19	7	37
2013-14	25.21	19.25	764	125.04	265.04	2120	20	7	36
2014-15	23.10	17.16	743	122.07	252.67	2069	19	7	36
2015-16	24.91	16.35	656	123.22	251.57	2042	20	7	32
2016-17*	29.28	22.40	765	127.60	273.38	2142	23	8	36

Source: DES, 2016-17- IIIrd Advance Estimate*

Table: 1.0 SEASON-WISE PULSE CONTRIBUTION TO TOTAL PULSES*(Area- lakh ha, Production-Lakh Tones, Yield-kg/ha)*

Year	Kharif Pulses			% Cont. to Total Pulses			Rabi Pulses			% Cont. to Total Pulses			Total Pulses		
	A	P	Y	A	P	YI	A	P	Y	A	P	YI	A	P	Y
2000-01	106.58	44.48	417	52.4	40.2	77	96.90	66.27	684	47.6	59.8	126	203.48	110.75	544
2001-02	107.22	48.38	451	48.7	36.2	74	112.86	85.30	756	51.3	63.8	124	220.08	133.68	607
2002-03	99.50	41.51	417	48.5	37.3	77	105.46	69.74	661	51.5	62.7	122	204.96	111.25	543
2003-04	116.83	61.65	528	49.8	41.4	83	117.75	87.41	742	50.2	58.6	117	234.58	149.05	635
2004-05	113.17	47.17	417	49.7	35.9	72	114.46	84.12	735	50.3	64.1	127	227.63	131.30	577
2005-06	106.80	48.65	456	47.7	36.3	76	117.12	85.20	727	52.3	63.7	122	223.91	133.84	598
2006-07	106.76	47.95	449	46.0	33.8	73	125.16	94.02	751	54.0	66.2	123	231.92	141.98	612
2007-08	114.90	64.03	557	48.6	43.4	89	121.44	83.58	688	51.4	56.6	110	236.33	147.62	625
2008-09	98.09	46.86	478	44.4	32.2	72	122.85	98.80	804	55.6	67.8	122	220.94	145.66	659
2009-10	105.82	42.04	397	45.5	28.7	63	127.00	104.58	823	54.5	71.3	131	232.82	146.62	630
2010-11	123.20	71.20	578	46.7	39.0	84	140.82	111.21	790	53.3	61.0	114	264.02	182.41	691
2011-12	111.90	60.58	541	45.7	35.4	77	132.72	110.31	831	54.3	64.6	119	244.62	170.89	699
2012-13	99.54	59.16	594	42.8	32.3	75	133.03	124.27	934	57.2	67.7	118	232.57	183.42	789
2013-14	103.33	59.95	580	41.0	31.1	76	148.85	132.60	891	59.0	68.9	117	252.18	192.55	764
2014-15	99.98	57.31	573	42.4	33.4	79	135.55	114.22	843	57.6	66.6	116	235.53	171.52	728
2015-16	113.14	55.30	489	45.4	33.8	74	135.98	108.18	796	54.6	66.2	121	249.11	163.48	656
2016-17	143.41	91.16	636	49.0	40.7	83	149.36	132.86	889	51.0	59.3	116	292.77	224.01	765

Source: DES, 2016-17- IIIrd Advance Estimate*

TABLE -1.1: AREA, PRODUCTION AND PRODUCTIVITY OF PULSES

(Area- lakh ha, Production-Lakh Tones, Yield-kg/ha)

Year	Tur			Gram			Mung			Urd			Peas			Lentil			Total Pulses		
	A	P	Y	A	P	Y	A	P	Y	A	P	Y	A	P	Y	A	P	Y	A	P	Y
1980-81	28.42	19.57	689	43.28	65.85	1522	28.44	9.80	344	28.30	9.59	339	4.23	2.91	688	9.35	4.65	498	224.45	106.24	473
1990-91	35.93	24.17	673	53.56	75.21	1404	33.55	13.84	413	34.83	16.46	473	5.54	6.05	1092	11.88	8.51	717	372.55	203.68	547
1995-96	34.47	23.09	670	49.79	71.16	1429	27.15	10.09	372	28.00	13.22	472	7.70	6.43	835	12.55	7.14	569	331.77	170.10	513
2000-01	36.32	22.46	618	51.85	38.55	744	30.08	10.23	340	30.11	12.96	431	6.60	5.42	821	14.78	9.15	619	203.48	110.75	544
2001-02	33.28	22.60	679	64.16	54.73	853	30.87	11.11	360	33.03	14.99	454	6.73	6.07	903	14.66	9.74	664	220.08	133.68	607
2002-03	33.59	21.86	651	59.06	42.37	717	30.15	8.67	288	35.50	14.74	415	6.72	6.01	895	13.77	8.73	634	204.96	111.25	543
2003-04	35.16	23.56	670	70.48	57.18	811	35.48	17.02	480	34.24	14.71	430	7.13	7.27	1019	13.96	10.38	743	234.58	149.05	635
2004-05	35.19	23.47	667	67.15	54.69	815	33.41	10.58	317	31.69	13.27	419	7.99	7.92	992	14.73	9.94	675	227.63	131.30	577
2005-06	35.81	27.38	765	69.26	56.00	808	31.09	9.46	304	29.69	12.45	419	7.83	7.20	920	15.06	9.46	628	223.91	133.84	598
2006-07	35.62	23.14	650	74.94	63.34	845	31.94	11.15	349	30.67	14.43	470	7.60	6.18	813	14.70	9.13	621	231.92	141.98	612
2007-08	37.26	30.76	826	75.44	57.49	762	37.27	15.23	409	31.88	14.57	457	6.30	4.84	768	13.06	8.12	622	236.33	147.62	625
2008-09	33.78	22.66	671	78.93	70.6	895	28.43	10.35	364	26.70	11.75	440	7.19	6.59	916	13.76	9.53	693	220.94	145.66	659
2009-10	34.66	24.65	711	81.69	74.76	915	30.70	6.92	226	29.58	12.36	418	7.61	6.75	888	14.80	10.32	697	232.82	146.62	630
2010-11	43.67	28.61	655	91.86	82.21	895	35.08	18.00	513	32.48	17.60	542	7.27	5.93	816	15.97	9.44	591	264.02	182.41	691
2011-12	40.07	26.54	662	82.99	77.02	928	33.87	16.34	483	32.16	17.66	549	7.56	7.06	933	15.62	10.59	678	244.62	170.89	699
2012-13	38.93	30.23	776	85.22	88.32	1036	27.19	11.86	436	31.53	19.71	625	7.67	8.43	1099	14.23	11.34	797	232.57	183.42	789
2013-14	39.04	31.74	813	99.27	95.26	960	33.83	16.05	475	30.62	16.99	555	9.63	9.25	960	13.41	10.17	759	252.18	192.55	764
2014-15	38.54	28.07	729	82.51	73.32	889	30.19	15.03	498	32.46	19.59	604	9.75	8.89	912	14.69	10.35	705	235.53	171.52	728
2015-16	39.63	25.61	646	83.99	70.58	840	38.28	15.93	416	36.24	19.45	537	9.03	7.42	821	12.76	9.76	765	249.11	163.48	656
2016-17	53.87	45.99	854	95.39	90.75	951	43.05	20.70	481	44.93	29.26	651							292.77	224.01	765

Source: DES, 2016-17- IIIrd Advance Estimate*

TABLE 1.2: PERCENTAGE SHARE TO TOTAL PULSES

(Area- lakh ha, Production-Lakh Tones, Yield-kg/ha)

Year	Tur			Gram			Mung			Urd			Peas			Lentil		
	A	P	YI	A	P	YI	A	P	YI	A	P	YI	A	P	YI	A	P	YI
1980-81	12.7	18.4	145	19.3	62.0	321	12.7	9.2	73	12.6	9.0	72	0.04	3	145	4.2	4.4	105
1990-91	9.6	11.9	123	14.4	36.9	257	9.0	6.8	75	9.3	8.1	86	0.06	3	200	3.2	4.2	131
1995-96	10.4	13.6	131	15.0	41.8	279	8.2	5.9	72	8.4	7.8	92	0.08	4	163	3.8	4.2	111
2000-01	17.8	20.3	114	25.5	34.8	137	14.8	9.2	62	14.8	11.7	79	0.07	5	151	7.3	8.3	114
2001-02	15.1	16.9	112	29.2	40.9	140	14.0	8.3	59	15.0	11.2	75	0.07	5	149	6.7	7.3	109
2002-03	16.4	19.6	120	28.8	38.1	132	14.7	7.8	53	17.3	13.2	76	0.07	5	165	6.7	7.8	117
2003-04	15.0	15.8	105	30.0	38.4	128	15.1	11.4	76	14.6	9.9	68	0.07	5	160	6.0	7.0	117
2004-05	15.5	17.9	116	29.5	41.7	141	14.7	8.1	55	13.9	10.1	73	0.08	6	172	6.5	7.6	117
2005-06	16.0	20.5	128	30.9	41.8	135	13.9	7.1	51	13.3	9.3	70	0.08	5	154	6.7	7.1	105
2006-07	15.4	16.3	106	32.3	44.6	138	13.8	7.9	57	13.2	10.2	77	0.08	4	133	6.3	6.4	101
2007-08	15.8	20.8	132	31.9	38.9	122	15.8	10.3	65	13.5	9.9	73	0.06	3	123	5.5	5.5	100
2008-09	15.3	15.6	102	35.7	48.5	136	12.9	7.1	55	12.1	8.1	67	0.07	5	139	6.2	6.5	105
2009-10	14.9	16.8	113	35.1	51.0	145	13.2	4.7	36	12.7	8.4	66	0.08	5	141	6.4	7.0	111
2010-11	16.5	15.7	95	34.8	45.1	130	13.3	9.9	74	12.3	9.6	78	0.07	3	118	6.1	5.2	86
2011-12	16.4	15.5	95	33.9	45.1	133	13.8	9.6	69	13.1	10.3	79	0.08	4	134	6.4	6.2	97
2012-13	16.7	16.5	98	36.6	48.2	131	11.7	6.5	55	13.6	10.7	79	0.08	5	139	6.1	6.2	101
2013-14	15.5	16.5	106	39.4	49.5	126	13.4	8.3	62	12.1	8.8	73	0.10	5	126	5.3	5.3	99
2014-15	16.4	16.4	100	35.0	42.7	122	12.8	8.8	68	13.8	11.4	83	0.10	5	125	6.2	6.0	97
2015-16	15.9	15.7	98	33.7	43.2	128	15.4	9.7	63	14.5	11.9	82	0.09	5	125	5.1	6.0	117
2016-17*	18.4	20.5	112	32.6	40.5	124	14.7	9.2	63	15.3	13.1	85						

Source: DES, 2016-17- IIIrd Advance Estimate*

4.3 GROWTH RATE OF TOTAL PULSES

From 1950-51 to 2006-07, the total acreage under pulses has almost been stagnated but for 1990-91 (24.66 million ha), however, the maximum growth rate in area was recorded between the period from 2002-03 to 2003-04 at 14.4%. Maximum production growth rate of 34.0% and maximum yield growth rate of 16.9% were also observed during the same period. The highest production (15 million tonnes) & yield (635 kg/ha) was recorded during 1998-99. The ever highest production was recorded during 2016-17 (23 million tones) (**Table 2**).

TABLE 2: GROWTH RATE OF TOTAL PULSES

(A- Million ha, P- Million tones, Y-kg/ha, Growth Rate (GR)- %)

Year	Area	GR	Prod.	GR	Yield	GR	% coverage under irrigation
1950-51	19.09		8.41		441		9.4
1955-56	23.22	4.3	11.04	6.3	476	1.6	8.4
1960-61	23.56	0.3	12.7	3.0	539	2.6	8.0
1965-66	22.72	-0.7	9.94	-4.3	438	-3.7	9.4
1967-68*	22.65	-0.1	12.1	4.3	534	4.4	8.7
1970-71	22.54	-0.1	11.82	-0.5	524	-0.4	8.8
1975-76	24.45	1.7	13.04	2.1	533	0.3	7.9
1980-81	22.46	-1.6	10.63	-3.7	473	-2.3	9.0
1985-86	24.42	1.7	13.36	5.1	547	3.1	8.5
1990-91	24.66	0.2	14.26	1.3	578	1.1	10.5
1995-96	22.28	-1.9	12.31	-2.7	552	-0.9	12.9
1996-97	22.45	0.2	14.24	3.1	635	3.0	12.7
1997-98	22.87	0.4	12.98	-1.8	567	-2.1	11.3
1998-99	23.5	0.6	14.91	3.0	634	2.4	12.1
1999-00	21.12	-2.0	13.42	-2.0	635	0.0	16.1
2000-01	20.35	-0.7	11.08	-3.5	544	-2.9	12.5
2001-02	22.01	1.6	13.37	4.1	607	2.3	13.3
2002-03	20.50	-1.4	11.13	-3.4	543	-2.1	14.4
2003-04	23.46	2.9	14.91	6.8	635	3.4	13.6
2004-05	22.76	-0.6	13.13	-2.4	577	-1.8	13.9
2005-06	22.39	-0.3	13.39	0.4	598	0.7	15.0
2006-07**	23.76	1.2	14.11	1.1	594	-0.1	15.4
2007-08	23.63	-0.1	14.76	0.9	625	1.0	16.2
2008-09	22.09	-1.3	14.57	-0.3	660	1.1	16.0
2009-10	23.28	1.1	14.66	0.1	630	-0.9	16.2
2010-11	26.4	2.7	18.24	4.9	691	1.9	14.8
2011-12	24.46	-1.5	17.09	-1.3	699	0.2	16.1
2012-13	23.26	-1	18.34	1.5	788	2.5	18.6
2013-14	25.23	8.5	19.27	5.1	764	-3.1	19.70
2014-15	23.55	-6.7	17.15	-11.0	728	-4.7	NA
2015-16	24.91	5.8	16.35	-4.7	656	-9.9	NA
2016-17	29.28	17.5	22.95	40.36	767	16.92	NA

Note: The yield rates given above have been worked out on the basis of production & area figure taken in '000 units. ** Green Revolution period, N.A. Not available.

Source: *Agricultural Statistics at a Glance, 2016*. Directorate of Economics and Statistics, Ministry of Agriculture, Govt. of India (Website <http://www.dacnet.nic.in/ean>).

TABLE 2.1 -GROWTH RATE OF PIGEONPEA & CHICKPEA*(A- Million ha, P- Million tones, Y-kg/ha, Growth Rate (GR)- %)*

Year	Pigeonpea						Chickpea					
	Area	GR	Prod.	GR	Yield	GR	Area	GR	Prod.	GR	Yield	GR
1980-81	2.84		1.96		689		4.33		6.58		1522	
1985-86	3.18	2.4	2.44	4.9	767	2.3	5.79	6.7	7.80	3.7	1348	-2.3
1990-91	3.59	2.6	2.42	-0.2	673	-2.5	5.36	-1.5	7.52	-0.7	1404	0.8
1995-96	3.45	-0.8	2.31	-0.9	670	-0.1	4.98	-1.4	7.12	-1.1	1429	0.4
1996-97	3.51	1.7	2.66	15.2	757	13.0	6.85	37.5	5.57	-21.7	814	-43.1
1997-98	3.36	-4.4	1.85	-30.5	551	-27.3	7.56	10.5	6.13	10.1	811	-0.3
1998-99	3.44	2.4	2.71	46.4	787	43.0	8.47	12.0	6.80	10.9	803	-1.0
1999-00	3.43	-0.4	2.69	-0.5	786	-0.2	6.15	-27.4	5.12	-24.7	833	3.7
2000-01	3.63	6.0	2.25	-16.6	618	-21.3	5.19	-15.6	3.86	-24.7	744	-10.7
2001-02	3.33	-8.4	2.26	0.6	679	9.8	6.42	23.7	5.47	42.0	853	14.7
2002-03	3.36	0.9	2.19	-3.3	651	-4.2	5.91	-7.9	4.24	-22.6	717	-15.9
2003-04	3.52	4.7	2.36	7.8	670	3.0	7.05	19.3	5.72	34.9	811	13.1
2004-05	3.52	0.1	2.35	-0.4	667	-0.5	6.71	-4.7	5.47	-4.3	815	0.4
2005-06	3.58	1.8	2.74	16.7	765	14.6	6.93	3.2	5.60	2.4	808	-0.7
2006-07*	3.56	-0.5	2.31	-15.5	650	-15.0	7.49	8.2	6.33	13.1	845	4.5
2007-08	3.73	4.6	3.08	32.9	826	27.1	7.54	0.7	5.75	-9.2	762	-9.8
2008-09	3.38	-9.3	2.27	-26.3	671	-18.8	7.89	4.6	7.06	22.8	895	17.4
2009-10	3.47	2.6	2.46	8.8	711	6.0	8.17	3.5	7.48	5.9	915	2.3
2010-11	4.37	26.0	2.86	16.1	655	-7.9	9.19	12.4	8.22	10.0	895	-2.2
2011-12	4.01	-8.2	2.65	-7.2	662	1.1	8.30	-9.7	7.70	-6.3	928	3.7
2012-13	3.89	-2.9	3.02	13.9	776	17.2	8.52	2.7	8.83	14.7	1036	11.7
2013-14	3.90	0.3	3.17	5.0	813	4.7	9.93	16.5	9.53	7.9	960	-7.4
2014-15	3.85	-1.3	2.81	-11.6	729	-10.4	8.25	-16.9	7.33	-23.0	889	-7.4
2015-16	3.96	2.8	2.56	-8.8	646	-11.3	8.40	1.8	7.06	-3.7	840	-5.4
2016-17	5.39	35.9	4.60	79.6	854	32.1	9.54	13.6	9.08	28.6	951	13.2

Source: *Agricultural Statistics at a Glance, 2016*. Directorate of Economics and Statistics, Ministry of Agri., Govt. of India (Website <http://www.dacnet.nic.in/ean>).

TABLE 2.2-GROWTH RATE OF MUNGBEAN & URDBEAN*(A- Million ha, P- Million tones, Y-kg/ha, Growth Rate (GR)- %)*

Year	Mungbean						Urdbean					
	Area	GR	Prod.	GR	Yield	GR	Area	GR	Prod.	GR	Yield	GR
1980-81	2.84		0.98		344		2.83		0.96		339	
1985-86	3.00	1.1	1.18	4.0	392	2.7	3.19	2.5	1.24	5.8	389	2.9
1990-91	3.36	2.3	1.38	3.5	413	1.1	3.48	1.9	1.65	6.6	473	4.3
1995-96	2.72	-3.8	1.01	-5.4	372	-2.0	2.80	-3.9	1.32	-3.9	472	0.0
1996-97	3.06	12.8	1.32	30.7	431	15.9	3.01	7.4	1.35	2.0	448	-5.1
1997-98	3.02	-1.5	0.95	-28.0	315	-26.9	3.06	1.9	1.38	2.2	450	0.3
1998-99	3.05	1.2	1.16	22.3	380	20.8	2.92	-4.8	1.35	-2.0	463	3.0
1999-00	2.91	-4.9	1.08	-7.2	371	-2.5	2.94	0.8	1.33	-1.4	453	-2.2
2000-01	3.01	3.5	1.02	-5.0	340	-8.3	3.01	2.4	1.30	-2.6	431	-4.9
2001-02	3.09	2.6	1.11	8.5	360	5.8	3.30	9.7	1.50	15.6	454	5.4
2002-03	3.01	-2.3	0.87	-21.9	288	-20.0	3.55	7.5	1.47	-1.7	415	-8.5
2003-04	3.55	17.7	1.70	96.2	480	66.7	3.42	-3.5	1.47	-0.2	430	3.5
2004-05	3.34	-5.8	1.06	-37.9	317	-34.0	3.17	-7.4	1.33	-9.8	419	-2.6
2005-06	3.11	-7.0	0.95	-10.5	304	-3.9	2.97	-6.3	1.25	-6.2	419	0.2
2006-07	3.19	2.8	1.12	17.9	349	14.7	3.07	3.3	1.44	15.9	470	12.2
2007-08	3.73	16.7	1.52	36.5	409	17.0	3.19	4.0	1.46	1.0	457	-2.9
2008-09	2.84	-23.7	1.03	-32.1	364	-10.9	2.67	-16.3	1.17	-19.4	440	-3.7
2009-10	3.07	8.0	0.69	-33.1	226	-38.0	2.96	10.8	1.24	5.2	418	-5.1
2010-11	3.51	14.3	1.80	160.0	513	127.6	3.25	9.8	1.76	42.4	542	29.7
2011-12	3.39	-3.5	1.63	-9.2	483	-6.0	3.22	-1.0	1.77	0.4	549	1.4
2012-13	2.72	-19.7	1.19	-27.4	436	-9.6	3.15	-2.0	1.97	11.6	625	13.8
2013-14	3.38	24.4	1.61	35.3	475	8.8	3.06	-2.9	1.70	-13.8	555	-11.3
2014-15	3.02	-10.7	1.50	-6.4	498	4.9	3.25	6.0	1.96	15.3	604	8.8
2015-16	3.83	26.8	1.59	6.0	416	-16.4	3.62	11.6	1.95	-0.7	537	-11.1
2016-17	4.30	12.5	2.07	29.9	481	15.5	4.49	24.0	2.93	50.4	651	21.3

Source: *Agricultural Statistics at a Glance, 2016*. Directorate of Economics and Statistics, Ministry of Agri., Govt. of India (Website <http://www.dacnet.nic.in/ean>).

TABLE 2.3-GROWTH RATE OF LENTIL & FIELDPEA

(A- Million ha, P- Million tones, Y-kg/ha, Growth Rate (GR)- %)

Year	Lentil						Fieldpea					
	Area	GR	Prod.	GR	Yield	GR	Area	GR	Prod.	GR	Yield	GR
1980-81	0.93		0.47		498		0.42		0.29		688	
1985-86	1.09	3.3	0.66	8.5	607	4.4	0.50	3.7	0.43	9.5	855	4.9
1990-91	1.19	1.8	0.85	5.7	717	3.6	0.55	2.1	0.60	8.2	1092	5.5
1995-96	1.26	1.1	0.71	-3.2	569	-4.1	0.76	7.6	0.64	1.1	836	-4.7
1996-97	1.37	9.1	0.96	34.8	702	23.6	0.74	-3.8	0.72	13.0	982	17.5
1997-98	1.29	-5.8	0.80	-16.4	623	-11.3	0.75	1.4	0.61	-15.6	818	-16.8
1998-99	1.39	7.7	0.94	16.7	675	8.3	0.84	12.4	0.71	15.8	842	3.0
1999-00	1.46	5.3	1.08	15.0	738	9.3	0.80	-5.0	0.82	15.6	1025	21.8
2000-01	1.48	1.1	0.92	-15.2	619	-16.1	0.66	-17.2	0.54	-33.7	821	-19.9
2001-02	1.47	-0.8	0.97	6.5	664	7.3	0.68	2.3	0.61	12.5	903	9.9
2002-03	1.38	-6.1	0.87	-10.4	634	-4.6	0.67	-0.5	0.60	-1.3	896	-0.8
2003-04	1.40	1.4	1.04	18.9	743	17.2	0.71	6.2	0.73	20.9	1019	13.8
2004-05	1.47	5.5	0.99	-4.2	675	-9.2	0.80	11.7	0.79	8.9	993	-2.6
2005-06	1.51	2.2	0.95	-4.8	628	-6.9	0.78	-1.8	0.72	-9.0	920	-7.3
2006-07*	1.47	-2.4	0.91	-3.5	621	-1.1	0.76	-3.0	0.62	-14.3	814	-11.6
2007-08	1.31	-11.2	0.81	-11.1	622	0.1	0.63	-16.9	0.48	-21.6	768	-5.6
2008-09	1.38	5.4	0.95	17.5	693	11.5	0.72	13.9	0.66	35.9	916	19.3
2009-10	1.48	7.5	1.03	8.2	697	0.6	0.76	6.4	0.67	2.5	883	-3.7
2010-11	1.60	7.9	0.94	-8.5	591	-15.2	0.73	-4.9	0.59	-12.1	816	-7.6
2011-12	1.56	-2.2	1.06	12.2	678	14.7	0.76	4.3	0.71	19.5	935	14.6
2012-13	1.42	-8.9	1.13	7.1	797	17.6	0.77	0.8	0.84	18.6	1099	17.6
2013-14	1.34	-5.8	1.02	-10.3	759	-4.8	0.96	25.9	0.92	10.0	960	-12.6
2014-15	1.47	9.5	1.04	1.7	705	-7.1	0.98	1.5	0.89	-3.6	912	-5.0
2015-16	1.28	-13.1	0.98	-5.7	765	8.5	0.90	-7.6	0.74	-16.8	821	-10.0

Source: *Agricultural Statistics at a Glance, 2016*. Directorate of Economics and Statistics, Ministry of Agri., Govt. of India (Website <http://www.dacnet.nic.in/ean>).

4.4 PER CAPITA AVAILABILITY OF PULSES IN INDIA

As a result of stagnant pulse production and continuous increase in population, the per capita availability of pulses has decreased considerably. The *per capita* per day availability of pulses in 1951 was 60 g that dwindled down to a provisional level of 47.2 g in the year 2014. The *per capita* per year availability shows the same decreasing trend from 22.1 kg in 1951 to 17.2 kg in 2014. However the increase trend shows during 2017 (P) both in per capita per day (52.9 g) and per capita per year (19.3 kg) respectively. This amply proves that increase in population growth affects the pulses availability on *per capita* basis (**Table 3**).

TABLE- 3: PER CAPITA AVAILABILITY OF PULSES IN INDIA

Year	Pulses Availability	
	(g per capita per day)	(kg per capita per year)
1951	60.7	22.1
1961	69.0	25.2
1971	51.2	18.7
1981	37.5	13.7
1991	41.6	15.2
1992	34.3	12.5
1993	36.2	13.2
1994	37.2	13.6
1995	37.8	13.8
1996	32.7	12.0
1997	37.1	13.5
1998	32.8	12.0
1999	36.5	13.3
2000	31.8	11.6
2001	30.0	10.9
2002	35.4	12.9
2003	29.1	10.6
2004	35.8	13.1
2005	31.5	11.5
2006	32.5	11.8
2007	35.5	12.9
2008	41.8	15.3
2009	37.0	13.5
2010	35.4	12.9
2011	43.0	15.7
2012	41.6	15.2
2013	43.3	15.8
2014	46.4	16.9
2015	43.8	16.0
2016	43.0	15.7
2017 (P)	52.9	19.3

P - Provisional figures is based on 2nd Advance Estimates of production for 2016-17, Net Import for Jan 2017 and stock position as on 01.02.2017. Source: Agricultural statistics at a glance-2014.

4.5 DEMAND AND SUPPLY STATUS – PRODUCTION AND IMPORT/EXPORT

The domestic production of pulses and imports/exports during few years is given in the table below (Table 4).

TABLE 4: AVAILABILITY STATUS OF PULSES PRODUCTION, IMPORT AND EXPORT

Year	Production (lakh tonnes)	Import (lakh tonnes)	Export (lakh tonnes)	Total availability (lakh tonnes)
1992-93	128.15	3.83	0.34	131.64
1993-94	133.05	6.28	0.44	138.89
1994-95	140.04	5.54	0.51	145.07
1995-96	123.10	4.91	0.61	127.40
1996-97	142.44	6.54	0.55	148.43
1997-98	129.79	10.08	1.68	138.19
1998-99	148.10	5.63	1.04	152.69
1999-2000	135.50	2.50	1.94	136.06
2000-01	110.80	3.50	2.44	111.86
2001-02	133.70	22.18	1.61	154.27
2002-03	111.30	19.92	1.48	129.74
2003-04	149.10	17.23	1.54	164.79
2004-05	131.30	13.39	2.71	141.98
2005-06	133.90	16.96	4.47	146.39
2006-07	142.30	22.56	2.47	162.40
2006-07	141.98	22.71	2.51	167.19
2007-08	147.62	28.35	1.64	177.61
2008-09	145.66	24.74	1.36	171.77
2009-10	146.62	35.10	1.00	182.71
2010-11	182.41	26.99	2.08	211.48
2011-12	170.89	33.65	1.74	206.28
2012-13	183.43	38.39	2.02	223.84
2013-14	192.53	30.49	3.43	219.60
2014-15	171.52	45.85	2.22	215.20
2015-16	163.48	57.98	2.56	218.90
2016-17	224.01	66.09	1.37	288.70

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

Chickpea's contributes the single largest share in India's export basket of pulses registering 85.64% and 84.87% share in the total pulses export during 2014-15 and 2015-16 respectively.

4.6 PULSE IMPORTING AND EXPORTING COUNTRIES OF MAJOR PULSES FOR 2016-17

TABLE 5: TOP 5 EXPORTING & IMPORTING COUNTRIES 2016-17

Pulses	Top 5 Export Destinations	Top 5 Import Sources
Peas (Pisum Sativum)	Shri Lanka DSR (96.3%), Myanmar (1.6%), Bhutan (1.4%), Nepal (0.5%), U Arab EMTS (0.09%).	Canada (54.5%), Russia (10.3%), Luthuania (9.0%), France (6.8%), USA (6.4%)
Chickpeas (Garbanzos)	Pakistan (21.6%), U Arab EMTS (10.6%), Algeria (11.6%), Saudi Arab (9.5%), Sri Lanka (7.3%)	Australia (85.1%), Russia (4.7%), Tanzania (3.8%), USA (1.4%), Canada (0.91%),
Moong/Urad	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 A RP (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%)

Note: Figures in parenthesis indicates percentage share of global import/export.

TABLE 5.1: TOP EXPORTING COUNTRIES OF PIGEONPEA & CHICKPEA

(Quantity-Thousand Tones)

S.No.	Pigeonpea			Chickpea		
	Country	Aveg.*	% Share	Country	Aveg.*	% Share
1	U S A	0.90	25.50	Pakistan IR	63.45	31.00
2	U K	0.62	17.54	Algeria	32.91	16.08
3	U Arab EMTS	0.50	14.17	Turkey	24.70	12.07
4	Canada	0.41	11.64	Sri Lanka DSR	14.77	7.21
5	Singapore	0.21	5.98	U Arab EMTS	11.26	5.50
6	Mozambique	0.16	4.60	Saudi Arab	9.00	4.40
7	Thailand	0.16	4.58	Spain	5.40	2.64
8	Brunei	0.11	3.20	Tunisia	5.31	2.59
9	Malaysia	0.09	2.67	Egypt ARP	4.48	2.19
10	Saudi Arab	0.07	1.86	Libya	3.94	1.92
11	Australia	0.06	1.76	Iraq	3.43	1.67
12	Angola	0.04	1.26	Kuwait	2.99	1.46
13	Sri Lanka DSR	0.04	1.16	Malaysia	2.17	1.06
14	Kuwait	0.03	0.75	Jordan	1.99	0.97
15	Tanzania Rep	0.02	0.57	France	1.88	0.92
16	Korea RP	0.02	0.43	Iran	1.79	0.88
17	New Zealand	0.01	0.33	Vietnam Soc. Rep	1.75	0.85
18	Qatar	0.01	0.31	U S A	1.59	0.78
19	Congo D Rep	0.01	0.25	U K	1.11	0.54
20	Others	0.05	1.42	Others	10.78	5.27
	Total	3.53		Total	204.70	

Source: Ministry of Commerce and Industry; Aveg.- 2012-13 to 2016-17*

TABLE 5.2: TOP EXPORTING COUNTRIES OF MUNGBEAN, URDBEAN, LENTIL & FIELDPEA

(Quantity-Thousand Tones)

S. No.	Mungbean & Urdbean			Lentil			Fieldpea		
	Country	Aveg.*	% Share	Country	Aveg.*	% Share	Country	Aveg.*	% Share
1	U S A	1.93	39.39	Sri Lanka DSR	1.76	23.50	Sri Lanka DSR	3.13	80.55
2	Sri Lanka DSR	0.69	14.03	Bangladesh PR	0.98	13.08	Myanmar	0.21	5.39
3	U K	0.52	10.59	Myanmar	0.93	12.37	Nepal	0.20	5.21
4	Canada	0.35	7.23	U Arab EMTS	0.62	8.27	Pakistan IR	0.10	2.66
5	Malaysia	0.30	6.03	U S A	0.39	5.20	Ukraine	0.06	1.42
6	U Arab EMTS	0.23	4.74	U K	0.39	5.14	Bangladesh PR	0.05	1.32
7	Singapore	0.20	4.13	Pakistan IR	0.38	5.13	Argentina	0.04	1.13
8	Australia	0.19	3.96	Iraq	0.30	4.04	Bhutan	0.03	0.84
9	Japan	0.09	1.75	Nepal	0.25	3.28	U S A	0.03	0.65
10	New Zealand	0.05	0.96	Singapore	0.21	2.75	Maldives	0.02	0.52
11	Kenya	0.04	0.90	Malaysia	0.20	2.72	Kuwait	0.003	0.07
12	Philippines	0.04	0.78	Australia	0.14	1.86	South Africa	0.002	0.06
13	Unspecified	0.03	0.70	Turkey	0.10	1.34	U Arab EMTS	0.001	0.03
14	Hong Kong	0.03	0.52	Egypt A RP	0.09	1.25	Denmark	0.001	0.03
15	Pakistan IR	0.02	0.49	Kuwait	0.09	1.25	Singapore	0.001	0.02
16	France	0.02	0.43	Bhutan	0.08	1.07	Australia	0.001	0.02
17	Germany	0.02	0.40	Saudi Arab	0.07	0.97	U K	0.001	0.01
18	Myanmar	0.02	0.39	Jordan	0.07	0.97	Cambodia	0.0004	0.01
19	Kuwait	0.02	0.32	Netherland	0.07	0.92	Malaysia	0.0003	0.01
20	Others	0.11	2.21	Others	0.37	4.91	Others	0.001	0.04
	Total	4.90		Total	7.50		Total	3.88	

Source: Ministry of Commerce and Industry; Aveg.*- 2012-13 to 2016-17

TABLE 5.3: TOP IMPORTING COUNTRIES OF PIGEONPEA & CHICKPEA

(Quantity-Thousand Tonnes)

S.No.	Pigeonpea			Chickpea		
	Country	Aveg.*	% Share	Country	Aveg.*	% Share
1	Myanmar	235.51	44.05	Australia	376.61	53.73
2	Tanzania Rep	131.21	24.54	Austria	131.79	18.80
3	Mozambique	94.70	17.71	Russia	76.87	10.97
4	Malawi	38.39	7.18	Sri Lanka DSR	32.49	4.64
5	Sudan	17.00	3.18	Tanzania Rep	18.11	2.58
6	Kenya	11.15	2.09	Thailand	12.63	1.80
7	Uganda	4.38	0.82	Mexico	12.23	1.74
8	Nigeria	1.26	0.23	U S A	6.89	0.98
9	Benin	0.22	0.04	Myanmar	6.31	0.90
10	Afghanistan Tis	0.21	0.04	Ethiopia	5.72	0.82
11	Canada	0.18	0.03	Canada	4.96	0.71
12	Australia	0.12	0.02	Argentina	2.30	0.33
13	Malaysia	0.10	0.02	Mozambique	2.15	0.31
14	Sri Lanka Dsr	0.09	0.02	Sudan	2.14	0.31
15	Ethiopia	0.06	0.01	Uzbekistan	1.95	0.28
16	U Arab Emts	0.03	0.01	El Salvador	1.93	0.27
17	U S A	0.03	0.005	Ukraine	1.91	0.27
	Total	534.62		Total	700.95	

TABLE 5.4: TOP IMPORTING COUNTRIES OF MUNGBEAN, URDBEAN, LENTIL & FIELDPEA
(Quantity-Thousand Tonnes)

S. No.	Mungbean & Urdbean			Lentil			Fieldpea		
	Country	Aveg.*	% Share	Country	Aveg.*	% Share	Country	Aveg.*	% Share
1	Myanmar	469.33	77.05	Canada	675.60	81.97	Canada	1256.96	62.40
2	Australia	31.79	5.22	U S A	82.97	10.07	Russia	219.60	10.90
3	Tanzania Rep	30.81	5.06	Australia	46.26	5.61	U S A	158.37	7.86
4	Kenya	20.67	3.39	Argentina	18.31	2.22	France	95.41	4.74
5	Uzbekistan	14.84	2.44	Myanmar	0.26	0.03	Australia	89.57	4.45
6	Mozambique	9.43	1.55	Nepal	0.23	0.03	Lithuania	75.47	3.75
7	Argentina	6.79	1.11	Turkey	0.16	0.02	Ukraine	73.20	3.63
8	Afghanistan TIS	6.26	1.03	Sri Lanka DSR	0.10	0.01	Estonia	12.51	0.62
9	Indonesia	5.00	0.82	Mozambique	0.08	0.01	Argentina	10.23	0.51
10	Ethiopia	4.50	0.74	Afghanistan TIS	0.07	0.01	Romania	8.86	0.44
11	Madagascar	2.34	0.38	Korea RP	0.06	0.01	Germany	4.61	0.23
12	China P RP	2.10	0.35	Vatican City	0.03	0.003	Bulgaria	3.24	0.16
13	Thailand	1.39	0.23	Uzbekistan	0.03	0.003	Myanmar	1.71	0.08
14	Uganda	0.99	0.16	Kenya	0.03	0.003	Moldova	1.32	0.07
15	Canada	0.64	0.10	Tanzania Rep	0.01	0.002	Turkey	0.80	0.04
16	U S A	0.44	0.07	Ukraine	0.01	0.001	Others	2.37	0.12
17	Iraq	0.34	0.06	Unspecified	0.01	0.001			
18	Brazil	0.23	0.04	Pakistan IR	0.005	0.001			
19	Malaysia	0.17	0.03	Madagascar	0.004	0.001			
	Total	609.09		Total	824.23		Total	2014.26	

Source: Ministry of Commerce and Industry; Avg.*- 2012-13 to 2016-17

4.7 PROJECTED DEMAND & GAP (XIth & XIIth PLAN)

TABLE 6: TENTATIVE DEMAND/PRODUCTION AND PROJECTED TARGET

(Qty: Million Tonnes)

Year	Demand *	Production @	Gap	Target
2007-08	16.77	13.61	-3.16	17.00
2008-09	17.51	13.65	-3.86	18.00
2009-10	18.29	13.68	-4.61	18.50
2010-11	19.08	13.72	-5.36	19.00
2011-12	19.91	13.75	-6.16	20.00
2012-13	19.00	18.34	-0.66	18.24
2013-14	20.00	19.25	-0.75	19.00
2014-15	21.00	17.15	-3.85	19.50
2015-16	21.00	16.35	-4.65	20.05
2016-17		22.95		20.75
2017-18				22.90

Source: Directorate of Economics & Statistics, DAC&FW, ND.

4.8 CROP/SEASON-WISE SHARE

TABLE 7: NORMAL AREA, PRODUCTION AND YIELD (CROP-WISE)

(Area-Lakh ha, Production-Lakh Tones, Yield-kg/ha)

Crop	Season	Area	Production	Productivity
Arhar	Kharif	39.24 (37.17%)	28.44 (26.94%)	725
Urd	Kharif	24.78 (23.48%)	12.87 (12.19%)	519
	Rabi/Summer	7.85 (5.72%)	5.85 (4.26%)	745
	Total	32.64	18.72	574
Moong	Kharif	23.41 (22.17%)	9.70 (9.18%)	414
	Rabi/Summer	9.26 (6.75%)	5.35 (3.90%)	577
	Total	32.67	15.04	460
Horse gram	Kharif	2.40 (2.28%)	1.10 (1.04%)	457
	Rabi/Summer	2.20 (1.60%)	1.12 (0.82%)	509
	Total	4.60	2.22	482
Moth	Kharif	10.43 (9.88%)	3.37 (3.19%)	323
Chickpea	Rabi	86.80 (63.25%)	80.90 (58.96%)	932
Lentil	Rabi	14.14 (10.31%)	10.44 (7.61%)	738
Peas & Beans	Rabi	8.72 (6.36%)	8.20 (5.98%)	940
Lathyrus	Rabi	4.70 (3.43%)	3.65 (2.66%)	776
Other Pulses	Kharif	5.30 (5.02%)	2.98 (2.82%)	562
	Rabi/Summer	3.55 (2.58%)	2.40 (1.75%)	677
	Total	8.84	5.38	608
Total	Kharif	105.57	58.44	554
	Rabi/Summer	137.22	117.91	859
	Total Pulses	242.79	176.36	726

Source: DES, DAC&FW, ND. (Normal- Avg. 2011-12 to 2015-16).

PRODUCTION TRENDS

5.1 GLOBAL SCENARIO: ALL PULSES

The total world acreage under pulses as recorded during 2014 is about 851.91 lakh ha with production at 774.73 lakh tones and productivity 909 kg/ha (**Table 8**).

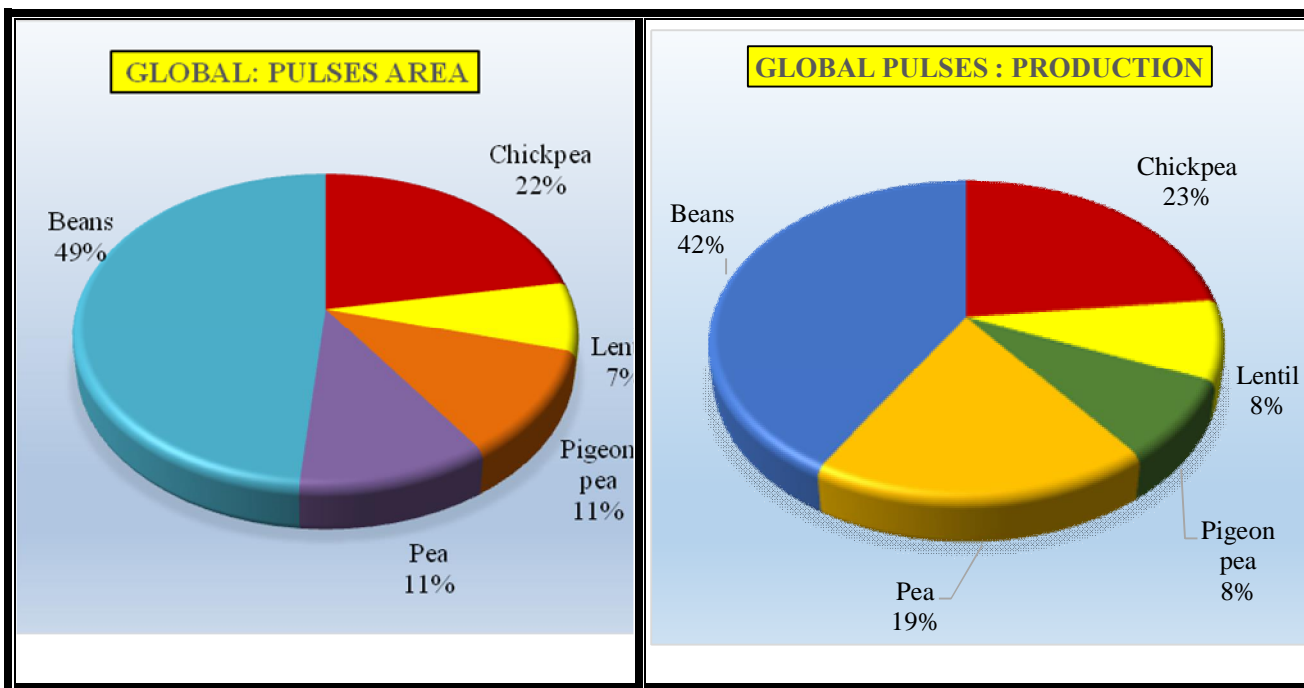
In the world, pulses are grown by 198 countries. Beans dry was cultivated by 152 countries, which contributed about 35.93 % area to total world area, Chickpea by 58 contributed about 16.41%, Peas dry by 98 contributed 8.14%, Pigeon pea by 23 contributed 8.26 %, Lentil by 56 contributed by 5.31% and others 25.95%. The share to World production of Beans dry was 31.64% followed by Chickpea 17.72%, Peas dry 14.44%, Pigeon pea 6.531%, Lentil 6.23 % & others 23.66% .

TABLE 8 : CROP-WISE TOTAL AREA, PRODUCTION AND YIELD : GLOBAL

(A-lakh ha, P-lakh tones, Y-kg/ha)

Crop	Area	% to Total	Production	% to Total	Productivity
Chickpea	139.81	16.41	137.31	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	801
Total Pulses	851.91		774.73		909

Source: FAO Statistics 2014.



5.1.1 GLOBAL SCENARIO: TOTAL PULSES

The total world acreage under pulses as recorded during 2014 is about 851.91 lakh ha with production at 774.73 lakh tones and productivity 909 kg/ha (**Table 8.1**).

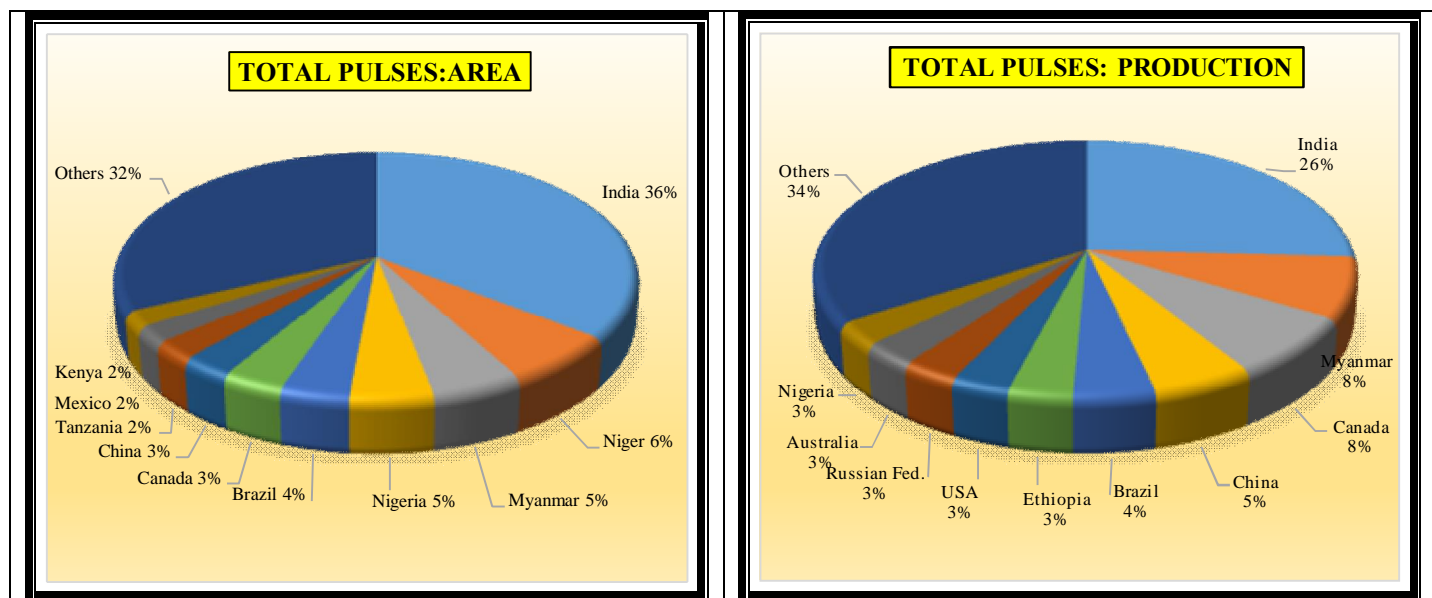
It reveals that the India ranked first in area and production with 35% and 25% respectively of world area and production. However, in case of productively Bahrain stood first with 18485 kg/ha. Thus it is also evident that the country's productivity at 660 kg/ha is far below the world average productivity of 909 kg/ha (**Table 8.1**).

TABLE 8.1 : GLOBAL RANKING IN AREA, PRODUCTION AND YIELD: TOTAL PULSES

(A-lakh ha, P-lakh tones, Y-kg/ha)

Country	Area	% cont.	Country	Prod.	% cont.	Country	Yield
India	303.09	35.58	India	199.8	25.79	Bahrain	18485
Niger	54.7	6.42	Myanmar	59.77	7.72	Ireland	5886
Myanmar	42.03	4.93	Canada	58.28	7.52	Israel	5576
Nigeria	38.49	4.52	China	41.13	5.31	Belgium	4445
Brazil	32.09	3.77	Brazil	33.06	4.27	Tajikistan	3985
Canada	28.7	3.37	Ethiopia	26.13	3.37	Denmark	3952
China	23.85	2.8	USA	23.95	3.09	Trinidad & Tobago	3919
Tanzania	20.68	2.43	Russian Fed.	22.94	2.96	United Kingdom	3755
Mexico	18.35	2.15	Australia	22.47	2.9	Netherlands	3639
Kenya	17.19	2.02	Nigeria	22.05	2.85	Switzerland	3638
Others	272.74	32.02	Others	265.15	34.22	Others	1068
World	851.91		World	774.73	World		909
					India		660

Source: FAO Statistics 2014.



5.1.2 GLOBAL SCENARIO: CHICKPEA

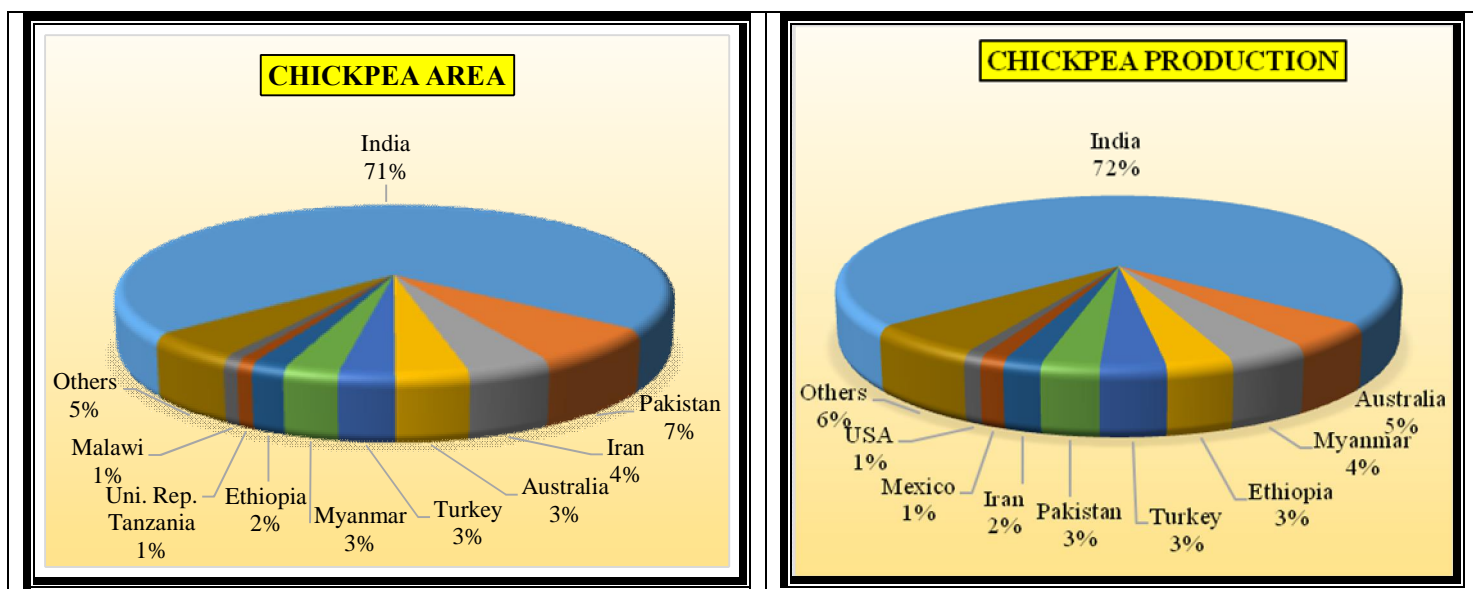
India ranked first in area and production in the world, followed by Pakistan, Iran and Australia. The highest productivity of 3759 kg/ha is observed in China followed by Israel, Repbl of Moldova and Bosnia & Herzegovina. India productivity was 995 kg/ha yields.

TABLE 8.2: GLOBAL RANKING IN AREA, PRODUCTION AND YIELD: CHICKPEA

(A-Lakh ha, P-Lakh tones, Y- kg/ha)

Country	Area	% Cont.	Country	Prod.	% Cont.	Country	Yield
India	99.27	71.00	India	98.80	71.95	China	3759
Pakistan	9.50	6.79	Australia	6.29	4.58	Israel	3559
Iran	5.94	4.25	Myanmar	5.62	4.09	Repbl of Moldova	3556
Australia	5.08	3.63	Ethiopia	4.59	3.34	Bosnia & Herzegovina	3204
Turkey	3.88	2.78	Turkey	4.50	3.28	Yemen	3093
Myanmar	3.84	2.75	Pakistan	3.99	2.91	Jordan	2632
Ethiopia	2.40	1.71	Iran	2.62	1.91	Hungary	2250
Uni. Rep. Tanzania	1.16	0.83	Mexico	1.72	1.25	Uzbekistan	2192
Malawi	1.15	0.82	USA	1.27	0.93	Egypt	2124
World	139.81		World	137.31		World	982
						India	995

Source: FAO 2014



5.1.3 GLOBAL SCENARIO: PIGEONPEA

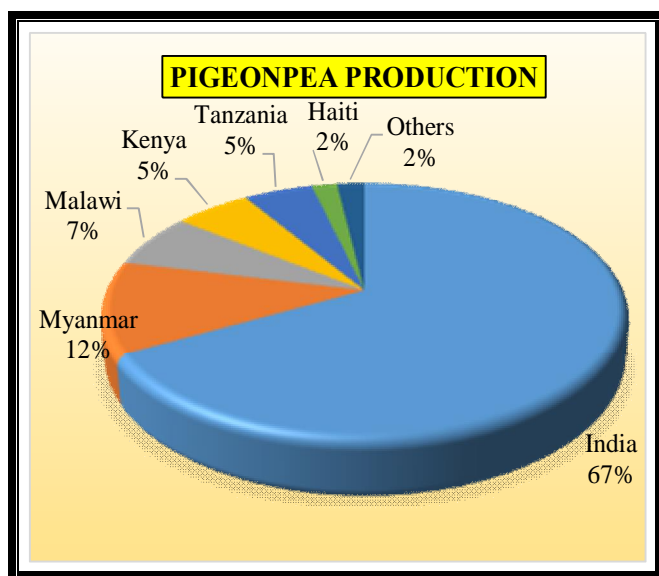
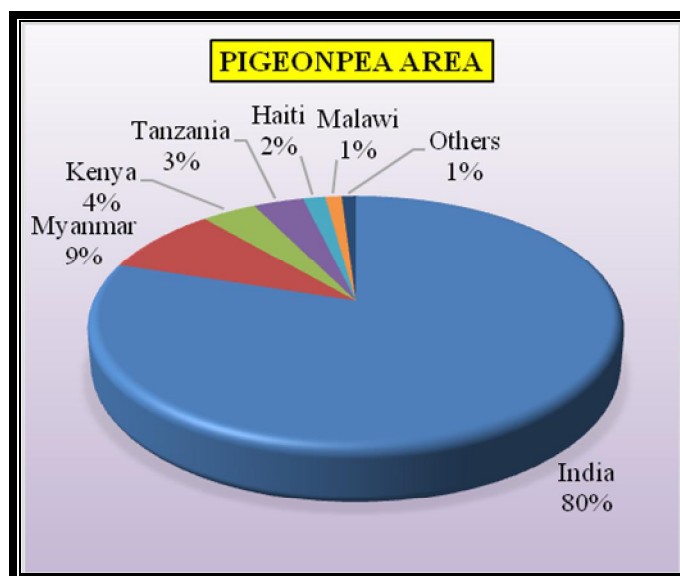
India rank first in area (79 %) and production (67 %) at Global level. Myanmar stands second position in area (8.70 %) followed by Kenya (3.93 %) respectively. Tanzania occupy forth position in area (3.56 %) and 5th position in production (2.48%). In productivity, Saint Vincent & Grenadines ranked first with 7926 kg/ha followed by Trinidad & Tobago(4103 kg/ha) and Malawi (4100 kg/ha). While, India's productivity is only 587 kg/ha.

TABLE 8.3: GLOBAL RANKING IN AREA, PRODUCTION AND YIELD: PIGEONPEA

(A-Lakh ha, P-Lakh tones, Y- kg/ha)

Country	Area	%Cont.	Country	Prod.	%Cont.	Country	Yield
India	56.02	79.65	India	32.90	67.28	Saint Vincent & Grenadines	7926
Myanmar	6.12	8.70	Myanmar	5.75	11.76	Trinidad & Tobago	4103
Kenya	2.76	3.93	Malawi	3.35	6.85	Malawi	4100
Tanzania	2.51	3.56	Kenya	2.75	5.61	Bangladesh	2500
Haiti	1.11	1.57	Tanzania	2.48	5.07	Philippines	1664
Malawi	0.82	1.16	Haiti	0.90	1.84	Grenada	1451
World	70.33		World	48.90		World	695
						India	587

Source: FAO, Stat. 2014



5.1.4 GLOBAL SCENARIO: FIELDPEA

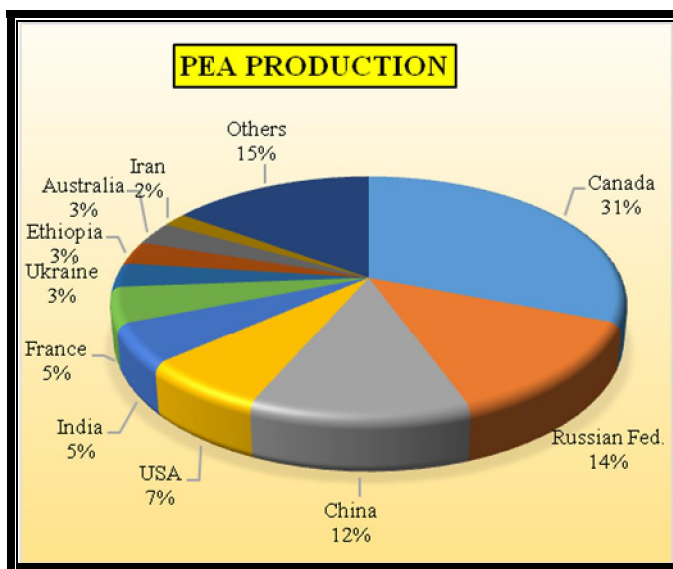
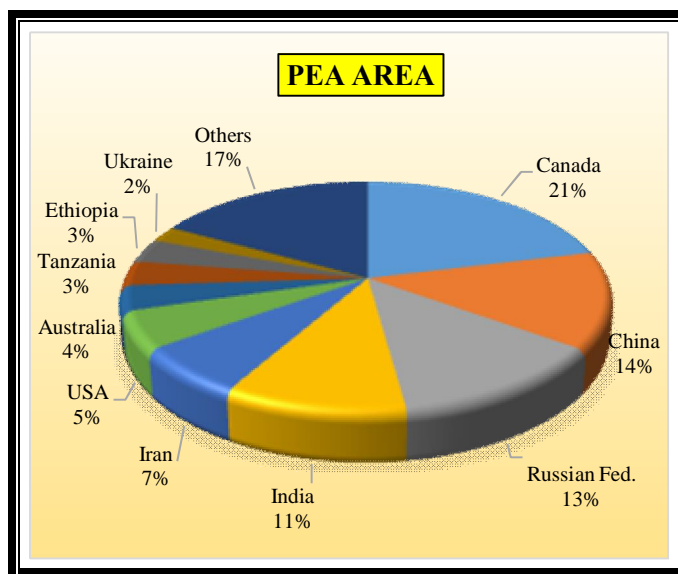
Canada rank first in area (21%) and production (35%) at Global level. China stands second position in area (13.70%) followed by Russian Fed. (12.94 %) respectively. India occupy forth position in area (10.53 %) and 5th position in production (5.36 %). Highest productivity is recorded in Ireland (5000 kg/ha) followed by Netherland (4766 kg/ha), and Denmark (4048 kg/ha). While, India's productivity is only 822 kg/ha.

TABLE 8.4: GLOBAL RANKING IN AREA, PRODUCTION AND YIELD: FIELDPEA

(A-Lakh ha, P-Lakh tonnes, Y- kg/ha)

Country	Area	%Cont.	Country	Prod.	%Cont.	Country	Yield
Canada	14.67	21.16	Canada	34.45	30.80	Ireland	5000
China	9.50	13.70	Russian Fed.	15.03	13.44	Netherlands	4766
Russian Fed.	8.97	12.94	China	13.50	12.07	Denmark	4048
India	7.30	10.53	USA	7.78	6.96	U.Kingdom	4000
Iran	4.75	6.85	India	6.00	5.36	Belgium	3873
USA	3.64	5.25	France	5.39	4.81	Switzerland	3744
Australia	2.45	3.53	Ukraine	3.59	3.21	Germany	3724
Tanzania	2.39	3.45	Ethiopia	3.43	3.06	France	3710
Ethiopia	2.31	3.33	Australia	3.42	3.06	Sweden	3218
Ukraine	1.54	2.21	Iran	2.00	1.79	Armenia	3167
World	69.32		World	111.86		World	1614
						India	822

Source: FAO 2014



5.1.5 GLOBAL SCENARIO : LENTIL

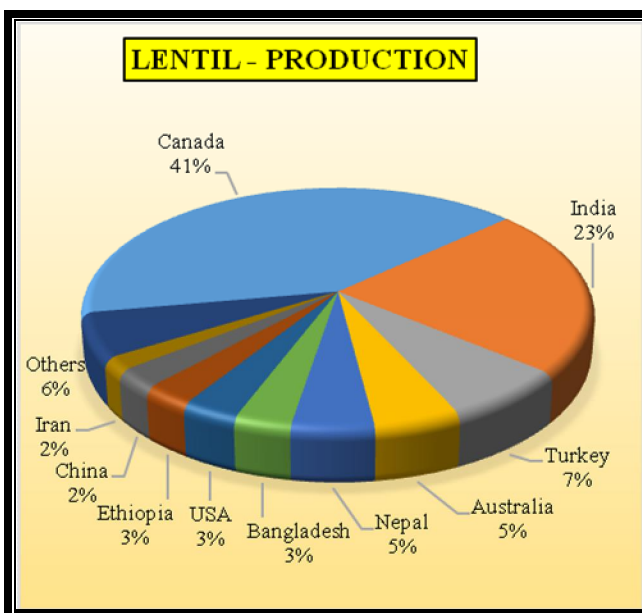
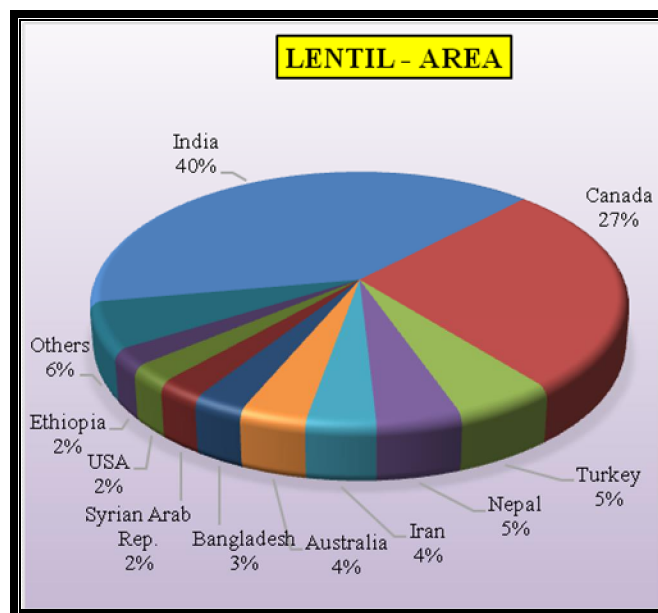
India ranked first in the area (18.00 lakh ha) and second in the production (11.00 lakh tonnes) with 39% and 22% of world area and production respectively. The highest productivity is recorded in Croatia (2862 kg/ha) followed by New Zealand (2469kg/ha). Canada rank first in production (41%) due to very high level of productivity (1633 kg/ha) as compared to India (611 kg/ha).

TABLE 8.5 : GLOBAL RANKING IN AREA, PRODUCTION AND YIELD: LENTIL

(A-Lakh ha, P-Lakh tonnes, Y-kg/ha)

Country	Area	% Cont.	Country	Prod.	% Cont.	Country	Yield
India	18.00	39.79	Canada	19.87	41.16	Croatia	2862
Canada	12.17	26.90	India	11.00	22.79	New Zealand	2469
Turkey	2.43	5.38	Turkey	3.45	7.15	Armenia	2263
Nepal	2.06	4.55	Australia	2.38	4.93	China	2083
Iran	1.68	3.71	Nepal	2.27	4.70	Egypt	2056
Australia	1.62	3.59	Bangladesh	1.57	3.25	Canada	1633
Bangladesh	1.25	2.75	USA	1.56	3.24	Iraq	1566
Syrian Arab Republic	1.11	2.46	Ethiopia	1.37	2.85	USA	1491
USA	1.05	2.32	China	1.25	2.59	Australia	1466
Ethiopia	0.99	2.19	Iran	0.85	1.76	Lebanon	1456
World	45.24		World	48.27		World	1067
						India	611

Source: FAO 2014



5.2 NATIONAL SCENARIO

5.2.1 TOTAL PULSES - PLAN PERIODS

A visit to different plan periods records a slight growth in total production and productivity from Annual plans 1990-92. The pulses development was brought under the Technology Mission (TMO) during 1990. The area remained almost stagnant, stabilized up-till tenth plan. However, the twelfth plan analysis shows that the decreasing per cent change trend under area (-1.47) and production (-0.81) of total pulses over previous plan periods (COPP) is given at **Table-10**.

TABLE-9 PLAN-WISE SCENARIO (APY)-ALL INDIA

(Area-Mha, Production-MTonnes, Yield-kg/ha)

Plan	Area	%COPP	Prod.	% COPP	Productivity	%COPP
First Plan (1951-56)	21.09		10.04		476	
Second Plan (1956-61)	23.71	12.42	11.75	17.03	496	4.10
Third Plan (1961-66)	23.86	0.63	11.14	-5.19	467	-5.79
Fourth Plan (1969-74)	22.21	-6.92	10.9	-2.15	491	5.11
Fifth Plan (1974-79)	23.32	5.00	11.71	7.43	502	2.32
Sixth Plan (1980-85)	23.08	-1.03	11.77	0.51	510	1.56
Seventh Plan (1985-90)	23.08	0.00	12.55	6.63	544	6.63
Eighth Plan (1992-97)	22.47	-2.64	13.34	6.29	594	9.18
Ninth Plan (1997-02)	21.97	-2.23	13.15	-1.42	599	0.82
Tenth Plan (2002-07)	22.44	2.14	13.35	1.52	595	-0.61
Eleventh Plan (2007-2012)	23.97	6.80	15.85	18.76	662	11.19
#Twelfth Plan (2012-2017)	25.24	5.33	18.70	17.95	741	11.98

* % COPP is percentage change over previous plan; # XIIth Plan upto 2016-17 (III^d Advance Estimate).

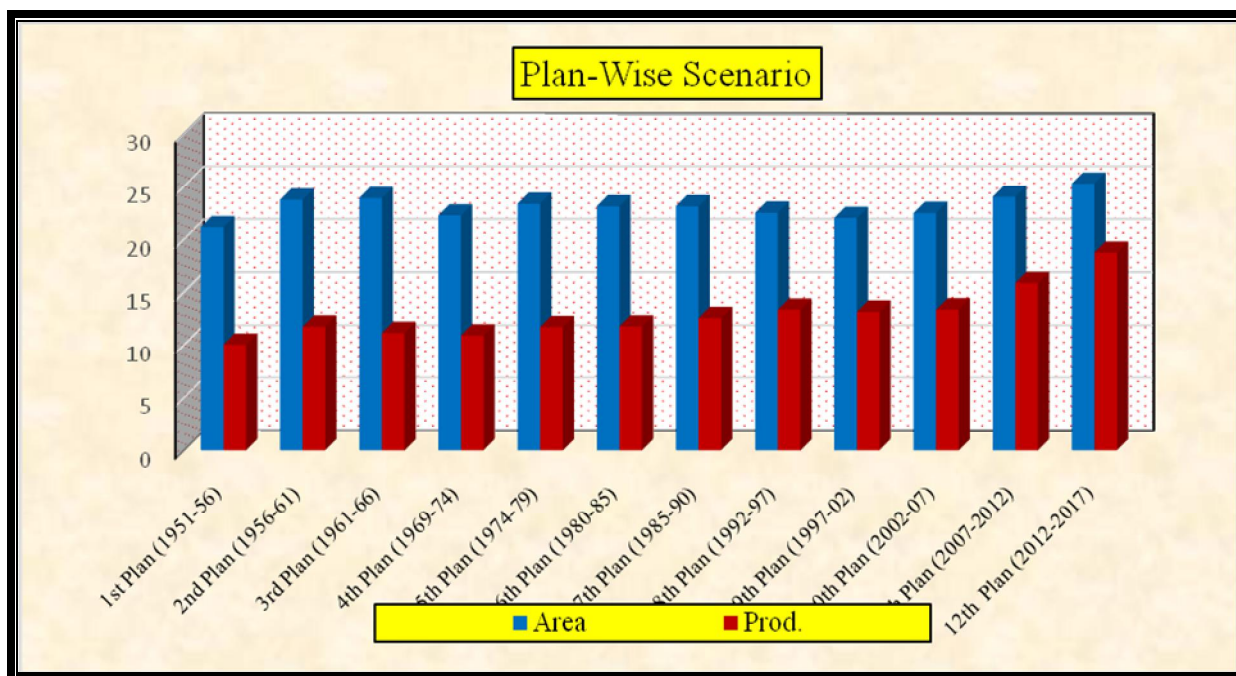


TABLE- 9.1 PLAN-WISE SCENARIO (APY) – PIGEONPEA*(Area-Mha, Production-MTonnes, Yield-kg/ha)*

Plan	Area	%COPP	Prod.	% COPP	Productivity	%COPP
Sixth Plan (1980-85)	3.03		2.27		749	
Seventh Plan (1985-90)	3.35	10.61	2.49	9.83	744	-0.71
Eighth Plan (1992-97)	3.48	3.75	2.43	-2.59	698	-6.12
Ninth Plan (1997-02)	3.44	-1.13	2.35	-3.12	684	-2.01
Tenth Plan (2002-07)	3.51	2.04	2.39	1.56	681	-0.47
Eleventh Plan (2007-2012)	3.79	8.03	2.66	11.56	703	3.26
#Twelfth Plan (2012-2017)	4.20	10.86	3.23	21.34	770	9.45

* % COPP is percentage change over previous plan;# XIIth Plan upto2016-17(IIIrd Advance Estimate).

TABLE-9.2 PLAN-WISE SCENARIO (APY) – CHICKPEA*(Area-Mha, Production-MTonnes, Yield-kg/ha)*

Plan	Area	%COPP	Prod.	% COPP	Productivity	%COPP
Sixth Plan (1980-85)	4.71		7.18		1524	
Seventh Plan (1985-90)	4.66	-1.19	6.73	-6.35	1444	-5.23
Eighth Plan (1992-97)	5.53	18.75	6.61	-1.77	1195	-17.28
Ninth Plan (1997-02)	6.76	22.13	5.48	-17.14	811	-32.15
Tenth Plan (2002-07)	6.82	0.92	5.47	-0.08	803	-0.99
Eleventh Plan (2007-2012)	8.22	20.54	7.24	32.35	881	9.80
#Twelfth Plan (2012-2017)	8.93	8.63	8.36	15.51	937	6.33

* % COPP is percentage change over previous plan;# XIIth Plan upto2016-17(IIIrd Advance Estimate).

TABLE-9.3 PLAN-WISE SCENARIO (APY)– TOTAL MUNGBEAN*(Area-Mha, Production-MTonnes, Yield-kg/ha)*

Plan	Area	%COPP	Prod.	% COPP	Productivity	%COPP
Sixth Plan (1980-85)	2.88		1.12		390	
Seventh Plan (1985-90)	3.13	8.77	1.24	10.42	396	1.51
Eighth Plan (1992-97)	2.92	-6.71	1.21	-2.71	413	4.28
Ninth Plan (1997-02)	3.01	3.19	1.06	-11.84	353	-14.57
Tenth Plan (2002-07)	3.24	7.53	1.14	6.89	351	-0.60
Eleventh Plan (2007-2012)	3.31	2.02	1.34	17.50	404	15.16
#Twelfth Plan (2012-2017)	3.45	4.34	1.59	19.04	461	14.09

* % COPP is percentage change over previous plan;# XIIth Plan upto2016-17(IIIrd Advance Estimate).

TABLE-9.4 PLAN-WISE SCENARIO (APY)– TOTAL URDBEAN*(Area-Mha, Production-MTonnes, Yield-kg/ha)*

Plan	Area	%COPP	Prod.	% COPP	Productivity	%COPP
Sixth Plan (1980-85)	2.86		1.06		373	
Seventh Plan (1985-90)	3.21	12.26	1.39	30.80	434	16.51
Eighth Plan (1992-97)	2.94	-8.42	1.35	-3.09	459	5.82
Ninth Plan (1997-02)	3.05	3.76	1.37	1.60	450	-2.08
Tenth Plan (2002-07)	3.24	6.20	1.39	1.52	430	-4.40
Eleventh Plan (2007-2012)	3.06	-5.56	1.48	6.24	484	12.50
#Twelfth Plan (2012-2017)	3.52	15.04	2.10	42.03	597	23.46

* % COPP is percentage change over previous plan;# XIIth Plan upto2016-17(IIIrd Advance Estimate).

TABLE-9.5 PLAN-WISE SCENARIO (APY) – LENTIL

Plan	<i>(Area-Mha, Production-MTonnes, Yield-kg/ha)</i>					
	Area	%COPP	Prod.	% COPP	Productivity	%COPP
Sixth Plan (1980-85)	0.96		0.51		527	
Seventh Plan (1985-90)	1.08	12.69	0.68	35.20	632	19.97
Eighth Plan (1992-97)	1.23	13.98	0.80	16.83	648	2.50
Ninth Plan (1997-02)	1.42	14.85	0.94	17.81	665	2.58
Tenth Plan (2002-07)	1.44	1.95	0.95	1.16	660	-0.78
Eleventh Plan (2007-2012)	1.46	1.37	0.96	0.72	655	-0.64
#Twelfth Plan (2012-2017)	1.38	-5.94	1.04	8.42	756	15.27

* % COPP is percentage change over previous plan;# XIIth Plan upto2016-17(IIIrd Advance Estimate).

TABLE-9.6 PLAN-WISE SCENARIO (APY) – FIELDPEA

Plan	<i>(Area-Mha, Production-MTonnes, Yield-kg/ha)</i>					
	Area	%COPP	Prod.	% COPP	Productivity	%COPP
Sixth Plan (1980-85)	0.44		0.32		740	
Seventh Plan (1985-90)	0.47	7.73	0.42	27.95	879	18.76
Eighth Plan (1992-97)	0.71	50.56	0.64	54.90	905	2.88
Ninth Plan (1997-02)	0.74	4.46	0.66	2.06	884	-2.30
Tenth Plan (2002-07)	0.74	0.22	0.69	5.30	929	5.06
Eleventh Plan (2007-2012)	0.72	-3.36	0.62	-9.80	867	-6.67
#Twelfth Plan (2012-2017)	0.90	25.34	0.85	36.19	942	8.66

* % COPP is percentage change over previous plan;# XIIth Plan upto2016-17(IIIrd Advance Estimate).

5.3 STATE'S SCENARIO

5.3.1 PLAN-WISE (X-XII) : TOTAL PULSES

1. **Tenth Plan (2002-2007):** The total pulse area in the country during the Tenth plan was 224.60 lakh hectares with a total production of 133.48 lakh tonnes. The same trend of pulses scenario was observed during the Tenth plan Madhya Pradesh ranked first in area (43.27 lakh hectares or 19.27 %) with a total production of 31.46 lakh tonnes or (23.57 % of the total production). While, Maharashtra was placed second with respect of area and its production 35.32 lakh hectares (15.73 %) and 19.98 lakh tonnes (14.97 %) followed by Rajasthan 31.77 lakh hectares (14.15 %) & 12.96 lakh tonnes (9.71 %) (Table 10).
2. **Eleventh Plan (2007-2012):** During Eleventh plan period the total pulses area and production were 239.75 lakh ha and 139.82 lakh tonnes respectively. Out of 239.75 lakh hectares about 53 % area under rabi and 46 % area under kharif were covered. However, approx. 59 % share of rabi production and 41 % share of kharif production exhibited in total pulse production in the country which explained the productivity of Rabi pulses is much higher than the kharif pulses. The state-wise analysis exhibited first rank to Madhya Pradesh, both in area and production with 47.75 lakh hectares and 35.98 lakh tonnes which was 19.92 % and 25.73 % respectively. Rajasthan ranked second in coverage with 16.90 % (40.51 lakh hectares) while at production front, state of Maharashtra ranked at second with 17.76 % (24.84 lakh tonnes) followed by Uttar Pradesh with 14.19 % (19.83 lakh tonnes). Maharashtra ranked third in area with 14.87% and Rajasthan ranked fourth in production with 14.00% (19.57 lakh hectares) of country's production while in area, Karnataka stood at IVth rank with 10.05 % of country coverage during that XIth plan.
3. **Twelfth plan (2012-2017):** In India, total pulse area and production irrespective of Twelfth Plan was 252.43 lakh hectares and 187.00 lakh tonnes respectively. Out of the total area, 57.03 lakh hectares is confined to Madhya Pradesh alone, earning a good pulse status and position contributing a remarkable 22.59 % of the country's total area and a production of 52.02 lakh tonnes, thereby ranking first both in area and production followed by Rajasthan in area (39.37 lakh hectares, 15.60% of the total area). While Rajasthan ranked third in production with 12.15% of the total pulse production and Maharashtra which ranked second (25.48 lakh tonnes or 13.63 % of the total production); Uttar Pradesh was hardly placed at the fourth rank in production (17.60 lakh tonnes or 9.41 % of the total production). While Karnataka is on the fourth rank in respect of area (25.71 lakh ha or 10.19 %).

TABLE NO. 10- PLAN-WISE STATES' SCENARIO – TOTAL PULSES

(A= lakh ha, P= Lakh Tonnes, Y= kg/ha)

States		Tenth Plan	% to Country	Eleventh Plan	% to Country	*Twelfth Plan	% to Country
A.P	A	19.71	8.78	19.76	8.24	12.79	5.07
	P	12.09	9.05	14.49	10.36	10.86	5.80
	Y	613		733		849	
Bihar	A	6.50	2.90	5.79	2.42	5.17	2.05
	P	4.95	3.71	4.98	3.56	4.82	2.58
	Y	761		859		931	
Chhattisgarh	A	9.06	4.03	8.52	3.55	8.72	3.46
	P	4.52	3.39	5.12	3.66	5.98	3.20
	Y	499		601		685	
Gujarat	A	8.04	3.58	8.49	3.54	7.19	2.85
	P	5.14	3.85	6.74	4.82	6.49	3.47
	Y	639		794		902	
Haryana	A	1.74	0.77	1.68	0.70	1.33	0.53
	P	1.26	0.94	1.33	0.95	0.99	0.53
	Y	725		792		742	
Jharkhand	A	2.74	1.22	4.01	1.67	6.12	2.42
	P	1.72	1.29	3.10	2.21	6.08	3.25
	Y	626		772		994	
Karnataka	A	20.78	9.25	24.09	10.05	25.71	10.19
	P	7.82	5.86	12.11	8.66	13.75	7.36
	Y	376		503		535	
Madhya Pradesh	A	43.27	19.27	47.75	19.92	57.03	22.59
	P	31.46	23.57	35.98	25.73	52.02	27.82
	Y	727		754		912	
Maharashtra	A	35.32	15.73	35.65	14.87	37.56	14.88
	P	19.98	14.97	24.84	17.76	25.48	13.63
	Y	566		697		679	
Orissa	A	7.01	3.12	8.28	3.45	7.88	3.12
	P	2.81	2.11	3.88	2.78	4.09	2.19
	Y	401		469		519	
Punjab	A	0.39	0.17	0.23	0.09	0.53	0.21
	P	0.32	0.24	0.19	0.14	0.46	0.25
	Y	811		858		871	
Rajasthan	A	31.77	14.15	40.51	16.90	39.37	15.60
	P	12.96	9.71	19.57	14.00	22.72	12.15
	Y	408		483		577	
Tamil Nadu	A	5.45	2.43	5.97	2.49	7.79	3.09
	P	2.19	1.64	2.34	1.67	5.47	2.93
	Y	402		391		702	
U.P.	A	27.31	12.16	23.58	9.84	22.86	9.05
	P	22.37	16.76	19.83	14.19	17.60	9.41
	Y	819		841		770	
West Bengal	A	2.32	1.03	1.86	0.78	2.96	1.17
	P	1.75	1.31	1.47	1.05	2.73	1.46
	Y	754		787		922	
All India	A	224.60		239.75		252.43	
	P	133.48		139.82		187.00	
	Y	594		583		741	

*Twelfth plan is the Ave. of 2012-13 to 2016-17) & 2016-17 APY is the IIIrd Adv. Estimates.

5.3.2 PLAN-WISE (X-XII): PIGEONPEA

1. **Tenth Plan (2002-2007):** The country's total area coverage and production of tur were 35.07 lakh hectares and 23.88 lakh tonnes respectively. The state-wise trend shows that Maharashtra ranked first both in respect of area and production (30.87% and 31.30%) followed by Karnataka (16.00% and 12.12%). The third place occupied by Andhra Pradesh in area (13.28%) and U.P. (15.15%) in production. The highest yield recorded by Bihar (1194kg/ha) followed by Haryana (1032 kg/ha) and U.P. (953 kg/ha). The lowest yield recorded in the state of A.P. (451 kg/ha) followed by Chhattisgarh (482 kg/ha) and Karnataka (515 kg/ha).
2. **Eleventh Plan (2007-2012):** The country's total area coverage and production of tur were 37.89 lakh hectares and 26.64 lakh tonnes respectively. The state-wise trend shows that Maharashtra ranked first both in respect of area and production (30.68% and 33.44%) followed by Karnataka (18.69% and 14.75%). The third place occupied by Andhra Pradesh in area (13.14%) and U.P. 10.97% in production. The highest yield recorded by Bihar (1286 kg/ha) followed by Haryana (1080 kg/ha) and Gujarat (1008 kg/ha). The lowest yield recorded in the state of A.P. (450 kg/ha) followed by C.G. (491 kg/ha) and Karnataka (555 kg/ha).
3. **Twelfth Plan (2012-2017):** The country's total area coverage and production of tur were 42.00 lakh hectares and 32.33 lakh tonnes respectively. The state-wise trend shows that Maharashtra ranked first both in respect of area and production (30.00% and 28.90%). Madhya Pradesh stood second position in production (16.09%) followed by Karnataka (15.68%). The third place occupied by Madhya Pradesh (13.26%) in area. The highest yield recorded by Bihar (1679 kg/ha) followed by Haryana (1047 kg/ha) and Gujarat (1103 kg/ha). The lowest yield observed in the state of A.P. (488 kg/ha) followed by C.G. (597 kg/ha) and Karnataka (621 kg/ha).

The overall trend of area, production and yield shown increasing trend during the last three Plan Period.

TABLE NO. 10.1 - PLAN-WISE STATES' SCENARIO – PIGEONPEA

(A= lakh ha, P= Lakh Tonnes, Y= kg/ha)

State		X th Plan	% to AI	XI th Plan	% to AI	XII th Plan	% to AI
A.P	A	4.66	13.28	4.98	13.14	2.21	5.27
	P	2.10	8.78	2.24	8.39	1.08	3.34
	Y	451		450	639	488	
Bihar	A	0.36	1.04	0.28	0.73	0.22	0.52
	P	0.43	1.79	0.36	1.35	0.37	1.13
	Y	1194		1286		1679	
Chattisgarh	A	0.56	1.59	0.55	1.46	0.58	1.38
	P	0.27	1.13	0.27	1.03	0.35	1.07
	Y	482		491		597	
Gujarat	A	2.81	8.02	2.64	6.96	2.43	5.79
	P	2.38	9.95	2.66	9.97	2.68	8.29
	Y	847		1008		1103	
Haryana	A	0.31	0.87	0.25	0.67	0.10	0.24
	P	0.32	1.32	0.27	1.02	0.10	0.32
	Y	1032		1080		1047	
Jharkhand	A	0.78	2.21	1.00	2.64	1.96	4.66
	P	0.55	2.30	0.77	2.89	1.97	6.11
	Y	705		770		1008	
Karnataka	A	5.61	16.00	7.08	18.69	8.17	19.44
	P	2.89	12.12	3.93	14.75	5.07	15.68
	Y	515		555		621	
Madhya Prd.	A	3.18	9.07	4.06	10.72	5.57	13.26
	P	2.32	9.71	2.57	9.63	5.20	16.09
	Y	730		633		934	
Maharashtra	A	10.83	30.87	11.62	30.68	12.60	30.00
	P	7.47	31.30	8.91	33.44	9.34	28.90
	Y	690		767		741	
Odisha	A	1.29	3.69	1.37	3.62	1.38	3.29
	P	0.93	3.88	1.16	4.37	1.23	3.80
	Y	721		847		888	
Punjab	A	0.08	0.24	0.05	0.13	0.03	0.08
	P	0.07	0.31	0.04	0.17	0.03	0.09
	Y	875		800		893	
Rajasthan	A	0.18	0.52	0.19	0.51	0.15	0.35
	P	0.11	0.46	0.13	0.50	0.11	0.35
	Y	611		684		755	
Tamilnadu	A	0.39	1.12	0.32	0.83	0.58	1.38
	P	0.24	0.99	0.23	0.86	0.53	1.63
	Y	615		719		909	
Telangana	A			3.20		2.79	6.64
	P			1.21		1.44	4.46
	Y			378		517	
Uttar Pradesh	A	3.80	10.85	3.30	8.72	3.00	7.15
	P	3.62	15.15	2.92	10.97	2.58	7.97
	Y	953		885		858	
All India	A	35.07		37.89		42.00	
	P	23.88		26.64		32.33	
	Y	681		703		770	

*Twelfth plan is the Ave. of 2012-13 to 2016-17) & 2016-17 APY is the IIIrd Adv. Estimates.

5.3.3 PLAN-WISE (X-XII): CHICKPEA

1. Tenth Plan (2002-2007): A total of 68.18 lakh ha of area and 54.72 lakh tonnes of gram production were observed in the country during the plan. Madhya Pradesh ranked first in terms of area and production (38.23% and 42.52%) followed by Maharashtra with 13.93% and 10.84% and Rajasthan with 13.77% and 11.60%, respectively. Andhra Pradesh has recorded and yield of 1147 kg/ha followed by Bihar with 913 kg/ha. The lowest yield observed in Karnataka (479 kg/ha) followed by Maharashtra (624 kg/ha) and Odisha (645 kg/ha).

2. Eleventh plan (2007-12): The total area and production of gram in the country were 82.18 lakh hectares and 72.42 lakh tonnes respectively. Madhya Pradesh outstanding position in area coverage and production of gram (35.34% and 38.12%) of the total area and production of the country), followed by Rajasthan (16.04% and 13.12%) and Maharashtra (15.27 % and 14.14%) respectively (Table-11.2). The highest productivity was recorded in plan period in Andhra Pradesh (1270 kg/ha) followed by Bihar (1067 kg/ha) and Gujarat (1048 kg/ha). The lowest yield was noticed in the state of Karnataka (600 kg/ha).

3. Twelfth Plan (2012-2017): The total area and production of gram during twelfth Plan was 89.28 lakh hectares and 83.65 lakh tonnes respectively. Madhya Pradesh ranked first contributing an area of (34.46% and 40.62% of total area and production of country). Maharashtra is on the second rank for area 15.41 lakh ha (17.26%) and third for production 11.98 lakh tones (14.32%). Whereas, Rajasthan stood second in production (14.47%) and third in area (15.37%). The highest yield was recorded in the state of Telangana (1459 kg/ha) followed by Gujarat (1201 kg/ha) and West Bengal (1163 kg/ha). The lowest yield was recorded in Karnataka (578 kg/ha).

Chickpea is a major pulse in India which contributed about 35% of area & 45% of pulse production. Overall trend of area, production and yield of last three plan periods was shown significantly increased.

TABLE NO. 10.2 - PLAN-WISE STATES' SCENARIO – CHICKPEA

(A= lakh ha, P= Lakh Tonnes, Y= kg/ha)

State		X th Plan	% to AI	XI th Plan	% to AI	XII th Plan	% to AI
Andhra Pradesh	A	4.30	6.30	6.07	7.38	4.49	5.03
	P	4.93	9.01	7.71	10.65	5.04	6.02
	Y	1147		1270		1122	
Bihar	A	0.69	1.01	0.60	0.72	0.60	0.68
	P	0.63	1.15	0.64	0.88	0.66	0.79
	Y	913		1067		1098	
Chhattisgarh	A	2.07	3.04	2.44	2.97	2.84	3.18
	P	1.54	2.81	2.22	3.06	2.62	3.13
	Y	744		910		922	
Gujarat	A	1.49	2.18	1.88	2.28	1.73	1.94
	P	1.23	2.25	1.97	2.72	2.08	2.48
	Y	826		1048		1201	
Haryana	A	1.05	1.53	1.01	1.23	0.59	0.66
	P	0.79	1.44	0.85	1.18	0.49	0.58
	Y	752		842		824	
Karnataka	A	4.95	7.26	8.13	9.89	10.60	11.87
	P	2.37	4.33	4.88	6.74	6.13	7.33
	Y	479		600		578	
Madhya Pradesh	A	26.06	38.23	29.04	35.34	30.76	34.46
	P	23.26	42.52	27.60	38.12	33.98	40.62
	Y	893		950		1105	
Maharashtra	A	9.50	13.93	12.55	15.27	15.41	17.26
	P	5.93	10.84	10.24	14.14	11.98	14.32
	Y	624		816		777	
Odisha	A	0.31	0.45	0.40	0.49	0.43	0.48
	P	0.20	0.36	0.29	0.41	0.33	0.39
	Y	645		725		766	
Rajasthan	A	9.39	13.77	13.18	16.04	13.72	15.37
	P	6.35	11.60	9.50	13.12	12.10	14.47
	Y	676		721		882	
Tamilnadu	A	0.06	0.09	0.07	0.09	0.07	0.07
	P	0.04	0.08	0.05	0.07	0.04	0.05
	Y	667		714		649	
Telangana	A			0.97		0.91	1.02
	P			1.10		1.33	1.59
	Y			1135		1459	
Uttar Pradesh	A	7.57	11.11	5.65	6.87	5.14	5.75
	P	6.80	12.43	5.32	7.35	4.63	5.54
	Y	898		942		901	
West Bengal	A	0.41	0.60	0.23	0.28	0.27	0.31
	P	0.37	0.67	0.24	0.33	0.32	0.38
	Y	902		1043		1163	
All India	A	68.18		82.18		89.28	
	P	54.72		72.42		83.65	
	Y	803		881		937	

*Twelfth plan is the Ave. of 2012-13 to 2016-17) & 2016-17 APY is the IIIrd Adv. Estimates.

5.3.4 PLAN-WISE (X-XII): MUNGBEAN

1. **Tenth Plan (2002-2007):** The total area under Moong during ninth plan was 32.41 lakh hectares with production of 11.38 lakh tones. Rajasthan stands first in respect of area (22.54%) followed by Maharashtra (17.06%) and A.P. (14.73%). The maximum contribution of production was in the state of Maharashtra (21.61%) followed by Rajasthan (20.23%) and A.P. (15.81%). The highest yield was recorded by the state of Punjab (800 kg/ha) followed by Bihar (548 kg/ha) and Jharkhand (538 kg/ha) with the overall National yield average of 351kg/ha. The lowest yield was recorded in Karnataka (146 kg/ha) followed by Odisha (238 kg/ha) and Chhattisgarh (235 kg/ha).
2. **Eleventh Plan (2007-2012):** The total area covered under moong in India was 33.32 lakh hectares with a total production of 13.52 lakh tonnes. Moong is a common crop grown in most of the states. The share of area and production are some what homogeneous in the Moong growing states. However, during the Plan Period, the coverage of area and its production was maximum in Rajasthan (31.21% & 31.68 %) followed by Maharashtra (15.26% & 18.57%) and Andhra Pradesh (10.36 % & 10.62%). The highest yield was recorded by the state of Punjab (778kg/ha) followed by Bihar (617 kg/ha) and Jharkhand (571 kg/ha). The National yield average was of 406 kg/ha. The lowest yield was observed in Karnataka (202 kg/ha) followed by Odisha (270 kg/ha) and C.G. (250 kg/ha).
3. **Twelfth Plan (2012-2017):** The total area covered under moong in India was 34.50 lakh hectares with a total production of 15.91 lakh tonnes. The coverage of area and its production was maximum in Rajasthan (32.76% & 30.61%) followed by Maharashtra (11.95 % & 10.58%) of the total area and production. Karnataka ranked third in area (8.81%) and Tamilnadu is on third position for production (7.63%). The highest yield was recorded by the state of Punjab (845 kg/ha) followed by Jharkhand (704 kg/ha) and Andhra Pradesh (696 kg/ha). The National yield average was 461 kg/ha. The lowest yield observed in the state of Karnataka (227 kg/ha) followed by C.G. (326 kg/ha) and Odisha (327 kg/ha).

During the last three Plan Period area, production and productivity showed increasing trend.

TABLE NO. 10.3 - PLAN-WISE STATES' SCENARIO – MUNGBEAN

(A= lakh ha, P= Lakh Tonnes, Y= kg/ha)

State		X th Plan	% to AI	XI th Plan	% to AI	XII th Plan	% to AI
Andhra Pradesh	A	4.77	14.73	3.45	10.36	1.61	4.68
	P	1.80	15.81	1.44	10.62	1.12	7.06
	Y	377		417		696	
Bihar	A	1.86	5.74	1.67	5.01	1.62	4.71
	P	1.02	8.92	1.03	7.59	1.00	6.27
	Y	548		617		614	
Chhattisgarh	A	0.17	0.53	0.16	0.49	0.16	0.47
	P	0.04	0.38	0.04	0.30	0.05	0.33
	Y	235		250		326	
Gujarat	A	1.73	5.35	2.20	6.62	1.45	4.20
	P	0.70	6.12	1.06	7.84	0.76	4.81
	Y	405		482		528	
Haryana	A	0.22	0.67	0.27	0.80	0.56	1.61
	P	0.07	0.58	0.12	0.86	0.33	2.08
	Y	318		444		597	
Jharkhand	A	0.13	0.40	0.21	0.63	0.24	0.68
	P	0.07	0.63	0.12	0.86	0.17	1.04
	Y	538		571		704	
Karnataka	A	4.11	12.69	3.76	11.27	3.04	8.81
	P	0.60	5.26	0.76	5.61	0.69	4.34
	Y	146		202		227	
Madhya Prd.	A	0.85	2.62	0.86	2.58	2.51	7.27
	P	0.27	2.39	0.28	2.07	1.16	7.31
	Y	318		326		464	
Maharashtra	A	5.53	17.06	5.08	15.26	4.12	11.95
	P	2.46	21.61	2.51	18.57	1.68	10.58
	Y	445		494		408	
Odisha	A	2.23	6.87	2.59	7.76	2.77	8.02
	P	0.53	4.67	0.70	5.16	0.90	5.68
	Y	238		270		327	
Punjab	A	0.15	0.46	0.09	0.26	0.42	1.21
	P	0.12	1.04	0.07	0.50	0.35	2.22
	Y	800		778		845	
Rajasthan	A	7.31	22.54	10.40	31.21	11.30	32.76
	P	2.30	20.23	4.28	31.68	4.87	30.61
	Y	315		412		431	
Tamilnadu	A	1.25	3.87	1.54	4.63	1.89	5.48
	P	0.54	4.73	0.54	3.99	1.21	7.63
	Y	432		351		642	
Telangana	A			0.72		1.25	3.61
	P			0.39		0.70	4.42
	Y			545		564	
Uttar Pradesh	A	0.74	2.30	0.79	2.38	0.93	2.70
	P	0.35	3.05	0.45	3.36	0.49	3.09
	Y	473		570		529	
All India	A	32.41		33.32		34.50	
	P	11.38		13.52		15.91	
	Y	351		406		461	

*Twelfth plan is the Ave. of 2012-13 to 2016-17) & 2016-17 APY is the IIIrd Adv. Estimates.

5.3.5 PLAN-WISE (X-XII) : URDBEAN

1. **Tenth Plan (2002-2007):** The total area was 32.39 lakh ha with a total production of 13.96 lakh tonnes. States showed that Maharashtra state stands first in area and second in production (17.15% and 19.53 %), whereas A.P. ranked first in Production (20.56 %). U.P ranked second in area and third in Production (16.14% and 15.46%) and M.P. stands third in area fourth in production (15.95% and 12.77%) respectively. The highest yield was recorded by the state of Bihar (760 kg/ha) followed by Andhra Pradesh (579 kg/ha) and Jharkhand (548 kg/ha) with the overall National yield average of (431 kg/ha). The lowest yield was observed in the state of Karnataka (187 kg/ha) followed by Odisha (268 kg/ha) and C.G. (286 kg/ha).
2. **Eleventh Plan (2007-2012):** The total production was 14.81 lakh tonnes on an area of 30.58 lakh hectares. As regards the total contribution from states, Madhya Pradesh stand first in respect of area (17.08%) followed by U.P. (16.53%) and Andhra Pradesh (14.87%), whereas in production U.P. stands first (19.00%) followed by Andhra Pradesh (18.37%) and Maharashtra (15.35%). The highest yield was recorded by the state of Bihar (842 kg/ha) followed by Jharkhand (663 kg/ha) and Gujarat (650 kg/ha). The lowest yield was observed in the state of C.G. (294 kg/ha) followed by Odisha (298 kg/ha) and Karnataka (311 kg/ha).
3. **Twelfth Plan (2012-2017):** The total production was 21.00 lakh tonnes on an area of 35.15 lakh hectares. As regards the total contribution from states, Madhya Pradesh stand first in respect of area (24.11%) followed by U.P. (16.71%) and Andhra Pradesh (11.05%), whereas in production M.P. stands first (22.32%) followed by Andhra Pradesh (15.65%) and U.P (14.49%). The highest yield was recorded by the state of Bihar (898 kg/ha) followed by Jharkhand (875 kg/ha) and A.P (846 kg/ha) the National yield average was (597 kg/ha). The lowest yield was recorded in the state of C.G. (310 kg/ha) followed by Odisha (325 kg/ha) and Karnataka (416 kg/ha).

The overall trend during last three plan period was shown increasing trend in Production and Productivity front but, area is fluctuating in the same period.

TABLE NO. 10.4 - PLAN-WISE STATES' SCENARIO – URDBEAN

(A= lakh ha, P= Lakh Tonnes, Y= kg/ha)

State		X th Plan	% to AI	XI th Plan	% to AI	XII th Plan	% to AI
A.P	A	4.96	15.31	4.55	14.87	3.89	11.05
	P	2.87	20.56	2.72	18.37	3.29	15.65
	Y	579		598		846	
Assam	A	0.38	1.17	0.43	1.39	0.54	1.52
	P	0.20	1.40	0.24	1.63	0.33	1.59
	Y	526		558		624	
Bihar	A	0.25	0.77	0.19	0.62	0.15	0.42
	P	0.19	1.34	0.16	1.08	0.13	0.63
	Y	760		842		898	
Chhattisgarh	A	1.19	3.66	1.09	3.57	1.00	2.85
	P	0.34	2.40	0.32	2.14	0.31	1.48
	Y	286		294		310	
Gujarat	A	1.02	3.16	1.00	3.28	1.03	2.94
	P	0.47	3.34	0.65	4.40	0.64	3.03
	Y	461		650		616	
Jharkhand	A	0.73	2.25	0.83	2.71	1.09	3.10
	P	0.40	2.84	0.55	3.70	0.95	4.54
	Y	548		663		875	
Karnataka	A	1.39	4.29	1.22	4.00	0.92	2.62
	P	0.26	1.83	0.38	2.55	0.38	1.83
	Y	187		311		416	
Madhya Pradesh	A	5.17	15.95	5.22	17.08	8.47	24.11
	P	1.78	12.77	1.85	12.50	4.69	22.32
	Y	344		354		553	
Maharashtra	A	5.56	17.15	4.26	13.93	3.40	9.68
	P	2.73	19.53	2.27	15.35	1.64	7.83
	Y	491		533		483	
Odisha	A	1.27	3.93	1.31	4.28	0.89	2.54
	P	0.34	2.40	0.39	2.60	0.29	1.38
	Y	268		298		325	
Rajasthan	A	1.78	5.50	1.56	5.11	2.61	7.42
	P	0.58	4.18	0.75	5.05	1.35	6.41
	Y	326		481		516	
Tamilnadu	A	2.18	6.73	2.88	9.43	3.58	10.19
	P	0.90	6.47	1.11	7.48	2.79	13.28
	Y	413		385		778	
U.P.	A	5.23	16.14	5.06	16.53	5.87	16.71
	P	2.16	15.46	2.81	19.00	3.04	14.49
	Y	413		555		518	
All India	A	32.39		30.58		35.15	
	P	13.96		14.81		21.00	
	Y	431		484		597	

*Twelfth plan is the Ave. of 2012-13 to 2016-17) & 2016-17 APY is the IIIrd Adv. Estimates.

5.3.6 PLAN-WISE (X-XII): LENTIL

1. **Tenth Plan (2002-2007):** The area under lentil was 14.44 lakh hectares with the total production of 9.53 lakh tonnes. The highest area and production contribution was made by U.P. (41.27% and 48.79%) followed by M.P. (35.04% and 25.50%) and Bihar (11.91% and 14.17 %). The highest yield was recorded by the state of Rajasthan (1000 kg/ha) followed by Haryana (833 kg/ha) and Bihar (785 kg/ha). The National yield average was (660 kg/ha). The lowest yield was recorded in the state of C.G. (294 kg/ha) followed by Maharashtra (429 kg/ha) and M.P. (480 kg/ha).
2. **Eleventh Plan (2007-2012):** The country's area under Lentil was 14.64 lakh hectares with a production of 9.60 lakh tonnes. The highest area and production contribution was made by U.P. (37.98% and 46.25%) followed by M.P. (37.57% and 24.27%) and Bihar (12.36% and 16.56 %). The highest yield was recorded by the state of Rajasthan (893 kg/ha) followed by U.P. (799 kg/ha) and Bihar (878 kg/ha). The National yield average was (656 kg/ha). The lowest yield was observed in the state of C.G. (313 kg/ha) followed by M.P. (424 kg/ha) and Maharashtra (429 kg/ha).
3. **Twelfth Plan (2012-17):** The country's area under Lentil was 13.77 lakh hectares with a production of 10.41 lakh tonnes. Madhya Pradesh is on first ranked with respect to acreage 41.04% (5.65 lakh ha) followed by UP 31.17 % and Bihar 12.00% respectively. While in terms of production MP is on first ranked 35.54% (3.70 lakh tonnes) followed by Uttar Pradesh (29.39%) and Bihar (17.14%). The highest yield was recorded by the state of Bihar (1080 kg/ha) followed by W.B. (969 kg/ha) and Rajasthan (909 kg/ha). The National yield average was (756 kg/ha). The lowest yield was observed in the state of Maharashtra (379 kg/ha) followed by C.G. (389 kg/ha) and M.P. (655 kg/ha).

The overall trend of area, production and yield during the last three plan period shows increasing trend in production and productivity however, area decline during XII plan period is a major concern.

TABLE NO. 10.5 - PLAN-WISE STATES' SCENARIO –LENTIL

(A= lakh ha, P= Lakh Tonnes, Y= kg/ha)

State		X th Plan	% to AI	XI th Plan	% to AI	XII th Plan	% to AI
Assam	A	0.20	1.39	0.22	1.50	0.29	2.11
	P	0.11	1.15	0.11	1.15	0.20	1.96
	Y	550		500		701	
Bihar	A	1.72	11.91	1.81	12.36	1.65	12.00
	P	1.35	14.17	1.59	16.56	1.78	17.14
	Y	785		878		1080	
Chhattisgarh	A	0.17	1.18	0.16	1.09	0.16	1.13
	P	0.05	0.52	0.05	0.52	0.06	0.58
	Y	294		313		389	
Haryana	A	0.06	0.42	0.04	0.27	0.04	0.31
	P	0.05	0.52	0.03	0.31	0.04	0.38
	Y	833		750		952	
Madhya Pradesh	A	5.06	35.04	5.5	37.57	5.65	41.04
	P	2.43	25.50	2.33	24.27	3.70	35.54
	Y	480		424		655	
Maharashtra	A	0.07	0.48	0.07	0.48	0.03	0.24
	P	0.03	0.31	0.03	0.31	0.01	0.12
	Y	429		429		379	
Punjab	A	0.03	0.21	0.01	0.07	0.01	0.06
	P	0.02	0.21	0.01	0.1	0.01	0.05
	Y	667		1000		640	
Rajasthan	A	0.19	1.32	0.28	1.91	0.45	3.25
	P	0.19	1.99	0.25	2.60	0.41	3.91
	Y	1000		893		909	
Uttar Pradesh	A	5.96	41.27	5.56	37.98	4.29	31.17
	P	4.65	48.79	4.44	46.25	3.06	29.39
	Y	780		799		713	
Uttarakhand	A	0.16	1.11	0.15	1.02	0.11	0.83
	P	0.08	0.84	0.09	0.94	0.09	0.86
	Y	500		600		782	
West Bengal	A	0.65	4.5	0.55	3.76	0.73	5.28
	P	0.45	4.72	0.44	4.58	0.70	6.77
	Y	692		800		969	
All India	A	14.44		14.64		13.77	
	P	9.53		9.60		10.41	
	Y	660		656		756	

**Twelfth plan is the Ave. of 2012-13 to 2016-17) & 2016-17 APY is the IIIrd Adv. Estimates.*

5.3.7 PLAN-WISE (X-XII): FIELDPEAS

1. **Tenth Plan (2002-2007):** The area and production during the plan were 7.45 lakh ha and 6.92 lakh tonnes respectively. The state of Uttar Pradesh ranked first in area and production (53.75% and 69.25%) followed by Madhya Pradesh (27.93% and 13.92%). Bihar stood in third position with area and production both 3.16% & 3.08% respectively. Rajasthan has recorded highest yield (2190 kg/ha) followed by Haryana (1214 kg/ha) and UP (1197 kg/ha) which is greater than the National productivity (929 kg/ha). Lowest yield was observed in Chhattisgarh (352 kg/ha) followed by Maharashtra (395 kg/ha) and M.P. (463 kg/ha).
2. **Eleventh Plan (2007-2012):** During eleventh plan, the area and production were 7.20 lakh hectares and 6.24 lakh tonnes respectively. U.P. stands first in respect of area and production (44.72 % and 62.19 %) followed by M.P. (32.46 % and 15.41%) and Jharkhand (4.28 % & 5.04%). Rajasthan ranked first in yield (1327 kg/ha) followed by U.P. (1205 kg/ha) and Punjab (1192 kg/ha). The lowest yield was observed in C.G. (352 kg/ha) followed by Maharashtra (371 kg/ha) and Madhya Pradesh (412 kg/ha).
3. **Twelfth Plan (2012-2016):** A total area of 9.01 lakh hectares and a total production of 8.49 lakh tonnes were recorded. Uttar Pradesh ranked first both in area and production (37.90% and 41.58%) followed by Madhya Pradesh (38.67% and 32.98%) and Jharkhand (3.80 % and 4.85%). In case of productivity Rajasthan ranked first with (1867 kg/ha) followed by Punjab (1297 kg/ha) and Jharkhand (1203 kg/ha). The lowest yield was observed in Maharashtra (390 kg/ha) followed by C.G. (437 kg/ha) and Assam (817 kg/ha).

The area, production and yield significantly increased during XII plan from previous plans.

TABLE NO. 10.6 - PLAN-WISE STATES' SCENARIO – FIELD PEAS

(A= lakh ha, P= Lakh Tonnes, Y= kg/ha)

State		X th Plan	% to AI	XI th Plan	% to AI	XII th Plan	% to AI
Assam	A	0.22	2.91	0.22	3.03	0.27	2.99
	P	0.13	1.93	0.13	2.14	0.22	2.59
	Y	616		615		817	
Bihar	A	0.24	3.16	0.22	3.00	0.19	2.08
	P	0.21	3.08	0.22	3.47	0.18	2.17
	Y	906		1005		984	
Chhattisgarh	A	0.16	2.17	0.16	2.20	0.15	1.71
	P	0.06	0.82	0.06	0.89	0.07	0.79
	Y	352		352		437	
Haryana	A	0.01	0.19	0.01	0.18	0.01	0.08
	P	0.02	0.24	0.02	0.23	0.01	0.09
	Y	1214		1154		1071	
Jharkhand	A	0.08	1.07	0.31	4.28	0.34	3.80
	P	0.07	0.96	0.31	5.04	0.41	4.85
	Y	838		1019		1203	
Kerala	A	0.02	0.31	0.02	0.29	0.01	0.11
	P	0.02	0.25	0.01	0.18	0.01	0.10
	Y	739		524		879	
Madhya Pradesh	A	2.08	27.93	2.34	32.46	3.48	38.67
	P	0.96	13.92	0.96	15.41	2.80	32.98
	Y	463		412		804	
Maharashtra	A	0.17	2.24	0.22	3.06	0.28	3.09
	P	0.07	0.96	0.08	1.32	0.11	1.28
	Y	395		371		390	
Punjab	A	0.04	0.51	0.03	0.37	0.02	0.25
	P	0.04	0.61	0.03	0.50	0.03	0.35
	Y	1105		1192		1297	
Rajasthan	A	0.12	1.62	0.05	0.68	0.13	1.47
	P	0.27	3.84	0.07	1.04	0.25	2.90
	Y	2190		1327		1867	
Uttar Pradesh	A	4.00	53.75	3.22	44.72	3.42	37.90
	P	4.79	69.25	3.88	62.19	3.53	41.58
	Y	1197		1205		1034	
Uttarakhand	A	0.04	0.56	0.06	0.84	0.06	0.69
	P	0.04	0.57	0.03	0.47	0.06	0.71
	Y	952		500		962	
West Bengal	A	0.13	1.75	0.10	1.44	0.14	1.50
	P	0.11	1.60	0.10	1.58	0.16	1.89
	Y	840		952		1183	
All India	A	7.45		7.20		9.01	
	P	6.92		6.24		8.49	
	Y	929		867		942	

*Twelfth plan is the Ave. of 2012-13 to 2016-17) & 2016-17 APY is the IIIrd Adv. Estimates.

6.0 POLICY FOR INCREASING DOUBLING PULSE PRODUCTION BY 2022

6.1 TARGET (Horizontal Expansion)

Increasing production from existing (XIIth Plan) 187.56 lakh tonnes to 260.00 lakh tones and productivity from 743 kg/ha to 1030 kg/ha. Focus attention on six crops-Chickpea, Pigeonpea, Mungbean, Urdbean, lentil and Peas. Crop-wise targeted production and productivity is given Table 12.

Table 11. CROP-WISE TARGETED PRODUCTION & PRODUCTIVITY

(A-lakh ha, P-lakh tones, Y-kg/ha)

Crop	XI th Plan			XII th Plan			% COP			Target- 2022	
	A	P	Y	A	P	Y	A	P	Y	Prod.	Yield
Arhar	37.90	26.66	703	42.00	32.69	778	10.84	22.64	11	48.00	1143
Urd	31.08	15.20	489	35.15	21.00	597	13.10	38.14	22	28.60	814
Moong	33.95	13.84	408	34.50	16.12	467	1.64	16.50	15	23.40	678
Kulthi	5.40	2.51	464	4.63	2.25	486	-14.23	-10.14	5	2.60	561
Gram	82.18	72.42	881	89.28	84.43	946	8.63	16.58	7	117.00	1311
Lentil	14.64	9.60	655	13.77	10.41	756	-5.94	8.42	15	15.00	1090
Lathyrus	5.16	3.42	662	4.69	3.76	803	-9.19	10.14	21	5.20	1109
Peas	7.16	6.22	869	9.01	8.49	942	25.95	36.48	8	13.00	1442
Total Pulses	245.10	161.89	661	252.43	187.56	743	2.99	15.85	12	260.00	1030

6.1.1 Crop diversification through diverting additional area of 25 lakh hectares under focussed crops

- Chickpea 9.41 lakh ha.
- Pigeonpea 4.55 lakh ha.
- Mungbean 4.75 lakh ha.
- Urdbean 3.81 lakh ha.
- Lentil 1.81 lakh ha
- Peas 0.60 lakh ha

6.2 ADDITIONAL POTENTIAL AREA PROPOSED TO BE BROUGHT UNDER DIFFERENT PULSE CROPS.

Crop	State/Regions	Additional Area (Lakh ha)	Cropping system /Situation
Chickpea	Punjab, Haryana, UP	0.75 (Desi) 0.20 (Kabuli)	• Popularization of rice-chickpea cropping system to diversity cereals based production system.
	Eastern UP, Jharkhand, Bihar, Chhatisgarh, AP, Karnataka, Orissa and WB	1.2	• Expansion of short duration varieties of chickpea in the non-traditional areas/rice fallows to ensure double cropping systems.
	Bhal areas of Gujarat and Tal areas of Bihar	0.26	• Expansion of chickpea areas.
	Maharashtra Karnataka & Maharashtra Karnataka, AP, Rajasthan, UP & Bihar	7.00	• Intercropping of chickpea with Sorghum & Safflower • Corriander • Mustard and Popularization of soybean-chickpea cropping system.
	Total	9.41	

Crop	State/Regions	Additional Area (Lakh ha)	Cropping system /Situation
Pigeonpea	Centrral & Western UP, MP and North Rajasthan	1.00	• Popularization of short duration pigeonpea-wheat sequential cropping system to diversify cereals based production system and sustainability.
	Bihar, Gujarat, AP, Maharashtra & Eastern UP	0.85	• Introduction of pre-rabi pigeonpea.
	UP and Chhatisgarh	0.20	• Replacing rainfed upland paddy with pigeonpea.
	MP, Bihar, Tamil Nadu, Karnataka and Orissa	1.00	• Cultivation of pigeonpea on paddy bunds.
	MP, Gujarat, Maharashtra, AP & Tamil Nadu, Bihar, UP, MP, MH, Karnataka	1.50	• Intercropping of pigeonpea with Soybean & Groundnut • Pearl Millet/Cotton/Mungbean and Urdbean
	Total	4.55	
Mungbean	UP, Bihar, Orissa, Gujarat & MP	1.00	• Spring/Summer mungbean after harvesting of mustard, potato, sugarcane, peas and wheat etc.
	AP, Orissa, Tamil Nadu, Karnataka, UP & Bihar	2.75	• Introduction of mungbean in rice fallow.
	UP Bihar and MP	0.50	• Sugarcane+Mungbean intercropping.
	Bihar, UP, MP, MH, Karnataka, AP, Gujarat, Orissa, Rajasthan and TN	0.50	• Intercropping with long duaration pigeonpea/sorghum/cotton/maize/pearl millet
	Total	4.75	
Urdbean	UP, Bihar, Orissa, Gujarat, MP	0.25	• Extension of cultivations of urdbean in spring season after harvesting of mustard, potato, sugarcane etc.
	AP, Orissa, Tamil Nadu, Karnataka	2.56	• Extension of cultivation of urdbean in rice fallow.
	Bihar, UP, MP, MH, Karnatajka, AP, Gujarat, Orissa, Rajasthan, TN	1.00	• Intercropping with long duration pigeonpea/sorghum/pearl millet/cotton.
	Total	3.81	
Peas	UP, Bihar, MP, Orissa and TN	0.45	• Introduction of peas in rice fallowas.
	UP and Bihar	0.15	• Introduction of peas in diaralands.
	Total	0.60	
Lentil	Eastern UP and Bihar	0.50	• Intrioduction of lentil areas in rice falllows.
	Tal areas of Bihar, Eastern UP, Bundelkhand region of UP, MP, MH and Rajasthan	1.20	• Expansion of lentil.
	UP and Bihar	0.11	• Lentil in diaralands
	Total	1.81	
Grand Total		24.93	

6.2.1 UTILIZATION OF POTENTIAL AREA OF RICE-FALLOW LANDS

Rice fallows are widely distributed in rainfed ecosystem of eastern, central and peninsular India, besides north-eastern hill region. It is expected that nearly 3.0 Mha area of rice fallows can be brought under cultivation, which can provide about 1.5-2.0 Mt of additional food grain production. The estimated extent of such fallow land is about 12 Mha, mostly in the eastern states of country. The potential horizontal expansion under post kharif rice fallow area to be cultivated during rabi, has been delineated by NCFC, now also a part of Targeted Rice fallow Area (TRFA-RKVY programme) *About 30-40% of the area currently left fallow after rice can be converted into productive farm lands. About 3.0 million ha additional land under pulses and 1.0 million ha under oilseeds can be brought with appropriate policy interventions. The distribution of rice fallows, potential districts and area is under Table-17 (a to c).*

Table 12 (a) DISTRIBUTION OF RICE FALLOWS

States	Major Districts
AP	Krishna, Guntur, East Godavari, West Godavari, Srikakulam, Nellore and Prakasam
Assam	Lakhimpur, Jorhat, Sibsagar, Dibrugarh, Golaghat, Karbi, Nagaon & Maringon
Bihar	Kisanganj, Sahibganj, Gaya, Aurangabad, Katihar and Bhagalpur
Chhattisgarh	Surguja, Jashpur, Raigarh, Durg, Bilaspur and Bastar
Jharkhand	Ranchi, Purbi Singhbhum, Paschim Singhbhum, Hazaribagh, Gumala Sahibganj, Deogarh, Palamau, Dumka and Dhanbad
Maharashtra	Dhule, Amravati, Nagpur, Wardah, Bhandara, Chandrapur and Nanded
MP	Shahdol, Seoni, Balaghat, Damoh, Mandla, Rewa, Betul and Sidhi
Odisha	Koraput, Kalahandi, Sambalpur, Sundergarh, Bhadrak, Cuttack, Puri, Dhenkanal and Mayurbhanj.
West Bengal	Purulia, Bankura, Birbhum, Bardhaman, Medinapur, Murshidabad, South 24-Parganas, Maldah, West Dinajpur, Jalpaiguri and Coochbihar
UP	Gonda, Siddarthnagar, Lakhimpur, Kheri, Pilibhit, Etawah, Mirzapur, and Sonbhadra
Karnataka	Shimoga and Belgaum
Tamil Nadu	Salem, Namakkal, Tiruchirappalli, Cuddalore, Ramnathpuram, Madurai, and Villupuram

Table 12. (b) RICE FALLOW AREA

S.No.	States	Rice fallow area (Mha)
1.	Odisha	2.961
2.	CG	2.856
3.	WB	1.159
4.	Assam	1.042
5.	Jharkhand	0.475
6.	Bihar	0.049
7.	Other States	3.458
Total		12.000

Source: (National Crop Forecast Centre, DAC & FW, New Delhi)

Table 12 (c) POTENTIAL PULSES AREA UNDER RICE FALLOWS

State	Potential area (M ha)	Rice-fallow Districts
Chhattisgarh	0.88	Bilaspur, Dhamtari, Kanker, Jashpur, Raipur, Durg, Rajgarh, Kabirdham, Korba, Mahasamund and Rananadgaon
MP	0.53	Anuppur, Chhattarpur, Damoh, Dindori, Raisen, Jabalpur, Katni, Jhabua, Rewa, Satna, Shahdol, Seoni, Mandla, Narsingpur and Umaria
Odisha	0.37	Baleswar, Dhenkanal, Sundergarh, Mayurbhanj, Kalahandi, Bolangir, Kheonjar, Puri and Cuttack
WB	0.52	Bankura, Purulia, Medinapur, West Dinajpur, Malda, Jalpaiguri, Bardhaman and Birbhum
Assam	0.16	Marigaon, Naogaon, Lakhimpur, Kokrajhar, Bongaigaon, Nalbari, Kamrup, BARPETA, Darrang, Cachar, Goalaghat, Jorhat, Dibrugarh, Tinsukia and Sonitpur
Total	2.46	

Source: The Expert Group on Pulses, DAC & FW, MoA & FW, GoI, (2009)

6.2.2 Existing scheme: Targeting Rice Fallows for Pulses Production (TRFA)

A new sub-scheme –Targeting Rice Fallow Area in six BGREI states to promote pulses/oilseeds with annual allocation of Rs. 200 crores under RKVY with central share of Rs. 130 crores (2016-17 onwards) has been approved by Hon'ble AM. Increase allocation under NFSM and NMOOP will also bring rice fallow area under cultivation of oilseeds and pulses.

6.2.3 Recommendations for improving pulses productivity under rice fallow

Under mentioned recommendations and policy issues indicated in the NAAS Policy Paper (64) on “*improving productivity of rice fallows*”, is relevant to harness the potential of rice fallows, and may be the part of ongoing programmes of pulses development under *NFSM- Additional Pulse Programme and RKVY-TRFA*.

i. Mechanization of field operations: Residual soil moisture in surface layer at the time of planting *rabi* crops is the major constraint in rice fallows. Relay cropping in standing rice is often practiced but with use of combine for rice harvesting, the option is now shifting for direct seeding using zero-till drill or turbo type Happy Seed drill which need to be designed for different situations. For harvesting and threshing, appropriate machines need to be designed and developed.

ii. Scaling-up crop management practices: Tillage and plant population management, application of nutrients and weed management in *rabi* crops pose serious challenges in rice fallows. Early-maturing crop varieties, relay cropping, higher seed rate, seed priming, seed inoculation with *Rhizobium* culture, seed pelleting, mulching, foliar spray of nutrients etc. are recommended practices which need to be further refined and standardized for different ecosystems. Work on development of short-duration, high-yielding varieties, appropriate seeding techniques, water harvesting and recycling, post-emergence herbicides, biotic and abiotic stresses etc. need to be strengthened.

iii. Crop-specific information on area expansion: Based on biophysical conditions, farm resources and market demand, likely coverage of area under each crop in different states/ region need to be estimated. This would facilitate area expansion in phased manner by arranging critical inputs.

iv. Periodic GIS mapping: In order to monitor impact of R&D efforts on area expansion in rice fallows under different crops, cropping systems and soil health, periodic monitoring through GIS is required.

v. Creation of community water reservoirs: Despite heavy rains during *kharif* season, soil moisture becomes the most critical limiting factor for raising second crop during winter as most of the runoff is wasted. It is, therefore, necessary to create farm pond and community water reservoirs in the area well supported by Government. This will serve as important source for life-saving and supplemental irrigation. Further, the loss of soil and plant nutrients from productive lands will be reduced.

vi. Quality seeds: Timely availability of quality seeds is often a major constraint for delayed planting and poor yields. Hence, community-based seed production programmes need to be launched with appropriate processing and storage facilities. The national and state seed Corporations should strengthen their activities in these areas.

vii. Ensuring timely availability of other critical inputs: Traditionally, the winter crops on residual soil moisture are grown using local varieties without application of plant nutrients, bio-fertilizers, fungicides and other agro-chemicals due to their non-availability. Since crop productivity is the driver for area expansion, which in turn is influenced by better crop management, emphasis needs to be placed on timely availability of all critical inputs.

viii. Marketing infrastructure: Marketing plays a key role in enthusing farmers for crop production. Well organized marketing and processing of farm produce need attention.

ix. Protection from stray cattle: Blue bull and other stray cattle cause heavy damage to pulses and thus discourage farmers to grow winter crops. Appropriate policies are needed to tackle this menace.

6.2.4 Recommendations based on Performance/ Experience

Under NFSM-pulses, *additional area coverage programme of spring/summer season and RKVY-TRFA*, the development efforts on increasing productivity of pulses in rice fallow areas includes identification of suitable varieties, planting methods, foliar nutrition and plant protection, refining and packaging improved technologies etc are based on the past experience, to address different problems.

- i) Selection of crops and varieties:** should be decided on the basis of winter temperature, soil texture, soil moisture content etc. (*In lentil and gram, small seeded varieties due to better contact with soil, less rotting be selected*)
- ii) Seed priming and optimum seed rate:** Overnight soaking of seeds (seed priming), hastens seed germination and crop establishment under relay cropping. Adoption of 20-25% higher seed rate over the recommended rate is recommended ensures desired plant stand.
- iii) Foliar nutrition:** Since application of fertilizers under relay cropping is not feasible, seed pelleting and foliar application of nutrients should be practiced. Foliar application of 2% urea at flowering and pod formation significantly improves yields of chickpea under rainfed conditions by increasing leaf N content and making them photosynthetically more active. Seed pelleting with micronutrients like Zn and Mo is also recommended as a part of nutrient management strategy in rice fallows.

- iv) **Planting strategy:** In rice fallows, planting is generally delayed. Under relay planting, seeds should be broadcast 2-5 days before harvest of rice. Zero-till seed-cum-fertilizer drill should be used wherever feasible when planting is done after harvest of rice. It is necessary to use short to medium maturing varieties of rice for timely planting of *rabi* crops.
- v) **Plant protection:** Since post-emergence herbicides are not commercially available specially for crops like chickpea and lentil and inter-cultivation is difficult due to hard soil, hand pulling of weeds is the only option which should be done at an early stage. Post-emergence herbicide (*Imazethapyr @ 50 g/ha*) has been found quite effective against seasonal grassy weeds in crops like groundnut, urdbean and mungbean. It should be applied at 3-4 leaf stage. Similarly, *quizalofop* can be used to check ratooning of rice stubbles which cause substantial moisture loss. Insect-pests and diseases should be promptly controlled. Seed dressing with fungicides like *carbendazim* should be done.
- vi) Issues based major technological interventions and region specific varieties are summarized under Table 18 (a) and (b).

Table 13. (a) MAJOR TECHNOLOGICAL INTERVENTIONS

Issues	Interventions	Action
Lack of suitable cultivars	Development of high-yielding varieties with appropriate maturity duration	ICAR-IIPR
Poor crop stand and establishment	Tillage machines, sowing methods, seed priming, higher seed rate, timely planting, seed treatment with fungicides	SDA/SAUs
Diseases and pests	Development of IPM modules	SDA/SAUs/NCIPM
Weed menace	Post-emergence herbicides like <i>Quizalofop ethyl</i> and <i>Imazethapyr</i>	SDA/SAUs/DWR
Nutrient management	Foliar spray of urea/DAP to supplement N and P	SDA/SAUs
Micronutrient deficiencies	Mo, B, Zn as seed pallets	SDA/IISS
Terminal moisture/heat stress	Residue mulching	SDA/SAUs/CRIDA
Non-availability of quality seeds	Informal and formal seed production and supply systems	SDA/SSC/NSC
Lack of mechanization	Tillage machines, zero-till planter and harvester	SDA/SAUs/CIAE
Poor transfer of technology	Innovative farmer's participatory approach	SDA/SAUs/KVKs

Table 13. (b) PERFORMANCE BASED RECOMMENDATION

Region Rec. Crops & Varieties		
Eastern Plains	Central region	Coastal Region
Lentil	Chickpea	Urdbean & Mungbean
Rust- A major threat Small seeded lentil varieties having resistance to rust WBL-77, KLS-218, PL-8, NM-1, DPL-15	<ol style="list-style-type: none"> 1. Chickpea var Pusa-372, PG-186, Udai 2. Small seeded chickpea var. JSC-55, JSC-56, JG-14, vijay, JG-315, JAKI-9516 3. Lathyrus- var- Ratan, Prateek, Mahateora 	Powdery Mildew a major threat <ol style="list-style-type: none"> 1. Urdbean-var.- powdery mildew resistance var., LBG-17, LBG-602, LBG-623 Urdbean Normal planting var. (Mid Nov to Mid Dec) LBG-402, LBG-611, LBG-22, LBG-648, LBG-685, LBG-645, LBG-709, LBG-752 2. Late Planting Urdbean (IInd fortnight of Dec) var. LBG-22, LBG-645, LBG-709, LBG-752 3. Mungbean varieties (Normal Planting) LGG-460, LGG-410, LGG-450, LGG-407, IM- 96-3, Pusa 9072, NARM-1,2 and 18.

Source: Policy Paper 64: Improving Productivity of Rice Fallows

6.2.5 Diversification: Replacement of less remunerative crops with pulses

More than 5 Lha area of upland paddy, 4.5 Lha of millets and 3 Lha area under barley, mustard and wheat may be diverted under kharif/rabi pulses.

6.2.6 Cultivation of spring/summer pulses

More than 20 Lha vacated by wheat, peas, potato, sugarcane and lentil may be brought under spring/summer pulses with critical irrigation support in the states of Bihar (3 Lha), TN (2.31 Lha), Odisha (2.14 Lha) MP (1.51 Lha), UP (1.36 Lha), AP (0.74 Lha), WB (0.61 Lha), Gujarat (0.40 Lha), CG (0.20 Lha), Punjab (0.20 Lha). During kharif 2017 against the state's target of 19.45 Lha, an area of 12.52 Lha (Mung 8.63+ Urd 3.61) was covered.

(Note: Figures in parentheses is the coverage during Spring/Summer 2017 as per WWWR of DPD, Bhopal).

6.2.7 Promotion of intercropping and utera cultivation

Intercropping of pulses is the best approach for increasing production of pulses through horizontal expansion. The farmers in rainfed states of Karnataka, Gujarat, MP, CG, MS and AP are traditionally cultivating pulses. Besides increasing the total productivity of the system, legume plays an important role in economizing the use of resources, particularly N fertilizer. Wheareas, mungbean and urdbean are ideal intercrop with spring planted sugarcane under irrigated/rainfed conditions. Cotton and spring summer sunflower, lentil, fieldpea, chickpea and rajmash are also ideal intercrops with autumn planted sugarcane under irrigated conditions.

In AP, out of 9 Lha groundnut area, 4 Lha alone goes under intercropping (GN+ Tur- 7:1, 11:1); (Cotton+ Tur-1:11,1:12,1:7); (Maize/Jowar+ Tur- 2:1); (Mung/Urd+ Redgram- 7:1).

Table 14. PROMINENT INTERCROPPING SYSTEMS

States	Intercropping Systems
Andhra Pradesh	Pigeonpea+Groundnut/castor, Chickpea+Sunflower, Rice + Mungbean / Urdbean, Tapioca+Mungbean/Urdbean
Bihar	Pigeonpea+Maize/Small millets/Turmeric, Chickpea+ Mustard/Linseed, Lentil+Mustard, Fieldpea+Mustard,Potato+Common bean, Rice+Pigeonpea
Gujrat	Pigeonpea+Groundnut, Cotton+ Pigeonpea, Pearl millet +Mothbean, Castor+Urdbean/Munhgbbean/Cowpea/Horse gram
HP	Maize+Urdbean/Soybean/Cowpea/Common bean
Karnataka	Pigeonpea+Horse gram/Small millets/Cowpea/Groundnut, Finger millet+Horse Gram, Chickpea+Sunflower, Tapoca+Mungbean/Urdbean
Madhya Pradesh	Pigeonpea+Pearlmillet/Sorghum/Urdbean/Mungbean/Castor/Soybean,Pearlmillet+Mungbean/Urdbean, Chickpea+ Mustard/ Wheat/ Barley/ Linseed, Field pea + Mustard,Lentil +Linseed/Mustard/Barley, Cotton+Pigeonpea
Maharashtra	Pigeonpea+Sorghum/Maize, Cotton+Pigeonpea/Mungbean/Urdbean, Grd.nut+Pigeonpea
Orissa	Pigeonpea+Ground nut, Tapioca+Mungbean/Urdbean
Punjab & Haryana	Chickpea+Wheat/Barley/Mustard/Linseed, Sugarcane+Summer Mungbean /Urdbean /Chickpea, Pigeonpea+Mungbean/Urdbean, Urdbean+Maize, Maize + Soybean
Rajasthan	Pearl millet+Urdbean/Mungbean/Cowpea/Mothbean, Sorghum+Mothbean, Clusterbean+Mothbean, Chickpea+Barley/Mustard/Wheat
Tamil Nadu	Pigeonpea+Sorghum, Tapioca+Mungbean/Urdbean, Sugarcane+Urdbean
UP	Pigeonpea+Pearlmillet/Sorghum/Castor/Maize/Urdbean/Mungbean,Pearlmillet+Urdbean/Mungbean,Sugarcane+Urdbean/Mungbean/Fieldpea/Chickpea,Chickpea+Wheat/Barley/Linseed/Mustard.
WB	Sunflower+Mungbean, Chickpea+Mustard/Lentil, Jute+Urdbean

Source: Adopted from Sekhon and Singh (2005)

6.2.8 Scope of area expansion for increasing pulses production through intercropping is indicated under Table 20.

Table 15. SCOPE OF AREA EXPANSION THROUGH INTERCROPPING SYSTEM MANIPULATION

Crop	Intercropping with	Specific Area
Mungbean/ Urdbean	<ul style="list-style-type: none"> Spring planted sugarcane (irrigated) Cotton and Millets (Rainfed upland) Spring/Summer Sunflower (Rainfed upland) 	<ul style="list-style-type: none"> Western U.P., Central U.P. and North Bihar, Maharashtra, A.P. and T.N.Western U.P., Haryana and Punjab
Lentil, Field pea, Chickpea, Rajmash	<ul style="list-style-type: none"> Autumn planted sugarcane (irrigated) 	<ul style="list-style-type: none"> Western U.P., Central U.P. & North Bihar
Rajmash	<ul style="list-style-type: none"> Potato 	<ul style="list-style-type: none"> Western UP, Central UP & North Bihar
Pigeonpea	<ul style="list-style-type: none"> Soybean, Sorghum, Cotton, Millets and Groundnut (Rainfed upland) 	<ul style="list-style-type: none"> A.P. Malwa Plateau of M.P., Vidarbha of M.H., North Karnataka, North T.N. South East Rajasthan, Punjab, Haryana, U.P. and Bihar
Chickpea	<ul style="list-style-type: none"> Barley, Mustard and sunflower (Rainfed upland) 	<ul style="list-style-type: none"> South East Rajasthan, Punjab, Haryana, U.P., Bihar, Vidarbha of Maharashtra

6.2.9 Cultivation of pigeonpea on rice bunds/transplanting

An area of 0.3 Lha can be brought under pigeonpea in CG, MP, Odisha, WB and Jharkhand.

6.3 STRATEGY

Despite various efforts of the Government of India, the pulse production from an area of 23 million ha has stabilised at around 18-20 million tonnes against the consumption of 22-26 million tonnes, which necessitates imports of 4-6 million tonnes pulses each year. To meet the projected pulses requirement, productivity level needs to be enhanced to 1000-1100 kg/ ha from the present 743kg/ha or about 2.5-3.0 million ha additional area has to be brought under pulse crops. Also, a sincere effort has to be made for reducing the post-harvest losses. Estimates indicate that India needs an annual growth rate of 2.5% in pulse production from existing production (22.95 MT) of terminal year 2016-17.

The existing production technology is capable of increasing productivity atleast by 40 % as amply demonstrated by on farm trials. This coupled with technological interventions & operational synergy among planners, administrators, researchers, extension workers and developmental agency in mission mode can translate the vision into reality.

• Production Constraints

The poor productivity level of pulses like pigeonpea, chickpea, lentil, green gram, black gram and peas etc. is attributed primarily to poor spread of improved varieties and technologies, untimely and inadequate availability of quality seed of improved varieties and other inputs, water use due to dependence on rainfall, low and high temperature stress, vulnerability to pests and diseases and cultivation on marginal and sub-marginal land.

• Future Thrust

- Introduce pigeonpea in rice-wheat cropping systems.
- Improve seed systems by seed village & seed hub programme.
- Introduce mechanization.
- Provide remunerative support price and assured marketing.
- Systems for surveillance and monitoring of pests in pigeonpea and chickpea for timely preventive /control measures.
- Transplanting and dibbling techniques to achieve optimum plant population and better productivity of pigeonpea.
- Site specific nutrient management including application of 20-25 kg sulphur and 15-20 kg ZnSO₄/ha.
- Foliar spray of 2% urea at pod formation stage under drought stress.
- Seed inoculation with Rhizobium and Phosphate Solubilizing Bacteria.
- Raised bed planting to economize water and also to off-set water-logging stress during excess rainfall period is reported to improve yield by 10-20%. Raised-bed planting may be promoted in rainfed areas.
- Large-scale promotion of drip and sprinkler irrigation for higher water-use efficiency and yield in rainfed areas.
- Stored rain water during monsoon can be effectively used for life-saving irrigation, employing precision irrigation techniques.
- **Research Issues**
 - Development of short-duration, high-yielding varieties suitable for adoption in rabi season.
 - Development of drought tolerant varieties.
 - Development of Tur varieties comprising early vigour to compete with weeds at the initial stage.

6.3.1 Vertical Expansion (Increasing Productivity through bridging yield gap)

The potential of vertical expansion explain the yield gap analysis of pulses such as *inter-state, intra-state and between FLD and state's average yield* under different pulses in the major growing states. Here, the strategy would be to bridge the yield gaps with the interventions of the improved recommended technologies vis-à-vis is the pulse development programmes under NFSM in all the 29 states of the country, with major emphasis on the major states contributing to more than 90 % of the pulse production of the country. Through bridging the yield gaps additional return may get by farmers. The yield gaps inter-state, intra-state and improved practices are given as under:

Table 16. YIELD GAP: NATIONAL AND INTER-STATE

<i>(Avg. Yield - kg/ha)</i>				
Crop/Season	National	Highest/Lowest Yield	States > National Avg.	States < National Avg.
Total Pulses	726	Jharkhand (970)/ Karnataka (534)	Jharkhand, MP, Gujarat, UP, AP	Karnataka, Maharashtra, RJ, CG, TN
Total Kharif	554	Jharkhand (883)/ Rajasthan (398)	Mha., MP, UP, Guj. Jha, TN	Rajasthan, Karnataka, Odisha, Telangana
Total Rabi	738	Jharkhand (963)/ Karnataka (578)	MP, UP, AP, Guj., Bihar, Jha.	Mha., Raj., Kar., CG,
Tur	727	Gujarat(1076)/ Telangana(456)	MP, UP, Guj., Jha., Odisha, TN	Maharashtra, Karnataka, Telangana, AP
Mungbean (K)	415	AP(783)/ Karnataka(53)	Raj., Mha., Guj., Telangana, MP, AP, TN, Jha.	Karnataka, Odisha,
Urdbean (K)	523	Jharkhand (830)/ Odisha (362)	UP, Jha., Guj., TN, WB,	MP, Mha, Raj., Odisha, Karnataka
Kulthi(K)	470	Bihar (889)/ CG (298)	Karnataka, Jha., Uttarakhand, TN, Bihar, Mha., AP,	Odisha, CG, MP,
Moth(K)	378	HP(2000)/ Mha(318)	Guj., HP, J&K, Haryana	Raj., Mha.,
Gram	936	Telangana(1386)/ Karnataka(672)	MP, AP, UP, Guj., Jha., Telangana	Raj., Mha., Karnataka, CG,
Urd (Rabi)	732	WB(917)/ Karnataka(429)	AP, WB,	TN, Assam, UP, Odisha, Telangana, MP, Karnataka, Gujarat
Mungbean(Rabi)	579	Punjab(865)/Odisha(356)	TN, AP, Bihar, Punjab, UP, WB	Odisha, MP, Haryana, Gujarat
Lentil	702	Bihar (1049)/ CG (400)	UP, Bihar, WB, Jha., Raj., Uttarakhand, Haryana	MP, Assam, CG,
Kulthi (Rabi)	514	TN(589)/ Maharashtra(308)	Karnataka, TN	AP, Mha., WB, Telangana
Lathyrus	745	WB(1103)/Maharashtra(286)	Bihar, WB	CG, MP, Maharashtra
Peas	944	Rajasthan(1667)/ Odisha(593)	UP, Jha., HP, Bihar, Manipur, Rajasthan, WB,	MP, Odisha, Assam

Source: Annual Report 2016-17, DPD, Bhopal

Table 22. Yield gap Intra - State (*District-wise*)

(Avg. Yield - kg/ha)

Crop/ Season	State Avg. Yield	Highest/ Lowest Yield	Districts Above the State average		Districts below the State average	
			HAHP	LAHP	HALP	LALP
Bihar						
Tur	1768	Bhojpur (2803) /Bhagalpur (1106)	(08) Purnia, Bhojpur, Aurangabad, Saharsa, Patna, Purbi Champaran, Begusarai, Vaishali,	(05) Buxar, Lakhisarai, Khagaria, Sheohar, Munger	(12) Kaimur (Bhabua), Gaya, Muzaffarpur, Siwan, Samastipur, Jamui, Nawada, Saran, Banka, Bhagalpur, Pashchim Champaran, Gopalganj,	(13) Nalanda, Sheikhpur, Arwal, Darbhanga, Jehanabad, Araria, Rohtas, Sitamarhi, Madhubani, katihar, Supaul,Kishanganj Madhepura
Mungbean (K)	758	Jehanabad (951)/ Puri Champaran((477)	(05) Araria, Kishanganj, Katihar, Nawada, nalanda,	(06) Suapaul, Jehanabad, Arwal, Gopalganj, Lakhisarai, kaimur	(09) Gaya, Bhagalpur, Purnia, Darbhanga, Banka, Madhepur, Madhubani, Khagaria, Samastipur,	(16) Begusarai, Purbi Champaram, Aurangabad, Bhojpur, Munger, Sheohar, Jamui, Sitamarhi, Saran, Paschim Champaran, Rohtas, Sheikhpura, Vaishali, Siwan, Saharsa, Buxar
Urdbean (K)	890	Saharsa (1000)/ Khagaria ((872)	(04) Lakhisarai, Samastipur, Supaul, Gaya,	(21) Vaishali, Purvi Champaran, Paschim Champaran, Kishanganj, nawada, Siwan, Saran, Jehanabad, Bhojpur, Muzaffarpur, Gopalganj, Rohtas, Buxar, Sheohar, Banka, Arwal, Sitamarhi, Saharsa, Sheikhpura, Jamui, Munger	(03) Katihar, Khagaria, Bhagalpur,	(10) Begusarai, Madhubani, Madhepura, Araria, Purnia, Aurangabad, Darbhanga, Nalanda, kaimur, Patna.

Crop/Season	State Avg. Yield	Highest/ Lowest Yield	Districts Above the State average		Districts below the State average	
			HAHP	LAHP	HALP	LALP
Gram	1163	Purnia ((1956)/ Jamui (831))	(07) Patna, Bhojpur, Lakhisarai, Gaya, Rohtas, Jehanabad, Sheohar,	(10)Sheikhpura, Kishanganj, Araria, Purnia, Kathihar, Vaishali, Paschim Champaran, Madhubani, Sitamarhi, Purvi Champaran,	(8)Aurangabada, Kaimur, Nalanda, Bhagalpur, Buxar, Banka, Nawada, Jamui,	(9)Munger, Arwal, Khagaria, Siwan, Muzaffarpur, Darbhanga, Samastipur, Begusarai, Saran,
Lentil	1058	Patna (1329)/ Saharsa(639)	(08) Patna, Nalanda, Pashchim Champaran, Lakhisarai, Jehanabad, kaimur, Buxar, Rohtas,	(09) Sheikhpura, Darbhanga, Araria, Jamui, Begusarai, Khagaria, Siwan, Saran, Gopalganj	(06) Aurangabad, Bhojpur, Purvi Chamaparan, Madhubani, Gaya, nawada,	(15) Arwal, Sitamarhi, Bhagalpur, Purnia,Muzzaffarpur, Katihar, Samastipur, Supaul, Banka, Sheohar, Kishanganj, Munger, Madhepura, Saharsa, Vaishali
Peas & Bean	1038	Jehanabad (1155)/ Puri Champaran (911)	(12) Kishanganj, Begusarai, madhepura, Bhojpur, Buxar, Siwan, Patna, Katihar, Samastipur, Nalanda, Rohtas, Jamui,	(07)Munger, Khagaria, Purnia, Saran, Sheikhpura, Lakhisarai, Jehanabad.	(06) Aurangabad, Bhagalpur, Kaimur, Madhubani, Arwal, Paschim Champaran,	(03)Supaul, Araria, Gaya, Gopalganj, Purbi champaran, Saharsa, Nawada,Muzaffarpur, Sheohar, Vaishali, Sitamarhi, Banka, Darbhanga
Gujarat						
Tur	1018	Panch Mahals (1457)/ Valsad (832)	(04) Vadodara, Panch mahal, Dohad, Surat,	(05) Bharuch, Narmada, Sabar Kantha, Tapi, Valsad		(17) Navsari, Dang, Kheda, Banaskantha, Ahmadabad, Anand, Junagadh, Rajkot, Amreli, Bhavnagar, Patan, Gandhinagar, Jamnagar, Mehsana, Surendra nagar, Kachchh, Porbandar

Crop/Season	State Avg. Yield	Highest/ Lowest Yield	Districts Above the State average		Districts below the State average	
			HAHP	LAHP	HALP	LALP
Mungbean (K)	435	Gandhinagar (593)/ Patan (373)	(04) Banaskantha, Mahesana, Sabarkantha, Surendranagar,	(06) Gandhinagar, Jamnagar, Ahmadabad, Panch mahals, Porbandar, Navsari	(03) Kachchh, Patan, Rajkot,	(12) Amreli, Bhavnagar, Junagadh, Surat, Bharuch, Valsad, Vadodara, Tapi, Kheda, Dohad, Anand, Narmada
Urdbean (K)	639	Vadodara (805)/ Patan (509)	(07) Vadodara, Dang, Banas Kantha, Jamnagar, Panch Mahals, Tapi, Bharuch,	(05) Porbandur, Gandhinagar, Kheda, Surendranagar, Kachchh	(09) Patan, Dohad, mahesana, Sabarkantha, Junagadh, valsad, Rajkot, Navsari, Amreli,	(05) Bhavnagar, Surat, Ahmadabad, Narmada, Anand
Gram	1057	Junagadh (1755)/ Patan (624)	(07) Jamnagar, Surendranagar, Porbandar, Junagadh, Rajkot, Dang, Amreli,	(10) Tapi, Vadodara, Navsari, Narmada, Bhavnagar, Valsad, Kheda, Surat, Banaskantha, Mahesana	(04) Dohad, Ahmadabad, Panch Mahals, Patan,	(05) Sabarkantha, Anamnd, Bharuch, Kachchh, Gandhinagar.
Jharkhand						
Tur	1330	Ramgarh (1898)/ Garhwa (1124)	(05) Latehar, Godda, Lohardaga, Hazaribagh, Pakur,	(06) Koderma, Ramgarh, Bokaro, Giridih, Saraikela Kharsawan, Deogarh	(08) Palamu, Garhwa, Ranchi, Chatra, Dumka, Gula, Khunti, Simdega,	(05) Sahebganj, West Singhbhum, East Singhbhum, Jamtara, Dhanbad
Gram	733	Giridih (989)/ Gumla (492)	(08) Palamu, Godda, Chatra, Sahebganj, Hazaribagh, Pakur, Koderma,	(07) Ranchi, Giridih, West Singhbhum, Deoghar, Khunti, Saraikela Kharsawan, Ramgarh, East Singhbhum	(03) Garhwa, Latehar, Dumka,	(06) Gumla, Lohardaga, Simdega, Bokaro, Jamtara, Dhanbad.
Lentil	646	Palamu (762)/ Ranchi (295)	(03) Godda, palamu, Latehar,	(01) Gumla	(04) Sahebganj, Garhwa, Pakur Chatra,	(08) WestSinghbhum, Ranchi, Koderma, Hazaribagh, Dumka, Lohardaga, simdega, Deoghar

Crop/Season	State Avg. Yield	Highest/ Lowest Yield	Districts Above the State average		Districts below the State average	
			HAHP	LAHP	HALP	LALP
Andhra Pradesh						
Tur	440	Guntur (1222)/ Anantpur (144)	(02) Prakasam, Guntur,	(06) Krishna, Vizianagaram, SPSR Nellore, Srikakulam, East Godavari, West Godavari	(04) Anantpur, Kurnool, Cudappah, Chittor,	(01) Vishakhapatnam
Mungbean (K)	598	Guntur (964)/ East Godavari (308)	(04) Guntur, Krishna, West Godavari, SPSR Nellore,	(03) Cudappah, Anantpur, Chittor	(06) Srikakulam, East Godavari, Vizianagaram, Prakasam, Vishakhapatnam, Kurnool	
Urdbean (K)	750	Guntur (930)/ East Godavari (271)	(03) Krishna, Guntur, Kurnool,	(02) Chittor, Anantpur	(06) Srikakulam, SPSR Nellore, East Godavari, Prakasam, Vizianagaram, West Godavari,	(02) Vishakhapatnam, Cudappah
Gram	1136	Guntur (2003)/ Anantpur (729)	(03) Kurnool, Prakasam, Guntur,	(07) SPSR Nellore, Krishna, Vizianagaram, East Godavari, Vishakhapatnam, West Godavari, Srikakulam	(02) Cudappah, Anantpur,	(01) Chittor
CG						
Tur	536	Bijapur (651)/ Gariyaband (335)	(07) Balrampur, Surguja, Jashpur, Surajpur, Bilaspur, Raigarh, Mungeli,	(06) Janjgir Champa, Kanker, Bastar, Sukma, Konbdagaon, Bijapur	(07) Kabirdham, Rajnandgaon, Korea, bemetara, Durg, Baloda Bazar, korba,	(07) Raipur, Mahasamund, Balod, Gariyaband, Dantewada, Dhamtari, Narayanpur

Crop/Season	State Avg. Yield	Highest/ Lowest Yield	Districts Above the State average		Districts below the State average	
			HAHP	LAHP	HALP	LALP
Mungbean	199	Kondagaon (378)/ Durg (36)	(05) Raigarh, Sukma, kanker, bijapur, Rajnandgaon,	(09) Dhamtari, Dantewada, Raipur, Kondagaon, Bastar, Kabirdham, Jashpur, Mungeli, Narayanpur	(03) Gariyaband, Mahasamund, Durg,	(10) Janjgir-Champa, Balod, Balopda Bazar, Bilaspur, Korba, Surajpur, Balrampur,. Bemetara, Korea, Surguja
Urdbean	313	Sukma (434)/ Raigarh (238)	(08) Jashpur, Kondagaon, Surajpur, Kanker, Balrampur, Surguja, Rajnandgaon, Kabirdham,	(09) Baloda bazaar, Bastar, gariyaband, Narayanpur, Dhamtari, Dantewada, Bijapur, Sukma, Raipur	(05) Raigarh, Mahasamund, Korba, Korea, Balod,	(05) Bilaspur, Janjgir Champa, Bemetara, Durg, Mungeli
Gram	989	Balod Bazar (1219)/ Korea (808)	(06) Bemetara, Durg, Mungeli, Bilaspur, Balod, Dhamtari,	(12) Raipur, Baloda bazaar, Bijapur, Jashpur, Kanker, Gariyaband, Raigarh, Kondagaon, Bastar, Mahasamund, Narayanpur, Dasntewada	(02) Kabirdham, Rajnandgaon,	(07) Surguja, Balrampur, Surajpur, Korea, korba, Janjgir-Champa, Sukma.
Lentil	327	Mahasamund (467)/ Kondagaon (250)	(06) Bemetara, Durg, Raipur, Baloda bazaar, Mungeli, Dhamtari,	(02) Gariyaband, Mahasamund	(08) Kabirdham, Rajnandgaon, Surguja, Balod, Jashpur, Surhguja, Balrampur, Bilaspur,	(07) Korea, Raigarh, kanker, Korba, janjgir-Champa, Bastar, Kondagaon
Pea & Beans	363	Mahasamund (511)/ Dantewada (143)	(08) Baloda bazaar, Surajpur, Raipur, Dhamtari, raigarh, Bilaspur, Balrampur, Gariyaband,	(04) Mungeli, Korea, Janjgir-Champa, Mahasamund	(08) Kanker, Sarguja, Jashpur, Kabirdham, Balod, Bemetara, Durg, Rajnandgaon,	(05) Korba, Bastar, Kondagaon, Narayanpur, Dasntewada

Crop/ Season	State Avg. Yield	Highest/ Lowest Yield	Districts Above the State average		Districts below the State average	
			HAHP	LAHP	HALP	LALP
Assam						
Tur	836	Goalpara (1125)/ Shivsagar (637)	(06) Sonitpur, Goalpara, Chirang, Kamrup, Darrng, Bongaigaon,	(04) Tinsukia, Dibrugarh, Kamrum Metro, Dhemaji	(08) Karbi Anglong, Nagaon, Kokrajhar, Dimahasao, Barpeta, Udalguri, Baksa, Golaghat,	(09) Cachar, Dhubri, Hailakandi, Marigaon, Nalbari, Lakhimpur, Karimganj, Sivasagar, Jorhat
Mungbean	594	Karbi Anglong (778)/ Marigaon (309)	(08) Sonitpur, Karbi Anglong, Kokrajhar, Lakhimpur, Darrng, Dhemaji, Hailakandi, Udalguri,	(01) Dhubri	(10) Jorhat, Nagaon, Marigaon, Barpeta, kamrup, Bongaigaon, Goalpara,Baksa, Nalbari, Golaghat,	(08) Tinsukia, Chirang, Dima Hasao, Dibrugarh, Sivasagar, Kamrup Metro, Cachar, Karimganj.
Urdbean	579	Sonitpur (735)/ Jorhat (352)	(08) Dhubri, Sonitpur, Goalpara, Nagaon, Lakhimpur, Udalguri, Tinsukia, Karbi Anglong,	(08) Dhemaji, Cachar, Marigaon, Nalbari, Hailakandi, Dibrugarh, Sivasagar, Karimganj	(05) Jorhat, Barpeta, Bongaigaon, Kokrajhar, Darrang,	(06) Baksa, Kamrup, Golaghat, Chirang, Dimahasao, kamrup Metro
Gram	656	Dhubri (1147)/ Dima hasao (318)	(04) Sonitpur, Dhubri, Goalpara, Bongaigaon,	(05) Darrang, Udalguri, Tinsukia, Sivasagar, Dibrugarh	(09) Karbi Anglong, Chirang, nagaon, Barpeta, kamrup, Baksa, Kokrajhar, Marigaon, Cachar,	(09) Golaghat, Lakhimpur, Nalbari, Jorhat, Dima hasao, Dhemaji, karim ganj, kamrup metro, Hailakandi
Lentil	640	Darrang (1197)/ Nagaon (456)	(07) Chirang, Sonitpur, Darrang, Bongaigaon, Dhubri, Marigaon, Udalguri,	(03) Kokrajhar, Golaghat, Sivasagar	(06) Barpeta, Nalbari, Kamrup, Baksa, Goalpara, Nagaon,	(11) Lakhimpur, Karbi Anglong, Kamrup Metro, Dhemaji, Jorhat, Cachar, Dibrugarh, Tinsukia, Karimganj, Dima Hasao, Hailakandi
Pea & Beans	744	Darrang (1184)/ Dibrugarh (443)	(07) Darrng, Nalbari, Kamrup Barpeta, Baksa, Golaghat, Marigaon,	(04) Dhubri, Bongaigaon, Chirang, Kamrup metro	(09) Sonitpur, Jorhat, Nagaon, Lakhimpur, Dhemaji, Tinsukia, Dibrugarh, Kokrajhar, Karbi Anglong,	(07) Udalguri, Dima hasao, Goalpara, Sivasagar, cachar, Karimganj, Hailakandi

Crop/ Season	State Avg. Yield	Highest/ Lowest Yield	Districts Above the State average		Districts below the State average	
			HAHP	LAHP	HALP	LALP
West Bengal						
Tur	1266	Murshidabad (1459)/ Birbhum (538)	(03) 24 Parganas South, Nadia, Murshidabad,	(01) Medinipur East	(05) Purulia, Medinipur West, Hoogly, Bardhaman, Maldah,	(04) Jalpaiguri, Darjeeling, Dinajpur Uttar, Birbhum,
Mungbean	734	Hoogly (1396)/ Maldah (332)	(05) Medinipur West, Dinajpur Uttar, Coochbehar, Nadia, Murshidabad	(01) Hoogly	(03) Purulia, Maldah, Jalpaiguri,	(04) Bardhaman, Darjeeling, Howrah, Bankura
Urdbean	695	Maldah (938)/ Bankura (191)	(04) Murshidabad, Nadia, Maldah, 24 Parganas North,	(03) Dinajpur Uttar, Medinipur West, 24 Parganas South	(04) Purulia, Coochbehar, Jalpaiguri, Dinajpur Dakshin,	(07) Darjeeling, Medinipur East, Birbhum, Bardhaman, Bankura, Hoogly, Howrah
Gram	1132	Bardhaman (1342)/ Dinajpur Uttar (910)	(02) Birbhum, Maldah,	(04) Purulia, Bardhaman, Hoogly, Medinipur West,	(04) Nadia, Murshidabad, 24 Parganas North, 24 Parganas south,	(05) Dinajpur Uttar, Jalpaiguri, Bankura, Dinajpur Dakshin, Howrah
Pea & Beans	1118	Murshidabad (1556)/ Bankura (711)	(03) Murshidabad, 24 Parganas North, 24 Parganas south,	(05) Hoogly, Coochbehar, Dinajpur Uttar, Purulia, Dinajpur Dakshin	(04) Nadia, Maldah, Bardhaman, Birbhum,	(05) Jalpaiguri, Darjeeling, Bankura Howrah, Medinipur West

Crop/ Season	State Avg. Yield	Highest/ Lowest Yield	Districts Above the State average		Districts below the State average	
			HAHP	LAHP	HALP	LALP
Madhya Pradesh						
Tur	646	Chhindwara (1343)/ Tikamgarh (168)	(06) Narsinghpur,Chhin dwara,Singrauli, Seoni, Jabalpur, Morena	(15) Khandwa, Hoshangabad, Mandla, Dewas, Balagahat, Bhind, Buhanpur, Jhabua, Bhopal, Sheopur, Guna, Ashoknagar, Ratlam, Indore, Harda	(13) Rewa, Raisen, Satna, Damoh, Betul, Sidhi, Khargone, Panna, Shadol, Sagar, Chhatarpur, Umaria, Sehore	(17) Katni, Anuppur, Dindori, Vidisha, Barwani, Dhar, Shajapur, Alirajpur, Rajgarh, Datia, Ujjain, Shivpuri, Agar Malwa, Gwalior, Mandsaur, Neemuch, Tikamgarh
Mungbean	379	Ratlam (825)/ Indore (70)	(3) Hoshangabad Barwani, Dhar,	(15) Harda, Jabalpur , Panna Datia Bhind, Rajgarh, Guna, Agar Malwa, Bhopal ,Morena, Ratlam, Gwalior, Dewas, Katni, Singrauli,	(11) Khargone, Sehore, Chhatarpur, Shivpuri, Tikamgarh, Narsinghpur, Rewa, Satna Khandwa ,Sagar, Raisen	(22) Chhindwara, Sidhi, Vidisha, Sheopur, Alirajpur, Betul, Ashoknagar, Damoh, Mandsaur, Burhanpur, Seoni, Jhabua, shajapur, Shahdol, Indore ,Ujjain, Balaghat, Neemuch, Anuppur, Umaria, , Mandla, Dindori,
Urdbean	397	Guna (620)/ Tikamgarh (248)	(5) Vidisha, Alirajpur, Datia, Shivpuri, Mandsaur,	(24) Narsinghpur, Jhabua, Shahdol, Guna, Barwani, Singhrauli, Ratlam, Gwalior, Balaghat, Neemuch, Katni, Dhar, Umaria, Anuppur, Ujjain, Mandla, Sheopur, Buhanpur, Bhopal, Bhind, Sehore, Morena, Harda, Dewas	(8) Tikamgarh, Chhatarpur, Ashoknagar , Sagar, Damoh, Jabalpur, Panna, Satna	(14) Rewa, Chhindwara, Seoni, Betul, Agar Malwa, Rajgarh, Dindori, Sidhi, Raisen, Khargone, Shajapur, Khandwa, Hoshangabad, Indore,

Crop/Season	State Avg. Yield	Highest/ Lowest Yield	Districts Above the State average		Districts below the State average	
			HAHP	LAHP	HALP	LALP
Gram	2729	Chhindwara (1940)/ Dindori(519)	(10) Vidisha, Dewas, Raisen, Ashoknagar, Rajgarh, Dhar, Narsinghpur, Guna, Shivpuri, Indore,	(15) Agar Malwa, Chhindwara, Bhopal, Hoshangabad, Harda, Datia, Bhind, Gwalior, Neemuch, Khandwa, Sheopur, Singrauli, Morena, Burhanpur, Barwani	(10) Ujjain, Sagar, Damoh, Shajapur, Sehore, Chhatarpur, Panna, Satna, Ratlam, Jabalpur	(16) Rewa, Seoni, Betul, Mandasaur, Katni, Tikamgarh, Sidhi, Jhabua, Dindori, Khargone, Mandla, Balaghat, Alirajpur, Shahdol, Umari, Anuppur
Lentil	501	Ashoknagar (852)/ khargone (325)	(6) Vidisha, Panna, Narsinghpur, Damoh, Ashoknagar, Raisen	(21) Rajgarh, Umari, Agar Malwa, Sidhi, Chhindwara, Bhind, Singrauli, Datia, Sehore, Mandasaur, Betul, Bhopal, Shahdol, Guna, Morena, Ratlam, Khandwa, Neemuch, Hoshangabad, Dewas, Sheopur,	(9) Sagar, Rewa, Satna, Dindori, Jabalpur, Mandla, Sheoni, Katni, Anuppur	(13) Shajapur, Chhatarpur, Shivpuri, Tikamgarh, Gwalior, Ujjain, Indore, Dhar, Balaghat, Harda, Burhanpur, Khargone, Jhabua
Pea	643	Datia (1385)/ Mandla(352)	(5) Datia, Narsinghpur, Raisen Chhindwara,	(21) Bhind, Dewas, Gwalior, Ashoknagar, Shivpuri, Rajgarh, Ratlam, Dhar, Sehore, Shahdol, Balaghat, Bhopal, Singrauli, Morena, Indore, Badwani, Mandasaur, Gunna, Neemuch, Alirajpur, Sheopur	(10) Mandla, Jabalpur, Panna, Sagar, Chhatarpur, Damoh, Dindori, Sheoni, Tikamgarh, Katni	(15) Betul, Satna, Umari, Anuppur, Rewa, Sidhi, Hoshangabad, Khandwa, Ujjain, Shajapur, Harda, Agar Malwa, Jhabua, Khargone, Burhanpur

Crop/ Season	State Avg. Yield	Highest/ Lowest Yield	Districts Above the State average		Districts below the State average	
			HAHP	LAHP	HALP	LALP
Karnataka						
Tur	663	Kolar (1296)/ Tumkur (307)	(2) Gulbarga, Bidar	(6) Chitradurga, Davangere, Kolar, Ramanagara, Hassan, Bangalore Rural	(3) Bijapur, Yadgir, Raichur	(16) Tumkur, Koppal, Chikballapur, Bellary, Bagalkot, Mysore, Belgaum, Dharwad, Haveri, Gadag, Mandya, Chamarajanagar, Bengaluru Urban, Chikmagalur, Shimoga, Uttar Kannad
Mungbean	256	Gulbarga (395)/ Bijapur (140)	(6) Bidar, Gulbarga, Dharwad, Uttar Kannad, Yadgir, Mysore	(6) Haveri, Chamarajanagar, Shimoga, Mandya, Ramanagara, Bangalore Rural	(7) Gadag, Bagalkot, Belgaum, Koppal, Hassan, Tumkur, Bijapur	(6)Chitradurga, Raichur, Chikmagalur, Davangere, Bellary, Bengaluru Urban
Urdbean	404	Uttar Kannad (500)/ Hassan (176)	(2) Bidar, Gulbarga	(7) Yadgir, Uttar Kannad, Mandya, Koppal, Ramanagara, Bellary, Shimoga	(4) Mysore, Chamarajanagar, Belgaum, Hassan	(12) Dharwad, Chikmagalur, Tumkur, Haveri, Bijapur, Bagalkot, Gadag, Davangere, Bengaluru Urban, Chitradurga, Raichur, Bangalore Rural

Crop/ Season	State Avg. Yield	Highest/ Lowest Yield	Districts Above the State average		Districts below the State average	
			HAHP	LAHP	HALP	LALP
Rajasthan						
Tur	694	Karauli (1258)/ Sikar (119)	(7) Udaipur, Alwar, Pratapgarh, Dholpur, Jhalawar, Karauli, Sirohi	(9) Jaipur, Sawai Madhopur, Bharatpur, Ganganagar, Chittorgarh, Baran, Kota, Hanumangarh, Bundi	(2) Dungarpur, Banswara	(11) Pali, Bhilwara, Sikar, Jaisalmer, Ajmer, Jodhpur, Dausa, Rajsamand, Tonk, Jalore, Bikaner
Mungbean	411	Ganganagar (639)/ Barmer (194)	(4) Nagaur, Jodhpur, Jaipur, Ganganagar	(13) Hanumagarh, Bikaner, Chitaurgarh, Baran, Pratapgarh, Jhalawar, Kota, Sawai Madhopur, Dholpur, Bundi, Bharatpur, Dausa, Alwar	(6) Pali, Jalore, Ajmer, Barmer, Tonk, Churu	(10) Jhunjhunu, Bhilwara, Sikar, Sirohi, Jailsalmer, Rajsamand, Udaipur, Karoli, Dungarpur, Banswara
Lentil	915	Bharatpur (1160)/ Dungarpur (667)	(2) Bundi, Bharatpur	(8) Dholpur, Alwar, Ajmer, Sikar, Jalore, Bikaner, Hanumangarh, Jhunjhunu	(5) Bhilwara, Pratapgarh, Jhalawar, Tonk, Chittorgarh	(9) Sawai Madhopur, Baran, Kota, Banswara, Ganganagar, Nagaur, Karauli, Jaipur, Dungarpur
Urdbean	478	Churu (1000)/ Ajmer (251)	(6) Bundi, Dungarpur, Tonk, Jhalawar, Kota, Sawai Madhopur	(11) Baran, Sirohi, Jaipur, Dholpur, Pali, Hanumangarh, Karauli, Dausa, Bikaner, Jaisalmer, Churu,	(6) Bhilwara, Banswara, Ajmer, Udaipur, Chittorgarh, Pratapgarh	(6) Rajsamand, Ganganagar, Barmer, Bharatpur, Jalore, Alwar
Gram	711	Bharatpur (1316)/ Churu (328)	(7) Ganganagar, Jhunjhunu, Jaipur, Sikar, Ajmer, Tonk, Jhalawar,	(21) Nagaur Pratapg,arh, Bhilwara, Pali, Sawai Madhopur, Karauli, Banswara, Dungarpur, Alwar, Chittorgarh, Udaipur, Bundi, Dausa, Kota, Baran, Bharatpur, Sirohi, Dholpur, Jodhpur, Rajsamand, Barmer	(4) Churu, Hanumangar h, Bikaner, Jaisalmer	(1) Jalore
Pea & Beans	2017	Jodhpur (12000)/ Jaisalmer (333)	(1) Jaipur	(2) Ganganagar, Baran, Jodhpur	(3)Nagaur, Bundi, Ajmer, Chittorgarh	(21) Jhalawar Jhunjhunu, Alwar, Bharatpur, Kota, Dholpur, Bhilwara, Tonk, Sawai Madhopur, Hanumangarh, Sirohi, Rajsamand, Dausa, Bikaner, Karauli, Banswara, Barmer, Jalore, Jaisalmer, Udaipur, .Pali,

Crop/Season	State Avg. Yield	Highest/ Lowest Yield	Districts Above the State average		Districts below the State average	
			HAHP	LAHP	HALP	LALP
Maharashtra						
Tur	695	Latur (994)/ Kolapur (286)	(7) Amravati, Yavatmal, Latur, Wardha Akola, Hingoli, Chandrapur	(4) Jalgaon, Bhandara, Gondia, Gadchiroli	(9) Osmanabad, Nanded, Parbhani, Buldhana, Nagpur, Beed, Washim, Jalna, Aurangabad	(13) Solapur, Nandurbar, Ahmednagar, Nashik, Dhule, Sangli, Pune, Thane, Satara, Kolhapur, Raigad, Ratnagiri, Palghar,
Mungbean	518	Nasik (861)/ Chandrapur (310)	(8) Buldhana, Jalgaon, Washim, Nanded, Dhule, Latur, Nandurbar, Nashik	(9) Ahmednagar, Beed, Pune, Aurangabad, Satara, Kolhapur, Solapur, Thane, Bhandara	(7) Amravati, Akola, Parbhani, Jalna, Hingoli, Osmanabad, Yavatmal	(9) Sangli, Nagpur, Chandrapur, Gadchiroli, Gondia, Raigad Wardha, Ratnagiri, Sindhudurg
Urdbean	648	Nasik (948)/ Amravati (444)	(8) Nanded, Buldhana, Jalgaon, Washim, Latur, Nashik, Nandurbar, Beed	(8) Dhule, Solapur, Thane, Pune, Aurangabad, Raigad, Ratnagiri, Bhandara	(7) Osmanabad, Hingoli, Akola, Parbhani, Jalna, Sangli, Ahmednagar	(10) Yavatmal, Amravati, Satara, Kolhapur, Nagpur, Sindhudurg, Wardha, Chandrapur, Gondia, Gadchiroli
Gram	836	Hingoli (1385)/ Jalna (550)	(10) Amravati, Akola, Latur, Hingoli, Nanded,, Pune, Jalgaon, Yavatmal, Dhule, Washim	(4) Nandurbar, Kolhapur, Thane, Raigad	(13) Ahmednagar, Osmanabad, Nagpur, Buldhana, Parbhani, Beed, Aurangabad, Nashik, Solapur, Chandrapur, Wardha, Satara, Sangli	(5) Jalna, Bhandara, Gondia, Gadchiroli, Palghar

Crop/ Season	State Avg. Yield	Highest/ Lowest Yield	Districts Above the State average		Districts below the State average	
			HAHP	LAHP	HALP	LALP
Uttar Pradesh						
Tur	904	Kanpur nagar (2030)/ Shravasti (450)	(6) Mirzapur, Jaunpur, Aligarh, Azamgarh, Kanpur Dehat, Pratapgarh	(24) Sultanpur, Jalaun, Ghazipur, Kanpur Nagar, Baliya, Sant Ravidas Sitapur, Auraiya, Chandauli, Ambedkar Nagar, Mau, Etah, Mathura, Etawah, Faizabad , Gautam Budh Nagar, Kasganj, Kannauj, Firozabad, Farrukhabad, Mainpuri, Agra, Pilibhit Varanasi,	(9) Banda, Fatehpur, Hamirpur, Allahabad , Chitrakoot, Sonbhadra, Bulandsheher, Kaushambi, Balrampur	(36) Gonda, Rai Barreilly, Deoria, Mahoba, Hathras, Amethi, Bahraich, Gorakhpur, Basti,Sant Kabir Nagar, Unnao, Shravasti, Jhansi,Siddharth Nagar Barabanki, Hardoi, Ghaziabad, Merrut, Kheri, Hapur, Khusinagar, Lucknow, Baghpat, Budaun, Shahajahanpur, Maharajganj, Sambhal, Amroha, Moradabad, Muzaffarnagar, Lalitpur, Barreilly, Rampur, Bijnor, Shamli, Saharnpur

Crop/ Season	State Avg. Yield	Highest/ Lowest Yield	Districts Above the State average	Districts below the State average	Crop/ Season	State Avg. Yield
			HAHP	LAHP	HALP	LALP
Mungbean	410	Hathras (646)/ Kheri (340)	(4) Lalit Pur, Unnao, Jalaun, Rai Barreilly, Fatehpur	(36) Aligarh, Etah, Kasganj, Kanpur Nagar, Pratapgarh, Budaun, Firozabad, Moradabad, Barabanki, Kannauj, Ghaziabad, Etawah, Lucknow, Farrukhabad, Amethi, Shahajahanpur, Ghaziabad, Hathras, Kaushambi, Sultanpur, Chandauli, Sonbhadra, Allahabad , Rampur, Sant Ravidas Nagar, Basti, Gonda, Bijnor, Ambedkar Nagar, Gorakhpur, Gautam Budh Nagar, Shamli, Azamgarh, Muzzaffarnagar, Faizabad , Mau	(5) Mahoba, Jhansi, Hamirpur, Banda, Chitrakoot	(22) Bulandsheher, Kheri, Varanasi, Kanpur Dehat, Sambhal, Hardoi, Mainpuri, Auraiya, Mirzapur, Agra, Amroha, Sitapur, Hapur, Merrut, Baghpat, Mathura, Jaunpur, Khusinagar, Baliya, Deoria, Balrampur, Barreilly

Crop/Season	State Avg. Yield	Highest/ Lowest Yield	Districts Above the State average		Districts below the State average	
			HAHP	LAHP	HALP	LALP
Pea & Beans	1139	Pilibhit (1900)/ Chitraloot (625)	(2) Jalaun, Lalitpur	(38) Azamgarh, Jaunpur Basti, Sant Kabir Nagar, Ghazipur, Mirzapur, Siddharth Nagar, Gonda, Varanasi, Baliya, Kanpur Dehat, Kanpur Nagar, Balrampur, Barreilly, Chandauli, Mau, Bahraich, Rampur, Mainpuri, Budaun, Kannauj, Farrukhabad, Etah, Shahajahanpur, Bulandsheher, Pilibhit, Firozabad, Moradabad, Etawah, Aligarh, Auraiya, Agra, Bijnor, Hathras, Gautam Budh Nagar, Muzaffarnagar, Saharnpur, Shamli	(3) Jhansi, Mahoba, Hamirpur	(32) Sultanpur, Amethi, Allahabad, Pratapgarh, Ambedkar Nagar, Sonbhadra, Banda, Barabanki, Faizabad , Rai Barreily, Sitapur, Gorakhpur, Fatehpur, Deoria, Kaushambi, Hardoi, Maharajganj, Sant Ravidas Nagar, Lucknow, Unnao, Kasganj, Kheri, Khusinagar, Shrawasti, Chitrakoot, Merrut, Sambhal, Amroha, Hapur, Baghpat, Ghaziabad, Mathura

Crop/Season	State Avg. Yield	Highest/ Lowest Yield	Districts Above the State average		Districts below the State average	
			HAHP	LAHP	HALP	LALP
Lentil	749	Hathras (1594)/ Chitrakoot (412)	(8) Bahraich, Jalaun, Balrampur, Shahajahanpur, Lalit Pur, Baliya, Kheri, Gonda	(37) Ghazipur, Hardoi, Mirzapur, Budaun, Barreilly, Pilibhit, Lucknow, Etah, Kasganj, Aligarh, Rampur, Farrukhabad, Sambhal, Kanpur Nagar, Bijnor, Moradabad, Agra, Unnao, Merrut, Jaunpur, Hathras, Kanpur Dehat, Mau, Varanasi, Kannauj, Ghaziabad, Mainpuri, Azamgarh, Gautam Budh Nagar, Amroha, Rai Barreily, Baghpat, Shamli, Firozabad, Mathura, Auraiya, Etawah	(9) Hamirpur, Banda, Mahoba, Jhansi, Sitapur, Shravasti, Chitrakoot, Barabanki, Sonbhadra	(21) Allahabad, Chandauli, Maharajganj, Sultanpur, Khusinagar, Siddharth Nagar, Amethi, Basti, Saharnpur, Faizabad, Gorakhpur, Sant Kabir Nagar, Bulandsheher, Fatehpur, Deoria, Ambedkar Nagar, Muzaffar Nagar, Hapur, Kaushambi, Pratapgarh, Sant Ravidas Nagar

Crop/Season	State Avg. Yield	Highest/ Lowest Yield	Districts Above the State average		Districts below the State average	
			HAHP	LAHP	HALP	LALP
Urdbean	601	Moradabad (927), Banda (355)	(5) Lalitpur, Budaun, Sambhal, Sitapur	(32) Moradabad, Barreilly, Kanpur Dehat, Pratapgarh, Rampur, Amroha, Sonbhadra, Kheri, Bijnor, Bahraich, Etawah, Auraiya, Kaushambi, Farrukhabad, Muzaffar Nagar, Saharnpur, Mirzapur, Sant Ravidas Nagar, Baghpat, Shamli, Kannauj, Ghaziabad, Basti, Agra, Azamgarh, Hathras, Pilibhit, Gorakhpur, Baliya, Aligarh, Deoria, Mau	(6) Jhansi, Mahoba, Unnao, Hardoi, Hamirpur, Rai Barreily	(33) Barabanki, Shahajahanpur, Jalaun, Fatehpur, Kanpur Nagar, Lucknow, Jaunpur, Amethi, Banda, Faizabad , Varanasi, Sultanpur, Bulandsheher, Chitrakoot, Balrampur, Merrut, Kasganj, Allahabad , Etah, Hapur, Gonda, Ghazipur, Shrawasti, Firozabad, Mainpuri, Siddharth Nagar, Mathura, Chandauli, Ambedkar Nagar, Maharajganj, Khusinagar, Gautam Budh Nagar, Sant Kabir Nagar

Crop/ Season	State Avg. Yield	Highest/ Lowest Yield	Districts Above the State average		Districts below the State average	
			HAHP	LAHP	HALP	LALP
Gram	810	Agra (1764)/ Amroha (500)	(8) Fatehpur, Hamirpur, Hathras, Kanpur Dehat, Jalaun, Lalitpur, Kanpur Nagar, Mirzapur	(40) Sonbhadra, Kaushambi, Auraiya, Jaunpur, Pratapgarh, Azamgarh, Unnao, Ghaziabad, Baliya, Amethi, Varanasi, Ghazipur, Etawah, Ambedkar Nagar, Chandauli, Mau, Agra, Lucknow, Kannauj, Mainpuri, Barabanki, Sant Ravidas Nagar, Farrukhabad, Firozabad, Etah, Hardoi, Bahraich, Shravasti, Merrut Bulandsheher, Muzaffarnagar, Bijnor, Aligarh, Mathura, Saharnpur, Siddharth Nagar, Rampur, Baghpat, Shamli, Gautam Budh Nagar	(6) Banda, Mahoba, Jhansi, Chitrakoot, Gorakhpur, Allahabad	(20) Rai Barreilly, Sultanpur, Faizabad, Basti, Gonda, Sitapur, Balrampur, Sant Kabir Nagar, Deoria, Kheri, Shahajahanpur, Moradabad, Maharajganj, Kasganj, Budaun, Khusinagar, Barreilly, Sambhal, Pilibhit, Amroha

Crop/ Season	State Avg. Yield	Highest/ Lowest Yield	Districts Above the State average		Districts below the State average	
			HAHP	LAHP	HALP	LALP
Telangana						
Tur	520	Adilabad (743)/ Rangareddi (422)	(4)Adilabad, Nalgonda, Warangal, Karimnagar,	(1) Khammam	(3) Mahbubnagar, Rangareddi, Medak	Nizamabad
Mungbean	617	Rangareddi (787)/ Mahbubnaga r (472)	(5) Warangal, Medak, Khammam, Karimnagar, Rangareddi,		(4)Nalgonda, Adilabad, Mahbubnagar, Nizamabad	
Urdbean	739	Rangareddi (997)/ Nalgonda (425)	(3)Adilabad, Rangareddi, Karimnagar		(5)Medak, Nizamabad, Khammam, Waranga l, Mahbubnagar	(1)Nalgonda
Gram	1597	Nizamad (1887)/ Warangal (1127)	Mahbubnagar, Nizamabad	Nalgonda, Khammam	Adilabad, Medak, Rangareddi	Karimnagar, Warangal
Tamil Nadu						
Tur	730	Theni (1313)/ Thiruvanna malai (301)	(5) Krishnagiri, DharmapuriSalem , Madurai, Theni	(6) Tiruppur, Sivaganga, Tuticorin, Kanchipura m, Thiruvapur, Kanniya kumari	(2) Vellore, Karur	(16) Namakkal, Dindigul, Erode, Tiruvannamalai, Tiruchirappalli, Thiruvallur, Perambalur, Pudukkottai, Virudhunagar, Coimbatore, Ariyalur, Villupuram, Cuddalore, Tirunelveli, Thanjavur, Ramanathapuram

Crop/ Season	State Avg. Yield	Highest / Lowest Yield	Districts Above the State average	Districts below the State average		
			HAHP	LAHP	HALP	LALP
Mungbean	500	Cuddalore (887)/ Tuticorin (178)	(6) Thiruvarur, Nagapattinam, Ramanathapuram, Thiruvallur, Cuddalore, Sivaganga,	(10) Dharmapuri, Tiruvannamalai, Villupuram, Tiruchirappalli, Namakkal, Kanniyakumari, Perambalur, Salem, Ariyalur, Thanjavur	(5) Tuticorin, Madurai, Virudhunagar, Tirunelveli, Tiruppur	(9) Dindigul, Krishnagiri, Karur, Vellore, Coimbatore, Theni, Erode, Kanchipuram Pudukkottai,
Urdbean	595	Villupuram (849)/ Tuticorin (169)	(5) Cuddalore, Thiruvarur, Villupuram, Thanjavur, Tiruchirappalli	(17) Dindigul, Dharmapuri, Salem, Krishnagiri, Pudukkottai, Ariyalur, Karur, Namakkal, Kanchipuram, Thiruvallur, Coimbatore, Madurai, Kanniyakumari, Erode, Sivaganga, Theni, Perambalur	(4) Nagapattinam, Tuticorin, Tirunelveli, Tiruvannamalai	(4) Virudhunagar, Ramanathapuram, Vellore, Tiruppur
Gram	650	Parambalur (1000)/ Karur (161)	(2) Tiruppur, Coimbatore	(4) Tirunelveli, Thiruvallur, Perambalur, Ramanathapuram	(3) Dharmapuri, Dindigul, Vellore	(14) Salem, Namakkal, Karur, Virudhunagar, Theni, Madurai, Tiruchirappalli, Villupuram, Tuticorin, Sivaganga, Krishnagiri, Thanjavur, Pudukkottai, Tiruvannamalai

Crop/ Season	State Avg. Yield	Highest/ Lowest Yield	Districts Above the State average		Districts below the State average	
			HAHP	LAHP	HALP	LALP
Uttrakhand						
Tur	779	Haridwar (1000)/ Champawat (255)	(5) Tehri Garhwal, Uttar Kashi, Dehradun, Pauri Garhwal Rudra Prayag	(2) Udam Singh Nagar, Haridwar	(2) Chamoli, Champawat	(2) Pithoragarh, Almora, Nainital, Bageshwar
Mungbean	552	Nainital (1333)/ Udham Singh Nagar (535)	(1) Haridwar	(1) Nainital	(2) Udham Singh Nagar, Dehrudun	
Urdbean	787	Uttarkashi (1054)/ Bageshwar (564)	(4) Tehri Garhwal, Uttar Kashi, Pithoragarh, Chamoli	(7) Pauri Garhwal, Nainital, Almora, Dehradun, Champawat, Udam Singh Nagar, Rudra Prayag		(2) Bageshwar, Haridwar
Gram	821	Uttar Kashi (1000)/ Bageshwar (563)	(1) Nainital	(1) Uttar Kashi	(5) Pauri Garhwal, Almora, Dehradun, Champawat, Tehri Garhwal,	(5) Udam Singh Nagar, Pithoragarh, Bageshwar, Haridwar, Chamoli
Lentil	797	Champawat (927)/ Haridwar (591)	(4) Pithoragarh, Tehri Garhwal, Champawat, Uttar Kashi	(7) Bageshwar, Pauri Garhwal, Almora, Dehradun, Haridwar, Nainital, Udam Singh Nagar		(2) Chamauli, Rudraprayag
Peas & Beans	999	Udham Singh Nagar (1117)/ Almora (511)	(1) Udham Singh Nagar	(5) Uttar Kashi, Dehradun, Nainital, Tehri Garhwal, Pithoragarh		(7) Almora, Chamoli, Champawat, Pauri Garhwal, Haridwar, Bageshwar, Rudra Prayag

Source: Annual Report 2016-17, DPD, Bhopal

Recommendation

High area- High productivity	High area- Low productivity	Low area- High productivity	Low area- Low productivity
<ul style="list-style-type: none"> • Post harvest management • Value addition/Branding • Per unit cost in productivity • Yield gap, if any 	<ul style="list-style-type: none"> • Vertical expansion • Seed SSR/ VRR • Micro irrigation system /critical irrigation • Mechanization 	<ul style="list-style-type: none"> • Horizontal expansion • Intercropping. • Transplanting (Dharwad method). • Branding 	<ul style="list-style-type: none"> • Replacement of low yielding crop with high yielding. • Incorporation of pulses for sustainable cropping. • Strategy for crop diversification

6.3.2 YIELD GAP ANALYSIS: FLD (CROP-WISE)

The gap over state average yield and the likely additional return by way of bridging the yield gap is about Rs.12554/ha over the farmers practices and Rs.22119/ha over the state average yield. The additional return has been worked out on the basis of quantity under yield gap multiplied by the MSP in all crops, excluding field pea. The field pea, having no provision of MSP, has been calculated on the basis of ruling market price (@ Rs3500/ql). The details crop-wise yield gaps and additional return by bridging the yield gap is given as under and also under individual crops, state-wise, is indicated under *Table 23 and 23(a to f)*.

Table 18. CROP-WISE YIELD GAP AND ADDITIONAL RETURN*(Yield: Kg/ha; Return: Rs./ha.)*

Crop	Yield (kg/ha)			Gap over FP		Gap over SAY		Yield 2016-17 *	Additional return by bridging yield gap (Rs/ha)	
	IP	FP	SAY	Actual	%	Actual	%		FP	SAY
Pigeonpea	1394	1078	863	316	29	530	61	787	17373	29177
Chickpea	1502	1244	907	257	21	594	66	860	10296	23776
Rice fallow Chickpea	1275	960	976	315	33	299	31	772	13871	13145
Mungbean(Kh)	781	608	435	173	28	345	79	455	9682	19339
Mungbean(R)	1398	1228	704	170	14	694	99	508	9520	38864
Mungbean(RF)	960	723	532	237	33	428	80	434	13272	23968
Mungbean Summer/Spring	931	559	674	372	66	257	38	717	20832	14414
Urdbean (Kh)	813	622	368	191	31	445	121	614	10287	24019
Urdbean (R)	1203	986	774	217	22	429	55	788	12152	24024
Urdbean (RF)	1185	1002	774	183	18	411	53	788	10220	22988
Lentil	1289	966	777	323	33	512	66	756	12920	20480
Field pea	1225	933	904	292	31	321	36	827	10220	11235
Average	1163	909	724	254	30	439	65	692	12554	22119

*State Average Yield - E&S (Ave. 2011-12 to 2015-16) *Third Advance Estimates 2016-17**IP: Improved Practise FP: Farmers Practise SAY: State Avergae Yield*

Table 18. (a) STATE-WISE YIELD GAP AND ADDITIONAL RETURN: PIGEONPEA*(Yield: Kg/ha; Return: Rs./ha.)*

State	Yield (kg/ha)			Gap over FP		Gap over SAY		Yield 2016-17 *	Additional return by bridging yield gap (Rs/ha)	
	IP	FP	SAY	Actual	%	Actual	%		FP	SAY
AP	1953	1498	493	455	30	1460	296	376	25025	80300
Bihar	2082	1765	1669	317	18	413	25	1561	17435	22715
Gujarat	1442	1098	1092	344	31	350	32	1105	18902	19250
Haryana	1897	1530	1104	368	24	793	72	915	20222	43633
Jharkhand	1513	1192	987	322	27	526	53	1043	17692	28948
Karnataka	1017	812	557	205	25	460	83	713	11293	25318
MP	1336	1043	819	293	28	517	63	1133	16097	28417
Maharashtra	1189	930	692	259	28	497	72	906	14263	27335
Nagaland	1191	702	891	489	70	300	34	0	26895	16482
Punjab	1542	1282	944	260	20	598	63	825	14300	32890
Odisha	1236	888	880	348	39	356	40	848	19140	19553
Rajasthan	750	632	703	118	19	47	7	879	6490	2585
Telangana	1518	1112	457	407	37	1061	232	555	22367	58373
TN	965	808	940	157	19	25	3	745	8653	1393
Tripura	895	616	716	279	45	179	25	0	15345	9827
UP	1773	1339	867	434	32	906	104	994	23852	49812
Average	1394	1078	863	316	29	530	61	787	17373	29177

Table 18. (b) STATE-WISE YIELD GAP AND ADDITIONAL RETURN: CHICKPEA*(Yield: Kg/ha; Return: Rs./ha.)*

State	Yield (kg/ha)			Gap over FP		Gap over SAY		Yield 2016-17*	Additional return by bridging yield gap (Rs/ha)	
	IP	FP	SAY	Actual	%	Actual	%		FP	SAY
AP	1651	1553	1085	98	6	566	52	1107	3920	22640
Assam	1082	749	692	333	44	390	56	1000	13320	15600
Bihar	2063	1798	1159	265	15	904	78	986	10600	36160
Haryana	2135	1803	848	332	18	1287	152	810	13280	51480
UP	1518	1522	916	-4	0	602	66	1125	-160	24080
Maharashtra	1441	1125	752	316	28	689	92	869	12640	27560
Gujarat	1620	1379	1179	241	17	441	37	1235	9640	17640
Uttarakhand	2000	1552	868	448	29	1132	130	1000	17920	45280
Tamil Nadu	887	741	648	146	20	239	37	648	5840	9560
Rajasthan	1690	1446	842	244	17	848	101	930	9760	33920
Chhattisgarh	981	911	912	70	8	69	8	1027	2800	2760
Manipur	1142	814	895	328	40	247	28	0.0	13120	9880
MP	1432	1052	1100	380	36	332	30	1101	15200	13280
Karnataka	1459	1231	619	228	19	840	136	380	9120	33600
Punjab	1598	1453	1191	145	10	407	34	1300	5800	16280
J & K	794	619	558	175	28	236	42	0	7000	9440
WB	2033	1402	1157	631	45	876	76	1100	25240	35040
Average	1502	1244	907	257	21	594	66	860	10296	23776
Rice fallow chickpea										
Assam	1257	901	692	356	40	565	82	1000	14240	22600
Bihar	1346	1037	1159	309	30	187	16	986	12669	7667
Manipur	1298	950	895	348	37	403	45	0	14616	16926
West Bengal	1198	950	1157	248	26	41	4	1100	10664	1763
Average	1275	960	976	315	33	299	31	772	13871	13145

Table 18. (c) STATE-WISE YIELD GAP AND ADDITIONAL RETURN: MUNGBEAN*(Yield: Kg/ha; Return: Rs./ha.)*

State	Yield (kg/ha)			Gap over FP		Gap over SAY		Yield 2016-17*	Additional return by bridging yield gap (Rs/ha)	
	IP	FP	SAY	Actual	%	Actual	%		FP	SAY
Kharif										
Tripura	1016	782	513	234	30	503	98	0	13104	28168
Gujarat	766	606	501	160	26	265	53	457	8960	14840
Karnataka	655	563	214	92	16	441	206	276	5152	24696
Maharashtra	546	430	418	116	27	128	31	522	6496	7168
Rajasthan	773	600	436	173	29	337	77	475	9688	18872
Tamil Nadu	1000	796	588	204	26	412	70	714	11424	23072
Manipur	642	479	0.00	163	34	642	0	-	9128	35952
WB	1229	915	838	314	34	391	47	727	17584	21896
Average	781	608	435	173	28	345	79	455	9682	19339
Rabi										
AP	1398	1228	704	170	14	694	99	508	9520	38864
Rice fallow										
AP	1094	947	704	147	16	390	55	508	8232	21840
Odisha	825	498	359	327	66	466	130	359	18312	26096
Average	960	723	532	237	33	428	80	434	13272	23968
Summer/Spring Mungbean										
Bihar	939	735	603	204	28	336	56	548	11424	18816
Uttar Pradesh	1176	953	709	223	23	467	66	631	12488	26152
Haryana	524	487	576	37	8	-52	-9	735	2072	-2912
Punjab	1143	0.00	857	1143	0	286	33	986	64008	16016
Assam	875	622	624	253	41	251	40	686	14168	14056
Average	931	559	674	372	66	257	38	717	20832	14414

Table 18. (d) STATE-WISE YIELD GAP AND ADDITIONAL RETURN: URDBEAN

(Yield: Kg/ha; Return: Rs./ha.)

State	Yield (kg/ha)			Gap over FP		Gap over SAY		Yield 2016-17*	Additional return by bridging yield gap (Rs/ha)	
	IP	FP	SAY	Actual	%	Actual	%		FP	SAY
Kharif										
Assam	868	701	0	167	24	868	0	-	9018	46872
J&K	576	403	358	173	43	218	61	-	9342	11772
Tamil Nadu	907	724	781	183	25	126	16	713	9882	6804
Karnataka	795	672	386	123	18	409	106	494	6642	22086
M.P.	570	393	475	177	45	95	20	660	9558	5130
Maharashtra	668	535	506	133	25	162	32	562	7182	8748
UP	1060	700	536	360	51	524	98	539	19440	28296
West Bengal	1196	927	622	269	29	574	92	692	14526	30996
Manipur	613	466	0.00	147	32	613	-	-	7938	33102
Rajasthan	875	702	474	173	25	401	85	641	9342	21654
Average	813	622	368	191	31	445	121	614	10287	24019
Rabi										
AP	1437	1188	831	249	21	606	73	922	13446	32724
Tamil Nadu	969	784	716	185	24	253	35	654	10175	13915
Average	1203	986	774	217	22	429	55	788	12152	24024
Rabi & rice fallow										
Tamil Nadu	927	764	716	163	21	211	29	848	8802	11394
AP	1442	1240	831	202	16	611	74	728	11110	33605
Average	1185	1002	774	183	18	411	53	788	10220	22988

Table 18. (e) STATE-WISE YIELD GAP AND ADDITIONAL RETURN: LENTIL*(Yield: Kg/ha; Return: Rs./ha.)*

State	Yield (kg/ha)			Gap over FP		Gap over SPY		Yield 2016-17*	Additional return by bridging yield gap (Rs/ha)	
	IP	FP	SAY	Actual	%	Actual	%		FP	SAY
Assam	1013	770	668	243	32	345	52	693	9720	13800
HP	642	396	567	246	62	75	13	263	9840	3000
Jharkhand	670	520	911	150	29	-241	-26	768	6000	-9640
Bihar	1805	1295	1068	510	39	737	69	932	20400	29480
Chhattisgarh	644	465	378	179	38	266	70	331	7160	10640
M.P.	918	721	594	197	27	324	55	719	7880	12960
Rajasthan	1788	1443	942	345	24	846	90	859	13800	33840
UP	1369	1112	755	257	23	614	81	710	10280	24560
Tripura	933	712	690	221	31	243	35	-	8840	9720
West Bengal	1899	1254	922	645	51	977	106	985	25800	39080
Average	1289	966	777	323	33	512	66	756	12920	20480

Table 18. (f) STATE-WISE YIELD GAP AND ADDITIONAL RETURN: FIELD PEA*(Yield: Kg/ha; Return: Rs./ha.)*

State	Yield (kg/ha)			Gap over FP		Gap over SAY		Yield 2016-17*	Additional return by bridging yield gap (Rs/ha)	
	IP	FP	SAY	Actual	%	Actual	%		FP	SAY
Assam	1205	960	782	245	26	423	54	782	8575	14805
Bihar	1805	1256	993	549	44	812	82	1053	19215	28420
Chhattisgarh	764	586	419	178	30	345	82	381	6230	12075
J&K	1164	942	831	222	24	333	40	-	7770	11655
Jharkhand	1284	964	1188	320	33	96	8	766	11200	3360
Manipur	784	582	936	202	35	-152	-16	940	7070	-5320
Tripura	1420	1390	850	30	2	570	67	-	1050	19950
UP	1628	1278	1110	350	27	518	47	997	12250	18130
Average	1225	933	904	292	31	321	36	827	10220	11235

*State Average Yield - E&S (Ave. 2011-12 to 2015-16) *Third Advance Estimates 2016-17**IP: Improved Practise FP: Farmers Practise SAY: State Average Yield*

6.4 EMPHASIS ON IMPROVEMENT IN TOTAL FACTOR PRODUCTIVITY

Total factor productivity is an important source of output growth which directly contributes to cost saving and the increase in income. Input use efficiency need to be improved. Some recent development initiatives taken by the Govt. aims at raising output and reduction in the cost of production. These development initiatives include PMKSY, SHCs, PKVY, PMFBY etc.

6.4.1 Precision Agriculture

Precision agriculture, farming by soil, site-specific management (SSM).Involves site-specific management, depending on the ability to collect and control information to accurately and appropriately address parts of field for actual and specific needs rather than whole field for average needs.

- It is an integrated agricultural management system, involving right amount of input at the right location and right time to enhance production, decrease input cost, improve quality of the product, and/or protect the environment.
- The technological tools often include the *global positioning system, geographical information system, yield monitor, variable rate technology, and remote sensing*
- The major philosophy of precision farming is: Find ways to reduce cost of cultivation/energy input;Use inputs appropriate to the productive capacity of the soil; Optimise outputs for safe and stable supply of food; Ability to handle variations in productivity within a field and to maximize financial returns; Reduce wastages; Minimize negative impacts on the environment.

6.4.2 Importance of Precision Farm Machinery

- Increased production/productivity - 10-15%
- Higher cropping intensity - 5-20%
- Savings in seeds - 15-20%
- Saving in fertilizer/chemicals - 15-20%
- Reduction in time/labour - 20-30% .

6.4.3 Effect of protective irrigation on yield of various crops

Crop and Irrigation	No. of protective irrigation	Yield (q/ha)		Increase Over rainfed (%)	WUE (Kg/ha/mm)	
		Rainfed	Irrigated		Rainfed	Irrigated
Pigeonpea	01	8.00	12.00	50.00	1.25	1.73
Greengram	01	5.00	11.25	125.00	0.78	1.63
Chickpea	01	5.00	9.50	90.00	0.78	1.48

Source: Annual report -2016-17, DPD, Bhopal

6.5 Policy for improving terms of trade for farmers

Doubling of farmers' income should not be viewed as same as doubling of farm output. The policy needed to ensure the market stability and remunerative prices of farm output, especially perishable and pulse crops.

6.5.1 Comparative statement of MSP & cost of production

The analysis of average gap between Minimum Support Price and cost of production of pulse crops during 2012-13 to 2014-15 reveals that the MSPs are above the cost of production in Arhar, Urdbean and Gram, however, less in Mungbean and lentil. It is pertinent to mention here that the cost of production vary from state to state, depending on cost of cultivation and productivity level of particular states. The detailed analysis under individual crops, state-wise, is indicated under *Table 24 and 24 (a to e)*.

Table 19. COMPARATIVE STATEMENT OF MSP & COST OF PRODUCTION

Crops	(Rs/quintal)											
	2012-13			2013-14			2014-15			Average		
	CP	MSP	+ -	CP	MSP	+ -	CP	MSP	+ -	CP	MSP	+ -
Arhar	3428	3850	422	3529	4300	771	5237	4350	-887	3847	4167	320
Mungbean	4832	4400	258	5257	4500	-6	6864	4600	-1283	4844	4500	-344
Urdbean	3614	4300	686	4310	4300	-10	4485	4350	426	3949	4317	367
Gram	2971	3000	326	3058	3100	348	3183	3175	-8	2870	3092	222
Lentil	2555	2900	345	3289	2900	-389	3839	3075	-764	3228	2958	-269

Table 19 (a) COMPARATIVE STATEMENT OF MSP & COST OF PRODUCTION-ARHAR

States	(Rs/quintal)											
	2012-13			2013-14			2014-15			Average		
	CP	MSP	+ -	CP	MSP	+ -	CP	MSP	+ -	CP	MSP	+ -
AP	4484	3850	-634	4701	4300	-401	6431	4350	-2081	5205	4167	-1039
Bihar	1759	3850	2091	1470	4300	2830		4350		1076	4167	3090
Guj.	3747	3850	103	3889	4300	411	4585	4350	-235	4074	4167	93
MP	2814	3850	1036	2830	4300	1470	4569	4350	-219	3404	4167	763
Kar	3102	3850	749	3058	4300	1242	4097	4350	253	3419	4167	748
MH	3102	3850	748	2982	4300	1318	5715	4350	-1365	3933	4167	234
Orissa	4314	3850	-464	4553	4300	-253	7076	4350	-2726	5314	4167	-1148
UP	4105	3850	-255	4751	4300	-451	4184	4350	166	4347	4167	-180
Avg.	3428	3850	422	3529	4300	771	5237	4350	-887	3847	4167	320

Table 19 (b) COMPARATIVE STATEMENT OF MSP & COST OF PRODUCTION -MUNG

States	2012-13			2013-14			2014-15			(Rs/quintal) Average		
	CP	MSP	+ -	CP	MSP	+ -	CP	MSP	+ -	CP	MSP	+ -
AP	4608	4400	-208	4328	4500	172	4656	4600	-56	4530	4500	-30
Gujarat		4400	4400		4500	4500	11264	4600	-6664	3755	4500	745
Kar	4437	4400	-37	3699	4500	801	6094	4600	-1494	4744	4500	-244
MH	4762	4400	-362	7817	4500	-3317	8099	4600	-3499	6892	4500	-2392
Orissa	4856	4400	-456	5183	4500	-683	5690	4600	-1090	5243	4500	-743
Raj	5639	4400	-1239	5989	4500	-1489	5378	4600	-778	5669	4500	-1169
TN	4690	4400	-290	4526	4500	-26		4600	4600	3072	4500	1428
Avg.	4832	4400	258	5257	4500	-6	6864	4600	-1283	4844	4500	-344

Table 19 (c) COMPARATIVE STATEMENT OF MSP & COST OF PRODUCTION- URD

State	2012-13			2013-14			2014-15			(Rs/quintal) Average		
	CP	MSP	+ -	CP	MSP	+ -	CP	MSP	+ -	CP	MSP	+ -
AP	3056	4300	1244	3165	4300	1135	3394	4350	956	3205	4317	1112
CG	1884	4300	2416	2594	4300	1706	3395	4350	955	2624	4317	1692
MP	2353	4300	1947	4363	4300	-63	3504	4350	846	3407	4317	910
MH	4413	4300	-113	4875	4300	-575	6107	4350	-1757	5131	4317	-815
Orissa	4548	4300	-248	4894	4300	-594	5791	4350	-1441	5078	4317	-761
Raj	3262	4300	1038	5393	4300	-1093		4350	4350	2885	4317	1432
TN	5224	4300	-924	4404	4300	-104	4447	4350	-97	4692	4317	-375
UP	4173	4300	127	4791	4300	-491	4756	4350	-406	4573	4317	-257
Avg.	3614	4300	686	4310	4300	-10	4485	4350	426	3949	4317	367

**Table 19 (d) COMPARATIVE STATEMENT OF MSP & COST OF PRODUCTION -
GRAM**

State	2012-13			2013-14			2014-15			(Rs/quintal) Average		
	CP	MSP	+ -	CP	MSP	+ -	CP	MSP	+ -	CP	MSP	+ -
AP	2985	3000	15	3094	3100	6	3106	3175	69	3062	3092	30
Bihar	3448	3000	-448	2452	3100	648	2390	3175	785	2763	3092	328
CG	2541	3000	459	3002	3100	98	3114	3175	61	2886	3092	206
HR	2830	3000	170	3346	3100	-246	3313	3175	-138	3163	3092	-71
JH		3000	3000		3100	3100	1631	3175	1544	544	3092	2548
KAR	3815	3000	-815	2507	3100	593	2989	3175	186	3104	3092	-12
MP	2715	3000	285	2946	3100	154	2916	3175	259	2859	3092	233
MH	2965	3000	35	2777	3100	323	3419	3175	-244	3054	3092	38
Raj	2393	3000	607	2192	3100	908	3443	3175	-268	2676	3092	416
UP	3048	3000	-48	5206	3100	2106	5507	3175	2332	4587	3092	-1496
Avg.	2971	3000	326	3058	3100	348	3183	3175	-8	2870	3092	222

**Table 19 (e) COMPARATIVE STATEMENT OF MSP & COST OF PRODUCTION -
LENTIL**

State	2012-13			2013-14			2014-15			(Rs/quintal) Average		
	CP	MSP	+ -	CP	MSP	+ -	CP	MSP	+ -	CP	MSP	+ -
Bihar	2662	2900	238	2278	2900	622	2400	3075	675	2447	2958	512
MP	2361	2900	540	3375	2900	-475	3575	3075	-500	3104	2958	-145
UP	2518	2900	382	3624	2900	-724	6851	3075	-3776	4331	2958	-1373
WB	2680	2900	220	3877	2900	-977	2529	3075	546	3029	2958	-70
Avg.	2555	2900	345	3289	2900	-389	3839	3075	-764	3228	2958	-269

Source: CACP, Min. of Agri & FW, GOI; CP-Cost of Production; MSP-Minimum Support Price

6.5.2 Economics of processing of pulses

To know the economics of processed/ value added pulses, discussed with the Dal Millers to *know percentage of Dal recovery and waste by- products as “broken grain and cattle feed” and also their market value*. The per quintal cost of whole grain has been considered as per MSP, subject to market rates at par or ruling below MSP. For Non- MSP pulses, the market rates have been considered.

The Net Return to a Dal Miller under six pulses after deductions of processing expanses and profit accrued over whole pulse grain due to value addition is at **Annex-B**.

It is revealed that the value addition through processing in various pulses range between 7 to 35 per cent from whole grain to dal. In pigeon pea 14 %, Lentil 10 %, Mung bean 6 %, Urd bean 35 %, Chickpea 11 % and Pea 14 %. Further more from dal to gram besan it is 18 % (total value addition 29 %) while for pea besan (Yellow Dal besan) it is 7 % (total value addition 21 %).

6.5.3 Household consumption of Pulses in India (as per NSSO 68th Round July 2011-June 2012)

The report of the consumption of pulses has been published in June, 2014 by MoSPI. This report is based on the information collected during 2011-12 from 101651 households in 7469 villages and 5268 urban blocks spread over entire country.

- For the pulses and pulse products group as a whole, per capita consumption rose by 77-78 g between 2004-05 and 2011-2012- from 705 g per month to 783 g in the rural sector and from 824 g to 901 g in the urban sector. Of this rise, however, as much as 69 g in the rural sector and 57 g in the urban sector was contributed by the four items split gram, whole gram, pea and *besan*.
- The four pulses arhar, mung, masur and urd- which is 2011-12 together made up about 64% of consumption of pulses products in rural India and 68 % in urban India- registered a total increase in monthly per capita consumption of only 14 g in the rural sector and 18 g in the urban sector over this 7-year period.
- Arhar (Tur) accounted for as much as 27% of pulse consumption in rural areas and 33% in urban areas. Mung and masur together contributed 26% in rural and 23 % in urban areas, the share of mung being greater in urban India. Split gram contributed about 10% in each sector. Products of pulses and gram had a total share of 9 % in rural and 11 % in urban areas. While whole gram had a share of 5% in both sectors, the share of peas was markedly higher in rural (7%) than in urban India.

Table 20. DETAILS OF CONSUMPTION OF SELECTED PULSES AND PULSE PRODUCTS, ALL INDIA

Pulse/pulse products	Per capita consumption in 30 days				% of consuming hhs (in 30 days)	
	R	U	R	U	R	U
Arhar, Tur	212	301	12.94	19.47	59.60	74.10
Gram: split	79	85	3.57	4.10	39.90	46.60
Gram: Whole	40	45	1.66	2.22	20.70	25.90
Mung	91	117	5.78	8.15	45.60	60.00
Masur	112	93	5.86	5.20	41.01	38.00
Urd	84	98	4.73	6.10	38.90	44.70
Peas	52	23	1.58	0.87	14.90	11.90
Besan	50	75	2.39	3.73	34.70	45.10
All pulses & products	783	901	41.58	53.66	98.10	92.50

*Source: NSSO 68th Round July 2011-June 2012. *R- Rural, U- Urban*

6.6 INCREASING SRR OF IMPROVED/RECOMMENDED VARIETIES

Seed is very important input for increasing the productivity of pulses. Increased production/productivity by 20-30% has been reported with improved /quality seeds.

Non- availability of quality seeds in adequate quantity is one of the major constraints in pulse production. The existing SRR under pulses are only 15-20%, may be enhanced to 42%.

Crop-wise requirement of certified seed, foundation seed and breeder seed up till 2022, as worked out are given below and also crop-wise and state-wise requirement of certified seed, foundation seed and breeder seed is indicated under *Table 26 & 26 (a) to (j)*:

Table 21. REQUIREMENT OF SEED UNDER DIFFERENT CATEGORIES (2018-19 TO 2021-22)
(Quantity in Qtl.)

Crop	Normal Area	Certified seed				Foundation seed				Breeder seed			
		2018-19 (36%)	2019-20 (38%)	2020-21 (40%)	2021-22 (42%)	2018-19	2019-20	2020-21	2021-22	2018-19	2019-20	2020-21	2021-22
Arhar	39.25	282.6	298.3	314.0	329.7	7.1	7.5	7.9	8.2	5.7	6.0	6.3	6.6
Urdbean	24.80	178.6	188.5	198.4	208.3	6.0	6.3	6.6	6.9	8.9	9.4	9.9	10.4
Mungbean	23.60	169.9	179.4	188.8	198.3	5.7	6.0	6.3	6.6	8.5	9.0	9.4	9.9
Other Kharif	18.14	130.6	137.9	145.1	152.4	4.4	4.6	4.8	5.1	6.5	6.9	7.3	7.6
Tot. Kharif	105.79	761.7	804.1	846.3	888.7	23.2	24.4	25.6	26.8	29.6	31.3	32.9	34.5
Gram	86.80	875.8	924.5	973.1	1021.8	58.4	61.6	64.9	68.1	87.6	92.5	97.3	102.2
Lentil	14.14	127.3	134.3	141.4	148.5	4.2	4.5	4.7	5.0	6.4	6.7	7.1	7.4
Fieldpea	9.93	357.5	377.3	397.2	417.1	23.8	25.2	26.5	27.8	35.8	37.7	39.7	41.7
Urdbean	7.85	56.5	59.7	62.8	65.9	1.9	2.0	2.1	2.2	2.8	3.0	3.1	3.3
Mungbean	9.26	66.7	70.4	74.1	77.8	2.2	2.4	2.5	2.6	3.3	3.5	3.7	3.9
Other Rabi	11.11	160.0	168.9	177.8	186.7	8.0	8.4	8.9	9.3	8.0	8.4	8.9	9.3
Total Rabi	139.09	1643.8	1735.1	1826.4	1917.8	98.5	104.1	109.6	115	143.9	151.8	159.8	167.8
Tot. Pulses	244.88	2405.5	2539.2	2672.7	2806.5	121.7	128.5	135.2	141.8	173.5	183.1	192.7	202.3

Table 21 (a) REQUIREMENT OF SEED UNDER DIFFERENT CATEGORIES (2018-19 TO 2021-22)-GRAM

(Quantity in Qtl.)

State	Normal Area	Certified seed				Foundation seed				Breeder seed			
		2018-19 (36%)	2019-20 (38%)	2020-21 (40%)	2021-22 (42%)	2018-19	2019-20	2020-21	2021-22	2018-19	2019-20	2020-21	2021-22
MP	30.41	875.8	924.5	973.1	1021.8	58.4	61.6	64.9	68.1	87.6	92.5	97.3	102.2
RAJ.	13.62	392.3	414.1	435.8	457.6	26.2	27.6	29.1	30.5	39.2	41.4	43.6	45.8
Mha	13.72	395.1	417.1	439.0	461.0	26.3	27.8	29.3	30.7	39.5	41.7	43.9	46.1
Kar.	10.15	292.3	308.6	324.8	341.0	19.5	20.6	21.7	22.7	29.2	30.9	32.5	34.1
AP	4.67	134.5	142.0	149.4	156.9	9.0	9.5	10.0	10.5	13.5	14.2	14.9	15.7
UP	5.17	148.9	157.2	165.4	173.7	9.9	10.5	11.0	11.6	14.9	15.7	16.5	17.4
CG	2.74	78.9	83.3	87.7	92.1	5.3	5.6	5.9	6.1	7.9	8.3	8.8	9.2
Gujarat	1.87	53.9	56.9	59.8	62.8	3.6	3.8	4.0	4.2	5.4	5.7	6.0	6.3
Jhar.	1.49	42.9	45.3	47.7	50.1	2.9	3.0	3.2	3.3	4.3	4.5	4.8	5.0
Telan.	0.88	25.3	26.8	28.2	29.6	1.7	1.8	1.9	2.0	2.5	2.7	2.8	3.0
Bihar	0.60	17.3	18.2	19.2	20.2	1.2	1.2	1.3	1.3	1.7	1.8	1.9	2.0
Haryana	0.63	18.1	19.2	20.2	21.2	1.2	1.3	1.3	1.4	1.8	1.9	2.0	2.1
Odisha	0.43	12.4	13.1	13.8	14.5	0.8	0.9	0.9	1.0	1.2	1.3	1.4	1.4
WB	0.26	7.5	7.9	8.3	8.7	0.5	0.5	0.6	0.6	0.8	0.8	0.8	0.9
Other	0.16	4.6	4.9	5.1	5.4	0.3	0.3	0.3	0.4	0.5	0.5	0.5	0.5
TOTAL	86.80	875.8	924.5	973.1	1021.8	58.4	61.6	64.9	68.1	87.6	92.5	97.3	102.2

Table 21 (b) REQUIREMENT OF SEED UNDER DIFFERENT CATEGORIES (2018-19 to 2021-22)
LENTIL

(Quantity in Qtl.)

State	Normal Area	Certified seed				Foundation seed				Breeder seed			
		2018-19 (36%)	2019-20 (38%)	2020-21 (40%)	2021-22 (42%)	2018-19	2019-20	2020-21	2021-22	2018-19	2019-20	2020-21	2021-22
MP	5.76	51.8	54.7	57.6	60.5	1.7	1.8	1.9	2.0	2.6	2.7	2.9	3.0
UP	4.58	41.2	43.5	45.8	48.1	1.4	1.5	1.5	1.6	2.1	2.2	2.3	2.4
Bihar	1.66	14.9	15.8	16.6	17.4	0.5	0.5	0.6	0.6	0.8	0.8	0.8	0.9
WB	0.70	6.3	6.7	7.0	7.4	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.4
Raj	0.42	3.8	4.0	4.2	4.4	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2
Jhar.	0.38	3.4	3.6	3.8	4.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2
Assam	0.28	2.5	2.7	2.8	2.9	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
CG	0.15	1.4	1.4	1.5	1.6	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Others	0.21	1.9	2.0	2.1	2.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
TOTAL	14.14	127.3	134.3	141.4	148.5	4.2	4.5	4.7	5.0	6.4	6.7	7.1	7.4

Table 21 (c) REQUIREMENT OF SEED UNDER DIFFERENT CATEGORIES (2018-19 TO 2021-22)-
FIELDPEA

(Quantity in Qtl.)

State	Normal Area	Certified seed				Foundation seed				Breeder seed			
		2018-19 (36%)	2019-20 (38%)	2020-21 (40%)	2021-22 (42%)	2018-19	2019-20	2020-21	2021-22	2018-19	2019-20	2020-21	2021-22
UP	3.38	121.7	128.4	135.2	142.0	8.1	8.6	9.0	9.5	12.2	12.8	13.5	14.2
MP	3.31	119.2	125.8	132.4	139.0	7.9	8.4	8.8	9.3	11.9	12.6	13.2	13.9
Odisha	1.35	48.6	51.3	54.0	56.7	3.2	3.4	3.6	3.8	4.9	5.1	5.4	5.7
Jhar.	0.35	12.6	13.3	14.0	14.7	0.8	0.9	0.9	1.0	1.3	1.3	1.4	1.5
Mha.	0.27	9.7	10.3	10.8	11.3	0.7	0.7	0.7	0.8	1.0	1.0	1.1	1.1
Assam	0.26	9.4	9.9	10.4	10.9	0.6	0.7	0.7	0.7	0.9	1.0	1.0	1.1
Bihar	0.19	6.8	7.2	7.6	8.0	0.5	0.5	0.5	0.5	0.7	0.7	0.8	0.8
Manipur	0.18	6.5	6.8	7.2	7.6	0.4	0.5	0.5	0.5	0.7	0.7	0.7	0.8
CG	0.15	5.4	5.7	6.0	6.3	0.4	0.4	0.4	0.4	0.5	0.6	0.6	0.6
Others	0.48	17.3	18.2	19.2	20.2	1.2	1.2	1.3	1.3	1.7	1.8	1.9	2.0
TOTAL	9.93	357.5	377.3	397.2	417.1	23.8	25.2	26.5	27.8	35.8	37.7	39.7	41.7

Table 21. (d) REQUIREMENT OF SEED UNDER DIFFERENT CATEGORIES (2018-19 TO 2021-22)-RABIURD
(Quantity in Qtl.)

State	Normal Area	Certified seed				Foundation seed				Breeder seed			
		2018-19 (36%)	2019-20 (38%)	2020-21 (40%)	2021-22 (42%)	2018-19	2019-20	2020-21	2021-22	2018-19	2019-20	2020-21	2021-22
AP	3.56	25.6	27.1	28.5	29.9	0.9	0.9	1.0	1.0	1.3	1.4	1.4	1.5
TN	2.73	19.7	20.8	21.8	22.9	0.7	0.7	0.7	0.8	1.0	1.0	1.1	1.2
Assam	0.50	3.6	3.8	4.0	4.2	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2
UP	0.46	3.3	3.5	3.7	3.9	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2
WB	0.12	0.9	0.9	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
Telana.	0.15	1.1	1.1	1.2	1.3	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
MP	0.11	0.8	0.8	0.9	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Kar.	0.08	0.6	0.6	0.6	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Odisha	0.05	0.4	0.4	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gujarat	0.03	0.2	0.2	0.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Others	0.08	0.6	0.6	0.6	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	7.85	56.5	59.7	62.8	65.9	1.9	2.0	2.1	2.2	2.8	3.0	3.1	3.3

Table 21 (e) REQUIREMENT OF SEED UNDER DIFFERENT CATEGORIES (2018-19 -2021-22)-RABI MUNG

(Quantity in Qtl.)

State	Normal Area	Certified seed				Foundation seed				Breeder seed			
		2018-19 (36%)	2019-20 (38%)	2020-21 (40%)	2021-22 (42%)	2018-19	2019-20	2020-21	2021-22	2018-19	2019-20	2020-21	2021-22
TN	1.61	11.6	12.2	12.9	13.5	0.4	0.4	0.4	0.5	0.6	0.6	0.6	0.7
AP	1.33	9.6	10.1	10.6	11.2	0.3	0.3	0.4	0.4	0.5	0.5	0.5	0.6
Bihar	1.51	10.9	11.5	12.1	12.7	0.4	0.4	0.4	0.4	0.5	0.6	0.6	0.6
Odisha	1.64	11.8	12.5	13.1	13.8	0.4	0.4	0.4	0.5	0.6	0.6	0.7	0.7
MP	0.88	6.3	6.7	7.0	7.4	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.4
UP	0.46	3.3	3.5	3.7	3.9	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2
Punjab	0.36	2.6	2.7	2.9	3.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
Haryana	0.53	3.8	4.0	4.2	4.5	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2
Gujarat	0.41	3.0	3.1	3.3	3.4	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2
Others	0.53	3.8	4.0	4.2	4.5	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2
Total	9.26	66.70	70.40	74.10	77.80	2.20	2.40	2.50	2.60	3.30	3.50	3.70	3.90

**Table 21 (f) REQUIREMENT OF SEED UNDER DIFFERENT CATOGERIES (2018-19 TO 2021-22)
OTHERS RABI INCLUDING LATHYRUS AND KULTHI**

(Quantity in Qtl.)

State	Normal Area	Certified seed				Foundation seed				Breeder seed			
		2018-19 (36%)	2019-20 (38%)	2020-21 (40%)	2021-22 (42%)	2018-19	2019-20	2020-21	2021-22	2018-19	2019-20	2020-21	2021-22
CG	3.53	50.9	53.7	56.5	59.4	2.5	2.7	2.8	3.0	2.5	2.7	2.8	3.0
Kar	1.48	21.4	22.6	23.7	24.9	1.1	1.1	1.2	1.3	1.1	1.1	1.2	1.3
Odisha	1.29	18.5	19.6	20.6	21.6	0.9	1.0	1.0	1.1	0.9	1.0	1.0	1.1
Mha	0.95	13.7	14.4	15.2	16.0	0.7	0.7	0.8	0.8	0.7	0.7	0.8	0.8
Bihar	0.74	10.7	11.3	11.8	12.4	0.5	0.6	0.6	0.6	0.5	0.6	0.6	0.6
TN	0.72	10.3	10.9	11.5	12.1	0.5	0.5	0.6	0.6	0.5	0.5	0.6	0.6
MP	0.49	7.1	7.5	7.9	8.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
AP	0.38	5.5	5.8	6.1	6.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
WB	0.32	4.6	4.9	5.1	5.4	0.2	0.2	0.3	0.3	0.2	0.2	0.3	0.3
Gujarat	0.24	3.5	3.7	3.9	4.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Naga.	0.18	2.6	2.8	2.9	3.1	0.1	0.1	0.2	0.2	0.1	0.1	0.2	0.2
Assam	0.15	2.2	2.3	2.4	2.5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Telan.	0.13	1.9	2.0	2.1	2.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Others	0.50	7.1	7.5	7.9	8.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
TOTAL	11.11	160.0	168.9	177.8	186.7	8.0	8.4	8.9	9.3	8.0	8.4	8.9	9.3

Table 21 (g) REQUIREMENT OF SEED UNDER DIFFERENT CATEGORIES (2018-19 TO 2021-22) -ARHAR

(Quantity in Qtl.)

State	Normal Area	Certified seed				Foundation seed				Breeder seed			
		2018-19 (36%)	2019-20 (38%)	2020-21 (40%)	2021-22 (42%)	2018-19	2019-20	2020-21	2021-22	2018-19	2019-20	2020-21	2021-22
Mha	12.00	86.4	91.2	96.0	100.8	2.2	2.3	2.4	2.5	1.7	1.8	1.9	2.0
Kar	7.27	52.3	55.3	58.2	61.1	1.3	1.4	1.5	1.5	1.1	1.1	1.2	1.2
MP	5.26	37.9	40.0	42.1	44.2	1.0	1.0	1.1	1.1	0.8	0.8	0.8	0.9
GJ.	2.25	16.2	17.1	18.0	18.9	0.4	0.4	0.5	0.5	0.3	0.3	0.4	0.4
UP	2.97	21.4	22.6	23.8	25.0	0.5	0.6	0.6	0.6	0.4	0.5	0.5	0.5
Telan.	2.61	18.8	19.8	20.9	21.9	0.5	0.5	0.5	0.6	0.4	0.4	0.4	0.4
Jhar	1.80	13.0	13.7	14.4	15.1	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.3
AP	1.88	13.5	14.3	15.0	15.8	0.3	0.4	0.4	0.4	0.3	0.3	0.3	0.3
Odisha	1.40	10.1	10.6	11.2	11.8	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2
CG	0.55	4.0	4.2	4.4	4.6	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
TN	0.53	3.8	4.0	4.2	4.5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Bihar	0.22	1.6	1.7	1.8	1.9	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Other	0.51	3.7	3.9	4.1	4.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
TOTAL	39.25	282.6	298.3	314.0	329.7	7.1	7.5	7.9	8.2	5.7	6.0	6.3	6.6

Table 21. (h) REQUIREMENT OF SEED UNDER DIFF.CATOGERIES (2018-19 TO 2021-22)- KHARIF URD
(Quantity in Qtl.)

State	Normal Area	Certified seed				Foundation seed				Breeder seed			
		2018-19 (36%)	2019-20 (38%)	2020-21 (40%)	2021-22 (42%)	2018-19	2019-20	2020-21	2021-22	2018-19	2019-20	2020-21	2021-22
UP	5.23	37.7	39.8	41.8	43.9	1.3	1.3	1.4	1.5	1.9	2.0	2.1	2.2
MP	7.15	51.5	54.3	57.2	60.1	1.7	1.8	1.9	2.0	2.6	2.7	2.9	3.0
Maha.	3.24	23.3	24.6	25.9	27.2	0.8	0.8	0.9	0.9	1.2	1.2	1.3	1.4
Raj	2.34	16.9	17.8	18.7	19.7	0.6	0.6	0.6	0.7	0.8	0.9	0.9	1.0
Jhar.	0.94	6.8	7.1	7.5	7.9	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.4
Gujarat	0.81	5.8	6.2	6.5	6.8	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3
TN	0.57	4.1	4.3	4.6	4.8	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2
Kar.	0.85	6.1	6.5	6.8	7.1	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.4
WB	0.64	4.6	4.9	5.1	5.4	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3
Odisha	0.88	6.3	6.7	7.0	7.4	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.4
Others	2.15	15.5	16.3	17.2	18.1	0.5	0.5	0.6	0.6	0.8	0.8	0.9	0.9
TOTAL	24.80	178.6	188.5	198.4	208.3	6.0	6.3	6.6	6.9	8.9	9.4	9.9	10.4

Table 21 (i) REQUIREMENT OF SEED UNDER DIFFERENT CATEGORIES (2018-19 TO 2021-22)
KHA.MUNG

(Quantity in Qtl.)

State	Normal Area	Certified seed				Foundation seed				Breeder seed			
		2018-19 (36%)	2019-20 (38%)	2020-21 (40%)	2021-22 (42%)	2018-19	2019-20	2020-21	2021-22	2018-19	2019-20	2020-21	2021-22
Raj	10.68	76.9	81.2	85.4	89.7	2.6	2.7	2.9	3.0	3.8	4.1	4.3	4.5
Mha	3.95	28.4	30.0	31.6	33.2	1.0	1.0	1.1	1.1	1.4	1.5	1.6	1.7
Kar.	2.73	19.7	20.8	21.8	22.9	0.7	0.7	0.7	0.8	1.0	1.0	1.1	1.2
Telan	1.10	7.9	8.4	8.8	9.2	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.5
Gujarat	1.21	8.7	9.2	9.7	10.2	0.3	0.3	0.3	0.3	0.4	0.5	0.5	0.5
MP	1.21	8.7	9.2	9.7	10.2	0.3	0.3	0.3	0.3	0.4	0.5	0.5	0.5
Odisha	1.03	7.4	7.8	8.2	8.7	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4
UP	0.40	2.9	3.0	3.2	3.4	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2
Others	1.29	9.3	9.8	10.3	10.8	0.3	0.3	0.3	0.4	0.5	0.5	0.5	0.5
TOTAL	23.60	169.9	179.4	188.8	198.3	5.7	6.0	6.3	6.6	8.5	9.0	9.4	9.9

**Table 21 (j) REQUIREMENT OF SEED UNDER DIFFERENT CATOGERIES (2018-19 TO 2021-22)
OTHERS KHARIF PULSES INCLUDING KULTHI**

(Quantity in Qtl.)

<i>State</i>	<i>Norm al Area</i>	<i>Certified seed</i>				<i>Foundation seed</i>				<i>Breeder seed</i>			
		2018-19 (36%)	2019- 20 (38%)	2020- 21 (40%)	2021- 22 (42%)	2018 -19	2019 -20	2020 -21	2021 -22	2018 -19	2019- 20	2020- 21	2021-22
Rajasthan	10.87	78.3	82.6	87.0	91.3	2.6	2.8	2.9	3.0	3.9	4.1	4.4	4.6
Karnataka	1.84	13.3	14.0	14.7	15.5	0.4	0.5	0.5	0.5	0.7	0.7	0.7	0.8
Odisha	1.14	8.2	8.7	9.1	9.6	0.3	0.3	0.3	0.3	0.4	0.4	0.5	0.5
Tamil Nadu	0.91	6.6	6.9	7.3	7.6	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.4
Maharashtra	0.91	6.6	6.9	7.3	7.6	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.4
Jharkhand	0.40	2.9	3.0	3.2	3.4	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2
Uttarakhand	0.27	1.9	2.1	2.2	2.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Gujarat	0.43	3.1	3.3	3.4	3.6	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2
Nagaland	0.14	1.0	1.1	1.1	1.2	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
Chhatttigarh	0.51	3.7	3.9	4.1	4.3	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2
Others	0.73	5.3	5.6	5.8	6.1	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3
TOTAL	18.14	130.6	137.9	145.1	152.4	4.4	4.6	4.8	5.1	6.5	6.9	7.3	7.6

6.7 BRIDGING THE YIELD GAPS- BY PLANTING IMPROVED/ RECOMMENDED VARIETIES

Table 22. VARIETIES FOR NORMAL AND RICE FALLOW AREAS

State	Crop	Variety	Sowing time/ Harvesting Time	Seed rate (kg/ha)
UP	Chickpea	Desi: BG- 256, Udai (KPG 59), Pusa 372, KWR-108, Gujarat, G-4, HK 2, GNG 1581, Rajas, Pusa 547, RSG 963, RSG-931, RSG 888, CSG-8962, DCP-92-3, GNG- 469, KWR-108, Pusa 362, Pusa 372, Pusa subhra, JG-16, Gujarat Gram 1, BGD 72, Pusa 391, Vijay, ICCV 10. Vallabh Kabuli Chana 1 (WCGK 2000-16), GNG 1958, GNG 1969, CSJ 515, GLK 28127 Kabuli: Pusa 1003, BG 1053, JGK 1, KAK 2, Subhra	Oct-Nov March-April	80-100
	Pigeonpea	Manak, Pusa 84, Pusa 33, Jagriti (ICPL-151), UPAS-120, Pusa 855 Bahar, Pusa 9, MAL 13, NDA 98-1 (NDA2), NDA 99-6 (NDA3), T 7, Narendra Arhar 1, Amar (KA 32-1), MA 6, Anand Grain Tur-2 (AGT-2), BDN-711 (BDN 2004-3), BR 6 183, C-28	June-July March-April	12-15
	Mungbean			
	Kharif	Pant Moong 2, Pant Moong 3, Narendra Moong 1, pant Moong 4, Pant Moong 5, KM 2195 (Swati), MH 421, BM 2003-2, SML 832	July-Aug Sep-Oct	15-20
	Spring /Summer	PDM 139, Pusa Vishal, Meha, pant Moong 5, TMB 37, HUM-16	Feb-March May	30-35
	Urdbean			
	Kharif	IPU 94-1 (Uttara), WBU 108, Narendra Urd 1, Pant U 35, Pant U 19, Pant U 30, Pant U 40, B.R.68, Pratap Urd 1 (KPU 07- 08), UH-1 (UH 04-06)	July-Aug Sep-Oct	15-20
	Spring	KU 92-1(Azad Urd 1), KU 300, PDU 1, T 9, Pant U 19, Narendra Urd 1	Feb-March May	30-35
	Lentil	Pant L 406, PL 639, Malika (K 75), Lens 4076, NDL-1, NDL-2, PL-62 (Sheri), Narendra Masoor 1, DPL 15 (Priya), PL-4, L 4147, IPL 81 (Noori), IPL-406, HUL 57, KLS 218, WBL 77, Pant L 4, Azad Masur-1, IPL- 316, VL Masoor -129, VL Masoor -133, VL Masoor -514	Oct- Nov March-April	50-60
	Fieldpea	Adarsh, Vikas, Prakash, Rachna, KPMR 400, KPMR 522, KFP 103, DMR 7, HFP 8909, VL Matar 3, Sapna, HUDP 15, Pant pea 42, VL 42, Hariyal, HFP-529, IPFD 10-12, HFP 715	Oct- Nov March-April	80-100
Bihar	Chickpea	Desi: BG 256, Udai (KPG-59), Pusa 372, KWR 108, Gujarat, G 4, HK 2, GNG 1958, GNG 1969, GJG 0809, CSJ 515, GLK 28127, Bidisha (BG 1084) (WBG 29) Kabuli: Pusa 1003	Oct-Nov March-April	80-100
	Pigeonpea	Bahar, Pusa 9, MAL 13, NDA 98-1 (NDA 2), NDA 99-6 (NDA 3), Birsa Arhar 1, Sharad (DA 11) MA 6, BR 6 183.	July March-April	12-15

	Mungbean			
	Kharif	Pant Moong 2, Pant Moong 4, Narendra Moong 1, Sunaina, PDM 139, MH2-15, HUM-1, IPM 2-3, MH 421	July-Aug Sep-Oct	15-20
	Spring/ Summer	PDM 139, Pusa vishal, Meha, Pant Moong 5, TMB 37, HUM- 16	Feb-March /May	30-35
	Urdbean			
	Kharif	IPU 94-1 (Uttara), Birsa Urd 1, Pant U 19, Pant U 30, Pant U 31, B.R.68	July-Aug Sep-Oct	15-20
	Spring	KU 92-1 (Azad urd 1), WBU- 109, Pant U-31,	Feb-March /May	30-35
	Lentil	Pant L-406, PL 639, Malika (K 75), Arun (PL-77-12), NDL 2, WBL-58, HUL-57, KLS 218, WBL 77, Azad Masur-1	Oct- Nov March- April	50-60
	Fieldpea	Rachna, HFP 4 (Aparna), HUDP 15, DDR 23, HFP 715,	Oct- Nov March- April	80- 100
Jharkhand	Chickpea	Desi: BG 256, Udai (KPG-59), Pusa 372, KWR 108, Gujarat, G 4, HK 2, GNG 1958, GNG 1969, GJG 0809, CSJ 515, GLK 28127, Bidisha (BG 1084) (WBG 29,Vallabh Kabuli Chana 1 (WCGK 2000-16) Kabuli: Pusa 1003	Oct- Nov March- April	80- 100
	Mungbean			
	Kharif	Pant Moong 2, Pant Moong 4, Narendra Moong 1, Sunaina, PDM 139, MH2-15, HUM-1, IPM 2-3, MH 421	July-Aug Sep-Oct	15-20
	Spring /Summer	PDM 139, Pusa vishal, Meha, Pant Moong 5, TMB 37, HUM- 16	Feb-March /May	30-35
	Urdbean			
	Kharif	IPU 94-1 (Uttara), Birsa Urd 1, Pant U 19, Pant U 30, Pant U 31, B.R.68	July-Aug Sep-Oct	15-20
	Spring	KU 92-1 (Azad urd 1), Wbu- 109, Pant U-31	Feb-March /May	30-35
	Lentil	Pant L-406, PL 639, Malika (K 75), Arun (PL-77-12), NDL 2, WBL-58, HUL-57, KLS 218, WBL 77, Azad Masur-1	Oct- Nov March- April	50-60
	Fieldpea	Rachna, HFP 4 (Aparna), HUDP 15, DDR 23	Oct- Nov March- April	80- 100
Assam	Chickpea	Desi: BG 256, Udai (KPG-59), Pusa 372, KWR 108, Gujarat, G 4, HK 2, HK 4 (HK 05-169) Kabuli: Pusa 1003	Oct- Nov March- April	80- 100
	Mungbean			
	Kharif	SG 1 (Pratap), Pant Moong 2, Pant Moong 4, Narendra Moong 1, IPM 2-3	Aug óSep Nov-Dec	15-20
	Spring /Summer	PDM 139, Pusa vishal, Meha, Pant Moong 5, TMB 37, HUM- 16	Feb-March /May	30-35

	Urdbean	Pant U 19, Pant U 30, Pant U 31, WBU 108, IPU 94-1 (Uttara)	Aug óSep Nov-Dec Aug ó Sep (rabi) Nov-Dec	15-20 25-30
	Lentil	Asha (B 77), HUL-57, KLS 218, WBL 77,	Oct- Nov March- April	50-60
	Fieldpea	Rachna, Malviya Matar	Oct- Nov March- April	80-100
West Bengal	Chickpea	Desi: BG 256, Udai (KPG-59), Pusa 372, KWR 108, Gujarat, G 4, HK 2, Bidisha (BG 1084) (WBG 29) Kabuli: Pusa 1003	Oct- Nov March- April	80-100
	Pigeonpea	Bahar, Pusa 9, MAL 13, NDA 98-1 (NDA 2), NDA 99-6 (NDA 3), WB 20-105	July March-April	12-15
	Mungbean			
	Kharif	Narendra Moong 1, Pant Moong 4, Pant Moong 5, MH 2-15, Srekumar	July óAug Sep-Oct	15-20
	Spring /Summer	PDM 139, Pusa vishal, Meha, Pant Moong 5, TMB 37, HUM- 16	Feb-March /May	30-35
	Urdbean			
	Kharif	IPU 94-1 (Uttara), T 9, Pant U -19	July-Aug Sep-Oct	15-20
	Spring	KU 92-1 (Azad urd 1), WBU- 109,	Feb-March /May	30-35
	Lentil	Ranjan (B 256), Asha (B 77), Malika WBL 77, WBL-58, Pant L-406, KLS 218, HUL 57	Oct- Nov March- April	50-60
	Fieldpea	Rachna, HUDP 15, DDR 23, DDR 23	Oct- Nov March- April	80-100

State	Crop	Variety	Sowing time/ Harvesting Time	Seed rate (kg/ha)
New Delhi	Chickpea	Desi: GNG 1581, Rajas, Pusa 547, RSG-963, RSG-931, RSG-888, CSG-8962, DCP 92-3, GNG 469, KWR 108, Pusa 362, Pusa 372, Udai, BG 256, GNG 1958, GNG 1969, GJG 0809, CSJ 515, GLK 28127, Bidisha (BG 1084) (WBG 29, Vallabh Kabuli Chana 1 (WCGK 2000-16), Pusa-547 (BGM-547) Kabuli: BG-1053	Oct-Nov March-April	80-100
	Pigeonpea	Pusa 992	June Nov-Dec	12-15
	Mungbean			
	Kharif	ML 337, Pant Moong 3, ML 267, Pant Moong 1, MUM 2, Ganga 8, MH 02-15, MH 421	July-Aug Sep-Oct	15-20
	Spring/Summer	Pusa Vishal, Ganga 8, SML 668, Pant Mung-5	Feb-March May	30-35
	Lentil	PL 639, Lens 4076, Sapna, Pant L 4, DPL-15 (Priya), L 4147, PL-4, DP 62 (Sheri), LH 84-8	Oct- Nov March- April	50-60
	Fieldpea	Rachna, KFP 103, DMR 7, KPMR 522, HFP 8909, DMR 11, DDR 27, Hariyal, HFP-529, HFP 715	Oct- Nov March- April	80-100
Punjab	Chickpea	Desi: GNG 1581, Rajas, Pusa 547, RSG-963, RSG-931, RSG-888, CSG-8962, DCP 92-3, GNG 469, KWR 108, Pusa 362, Pusa 372, Udai, BG 256, GJG 0809, GNG 1958, GNG 1969, CSJ 515, GLK 28127, Vallabh Kabuli Chana 1 (WCGK 2000-16), PBG -5 Kabuli: BG-1053	Oct-Nov March-April	80-100
	Pigeonpea	Pusa 992, Manak, Pusa 84, Pusa 33, Jagriti (ICPL 151), UPAS 120, Pusa 855, AL 201, AL-15, Pusa 992	June Nov-Dec	12-15
	Mungbean			
	Kharif	ML 337, Pant Moong 3, ML 267, Pant Moong 1, MUM 2, Ganga 8, MH 02-15, IPM 2-3, ML 5, ML 32, ML 613, MH 421,	July- Aug Sep-Oct	15-20
	Spring/ Summer	Pusa Vishal, SML 668, Pant Mung-5, Pant Mung-2	Feb-March May	30-35

	Urdbean			
	Kharif	IPU 94-1 (Uttara), WBU 108, Krishna, UG 218	July- Aug Sep-Oct	15-20
	Spring/ Summer	KU 300, PDU 1	Feb-March May	30-35
	Lentil	Pant L 406, PL 639, Lens 4076, Sapna, Pant L 4, DPL-15 (Priya), L 4147, PL-4, DP 62 (Sheri), LH 84-8, LL- 931	Oct- Nov March- April	50-60
	Fieldpea	Rachna, KFP 103, DMR 7, KPMR 522, HFP 8909, DMR 11, DDR 27	Oct- Nov March- April	80-100
Haryana	Chickpea	Desi: GNG 1581, Rajas, Pusa 547, RSG-963, RSG-931, RSG-888, CSG-8962, DCP 92-3, GNG 469, KWR 108, Pusa 362, Pusa 372, Udai, BG 256, GJG 0809, GNG 1958, GNG 1969, CSJ 515, GLK 28127, Vallabh Kabuli Chana 1 (WCGK 2000-16) Kabuli: BG-1053	Oct-Nov March-April	80-100
	Pigeonpea	Pusa 992, Manak, Pusa 84, Pusa 33, Jagriti (ICPL 151), UPAS 120, Pusa 855, AL 201, AL-15, Pusa 992	June Nov-Dec	12-15
	Mungbean			
	Kharif	MUM 2, Pusa Vishal, Ganga 8, MH 02-15, IPM 2-3, Muskan, MH 421, SML 832	July- Aug Sep-Oct	15-20
	Spring/ Summer	Pusa Vishal, SML 668, Pant Mung-5	Feb-March May	30-35
	Urdbean			
	Kharif	Mash 338, Pant U-19, KU 300, (Shekhar 2) UG 218	July- Aug Sep-Oct	15-20
	Spring	Pant U 31, PDU 1	Feb-March May	30-35
	Lentil	PL 639, Lens 4076, Sapna, Pant L 4, DPL-15 (Priya), L 4147, PL-4, DP 62 (Sheri), LL- 931	Oct- Nov March- April	50-60
	Fieldpea	Rachna, KFP 103, DMR 7, KPMR 522, HFP 8909, Hariyal	Oct- Nov March- April	80-100

Rajasthan	Chickpea	Desi: GNG 1581, Rajas, Pusa 547, RSG-963, RSG-931, RSG-888, CSG-8962, DCP 92-3, GNG 469, KWR 108, Pusa 362, Pusa 372, Udai, BG 256, GJG 0809, GNG 1958, GNG 1969, CSJ 515, GLK 28127, Vallabh Kabuli Chana 1 (WCGK 2000-16) Kabuli: BG-1053	Oct-Nov March-April	80-100
	Pigeonpea	Manak, Pusa 84, Pusa 33, Jagriti (ICPL 151), UPAS 120, Pusa 855	June Nov-Dec	12-15
	Mungbean			
	Kharif	RMG 62, PMG 268, MUM 2, RM 492, Ganga 8, MH 02-15, IPM 2-3, MH 421, SML 832	July- Aug Sep-Oct	15-20
	Spring/Summer	RMG 268, PDM 139, Meha SML 668	Feb-March May	30-35
	Urdbean			
	Kharif	IPU 94-1 (Uttara), WBU-108, Krishna, Pant U-31, KU 300, RBU-38, Pratap Urd 1 (KPU 07-08)	July- Aug Sep-Oct	15-20
	Spring	KU 300, PDU 1	Feb-March May	30-35
	Lentil	K 75, L 4076, DPL 62, IPL 406	Oct- Nov March-April	50-60
	Fieldpea	Rachna, KFP 103, DMR 7, KPMR 522, HFP 8909, Hariyal, DDR-27	Oct- Nov March-April	80-100
Madhya Pradesh	Chickpea	Desi: Pusa Subhra, JG-16, Gujarat Gram-1, BGD 72, Pusa 391, Vijay, Pusa 372, ICCV 10, BG 256, Raj Vijay Kabuli gram 101 (JSC 42), Raj Vijay gram 201 (JSC 40), Raj Vijay Kabuli gram 202 (RVG 202), Raj Vijay Kabuli gram 203 (RVG-203), JG 12 Kabuli: JGK 1, KAK 2, Subhra	Oct- Nov March-April	80-100

	Pigeonpea	C 11, Vishakha-1 (TT 6), ICPL 87 (Pragati), Asha (ICPL 87119), Jawahar (JKM 7), Malviya Vikalp (MA 3), TT 401, TJT-501, GAUT 001E, JA 4, GTH 1 (Hybrid), BDN-711 (BDN 2004-3), NP (WR) 6 15, Gwalior 6 3	June-July Jan-Feb	12-15
	Mungbean			
	Kharif	Pant Moong 3, Pusa 105, ML 337, BM 4, JM 721, Jawahar 45, HUM-1, Meha, TJM 3	June-July Aug-Sep	15-20
	Summer/Spring	HUM 1, Pusa 5931, PDM 139, Meha	Feb-march May	30-35
	Urdbean			
	Kharif	RBU 38 (Barkha), TPU 4, Jawahar Urd 2, Jawahar Urd 3, Khargone 3, Pant U 30	June-July Aug-Sep	15-20
	Spring	Pdu 1, Pant U 30, Pant U 31	Feb-march May	30-35
	Lentil	Malika (K 75), Lens 4076, IPL 81 (Noori), JL 3, IPL 406, IPL- 316, Raj Vijay Lentil -31	Oct- Nov March- April	50-60
	Fieldpea	Adarsh, Vikas, Prakash, Rachna, Ambika, KPMR 400, IPFD 10-12	Oct- Nov March- April	80-100
Chhattisgarh	Chickpea	Desi: Pusa Subhra, JG-16, Gujarat Gram-1, BGD 72, Pusa 391, Vijay, Pusa 372, ICCV 10, BG 256, JG 12 Kabuli: JGK 1, KAK 2, Subhra	Oct- Nov March- April	80-100
	Pigeonpea	C 11, Vishakha-1 (TT 6), ICPL 87 (Pragati), Asha (ICPL 87119), Jawahar (JKM 7), Malviya Vikalp (MA 3), TT 401, TJT-501, GAUT 001E, JA 4, GTH 1 (Hybrid), BDN-711 (BDN 2004-3)	June-July Jan-Feb	12-15
	Mungbean			
	Kharif	Pant Moong 3, Pusa 105, ML 337, BM 4, JM 721, Jawahar 45, HUM-1, Meha, TJM 3	June-July Aug-Sep	15-20
	Summer /Spring	HUM 1, Pusa 5931, PDM 139, Meha	Feb-march May	30-35

	Urdbean			
	Kharif	RBU 38 (Barkha), TPU 4, Jawahar Urd 2, Jawahar Urd 3, Khargone 3, Pant U 30	June-July Aug-Sep	15-20
	Spring	PDU 1, Pant U 30, Pant U 31	Feb-march, May	30-35
	Lentil	Malika (K 75), Lens 4076, IPL 81 (Noori), JL 3, IPL 406	Oct- Nov March- April	50-60
	Fieldpea	Adarsh, Vikas, Prakash, Rachna, Ambika, KPMR 400	Oct- Nov March- April	80-100
Gujarat	Chickpea	Desi: Pusa Subhra, JG-16, Gujarat Gram-1, BGD 72, Pusa 391, Vijay, Pusa 372, ICCV 10, BG 256, GJG 0809 Kabuli: JGK 1, KAK 2, Subhra	Oct- Nov March- April	80-100
	Pigeonpea	C 11, Vishakha-1 (TT 6), ICPL 87 (Pragati), Asha (ICPL 87119), Jawahar (JKM 7), Malviya Vikalp (MA 3), TT 401, TJT-501, GAUT 001E, JA 4, GTH 1(Hybrid), Anand Grain Tur-2 (AGT-2)	June-July Jan-Feb	12-15
	Mungbean			
	Kharif	Pant Moong 2, Pusa 105, ML 337, BM 4, PIMS 4 (Sabarmati), Gujarat Moong 2, Gujarat Moong 4	June-July Aug-Sep	15-20
	Summer/Spring	Gujarat Moong 2, PDM 139,	Feb-march May	30-35
	Urdbean			
	Kharif	RBU 38 (Barkha), TPU 4, T 9, TAU 2, AKU 4, WBU 108, GU 1	June-July Aug-Sep	15-20
	Spring	PDU 1, Pant U 31	Feb-march May	30-35
	Lentil	Malika (K 75), Lens 4076, JL 3, IPL 81	Oct- Nov March- April	50-60
	Fieldpea	-	Oct- Nov March- April	80-100

Maharashtra	Chickpea	Desi: Pusa Subhra, JG-16, Gujarat Gram-1, BGD 72, Pusa 391, Vijay, Pusa 372, ICCV 10, BG 256, PKV harita (AKG 9303-12), Phule G-95311 Kabuli: JGK 1, KAK 2, Subhra	Oct- Nov March- April	80-100
	Pigeonpea	C 11, Vishakha-1 (TT 6), ICPL 87 (Pragati), Asha (ICPL 87119), Jawahar (JKM 7), Malviya Vikalp (MA 3), TT 401, TJT-501, GAUT 001E, BDN 2, TAT-10, BSMR 175, BSMR 736, AKT 8811, BDN-711(BDN 2004-3)	June-July Jan-Feb	12-15
	Mungbean			
	Kharif	Kopergaon, ML 131, Phule M 2, TARM 1, TARM 18, TARM 2, BM 200-1, BM 4, BM 2003-2	June-July Aug-Sep	15-20
	Summer/Spring	HUM 1, Pusa 9531, AKM 880	Feb-march May	30-35
	Urdbean			
	Kharif	RBU 38 (Barkha), TPU 4, TAU 1, TAU 2, PDU 1, Pant U 30, AKU 4 (Melghat), Vishwas (NUL-7)	June-July Aug-Sep	15-20
	Lentil	Malika (K 75), Lens 4076, JL 3, IPL 81, IPL-316	Oct- Nov March- April	50-60
	Fieldpea	Adarsh, Vikas, Prakash, Rachna, Ambika, KPMR-400, IPFD 10-12,	Oct- Nov March- April	80-100
Andhra Pradesh	Chickpea	Phule G 9531, JG 11, ICCV 10	Oct- Nov March- April	80-100
	Pigeonpea	Jagriti (ICPL 151), Maruthi (ICPL 8863), Visskha-1 (TT-6), ICPL 87 (Pragati), Asha (ICPL 87119), CORG 9701, SA 1, Abhaya (ICPL 332), Sarita (ICPL 85010) Durga (ICPL 84031) Laxmi (ICPL 85063), LRG 6 36	June-July Jan-Feb	12-15

	Mungbean			
	Kharif	Warangal-2, LGG 407, LGG 450, Madhira 295	June-July Aug-Sep	15-20
	Rabi	Pusa 9072, LGG 460, TM 96-2, WGG-2	Oct-nov Jan-Feb	25-30
	Urdbean			
	Kharif	KU 301, WBG 26, WBU 108, Pant U 30, IPU 2-43	June-July Aug-Sep	15-20
	Rabi	TU 94-2, LBG 611, LBG 20, LBG 402, LBG 17, LBG 623, LBG-709, WBG-26	Oct-nov Jan-Feb	25-30
Karnataka	Chickpea	Phule G 9531, JG 11, ICCV 10	Oct- Nov March- April	80-100
	Pigeonpea	Jagriti (ICPL 151), Maruthi (ICPL 8863), Visskha-1 (TT-6), ICPL 87 (Pragati), Asha (ICPL 87119), CORG 9701, SA 1, TTB 7, TS 3	June-July Jan-Feb	12-15
	Mungbean			
	Kharif	ML 131, PDM 84-178, HUM 1, China Moong, KKM 3	June-July Aug-Sep	15-20
	Urdbean			
	Kharif	KU 301, WBG 26, WBU 108, LBG 402, LBG, Manikya, T 9, Pant U 30, TU 94-2	June-July Aug-Sep	15-20
Tamil Nadu	Chickpea	Phule G 9531, JG 11, ICCV 10	Oct- Nov March- April	80-100
	Pigeonpea	Jagriti (ICPL 151), Maruthi (ICPL 8863), Visakha-1 (TT-6), ICPL 87 (Pragati), Asha (ICPL 87119), CORG 9701, Co 5, Co 6, Vamban 1	June-July Jan-Feb	12-15
	Mungbean			
	Kharif	Paiyur 1, Vamban 1, ADT 3, CO 5, TM 96-2, COGG 912	June-July/Sept	15-20
	Rabi	Pusa 9072, Sujata (Hyb 12-4), ADT-3	Oct-Nov Jan-Feb	25-30
	Urdbean			
	Kharif	ADT 3, ADT 5, Vamban 2, Pant U 30, WBU 108, Vamban 3, Vamban 4, (VBG04-008) VBN (Bg) 7, VBN 6, MDU 1	June-July/ Sept	15-20
	Rice fallow	WBG 26, Vamban 3, TU 94-2, Vamban 5, IPU 2-43, KBU 512	Oct-Nov/Jan-Feb	25-30
Odisha	Chickpea	Phule G 9531, JG 11, ICCV 10	Oct- Nov March- April	80-100
	Mungbean			
	Kharif	ML 131, Kopergaon, PDM 54, TARM 1, PDM 139	June-July / Sept	15-20
	Rabi/Spring	Pusa 9072, Sujata (Hyb 2-4) TARM-1, OBG_52, LGG-460, PDM-139	Oct-Nov/ Jan-Feb	25-30

	Urdbean			
	Kharif	KU 301, WBG 26, WBU 108, T-9, Sarla	June-July/ Sept	15-20
	Rabi	TU 94-2, LBG 402, LBG 17, OBG 17, B-3-8-8	Oct-Nov (Rabi) Jan-Feb	25-30
	Lentil	B 77 (Asha)	Oct- Nov March- April	50-60
Himachal Pradesh	Mungbean	Pant Moong 2, Pant Moong 6, KM 2241, Shalimar Moong 1	June-July Sept	15-20
	Urdbean	Pant U 19, UG-218, PDU 1, Pant U 31, NDU 99-2	June-July/ Sept	15-20
	Lentil	Pant L 406, Pant L 639	Oct- Nov March- April	50-60
	Field Pea	Prakash, Rachna, VL Matar-3	Oct- Nov March- April	80-100
Jammu & Kashmir	Mungbean	Pant Moong 2, Pant Moong 6, KM 2241, Shalimar Moong 1	June-July/Sept	15-20
	Urdbean	Pant U 19, UG-218, PDU 1, Pant U 31, NDU 99-2	June-July/Sept	15-20
	Lentil	Pant L 406, Pant L 639, VL 4	Oct- Nov March- April	50-60
	Field Pea	Prakash, Rachna, HUDP 15	Oct- Nov March- April	80-100
NEH Region	Lentil	Pant L 406, Pant L 639, B 77 (Asha), DPL-62, HUL-57, KLS 218	Oct- Nov March- April	50-60

6.7.1 TECHNOLOGICAL INTERVENTIONS

Activity	State	Recommendations
Spring/ Summer pulses mungbean and urdbean	Bihar, Odisha, Tamil Nadu, MP, UP, AP, Gujarat West Bengal, CG, Punjab, Haryana, Jharkhand	<ul style="list-style-type: none"> • Weed Management- Apply Pendimethalin (30 EC) @ 1.0 kg a.i/ ha as pre-emergence and Imazathapyr @ 70-80 g/ha as post emergence at 20-25 DAS after assuring the germination of weed. • Irrigations- First Irrigation may be delayed convincingly to 20 days depending upon the moisture status as results of pre-plant irrigations (Palewa). Subsequent irrigation schedule should be need based. • Seed Treatment- with 5 ml Emida chloroprid (17.8 SL) / kg seed followed by usual PGPR seed inoculation. • Thrips control- spray Emida chloroprid (17.8 SL) @ 3 ml in 10 litres of water (@ 600 to 800 liters of solutions per ha).
All Pulses	UP, MP, Rajasthan, Maharashtra, Andhra Pradesh, Karnataka	<ul style="list-style-type: none"> • Adoption of Life saving Irrigations It is far more rewarding in pulses if limited irrigation is given and water is used efficiently and effectively. One or two lifesaving irrigations have been found to be highly remunerative in chickpea, lentil, pea lathyrus, rabi rajmash and early sown pigeonpea. • Delineation of areas for one or two supplemental irrigation especially linked with sprinkler system can bring stability in the production as well as enhancement of productivity. • One pre sowing irrigation and other at flowering stage can give assured production and better returns. • Drip fertigation at branching and pod development stage with half of recommended dose of N and potash (other as basal) brought about maximum seed yield (37 q/ha) and water use efficiency in a long duration pigeonpea.
Seed priming	Chhattisgarh, Bundelkhand region of MP & UP, Bihar, West Bengal, Odisha and Assam	<ul style="list-style-type: none"> • Recommended for rabi pulses like chickpea, lentil and lathyrus, grown on residual soil moisture. Soil moisture in seed zone generally remains a limiting factor due to early withdrawl of monsoon. seed priming (soaking seeds for 6-8 hours in water) improves plant stand and early vigour which results in improving production.

Activity	State	Recommendations
Ridge planting of pigeonpea	Eastern UP, Bihar, Jharkhand, West Bengal and MP	<ul style="list-style-type: none"> • Kharif pulses especially pigeon pea suffer heavy losses due to water stagnation, resulting in poor plant population and seed yield. • Ridge planting of pigeonpea has been advocated for its successful cultivation especially in North- East Plain Zone (Eastern UP, Bihar, Jharkhand and West Bengal) not only to ensure desired plant stand of the crop but also to minimize the incidence of <i>Phytophthora stem blight</i>. The technology involves making ridge and furrows by tractor/bullock drawn ridge planter at 60 cm spacing and sowing seeds in the centre of the ridge.
2 % foliar spray of urea	Rainfed areas	<ul style="list-style-type: none"> • Foliar spray of 2 % urea/ DAP at flowering/pod filling stage has been turned out to be rewarding in term of higher yield. A large number of frontline demonstrations carried out in chickpea, lentil, mungbean and urdbean in different regions have shown spectacular increase of 13-20 % in productivity of these pulses. This could prove to be one of the simplest and low cost technologies for improving production of pulses in the rainfed areas.
Use of critical micronutrients	Rajasthan, WB, Jharkhand, Gujarat UP, Andhra Pradesh, Karnataka, Maharashtra, MP, Bihar	<ul style="list-style-type: none"> • Use of Sulphur @ 40 kg/ha has demonstrated enhanced yield upto 25-30 % in different pulse crops. Lentil 19.5%, Mungbean 17%, Urd-13%, gram-19%, tur-21%, guar-35%. • The average absorption of zinc in chickpea is 50 +/- 16 g per tonnes. While in pigeonpea it is 30 g +/-17 g per tonnes. • Sources of Sulphur at Annex-A • Crop-wise recommendation of zinc as basal dressing is recommended as - for pigeonpea is 3 kg zinc {(15 kg ZnSO₄: Chickpea 2.5 kg Zn (12.5 kg ZnSO₄): other pulses 3.5 kg Zn (12.5 kg ZnSO₄)}. Zinc sulphate monohydrate (ZnSO₄. H₂O-33% zinc) or Zinc Sulphate Hepta hydrate (ZnSO₄. 7H₂O-21% Zn) or Chelated Zinc (Zn-EDTA, 12 %) etc may be used as source of zinc. • use of Zn responding crop varieties (pigeonpea- C- 11, ICPL 87-119. GT-101, T-15-15)
I. Sulphur	MP, TN, Maharashtra, Bihar, UP, Gujarat, Rajasthan	
II. Zinc		

6.7.2 INTEGRATED NUTRIENT MANAGEMENT

Crop	States	Recommendations
Chickpea	MP, Maharashtra, Rajasthan, UP, Andhra Pradesh, Karnataka, CG	<ul style="list-style-type: none"> • Application of 15-20 kg N/ha, 20-60 kg P₂O₅ and 20 kg K₂O and 20 kg S/ha as basal placement is recommended for normal conditions. • Need based application fo 15-20 kg ZnSO₄/ha and 1-1.5 kg Ammonium Molybdate/ha depending upon the deficiency of a particular micronutrient in soil. • Foliar spray of 2% urea/DAP twice during flowering and 15 days after first spray.
Pigeonpea	Maharashtra, Karnataka, MP, Gujarat, UP, Telangana, Jharkhand, Andhra Pradesh, Odisha & CG	<ul style="list-style-type: none"> • Application of 15-20 kg N/ha, 40-60 P₂O₅ and 20 kg S/ha basal placement is recommended for normal conditions. • Need based application of 15-20 kg ZnSO₄ and 1-1.5 kg ammonium Molybdate/ ha is recommended depending upon the deficiency of a particular micronutrient in soil. • Foliar spray of 2 % urea/ DAP twice during flowering and 15 days after first spray.
Mungbean & Urdbean	MP, UP, MS & Rajasthan, Jharkhand Gujarat, AP, TN, Karnataka & West Bengal, Odisha, Telangana & CG	<ul style="list-style-type: none"> • Application of 10-15 kg N/ha, 40 kg P₂O₅ and 20 kg S/ha as basal placement for normal conditions. • Need based application of 15-20 kg ZnSO₄/ ha and 1-1.5 kg Ammonium Molybdate/ha is recommended depending upon the deficiency of a particular micronutrient in soil. • Foliar spray of 2 % urea/DAP twice during flowering and 15 days after first spray.
Lentil & Fieldpea	MP, UP and Bihar	<ul style="list-style-type: none"> • Application of 15-20 kg N/ha, 40-60 kg P₂O₅ and 20 kg K₂O and 20 kg S/ha as basal placement for normal conditions. • Need based application of 15-20 kg ZnSO₄/ha and 1-1.5 kg Ammonium Molybdate/ha is recommended depending upon the deficiency of a particular micronutrient in soil. • Foliar spray of 2 % urea/ DAP twice during flowering and 15 days after.

6.7.3 CRITICAL IRRIGATION

About 63% area under pulse is rainfed and consequently pulses face severe moisture stress with low productivity. Quantum jump in productivity can be achieved by applying come-up life saving irrigation. Especially in rabi pulses grown on residual moisture. Micro- irrigation can be used for most efficient use of scarce irrigation water.

On light textured soils 1-2 irrigations at branching and or pod development prove highly productive in most of rabi season pulse. *Irrigation should be avoided during active flowering period otherwise flower shedding and reversion to vegetative growth may occur.* Crop-wise recommendation is given as under:

Crop	States	Recommendations
Chickpea	• MP, CG, Rajasthan, Bundelkhand region of UP.	• Two irrigation I st at branching and II nd at pod formation.
	• Punjab, Haryana, Delhi, Western UP, Plains of Uttarakhand, eastern UP, Bihar, Jharkhand, West Bengal, Assam	• Response to irrigation is generally low due to adequate winter rains and high relative humidity.
Fieldpea	• Eastern UP, Bihar, Jharkhand, West Bengal and Assam	• One irrigation at flowering stage is found beneficial.
	• MP, Maharashtra, CG, Bundelkhand region of UP, Gujarat, Punjab, Haryana, Rajasthan, Delhi, western UP plains of Uttarakhand.	• Two irrigation one each at branching and flowering stages are found most critical.
Lentil	• MP, UP and Bihar	• One to two irrigations are required for enhanced productivity.
Spring/ Summer Mungbean & Urdbean	• MP, UP, Bihar and Tamilnadu	• Four to five irrigations, first at 20 DAS followed by subsequent irrigations after 10 days of interval.

6.7.4 WEED MANAGEMENT

Crops	Recommendations
Chickpea, Lentil and Fieldpea	<ul style="list-style-type: none"> • Crops must be kept free from weeds to avoid loss in yield • Cultural practices like hoeing and hand weeding coupled with application of herbicides are ideal for weed management. • Pre-emergence application of pendimethalin 1.0-1.5 kg a.i./ha is very effective for controlling initial flush of weeds.
Pigeonpea, Mungbean, Urdbean	<ul style="list-style-type: none"> • Pre-emergence application of pendimethalin 1.0-1.5 kg a.i./ha is very effective for controlling initial flush of weeds. • Application of post-emergence herbicide Imazethapyr @ 70-80 g/ha, 20-25 DAS is effective in controlling the weeds.

6.7.5 INTEGRATED PEST MANAGEMENT

On an average 20-40% crop is annually lost due to damage caused by Pod borers in pigeonpea and chickpea. Pod fly also causes 10-15% loss especially in North India. Wilt and Root rots cause heavy loss to pigeonpea and chickpea crops. Effective IPM module is given as under for management of targeted pest and diseases.

Crop	Activity	Recommendations
Chickpea	Before Sowing	<ul style="list-style-type: none"> • Deep summer ploughing • Application of neem seed kernel powder @ 50 kg/ha in nematode infested soils.
	At the time of sowing	<ul style="list-style-type: none"> • Timely sowing • Seed treatment with carbendazim+ thiram (1+2 g/kg) or Trichoderma (4 g) + carboxin (1g)/kg • In nematode infested soils, seed treatment with carbofuran @ 1 %.
	Standing crop	<ul style="list-style-type: none"> • Use of pheromone trap @ 4-5 per ha • Installation of bird perches (35-40/ha) • Start insecticidal spray if the pod borer reaches economic threshold level i.e. 1-2 larvae per linear meter. • First spray of NSKE (5 %). • Second spray of NPV 250 LE.
Pigeonpea	Before sowing	<ul style="list-style-type: none"> • Deep summer ploughing • Application of neem seed kernel powder @ 50 kg/ha in soil infested with nematode.
	At the time of sowing	<ul style="list-style-type: none"> • Sowing on ridges • Intercropping with sorghum (2:1 or 4:2) • Seed treatment with carbendazim @ 1 g/kg or Trichoderma (4 g) and vitavax (2 g)
	Standing crop	<ul style="list-style-type: none"> • Monitoring of the crop for the occurrence of diseases and pests • Use of pheromone trap @ 4-5/ha • When the moth reaches 4-5 per trap for 3-4 consecutive nights start pest management
	Early maturing crop	<ul style="list-style-type: none"> • First spray of monocrotophos (0.04 %) • Second spray of NSKE (5%) • If required, third and fourth spray of either NSKE or NPV @ 250 LE.
Mungbean & Urdbean	Before sowing	<ul style="list-style-type: none"> • Deep summer ploughing
	At the time of sowing	<ul style="list-style-type: none"> • Seed treatment with carbendazim+ thiram (1+2 g/kg)
	Standing crops	<ul style="list-style-type: none"> • In summer sown crops, timely irrigation minimizes thrips infestation • Foliar spray of monocrotophos 0.08% or dimethoate 0.03% against pod borers and sucking pests. • Foliar spray of carbendazim (0.05%) or thiophanate methyl (0.025%) at 30 DAS.

Crop	Activity	Recommendations
Lentil	Before sowing	<ul style="list-style-type: none"> • Deep summer ploughing
	At the time of sowing	<ul style="list-style-type: none"> • Timely sowing to avoid rust • Seed treatment with carbendazim+ thiram (1+2 g/kg) or Trichoderma (4 g) + carboxin (1g)/kg • Intercropping (2:1) or mixed cropping with linseed (1:1)
	Standing crop	<ul style="list-style-type: none"> • Foliar spray of dimethoate 0.03% in case of aphid infestation • Foliar spray of wettable Sulphur (0.2-0.3%) or mancozeb (0.2%) against rust. • Removal of diseased plant debris.
Fieldpea	Before sowing	<ul style="list-style-type: none"> • Deep summer ploughing
	At the time of sowing	<ul style="list-style-type: none"> • Timely sowing to avoid powdery mildew and rust • Seed treatment with carbendazim+ thiram (1+2 g/kg) or Trichoderma (4 g) + carboxin (1g)/kg
	Standing crop	<ul style="list-style-type: none"> • Regular monitoring of the crop • Foliar spray of wettable Sulphur (0.2-0.3%) against rust and powdery mildew • Carbendazim (1 g/l of water) or dinocap, karathane 48 EC (0.05 ml/l of water) are also used against powdery mildew • Removal of diseased plant debris.
Rajmash	At the time of sowing	<ul style="list-style-type: none"> • Seed treatment with carbendazim+ thiram (1+2 g/kg) or Trichoderma (4 g) + carboxin (1g)/kg
	Standing crop	<ul style="list-style-type: none"> • Foliar spray of metasystox or monocrotophos (0.04%) for aphid that are vectors of bean common mosaic virus. • Foliar spray of carbendazim (1g/l of water) against stem blight • Removal and destruction of stem blight affected plants • Avoiding stagnation of water in the field for limiting the buildup of stem blight and root rot diseases.

Source: Approach Paper on Pulses, IIPR- Kanpur

6.7.6 CROPPING SYSTEM APPROACH

Cropping System Approach: Addressing Biotic and Abiotic constraints.

• Abiotic Stresses

Abiotic stresses are primarily unavoidable and are most detrimental to the growth and productivity of pulses, especially under un-irrigated areas. The ability to tolerate effectively by challenging these stresses is a complicated phenomenon stemming out from various plant interactions occurring in the specific environments. Abiotic stresses are occurring naturally and can only be resolved with mitigation strategies under varied climatic conditions.

- **Abiotic and biotic stress management**

Various non-monetary inputs/techniques, viz. selection of crops, selection of drought-resistant/tolerant/early-maturing/short-duration varieties, healthy and disease-free seeds, seed treatment need to be adopted for mitigating abiotic and biotic stress for maximizing productivity and profitability of pigeonpea in dry land areas. Better crop-management practices like nutrient, water and weed management, insect-pest and disease management are essential to withstand these stresses. Climate-resilient crop varieties along with other suitable adaption and mitigation strategies will help overcome the adverse impact of climate change by lowering the yield losses under stress condition.

- **Drought Stress**

Impact of moisture stress depends on its intensity/ severity and duration; prevents the crops from reaching the maximum yield. Nitrogen fixation, uptake and assimilation by leguminous plants are reduced due to reduction in leg haemoglobin in nodules and number of nodule under moisture stress conditions. Depending on the level of stress, legumes may suffer from grain yield losses to a larger extent than shoot biomass reduction.

- **Water logging stress**

Water logging affects a number of biological and chemical processes in plants and soils that can impact crop growth in both the short and long term. Germinating seeds/ emerging seedling are very sensitive to water logging, as their level of metabolism is high. Pigeonpea is sensitive to water logging than other crops.

- **High temperature**

Optimum temperature for kharif pulse 15-30°C is required for better growth and development. Soil moisture stress coupled with high temperature affects the growth and development of crop plants to larger extent in dryland areas.

- **Low temperature stress**

Temperature lower than optimal growth temperature requirement causes low temperature requirement of chilling stress. Stress due to temperature less than 15°C is known as chilling stress and this occurs in plants which grow at 25-35°C. In majority of crops, chilling stress occurs at temperature less than 10°C but above 0°C. Chilling stress is most common in tropical and sub-tropical species, such as pigeonpea. Cool/ winter season pigeon pea highly sensitive to low temperature stress during flowering and early pod-formation stages.

- **Nutrients stress**

Nutrient deficiency and excess occurs when an essential nutrient is either not available to plant in required quantity or available in excess of plant needs. Unlike deficiency symptoms, toxicity symptoms are common. In some cases the presence of one element in excess concentrations may include the deficiency of another element.

6.7.7 Varieties with special traits

Table 23. FLOOD AND DROUGHT TOLERANT VARIETIES/ HYBRIDS

Crops	Varieties/ Hybrids
Deep water/ submergence / water logging tolerance	
Rice	Swarna Sub-1, Sambha Mahsuri Sub-1, Varshadhan, Gayatri, Sarla, Pooja, Prateekhsha, Durga, JalaMani, CR Dhan 505, CR Dhan 502, Jalnidhi, Neerja, Jaladhi 1, Jaladhi 2, Hemavathi
Maize	HM-5, Seed Tech-2324, HM-10, PMH-2
Drought tolerance	
Rice	Sahabhagi Dhan, Vandana, Anjali, Satyabhama, DRR Dhan 42 (IR64 Drt 1), DRR Dhan 43, Birsa Vikas Dhan 203, Birsa Vikas Dhan 111, Rajendra Bhagwati, Jaldi Dhan 6
Wheat	PBW 527, HI 1531, HI 8627, HD 2888, HPW 349, PBW 644, WH 1080, HD 3043, PBW 396, K 9465, K 8962, MP 3288, HD 4672, NIAW 1415, HD 2987
Maize	Pusa Hybrid Makka 1, HM 4, Pusa Hybrid Makka 5, DHM 121, Buland,
Chickpea	Vijay, Vikas, RSG 14, RSG 888, ICCV 10, Pusa 362, Vijay
Soybean	NRC 7, JS 95-60
Cotton	HD 324, CICR-1 Raj DH-7, Jawahar Tapti, Pratap Kapi, Suraj, Surabhi, Veena, AK 235

Table 24. STATE SPECIFIC STRATEGY

S. No.	Constraints	States	Season	Crop
A.	Climatic Variability			
(i)	Occurrence of mid-season cold waves and terminal heat during winter season	UP,MP	Kharif	Pigeonpea Urd,Mung
(ii)	Inundation of water in black cotton soils during heavy rains. Sub-optimal nutrient uptake.	MP,MS,AP, Guj., TN		
(iii)	Micro-nutrient deficiency (Zn, Fe, B, Mo) unbalanced and seldom soil test based use of micro-nutrient.	All States	All Season	All Crops
(iv)	Sulphur deficiency, inadequate availability of Gypsum or Pyrites.	MP,MS,AP, Karnataka, Guj, UP	All Season	All Crops
(v)	Pod Borer, Pod-fly and Maruca			Tur, Gram
(vi)	Fusarium wilt			Tur, Gram, Lentil
(vii)	YMV & Powdery mildew			Urd, Mung
(viii)	Blue Bull Menace	UP,Bihar, MP, Raj.,CG		
(ix)	Region Specific Technology	All States		All Crops

7. BRIEF STRATEGY FOR SUSTAINABILITY OF PULSES PRODUCTION

- Assured procurement of pulses should be ensured by State Governments at MSP.
- Mapping of major pulse growing areas and integration with PMKSY water resources for life saving irrigation should be ensured.
- Use of quality bio-fertilizer and bio-agents (MoU with ICAR/SAU) should be ensured.
- Soil test based nutrient applications including quality micro nutrients should be adopted.
- Adopting of line sowing, BBF, raised-bed & ridge-furrow planting techniques should be ensured
- Cultivation should be made under new niches-sole, catch crop, relay crop & inter cropping.
- Utilization of rice fallows and promotion of spring/summer pulse cultivation should be ensured.
- Adoption of short duration of paddy varieties should be encouraged to accommodate the pulses.
- Availability of Gypsum/promotion as nutrient supplement, effective pest-surveillance and community approach management methods/techniques should be ensured as practiced in Maharashtra.
- Moisture conservation technique, contingent drainage in the event of high rainfall through promotion of ridge planter, raised bed planter and sprinklers should be adopted.
- There is a need to promote Zero-tillage to reduce cost of cultivation/timely sowing.
- Custom Hiring for farm mechanization should be promoted.
- Convergence of fallow lands into pulse cultivation should be explored.
- Transplanting and dibbling method of Tur planting under SCSP/TSP with SMF should be adopted.
- PHM/Value Addition Promotion (spiral graders, clearer, mini dal-mill) as adopted in Assam should be encouraged.
- Screening and identification of potential local cultivars of Rajmash and Ricebean for NEH region should be promoted.
- Area under Cluster demonstration of NFSM may be reduced from 100 ha to 25 ha per cluster in case if area under crop is less.
- Fencing/solar fencing project for wild animal/stray cattle menace as adopted in Gujarat and Madhya Pradesh should be replicated.
- MSP for Moth bean may be considered
- Hoeing/weeding in major pulse districts of Rajasthan may be dove-tailed with MGNREGA.
- Large scale FLD for seed should be conducted in Seed Hubs and variety should be taken into chain.
- Short duration summer Mung seeds of 45 days should be procured by States in advance.
- Short duration seeds of pigeon pea available in Punjab and Haryana should be indented on priority.
- States should take pro-active steps to procure pulses under PSS

STATE'S PROFILE: ASSIGNED STATES
MADHYA PRADESH

Particulars		M.P.		
Population (Crore)		7.27(Male- 3.77, Female-3.51)		
Population Growth (%)		20.35 - 2011		
Revenue Districts (Nos.)		51		
Block/ Janpad Panchayat (Nos.)		313 (89 Tribal Blocks)		
Village Panchayat (Nos.)		23006		
Tehsil (Nos.)		364		
Total Village (Nos.)		54903		
Krishi Upaj Mandi (Nos.)		520		
Annual Rainfall (Ave.)		1200 mm		
Land Use Pattern (Area : lakh ha)			Agricultural land use (Area -lakh ha)	
Geographical Area		307.56	Net sown area	154.55
Cultivable area		158.72 (51.60%)	Double Cropped Area	77.78
Forest area		85.88 (27.92%)	Gross cropped area	232.33
Land under non-agricultural use		19.92 (6.48%)	Kharif Area	123.04
Permanent pastures		13.48 (4.38%)	Rabi Area	106.42
Cultivable wasteland		8.67 (2.82%)	Cropping Intensity	150 %
Barren and uncultivable land		14.06 (4.57%)		
Current fallows		7.69 (2.50%)		
Operational Land Holding (Area : Lakh ha, Number-Lakh)				
Average Size of Social Groups		Average Size (ha)	Numbers (%)	Area (%)
Marginal	(< 1 ha)	0.49	38.91 (43.85)	19.15 (12.09)
Small	(1 to 02 ha)	1.42	24.49 (27.60)	34.66 (21.89)
Semi Medium	(02 to 04 ha)	2.73	16.55 (18.65)	45.10 (28.48)
Medium	(04 to 10 ha)	5.76	7.89 (8.90)	45.45 (28.70)
Large	(10 ha & Above)	15.73	0.89 (1.00)	14.00 (8.84)
Total		1.78	88.73	158.36

Irrigation (lakh ha)		Sources of Irrigation (Area : lakh ha)	
Net irrigated area	85.50 (64%)	Canals	10.91 (17 %)
Gross irrigated area	89.65	Tanks	1.49 (2.34 %)
Rainfed area	60%	Open wells	24.03 (37.75%)
		Bore wells/ Tube Wells	17.93 (28.17%)
		Other Sources	14.25 %
		Total Irrigated Area	63.65
Major Soils (Area - lakh ha)			
1. Alluvial Soil	33.5	2. Deep Medium black soils	162.1
3. Shallow & Medium Black Soil	30.6	4. Mixed Red & Black Soil	81.1
Major Crops			
Kharif	Soyabean, Paddy, Pigeonpea. Urdbean, Moongbean, Maize, Jowar, Cotton		
Rabi	Wheat, Gram, Lentil , Field Pea, Mustard, Linseed		
Development Programme under implementation			
NFSM	NFSM-Paddy (8) ; Wheat (16) ; Pulses (51); Coarse Cereals (16); Cotton (10); Sugarcane (8) PMT District-51		
NMOOP	Mini Mission I- (Oilseeds) Mimni Mission III- (TBOs)		

**Source- ENVIS, Centre of M.P. State.)*

8.1.1 CROP-WISE AREA UNDER IRRIGATION

(Area-Lakh ha)

Crops	Area (2016-17)				
	Normal*	Irrigated	% Irrigation	Rainfed	% Rainfed Area
Cereals					
Paddy	20.50	5.57	27.2	14.67	71.6
Jowar	2.37	0.02	0.8	2.03	85.7
Maize	10.41	0.21	2.0	10.77	103.5
Bajra	2.30	1.67	72.6	1.00	43.5
Kodo& Others	1.80	0.01	0.6	1.9	105.6
Pulses					
Tur	5.57	0.06	1.1	5.73	102.9
Urad	8.50	0.07	0.8	9.25	108.8
Moong	2.50	1.21	48.4	0.72	28.8
Kulthi& Others	0.17			0.14	81.4
Oilseeds					
Soybean	59.22	0.23	0.4	58.83	99.3
Groundnut	2.34	0.2	8.5	2.16	92.3
Sesamum	3.37	0.09	2.7	3.56	105.6
Niger & Others	0.72				
Commercial Crops					
Cotton	5.99	3.25	54.3	2.22	37.1
State Total	125.76	12.59	10.0	112.98	89.8

8.1.2 PRODUCTION SCENARIO: PLAN ANALYSIS (XITH- XIITH PLAN)

8.1.2.1 KHARIF PULSES

(A-Lakh ha, P-Lakh tonnes, Y-kg/ha)

S. N.	Crops	State/ AI	XI Plan			XII Plan			% Share in XII Plan			Increase/decrease over XI Plan		
			A	P	Y	A	P	Y	A	P	YI	A	P	Y
A	Cereals													
1	Paddy	MP	15.90	16.56	1041	20.50	33.90	1654	4.71	3.19	68	28.90	104.67	59
		AI	436.53	972.49	2228	434.84	1061.85	2442				-0.39	9.19	10
2	Jowar	MP	4.57	5.93	1297	2.37	4.38	1848	4.03	8.66	215	-48.18	-26.17	42
		AI	73.42	69.71	949	58.75	50.49	859				-19.98	-27.56	-9
3	Bajra	MP	1.72	2.79	1616	2.30	4.84	2103	3.11	5.37	173	33.60	73.86	30
		AI	91.24	92.03	1009	74.05	90.20	1218				-18.84	-1.99	21
4	Maize	MP	8.49	11.32	1333	10.41	21.75	2088	11.45	9.11	80	22.60	92.04	57
		AI	85.46	203.65	2383	90.97	238.79	2625				6.45	17.26	10
5	Small millet	MP	2.80	0.84	300	1.80	0.87	481	27.53	20.81	76	-35.79	2.93	60
		AI	8.80	4.57	519	6.53	4.16	637				-25.83	-8.97	23
6	*Kha. Coarse Cereals	MP	17.59	20.88	1187	16.93	31.85	1882	7.00	7.94	113	-3.76	52.59	59
		AI	272.20	390.73	1435	241.74	401.38	1660				-11.19	2.73	16
7	Total Cereals	MP	33.49	37.44	1118	37.43	65.76	1757	5.53	4.49	81	11.75	75.63	57
		AI	708.73	1363.22	1923	676.58	1463.23	2163				-4.54	7.34	12
*Kharif Coarse Cereals incl. (Jawar, Bajra, Maize, Ragi, Small Millets)														
B	Pulses													
1	Arhar	MP	4.06	2.57	632	5.57	5.20	934	13.26	16.09	121	37.13	102.74	48
		AI	37.90	26.66	703	42.00	32.33	770				10.84	21.28	9
2	Urd	MP	5.15	1.83	354	8.38	4.64	553	31.03	31.57	102	62.59	153.85	56
		AI	23.24	11.09	477	27.01	14.69	544				16.20	32.45	14

3	Moong	MP	0.83	0.27	328	1.49	0.67	448	5.99	6.50	109	79.94	145.48	36
		AI	26.41	10.50	397	24.90	10.27	413				-5.71	-2.12	4
4	Kulthi	MP	0.23	0.07	301	0.17	0.06	385	6.97	5.82	84	-28.26	-8.24	28
		AI	3.29	1.43	433	2.39	1.10	461				-27.54	-22.87	6
5	*Other Pulses	MP	0.05	0.01	310	0.05	0.03	553	0.33	0.46	139	12.80	100.87	78
		AI	20.69	7.70	372	15.58	6.19	397				-24.69	-19.69	7
6	Total Pulses	MP	10.32	4.75	460	15.66	10.60	677	14.00	16.41	117	51.71	123.21	47
		AI	111.53	57.37	514	111.88	64.57	577				0.31	12.56	12
	*Other Pulses incl.(Mothbean, Other & Other Pulses)													
C.	Oilseeds													
1	Soybean	MP	53.45	61.37	1148	58.45	62.70	1073	51.74	52.69	102	9.35	2.16	-7
		AI	95.70	111.60	1166	112.96	119.00	1053				18.03	6.63	-10
2	G.Nut	MP	2.00	2.56	1277	2.27	3.58	1577	4.72	5.14	109	13.38	40.01	23
		AI	58.15	74.06	1274	48.13	69.69	1448				-17.23	-5.90	14
3	Sesamum/Til	MP	2.46	1.12	456	3.37	1.80	534	19.17	23.08	120	37.13	60.77	17
		AI	19.07	7.38	387	17.58	7.80	444				-7.81	5.72	15
4	Niger/Ramtil	MP	1.15	0.24	212	0.72	0.25	352	26.64	29.07	109	-37.44	4.21	67
		AI	3.87	1.08	280	2.69	0.87	323				-30.47	-19.69	16
5	Total Oilseeds	MP	59.06	65.29	1106	64.81	68.33	1054	35.73	31.28	88	9.73	4.66	-5
		AI	176.79	194.13	1098	181.36	218.44	1204				2.58	12.52	10
D	Cotton*	MP	6.44	13.15	347	5.99	25.19	715	5.55	7.73	139	-7.05	91.52	106
		AI	105.05	283.82	459	108.00	325.76	513				2.81	14.78	12
* Thousand bales of 170 kgs each.														

Source: DES, M/A, GoI (XIIth Plan* : Average of 2012-13 to 2016-17

8.1.2.2 RABI PULSES

(A-Lakh ha, P-Lakh tonnes, Y-kg/ha)

S. No.	Crops	State / AI	XI Plan			XII Plan*			% Share in XII Plan			Increase/decrease over XI Plan		
			A	P	Y	A	P	Y	A	P	YI	A	P	Y
A.	Cereals													
1	Wheat	MP	42.07	80.26	1908	57.07	157.28	2756	18.64	16.89	91	35.65	95.97	44
		AI	286.38	843.65	2946	306.13	931.21	3042				6.90	10.38	3
2	Barley	MP	0.75	1.02	1363	0.94	1.67	1775	14.04	9.94	71	26.30	64.42	30
		AI	6.58	15.06	2289	6.72	16.84	2508				2.13	11.86	10
3	Total Cereals	MP	42.81	81.28	1898	58.01	158.96	2740	18.54	16.77	90	35.49	95.57	44
		AI	292.95	858.71	2931	312.85	948.06	3030				6.79	10.41	3
B.	Pulses													
1	Urd	MP	0.07	0.02	348	0.12	0.06	539	1.46	1.01	70	73.61	168.91	55
		AI	7.84	4.11	524	8.15	6.31	775				3.89	53.53	48
2	Moong	MP	0.03	0.01	239	1.01	0.49	487	10.57	8.76	83	3174	6582	104
		AI	7.54	3.34	443	9.60	5.64	588				27.40	68.85	33
3	Kulthi	MP	0.00	0.00	296	0.002	0.001	333	0.07	0.04	65	-62.65	-57.91	13
		AI	2.11	1.08	512	2.25	1.15	513				6.54	6.66	0
4	Gram	MP	29.04	27.61	951	30.76	34.67	1127	34.46	41.06	119	5.92	25.59	19
		AI	82.18	72.42	881	89.28	84.43	946				8.63	16.58	7
5	Lentil	MP	5.50	2.33	424	5.65	3.70	655	41.03	35.56	87	2.68	58.59	54
		AI	14.64	9.60	655	13.77	10.41	756				-5.94	8.42	15
6	Lathyrus	MP	0.47	0.31	654	0.43	0.36	827	9.26	9.54	103	-7.64	16.79	26
		AI	5.16	3.42	662	4.69	3.76	803				-9.19	10.14	21
7	Peas	MP	2.34	0.96	412	3.48	2.80	804	38.65	33.00	85	49.07	191.15	95
		AI	7.16	6.22	869	9.01	8.49	942				25.95	36.48	8
8	*Total Pulses	MP	37.49	31.25	834	41.37	41.42	1001	29.44	33.83	115	10.35	32.55	20
		AI	133.57	104.52	783	140.55	122.42	871				5.23	17.13	11
	*Total Pulses incl. (Other Pulses)													

C.	Oilseeds													
2	Rapeseed /Mustard	MP	7.22	7.69	1065	7.17	8.11	1131	11.64	10.96	94	-0.76	5.41	6
		AI	61.01	68.85	1128	61.59	73.97	1201				0.95	7.44	6
3	Linseed	MP	1.19	0.46	390	1.14	0.57	504	38.78	39.50	102	-4.17	23.82	29
		AI	3.80	1.57	413	2.93	1.45	495				-22.94	-7.71	20
4	Total Oilseeds*	MP	8.43	8.16	968	8.45	8.70	1030	10.88	9.27	85	0.21	6.54	6
		AI	90.95	95.36	1048	77.65	93.86	1209				-14.63	-1.57	15
D	Sugarcane	MP	0.68	28.07	41023	0.88	41.23	46999	1.79	1.21	67	28.21	46.88	15
		AI	47.14	3258.3	69119	48.98	3420.3	69834				3.90	4.97	1
E	Jute & Mesta**	MP	0.02	0.02	154	0.06	0.05	154	0.75	0.05	6	158.97	158.60	-0.1
		AI	9.09	110.86	2195	8.08	109.08	2430				-11.12	-1.60	11
* Total Oilseeds include: Safflower, Sunflower & Castor), ** Thousand Bales of 180 kgs each.														

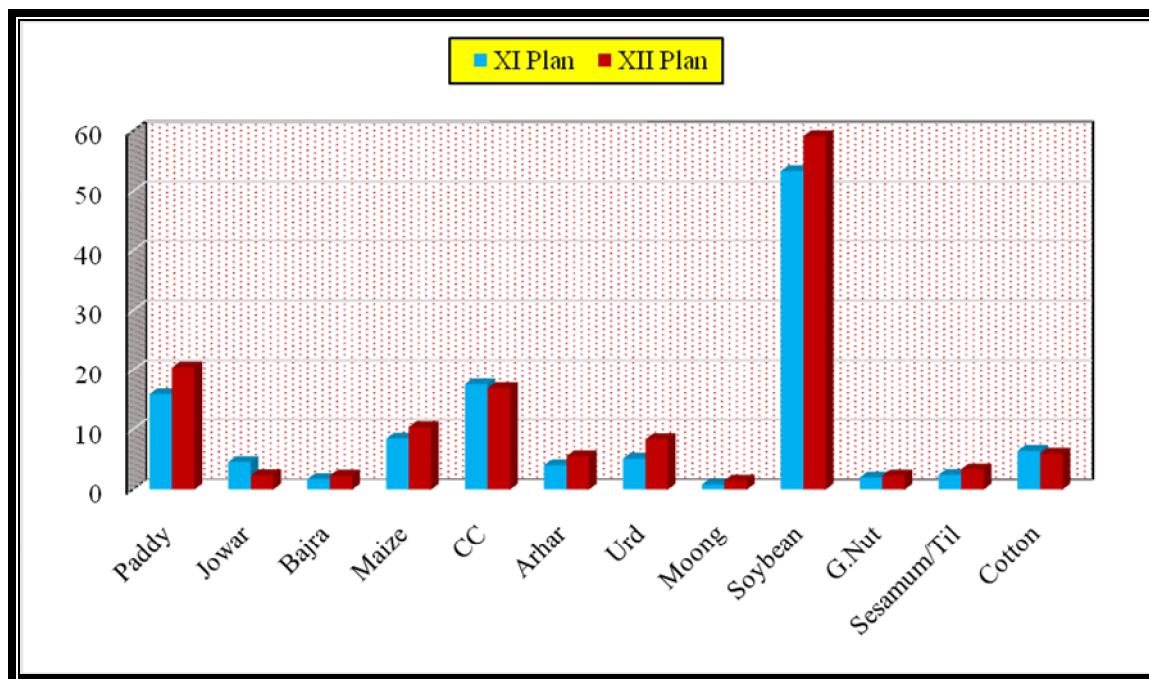
Source: DES, M/A, GoI (XIIth Plan* : Average of 2012-13 to 2016-17)

Impact Analysis: The comparative analysis of the two Plan period reveal that the NFSM launched during 11th Plan has paid dividends in the productivity of Paddy **which was 59% higher during the 12th Plan** (2012-13 to 2016-17) over its previous five year Plan in M.P.

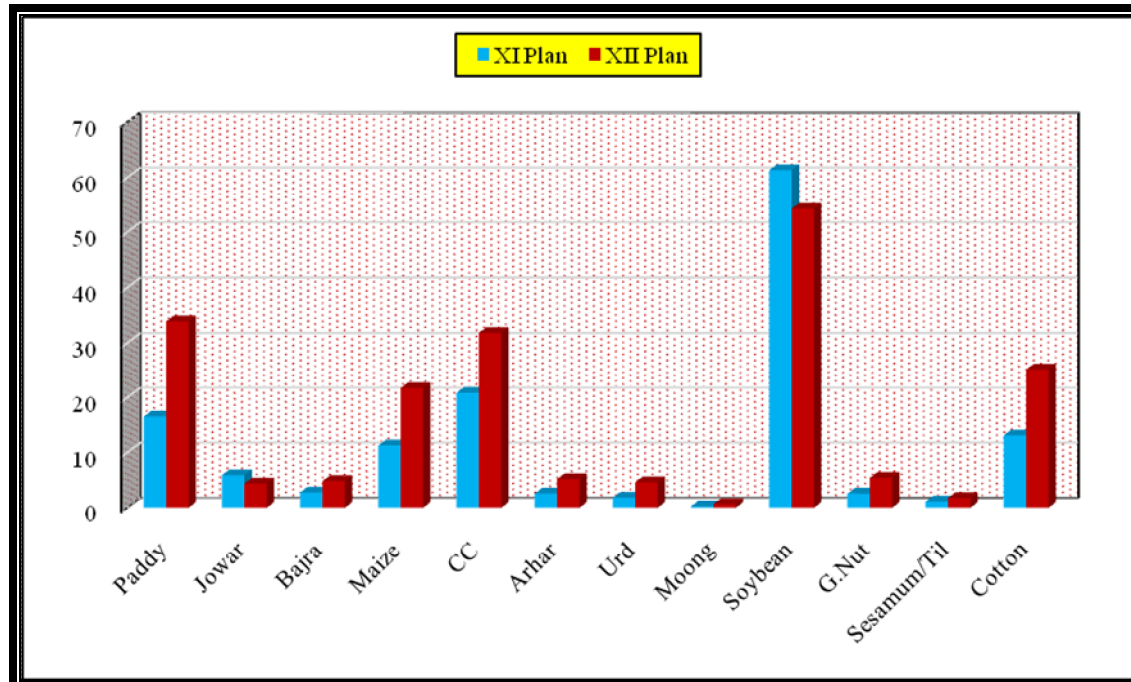
Similarly, the production and productivity of wheat has also increased to 95% and 44% during XIIth plan. A quantum jump has been recorded under pulses under all kharif pulses such as Arhar where productivity level of 934 kg/ha could be realized over the XIth Plan productivity of 632 kg/ha which is approx. 48% increase. Similarly increase in productivity approx. 55% in Urd & 104% in Mung over the XIth plan period during kharif as well as all pulses of rabi season also sown remarkable increase in productivity depicted in above table. Also observed noticeable productivity increase in Cotton which is approx. 106%, however, area declined during the period.

Crop Scenario: XIth & XIIth Plan – Madhya Pradesh

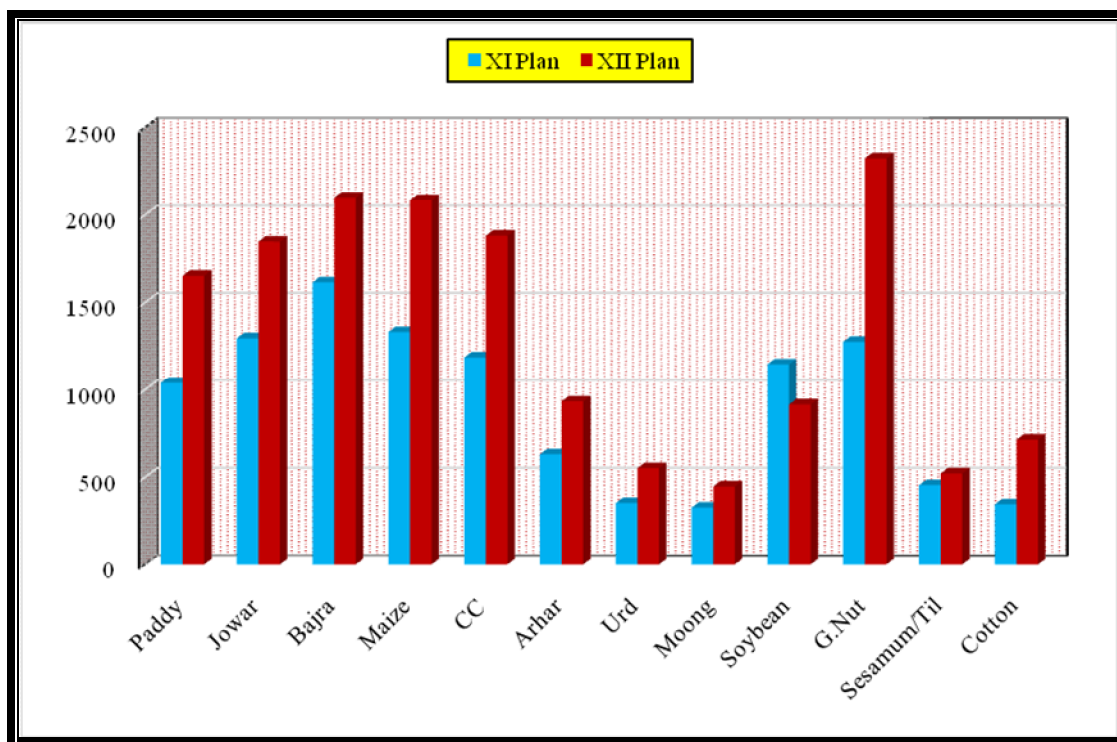
Kharif Crops Scenario



Crop Coverage: Pre-NFSM (XIth Plan) and Post-NFSM (XIIth Plan)

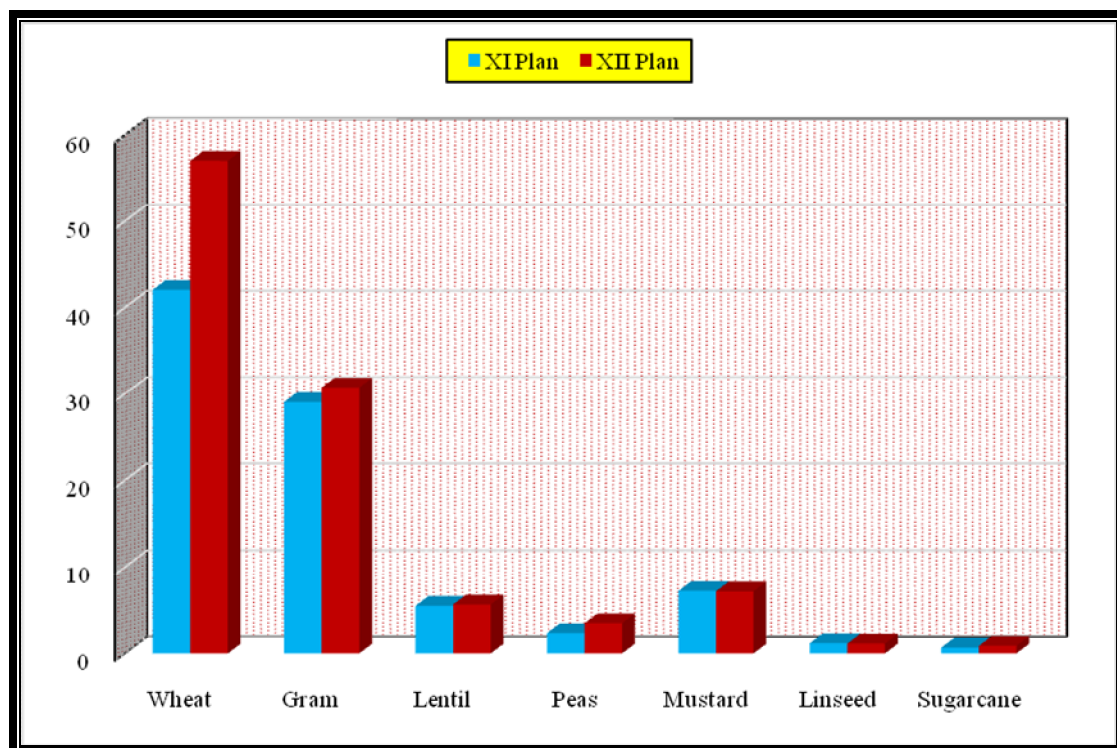


Production: Pre-NFSM (XIth Plan) and Post-NFSM (XIIth Plan)

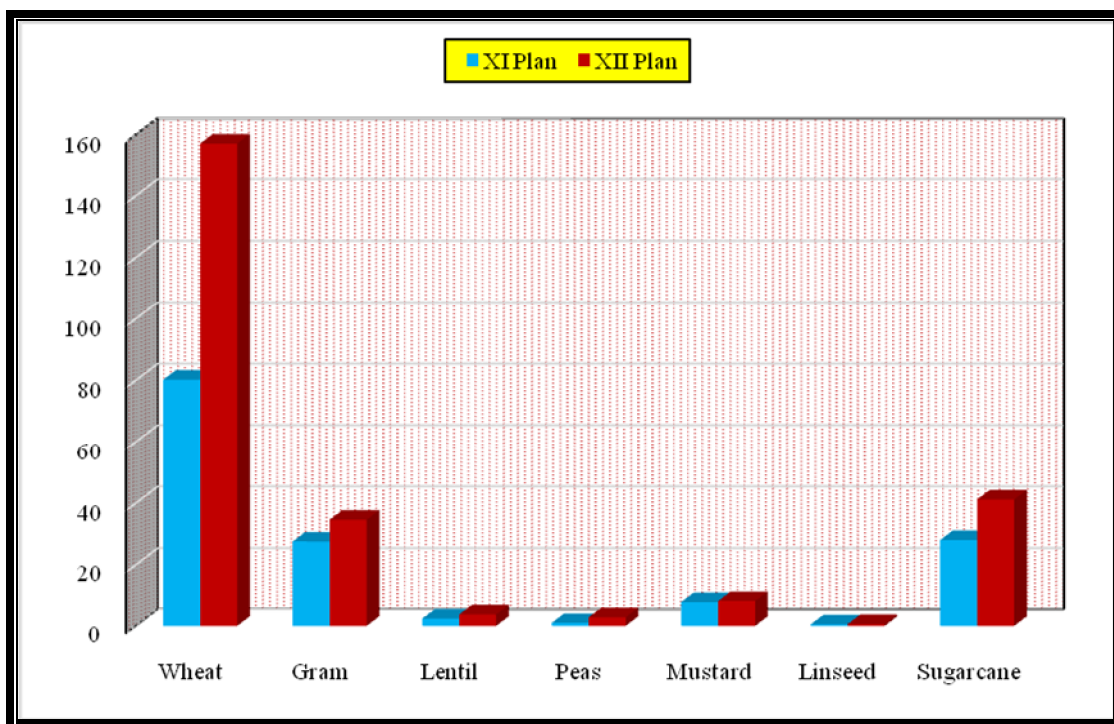


Yield: Pre-NFSM (XIth Plan) and Post-NFSM (XIIth Plan)

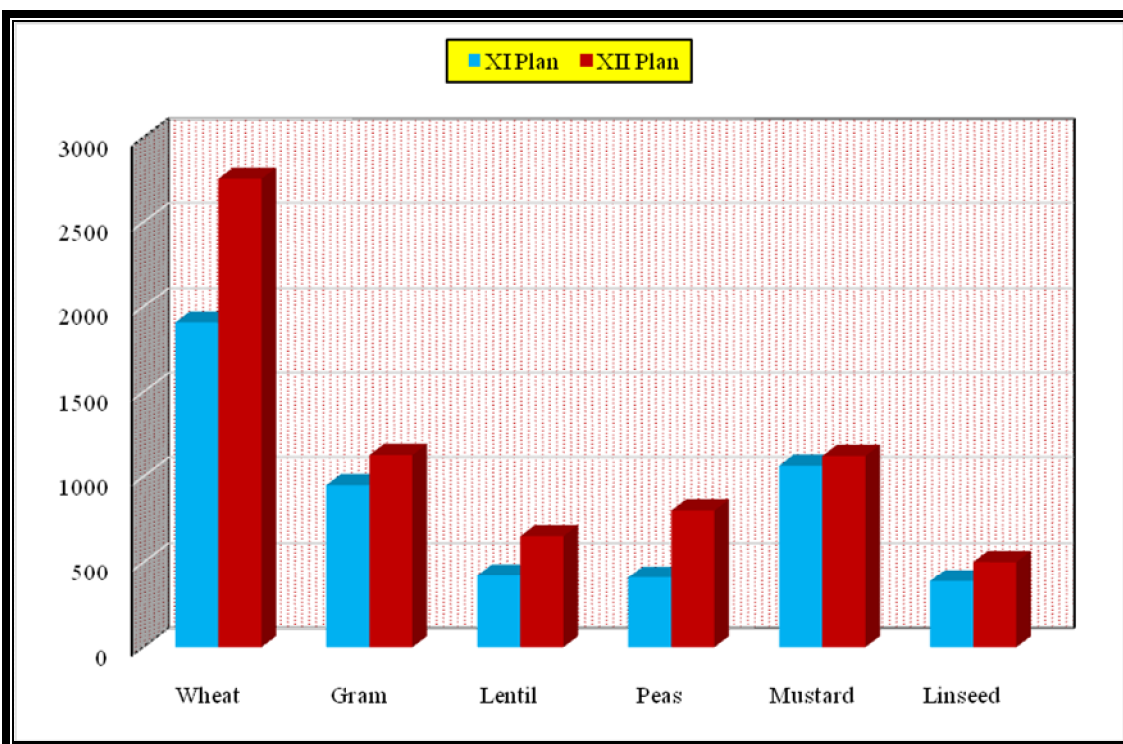
Rabi Crops Scenario



Crop Coverage: Pre-NFSM (XIth Plan) and Post-NFSM (XIIth Plan)



Production: Pre-NFSM (XIth Plan) and Post-NFSM (XIIth Plan)



Yield: Pre-NFSM (XIth Plan) and Post-NFSM (XIIth Plan)

8.1.3 CROP SCENARIO (KHARIF & RABI): 2016-17

(A-lakh ha, P- lakh tons, Y-kg/ha)

S.No.	Crop	Area		Production		Yield	
		DES	SDA	DES	SDA	DES	SDA
1	Paddy	22.60	22.89	41.58	81.74	1840	3571
2	Sorghum	2.20	2.20	4.65	3.61	2112	1641
3	Maize	12.63	12.84	31.16	43.78	2468	3410
4	Arhar	6.90	6.90	7.82	10.32	1133	1496
5	Urd	11.68	12.03	7.71	11.04	660	918
6	Moong	2.94	4.87	1.39	4.46	473	916
7	Soybean	54.01	54.01	70.48	70.75	1305	1310
8	Wheat	59.40	64.22	177.78	219.18	2993	3413
9	Bajra	2.80	2.80	6.81	7.78	2431	2779
10	Small Millets	1.35	1.35	0.88	0.88	652	652
11	Barley	1.20	1.20	2.62	4.06	2180	3383
12	Gram	32.22	32.22	35.49	44.62	1101	1385
13	Rapseed& Mustard	7.08	7.08	8.73	9.19	1233	1298
14	Linseed	1.21	1.21	0.59	0.61	488	504
15	Groundnut	2.55	2.55	4.33	3.84	1699	1506
16	Sesame	3.80	3.80	2.19	1.68	578	442
17	Cotton	5.99	5.99	25.19	9.46	715	268
18	Sugarcane	0.92	0.92	49.50	47.30	53804	51413

Source-DES, M/A IIIrd Advance) / SDA-IVth Advance Estimate.

8.1.4 FINANCIAL PROGRESS

a) ALLOCATION & EXPENDITURE: 2016-17

(Rs in Lakh)

Name of Scheme	Allocation			Release Central	Total Avail.of funds	Expenditure			% of utilization against (CS)	
						Central	State	Total	Allo.	Avail.
NFSM										
Pulses	22771.16	15180.78	37951.94	23721.73	23721.73	6224.32	4149.55	10373.87	27	26
Additional	6060	4040	10100	10100	10100	1261.7	841.13	2102.83	21	12
Sub-Total	28831.16	19220.78	48051.94	33821.73	33821.73	7486.02	4990.68	12476.7	26	22
Paddy	1463.45	975.64	2439.09	1581.63	1581.63	414.71	276.48	691.19	28	26
Wheat	2327.86	1551.91	3879.77	1547.67	1547.67	853.19	568.8	1421.99	37	55
Coarse Cereals	1045.8	697.2	1743	1307.25	1307.25	239.32	159.55	398.87	23	18
Cotton	71.42	47.61	119.03	132.42	132.42	0	0	0	0	0
Sugarcane	19.78	13.18	32.96	16.48	16.48	5	3.34	8.34	25	30
NFSM Total	33759.47	22506.32	56265.79	38407.18	38407.18	8998.24	5998.85	14997.09	27	23
NMOOP										
MM-I & II	9805.33	6536.88	16342.21	4829.09	4829.09	2469.2	1646.13	4115.33	25	51
RKVY	43374.77	28916.52	72291.29	47103.33	47103.33	21236.8	14157.9	35394.72	49	45
NMSA (RAD)	1123.8	749.2	1873	1870.23	1870.23	643.1	428.74	1071.84	57	34
SAME-ATMA	7309.21	4872.81	12182.02	6691.2	6691.2	3562.9	2375.27	5938.17	49	53
SMSP-NMAET	0	0		3738.28	3738.28	882.48	588.32	1470.8		24
Total Above	95372.59	63581.72	158954.3	102639.31	102639.31	37792.8	25195.2	62987.95	40	37

Details of physical and financial progress is at Annexure –I

CHHATISGARH

Particulars		STATUS	
Population(Crore)		2.56 (Male - 1.29, Female -1.28)	
Population Growth (%)		22.61 ó 2011	
Forest Village		74	
Revenue Districts (Nos.)		27	
Block/ Janpad Panchayat (Nos.)		146	
Village Panchayat (Nos.)		10971	
Tehsil (Nos.)		150	
Total Village (Nos.)		20273	
Krishi Upaj Mandi (Nos.)		73	
Annual Rainfall (Ave.)		1296 mm (October 2016 - 1262 mm)	
Land Use Pattern (Area : lakh ha)		Agricultural land use (Area -lakh ha)	
Geographical Area	137.90	Net sown area	46.81
Cultivable area	57.28 (41.53%)	Double Cropped Area	10.47
Forest area	63.15 (45.80%)	Gross cropped area	57.28
Land under non-agricultural use	10.30 (7.46%)	<i>Kharif</i> Area	46.04
Permanent pastures	5.25 (3.80%)	<i>Rabi</i> Area	11.23
Cultivable wasteland	3.51 (2.55%)	Cropping Intensity	123%
Barren and uncultivable land	8.88 (6.43%)		
Current fallows	2.67 (1.93%)		
Irrigation (Area: lakh ha)		Source of Irrigation (Area : lakh ha)	
Net irrigated area	14.68	Canals	9.03 (61.55%)
Gross irrigated area	17.87	Tanks	0.43 (2.93%)
Rainfed area (to Cultivable Area)	39.41 (69%)	Open wells	0.20 (1.37%)
		Bore wells/ Tube Wells	4.28 (29.17%)
		Other Sources	0.73 (4.98%)
		Total Irrigated Area	14.67

Soil Type		(Area - lakh ha)	
Alluvial Soil (Kachhar)	1.38 (2.7%)	Inceptisols (Matasi)	13.54 (26.9%)
Entisols (Bhata)	10.02 (20%)	Vertisols (Kanhar)	11.43 (22.8%)
Alfisols (Dorsa)	13.82 (27 %)	Land Classif. Total	50.19
Major Agricultural crops			
Kharif	Paddy, Pigeonpea. Soyabean, Maize,Mung, Urd, Kulthi		
Rabi	Wheat, Gram, Mustard, Safflower, Lathyrus, Field Pea, Lentil, Linseed, Groundnut		
Development Programme CSS / CS			
NFSM	NFSM-Paddy (13) ; Pulses (27); Coarse Cereals (09); PMT District- 27		
NMOOP	Mini Mission I- (Oilseeds) Mini Mission III- (TBOs)		
(*Source- ENVIS, Centre of M.P. State.)			

8.2.1 Production Scenario: Plan analysis (XI-XII Plan)

8.2.1.1 Kharif Crops

(A-Lakh ha, P-Lakh tonnes, Y-kg/ha)

S. N.	Crops	State /AI	XI Plan			XII Plan			% Share in XII Plan			Increase/decrease over XI Plan			
			A	P	Y	A	P	Y	A	P	Y	A	P	Y	
A	Cereals														
	Paddy	CG	37.27	52.23	1402	38.08	66.97	1759	8.76	6.31	72	2.19	28.22	25	
		AI	436.53	972.49	2228	434.84	1061.85	2442				-0.39	9.19	10	
	Jowar	CG	0.05	0.06	1180	0.05	0.04	763	0.09	0.08	89	-3.07	-37.34	-35	
		AI	73.42	69.71	949	58.75	50.49	859				-19.98	-27.56	-9	
	Bajra	CG	0.00	0.00	1000	0.001	0.001	1000	0.001	0.001	82	0.00	0.00	0	
		AI	91.24	92.03	1009	74.05	90.20	1218				-18.84	-1.99	21	
	Maize	CG	1.03	1.61	1567	1.15	2.24	1949	1.26	0.94	74	11.63	38.84	24	
		AI	85.46	203.65	2383	90.97	238.79	2625				6.45	17.26	10	
	Small millet	CG	1.65	0.35	212	1.11	0.25	222	17.04	5.94	35	-32.60	-29.58	4	
		AI	8.80	4.57	519	6.53	4.16	637				-25.83	-8.97	23	
	*Kha.	CG	2.82	2.05	727	2.38	2.54	1068	0.99	0.63	64	-15.48	24.11	47	
		Coarse Cereals	AI	272.20	390.73	1435	241.74	401.38	1660				-11.19	2.73	16
	Total Cereals		CG	40.09	54.28	1354	40.47	69.51	1718	5.98	4.75	79	0.95	28.06	27
		AI	708.73	1363.22	1923	676.58	1463.23	2163				-4.54	7.34	12	
*Kharif Coarse Cereals incl. (Jawar, Bajra, Maize, Ragi, Small Millets)															
B	Pulses														
	Arhar	CG	0.55	0.27	497	0.58	0.35	597	1.38	1.07	78	4.78	25.81	20	
		AI	37.90	26.66	703	42.00	32.33	770				10.84	21.28	9	
	Urd	CG	1.05	0.31	292	0.93	0.29	315	3.45	2.00	58	-11.05	-4.12	8	
		AI	23.24	11.09	477	27.01	14.69	544				16.20	32.45	14	
	Moong	CG	0.09	0.02	270	0.09	0.03	361	0.37	0.33	88	2.19	36.91	34	
		AI	26.41	10.50	397	24.90	10.27	413				-5.71	-2.12	4	
	Kulthi	CG	0.48	0.14	298	0.46	0.15	321	19.07	13.28	70	-4.49	2.68	8	
		AI	3.29	1.43	433	2.39	1.10	461				-27.54	-22.87	6	
	*Other Pulses	CG	0.05	0.02	317	0.02	0.01	590	0.13	0.20	149	-60.78	-27.04	86	
		AI	20.69	7.70	372	15.58	6.19	397				-24.69	-19.69	7	
	Total Pulses	CG	2.22	0.76	344	2.08	0.83	399	1.86	1.29	69	-6.34	8.72	16	
		AI	111.53	57.37	514	111.88	64.57	577				0.31	12.56	12	
	*Other Pulses incl.(Mothbean, Other & Other Pulses)														

C.	Oilseeds													
	Soybean	CG	0.93	0.92	995	1.09	0.89	817	0.96	0.64	66	17.63	-3.49	-18
		A I	95.70	111.60	1166	112.96	140.08	1240				18.03	25.52	6
	G.Nut	C G	0.29	0.38	1349	0.26	0.36	1385	0.54	0.52	96	-8.77	-6.40	3
		A I	58.15	74.06	1274	48.13	69.69	1448				-17.23	-5.90	14
	Sesamum/ Til	CG	0.21	0.07	354	0.19	0.07	352	1.06	0.84	79	-9.62	-10.16	-1
		A I	19.07	7.38	387	17.58	7.80	444				-7.81	5.72	15
	Niger/ Ramtil	CG	0.70	0.12	173	0.64	0.11	177	23.81	13.03	55	-8.69	-6.60	2
		A I	3.87	1.08	280	2.69	0.87	323				-30.47	-19.69	16
	Total Oilseeds	CG	2.12	1.50	708	2.18	1.43	656	1.20	0.65	54	2.72	-4.81	-7
		A I	176.79	194.13	1098	181.36	218.44	1204				2.58	12.52	10
* Thousand bales of 170 kgs each.														

Kharif Impact Analysis: The comparative analysis of crop performance during the XIth Plan period and XIIth Plan period reveal that the NFSM interventions since 11th Plan has paid dividends in the production and yield of Paddy which is 28% and 25% higher during XIIth Plan over its previous five year Plan and also seen under maize crop with an increase in area, production and yield at 11 %, 38% and 24% respectively. The crops replaced through diversification by maize and soybean in kharif season are Small Millets (> 32%), Urd (> 11%), Kulthi (> 4%), Til (> 9%) and Niger (> 8%) of concerned here. Reduction in area under Urd and Kulthi is a major cause of concern. The production trend for kharif crops has shown an increasing trend in Maize, Mung, Paddy and Tur. As regards the per hectare yield, quantum jump has been recorded under Mung, Paddy, Maize and Arhar at > 34, 25, 24 and 20 % respectively.

8.2.1.2 Rabi Pulses

(A-Lakh ha, P-Lakh tonnes, Y-kg/ha)

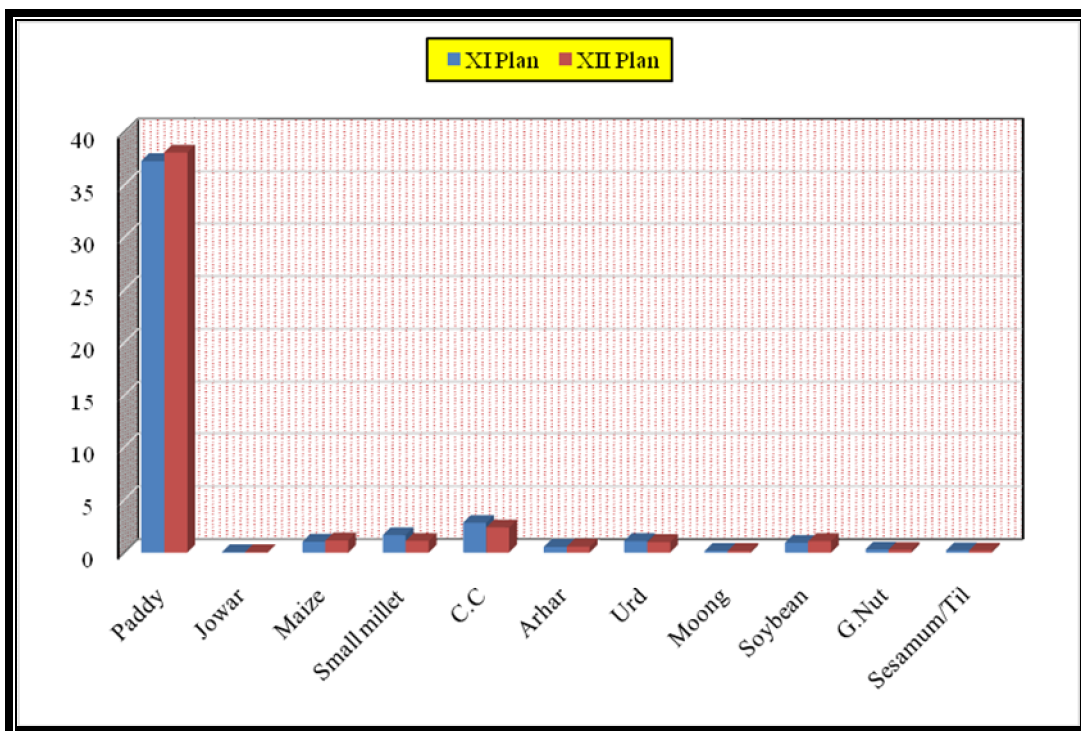
S. No.	Crops	State/ AI	XI Plan			XII Plan			% Share in XII Plan			Increase/decrease over XI Plan		
			A	P	Y	A	P	Y	A	P	YI	A	P	Y
A.	Cereals													
1	Wheat	CG	1.03	1.15	1116	1.05	1.40	1338	0.34	0.15	44	1.97	22.25	20
		AI	286.38	843.65	2946	306.13	931.21	3042				6.90	10.38	3
2	Barley	CG	0.03	0.03	833	0.02	0.02	863	0.37	0.13	34	-20.51	-17.69	4
		AI	6.58	15.06	2289	6.72	16.84	2508				2.13	11.86	10
3	Total Cereals	CG	1.06	1.17	1107	1.07	1.42	1327	0.34	0.15	44	1.30	21.36	20
		AI	292.95	858.71	2931	312.85	948.06	3030				6.79	10.41	3
B.	Pulses													
1	Urd	CG	0.04	0.01	255	0.07	0.02	243	0.84	0.26	31	57.87	50.91	-4
		AI	7.84	4.11	524	8.15	6.31	775				3.89	53.53	48
2	Moong	CG	0.07	0.02	229	0.07	0.02	277	0.72	0.34	47	-1.98	18.52	21
		AI	7.54	3.34	443	9.60	5.64	588				27.40	68.85	33
3	Kulthi	CG	0.03	0.01	295	0.04	0.01	300	1.83	1.07	58	37.90	40.02	2
		AI	2.11	1.08	512	2.25	1.15	513				6.54	6.66	0
4	Gram	CG	2.44	2.22	908	2.84	2.66	935	3.18	3.15	99	16.31	19.78	3
		AI	82.18	72.42	881	89.28	84.43	946				8.63	16.58	7
5	Lentil	CG	0.16	0.05	322	0.16	0.06	389	1.13	0.58	51	0.55	21.41	21
		AI	14.64	9.60	655	13.77	10.41	756				-5.94	8.42	15
6	Lathyrus	CG	3.39	1.99	589	3.41	2.46	723	72.75	65.47	90	0.65	23.53	23
		AI	5.16	3.42	662	4.69	3.76	803				-9.19	10.14	21
7	Peas	CG	0.16	0.06	352	0.15	0.07	437	1.71	0.79	46	-2.70	20.77	24
		AI	7.16	6.22	869	9.01	8.49	942				25.95	36.48	8
8	*Total Pulses	CG	6.31	4.36	691	6.64	5.15	774	4.73	4.20	89	5.31	17.98	12
		AI	133.57	104.52	783	140.55	122.42	871				5.23	17.13	11
*Total Pulses incl. (Other Pulses)														

S. No.	Crops	State/ AI	XI Plan			XII Plan			% Share in XII Plan			Increase/decrease over XI Plan		
			A	P	Y	A	P	Y	A	P	YI	A	P	Y
C.	Oilseeds													
1	Rapeseed /Mustard	CG	0.53	0.22	409	0.47	0.25	535	0.77	0.34	45	- 11.23	16.22	31
		AI	61.01	68.85	1128	61.59	73.97	1201				0.95	7.44	6
2	Linseed	CG	0.45	0.14	301	0.29	0.10	355	9.95	7.13	72	- 35.37	-23.97	18
		AI	3.80	1.57	413	2.93	1.45	495				- 22.94	-7.71	20
3	Total Oilseeds*	CG	1.28	0.47	365	0.77	0.36	465	0.99	0.38	38	- 39.77	-23.41	27
		AI	90.95	95.36	1048	77.65	93.86	1209				- 14.63	-1.57	15
4	Sugarcane	CG	0.10	0.26	2491	0.18	0.47	2583	0.37	0.01	4	74.76	81.22	4
		AI	47.14	3258.30	69119	49.03	3427.73	69911				4.01	5.20	1
5	Jute & Mesta**	CG	0.01	0.03	355	0.01	0.02	333	0.15	0.02	14	- 16.67	-21.83	-6
		AI	9.09	110.86	2195	8.08	109.08	2430				- 11.12	-1.60	11
* Total Oilseeds include: Safflower, Sunflower & Castor), ** Thousand Bales of 180 kgs each.														

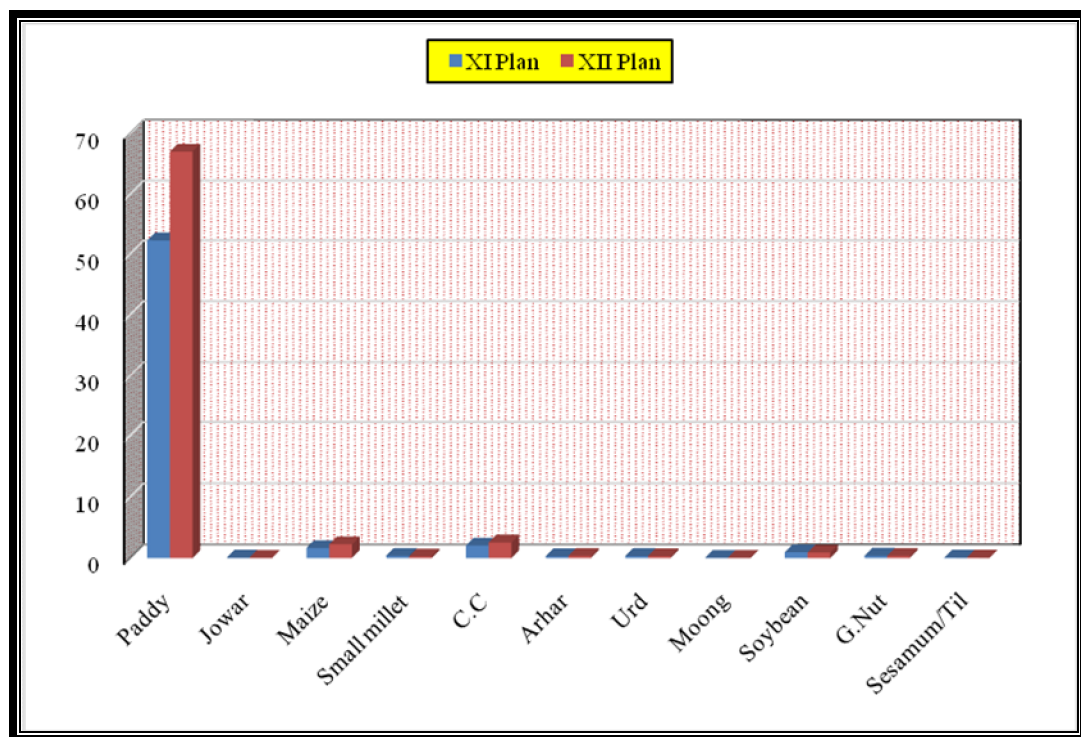
Rabi Impact Analysis: The comparative analysis of crop performance during the XIth Plan period and XIIth plan reveal that the NFSM interventions since 11th Plan has paid dividends in the production and yield of Wheat which is 22% and 20% higher during XIIth plan over its previous five year Plan and also seen under Sugarcane, Urd, Kulthi and Gram crop with an increase in area at >74, 57, 37 and 16 whereas, increasing trend in production at 81% 50% & 40% and 19% respectively. The crops replaced through this diversification in rabi season are Barley (>20%) Peas (> 2%), Mustard (>11%) and Linseed (>35%) of concern here. The production trend for kharif crops has shown an increasing trend in Sugarcane, Kulthi, Urd, Lathyrus, Wheat, Lentil etc. As regards the per hectare yield, quantum jump has been recorded under Mustard, Peas, Lathyrus, Wheat, & Mung/Lentil at >31, 24, 23 and 21% respectively.

Crop Scenario: XIth&XIIth Plan – Chhattisgarh

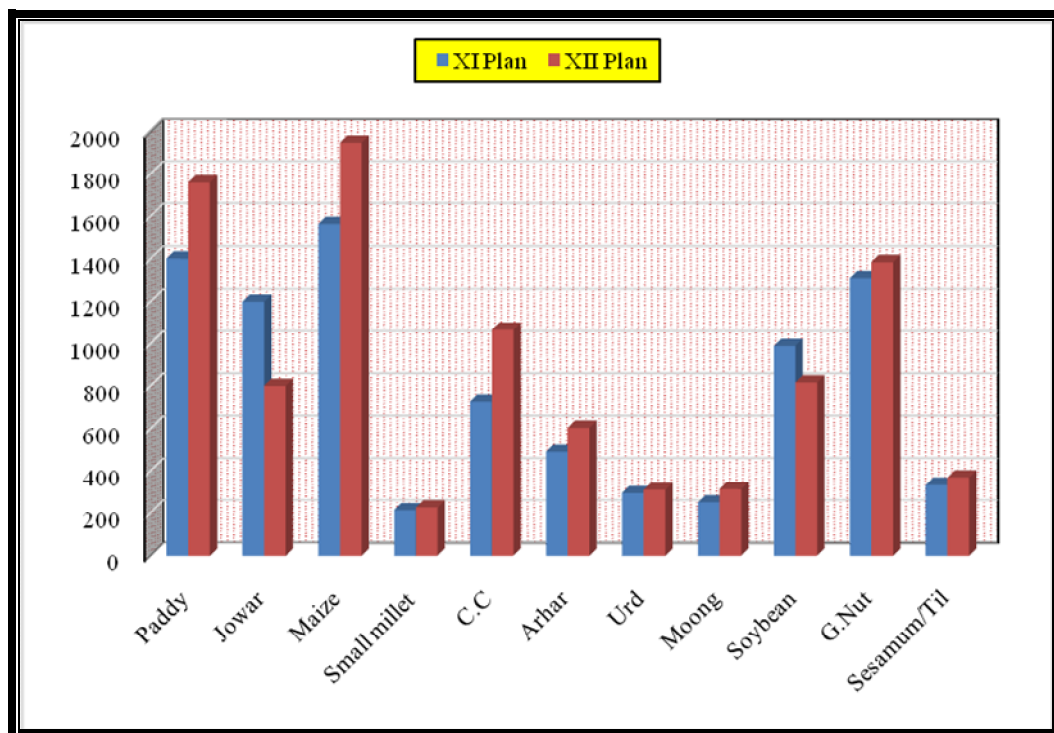
Kharif Crops Scenario



Crop Coverage: Pre-NFSM (XIth Plan) and Post-NFSM (XIIth Plan)

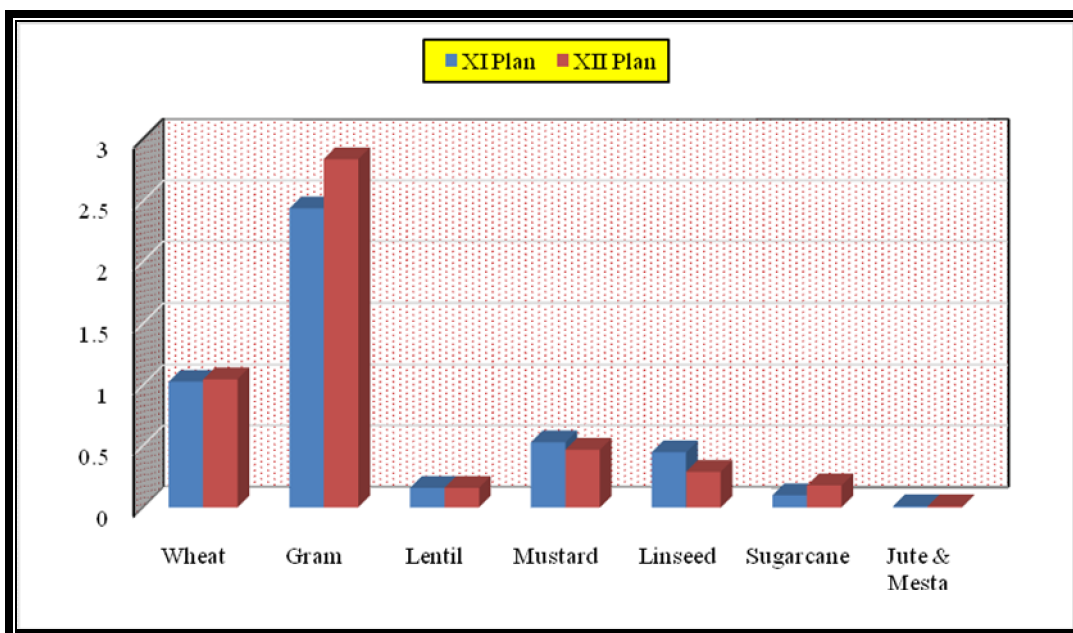


Production: Pre-NFSM (XIth Plan) and Post-NFSM (XIIth Plan)

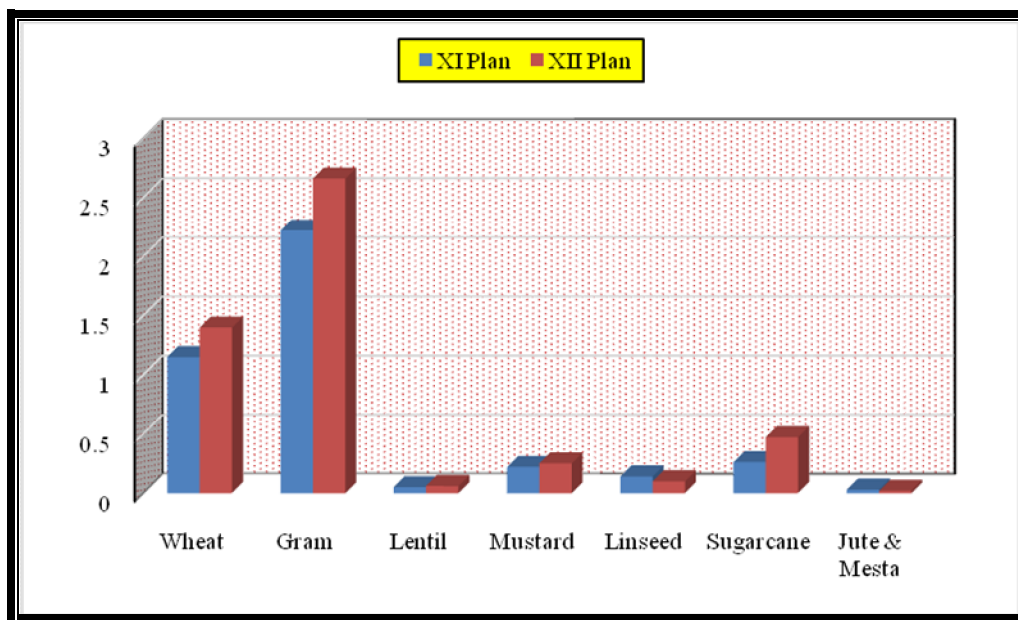


Yield : Pre-NFSM (XIth Plan) and Post-NFSM (XIIth Plan)

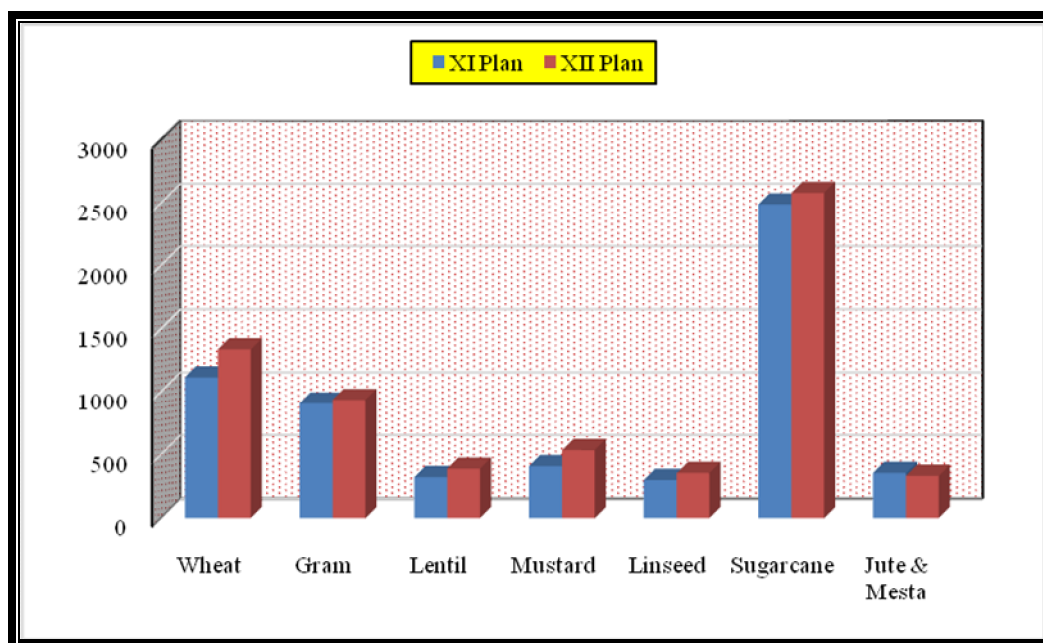
Rabi Crops Scenario



Crop Coverage: Pre-NFSM (XIth Plan) and Post-NFSM (XIIth Plan)



Production: Pre-NFSM (XIth Plan) and Post-NFSM (XIIth Plan)



Yield : Pre-NFSM (XIth Plan) and Post-NFSM (XIIth Plan)

8.2.2 CROP SCENARIO (Kharif & Rabi): 2017

Crop	Area (lakh ha)		Production (Lakh tons)		Yield (kg/ha)	
	DES	SDA	DES	SDA	DES	SDA
Paddy	38.30	38.55	80.48	79.50	2101	2062
Maize	1.20	3.05	2.60	5.83	2167	1910
Arhar	0.69	1.43	0.46	0.93	667	650
Urd	0.99	1.69	0.32	0.77	323	456
Moong	0.17	0.55	0.07	0.23	412	418
Soybean	1.04	1.34	0.73	1.73	702	1291
Wheat	1.15	1.68	1.53	2.44	1330	1452
Gram	2.93	3.70	3.01	4.26	1027	1151
Lathyrus	-	3.39	-	2.27	-	670
Peas	-	0.50	-	0.29	-	580
Rapeseed/Mustard	0.49	1.46	0.25	0.88	510	603
Sugarcane	0.24	0.35	0.56	0.97	2333	2771

Source-DES, M/A (Final est.) / CLR-State

8.2.3 FINANCIAL PROGRESS

(a) ALLOCATION & EXPENDITURE: (2016-17)

(Rs In Lakh)

Name of Scheme	Allocation			Release Central	Total avail. of funds	Expenditure			% of utilization against (CS)	
	Central	State	Total			Central	State Share	Total	Allo	Avail
									.	.
NFSM										
Pulses	3678.00	2452.00	6130.00	3022.55	3022.55	2039.92	1359.94	3399.86	55	67
Additional	960.00	640.00	1600.00	1600.00	1600.00	889.04	592.69	1481.73	93	56
Sub-Total	4638.00	3092.00	7730.00	4622.55	4622.55	2928.96	1952.63	4881.59	63	63
Paddy	2795.40	1863.60	4659.00	4014.12	4014.12	1643.85	1095.90	2739.75	59	41
Coarse Cereals	156.00	104.00	260.00	259.78	259.78	89.70	59.80	149.50	58	35
NFSM Total	7589.40	5059.60	12649.00	8896.45	8896.45	4662.51	3108.33	7770.84	61	52
NMOOP										
MM-I & I	652.98	435.32	1088.31	702.10	702.10	352.91	235.27	588.18	54	50
RKVY	2316.40	1544.26	3860.66	3357.71	3357.71	1934.97	1289.98	3224.95	84	58
BGREI	9901.09	6600.73	16501.82	14961.12	14961.12	8064.90	5376.60	13441.50	81	54
NMSA (RAD)	240.00	160.00	400.00	978.81	978.81	262.17	174.78	436.95	109	27
Total Above	20699.87	13799.91	34499.79	28896.19	28896.19	15277.46	10184.96	25462.42	74	53

BACKGROUND:

The Centrally Sponsored Scheme of Crop development programme on National Food Security Mission for 03 commodities (viz. Rice, Wheat and Pulses) was launched during the 11th five year plan (2007-08 to 2011-12) with the objectives to achieve additional food-grain production consisting of Rice, Wheat & Pulses by 10, 8 and 2 million tonnes respectively by the terminal year of Eleventh Plan. With the critical interventions on demonstrations of improved package of practices, SRI and Hybrid Rice Technology, Seed etc., the envisaged targets of 20 million tonnes of food-grain was achieved.

Along with the other four Missions, viz. NMAET, NMSA, NMOOP & MIDH, the revamped NFSM, cleared by Cabinet Committee on Economic Affairs, has been continued during the 12th five year plan 2012-13 to 2016-17 with an allocation of Rs. **12350 Crore**. The revamped NFSM, however, became operational from 2014-15.

The NFSM during Twelfth Five Year Plan (2012-13 to 2016-17) have five components viz. NFSM-Rice, Wheat, Pulses, Coarse Cereals and Commercial Crops (Sugar, Jute, Cotton) from 2014-15, has targeted an additional production of 25 million tonnes of food grains consisting of Rice-10 million tonnes, Wheat- 8 million tonnes, Pulses- 4 million tonnes & Coarse Cereals-3 million tonnes.

The basic strategy of the Mission is to promote and extend improved technology package. The interventions include organisation of Cluster Demonstrations, including 30% of total demonstrations under Cropping System Based Approach focusing *low productivity* and *high potential districts* by SDA with technical backstopping of ICAR/SAUs/ on Rice, Wheat, Pulses; distribution of certified HYV seeds/Hybrid seeds, RCT tools, irrigation machineries/MIS, trainings and undertaking local initiatives to the tune of 5% of total budgetary allocation to improve productivity.

The NFSM strategy further emphasise has to targeting reclamation of problematic soils, water logging areas and mitigation of adverse effect of climate change for high productivity areas, value chain integration (FPOs), and assistance for Custom Hiring Centre (CHCs).

A total of 05 NLMT were conducted by this Directorate during 2016-17.

A. NFSM

State	Season	Districts covered	Date	Report Submission
MP	Kharif 2016	Indore, Jhabua, Ratlam, Dewas	Sept, 06 th - 10 th	17 th October 2016
	Rabi 2016-17	Sagar, Chhaturpur, Tikamgarh & Panna	Feb, 14 th -20 th	12 th , April, 2017
CG	Kharif 2016	Korba, Jangir-Champa, Baloda Bazar	Sept. 28 th -Oct. 01 st	28 th October 2016
	Rabi 2016-17	Rajnandgaon, Dhamtari, Kanker & Jagdalpur	Feb, 27 th -March, 03 rd	12 th , April, 2017

B. BGERI

CG	Kharif 2016	Mahasamund & Gariyaband	September 6 th -08 th	17 th October 2016
----	-------------	-------------------------	---	-------------------------------

OBSERVATIONS

1. The monitoring/review of the Centrally Sponsored Scheme NFSM was done in consonance with the other CSS (NMOOP, NMSA, NMAET, RKVY, PKVY, SHC, PMFBY) and the State-Plan Agricultural Development Programmes (Surajdhara, Annapurnna, Biogas, SC/ST Tubewell, MAPWA, Top-up Subsidy, IT and State Minor Irrigation) in the districts.
2. Overall kharif crop position is excellent this year with low insect pest infestation both in the visited districts and the state as a whole. About 1 % (1.37 lakh ha) of the total kharif-2016 sown area has been reported as affected due to heavy rainfall across the state during whole S-W Monsoon period (Soybean -0.4 lakh ha, Black Gram-0.39 lakh ha & Arhar-0.37 lakh ha) owing to heavy rainfall /flood during August 2016 in the eastern part of Madhya Pradesh
3. As compared to last 03 kharif seasons (2013-2015), soybean is in good condition. Major Kharif crops of the state i.e. Soybean is at nearing maturity stage & excellent this year. The last 03 seasons have been worst for the state. Crop expression in the demonstrations under NMOOP as also in the fields of farmers own practice was found good. Given to favourable weather conditions prevailing further for 10615 days, it is expected that the yield levels may be > 14 quintals/ha. *During the field visit, mite infestation in soybean has been observed occurring as a new problem.*
4. Major Kharif pulses like Blackgram and Arhar are generally satisfactory except phytophthora blight (below ETL) in some fields. Mungbean crop, however, not found in good condition in demonstration trials owing to water logging/heavy rains, insect pest and poor agronomic management etc.
5. In General, including district Dewas & Jhabua, the norms of laying out of cluster demonstrations i.e. contiguous block in a cluster of 100 ha or more, could not be followed in the state. The ***control plot*** depicting the farmers practice, were also not identified or documented.
6. Demonstrations on pulses and coarse cereals (Maize) have been found scattered in almost all the districts. Proper display boards / publicity etc., were lacking in many places. In case of Arhar demonstrations, proper row to row and plant to plant spacing (45X10 6Early Maturing var. & 60X15-medium/late maturing var.) not maintained at most of the sites.
7. Action plan/document depicting total category-wise beneficiaries details on mandatory implementation of NFSM under Special Component Plan (SCP) for Scheduled Castes (16%), Tribal Sub-Plan (TSP) for Scheduled Tribes (8%); SMF 33% and 30% of total allocation of funds to Women beneficiaries etc., was lacking/not provided to the NLMT.

Thus the equity criteria for identification of areas and beneficiaries in programme implementation could not be adjudged holistically, in general. ***However, the State HQ has directed the districts to achieve enhanced targets of 20%, 15% and 33% under SCP, TSP and women beneficiaries respectively.***

8. The mandatory principles of conducting improved cluster demonstrations have been rated as average. These includes : viz., ***Selection of site(representing soil type/soil fertility status of the area), Soil Analysis, Input Package (based on soil fertility status of the AES), an Orientation Training before laying out demonstration including ‘control plot’ and a display board*** (containing minimum 11 parameters ó i) no. of farmers ii) name of village iii) name of variety/hybrid iv) type of demonstration v) fertilizers applied vi) bio-fertilizer applied vii) micronutrient applied viii) date of sowing/transplanting ix) seed rate and spacing x) any other critical input used xi) mobile no. of DC /TA etc.).
9. It is observed that farmers are using the pesticides as per the advice of pesticide dealer not as per the recommendation of the extension department. The major insecticides/weedicides have been distributed as input under the demonstration.
10. During the course of monitoring of NFSM/NMOOP for last 08-09 years, it is observed that several *Growth promoters and Tonics* are being used abruptly and applied in combination with pesticides and these need to be checked. The online registration process for distribution of Sprinkler Pump sets, Water Carrying Pipes and power drawn implements has been initiatives this year by the State Department of Agriculture.
11. Delayed communication of NFSM Kharif 2016-17 targets by State Head Quarter to the districts ó {(Paddy & Pulses) May 28th, Commercial Crops (Cotton & Sugarcane), May 31st Coarse Cereals May 26st, 2016} and release of 1st instalment on August 12th, 2016 has resulted to delay preparation of plan at block level for input and other arrangement. The NFSM ó PMT Staff (1 District Consultant + 02 Technical Assistants) also could not receive their honorarium continuously for 4 months (April - July 2016).
12. The Govt. of India administration approval for NFSM 2016-17 (***Rs. 46011.71 Lakh –Rs. 27607.02 Lakh: GoI Share + Rs. 18404.68 Lakh: State Share***) was issued on May 2nd, 2016 with 1st financial released (Viz., Sugarcane- July 6th, 2016; Rice, Wheat, Pulses, Coarse Cereals- August, 9th, 2016)
13. The Direct Benefit Transfer Scheme (DBT) is under partial implementation w.e.f Kharif 2016 for ***03 CSSSchemes of NFSM (Paddy, Pulses, Wheat, Maize, CC, Sugarcane, Cotton), NMOOP & ATMA*** vide the state's directives to districts dated ***June 10th 2016***. Only the seed component has excluded from DBT while other inputs were to be purchased by farmers themselves and to be submitted to RAEO/ADO for reimbursement through DBT.
14. The farmers were not aware of the input cafeteria at the first hand and also, these inputs were not easily accessible to the farmers within a very short sowing window during kharif. Thus it had badly hampered the quality and quantity of NFSM or other demonstrations; almost 90% of total demonstration organized in the state are based only on single input seed. How these Cluster Demonstration may be considered as Demonstration.
15. Under the Cluster Demonstrations, of the total input cafeteria, only the seed was directed to be provided to the beneficiary. The other input has to be purchased/procured by the farmers themselves through licence dealer and after verification by the RAEO/ADO/SADO/BTM-ATMA/ABTM-ATMA, the subsidy amount is to be paid through DBT to the farmers account.
16. In general the DBT scheme is under partial implementation. To achieve 100 % DBT implementation by March 2017, as per the DBT Mission & directives of the Ministry vide letter no. Z-11018/34/2016-IT, DAC&FW dated July 28th, 2016.

17. The gazette notification on Pradhan Mantri Fasal Bima Yojna, in pursuant to letter. no. 13015-03-2016-Credit II, dated 23rd Feb. 2016, has been issued by the state for crop year 2016-17 for Kharif & Rabi both. The crop acreage with 100 ha or more (Patwari circle-wise) has been notified for Soybean, Maize, Paddy (un-irrigated), Sesame, Cotton, Groundnut, Kodo millet (kodo) Kutki (little Millet), Sorghum, Greengram, Blackgram.
18. More affords are needed to extend PMFBY to cover non-loany farmers by involving the revenue department and the RRBs in the districts.
19. Farmers' response was positive on Fasal Beema Yojana, Soil Health Card, Kisan Credit Card, Organic Farming, Farm Mechanization and they are expecting much more Mechanized Farming and improvement in seed and plant protection techniques.
20. Use of Sulphur and need based micronutrients like Zn, molybdenum, boron etc. not ensured in demonstrations as these were to be purchased by farmers and receipt are to be submitted under DBT.
21. No. of varieties, method of planting and appropriate sowing time etc., is not being followed in the cluster demonstrations of NFSM, either under Sole Demonstration & for Cropping System Based Demonstration (CSBD).
22. Farmers are well aware of weed management. In Kharif crops, major weed management has been observed in Soybean & Paddy with large scale use of herbicides owing to labour constraints. However, for keeping their soil eco-friendly/health, locally developed innovative mechanical devices (*e.g. motorcycle driven crop weeder in soybean, a local "JUGAD" device*). However, such of locally designed machines are not covered under subsidy plan.
23. Weeds like *Dinebra retroflexa*, *Biophytum indicum*, *Commelina dufua*, *Euphorbia geniculata*, *Digitaria sanguinalis* etc were prominent and rampant and creating resistant to persuit (Imzethapyr), now even increased dose could not smothering to weeds effectively. That is why farmers want a mechanical measures with new innovation into existing or *Jugad* by local artisans.
24. In general, the approach to organize Field Day for a cluster demonstrations site, is lukewarm which is an integrated part to disseminate/convey messages of technology/new varieties etc., demonstrated. Although, the expenditure towards this component was shown as cent per cent. However, no such documents or compilation could come across to the knowledge of NLMT Members.
25. Seed Component such as, purchase of Breeder seed, Production of Foundation & Certified seed etc., having a subsidy component is not being implemented seriously. The DDAs have shown their ignorance on implementation of this component. Therefore, this component is directly handled by State Seed Corporation (SSC). The NLMT observes a major lacunae, both in addressing the Seed Replacement Rate (SRR) & Varietal Replacement Rate (VRR). Seed Distribution component lacks proper follow-up with the farmer/beneficiaries in terms of quality, germination & characteristics etc.
26. After discussion, visited farmer's field (Shri Bharat Anjana) who sowed soybean var: RVS 2001- 4 bearing 100-125 pods per plant which is registered for foundation seed production on ridge with 3 rows to drain excess moisture during early stage of growth, a better planting method for soybean production under weather aberrations.
27. Machinery interventions includes Seed drill, Multi-crop Thresher, Rotavator, M.B. plough and Laser Land leveller & Custom Hiring Centres (CHCs), initially opened under Rashtriya Krishi Vikas Yojna (RKVY) . *Areas of Nimar and Malwa covered 100% line sowing with almost 50% -50% tractor and bullock drawn implements as popular system of the region.*

28. These machineries have benefited the farmers both in terms of timely agricultural operations, risk management, reduction in cost of cultivation and earning of additional income by way of providing Custom Hiring Services thereby, providing employment & earning extra income.
29. Soil testing labs at KVK Jaora and Dewas and Mandi lab at Dewas were also visited wherein SHC preparation program is going on.
30. NLMT-NFSM Kharif-2016 for MP was conducted without the benefit of State Nodal Officer during 6-10 September 2016. Apathy of State HQ on such monitoring also convey wrong messages to district functionaries and devoid the team of real feedback/coordination etc.
31. Even after very long initiation period of NFSM programme, the implementing authorities at field level are ignorant about the objectives of the Missions and could not depict the significance of this programme through documents, display board, proper site selection, field days, cropping system approach etc.
32. Input cafeteria decided at State level itself defeat the sole purpose of AES based input recommendation.
33. Large number of Light-trap apparatus costing Rs. 1800/- per light trap had been distributed to the farmers according to their statements but not a single light trap was seen during monitoring visit in Dewas & Jhabua was disappointing..
34. Gross Root level workers were not able to identify Soybean-Mite and Pigeonpea-Phytophthora blight which shows lack of proper training.
35. On talking with farmer it was found that they could not get the proper benefits of various schemes due to lack of coordination among the stake holders like MARKFED, MP AGRO, Seed certification etc.
36. In Jhabua & Dewas it was found during monitoring that the crop raised under demonstration was inferior to that of raised by the farmers themselves under similar situation of land and climate.
37. Agricultural welfare activities especially the technology demonstration may be oriented towards the wellbeing of all the farmers / farming community irrespective of their caste and categories; this would be helpful in target achievement.
38. In village ó Baundikala kheda, pulse crop moong (Variety: SML 668) was seen which was fully infested by weeds and powdery mildew, sown with broadcasting method and poor management **and low plant population under demonstration of NFSM programme**. Local Bhil tribal farmer sown local Mung varieties with country plough under line sowing was really fascinating with low weed and disease pressure on the moong crop.
39. Inter-cultural tools were needed for managing weed, first at early phase of crop growth, farmers have requested for making available improved hand operated weeding tools, suited to their region.
40. Jhabua having 6 blocks with different population dynamics and cultivation practices under undulating topography, Village-Petlawad is known for medium (Inceptisol and Alfisol) and heavy soil (Vertisol) which is suited for soybean and arhar and require implements modified with innovation (*Jugad*) / developed at personal workshop at village.
41. In Rabi season, wheat and other Rabi crops are not getting remunerative prices due to processing drudgery like half processed or semi cleaned seed, appropriate grading processing machine and technology are needed at domestic level. Wheat var. Lok -1 is suited due to dwarf height of plant.

42. Under RKVY in village- Naygaon Jagir, Block-Meghpur rice SRI was undertaken with variety- DRH775 in one acre where no proper principle of SRI was followed for this practice, because age of seedlings are key factor in first step of SRI production.
43. The NLMT had a short meeting with the Director/Scientist of ICAR-IISR, Indore, to have a feedback on major existing kharif crop (soybean) of the state vis-a-vis the prospects of rabi-2016-17. Some of the observations on soybean may be recorded as under.
44. Mite infestation in soybean is generally observed in the areas growing Okara (lady finger); variety JS 93 05, a late var., is highly susceptible to mite, could be controlled with the use of O-Mite/fast-mite; Proper spacing in var. JS 335, may escape the menace; Promotion of Granular Super Phosphate in the state, if applied under split application (i.e. 50% at the time of sowing and 50% at the time of flowering), is known to harvest good yield.
45. The FLDs on soybean var. JS 20 29 (Resist. to YMV), JS 20 34 have been organized by NRCS and these are in good condition; the centre has advised that all bold seeded varieties should be shown on shallow depth. As regards *“Mera Gaon- Mera Desh”* Programme, 5 Teams @5 village/ team have been adopted. Weed is a major constraints, the herbicide *Pursuit, being used for the last 12-13 years*, is now proving ineffective and need the attention of the department/SAUs.
46. ***Some of the Innovative Activities include:*** Cultivation of transplanted Arhar under Dharwad method (although small scale); Inter-cropping of *Arhar+Soybean, Maize+Arhar, Cotton+Maize+Arhar, Arhar+ Tomato*; Soybean under Raised Bed System; Plantation of Bamboo, Mahua & Neem under Agro-Forestry; Cultivation of Castor in Jhabua region; Cultivation of Sweet Corn, Sesame and Vegetables under crop diversification; Marigold with innovation irrigation channel; Introduction of Lentil & Linseed in Jhabua; Rabi Maize in Jhabua.

Suggestions

1. Implementation of Seed Component such as, *Purchase of Breeder seed, Production of Foundation & Certified seed etc., and Distribution of Certified Seed etc., need a serious attention of NFSM Head Quarter and JDAs/DDAs .It needs accountability of DDAs in identification of variety for Breeder Seed, and Production of Foundation & Certified Seeds both by SSC or by Seed Grower Societies.*
2. Each District DDAs should be directed to prepare a list of suitable and best performing recently released varieties/old varieties and also local cultivar (Non-descript) of different pulses/oilseeds/cereals and other dominating crops of their districts for realistic seed demand of only those HYV. This will also help in formulation of district plan.
3. There should be one online seed availability portal for released variety seed in which additional produced quantity of breeders/certified/foundation seeds available with any recognized agency should be uploaded so that anybody can access the site and collect/procure seed as per their need.
4. Cluster demonstrations area should be reduced to a maximum of 5 to 10 hectares from existing 100 hectares. The field extension staff has apprised that such a big cluster is not practical for crops of Mung, Urd, Lentil and Tur except the major crops of region like Soybean & Gram. Also Small Clusters in a large representative areas are being demanded by farmers.
5. There is a need to introduce inter-crop with transplanted pigeon pea to increase food production (cereals and pulses) including double crop area. It also provides the risk bearing capacity against the crop loss due to natural weather at one side and enhances the soil productivity on the other.

6. Feasibility of conduction of Cropping System Based Demonstrations (CSBDs) should be re assessed for continuing in program. This should have direct linking with the recommendation of IFS/CSR of the State agriculture Universities and may be conducted in association with extension deptt. of SAUs/KVKs.
7. Demonstration based on cropping system (CSBD) which easily can tune with adoptability of farmers are most essential and should be taken seriously rather than introducing new interventions over existing.
8. Self sustaining seed chain system for seed production is required to ensure availability of seed at village level, as seed has also been observed as a major bottleneck.
9. Documentary evidence in favour of conduction of demonstrations should be made mandatory like ***GPS based photos of each trial with boards, proof of training programme conduction with photos and paper news-cuttings wherever possible.***
10. All Central Sector Schemes of DAC&FW shall have to utilize PFMS Portal of Controller General of Accounts/Ministry of Finance for entering their Aadhar-seeded beneficiary data with immediate effect as all future releases for CSS / Post March 31st, 2017, would be based on Aadhar linked data bases of beneficiaries. ***However, the critical input like seed treating material + PSB + Rhizobium etc costing within Rs.500 to 1000/- per ha per demonstration, could be exempted from DBT with the accountability of its quality and assured utilization at the level of SADO/ADO.*** This is important for accurate demonstration of technology.
11. Farmers are mostly using NPK grade fertilizers in Soybean. Hence use of Sulphur and need based micronutrients application like Zn, Mo etc. required to be promoted by extension agencies through training and awareness program. ***Possibilities for Fortification of available NPK fertilizers with Sulpuhr, Zn and Molydenum particularly for Soybean-Chickpea system in M.P. needs to be explored.***
12. There is need of comparative analysis of elements/parameters (P^H , ***Electrical Conductivity, Organic Carbon, N.P.K.S., Cu, Zn, Mg, Fe, B, Mn, Calcareousness, lime & Gypsum requirement***) especially micronutrients (through Mrida-Parikshak and with other lab equipments so that percent variation in results (if any) can be standardized for different soils. Similarly the cost of economics of per sample analysis by both the methods also need to be conducted, so that the analysis could be conducted without heavy expenses on recurring expenditure. The cost of instrument is Rs. 86,000/-***(Including 1 Kit of reagent worth Rs. 17,000/- for 100 sample).***
13. Inputs like bio fertilizers (liquid/carrier based) and micronutrients products supplied by various agencies/company needs to be tested for their quality to ensure supply of good quality material for yielding good crops and developing faith and confidence of farmers for use of these materials as per recommendations. Bio fertilizers of Co-operatives like KRIBHCO /IFFCO/NFL/MP AGRO /NAFED etc. and other standard institution/company should be promoted after ensuring their quality testing. Similarly micronutrients material should be sampled and got tested separately ***in 2-3 standard labs to ensure quality and content of elements (%)***.
14. Under weather aberration strategies in rainfed system of farming, contingent crop planning is must for early, mid and late onset or break in monsoon by soil manipulation and incorporation of water holding materials.

15. In oilseed crops, less than the normal area coverage in soybean may be attributed to last three years (2013 to 2015) poor performance, heavy rains causing washing out of sesame seed and diversion towards urd and pigeonpea due to good MSP / market prices.
16. Dharwad system of Arhar growing is being widely adopted by farmers in Sangwa, the farmer Gopal Sukhram Patidar grew Arhar into polybags then dibbled in soybean row and did nipping at 30-35 day crop stage. Such technique may be popularised in open grazing areas.
17. Soybean + Arhar + Sweet corn was seen in innovation over Dharwad system of arhar growing in the village. This need to be popularised.
18. Dhaincha crop is being taken in village Mirzapur (Indore) to promote Green manuring and organic farming. However, the farmers need training on proper procedure of green manuring, age of crop and also method of seed production of this crop.
19. Til (sesame) was used as border crop of maize + cotton intercropping system of the region. Team has suggested to promote this technique to spread amongst 100 farmers at least per block in next year; **another problem of Nilgai or blue bull (*Boselaphus tragocamelus*)** in rabi season again Dr. Tiwari and his team have given to grow Kusum (Safflower) crop due to spiny and rough enough on surface for foraging and also works as guard crop. For economical strengthening maize was dibbled in the row of cotton to earn extra income through green cobs selling during September month.
20. Some training and skill development on secondary agriculture, processing etc is needed for involving youngsters in agribusiness sector / modules.
21. Team found that the KVK-Kasturba Gram has developed well arranged data base on demonstration giving location, farmers' detail based on Aadhaar Card, nutrient status with geo-referencing. This strategy may be taken for state demonstration, as well.
22. Under soybean, **selection of variety for high and low rain fall areas with management strategies**; Nutrient management to using sulphur 50% at sowing and 50% as side dressing, similarly, use of potassium; Raised bed and furrow techniques to avoid moisture loss and seed treatment with insecticide 20-30 days prior to sowing in soybean crop; Popularisation of soybean varieties which are drought tolerant (like NRC 121 and NRC 7, NRC 7) etc., need to be promoted. Problem of soybean mosaic is seriously affecting the crop, for which NRC soybean has started the work for management, the state may constitute a committee involving NRCS + SAU + NCIPM + DPD, Bhopal to study problem and expedite the solution.
23. To control aphid on Maize, Emidachlorprid @10 ml/spray pump, against sucking pest in cotton Ectetamaprid @45ml/spray pump and against Helicoverpa or Tobacco Caterpillar in soybean, Prophenofos + Cypermethrin @ 45 ml/spray pump has been advised to be used. *Farmers are mostly using Corazen/Trizophos to control caterpillar in soybean.*
24. *Growth promoters and Tonics* are being used abruptly and applied in combination with pesticides and these need to be checked.
25. The District Agriculture Officers should be made accountable for implementation of seed component especially for identification of breeder seed variety, production of foundation seed and production of certified seeds in their district/ division.
26. Involvement of PD ATMA (BTM/ATM) & NGOs should be ensured in the conduct of technological demonstrations to insured the quality and accountability.

27. Heavy weed infestation has enhanced the virus and insects above ETL. Further heavy use of weedicides has enhanced the cost of cultivation. There is a need of recommendation on better agronomy, weed management and mechanization to reduce the cost of cultivation. Locally made innovative òJugadò tools in districts may be popularised using Innovative Component / Local Initiative budget.
28. A list of all beneficiary who got machinery under any govt. subsidy scheme especially with > 10,000/- per unit subsidy should be displayed in board with their contact number at village panchayat/sahakari samitee office so that other farmers can hire the same when they needed the same implement for example ó Rotavator, M/B ploughand Reaper-cum-binder etc.
29. Residual moisture utilization during rabi season for second crops through zero till techniques using relay cropping of pulses like chick pea, field pea, mustard and linseed need to be propagated through quality demonstrations.
30. Bullock based mechanical weeder is urgently needed and initiated as local initiative through innovation in tribal areas because continuous use of same herbicide on same field created resistant and profusely increasing the population of unwanted plant (weeds) ultimately uprooting by farmers is done. Some improvised technique of lifting and non lifting type adjustable mechanical weeder should be initiated as farmer willings.
31. The online registration process for Sprinkler sets, Water carrying pipes and Power drawn implements need to be relaxed for Tribal districts, requiring continuation for whole year and on the principals of ***“First Come First Serve”*** basis.
32. The tools distribute under RCT component with subsidy amount of more than Rs. 10,000/- (Multi-crop Planter, Power Tiller, Seed Drill, Power Weeder, Zero-till-Multi crop Planter, Rotavator, Reaper etc.) should have a provision of User Group involving 10-15 Fellow Farmers.
33. Impact evaluation after 2-5 years of this components should be done in respect of cast cutting, increasing mechanization and employment generation etc., in consultation with Agro Economic Research Centre (AERC) of the SAUs.
34. Under Local initiatives component of the CSS or through the state plan budget the repair/maintenance training on RCT should be the part of the Skill Development Programme.

OBSERVATIONS

1. **The total seasonal rainfall** during the current SW monsoon (01.06.2016 to 30.09.2016) was 1073.2 mm which is 13% more as against the state's normal rainfall of 949.1 mm. As per the data, 24 districts received excess, 22 normal and 05 received deficit rainfall.
2. In general, the overall crop condition in the state as well as the visited districts is quite good and satisfactory and there is opportunity and scope to increase the production and productivity with the effective quality demonstrations and widening of varietal knowledge based and recommended agronomy amongst the farmers. All the crops were free from diseases, insects and pests in all the districts.
3. The state's normal area (avg. 2012-13 to 2014-15) under rabi crops is about 105 lakh ha. Wheat is a major rabi cereal crop occupying 55 % of the total normal area. This year, as per the WWWR (Weekly Weather Watch Report), wheat has been planted in 62.23 lakh ha which is 3% less against the targeted area of 64.22 lakh ha. The pulses has been planted in 44 lakh ha which is 1 % higher against the targeted area of 43.45 lakh ha. Gram, the major rabi pulse of the state has been planted in an area of 32.52 lakh ha followed by lentil and pea in 5.86 and 4.87 lakh ha area respectively. The area under gram has been higher against the normal and targeted area during the year under report. Rabi crops have been sown in an area of 117.61 lakh hectares which is also above the normal (105 lakh ha) as well as targeted area (117.16 lakh ha).
4. Major wheat varieties grown in M.P. are - Sujata, C-306, HI-1531 (Harshita), HI-1500 (Amar), HI-8627 (Malaw Kirti), GW-366, GW-322, JW-273, HI-1544 (Purna), HI-8498 (Malaw Shakti) HI 8381 (Malaw Shri), HI 8663 (Poshan), MPO 1106 (Sudha), MPO 1203, MPO 1215, HD 4672 (Malaw Ratna) etc. Durum varieties have only 5 to 6 % area in Madhya Pradesh. The Durum varieties are MPO 1215, HI-8498 which are most popular, matures in 115-120 days with potential yield of 70 q/ha.
5. Major rabi pulses grown in M.P. are- Chickpea (**Desi-** JG-16, JG- 63, JAKI- 9218, JG -130 **Kabuli-** KAK 2, JGK-1, JGK-2), Lentil- JL-3 (Sagar Masara), JL-1, JL-2, Kala Masara, IPL 81 (Noori). The other recommended varieties for lentil in MP are RVL-31, L-4076, PL-8, DPL-62 & the local varieties (non-descript) and under Pea, varieties- Prakash (IPFD 1-10), KPMR-400 (Indra), Malviya Matar (HUDP 15), Rachna, JP-88, Ambika, IPF99-25, JM-6 have been recommended.
6. Most of the areas under dwarf varieties of wheat have been observed with off-type admixture of tall/other varieties in visited districts. Hence, a short duration seed production training programme/orientation to improve the quality of farm saved seeds is strongly recommended.
7. In general the Bundelkhand region of MP, especially Sagar district is known for production of *sharbati* wheat. The quality of wheat produced here is incomparable and fetches high market premium in Delhi, Maharashtra and Karnataka *mandies*. The *sharbat* variety cultivated in Sagar is having bold grains, shine, lustre, high protein etc. as compared to other parts of the state viz. Baghelkhand, Mahakoshal, Nimar, central narmada valley or grid region.
8. The Bundelkhand area is traditionally known for rainfed cultivation. Now significant change is observed in Bundelkhand and elsewhere in the state with the increase in irrigation. The rainfed wheat cultivation scenario is changing in MP. The wheat is cultivated with one, two or more irrigations.

9. There were many fields showing the potential of 35 to 70 q/ha yield. The area under traditional *sharbati* wheat variety C 306 is decreasing continuously and being replaced by HW 2004, JW 3288, HI 1500, JW3211 etc.
10. It was observed that GW 322 variety is being cultivated even with two irrigations, while this is recommended for adequate irrigation (4 to 5). The selection of variety as per availability of number of irrigations and time of sowing is not proper. This practice is hampering the yield significantly.
11. Two cluster demonstrations at Baraitha, Shahgarh (Sagar) were discussed. The varieties were HI 1544 and HI 8627. The varieties were sown in last week of November and three irrigations have already been provided. The stage of crop indicated the requirement of two more irrigations. The awareness regarding the selection of varieties with availability of water is lacking. Variety HI 8627 is developed for rainfed or one irrigation condition. Variety HI 1544 is for adequate irrigation. Similarly, HI 8627 (durum variety) should have been planted in end of October or early November but was sown with HI 1544. This is waste of input and valuable irrigation water which increases the cost of cultivation. The issue was discussed with staff and farmers.
12. The irrigation sources have continuously increased during last one and half decade. New technologies of cultivation have come up and the use of micronutrients has also increased. In spite of all these additional resources the productivity of wheat has not increased to desired level in the districts of Bundelkhand as compared to MP/all India. The yield during 2014-15 was 20 q/ha in the Sagar division, comprising five districts of Bundelkhand as compared to state/National yields of 30 q/ha. The matter was discussed with staff and field workers in detail.
13. The success story was witnessed by observing and discussing the use of machinery by other farmers (with economics) during visit of fields. A good no. of machineries/implements such as tractors, rotavators, seed-cum-fertilizer drill, Reaper-cum-Binder, Laser land leveller, tractor mounted sprayer etc. distributed among the farmers, in addition to the custom-hiring centres by the Directorate of Engineering. Shri Radhey S/o Prayag Yadav, vill- Badagaon (Tikamgarh) Reaper-cum-Binder beneficiary farmer- 2013-14 was extending the custom hiring services to other farmers to generate income.
14. In district Tikamgarh the team had a proper feedback/briefing meeting involving all stakeholders. The Rampura nursery, developed by the district agriculture department is an excellent model of agriculture diversity. The integrated approach with bee keeping, vegetables, oilseeds, pulses, cereals, spices and orchards have been demonstrated. Similarly, in Nadia village under PKVY program the demonstration under 'Bio cluster' was observed. The farmer Amar Chand Prajapati had earned Rs. 2.5 lakhs in one season by cultivating tomato and chilly in one acre only. He has controlled the white fly with self-made 'Coconut Chutney'.
15. The ATMA (Tikamgarh) is converging the NFSM and other CSS/State schemes in enhancing of the area under line sowing through incentivisation. The ridge furrow planting/line sowing has recorded the harvest/yield of (5 q/acre) in blackgram and (10 q/acre) in soybean.
16. It is concluded that the energetic staff and enthusiastic farmers are making efforts to adopt new technologies and innovations in crops and vegetables. The district Seed certification agency has also joined hands with the DDA to promote line sowing and Furrow Irrigated Raised Bed (FIRB) Technology. The certification has made mandatory to follow FIRB technology for their registered seed growers. It indicates that cumulative efforts may change the scenario of agriculture in the district.

17. This is important to mention that the Tikamgarh district has shown the maximum varietal diversity in wheat. As per information from DDA more than one dozen varieties are under cultivation in the district and has exhibited the example of *Gene Deployment*.
18. Overall crop condition was excellent in the district of Tikamgarh.
19. District Chhatarpur of Bundelkhand zone was known for growing traditional *Kathi* wheat exclusively under rainfed condition and it belongs to *durum* species. The cultivated wheat was having inherent property of tolerating high temperature at grain filling stage.
20. In due course of time the dug wells, ponds, nallah came up in districts through different schemes. Farmers left the durum wheat cultivation and switched over to *aestivum* wheat. However, few durum cultivars were collected and maintained in genetic stocks as germplasm by the scientists.
21. It is pleasant to observe that area, production and productivity have increased tremendously in the district of Chhatarpur. Though the soils are light in maximum areas as compared to Sagar and Tikamgarh, the irrigation facilities have changed the scenario of the wheat cultivation.
22. Demonstration of wheat variety JW (MP) 3288 by district chhatarpur is encouraging as the department has introduced recently released new variety. The positive point is the use and adoption of newly developed best variety which can increase the varietal replacement rate in the area. However, this variety should have been sown by first fortnight of Nov., strictly for rainfed or only one irrigation but it was seen that the variety was sown late and three irrigations were already given and the fourth irrigation was also proposed. Delayed sowing hampers the yield, grain quality and also suppresses the boldness of the grain.
Such technological gaps are noticeable at level of the extension officers of the department as this is the loss of Natural resources (irrigation water) and also the likely potential yield. The awareness regarding selection of varieties as per availability of inputs, resources and time of sowing is essential.
23. The quantity of nutrients and micronutrients should be optimized. The farmer's field as well as demonstrated fields was full of off type plants and purity of variety was lost. However, the crop condition in the district was good and many fields have the potential to give more than 50q/ha yield.
24. In Panna the black awned tall durum mixed with white awned having hard and long grains was the specialty of the area. The district is having alluvial and light soil. The temperature remains high at the grain filling stage.
25. The change in cultivation, production and productivity of crops is visible through the best use of water from various resources such as wells, ponds and stored water in low lying areas in the fields.
26. The Lok-1 has been replaced by the varieties GW 322 and GW 366 resulting increase in productivity in the district.
27. The cluster demonstration of wheat in Semariya village, block Pavai was visited by the team. Varieties GW 366 and GW 322 were the dominating variety. The time of sowing of these varieties was not proper. The old variety of gram i.e. JG 315 is also being cultivated, while no. of recently developed varieties are available for cultivation.
28. Team visited the village Mohandara, where cluster demonstration of variety GW 366 was laid out. Sowing was done in the month of December which is not appropriate for this variety. The off type plants were also present in the field.

29. It was informed during discussion with staff and farmers that many new varieties viz. JW 3288, JW3211, HI 1544, MPO 1215, JW 12013 are also being cultivated in different pockets of the Panna district. It indicated that the awareness towards the adoption of technologies are increasing.
30. The Panna district is diversified with the introduction of pulses (gram, arhar and lentil) and oilseeds (Mustard and Sesame) in considerable areas. Mahua is also planted in large area of interior parts.
31. Expansion of oil expeller and paddy huller was also observed in the district. The business of oil cakes and paddy straw with the business men of other areas for industrial use is increasing. This practice has generated the employment and income in pockets.
32. Overall, crop condition was good in the district of panna and all farmer friends have been engaged and they are doing very good work.
33. **NFSM Seed hub:** A project on creation of Seed Hubs for increasing indigenous production of pulses in India is operational (2016-17 to 2018-19) at 150 locations (ICAR/AICRPs/KVKs) in 24 states at a total budgetary allocation of Rs. 225.31 crores. In M.P. 16 seed hub centres (ICAR/AICRPs-07+ ATARI/KVKs-09) have been targeted to produce 950 tonnes of quality seeds (Rabi-590 tonnes (gram-300 tons+Lentil 150 tonss+ Pea- 140 tons); Kharif-360 tons (Pigeonpea -190 +Urd 110 tonnes+ Mungbean- 60 tons). The programme could not be taken up during kharif and hence started during rabi (2016-17) where the targets are likely to be achieved.
34. **NFSM ABSP:** A project on Enhancing BSP for increasing indigenous production of Pulses is operational at 12 locations in 08 states, including MP at a total budgetary allocation Rs. 20.39 crores. The ABSP programme is being taken up at ICAR-IIPR RS, Fanda (Allo.-Rs. 275 Lakhs, (works- Rs. 190 lakhs+ SPU- Rs. 35 lakhs+ Implements- Rs. 50 Lakhs), Bhopal, JNKVV, Jabalpur (Allo- Rs. 190 Lakhs- Works Rs. 160 Lakhs+ farm implements Rs. 30 Lakhs) and RVSKVV (Allo. Rs. 92 lakhs- Works Rs. 50 lakhs+ farm implements Rs. 42 Lakhs) Gwalior. Kharif 2016 ABSP all India targets were 124.8 tons (Mungbean- 27.5 tons, Pigeonpea- 80.9 tons+ Urdbean 16.5 tons). The likely production is 160.6 tons. In MP the Kharif BSP targets were 59.15 tons (Mungbean- 5 tons+ Pigeonpea-50.40 tons+Urdbean-3.75 tons) against the all India targets of 125 tons. The production achieved is 39.75 tons (Mungbean- 5 tons+ Pigeonpea-26.70 tons+Urdbean-8.05 tons against the all India production of 158 tons. The varieties considered under the ABSP are 6 Mungbean- Samrat (PDM-139), IPM 2-3, TMV-37; pigeonpea- TJT-501, ICPL87-119 (Asha), ICPL151; Urdbean- Uttara, PU-35, LBG-20, Azad U-1, Azad U-19. IN MP the ABSP rabi (2016-17) targets were 135.5 tons (Chickpea-116.5 tons + Lentil-9.5 tons+ Field pea-9.5 tons.) against the all India targets of 309.1 tons. The likely production is 385.9 tons (Chickpea- 355.75 tons + Lentil- 8.4 tons+ Field Pea-21.75 tons) against the all India production of 637.35 tons.
The varieties considered Chickpea- JG-14, RVG-202, RVG-201, Shubhra, JG-12, JAKI-9218, JG-63 and RVKG-101, RVG-203; Lentil- IPL-406, IPL-316, JL-3 and RVL-31; fieldpea- Vikas, JP 885, JM 6.
35. **Seed Minikits of Oilseeds and Pulses-** The seed minikits of pulses, new components under NFSM has been started since 2016-17 (Kharif-2016). During 2016-17 a total of 15000 numbers of minikits of Urdbean were allocated during kharif, however no minikits have been supplied. During rabi/summer a total of 12915 nos. of minikits under pulses (Gram- JG-63) and 82483 nos. under NMOOP-oilseeds (Mustard, var. PM-27, PM-30, RGN-73, NRCHB-101, RVM-2, RH-0749) have been allocated.

- 36. FLD-** During 2016-17 a total of 2620 ha area/ 6550 nos. of demonstrations were targeted during kharif and rabi in pulses against the target 2357 ha/5720 nos (kharif-Pigeonpea, green gram, black gram-1149 ha/2846 nos.; rabi- chickpea, field pea, lentil-1208 ha/2874 nos.) could be achieved.
- 37.** Similarly, the oilseed FLDs by ATARI were also organized (1830 ha/4424 nos.; kharif-1042 (Groundnut, Niger, Sesame, Soybean- 1042 ha/2465 nos. + rabi-Linseed, R/M- 788 ha/1959 nos.). During interactions with the extension officers and KVK Scientists, it is noticed that the department is not aware of such FLDs and there exist an information/communication gap.

NOTE: All the crops were free from diseases, insects and pests in all the districts.

SWOT Analysis of the State (Including visited Bundelkhand division)

Strength	Threat
<ul style="list-style-type: none"> Irrigated area is increasing (Net area-85.5 lakh ha (64%); Gross area-89.65 lakh ha) 	<ul style="list-style-type: none"> Short winter
<ul style="list-style-type: none"> New sources of irrigations are exploited through various schemes and missions 	<ul style="list-style-type: none"> High temperature regime at grain filling stage
<ul style="list-style-type: none"> More than two dozen varieties of wheat under cultivation, unique in country and an example of 'Gene Deployment' in the nation; Free from yellow rust; Karnal bunt free area 	<ul style="list-style-type: none"> Adoption and expansion of Karnal bunt in warmer areas
<ul style="list-style-type: none"> Quality of wheat is bold and lustrous grains with high protein content as compared to North India 	<ul style="list-style-type: none"> Adoption of yellow rust to high temperature
<ul style="list-style-type: none"> More than three dozen chickpea varieties including <i>desi</i> and <i>bold</i> seeded 	<ul style="list-style-type: none"> Erratic monsoon behaviour
<ul style="list-style-type: none"> Protein content is high as compared to north India 	<ul style="list-style-type: none"> Imbalance use of inputs like fertilizers, irrigation, micro-nutrients etc.
<ul style="list-style-type: none"> Availability of high fertile black soil 	
<ul style="list-style-type: none"> Strong seed production program and seed chain in the state 	
<ul style="list-style-type: none"> Increasing mechanization, custom hiring giving dividends to farmers and also employments to youth in Agriculture. 	

1. CONSTRAINTS OBSERVED

- Imbalance use of fertilizer deteriorating soil health.
- Policy of timely procurement and supply of input.
- Increasing nitrogen toxicity in soil and water due to blanket use of urea.
- Lack of awareness regarding soil testing to minimize the use of chemical fertilizers.
- Less adoption of improved varieties due to lack of knowledge and availability of seeds among farmers (low varietal replacement).
- Non-adherence of seed production guidelines under cluster demonstrations which suggests mandatory registration of cluster demonstrations fields with the state seed certification. Even 1/4th of the total cluster demonstration in a district miss the departmental campaign on seed production advisory like rouging of off-types, maintenance of plant population etc.
- Admixture of off- types plants/varieties which making the produced seed unsuitable for next the season. Farmers are bound to purchase seed every year which is increasing cost of cultivation
- Less and imbalance use of micronutrients along with poor quality of input.
- No/less use of Potash. Sagar, Vidisha, Raisen, Sehore and other districts of Malwa region were known for high Potash content in the soil. Exhaustive cropping system has decreased the availability of Potash. Potash has significant role in making the MP wheat grain unique with shine and lustre.
- Selection of varieties for different sowing time and water availability is improper.

- Method of using fertilizer, irrigation and also the critical stages of these inputs need more extension.
- Proper plant geometry, use of inter-cropping with mechanization keeping in view the IPM is not being fully exploited, need aggressive extension.
- No use of conservation technologies among farmers. The zero-tillage technology can avoid the late sowing of crop. It also saves the energy, money and water used during field preparation.
- No use of FIRB technology. This system of cultivation may reduce the seed rate upto 30%. The mechanical weed control is easily possible in furrows. The requirement of fertilizer will also be reduced. Thus the technology can drastically reduce cost of cultivation.

2. RECOMMENDATIONS

1. In changing scenario of climatic condition and increasing cost of cultivation, precision technology is required for sustaining the yield especially the wheat & pulses.
2. The team has suggested that in the event of 5 % off-type variety plant in the field, the farmers should be taught to do rouging.
3. Long range of varieties available for different conditions of wheat cultivation, as under, need a seed rolling plan and also adoption of these varieties to demonstrate under the cluster demonstration programme.
4. It is suggested that seed production programme of new wheat varieties (JW-1201 or JW-1203 may be taken by the department). The breeder seed of these varieties is available with JNKVV, ZARS (Powarkheda).
5. After harvest of tur in Dec. last week, late varieties of wheat JW-3336, JW-1203 should be adopted.
6. **Early sowing** (15th Oct. to 10th Nov.): **rainfed/ one irrigation:** JWS 17, HI 1500, HI 1531, HD 4672 (d), HI 8627 (d), MP (JW) 3020, MP (JW)3269, JW (MP) 3288, MPO1255 (d)**For two irrigations** (1-20 Nov.): MP (JW) 3211, MP (JW) 3173, JWS 17, HI 1531, MP(JW) 1142, MP (JW) 1202.
7. **Timely sown** (15-30 Nov.): **Adequate irrigation:** HI 1544, GW 322, GW 366, JW (MP)1201, JW (MP) 1203, MPO 1215 (d), MPO 1106 (d), JW (MP)3382, HI 8713 (d), HI 8759, HI 8498 (d).
8. **Late sown** (1st Dec. onwards): **Adequate irrigation:** MP (JW) 3336, MP (JW) 4010, MP(JW) 1202, MP (JW) 1203, HD 2864, HD 2932, Raj 4238.
9. **Nutri-rich Varieties** (Identified by Ministry of Agriculture): MP 1203, MP 3211, MPO1215, MP 1202.
10. The cultivation of wheat variety GW 322 and HI 1544 should be discouraged because the incidence of Karnal bunt was 22% and 30% respectively. The tolerance limit for export is 0%.

11. **Poshan** (HI 8663) is being cultivated in the state. It is not recommended for the state. This variety is released for peninsular zone.
 12. Variety **MP 1203** is Climatic Hazard Resilient variety. It has shown no lodging even in excess rain at reproductive phase. This variety may be proposed as contingent variety for low lying areas.
 13. **MPO 1255** is the first product specific variety of the country and released especially for *pasta products*, may be targeted as branded variety for fetching good income.
 14. Seed cum fertilizer drill should be used for sowing. The farmers are still using only seed drill. The fertilizer is mixed with seed during sowing. The scientific report indicates that up to 30% loss in germination is occurred by mixing fertilizer with seed.
1. Recommended dose of nutrients for pulses and wheat must be adopted. The recommendations for wheat is as under-
 - **For adequate irrigation-** 120:60:30 : kg/ha, NPK
 - **For one irrigation-** 100 : 50 : 25 kg/ha, NPK
 - **Two irrigation-** 80 : 40 : 20 kg/ha, NPK
 - **For rainfed / one irrigation-** 60:30:15 kg/ha, NPK.
 2. 50% N and full dose of P &K should be given as basal dose; remaining 50% N should be divided in two doses.
 3. 25 kg/ha ZnSo₄ must be used at the time of final preparation of field after three crops.
 4. Raised bed system of cultivation will reduce the cost of cultivation. Similarly, zero tillage technology avoids the delay in sowing. The weed control is effective and also minimizes the cost of cultivation.
 5. Implementation of Seed Component such as, Purchase of Breeder seed, Production of Foundation & Certified seed and Distribution of Certified Seed etc., need a serious attention of NFSM Head Quarter and JDAs/DDAs .It needs accountability of DDAs in identification of variety for Breeder Seed, and Production of Foundation & Certified Seeds by KVKs- seed hub, SSC and by Seed Grower Societies. The Committee recommends that the districts (DDAs may enter into MoU with the designated seed hub centres namely ICAR/AICRPs, KVKs for the lifting of the quantities of the certified seeds produced under NFSM. This recommendation is important both for sustainability of the seed hubs and in ensuring the quality seed/varieties availability to achieve the targeted cluster demonstrations and of seed component for effective technology transfer/sustainable production.
 6. The NLMT recommends to take the advantage of the ABSP components wherein the seeds of the varieties produced in the state may be procured by the directorate of Agriculture, Govt. of M.P. to organize foundation seed production programmes through SSC/State farms/ seed grower foundation. Here, the component of seed production with financial assistance of Rs. 2500/qtls may be used.

7. The seed grower societies may be facilitated and advised to get seed indent of appropriate crop/varieties through seed production of pulses by seed hubs/KVKs/Societies. The efficient societies which are very enthusiastic in production of seeds; must be encouraged in hand holding for the benefits of farming community. The SDA may chalk out the programme accordingly.
8. It is recommended that the SDA may document the district-wise impact of the varieties distributed under seed minikits and also the indenting of the breeder seeds based on the performance of the varieties under minikits for organization of seed production program in the state.
9. In order to benefit from the technological demonstrations organized under pulses and oilseeds through KVKs, the deputy director (Agriculture) may be advised to take the list of such demonstrations from KVKs and should visit/organized field days to learn from each other.
10. Most of the seeds purchased from the grower societies in Bundelkhand division was found with poor germination, off-types/admixture of other varieties.
11. Each district should prepare a 10 year varietal impact of the varieties considered under demonstrations in comparison to local cultivar (Non-descript) of their districts for realistic seed and varietal assessment. This will also help in formulation of district plan.
12. Cluster demonstrations area may be reduced to a maximum of 5 to 10 hectares from existing 100 hectares thereby increasing technology transfer to large representative areas. The field extension staff has appraised that such a big cluster is not practical for pulse crops of Mung, Urd, Lentil and Tur except the major crops of region like Soybean, Gram, Wheat.
13. Cropping System Based Demonstrations (CSBDs) should have direct linking with the recommendation of Integrated farming system/cropping system research of the JNKVV, Jabalpur, and RVSKVV, Gwalior. It is recommended that 50 % of the CSBD should be conducted through or in association with extension department of the university and KVKs.
14. Demonstration based on cropping system (CSBD) which easily can tune with adaptability of farmers are most essential and should be taken seriously rather than introducing new interventions over existing.
15. Self-sustaining seed chain system for seed production is required to ensure availability of seed at village level, as seed has also been observed as a major bottleneck.
16. Documentation of conduction of demonstrations and cropping system based trainings (four sessions i.e. one before kharif and rabi seasons. One each during kharif and rabi crops) should be made mandatory like GPS based photos of each trial with boards, proof of training programme conduction with photos and paper news-cuttings wherever possible.

17. All CSS of DAC&FW shall have to utilize PFMS Portal of Controller General of Accounts/Ministry of Finance for entering their Aadhar-seeded beneficiary data with immediate effect as all future releases for CSS / Post March 31st, 2017, would be based on Aadhar linked data bases of beneficiaries. However, the critical input like seed treating material + PSB + Rhizobium etc costing within Rs.500 to 1000/- per ha per demonstration, could be exempted from DBT with the accountability of its quality and assured utilization at the level of SADO/ADO. This is important for accurate demonstration of technology.
18. To ascertain the accuracy of the analysis of the elements /parameters, especially the micronutrients through Mrida-Parikshak, atleast 2 to 5 % of the samples should be got analysed through the referral lab of the SAU etc.
19. Inputs like bio fertilizers (liquid/carrier based) and micronutrients products prescribed under input cafeteria of the cluster demonstrations have been reported as of poor quality/efficacy. it is therefore suggested that the department may enter into MoU preferably with the state agriculture universities who have been strengthened under RKVY/NFSM in production of bio-fertilizers/bio-agents. This will help the farmers getting a quality product as well as will support the SAUs in sustaining the production of bio-fertilizers/unit in their institution. Similarly, micronutrients material should be sampled and got tested separately in 2-3 standard labs to ensure quality and content of elements (%).
20. Trainings/orientation on skill development on secondary agriculture, value addition and marketing orientation for the extension staff of the district level is strongly recommended.
21. Growth promoters and Tonics are being used abruptly and applied in combination with pesticides. Similarly, the input cafeteria under NFSM should be need based and should be left to the Deputy Director and KVKs of the district.
22. Under Farm mechanization, Seed drill, Rotavator and Diesel pumps etc., are being provided. It is suggested that in view of the Natural Resource Management issues (NRM), Resource conservation technologies (RCT) such as Double Box Seed Drill, Machinery for BBF / Ridge Furrow planting coupled with micro-irrigation system need popularization. The District Agriculture functionaries need orientation in this regard.
23. The increasing awareness in mechanized farming and existing machineries with the farmers is creating the demand of implement Servicing Centre, farmers at present hire the services of technicians from Punjab who are charging @ Rs.50, 000/month during the crop season for repair of combine harvester, reaper etc.
24. The role of the District Agriculture Officers (DDAs) in implementation of seed component under NFSM should not be marginalized. It has been observed that their role is limited to release of the production subsidy.

25. The team strongly recommend the involvement of ATMA, NGOs and KVKs in the conduct of technological demonstrations to ensure the quality of the demonstration.
26. The RCT beneficiaries with > 10,000/-per unit financial assistance under NFSM during 10 years of the NFSM programme (2007-08 to 2016-17) may be documented at district level and be displayed at village panchayat/PACS office/ DMO/MPAIDC and collectorateto enable the other farmers avail the custom hiring services of implements, to mutually benefit each other (income generation and increase in mechanization).
27. The district may be advised to constitute MachineriesøUser Group (MUG) for each RCT with a financial assistance of > Rs. 10,000/- such as Multi-crop Planter, Power Tiller, Seed Drill, Power Weeder, Zero-till-Multi crop Planter, Rotavator, Reaper etc.
28. All the 51 districts may be advised to conduct a joint Impact Assessment Survey (IES) with KVK department + gram panchayat in respect of cost cutting, % increase in mechanization, cropping intensity and employment/income generated due to this intervention between 2007-08 to 2016-17 (XIth óXIIth five year plan of NFSM).
29. The district-wise Local Initiatives should be ascertained with 9% of the total budgetary allocation under NFSM as a whole. The Local Initiatives may include Augmentation of water resources, Convergence of pulses in PMKSY area, godowns for safe storage of critical inputs post harvest/processing facilities like grader, dehushing machine, Mini dall mills, promotion of local germplasm (like Begaani arhar grown by baiga tribes of Dindori and Mandla, gulabi chana, Sagar Masara, Local urd of Jhabua etc).
30. The Team recommends that sample tested with MridaParishak need to be verified with analysis of different standard instruments/equipment and procedure used in soil analysis. At least 2-5 per cent of these samples may be sent to referral lab of SAUs.
31. Field Days should be organized in each & every season with respect to crop condition.
32. Weed management should be mandatory activity and done on the demonstration plot, the programme should be registered under seed production programme, as mandatory for cluster demonstration.
33. The staff appointed under NFSM are engaged only for report preparation, active involvement of Staff (Consultant and TA) appointed under this programme (TA and Consultant) is necessary for effective implementations of NFSM programme.
34. Site selection and Timely availability of inputs reflects on success or failure of programme, proper planning and their execution need a serious attention at district level.
35. The cluster demonstration beneficiaries should also be motivated and facilitated for taking seed production programme of their demonstration plot.

36. Permanent display board should be erected at the cluster demonstration site with all relevant information.
37. Necessary improvement in seed cum fertilizer seed drill is required for solving the chocking problem of fertilizer.
38. Water conservation programme should be implemented in this area. The basic principles of soil and moisture conservation should be followed for increasing water efficiency and getting good yield.
39. Farmers perception of use of more seed rate and more fertilizer to get the more crop yield, need to be changed by demonstrating recommended seed rate and balance fertilizer on the basis of soil type and soil testing report.
40. Use of wilt resistant cultivars of pulses, seed treatment of pulses with Trichoderma, mandatory follow-up of IPM in place of sole dependency on pesticides, is recommended.

Observations

1. The DFSMECs are duly constituted in all three visited districts but no meetings were conducted. Almost all visited districts opt the system of involvement of Panchayati Raj system for the selection of beneficiaries.
2. Paddy varieties PKV-HMT, IGKV-12444, IGKVR-1, IGKVR-2, NDR-8002, Karma Mashuri introduced in Cropping System Based Demonstration (CSBD).
3. The Direct Seeded Rice (DSR) is observed with severe problems of common weed wild rice (*Sadwa*) mixture, which matures prior to ripening/ harvesting of main rice resultantly its seeds shatters in the field and germinated again in next kharif.
4. To harness the potential of Coarse Cereals / Millets, there is need of identification of niche areas, bridging yield gaps through availability of quality seeds of promising location specific varieties/hybrids (both grain and fodder); streamlining seed production; listing the best management practices etc.
5. Availability of seeds of recommended HYV perspective crop and animal based agriculture development plan in the areas with soil and water conservation infrastructures (Check dams/ Stop dam/MIT) crop rotation, crop diversity, organic farming and mechanized farming should be considered for sustainable agriculture.
6. To control prominent weed such as *Saccharumspontaneum*, *Ageratum conyzoides*, *Partheniumhysterophorus*, *Ecliptaalba*, *Bluniauxidentia*, *Ocimum sanctum*, *Commelinabenghalensis*, *Cleome viscosa*, pre-& post emergence herbicide should be demonstrated effectively.
7. Water table of many villages in Mungeli district has gone down, even below 400 feet. In the district, the lower portion of soil i.e. the parental rock strata is porous which causes/ collapsing of bore or require more casing under tube well.
8. Prospective plan and impact assessment part is lacking in the programme, it should be the integral part of all Govt. Supported development programmes.
9. Soil health card preparation work is going well, however, in most of the visited labs, it was noticed that the micronutrients analysis is not being done. Also, AAS, at many STLs are not in order either due to maintenance issue or non-engagement of skilled manpower having analytical background.
10. The rice crop suffered at vegetative stage due to delayed rains during September. For the last 2-3 years, delayed or irregular rainfall scenario in rice growing region has been observed.
11. Almost after 9 years of the implementation of the programme, proper documentation i.e. no of demo conducted and number of farmers covered, VRR introduction of cropping system as a consequence of the CSBD, implement distributed, employment generation and impact assessment on cost of cultivation is lacking at district level.
12. After the field visit also wrap up meeting with ACS/APC and members of NLMT and other officials related with the programme. In meeting all technical and administrative issues discussed are given as under:

Scope of Review : NFSM/BGREI/RKVY/CSS/State Plan, Other NFSM funded Projects

Districts visited: Baloda bazaar, Mungeli, Janjgir-Champa and Bilaspur.

➤ **NFSM-funded Projects to ICAR/ATARI**

I) ICAR

(a)SEED HUB REVIEW:

- i) Creation of seed hubs of (2016-17 to 2018-19) for increasing indigenous production of pulses in India. (Rs.150 crores) Target pulses viz; Tur, Pea, Mung, Lentil and Lathyrus: **Implementation (IGKV, KVK Bhatapara, Ambikapur, Rajnandgaon and Kawardha).**
- ii) Enhancing Breeder seed Production for Increasing Indigenous Production of Pulses in India.

II) ICARDA

- Enhancing grass pea Production in Eastern/NE for animal feed, safe human food and sustainable Rice based Production System (2010-2011 to 2015-16).
- Enhancing Lentil Production in Eastern and NE states for nutritional security and sustainable rice based production system.

(b)FLD: (ATARI/SAU, Kharif-2016)- The ATARI/ SAU/KVK FLDs were conducted in an area of 1106 ha and almost 2851 farmers were the beneficiaries. The major issues in the FLDs were registration of farmers with SSC seed certification for seed certification and lifting tie-up arrangement of seed between State Seed Corporation (SSC) + (SAU) + Krishi Vigyan Kendra.

(c) FLD: ICAR (TSP)

(d) FLD: ICAR Regular

- **Crop Scenario:** i) Over all excellent for oilseeds and pulses.
ii) Paddy excellent, except about 10 % loss in dry spell area.

➤ **Programme Implementation/Intervention wise Feedback:**

- Seeds: Breeder seed purchase/ identification of variety : Non-involvement.
- Production of foundation and certified seed : Non-involvement of DDAs
- Distribution of HYVs/Certified seeds : Quality is not varietal issue/ timeliness fixation of seed rate.

➤ **Technology Demonstration:**

a) Sole Demonstration

- Input Cafeteria : To be decided at district level.
- Site selection : Representative of soil type / Fertility status.
- Ensuring input availability other than seed : Package and accessibility.
- INM application : Soil test based.
- Integrated Pest Management : Demonstration/ timely use.
- Herbicide/ weed management : Demonstration/ timely use.
- Agronomical practices : Line sowing and Plant population.
- Missing clusters Area : Pulses and Oil seeds.
- Control (Comparison plot) : Variety, method of planting and sowing time.

- *Field day* : *Documentation*
- *PMT* : *Recruitment/ involvement/quality.*
- *Apathy of DFSMEC in quality TOT* : *GPS/ Documentation.*
- b) CSBD**
- *Missing criteria of 30 %*
- *Missing Linkage with IFS/CSR recommendations* : *Cropping system, INM and Climate change.*
- *Lacking Concept* : *Problematic area, saline/alkaline soils, waterlogged etc.*
- *Lacking consolidated evaluation impact/ new* : *Varieties, method of Planting system recommendations sowing, time manipulation, inter-cropping etc.*
- *Economise cost of cultivation* : *C:B ratio not documented.*
- **INM: Revisit input cafeteria:**
- *ST based recommendation.*
- *Trichoderma has no relevance in submergence.*
- *Paddy field.*
- *Micronutrient application high zinc plus. (Akash labs Raipur) Zn- 5 %, B- 1.6%, Cu, Fe- 5 % and Mn- 3 %.*
- **RCT/Tools:**
- *10000/- subsidy tool (Multi crop planter, Power tiller, Seed drills Power weeder, Zero till multi-crop planter, Rotavator, Reaper, Tractor Mounted Sprayer, Ridge- furrow planter, Laser land leveller, tractor mounted sprayer should have user group.*
- *Impact evaluation (after 2-4 years) (on cost cutting, employment generations, increase in mechanisation)*
- *Repair/maintenance / trainings under local initiatives/state plan.*
- **Efficient water application tools:**
- *Excellent Sprinkler set (@ Rs 10000/ ha), Pump set (@ Rs 10000/unit), pipeline @ Rs. 15000 or Rs 50 perm upto 600 meter*
- *Tie up with stop dam, check dam and MIT.*
- *Evaluation of potential increase*
- **CSBD training:** *Non-strategic/incommensurate*
- **Local initiatives:**
- *Good performance.*
- *Evaluate utilization status.*
- *Converge as local input hub by SHG/FPO.*
- *May include land consolidation, community threshing yard through NGO/SHG Mgmt., Mini dal mill/ branding unit etc.*
- **Pradhan Mantri Fasal Bima Yojna (PMFBY):**
- *Flexi-boards in Panchayats and village (Rates, crops etc.)*
- *Extending Non- loanee cover*
- *Involve accountability of Revenue department*
- *Aadhar seeded data.*

➤ **Direct Benefit Transfer (DBT):**

- March 2017
- Aadhar seeded beneficiaries

Other Suggestions:

- Timely release of funds by Govt. of India and States.
- Involvement of ATM/BTM (ATMA) in demo of NFSM.
- Involvement of KVK/NGO.
- Exchange of demo list (Deptt. + KVK).
- Perspective plan for Soil & Water conservation infrastructure- (Check dam/ Stop dam).
- Activation of Water User Association (WUA)/ Pani Panchayat.
- 3 years maintenance provision of check dam/stop dam.
- Accountability of quantity/ maintenance of block level (BMPC)- (e.g Kota).
- Providing funds on furnishing to DDA B/d Mungeli.
- Position of M.Sc. (Soil Science) RAEO with STL to run AAS/ Double beam photometer.
- Mandatory 5% referral sampling of results of SHG from Mrida-Parikshak.
- Target issued delayed: 1st instalment without conditionally of UC.

RECOMMENDATIONS/SUGGESTIONS

1. Quality seed production activities were undertaken which can give direct benefit to farmers if adopted in large areas in effective ways. Such state initiative is appreciable.
2. Arhar cluster demonstration under variety LRG 41, Asha and Rajeev Lochanboth as sole and on rice bunds (@ 10 percent of total rice area as bunds) have been targeted under NFSM pigeonpea demonstration with wider sowing window during kharif (7th July to 28th August), the Arhar as rainfed crop is being popularized by the state and adopted by the farmers. The crop stand was found good at many places.
3. In rainfed ecosystem, medium to late maturing Tur varieties (180-200 days) restrict the option for succeeding crop with low yield levels i.e. 6-7 q/ha yield in a whole year. Thus early varieties of pigeon pea are needed for CG which would facilitate chickpea in Rabi season.
4. Economics of total annual harvest in a unit area is the main reason of its area declining in the state. **In Arhar, farmers need mid-early varieties maturing within 140-150 days.**
5. The visited SRI as cluster demonstration in village Devari has not been demonstrated with proper principles and practices of SRI, i.e. i) Age of seedlings 8-14 days, ii) Field preparation (50% organic and 50% inorganic), iii) Square planting (20x20 cm or 25x25 cm), iv) Inter-row weeding and v) Water management i.e., alternate wetting and drying, watering only when hair line cracks appear in the field. 35 days old seedlings were transplanted that is why only 18 tillers were observed under SRI method of rice cultivation, even no square planting. Trichoderma is being applied in rice field under demonstration as one of the inputs.

- However, Trichoderma is not recommended under water logging conditions. This indicates that the district level field extension functioningø need skill development trainings at one hand and more stringent monitoring of the programme at the level of Directorate of Agriculture.
6. DSR demonstration with var. Sahbhagi has been demonstrated. As a major resource conservation of resources, DSR planting technique is need of the state and should be popularized.
 7. Based on the experience/outcomes of NFSM/BGREI CSBD, district-wise **“Cropping systems may be standardised”** in the existing **rice-fieldpea-wheat-moong/urd cropping** appropriate varietal selection, sowing time, method of planting and other crop management manipulations may be worked out for all 03 agro-climatic zones of CG.
 8. Custom hiring of machineries/equipments is gaining popularity as hiring tractor with implements is easier than maintaining a pair of bullocks throughout year.
 9. To establish and sustain **the SRI cultivation and pigeon- pea- bund** cultivation in the state, the SAU, devised technology package/ modified package of SRI suited to CG. State in view of varied **Agro-eco-situations** of Chhattisgarh.
 10. The parallel district level / block level extension functionaries like ATMA and KVK have not been associated in conduct of participatory mode of Demonstrations. Even Reputed NGOs mayalso be involved in the TOT activities especially in problematic areas like Bastar region under NFSM.
 11. GPS based documentation of all cluster demonstrations and also for machinery beneficiaries is recommended for effective ToT and transparency.
 12. To promote mechanizations, especially as first step in mechanization seed-cum-fertilizer drill and power tiller should be made available to farmers. This may not only reduce the cost of cultivation but would propagate Resources Conservation Technology.
 13. Single box seed drills should be replaced by double box seed drill (Seed-cum-fertilizer drill). **Mixing of seed and fertilizer together in one box is common practice and not recommended as it may damage to seeds due to hygroscopic nature of fertilizers.**
 14. The team recommends involvement of KVKs/SAUs in drawing proper AES based technologies at field level to address gap in planning and execution of the Mission activities.
 15. Rotavator is in high demand for doing agricultural operations and reduction of labour cost under dwindling labourers in the region.
 16. Every implement distribution to farmers should be properly labelled indicating the programme, component, subsidy details, etc. Further, no of particular implements/machineries such as rotavator, straw reaper or costing > Rs.10000/- subsidy should not be more in one village to ensure higher utilization efficiency of machines and also equitable distribution and demonstration of resource to other villages/farmers.

17. Selection of site for Cluster Demonstration both under sole and CSBD as per situational recommendation of variety, medium duration rice was grown in lowland areas, which need specific attention of the SDA.
18. Missing links like synergistic extension efforts, lack of skill amongst extension functionaries/in selection of site, organization of cluster demonstration; documentation and season based trainings to farmers etc. are the issue needing attention of the State deptt. of Agriculture.
19. The mandatory soil health cards must be distributed to all the participating farmers under NFSM cluster demonstration. The status of soil health, thus, was not taken into consideration while recommending the balance nutrition.
20. The organic growers in the state must be facilitated in terms of the accreditation, marketing and strengthening of the organic manures, vermin-compost preparation and skill up-gradation etc.
21. Organic Certification Agency is lacking in the division this is highly useful for preparation of environment for promotion of organic cultivation.
22. Soil testing report generated by MridaParikshak (Mini Lab) may be randomly conformed by the referral laboratories for its authenticity.
23. Soil testing report must be given at least for the demonstration crop where micronutrients are being applied blindly.
24. Skill development in the field of instrumentation is advised for the staff involved in soil testing work and similarly, annual maintenance contract (AMC) for the sophisticated Instruments like AAS and double beam Photometer etc. should be provided for the district soil testing laboratories
25. To contain major diseases like Blast, Neck blast, BLB, Brown spot, False smut, Wilt, Root Knot etc. effectively, demonstration on cultural, mechanical, bio-intensive & chemical methods need to be conducted as well as Community IPM approach may be advocated.
26. The earlier popular *Rice-lathyrus cropping system* is now diverting to *rice-gram system*. Lathyrus is non-resilient to climate, the rains, therefore, vitiate the standing crop whereas gram is comparatively more reliable to the present climatic scenario subject to management practices to control *Helicoverpa armigera* and recommended dose of fertilizers to harness (15-20 q/ha) yield potential in rice- gram sequence.
27. Economics of SRI cultivation in Chhattisgarh such as cost of cultivation, manpower used, total production and economic return etc. should be studied at the end of demonstration to ensure sustainability of the system, as also to conclude its suitability for Chhattisgarh.
28. *Cereal-pulse cropping system* in alternate year, to gain soil fertility and sustainable production system, is highly recommended. The state and DFSMEC is advised to critically monitor the NRM issues and suggest cropping systems suited to the eco-system of the region on sustainable basis.

29. The districts like Janjgir having > 92% area under assured irrigation, proper crop plan for whole year i.e. rice succeeding pulse excess moisture and increase should be prepared to utilize cropping intensity.
30. In all the sample districts visited by the Team, it is noticed that execution of cropping system based cluster demonstration (mandatory 30% of total demonstration in a district has not been done. The objective of CSBD system in the mission was aimed at a definite support to rabipulses for higher total system productivity. The state need to look seriously to this component.
31. Local Initiative components should have wider shelves of activities on the basis of local needs and efficiency. In Mungeli district the godown under this component does not confirms the norms and publicity board. The team suggests that this component should be evaluated in terms of its utility, reduction in storage loss, and as local seed storage hub etc. Crop like arhar safer in weather vagaries and survive well in scarcity of rainfall with higher remunerative prices and yield security owing to deep root system etc as compared to rice under low rainfall, need to be promoted in uplands and upland topography as a policy to diversify cropping pattern.
32. Pre-emergence application of Pendimethalin and 2,4-D as post emergence application was demonstrated under cluster demonstration.
33. Karga (Wild rice) is one of the severe problems in rice cultivation which involve more cost in rouging and managing the crop. *Shyamala* variety of rice should used for karga (wild rice) which is violate in colour and initial stage of identification will support to farmers because they generally used to remove rice at flowering and later stage.
34. Chemical or microbial degradation of wild rice seed is a researchable issue for the effective control of wild rice problem in rainfed areas of Chhattisgarh.
35. Except seed other inputs like seed treatment material and herbicides for early stage weed control could not be made available well in time, have no use at later stage.
36. Bund cultivation of Arhar (10 % of rice field areas considered under bunds for NFSM-Pulse) should be standardized in terms of seed rate, time of sowing, spacing, methods of planting, bund-bed preparation etc. So that every demonstration can follow the package. As of now only seed rate is a major parameter whereas the other agronomical operations are not documented as follow up action under the demonstration.
37. In village **Pindarika (Mungeli)**: team visited VaishnavKrishi Farm (owner-Shri VidhyabratVaishnav) and saw the integration of broad based agriculture with organic farming viz.AHD (150 nos. of Sahiwal cows with less no. of HF) with cultivation of fodder grass and sugarcane fodder using cow dung as biogas for running Confectionary unit. In fact such models need replications.

38. Contingent crop planning for rice under weather variation like early, mid and late season water deficit by giving them proper training under vagaries of rainfall and crop selection varieties, method selection should be kept in mind for combating situation.
39. The team suggested that actual allotment and performance of demonstrations by SADO and subordinate staff based on input criteria would be detailed in register and purchasing and demand placing so that things will be clear. As per the norm of cluster demonstration 30% area should be under cropping system based demonstration.
40. Seed grower's societies are lacking in the Bilaspur division, suitable environment should be made for promoting seed production work by farmer's participatory approach.
41. Seed availability for demonstration purpose should be made as per the local recommendation of concerned KVK. The position of Plant Breeder should be made in the KVK.

OBSERVATIONS

- The overall crop scenario in the state was very good. No incidence of insect-pest and disease was noticed throughout the visit in different districts.
- In Dhamtari, under *Local Initiatives* component the *seed godown* was visited by the team, it was noticed that this godown was lacking prescribed rodent proofing, a pre-requisite for such structure.
- The Custom hiring centre and the other equipment and machineries supported under National Mission on Agriculture Mechanization (NMAM) should be documented at state level by the Dte. of Engineering in terms of its impact on cost of cultivation, maintenance and need based feed back of the machineries provided.
- The local initiative component i.e. storage godown is very useful and successful. In village Tilai paddy (var. Mahamaya) whose rates were @ Rs. 1150/qtls at the time of harvesting i.e., Nov. At the time of visit Feb 27th, paddy rates are @ Rs. 1600/ qtls, the farmer is deriving the benefits of the storage godown constructed under NFSM.
- Funds under Sub-mission on seed and Planting Material (SMSP) for distribution of seed are given to SSC.
- The DBT Scheme is proposed to be implemented from 2017-18. The Aadhar feeded data is being collected at district level. PFMS/ECS is not under implementation in the district.
- Under RKVY the state govt. is implementing *shallow tube wells @ Rs. 20,000/- (Rs. 5000/- boring charges + Rs. 15000/- Pumps- 3 HP) and Checkdam- @ Rs. 10.00 Lakh.*
- Availability of quality input such as pesticides, herbicides, micronutrients etc for cluster demonstration is a major issue and observed as a major feedback in the district. The extension functionaries have also endorsed this fact. The deterioration in the quality inputs under NFSM and BGREI has been observed from 2014-15 onwards
- Timely availability of inputs in desired quantities in NFSM programme is another major issue in almost all the visited districts in particular and the state as a whole, in general.
- State quality control lab of pesticides handles 19 types of pesticides, but no pesticides samples are being made available to this lab
- Ridge and Furrow system of Soybean with JS-9752 in 5:2 intercropping soybean +Pigeonpea (var. Asha+ Rajeev lochan 180 days) was also found as demonstrated.
- About 20,000 ha area under pulses has been diverted due to non-release of water from dams (Gangrel or Madamsilli, Dudhawa, Sondur, Gariyaband).

- Mid duration Paddy hybrid US-312, US-382, DRS-775 (120-130 days) and long duration (140-145 days)-Arize gold (6-444) of Bayer Company and US-366 are popular in Kanker and adjoining districts of CG.
- Pre-emergence herbicide- *Atrazine* supplied under NFSM coarse cereal for Maize has not been found effective. Shri. Chitrasen Sonkar & others. (Mo. 9516331373).
- In district Dhamtari under BGREI, wheat variety GW-273 was demonstrated on 150 acres. The district is known for summer rice cultivation, but farmers have developed its own cropping system like rice-chickpea (green pod)-summer rice and rice-pea (green pea)-summer rice.
- At Mujhgahan Shri Chandal Sahu, chickpea demonstration was good but there was no adoption of line sowing.
- In general the custom hiring centers provided under NFSM/RKVY etc. is helping farmers earning handsome money/employment through hiring thresher and Rotavator etc.
- Shri Hari Ram awarded *krishak utpadakta puruskar* with cash Rs.50000/- for his excellent work in district. He has adopted very good IFS model, there is need to replicate such model across the state.
- Under Local initiatives Agricultural department provided seed godown but it was not having rate protection structures.
- Maize is the traditional crop, adjacent to house, in badi. Horsegram (Kulthi) is another crop under pulses. Toria is grown after harvest of maize, ragi (*finger millet*) Kodo and kutki are major minor millets of the area. (1600 mm Rainfall in 2016-17).
- Maize is major crop during Rabi/Summer i.e. 30,000 ha. RKVY shallow tube wells Shakambhari check dam has contributed in expansion of maize. However, the area converged is under-reported and is not being captured by the state land records.
- During summer the mungbean varieties IPM 410-3, IPM-2-7 are being popularized.

There is need to change either the existing cropping system or otherwise soil should be unproductive for the future.

- In Bastar the team visited at Rajur, Tokapal block, there was good chickpea crop stand but they do not follow line sowing because of land situation was not suitable for good field preparation. Small fields do not dry uniformly at the same time hence sowing is done in pieces at different plots of the same field at 2-3 intervals as per the moisture conditions. Due to this constraint sowing was delayed.
- Sourya Urja Yojna (Solar energy) at Hatpadmur was excellent work, Solar system established in more than six unit. This yojna was executed by DDA and CREDA, this system can be replicate in entire state where electrification is still not reached.

- At village Bakel, Bastar block, team saw a mass area of winter and summer maize, the crop was excellent, farmers are using water from Narangi Nadi by diesel or electric pumps which was provided by department of agriculture, due to anicut (water storage structure) good amount of water storage. There is need to change the cropping system otherwise soil should be unproductive for the future.
- The work done on development of irrigation under various schemes such as: State plan -Kisan Samridhi Yojna ó (Tube-well + Motor Pump), Shakambhari Yojna ó (Dug-well + Electric/Diesel Pump), RKVYó (Shallow Tube-well -75 feet + Electric/Diesel Pump), NFSM ó (Diesel/Electric Pump); Ground Water Recharge, Laghuttam Sinchai (Pond), Sprinkler ó Central/State Sponsored MIS etc., has increased the irrigation potential and cropping intensity of the area.
- In district Kondagaon River Narangi is the life line. The department has provided huge number of diesel and electric pumps to the farmers and also done good work on water harvesting structures. The availability of irrigation resources has resulted in expansion of huge area under Summer Maize for the last 2-3 years.
- During Rabi/Summer Maize is major crop *i.e.* 30,000 ha in Kondagaon district. However, the area converged is *under-reported* and is not being captured by the State Land Records (SLR). Such diversion of crops/area expansion should be reported for future planning.
- With increase in irrigation facilities, during summer the Mungbean varieties IPM 02-14, IPM-2-3 are being popularized.
- In Bastar the team visited at Rajur, block Tokapal, to see cluster demonstration of gram, crop stand was good, however, line sowing was not followed as the soils were not suitable for good field preparation.
- Here the undulated small pieces of land holding do not dry uniformly, hence sowing is done in pieces at different plots of the same field at 2-3 intervals as per the moisture conditions. Due to this constraint sowing was also delayed.
- At village Bakel, block Bastar, a mass area of winter and summer maize was visited, the crop was excellent, farmers are using water from Narangi Nadi by diesel or electric pumps provided by the department of agriculture, due to anicut (water storage structure), a good amount of water storage was there.
- The stop dam/check dam constructed under various schemes has contributed the recharging of dug-wells, increase in crop diversification and the cropping intensity in whole of the state, including Bastar division.

- Functioning of multiple extension system has been noticed in the state. Farmers also receive the advisory on Agriculture through Reliance Foundation over SMS. The Pesticide dealers, Seed suppliers, Micro-nutrients dealers also function as extension agents.
- Farmers in Bastar prefer Local Urd germplasm, which is trailing type with high vegetative mass and cluster fruiting with long duration, sown during second fortnight of August to 1st fortnight of September and matures by October last to November (> 100 days maturity).
- During 2015-16, oilseed and pulses quality seed was not available for Bastar division hence, the distribution of seed component could not be implemented.
- The Suryas Power Industries has done the MoU with CREDA-Chhattisgarh Renewable Energy Development Agency for Sour Sujala Yojna of the Government.
- NFSM-Seed-hub programme (2016-17 to 2018-19) is being implemented at 6 KVKs namely Bhatapara, Sarguja, Rajnandgaon, Kawardha, Kanker & Janjgir-champa.
- Against a targets of 3200 q of seed production during 2016-17 under NFSM Seed hub, expected production is 3307 q for all pulses (Pigeonpea 6var. Asha-332 q ; Fieldpea- var. Parash Adharsh& Shubhra- 615 q; Chickpea- var. JG-14 , JAKI-9218, JG- 63 & JG-130 -2120 q ; Lentil var. Azad Masur-2 (KLS-218)-150 q ; Green gram var.- IPM-02-14- 90 q. Pigeonpea var. Asha is more than 24 years old.
- In Chhattisgarh, the work relating to seed processing and storage infrastructure has been initiative in almost all the centers.
- The procurement policy, storage and lifting off the seed for succeeding season is not yet finalized both at the level of nodal agency i.e. IIPR & implementing agency/institute i.e. ATARI/SAUs/KVKs.
- During kharif 1036 ha/ 2516 nos. of demonstration of pulses (*Pigeonpea-922*, *Mung bean 530*, *Urdbean 770* and *Horse gram 294*) were organized. While during rabi a total of 1152 ha /2570 no. of cluster demonstration under Chickpea- 1411, Green gram- 10, Lentil- 307, Lathyrus -201 and Pigeonpea- 163, have been organized.
- The Director Extension IGKV, Raipur also gave an account of FLDs on Oilseed for both the season (kharif 290 ha /620 no.; rabi 821 ha/1914 no.). Crops covered during kharif were Groundnut, Niger, Sesame and Soybean. The rabi crops were Linseed, R&M, and Sesame.
- The team also had a meeting with the hounarable Vice-Chancellor Dr. S.K. Patil, IGKV (C.G.) and discussed the various research and Technology transfer aspects relating to the State.
- The Vice Chancellor informed that State Bio-Control Laboratory TCB, College of Agriculture & Research Station Sasal Farm, Chorbhatti, Bharni District-Bilaspur is registered with CIB (Central Insecticide Board) for Tricoderma viride 1.5% WP including other Bio-fertilizers.
- Sufficient quantities as per the requirement of the state can be made available under the NFSM, NMOOP and BGREI programme subject to advance MoU with the Directorate of Agriculture, CG.

RECOMMENDATIONS

- The NLMT recommends that there should be a single agency to implement mechanization component in the State. It should be either the DDA or Directorate of Agricultural Engineering.
- As also suggested by almost all the districts/farmers, bulk demonstration/Cluster demonstration of 100 hectares should be curtailed and be minimized to 10-15 ha per cluster. During the course of field visits for the last > 03 years no cluster demonstration of pulses with 100 hectares prescribed area could be seen. This will not only facilitate the quality technological demonstrations but would benefit the farmers in remote areas as well.
- Stem borer of wheat (Pink borer) noticed in certain visited districts. This need to be monitored seriously by formulating a team of SDA + KVK so that the insect infestation may be contained in the initial stage.
- Paddy variety Swarna Sub-1, stress tolerant for submergence area and Rajeshwari for survival in dry spell area were reported by KVKs as surviving well. The department may take demonstration of this variety while conducting sole or CSBD in the identified blocks with varied AES.
- The NLMT recommends to introspect the criteria of deciding input cafeteria. Even today it is not based on soil test recommendations and not decentralised at the level of district and KVK. The State may also look into the aspects of *timely supply of quality inputs at the appropriate time of planting of crops/ laying out of demonstrations* in the district. This is important to ascertain quality technology demonstrations under the programme.
- The team strongly recommends compliance of full package of practices, where all inputs are used with mandatory planting by line sowing.
- Due to crop diversion towards spring/summer maize in Bastar parts and continuously growing of paddy the soil are becoming fatigue acidic. The upland and summer paddy areas should be diversified towards oilseeds and pulses.
- The IWMP should be implemented with catchment based treatment of watershed area.
- Expansion of sole maize cultivation during spring/summer is the result of double crop area expansion programme of the state government. However, the department should introduce /demonstrate the inter-cropping of maize with Mung/Urd and also emphasizing MIS in maize so as to make the area expansion programme sustainable. Because, the maize is a water guzzling crop and continuous cultivation of sole maize may hamper the productivity of the soil in a long run.
- The Director Extension IGKVV, CG/Director ATARI may provide recommendations to the State of Chhattisgarh with regard to performance of Kharif/rabi oilseeds & pulse varieties, package of practices demonstrated in the FLDs over the control. This should be year on year basis. Such feedback was not found, while interactions with the district.

- The varieties distributed under minikits should be monitored (at least 10% of total minikits in a block/district) on the parameters of yield, tolerance/resistance to insect pest and disease, adaptability, duration and suitability in the cropping system in the region/ district. Further, the best performing variety should be dove-tailed with the indenting of the breeder seed for organization of the seed production programme of pulses & oilseeds for the next season.
- The districts (DDAs) may enter into MoU with the designated NFSM-Seed-hub Centres namely ICAR/AICRPs, KVKs for the lifting of the quantities of the certified seeds produced under NFSM. It is important both for sustainability of the seed-hubs and ensuring the availability of the quality seeds/varieties to achieve the targeted cluster demonstrations for effective technology transfer/sustainable production and improvement of SRR/VRR.
- Saur Sujala Yojna (Solar energy) at village Hatpadmur was noticed as excellent work by the department. Solar system prompted the farmers to grow summer pulses and vegetables in the area. This system can be replicated in entire state where electrification is still not reached.
- Each district based on the 10 years of NFSM implementation may prepare varietal impact considered under demonstrations in comparison to local cultivar (Non-descript) for realistic seed and varietal assessment. This will also help in formulation of district plan.
- Cluster demonstrations area may be reduced to a maximum of 5 to 10 hectares from existing 100 hectares thereby increasing technology transfer to large representative areas with quality demonstration. The field extension staff has appraised that such a big cluster is not practical for pulse crops of Mung, Urd, Lentil and Tur except the major crops of region like Soybean, Gram, Wheat.
- The RCT beneficiaries with > 10,000/- per unit financial assistance under NFSM during 10 years of the NFSM programme (2007-08 to 2016-17) may be documented for wider publicity, dove-tailing with the CHCs to enable the farmers to avail the custom hiring services of implements. This will mutually benefit the owner as well as the other farmers (income generation and increase in mechanization).

Observation

- The District Level Monitoring Team (DLMT) has been formulated in the visited districts in the month of August 2016. However, no visit has been conducted by the D.L.M.T. in this crop season.
- The District Steering Committee (DSC) has not been constituted in visited districts.
- Paddy variety PKV HMT has been given cluster demonstration in the Balod district during kharif 2015, incidence of fungal disease was noticed. This observation has been given in NLMT kharif 2015. However, the same variety has again been demonstrated/distributed in cluster demonstration in Gariyaband district, during kharif, 2016. The incidence of blast disease and aphid insect were noticed (below E.T.L.).
- Paddy variety Sambha Masuri (Release year 1989) has been given in cluster demonstration in Gariyaband district. Incidence of Blast disease was noticed. However, this variety is more than 10 years.
- In general, the paddy crop condition was good in visited districts.
- Arhar variety LRG-6 has been given to the farmers for rice bund in cluster demonstrations in Mahasamund district but farmers have not planted on rice bund field.
- The display board has been installed on cluster demonstration; however, the requisite information is missing.
- Paddy has been planted in SRI method in low lying area, which is not advisable under SRI.
- Information in respect of cropping system based training has not been provided.

Recommendations/ Suggestions

- District Level Monitoring Team (DLMT) should visit thrice in a crop season i.e. i) before sowing, for selection of field for suitable interventions of cluster demonstration, ii) mid crop season, to see the crop condition and disease & Pest Control and iii) at harvesting time to check the crop cutting experiments.
- District Steering Committee (DSC) should also be constituted to prepare the district action plan on the basis of previous experiences.
- Cropping System based training should be organised Ist at the beginning of Kharif season and IInd in during mid Kharif crop situation.
- Display board should contain information on the critical inputs used and the interventions being demonstrated.
- Paddy variety PKV HMT (Release year 2008) has been susceptibility to disease & pest may not be considered in the next programme.
- Farm machineries & implements and irrigation devices etc are being provided in the other scheme (NFSM 6 Pulses etc) . So, Site specific Activities i.e. Check dam, stop dam etc may not only be enhanced from the present level of funding norms from 10 % to 15 % but these should have provision for 2-3 years repair and maintenance cost to the tune of 10 % of prices cost of structure. Asset Building (farm machines & implements, Irrigation devices funds-may be reduced from 20% to 15 %.
- All the soil and water conservation structures created during the BGREI (check dam/stop dam) etc do not have 05 year perspective plan. The team comprising surveyor /SCO and ADO may be deputed to prepare an extension and development plan for all these structures. The tangible targets of plan may be C1, Average crop yield level, IFS, seed grower society etc over the Base year. The NMSA, RKVY, NFSM and NHM schemes may be converged on these sites.

- Water stress is a frequent phenomenon due to scanty or uneven rainfall, in Chhattisgarh. Therefore, high yielding popular varieties should be bred/improved for drought tolerance. IR 64 is cultivated in many parts of Chhattisgarh and popular for its good grain type. But this variety cannot be incorporated in BGREI as it is older than 10 years. **DRR Dhan 42 (IR 64 Drt 1)** under BGREI programme, may be considered.
- Submergence with flood water is also commonly occurred in many parts of Chhattisgarh. In place of Samba Mahsuri (BPT 5204) and Swarna (MTU 7029), we recommend to take **Samba Mahsuri (BPT 5204) Sub-1 and Swarna Sub 1**, respectively in submergence prone areas.
- Varieties are being grown since long are subjected to high incidence of insect-pests and diseases. Samba Mahsuri is one of the popular varieties, being cultivated in Chhattisgarh for its good grain quality. But this variety has been notified more than 10 years and susceptible to pest and diseases such as bacterial blight. This can be replaced by **Improved Samba Mahsuri (RP Bio-226)**, a high yielding rice variety with major bacterial blight resistance genes Xa21, xa13 and xa5.
- High yielding varieties with high nutrient (Protein, Fe, Zn) content is required to cultivate in large scale to achieve the food and nutritional security. Presently high yielding varieties with high nutrient content are available. **CR Dhan 310 (with high protein content), DRR Dhan 45 (with high Zn content) and Chattrisgarh Zinc rice 1** (with high Zn content) can be incorporated under BGREI programme.
- Experts from the University and ICAR-National Rice Research Institute, Cuttack level should be called at the time of finalization of BGREI programme for the coming kharif season.

10. WORKSHOP/CONFERENCE/ TRAININGS/MEETINGS/PARTICIPATION

Name	Organization/ Institute	Duration	Purpose
Dr. A. K. Tiwari (Director)	KB, New Delhi	April, 11-12, 2016	National Conference on Kharif Campaign
	KB, New Delhi	April, 13 th , 2016	Review Meeting with CDDs
	IISS, Bhopal	April, 16 th , 2016	Participation in Celebration of 29 th Foundation Day of ICAR-IISS
	JNKVV, Jabalpur	April, 30 th , 2016	Symposium on Physiological Approaches for enhancing productivity of Climate Change
	RVSKVV, Gwalior	May, 10th-11th, 2016	Zonal Workshop on Annual Technical Work Plan for FLD by KVK
	KB, New Delhi	October, 26 th , 2016	Review Meeting with CDDs
	IISS, Bhopal	December, 05 th , 2016	Participation in Celebration of World Soil Day & International Year of Pulses 2016
	KVK-Sehore	December, 05th, 2016	Participation in <i>Fasal Sangosthi</i>
	KVK-Ujjain	December, 28 th , 2016	Participation in Rabi Kishan Sammelan
	KB, New Delhi	Dec, 21 st , 2016	Review Meeting with CDDs
	Bhopal	Jan, 03 rd , 2017	<i>E-Kishan Sarthi</i> Programme organized by Dte. of Agei. Engg, Bhopal
	JNKVV, Jabalpur	Jan, 21 st , 2017	Brain Storming session on Soybean Research & Cultivation in India vis-a-vis Brazil & Japan
	Bhopal	Jan. 24 th , 2017	FSSAI Workshop/Zonal Multi stakeholder consultation on fortification of Food
	KB, New Delhi	Feb, 03 rd , 2017	Participation in the DAC-ICAR Interface-Pre Kharif Campaign-2017
	IISS, Bhopal	March, 21-23, 2017	National Workshop of AICRP-MSPE & Interface Meeting with Researcher-Entrepreneurs-Farmers
	KB, New Delhi	March 24th, 2017	Review Meeting with CDDs
	CSAUA&T, Kanpur	March, 25-25, 2017	National Conference on Farmers Centric Agri-innovation for sustainable Development
	Raisen, Hoshangabad, Sehore & Dewas MP	March, 10-12, 2017	Accompany the Secretary (AC&FW), Govt. of India of MP state visit

Name	Organization/ Institute	Duration	Purpose
Dr. A.K. Shivhare (AD)	Bhopal	April 7 th , 2016.	Workshop on Organic Farming of Products, related problems and their solutions.
	UAS, GKVK, Bangalore	May, 22-24, 2016	AGM on Pigeonpea, MULLaRP & Arid Legume.
	ARS, Gulberga, KN	Aug. 29-31, 2016	AGM on Chickpea.
	NAARM, Hyderabad	Aug., 18-23, 2016	Training programme on Analysis of Experimental Data.
	Bhopal MP	Jan. 24 th , 2017	FSSAI Workshop/Zonal Multi stakeholder consultation on fortification of Food.
	Raisen, Hoshangabad, Sehore & Dewas	March 10.12.2017	Accompanied the Secretary (AC&FW), Government of India during field visit to M.P. state.
	Jabalpur MP	March, 22, 2017	Review Meeting of seed-hubs at ICAR-ATARI
	New Delhi	March, 24, 2017	Review Meeting with CDDs
Shri. Vipin Kumar(AD)	SKRAU, Bikaner	Nov, 29-30, 2016	AGM on Munbbean, Urdbeanm Cowpea & Guar for Spring Summer & Rice fallow cultivation
Shri. Sarju Pallearwar (SI)	RVSKVV, Gwalior	Aug. 09-10, 2016	Zonal Workshop on Oilseed/Pulses Cluster FLDs
Dr. Sandip Silawat (STA)	ICAR--IISR, Indore	Aug, 22-29, 2016	MTC on Integrated Approaches for Sustainable Soybean production
Shri. Sateesh Dwivedi (TA)	IGKV, Raipur-CG	Aug. 23-30, 2016	MTC on Rice Mechanization in Rainfed Agriculture

Name	Organization/ Institute	Duration	NLMTs
Dr. A. K Tiwari (Director)	Indore, Ratlam, Jhabua Ujjain	Sept, 06 th -10 th , 2016	MP-NLMT-NFSM -Kharif 2016
	Sagar, Tikamgarh, Chhaturpur & panna	Feb. 14 th -20 th , 2017	MP-NLMT-NFSMóRabi 2016-17
	Bilaspur, Korba, Jangir-Champa & Mungeli	Sept. 26 th -30 th , 2016	MP-NLMT NFSM CG- Kharif -2016
	Rajnandgaon, Dhamatari, Kanker & Jagdalpur	Feb. 27 th -March, 03 rd , 2017	CG-NLMT-NFSMóRabi 2016-17
Shri. VipinKumar (AD)	Mahasamund & Gariyaband	Sept. 06 th -08 th , 2016	NLMT- BGERI Monitoring of mission Implementation and Crop Scenario in CG

11. FIELD VISIT FOR MONITORING OF CS/CSS

Dr. A.K. Tiwari (Director)

State	Visited District	Date/Duration	Purpose
MP	Morena	April, 11 th , 2016	Visit of NFSM-Summer Pulses Demonstration
MP	Hoshangabad	May, 24 th , 2016	Visit of NFSM-Summer Pulses Demonstration
MP	Vidisha & Raisen	July, 05-06, 2016	Field visit on strategies for increasing Kharif Pulses
MP	Sehore	Nov. 11 th -12 th , 2016	Monitoring of NFSM/ABSP/Seed-Hub/CFLD and other CSS
MP	Harda	Nov. 17, 2016	
MP	Betul	Nov. 18 th -19 th , 2016	
M.P.	Ujjain	Dec. 6-7, 2016	
M.P.	Dewas	Dec. 8 th -9, 2016	
M.P.	Sagar	Dec. 14-16, 2016	
MP	Gwalior	Jan, 12-13, 2017	
MP	Mandsore	Jan, 17-18, 2017	Review of CSS (NFSM/RKVY/NMOOP etc.)/ABSP/Seed-hub/CFLD etc.
MP	Narsinghpur	Jan, 23 rd , 2017	
M.P.	Hoshangabad	Feb. 07-08, 2017	
UP	Kanpur	March, 26, 2017	

Assistant Director (Dr. A.K.Shivhare)

State	Visited Districts	Date/Duration	Purpose
MP	Indore & Khargone	July, 02-03, 2016	Review of CSS (NFSM/RKVY/NMOOP etc.)/status of current Kharif-2016
MP	Harda, Katni & Panna	Sept, 09-17, 2016	Monitoring of Crop prospects of Kharif Pulses

Assistant Director (Shri Vipin Kumar)

State	Visited Districts	Date/Duration	Purpose
MP	Balaghat & Chhindwara	May, 23-24, 2016	Review of CSS (NFSM/RKVY/NMOOP etc.)/Additional Rabi/Summer-Pulses
MP	Gwalior, Shivpuri & Datia	July, 04-05, 2016	Review of CSS (NFSM/RKVY/NMOOP etc.)/status of current Kharif-2016
MP	Hoshangabad & Raisen	Aug, 29-30, 2016	Monitoring Cluster FLDs-Pulses/Oilseeds
ND	New Delhi	Oct, 26, 2016	Training on RTI-MIS
MP	Balaghat & Seoni	Nov, 15-16, 2016	Review of CSS (NFSM/RKVY/NMOOP etc.)/Additional Rabi/Summer-Pulses
MP	Indore, Ujjain & Jabalpur	March, 1-5, 2017	Monitoring FLDs on Wheat & Barley

Statistical Investigator (Shri Sarju Pallearwar)

State	Visited Districts	Date/Duration	Purpose
MP	Sagar & Damoh	July, 01-02, 2016	Review of CSS (NFSM/RKVY/NMOOP etc.)/status of current Kharif-2016
MP	Rajgarh	July, 22, 2016	Review of CSS (NFSM/RKVY/NMOOP etc.)/status of current Kharif-2016
MP	Narsinghpur	Aug, 30, 2016	Monitoring Cluster FLDs-Pulses/Oilseeds
MP	Rewa & Sidhi	Nov, 15-16, 2016	Review of CSS (NFSM/RKVY/NMOOP etc.)/Cluster FLDs-Pulses/Oilseeds
CG	Raipur	Jan, 21-23, 2017	Review of CSS (NFSM/RKVY/NMOOP etc.)/Cluster FLDs-Pulses/Oilseeds

Senior Technical Assistant (Dr. Sandip Silawat)

State	Visited Districts	Date/Duration	Purpose
MP	Rewa & Sidhi	May, 23-24, 2016	Review of CSS (NFSM/RKVY/NMOOP etc.)/Additional Rabi/Summer-Pulses
MP	Shahdol & Umaria	July, 01-02, 2016	Review of CSS (NFSM/RKVY/NMOOP etc.)/status of current Kharif-2016
MP	Jabalpur & Bhopal	Aug., 7-8, 2016	Assessment of Kharif crop Scenario
MP	Sehore	Sept, 02, 2016	Monitoring of Crop prospects of Kharif Pulses
CG	Durg & Balod	Sept, 21-22, 2016	Review of CSS (NFSM/RKVY/NMOOP etc.)/Crop prospects of Kharif Pulses

Senior Technical Assistant (Dr. Divya Sahare)

State	Visited Districts	Date/Duration	Purpose
CG	Kawardha	Jan, 14, 2017	Review of CSS (NFSM/RKVY/NMOOP etc.)/ Crop prospects of Rabi crops/CFLD

Technical Assistant (Smt Ashwini Bhoware)

State	Visited Districts	Date/Duration	Purpose
MP	Jabalpur & Narsinghpur	June, 29-30, 2016	Monitoring/Implementation of CSS schemes
MP	Sehore	Oct, 24-26, 2016	Monitoring/Implementation of CSS schemes/Cluster FLDs

Technical Assistant (Shri Sateesh Dwivedi)

State	Visited Districts	Duration	Purpose
MP	Panna	April, 18 ^h -19 th , 2016	Assessment of crop damage due to hail storm
MP	Dhar & Khargone	May, 23-24, 2016	Monitoring/Implementation of CSS schemes/Additional Rabi/Summer
MP	Rewa	July, 4-5, 2016	Monitoring/Implementation of CSS schemes
MP	Chhattarpur	July, 27-28, 2016	Monitoring/Implementation of CSS schemes
MP	Jabalpur	Aug, 31, 2016	Monitoring/Implementation of CSS schemes/NFSM Projects
MP	Tikamgarh	Sept, 26-27, 2016	Monitoring/Implementation of CSS schemes
CG	Bilaspur, Raigarh & Korba	Nov, 28-30, 2016	Monitoring/Implementation of CSS schemes/Cluster FLDs

12 TECHNICAL REPORTS SUBMITTED TO MINISTRY

Sl. No.	TITLE OF TECHNICAL REPORT	REPORT SUBMITTED
2.	Enhancing Grasspea Production and for Safe Human Food, Animal Feed and Sustainable Rice based Production System in India.	05.04.2016
3.	Crop Specific Advisory on Spring/ Summer Crops-2016	02.05.2016
4.	Crop Specific Advisory on Kharif Crops-2016	24.06.2016
5.	Impact Evaluation Study on Causes of Out Break of Yellow Moisac and Estimation of Yield Losses in Soybean during Kharif-2015 under NMOOP	07.06.2016
6.	National Level Crop Specific Advisory on Kharif Pulses Crops-2016	17.08.2016
7.	Monitoring of Seed-Hub/ ABSP for Increasing Indegenious Production of Pulses in India.	05.09.2016
8.	Impact Assessment of Dry-Spell/ Heavy Rains on Kharif Crops-MP & CG	04.10.2016
9.	Monitoring of Crop Scenario/ Programme Implementation under CSS in assigned states	
10.	Demand and Supply Projection in Agriculture: Pulses- Niti Ayog Working Group 2019-20; 2022-23 and 2032-33	16.11.2016
11.	Monitoring of Crop Scenario/ Programme Implementation under CSS including ABSP/ Seed-Hub and Seed Minikits in assigned states	04.01.2017
12.	Draft Note/ Input on State of Indian Agriculture 2016-17	13.01.2017
13.	FSSAI workshop/ Multi-Stakeholders Consultation on Fortification of Food Articles	31.01.2017
14.	National Level/ Assigned States Crop Specific Advisory on Kharif Pulses Crops-2016	15.02.2017
15.	Monitoring of Crop Scenario/ Programme Implementation under CSS including ABSP/ Seed-Hub, Seed Minikits and Additional Area Rabi/ Summer in assigned states	02.02.2017
16.	Quarterly Progress Report-NFSM-Pulses	07.03.2017
17.	Quarterly Progress Report-NMOOP	16.03.2017
18.	Quarterly Progress Report- BGREI	18.03.2017
19.	Proceedings on Secretaries' Visit to MP State	15.03.2017
20.	Detailed Demands for Grants (DDGs) Statement for Budgetary Adviosry Committee of Parliament - MP & CG States	18.03.2017
21.	Utilization Certificates of CSS-Assigned States	18.03.2017
22.	Monitoring of Wheat & Barley FLDs-MP States	20.03.2017
23.	Concept Note on Processing/ Value Addition of Pulses	20.03.2017

13 ADMINISTRATION AND ACCOUNT**13.1 FINAL EXPENDITURE OF DPD, BHOPAL****F.No.2-5/2012-DPD**

Directorate of Pulses Development, Bhopal (2016-17)

Status of (01.04.2016 to 31.03.2017)

Major Head/Sub-head/Object head as in the Detailed Demands for Grants	BE 2016-17	RE 2016-17	Final Exp.	Excess (+) / Saving w.r.t.		% of savings/ excess	
				BE 2016-17	RE 2016-17	BE 2016-17	RE 2016-17
Major Head:2401-Crop Husbandry 05-Directorate of Pulses Dev.							
050001-Salary	5501000	6686000	6995000	(+) 1494000	(+) 309000	27.16	4.62
050006-Medical	150000	150000	31000	(-) 105000	(-) 105000	70.00	70.00
050003 O.T.A.	14000	14000	7000	(-) 6921	(-) 6921	49.44	49.44
050011 T.A.	500000	494000	344000	(-) 125000	(-) 119000	25.00	24.09
050013 O.E. (Non-Plan)	935000	935000	935000	0	0	0.00	0.00
Total	7100000	8279000	8312000	(+) 1257079	(+) 78079		

13.2 FUND REQUIREMENT OF HONORARIUM, CONVEYANCE ALLOWANCE & TOUR FOR TAs IN DDs DURING 2016-17**Status-2016-17 (01-04-2016 to 31.03.2017)**

No. of T.As sanctioned 6 02

No. of T.As available as on date 6 02

1. Smt. Ashwini Bhoware
2. Shri Sateesh Dwivedi

(Amount in Rupees)

Head	U.B. as on 01.04.16	Fund released by DAC 2016-17	Total Fund Available 2016-17	Fund Utilized 2016-17	U.B. as on 01.04.17	Gross requirement 2017-18	Net requirement 2017-18
1	2	3	4=(2+3)	5	6=(4-5)	7	8=(7-6)\$
Honorarium	1667	598333	600000	588710	11290	600000	588710
Conveyance Allowance	100	35900	36000	35321	679	36000	35321
Travelling Allowance, etc.	23168	26832	50000	19815	30185	50000	19815

** Gross requirement 2017-18 (for 12 months 6 April, 2017 to March, 2018)

*No. of TAs sanctioned and No. of TAs available as on date (with names).

\$ Net requirement is equal to gross requirement (i.e. total fund requirement for salary components of TAs) minus Unspent Balance of 2016-17. i.e. column 8=(7-6)

12.3 Hindi Workshop & Meeting

Hindi Meeting (Quarterly)

S. No.	Dates
1	30.06.2016
2	15.09.2016
3	30.12.2016
4	16.03.2017

International Yoga Day

I st International Day	21.06.2015
II nd International Day	21.06.2016
III rd International Day	21.06.2017

Every Wednesday the YOGA DAY and Deep Cleaning day to observed *Samagra Swachta Abhiyan*.

Kharif-2016-Crop Coverage-All India**ARHAR**

(Area : Lakh ha)

S.No	States	Normal Area	Area Covered		Change over (+/-)	
			2016	2015	2015	2014
1	Andhra Pradesh	2.039	3.090	1.920	1.170	1.690
2	Arunachal Pradesh	0.006			0.000	0.000
3	Assam	0.062			0.000	-0.062
4	Bihar	0.224	0.600	0.550	0.050	0.000
5	Chhattisgarh	0.530	1.374	1.251	0.123	0.154
6	Gujarat	2.346	3.450	2.310	1.140	1.197
7	Haryana	0.147			0.000	0.000
8	Himachal Pradesh	0.000			0.000	0.000
9	Jammu & Kashmir	0.000			0.000	0.000
10	Jharkhand	1.612			0.000	0.000
11	Karnataka	7.740	11.910	7.310	4.600	4.770
12	Kerala	0.012			0.000	0.000
13	Madhya Pradesh	5.076	6.900	5.790	1.110	1.380
14	Maharashtra	12.132	15.361	10.391	4.970	4.965
15	Manipur	0.000	0.005	0.005	-0.001	0.005
16	Meghalaya	0.009			0.000	0.000
17	Mizoram	0.005	0.030	0.026	0.004	0.020
18	Nagaland	0.028	0.030	0.025	0.005	0.002
19	Odisha	1.390	1.352	1.389	-0.037	-0.037
20	Punjab	0.032	0.150	0.050	0.100	0.100
21	Rajasthan	0.170	0.174	0.180	-0.006	0.023
22	Sikkim	0.000			0.000	0.000
23	Tamil Nadu	0.487	0.472	0.408	0.064	0.000
24	Telangana	2.799	4.340	2.250	2.090	1.980
25	Tripura	0.021			0.000	0.000
26	Uttar Pradesh	3.126	3.520	3.750	-0.230	0.320
27	Uttarakhand	0.027	0.050	0.050	0.000	0.050
28	West Bengal	0.016			0.000	0.000
29	Others	0.014			0.000	0.000
	TOTAL	40.050	52.808	37.655	15.153	16.557

(Normal Area- DES Ave. : 2010-2011 to 2014-2015)

URDBEAN
(Area : Lakh ha)

S.No	States	Normal Area	Area covered		Change over (+/-)	
			2016	2015	2015	2014
1	Andhra Pradesh	0.188	0.510	0.130	0.380	0.450
2	Arunachal Pradesh	0.027			0.000	0.000
3	Assam	0.000	0.150	0.190	-0.040	0.040
4	Bihar	0.147	0.140	0.130	0.010	0.010
5	Chhattisgarh	0.966	1.504	1.550	-0.047	-0.047
6	Gujarat	0.896	2.009	0.676	1.333	1.334
7	Haryana	0.034			0.000	0.000
8	Himachal Pradesh	0.093			0.000	0.000
9	Jammu & Kashmir	0.081			0.000	0.000
10	Jharkhand	0.931			0.000	0.000
11	Karnataka	0.926	0.830	0.810	0.020	0.230
12	Kerala	0.001			0.000	0.000
13	Madhya Pradesh	6.451	11.680	9.320	2.360	3.130
14	Maharashtra	3.634	4.530	2.803	1.727	1.973
15	Manipur	0.000	0.011	0.015	-0.004	-0.003
16	Meghalaya	0.000			0.000	0.000
17	Mizoram	0.000			0.000	0.000
18	Nagaland	0.085	0.004	0.003	0.001	0.001
19	Odisha	0.999	2.499	2.607	-0.107	-0.113
20	Punjab	0.025			0.000	0.000
21	Rajasthan	1.997	3.898	2.279	1.619	1.911
22	Sikkim	0.034			0.000	0.000
23	Tamil Nadu	0.533	0.600	0.351	0.249	-2.250
24	Telangana	0.388	0.460	0.270	0.190	0.230
25	Tripura	0.011			0.000	0.000
26	Uttar Pradesh	5.206	6.010	6.550	-0.540	0.400
27	Uttarakhand	0.140	0.290	0.280	0.010	0.290
28	West Bengal	0.606	0.560	0.550	0.010	0.030
29	Others	0.016			0.000	0.000
	TOTAL	24.415	35.685	28.514	7.171	7.617

(Normal Area- DES Ave. : 2010-2011 to 2014-2015)

MUNGBEAN

(Area : Lakh ha)

S.No	States	Normal Area	Area Covered		Change over (+/-)	
			2016	2015	2015	2014
1	Andhra Pradesh	0.259	0.330	0.310	0.020	0.250
2	Arunachal Pradesh	0.011			0.000	0.000
3	Assam	0.000			0.000	0.000
4	Bihar	0.092	0.120	0.110	0.010	0.010
5	Chhattisgarh	0.093	0.340	0.320	0.020	0.111
6	Gujarat	1.360	1.470	1.038	0.432	0.660
7	Haryana	0.121			0.000	0.000
8	Himachal Pradesh	0.003			0.000	0.000
9	Jammu & Kashmir	0.014			0.000	0.000
10	Jharkhand	0.249			0.000	0.000
11	Karnataka	2.830	4.150	3.170	0.980	1.710
12	Kerala	0.000			0.000	0.000
13	Madhya Pradesh	1.018	2.250	1.930	0.320	0.580
14	Maharashtra	4.328	5.124	3.857	1.267	1.934
15	Manipur	0.000	0.004	0.004	-0.001	-0.002
16	Meghalaya	0.000			0.000	0.000
17	Mizoram	0.000			0.000	0.000
18	Nagaland	0.000			0.000	0.000
19	Odisha	1.053	2.055	2.056	-0.002	-0.152
20	Punjab	0.056	0.120	0.090	0.030	0.020
21	Rajasthan	10.053	15.827	10.853	4.974	7.015
22	Sikkim	0.000			0.000	0.000
23	Tamil Nadu	0.267	0.273	0.296	-0.023	0.054
24	Telangana	1.287	1.550	1.070	0.480	0.730
25	Tripura	0.005			0.000	0.000
26	Uttar Pradesh	0.484	0.490	0.520	-0.030	-0.150
27	Uttarakhand	0.000			0.000	0.000
28	West Bengal	0.011	0.011	0.010	0.001	-0.006
29	Others	0.009			0.000	0.000
	TOTAL	23.603	34.113	25.634	8.479	12.764

(Normal Area- DES Ave. : 2010-2011 to 2014-2015)

KULTHI

(Area : Lakh ha)

S.No	States	Normal Area	Area Covered		Change over (+/-)	
			2016	2015	2015	2014
1	Andhra Pradesh	0.068	0.010	0.100	-0.090	-0.010
2	Arunachal Pradesh	0.000			0.000	0.000
3	Assam	0.000			0.000	0.000
4	Bihar	0.086			0.000	0.000
5	Chhattisgarh	0.468	0.225	0.0700	0.155	-0.174
6	Gujarat	0.000			0.000	0.000
7	Haryana	0.006			0.000	0.000
8	Himachal Pradesh	0.019			0.000	0.000
9	Jammu & Kashmir	0.014			0.000	0.000
10	Jharkhand	0.213			0.000	0.000
11	Karnataka	0.672	0.180	0.370	-0.190	-0.240
12	Kerala	0.000			0.000	0.000
13	Madhya Pradesh	0.182	0.340	0.140	0.200	0.160
14	Maharashtra	0.190			0.000	0.000
15	Manipur	0.000			0.000	0.000
16	Meghalaya	0.000			0.000	0.000
17	Mizoram	0.000			0.000	0.000
18	Nagaland	0.000			0.000	0.000
19	Odisha	0.483			0.000	0.000
20	Punjab	0.000			0.000	0.000
21	Rajasthan	0.000			0.000	0.000
22	Sikkim	0.000			0.000	0.000
23	Tamil Nadu	0.157	0.004	0.007	-0.003	-0.051
24	Telangana	0.008			0.000	0.000
25	Tripura	0.000			0.000	0.000
26	Uttar Pradesh	0.000			0.000	0.000
27	Uttarakhand	0.135			0.000	0.000
28	West Bengal	0.000			0.000	0.000
29	Others	0.000			0.000	0.000
	TOTAL	2.701	0.759	0.687	0.072	-0.315

(Normal Area- DES Ave. : 2010-2011 to 2014-2015)

OTHER KHARIF PULSES

(Area : Lakh ha)

S.No	States	Normal Area	Area Covered		Change over (+/-)	
			2016	2015	2015	2014
1	Andhra Pradesh	0.066	0.080	0.060	0.020	0.040
2	Arunachal Pradesh	0.024	0.135	0.130	0.005	0.135
3	Assam	0.000			0.000	0.000
4	Bihar	0.030	0.190	0.120	0.070	0.060
5	Chhattisgarh	0.051			0.000	0.000
6	Gujarat	0.507	0.399	0.240	0.159	0.173
7	Haryana	0.035	0.800	0.220	0.580	0.480
8	Himachal Pradesh	0.078	0.230	0.210	0.020	-0.110
9	Jammu & Kashmir	0.128	0.165	0.166	-0.001	-0.018
10	Jharkhand	0.246	3.760	2.620	1.140	0.370
11	Karnataka	1.312	1.170	1.380	-0.210	-0.080
12	Kerala	0.001			0.000	0.000
13	Madhya Pradesh	0.041			0.000	0.000
14	Maharashtra	1.282	0.886	1.183	-0.297	0.125
15	Manipur	0.046	0.025	0.025	0.000	-0.024
16	Meghalaya	0.005			0.000	0.000
17	Mizoram	0.023	0.022	0.030	-0.008	0.022
18	Nagaland	0.138	0.139	0.136	0.003	0.003
19	Odisha	0.770	0.882	0.862	0.020	0.057
20	Punjab	0.000			0.000	0.000
21	Rajasthan	12.196	12.982	12.386	0.596	3.392
22	Sikkim	0.030			0.000	0.000
23	Tamil Nadu	0.710	0.532	0.597	-0.065	0.063
24	Telangana	0.024	0.010	0.010	0.000	0.000
25	Tripura	0.016	0.131	0.060	0.071	0.131
26	Uttar Pradesh	0.000			0.000	0.000
27	Uttarakhand	0.153	0.330	0.275	0.055	-0.170
28	West Bengal	0.009	0.008	0.008	0.000	-0.004
29	Others	0.003			0.000	0.000
	TOTAL	17.924	22.875	20.717	2.158	4.644

(Normal Area- DES Ave. : 2010-2011 to 2014-2015)

TOTAL KHARIF PULSES

(Area :Lakh ha)

S.No	States	Normal Area	Area Covered		Change over (+-)	
			2016	2015	2015	2014
1	Andhra Pradesh	2.620	4.020	2.520	1.500	2.420
2	Arunachal Pradesh	0.068	0.135	0.130	0.005	0.135
3	Assam	0.062	0.150	0.190	-0.040	-0.022
4	Bihar	0.579	1.050	0.910	0.140	0.080
5	Chhattisgarh	2.108	3.443	3.191	0.252	0.045
6	Gujarat	5.109	7.328	4.264	3.064	3.364
7	Haryana	0.343	0.800	0.220	0.580	0.480
8	Himachal Pradesh	0.193	0.230	0.210	0.020	-0.110
9	Jammu & Kashmir	0.237	0.165	0.166	-0.001	-0.018
10	Jharkhand	3.251	3.760	2.620	1.140	0.370
11	Karnataka	13.480	18.240	13.040	5.200	6.390
12	Kerala	0.014	0.000	0.000	0.000	0.000
13	Madhya Pradesh	12.768	21.170	17.180	3.990	5.250
14	Maharashtra	21.566	25.900	18.233	7.667	8.996
15	Manipur	0.046	0.044	0.049	-0.005	-0.024
16	Meghalaya	0.014	0.000	0.000	0.000	0.000
17	Mizoram	0.028	0.052	0.056	-0.004	0.042
18	Nagaland	0.251	0.173	0.164	0.009	0.006
19	Odisha	4.695	6.788	6.914	-0.126	-0.245
20	Punjab	0.113	0.270	0.140	0.130	0.120
21	Rajasthan	24.416	32.881	25.698	7.183	12.341
22	Sikkim	0.064	0.000	0.000	0.000	0.000
23	Tamil Nadu	2.154	1.881	1.659	0.222	-2.184
24	Telangana	4.506	6.360	3.600	2.760	2.940
25	Tripura	0.053	0.131	0.060	0.071	0.131
26	Uttar Pradesh	8.816	10.020	10.820	-0.800	0.570
27	Uttarakhand	0.455	0.670	0.605	0.065	0.170
28	West Bengal	0.642	0.579	0.568	0.011	0.020
	Others	0.042	0.000	0.000	0.000	0.000
	TOTAL	108.693	146.240	113.208	33.033	41.267

(Normal Area- DES Ave. : 2010-2011 to 2014-2015)

SUMMARY ALL INDIA : Kharif Pulses**(Area:Lakh ha)**

S.No	Crops	Normal Area	Area Covered		Change over (+-)	
			2016	2015	2015	2014
1	Arhar (Tur)	40.050	52.808	37.655	15.153	16.557
2	Urdbean	24.415	35.685	28.514	7.171	7.617
3	Moongbean	23.603	34.113	25.634	8.479	12.764
4	Kulthi	2.701	0.759	0.687	0.072	-0.315
5	Other Kharif Pulses	17.924	22.875	20.717	2.158	4.644
	TOTAL	108.693	146.24	113.208	33.033	41.267

(Normal Area- DES Ave. :2010-2011 to 2014-2015)

All India: Crop-wise and State-wise Rabi Crop Coverage- 2016-17**Gram****(Area :Lakh ha)**

Sl.No	States	Normal Area (DES)	Area Covered		Change over (+/-)	
			2016	2015	2015	2014
1	Andhra Pradesh	4.676	3.880	4.700	-0.820	0.440
2	Arunachal Pradesh	0.000			0.000	0.000
3	Assam	0.019	0.020	0.011	0.009	0.020
4	Bihar	0.586	1.040	1.060	-0.020	-0.010
5	Chhattisgarh	2.635	3.676	3.513	0.163	0.228
6	Gujarat	1.992	1.700	1.173	0.527	0.002
7	Haryana	0.772	0.580	0.610	-0.030	-0.310
8	Himachal Pradesh	0.005	0.020	0.020	0.000	0.000
9	Jammu & Kashmir	0.001			0.000	0.000
10	Jharkhand	1.304			0.000	0.000
11	Karnataka	9.232	10.810	15.450	-4.640	0.400
12	Kerala	0.000			0.000	0.000
13	Madhya Pradesh	30.595	32.520	30.170	2.350	3.360
14	Maharashtra	13.712	18.681	14.401	4.280	6.144
15	Manipur	0.011			0.000	0.000
16	Meghalaya	0.011	0.019	0.018	0.000	0.001
17	Mizoram	0.000			0.000	0.000
18	Nagaland	0.007	0.003	0.003	0.000	0.002
19	Odisha	0.433	0.370	0.351	0.019	0.075
20	Punjab	0.020	0.030	0.040	-0.010	-0.020
21	Rajasthan	15.300	17.514	12.380	5.134	2.544
22	Sikkim	0.000			0.000	0.000
23	Tamil Nadu	0.077	0.050	0.043	0.007	-0.014
24	Telangana	0.958	1.390	1.170	0.220	0.640
25	Tripura	0.002			0.000	0.000
26	Uttar Pradesh	5.772	6.430	4.000	2.430	0.530
27	Uttarakhand	0.007	0.010	0.010	0.000	0.010
28	West Bengal	0.243	0.266	0.330	-0.064	-0.064
29	Others	0.002			0.000	-0.010
	TOTAL	88.372	99.008	89.454	9.555	13.977

(Normal Area- DES Ave. 2010-11 to 2014-15)

Lentil**(Area :Lakh ha)**

SLNo	States	Normal Area (DES)	Area Covered		Change over (+/-)	
			2016	2015	2015	2014
1	Andhra Pradesh	0.000			0.000	0.000
2	Arunachal Pradesh	0.000			0.000	0.000
3	Assam	0.270	0.330	0.180	0.150	-0.110
4	Bihar	1.834	2.130	2.160	-0.030	-0.040
5	Chhattisgarh	0.148	0.255	0.232	0.023	-0.013
6	Gujarat	0.000			0.000	0.000
7	Haryana	0.045			0.000	0.000
8	Himachal Pradesh	0.006			0.000	0.000
9	Jammu & Kashmir	0.004			0.000	0.000
10	Jharkhand	0.394			0.000	0.000
11	Karnataka	0.000			0.000	0.000
12	Kerala	0.000			0.000	0.000
13	Madhya Pradesh	5.851	5.860	5.480	0.380	0.730
14	Maharashtra	0.035			0.000	0.000
15	Manipur	0.000			0.000	0.000
16	Meghalaya	0.000	0.013	0.012	0.000	0.001
17	Mizoram	0.000			0.000	0.000
18	Nagaland	0.000	0.012	0.011	0.001	0.010
19	Odisha	0.000	0.104	0.074	0.030	0.004
20	Punjab	0.010	0.020	0.030	-0.010	-0.020
21	Rajasthan	0.362			0.000	0.000
22	Sikkim	0.000			0.000	0.000
23	Tamil Nadu	0.000			0.000	0.000
24	Telangana	0.000			0.000	0.000
25	Tripura	0.010			0.000	0.000
26	Uttar Pradesh	5.082	6.630	4.530	2.100	0.530
27	Uttarakhand	0.119	0.160	0.170	-0.010	0.140
28	West Bengal	0.624	1.132	0.850	0.282	0.402
	TOTAL	14.794	16.645	13.729	2.916	1.633

(Normal Area- DES Ave. 2010-11 to 2014-15)

Fieldpea**(Area :Lakh ha)**

Sl.No	States	Normal Area (DES)	Area Covered		Change over (+/-)	
			2016	2015	2015	2014
1	Andhra Pradesh	0.000			0.000	0.000
2	Arunachal Pradesh	0.000			0.000	0.000
3	Assam	0.273	0.330	0.260	0.070	-0.020
4	Bihar	0.193	0.320	0.330	-0.010	0.000
5	Chhattisgarh	0.153	0.535	0.466	0.069	0.067
6	Gujarat	0.000			0.000	0.000
7	Haryana	0.010			0.000	0.000
8	Himachal Pradesh	0.114			0.000	0.000
9	Jammu & Kashmir	0.010			0.000	0.000
10	Jharkhand	0.341			0.000	0.000
11	Karnataka	0.000			0.000	0.000
12	Kerala	0.013			0.000	0.000
13	Madhya Pradesh	2.868	4.870	4.580	0.290	1.960
14	Maharashtra	0.286			0.000	0.000
15	Manipur	0.168			0.000	0.000
16	Meghalaya	0.000	0.024	0.023	0.000	0.001
17	Mizoram	0.000			0.000	-0.012
18	Nagaland	0.000	0.053	0.050	0.003	0.044
19	Odisha	1.353	0.314	0.252	0.062	0.017
20	Punjab	0.022			0.000	0.000
21	Rajasthan	0.094			0.000	0.000
22	Sikkim	0.000			0.000	0.000
23	Tamil Nadu	0.000			0.000	0.000
24	Telangana	0.000			0.000	0.000
25	Tripura	0.012			0.000	0.000
26	Uttar Pradesh	3.414	4.620	3.430	1.190	-1.060
27	Uttarakhand	0.063	0.050	0.050	0.000	0.050
28	West Bengal	0.126	0.140	0.150	-0.010	-0.010
	TOTAL	9.513	11.256	9.591	1.665	1.037

(Normal Area- DES Ave.: 2010-11 to 2014-15)

Kulthi**(Area :Lakh ha)**

Sl.No	States	Normal Area (DES)	Area Covered		Change over (+/-)	
			2016	2015	2015	2014
1	Andhra Pradesh	0.236	0.100	0.200	-0.100	-0.170
2	Arunachal Pradesh	0.000			0.000	0.000
3	Assam	0.000			0.000	0.000
4	Bihar	0.000			0.000	0.000
5	Chhattisgarh	0.032	0.222	0.254	-0.032	-0.062
6	Gujarat	0.000			0.000	0.000
7	Haryana	0.000			0.000	0.000
8	Himachal Pradesh	0.000			0.000	0.000
9	Jammu & Kashmir	0.000			0.000	0.000
10	Jharkhand	0.000			0.000	0.000
11	Karnataka	1.230	0.900	1.090	-0.190	-0.400
12	Kerala	0.000			0.000	0.000
13	Madhya Pradesh	0.003			0.000	0.000
14	Maharashtra	0.130			0.000	0.000
15	Manipur	0.000			0.000	0.000
16	Meghalaya	0.000			0.000	0.000
17	Mizoram	0.000			0.000	0.000
18	Nagaland	0.000			0.000	0.000
19	Odisha	0.001	2.079	1.920	0.159	-0.471
20	Punjab	0.000			0.000	0.000
21	Rajasthan	0.000			0.000	0.000
22	Sikkim	0.000			0.000	0.000
23	Tamil Nadu	0.563	0.447	0.748	-0.301	-0.526
24	Telangana	0.026	0.010	0.010	0.000	0.000
25	Tripura	0.000			0.000	0.000
26	Uttar Pradesh	0.000			0.000	0.000
27	Uttarakhand	0.000			0.000	0.000
28	West Bengal	0.027	0.022	0.021	0.001	0.022
	TOTAL	2.248	3.780	4.243	-0.463	-1.607

(Normal Area- DES Ave. 2010-11 to 2014-15)

Urdbean**(Area :Lakh ha)**

SLNo	States	Normal Area (DES)	Area Covered		Change over (+/-)	
			2016	2015	2015	2014
1	Andhra Pradesh	3.462	4.040	3.910	0.130	0.950
2	Arunachal Pradesh	0.012			0.000	0.000
3	Assam	0.497	0.000	0.000	0.000	-0.490
4	Bihar	0.000			0.000	0.000
5	Chhattisgarh	0.059	0.129	0.095	0.034	0.023
6	Gujarat	0.025			0.000	0.000
7	Haryana	0.000			0.000	0.000
8	Himachal Pradesh	0.000			0.000	0.000
9	Jammu & Kashmir	0.000			0.000	0.000
10	Jharkhand	0.000			0.000	0.000
11	Karnataka	0.078	0.040	0.080	-0.040	-0.010
12	Kerala	0.000			0.000	0.000
13	Madhya Pradesh	0.115			0.000	0.000
14	Maharashtra	0.000			0.000	0.000
15	Manipur	0.000			0.000	0.000
16	Meghalaya	0.000			0.000	0.000
17	Mizoram	0.000			0.000	0.000
18	Nagaland	0.008			0.000	0.000
19	Odisha	0.050	2.053	1.849	0.204	-0.227
20	Punjab	0.000			0.000	0.000
21	Rajasthan	0.000			0.000	0.000
22	Sikkim	0.013			0.000	0.000
23	Tamil Nadu	2.586	2.209	1.911	0.298	0.047
24	Telangana	0.164	0.180	0.080	0.100	0.090
25	Tripura	0.005			0.000	0.000
26	Uttar Pradesh	0.463			0.000	0.000
27	Uttarakhand	0.001			0.000	0.000
28	West Bengal	0.122	0.089	0.090	-0.001	-0.001
29	Others	0.020			0.000	0.000
	TOTAL	7.680	8.740	8.015	0.725	0.382

(Normal Area- DES Ave. 2010-11 to 2014-15)

Moongbean**(Area :Lakh ha)**

SL.No	States	Normal Area (DES)	Area Covered		Change over (+/-)	
			2016	2015	2015	2014
1	Andhra Pradesh	1.214	0.800	1.500	-0.700	-0.540
2	Arunachal Pradesh	0.000			0.000	0.000
3	Assam	0.100			0.000	0.000
4	Bihar	1.522			0.000	0.000
5	Chhattisgarh	0.066	0.210	0.229	-0.019	-0.033
6	Gujarat	0.560			0.000	0.000
7	Haryana	0.587			0.000	0.000
8	Himachal Pradesh	0.000			0.000	0.000
9	Jammu & Kashmir	0.000			0.000	0.000
10	Jharkhand	0.000			0.000	0.000
11	Karnataka	0.076	0.030	0.040	-0.010	-0.020
12	Kerala	0.000			0.000	0.000
13	Madhya Pradesh	0.687			0.000	0.000
14	Maharashtra	0.036			0.000	0.000
15	Manipur	0.000			0.000	0.000
16	Meghalaya	0.000			0.000	0.000
17	Mizoram	0.000			0.000	0.000
18	Nagaland	0.000			0.000	0.000
19	Odisha	1.607	4.495	3.350	1.145	0.473
20	Punjab	0.392			0.000	0.000
21	Rajasthan	0.090			0.000	0.000
22	Sikkim	0.000			0.000	0.000
23	Tamil Nadu	1.490	0.675	0.883	-0.208	-0.116
24	Telangana	0.156	0.170	0.170	0.000	-0.021
25	Tripura	0.003			0.000	0.000
26	Uttar Pradesh	0.413			0.000	0.000
27	Uttarakhand	0.000			0.000	0.000
28	West Bengal	0.198	0.023	0.020	0.003	-0.047
29	Others	0.015			0.000	0.000
	TOTAL	9.212	6.403	6.191	0.211	-0.304

(Normal Area- DES Ave. 2010-11 to 2014-15)

Lathyrus**(Area :Lakh ha)**

Sl.No	States	Normal Area (DES)	Area Covered		Change over (+/-)	
			2016	2015	2015	2014
1	Andhra Pradesh	0.000			0.000	0.000
2	Arunachal Pradesh	0.000			0.000	0.000
3	Assam	0.000			0.000	0.000
4	Bihar	0.723			0.000	0.000
5	Chhattisgarh	3.490	3.435	3.091	0.344	0.102
6	Gujarat	0.000			0.000	0.000
7	Haryana	0.000			0.000	0.000
8	Himachal Pradesh	0.000			0.000	0.000
9	Jammu & Kashmir	0.000			0.000	0.000
10	Jharkhand	0.000			0.000	0.000
11	Karnataka	0.000			0.000	0.000
12	Kerala	0.000			0.000	0.000
13	Madhya Pradesh	0.473			0.000	0.000
14	Maharashtra	0.208			0.000	0.000
15	Manipur	0.000			0.000	0.000
16	Meghalaya	0.000			0.000	0.000
17	Mizoram	0.000			0.000	0.000
18	Nagaland	0.000			0.000	0.000
19	Odisha	0.000			0.000	0.000
20	Punjab	0.000			0.000	0.000
21	Rajasthan	0.000			0.000	0.000
22	Sikkim	0.000			0.000	0.000
23	Tamil Nadu	0.000			0.000	0.000
24	Telangana	0.000			0.000	0.000
25	Tripura	0.000			0.000	0.000
26	Uttar Pradesh	0.000			0.000	0.000
27	Uttarakhand	0.000			0.000	0.000
28	West Bengal	0.288	0.850	0.820	0.030	0.150
	TOTAL	5.182	4.285	3.911	0.373	0.251

(Normal Area- DES Ave. 2010-11 to 2014-15)

Other Rabi Pulses

(Area :Lakh ha)

SL.No	States	Normal Area (DES)	Area Covered		Change over (+/-)	
			2016	2015	2015	2014
1	Andhra Pradesh	0.147	0.190	0.230	-0.040	-0.030
2	Arunachal Pradesh	0.047	0.056	0.050	0.006	0.008
3	Assam	0.151	0.220	0.013	0.207	0.220
4	Bihar	0.017	1.120	1.230	-0.110	-0.150
5	Chhattisgarh	0.011	0.027	0.058	-0.031	-0.038
6	Gujarat	0.243	0.266	0.246	0.020	0.057
7	Haryana	0.000	0.080	0.110	-0.030	-0.040
8	Himachal Pradesh	0.000	0.071	0.126	-0.055	-0.029
9	Jammu & Kashmir	0.011	0.150	0.150	0.000	0.000
10	Jharkhand	0.112	3.273	2.553	0.720	1.423
11	Karnataka	0.254	0.120	0.350	-0.230	-0.070
12	Kerala	0.000			0.000	0.000
13	Madhya Pradesh	0.017	0.740	0.670	0.070	-0.060
14	Maharashtra	0.612	1.200	0.884	0.316	0.590
15	Manipur	0.070			0.000	0.000
16	Meghalaya	0.030	0.017	0.016	0.000	0.017
17	Mizoram	0.015			0.000	0.000
18	Nagaland	0.183	0.106	0.102	0.004	0.106
19	Odisha	1.285	0.773	0.576	0.197	0.112
20	Punjab	0.000	0.040	0.040	0.000	-0.010
21	Rajasthan	0.072	0.536	0.501	0.035	0.152
22	Sikkim	0.009			0.000	0.000
23	Tamil Nadu	0.154	0.487	0.539	-0.052	-0.511
24	Telangana	0.105	0.060	0.080	-0.020	0.000
25	Tripura	0.013			0.000	0.000
26	Uttar Pradesh	0.000	0.000	0.000	0.000	0.000
27	Uttarakhand	0.000	0.000	0.000	0.000	-0.190
28	West Bengal	0.005	0.069	0.041	0.028	-0.041
29	Others	0.117			0.000	0.000
	TOTAL	3.680	9.601	8.565	1.035	1.516

(Normal Area- DES Ave. 2010-11 to 2014-15)

Total Rabi Pulses**(Area :Lakh ha)**

Sl.No	States	Normal Area (DES)	Area Covered		Change over (+/-)	
			2016	2015	2015	2014
1	Andhra Pradesh	9.735	9.010	10.540	-1.530	0.650
2	Arunachal Pradesh	0.059	0.056	0.050	0.006	0.008
3	Assam	1.310	0.900	0.464	0.436	-0.380
4	Bihar	4.875	4.610	4.780	-0.170	-0.200
5	Chhattisgarh	6.594	8.489	7.937	0.552	0.274
6	Gujarat	2.820	1.966	1.419	0.547	0.059
7	Haryana	1.414	0.660	0.720	-0.060	-0.350
8	Himachal Pradesh	0.125	0.091	0.146	-0.055	-0.029
9	Jammu & Kashmir	0.026	0.150	0.150	0.000	0.000
10	Jharkhand	2.151	3.273	2.553	0.720	1.423
11	Karnataka	10.870	11.900	17.010	-5.110	-0.100
12	Kerala	0.013	0.000	0.000	0.000	0.000
13	Madhya Pradesh	40.609	43.990	40.900	3.090	5.990
14	Maharashtra	15.019	19.881	15.285	4.596	6.734
15	Manipur	0.249	0.000	0.000	0.000	0.000
16	Meghalaya	0.041	0.071	0.071	0.001	0.018
17	Mizoram	0.015	0.000	0.000	0.000	-0.012
18	Nagaland	0.198	0.174	0.166	0.008	0.162
19	Odisha	4.729	10.187	8.372	1.815	-0.018
20	Punjab	0.444	0.090	0.110	-0.020	-0.050
21	Rajasthan	15.918	18.050	12.881	5.169	2.696
22	Sikkim	0.022	0.000	0.000	0.000	0.000
23	Tamil Nadu	4.870	3.868	4.124	-0.256	-1.120
24	Telangana	1.409	1.810	1.510	0.300	0.709
25	Tripura	0.045	0.000	0.000	0.000	0.000
26	Uttar Pradesh	15.144	17.680	11.960	5.720	0.000
27	Uttarakhand	0.190	0.220	0.230	-0.010	0.010
28	West Bengal	1.633	2.591	2.322	0.269	0.411
29	Others	0.154	0.000	0.000	0.000	-0.010
	TOTAL	140.681	159.717	143.700	16.017	16.885

(Normal Area- DES Ave. 2010-11 to 2014-15)

MADHYA PRADESH: CROP-WISE COVERAGE: KHARIF 2016

(Area : Lakh ha)

S. No.	Crop	Target-2016 (SDA)	Normal Area	Area Covered (SDA)		Difference over		% coverage over	
				2016	2015	2015	2014	Normal	last year
1	Rice	21.24	18.460	22.600	20.240	2.360	1.410	122.43	111.66
2	Sorghum	2.73	3.160	2.200	2.050	0.150	0.080	69.62	107.32
3	Bajra	2.32	1.890	2.800	2.670	0.130	0.640	148.15	104.87
4	Small Milletes	2.08	2.170	1.850	1.910	-0.060	0.390	85.25	96.86
5	Maize	11.00	9.080	12.630	10.980	1.650	2.080	139.10	115.03
	Total Cereals	39.37	34.76	42.080	37.850	4.230	4.600	121.06	111.18
6	Red Gram	7.79	5.076	6.900	5.790	1.110	1.380	135.93	119.17
7	Black Gram	11.00	6.451	11.680	9.320	2.360	3.130	181.06	125.32
8	Green Gram	2.50	1.018	2.250	1.930	0.320	0.580	221.02	116.58
9	Other Kharif Pulses	0.22	0.223	0.340	0.140	0.200	0.160	152.47	242.86
	Total Pulses	21.51	12.768	21.170	17.180	3.990	5.250	165.81	123.22
10	Groundnut	2.40	2.120	2.550	2.360	0.190	0.200	120.28	108.05
11	Soybean	56.50	58.300	54.010	59.060	-5.050	-2.960	92.64	91.45
12	Sunflower	0.00	0.001	0.000	0.000	0.000	0.000	0.00	0.00
13	Sesame	4.90	3.050	3.800	3.650	0.150	0.190	124.59	104.11
14	Other Kharif Oilseeds	0.80	0.869	0.750	0.800	-0.050	0.430	86.31	93.75
	Total Oilseed	64.60	64.340	61.11	65.87	-4.760	-2.140	94.98	92.77
15	Sugarcane	0.00	0.760	0.000	0.000	0.000	0.000	0.00	0.00
16	Cotton	5.72	6.050	5.990	5.470	0.520	-0.400	99.01	109.51
17	Jute & Mesta	0.00	0.050	0.000	0.000	0.000	0.000	0.00	0.00
	Total Kharif Crops	131.20	118.728	130.35	126.37	3.980	7.310	109.79	103.15

(Normal Area- DES Ave. : 2010-2011 to 2014-2015)

Madhya Pradesh: Season-Rabi Crops (2016-17)

(Area:Lakh ha)

Sl No	Crop	Normal Area (SDA)	Target Area 2016-17 (SDA)	Area Covered		Change over (+-)	
				2016	2015	2015	2014
1	Wheat	57.350	64.215	62.230	51.840	10.390	4.100
2	Others	0.700	0.700	1.480	1.040	0.440	0.310
Total Cereals		58.050	64.915	63.710	52.880	10.830	4.410
3	Gram	28.840	31.651	32.520	30.170	2.350	3.360
4	Lentil	5.190	6.100	5.860	5.480	0.380	0.730
5	Pea	2.580	5.203	4.870	4.580	0.290	1.960
6	Others	0.450	0.500	0.740	0.670	0.070	-0.060
Total pulses		37.060	43.454	43.990	40.900	3.090	5.990
Total foodgrains		95.110	108.369	107.700	93.780	13.920	10.400
7	Rapeseed/Mustard	7.730	6.200	7.230	6.290	0.940	0.490
8	Linseed/ Others	1.100	1.120	1.690	1.180	0.510	0.520
9	Others	0.114	0.350	0.000	0.000	0.000	0.000
Total oilseeds		8.944	7.670	8.920	7.470	1.450	1.010
10	Sugarcane	0.820	1.120	0.990	1.060	-0.070	-0.200
Total area Rabi		104.874	117.159	117.610	102.310	15.300	11.210

(Normal Area- DES Ave. : 2010-2011 to 2014-2015)

CHHATTISGARH: CROP-WISE COVERAGE: (KHARIF 2016)**(Area :Lakh ha)**

S.No.	Crop	Target-2016 (SDA)	Normal Area	Area Covered (SDA)		Difference over		% coverage over	
				2016	2015	2015	2014	Normal	last year
1	Rice	36.26	37.740	37.070	37.080	-0.010	-0.490	98.22	99.97
2	Sorghum	0.00	0.053			0.000	0.000	0.00	0.00
3	Bajra	0.00	0.001			0.000	0.000	0.00	0.00
4	Small Milletes	0.91	1.360	0.812	0.453	0.360	-0.068	59.73	179.47
6	Maize	2.25	1.090	2.250	2.080	0.170	0.035	206.44	108.18
7	Total Coarse Cereals	39.42	40.244	40.133	39.613	0.520	-0.523	99.72	101.31
8	Red Gram	1.45	0.530	1.374	1.251	0.123	0.154	259.32	109.83
9	Black Gram	1.67	0.966	1.504	1.550	-0.047	-0.047	155.64	97.00
10	Green Gram	0.33	0.093	0.340	0.320	0.020	0.111	365.59	106.25
11	Other Kharif Pulses	0.43	0.518	0.225	0.070	0.155	-0.174	43.40	321.14
12	Total Kharif Pulses	3.88	2.107	3.443	3.191	0.251	0.045	163.39	107.87
13	Groundnut	0.62	0.274	0.584	0.574	0.010	0.065	213.28	101.79
14	Soybean	1.52	1.050	1.340	1.408	-0.068	-0.042	127.62	95.17
15	Sunflower	0.01	0.010	0.009	0.010	-0.001	0.005	90.00	90.00
16	Sesame	0.42	0.194	0.351	0.380	-0.030	0.011	180.67	92.24
17	Other Kharif Oilseeds	0.82	0.650	0.365	0.202	0.163	-0.287	56.14	180.38
18	Total Oilseed	3.39	2.178	2.649	2.574	0.074	-0.248	121.62	102.89
19	Sugarcane		0.120			0.000	0.000	0.00	0.00
20	Cotton		0.002			0.000	0.000	0.00	0.00
21	Jute & Mesta		0.013			0.000	0.000	0.00	0.00
22	Others	1.42	0.000	1.436	1.380	0.056	0.176	0.00	104.09
23	Total	48.11	44.664	47.660	46.758	0.902	-0.550	106.71	101.93

(Normal Area- DES Ave.: 2010-2011 to 2014-2015)

Chhattisgarh: Season-Rabi Crops 2016-17

(Area:Lakh ha)

Sl No.	Crop	Normal Area (SDA)	Target Area 2016-17 (SDA)	Area Covered		Change over (+-)	
				2016	2015	2015	2014
1	Wheat	1.557	1.780	1.736	1.548	0.188	0.041
2	Paddy	2.214	1.750	0.590	0.627	-0.037	-0.128
3	Jowar	0.054	0.070	0.063	0.056	0.008	0.017
4	Maize	0.612	0.750	0.503	0.658	-0.156	0.127
5	Others	0.000	0.000	0.000	0.000	0.000	0.000
Total Cereals		4.437	4.350	2.891	2.888	0.003	0.057
6	Gram	3.736	4.000	3.676	3.513	0.163	0.228
7	Lentil	0.259	0.300	0.255	0.232	0.023	-0.013
8	Peas	0.460	0.550	0.535	0.466	0.069	0.067
9	Kulthi	0.307	0.300	0.222	0.254	-0.032	-0.062
9	Urd	0.142	0.150	0.129	0.095	0.034	0.023
10	Moong	0.227	0.250	0.210	0.229	-0.019	-0.033
12	Lathyrus	3.325	3.500	3.435	3.091	0.344	0.102
13	Others	0.059	0.000	0.027	0.058	-0.031	-0.039
Total Pulses		8.515	9.050	8.488	7.937	0.551	0.273
Total foodgrains		12.952	13.400	11.379	10.825	0.554	0.330
14	Rapeseed/ Mustard	1.401	1.550	1.494	1.252	0.242	0.143
15	Linseed	0.635	0.700	0.553	0.494	0.058	-0.078
16	Sesamum	0.024	0.050	0.021	0.025	-0.004	-0.004
17	Sunflower	0.114	0.150	0.011	0.063	-0.052	-0.031
18	Groundnut	0.270	0.300	0.133	0.233	-0.100	-0.007
19	Safflower	0.063	0.100	0.056	0.050	0.006	-0.013
20	Others	0.042	0.000	0.017	0.039	-0.021	-0.026
Total Oilseeds		2.549	2.850	2.285	2.155	0.130	-0.015
21	Sugarcane	0.245	0.350	0.199	0.155	0.044	-0.042
22	Others	1.709	1.700	1.565	1.415	0.151	0.047
Total area Rabi		17.455	18.300	15.428	14.549	0.878	0.320

(Normal Area (SDA) Ave. 2012-13 to 2014-15)

Spring / Summer Pulses: State wise Area Coverage-2016

(Area in Lakh ha)

SN	State	Target	Area covered (SDA)			Increase /Decrease	
						2015	2014
			2016	2015	2014		
			Current Year	Last Year	Before Last Year		
1	Andhra Pradesh	1.45	0.26	0.44	1.53	-0.18	-1.27
2	Arunachal Pradesh	0.07		0.07		-0.07	0.00
3	Assam	1.09				0.00	0.00
4	Bihar	6.35	0.73	2.03		-1.30	0.73
5	Chhattisgarh	0.22	0.15	0.00	0.00	0.15	0.15
6	Gujarat	0.55	0.43	0.52	0.56	-0.09	-0.13
7	Haryana	0.64	0.06	0.13		-0.07	0.06
8	Himachal Pradesh					0.00	0.00
9	Jammu & Kashmir					0.00	0.00
10	Jharkhand	0.03	0.02			0.02	0.02
11	Karnataka	0.21	0.19	0.15	0.13	0.04	0.06
12	Madhya Pradesh	3.00	1.67	1.69	2.24	-0.02	-0.57
13	Maharashtra					0.00	0.00
14	Meghalaya					0.00	0.00
15	Nagaland					0.00	0.00
16	Odisha					0.00	0.00
17	Punjab	0.50	0.32	0.36		-0.04	0.32
18	Rajasthan					0.00	0.00
19	Tamil Nadu	4.07	2.38	2.04		0.34	2.38
20	Telangana		0.04	0.13	0.05	-0.09	-0.01
21	Tripura					0.00	0.00
22	Uttar Pradesh	3.08	1.56	2.04	0.68	-0.48	0.88
23	Uttarakhand		0.00	0.00	0.00	0.00	0.00
24	West Bengal	0.52	0.52	0.39	0.40	0.00	0.00
25	Others					0.00	0.00
Total		21.77	8.33	9.99	5.59	-1.66	2.74

State targets received over email/telephone

State wise Area/ Crop wise Coverage under Spring / Summer Pulses during-2016

(Area in Lakh ha)

States	Area Targets			Area Coverage			2015
				2016		Total	
	Moong	Urd	Total	Moong	Urd		
Andhra Pradesh	0.28	1.17	1.45	0.26	0.00	0.26	0.44
Arunachal Pradesh	0.07	0.00	0.07	0.00		0.00	0.07
Assam	0.058	1.03	1.09	0.00		0.00	
Bihar	6.35	0.00	6.35	0.73	0.00	0.73	2.03
Chhattisgarh	0.12	0.10	0.22	0.08	0.07	0.15	0.00
Gujarat	0.52	0.03	0.55	0.34	0.09	0.43	0.52
Haryana	0.64	0.00	0.64	0.06		0.06	0.13
Himachal Pradesh	0.00	0.00	0.00	0.00		0.00	
Jammu & Kashmir	0.00	0.00	0.00	0.00		0.00	
Jharkhand	0.03	0.00	0.03	0.020		0.02	
Karnataka*	0.18	0.03	0.21	0.15	0.04	0.19	0.15
Madhya Pradesh	2.90	0.10	3.00	1.62	0.05	1.67	1.69
Maharashtra	0.00	0.00	0.00	0.00		0.00	
Meghalaya	0.00	0.00	0.00	0.00		0.00	
Nagaland	0.00	0.00	0.00	0.00		0.00	
Odisha	0.00	0.00	0.00	0.00		0.00	
Punjab	0.50	0.00	0.50	0.32		0.32	0.36
Rajasthan	0.00	0.00	0.00	0.00		0.00	
Tamil Nadu **	0.00	0.00	4.07	1.32	1.06	2.38	2.04
Telangana	0.00	0.00	0.00	0.04	0.00	0.04	0.13
Tripura	0.00	0.00	0.00	0.00		0.00	
Uttar Pradesh	1.41	1.67	3.08	0.89	0.67	1.56	2.04
Uttrakhand	0.00	0.00	0.00	0.00		0.00	0.00
West Bengal	0.52	0.00	0.52	0.52	0.00	0.52	0.39
Others	0.00	0.00	0.00	0.00		0.00	
All India	13.58	4.13	21.77	6.35	1.97	8.32	9.99

* includes other pulses (cowpea & avare) area of 0.14 lakh ha & 0.11 lakh ha in moong target & area coverage

**includes other pulses area of 0.18 lakh ha in area coverage of moong crop.

**VISIT PHOTOGRAPHS: VISIT OF HON'BLE SECRETARY, GOVT. OF INDIA,
DEPTT. OF AGRICULTURE COOPERATION & FARMER'S WELFARE,
MIN. OF AGRI. & FW IN THE STATE OF MADHYA PRADESH (MARCH, 10TH-12TH, 2017)**



Secretary (AC&FW), GoI in Custom Hiring Center Sammelan/ Goshthi in Madhya Pradesh



**Machineries Exhibition in Custom Hiring
Center, Chandlakhedi**



Kisan Goshthi at village- Chandlakhedi

Reviewed the programmes of NFSM-Seed-hub, Breeder Seed Production Programme, FLDs, Cluster Demonstration and Other components of CS/CSS in the visited districts/organizations

District-Narsinghpur, Krishi Vigyan Kendra



MONITORING OF NFSM PROGRAMME THROUGH FIELD VISIT AT DISTRICT-NARSINGHPUR



Cluster FLD, Chickpea Var.- JAKI -9218



Organic Sugarcane Cultivation (NFSM-CC)



NFSM: Sugarcane + Lentil Intercropping



NFSM-FLD Pigeonpea , Var. TJT 501

MONITORING & REVIEW OF PULSES DEVELOPMENT PROGRAMME

A) Review of NFSM Project-Seed-hub in IGKV, Raipur (CG)



B) Review/Monitoring of NFSM- Pulses, Cluster Demo. Of pigeonpea in Karnataka



**Demo Pigeonpea (var-TS3R) at RSK- Moratgi Taluka
Dist.- vijayapur**



**Cluster Demo Pigeonpea (var-TS3R) at RSK- Kumatagi
Taluka Ditt.- vijayapur**



Cluster FLD conducted by KVK, Raisen on Pulses Urd (PU-31) arhar (TJT-501)



C) Review/Monitoring of NFSM- Pulses, Cluster FLDs

<p align="center"><u>Cluster FLD conducted by KVK, Raisen on Pulses Urd (PU-31) arhar (TJT-501)</u></p> 	
<p align="center"><u>Cluster FLD conducted by KVK-Narsinghpur Arhar variety TJT-501</u></p> 	<p align="center"><u>Cluster FLD conducted by KVK-Jabalpur Arhar variety TJT-501</u></p> 
<p align="center"><u>Cluster FLD conducted by KVK, Panna Urd Var. IPUI-94-1(Uttara)</u></p>	<p align="center"><u>Kisan Gosthi at Durg</u></p>

