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GOVERNMENT OF INDIA

MINISTRY OF AGRICULTURE & FARMERS WELFARE

(DEPARTMENT OF AGRICULTURE, COOPERATION & FARMERS WELFARE)

DIRECTORATE OF PULSES DEVELOPMENT

VINDHYACHAL BHAVAN

BHOPAL (M.P.

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Dr. A.K. Tiwari
Director

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 27 states in 622 districts of the country during 2015-16. 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 have 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 2.32% area, 4.48% production and 17% under yield.

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/ conduct of NLMT, IMCT, Field visit, Studies, Surveys & varietal profile etc.

I acknowledge the sincere efforts of Technical Officers of this Directorate S/Sh. Dr. A.K. Shivhare, Vipin Kumar,Assistant Directors; Sarju Pallewar, Statistical Investigator, Smt. Ashwini Bhoware, & Satish Dwivedi, Technical Assistants (NFSM) 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.

July, 2016 (A.K. Tiwari)

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 (DAC&FW) was established at Lucknow in 1971 with the merger of Regional Extension Units at Ahmedabad (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 622 districts of 29 States in the Country. With the bi-foal 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 and Coarse Cereals), NMSA, NMAET, NMOOP, MIDH & 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, 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 Cooperation (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 XIth 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 implementation of the NFSM scheme is continued during XIIth Plan.

The NFSM aimed at increasing production of rice, wheat and pulses through area expansion and productivity enhancement; restoring soil fertility and productivity; creating employment opportunities; and enhancing farm level economy to restore confidence of farmers 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 XIIth 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, Gujarat, Goa, Haryana, Himachal Pradesh, Jammu & Kashmir, Jharkhand, Karnataka, Kerela, 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).

Under NFSM 2015-16, the DPD, Bhopal organized Two National Seminar/Workshop on Pulses Developmental: Challenges & Opportunities in Central & Southern State at CIAE, Bhopal (February 3~~rd~~-4th,2016) and Brainstorming Session on Promotion of pules in non-traditional niches: Summer cultivation at IIPR, Kanpur (February 9th-10th, 2016) involving all Stake holder's representing NFSM States and Other Central Development/Research Agencies and Two Training organized at KVK, CRDE, Sehore (7th-8th Oct. 2015) & KVK, Raisen (28th-29th Oct., 2015) .

2. Objectives:

i) 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.

ii) 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.

iii) Formulation of Annual and Five year National plan, coordination in execution and monitoring of crop production programmes of pulses at national level.

iv) Assisting states (M.P. &Chhattisgarh) in planning the Programme convergence and monitoring

v) Critical monitoring of the NFSM-Pulses, all Central Sector/Centrally Sponsored Schemes in the states of Madhya Pradesh and Chhattisgarh (the assigned states).

vi) 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.

vii) 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.

viii) 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.

ix) Crop Tracking during growing season and production estimate forecast.

3. Functions of Directorate:

i) To plan, Coordinate and monitor nodal commodity (crops) development programmesi.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;

ii) To monitor CSS viz. National Food Security Mission (NFSM–Rice, Pulses, Wheat, Commercial Crops, Coarse Cereals) and Front Line Demonstration Programmes.

iii) 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.

iv) 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).

v) 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.

vi) 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).

vii) 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;

viii) To have closer interaction/coordination with the Project Directorates/ Institutes /SAUs/KVKs and other Research Centers of the ICAR and represent.

ix) Built data base and maintain the flow of information and ideas between research and development.

x) 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 organise 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 and 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, production and productivity was 19.62, 16.55 and 84.48 per cent respectively during 1950-51. This trend continued till 1960-61 and started decleration from 1970-71(after green revolution) due to no break through in production technology of pulses in comparision to other commodities of foodgrains. At present, except the area stablization, 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 foodgrains. Deceleration of Per cent contribution of pulses to total foodgrains has prompted the Ministry of Agriculture to vigorously pursue the NFSM-Pulses during the Twelfth Plan (2012-13 to 2015-16), a centrally sponsored scheme, in addition to on going ISOPOM scheme for all 14 pulse potential states (**Table 1**).

Table 1 - Contribution of pulses to total foodgrains 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	19.62	16.55	84.48
1960-61	23.56	12.70	539	115.58	82.02	710	20.38	15.48	75.92
1970-71	22.54	11.82	524	124.32	108.42	872	18.13	10.90	60.09
1980-81	22.46	10.63	473	126.67	129.59	1023	17.73	8.20	46.24
1990-91	24.66	14.26	578	127.84	176.39	1380	19.29	8.08	41.88
1995-96	22.28	12.31	552	121.01	180.42	1491	18.41	6.82	37.02
2000-01	20.35	11.08	544	121.05	196.81	1626	16.81	5.63	33.46
2001-02	22.01	13.37	607	122.78	212.85	1734	17.93	6.28	35.01
2002-03	20.50	11.13	543	113.86	174.77	1535	18.00	6.37	35.37
2003-04	23.46	14.91	635	123.45	213.19	1727	19.00	6.99	36.77
2004-05	22.76	13.13	577	120.00	198.36	1652	18.97	6.62	34.93
2005-06	23.39	13.39	598	121.60	208.60	1715	18.41	6.42	34.87
2006-07	23.76	14.11	594	124.07	211.78	1707	19.15	6.66	34.80
2007-08	23.63	14.76	625	124.07	230.78	1860	19.05	6.40	33.58

2008-09	22.09	14.57	660	122.83	234.47	1909	17.98	6.21	34.55
2009-10	23.28	14.66	630	121.33	218.11	1798	19.19	6.72	35.03
2010-11	26.40	18.24	691	126.67	244.49	1930	20.84	7.46	35.80
2011-12	24.46	17.09	699	124.76	259.32	2079	19.61	6.59	33.61
2012-13	23.25	18.34	789	120.77	257.12	2129	19.25	7.13	37.06
2013-14	25.21	19.25	764	125.04	265.04	2120	20.16	7.26	36.03
2014-15	23.10	17.16	743	122.07	252.67	2069	18.92	6.79	35.91

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 (635kg/ha) was recorded during 1998-99 and 2013-14 (**Table 2**)

Table 2 -Growth Rate of Total Pulses

Year	Area		Production		Yield		% coverage under irrigation
	Million ha	Growth rate %	Million Tonnes	Growth rate %	kg/ha	Growth rate %	
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
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
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
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
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	1.7	19.27	1	764	-0.6	

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, 2013.* Directorate of Economics and Statistics, Ministry of Agriculture, Govt. of India (Website http://www.dacnet.nic.in/eands).

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. 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 (P)	47.2	17.2

P= Provisional

Source: Agricultural statistics at a glance-2014

4.5 DEMAND AND SUPPLY STATUS – PRODUCTION AND IMPORT/EXPORT

4.5.1. Domestic supply/availability vis-a-vis 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 8ones)	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	226.45

Source: DGCI&S, Ministry of Commerce, Kolkata

4.6 Pulse importing and exporting countries of major pulses for 2013-14

Table 5 Top 5 Exporting & Importing Countries 2013-14.

Pulses	Top 5 Export Destinations	Top 5 Import Sources
Peas (Pisum Sativum)	Myanmar (84.70%), Pakistan (7.37%), Nepal (5%), Shri Lanka DSR (2.82%), Malaysia (0.04%)	Canada (70.59%), Russia (11.06%), USA (8.37%), Australia (6.19%), France (1.74%)
Chickpeas (Garbanzos)	Pakistan (29.93%), Turkey (18.11%), Algeria (17.24%), Sri Lanka (5.34%), U Arab EMTS (4.43%)	Australia (61.43%), Russia (22.77%), Tanzania (7.84%), Myanmar (6.40%), USA (0.47%)
Moong/Urad	USA (49.69%), Unspecified (10.21%), Sri Lanka (7%), Canada (7.72%), Kenya (4.29%)	Myanmar (82.83%), Tanzania (4.23%), Kenya (3.55%), Australia (3.05%), Mozambique (1.61%)
Lentils (Masur)	Myanmar (35.16%), USA (25.17%), Kuwait (7.17%), Bhutan (6.55%), Singapore (5.92%)	Canada (79.33%), USA (10.70%), Australia (9.85%), Uzbekistan (0.01%), Turkey (0.01%)
Pigeon Peas (Tur)	Nepal (78.79%), Canada (19.19%), Israel (1.92%), Korea (0.09%)	Myanmar (51.37%), Tanzania (27.44%), Mozambique (14.69%), Malawi (4.53%), Kenya (1.79%)

Note:*figures in parenthesis indicates percentage share of global import/export*

4.7 PROJECTED DEMAND & GAP (Eleventh 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	-3.87	18.00
2009-10	18.29	13.68	-4.60	18.50
2010-11	19.08	13.72	-5.37	19.00
2011-12	19.91	13.75	-6.16	20.00

4.8 CROP/SEASON-WISE SHARE

Table 7 Normal area, production and yield (crop-wise)

Crop	Season	Area* (lakh ha.)	Production * (lakh tonnes)	Productivity* (kg/ha.)
Arhar	Kharif	40.283 (17%)	29.795 (17%)	740
Urd	Kharif	25.275	12.923	511
	Rabi/Summer	8.059	5.937	737
	Total	**33.334 (14%)**	**18.86 (11%)**	566
Moong	Kharif	23.465	9.420	401
	Rabi/Summer	9.910	5.963	602
	Total	**33.375 (14%)**	**15.383 (9%)**	461
Horse gram	Kharif	2.319	1.051	453
	Rabi/Summer	2.277	1.104	485
	Total	**4.596 (2%)**	**2.155 (1%)**	**469**
Moth	Kharif	9.256 (4%)	2.77 (2%)	299
Chickpea	Rabi	88.432 (37%)	82.914 (47%)	938
Lentil	Rabi	13.901 (6%)	10.929 (6%)	786
Peas & Beans	Rabi	11.495 (5%)	10.357 (6%)	901
Lathyrus	Rabi	4.9311 (2%)	3.84 (2%)	779
Total	**Kharif**	**100.598**	**55.959**	**556**
	Rabi/Summer	**139.005**	**121.044**	**871**
	Total Pulses	**239.603**	**177.003**	**739**

*Average of 2012-13 to 2015-16 (figures in parenthesis indicates % share of crop)

PRODUCTION TRENDS

5.1 Global Scenario

The total world acreage under pulses as recorded during 2013 is about 807.54 lakh ha with production at 730.07 lakh tones and productivity 904 kg/ha (**table 1.9**). 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 Ireland stood first with 5333 kg/ha. Thus it is also evident that the country's productivity at 650 kg/ha is far below the world average productivity of 904 kg/ha (**table 8**).

Table- 8 Crop-wise total area, production and yield : Global

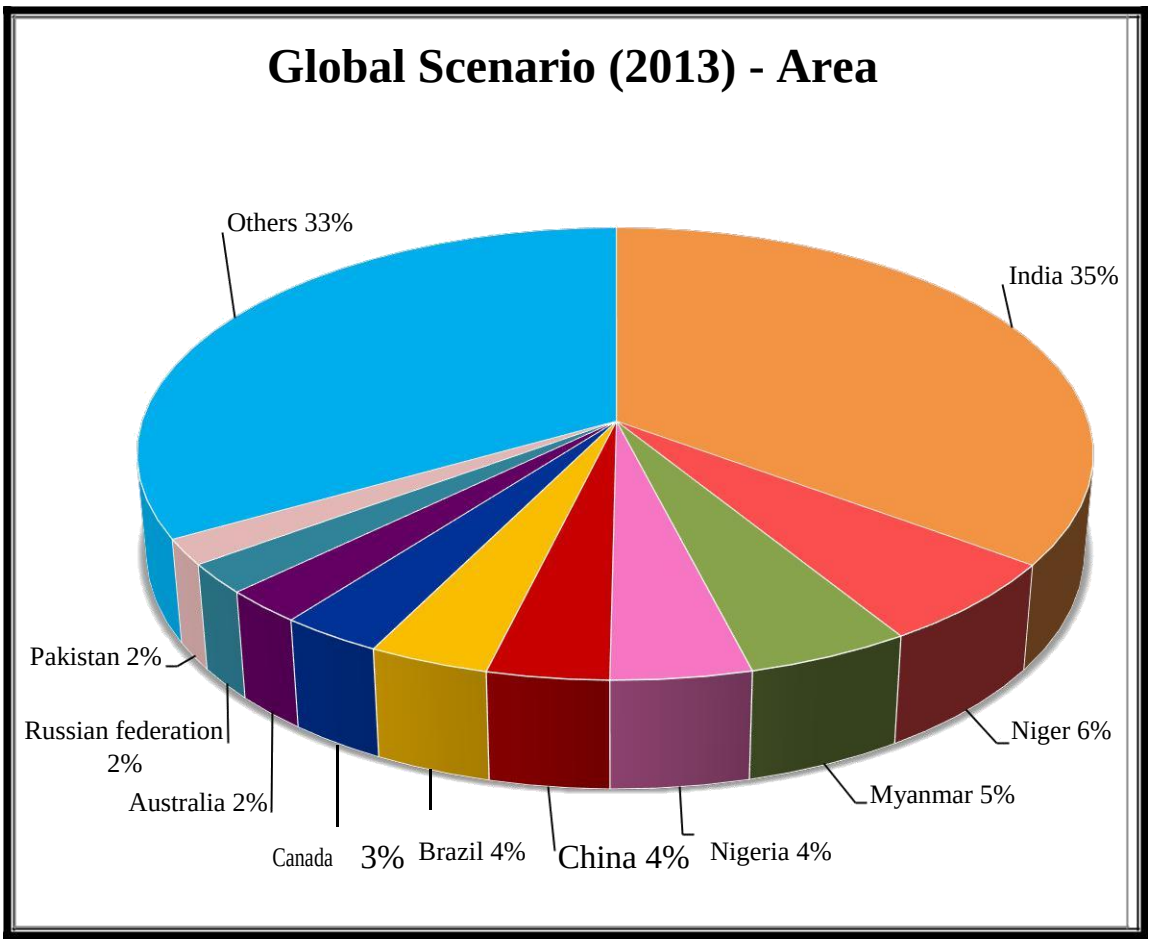
Crop	Area (Lakh ha)	% to Total	Production (Lakh tonnes)	% to Total	Productivity (Kg/ha)
Chickpea	135.40	16.77	131.02	17.95	968
Lentil	43.45	5.38	49.52	6.78	1140
Pigeon pea	62.20	7.70	47.42	6.50	762
Other Pulses	566.49	70.15	502.12	68.78	886
Total Pulses	807.54		730.07		904

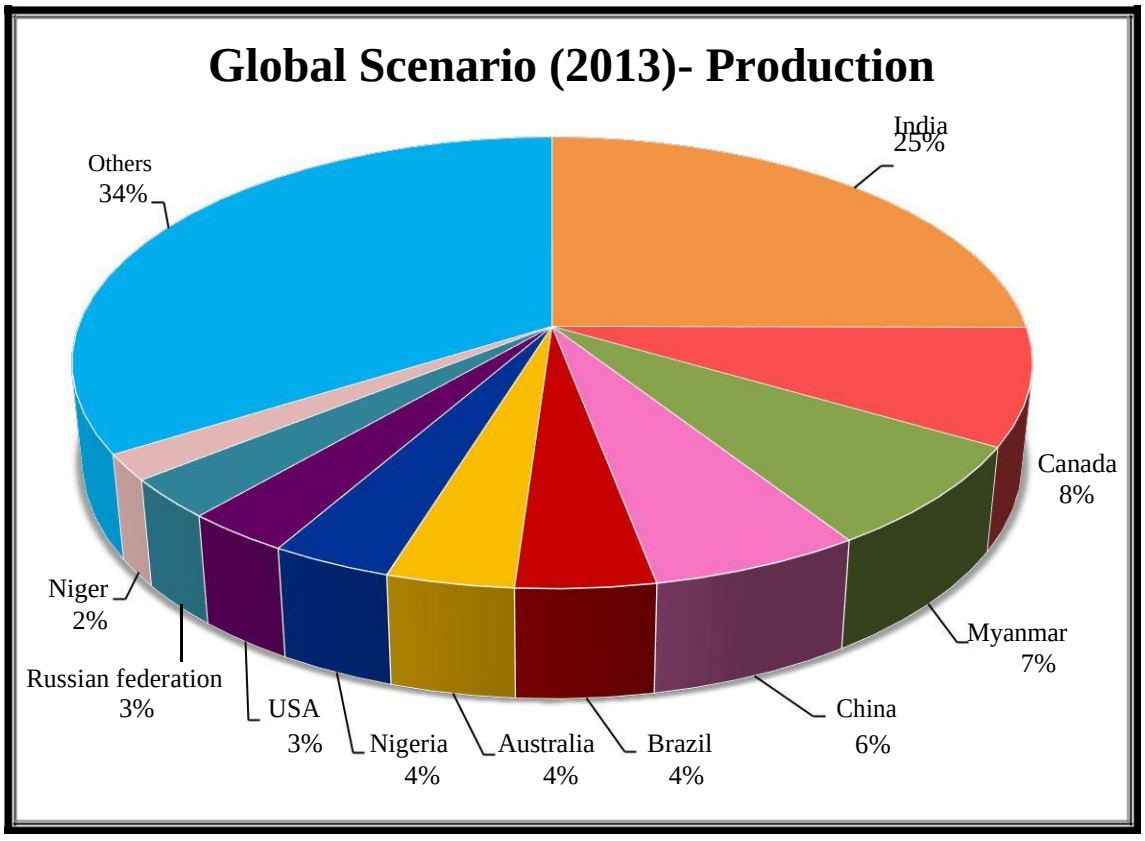
Source: FAO Statistics 2013.

Table – 9 Global ranking in area, production and yield : Major countries

Country	Area (Lakh ha)		Country	Production (Lakh tonnes)		Country	Yield (Kg/ha)
	Area	% to World		Prod.	% to World		
India	281.70	34.88	India	183.11	25.08	Ireland	5333
Niger	48.41	6.00	Canada	61.05	8.36	Tajikistan	4753
Myanmar	38.88	4.81	Myanmar	54.37	7.45	Belgium	4224
Nigeria	33.3	4.12	China	44.73	6.13	France	3637
China	28.84	3.57	Brazil	29.46	4.04	UK	3526
Brazil	28.55	3.54	Australia	27.04	3.70	Netherland	3441
Canada	24.22	3.00	Nigeria	25.60	3.51	Denmark	3416
Australia	19.18	2.38	USA	22.33	3.06	Switzerland	3302
Russian federation	17.01	2.11	Russian federation	20.84	2.85	Luxembourg	3191
Pakistan	14.804	1.83	Niger	13.63	1.87	India	650
World	**807.54**		**World**	**730.07**		**World**	**904**

Source: FAO Statistics 2013


Global Scenario (2013) - Area
Others 33%
India 35%
Pakistan 2%
Russian federation 2%
Australia 2%
Canada 3%
Brazil 4%
China 4%
Nigeria 4%
Myanmar 5%
Niger 6%


Global Scenario (2013)- Production
India 25%
Others 34%
Canada 8%
Niger 2%
Russian federation 3%
USA 3%
Nigeria 4%
Australia 4%
Brazil 4%
China 6%
Myanmar 7%

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. However, the area remained almost stagnant, stabilized uptill tenth plan. Plan-wise area and production of total pulses and percentage change over previous plan periods (COPP) is given at **table-10.**

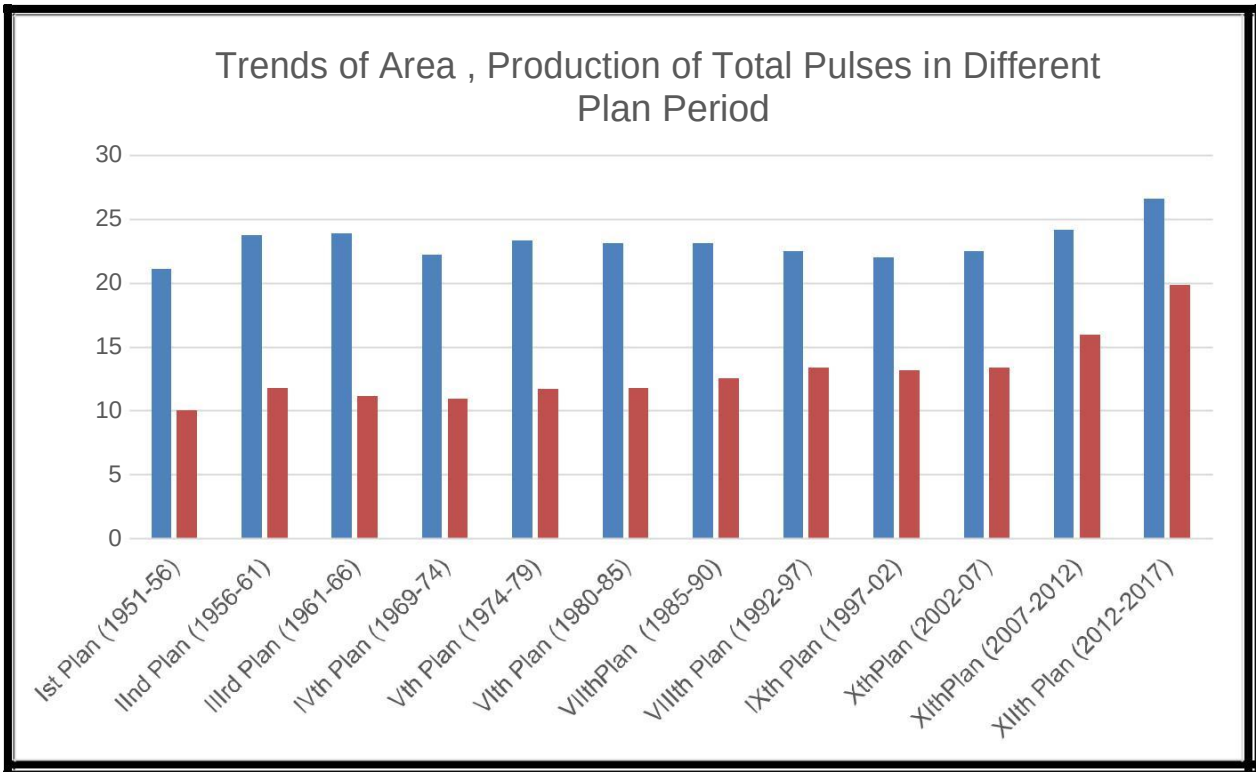
Table-10 Plan-wise scenario (APY) – All India

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	41.0
Third Plan (1961-66)	23.86	0.63	11.14	-5.19	467	-57.9
Fourth Plan (1969-74)	22.21	-6.92	10.9	-2.15	491	51.1
Fifth Plan (1974-79)	23.32	5.00	11.71	7.43	502	23.2
Sixth Plan (1980-85)	23.08	-1.03	11.77	0.51	510	15.6
Seventh Plan (1985-90)	23.08	0.00	12.55	6.63	544	66.3
Eighth Plan (1992-97)	22.47	-2.64	13.34	6.29	594	91.8
Nineth Plan (1997-02)	21.97	-2.23	13.15	-1.42	599	8.2
Tenth Plan (2002-07)	22.44	2.14	13.35	1.52	595	-6.1
Eleventh Plan (2007-2012)	24.16	7.66	15.97	19.63	661	111.1
#Twelfth Plan (2012-2017)	26.57	9.98	19.82	24.11	746	128.5

** % COPP is percentage change over previous plan.*

 # Twelfth Plan upto 2015-16 (IIIrd Advance Estimate)



5.3 State's Scenario

5.3.1 Total Pulses – Plan-wise (X-XII)

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 scenerio was observed during the Tenth plan Madhya Pradesh ranked first in area (43.27 lakh hectares or 19.26 %) with a total production of 31.45 lakh tonnes or (23.56 % of the total production). While, Maharashtra was placed second with recpect of area and its production 35.32 lakh hectares (i.e.15.72 %) and 19.98 lakh tonnes (i.e.14.97 %) followed by Rajasthan 31.77 lakh hectares (i.e.14.14 %) &
   12.95 lakh tonnes (i.e.9.70 %) (Table 1.12).

2. ***Eleventh Plan (2007-2012)***: During Eleventh plan period the total pulses area and production were 239.74 lakh ha and 139.81 lakh tonnes respectively. Out of 239.74 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 47.74 lakh hectares and 35.97 lakh tonnes which was 19.91 % and 25.73 % respectively. Rajasthan ranked second in coverage with 16.89 % i.e (40.51 lakh hectares) while at production front, state of Maharashtra ranked at second with 17.76 % (i.e. 24.83 lakh tonnes) followed by Uttar Pradesh with 14.18 % (i.e.
   19.83 lakh tonnes). Maharshtra ranked third in area with 14.87 % and Rajasthan ranked fourth in production with 13.99% (i.e. 19.56 lakh hectares) of country's production while in area, Karnataka stood at IVth rank with 10.04 % of country coverage during that XIth plan.

3. ***Twelfth plan (T.E.2012-2016):*** In India, total pulse area and production irrespective of Twelfth Plan was 244.87 lakh hectares and 183.63 lakh tonnes respectively. Out of the total area, 54.68 lakh hectares is confined to Madhya Pradesh alone, earning a good pulse status and position contributing a remarkable 22.33 % of the country's total area and a production of 49.20 lakh tonnes ,thereby ranking first both in area and production followed by Rajasthan in area (36.91 lakh hectares, 15.07 % of the total area). While Rajasthan ranked third in production with 11.65 % of the total pulse production and Maharashtra which ranked second (21.83 lakh tonnes or 11.89 % of the total production); Uttar Pradesh was hardly placed at the forth rank in production (17.62 lakh tonnes or 9.62 % of the total production) and fifth rank in respect of area (23.33 lakh ha or 9.12 %).

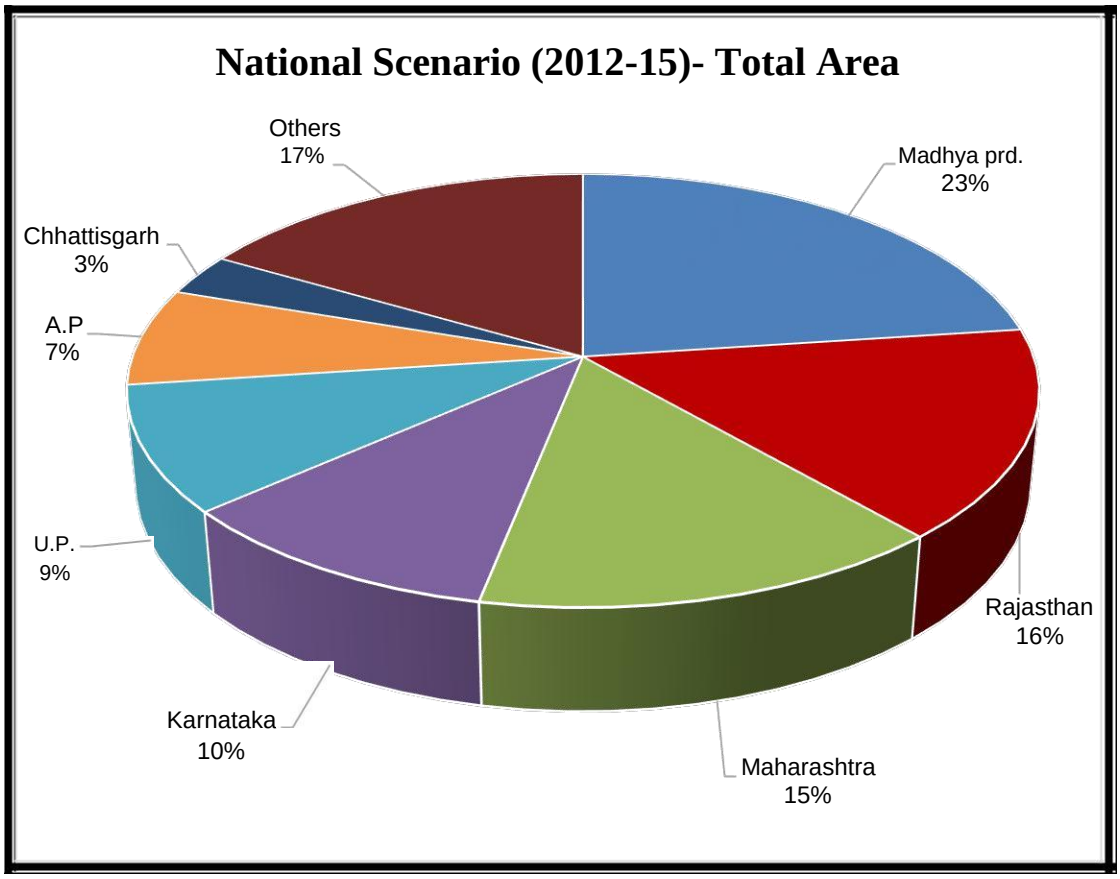
Table No. 11- Plan-wise states' scenario – Total Pulses

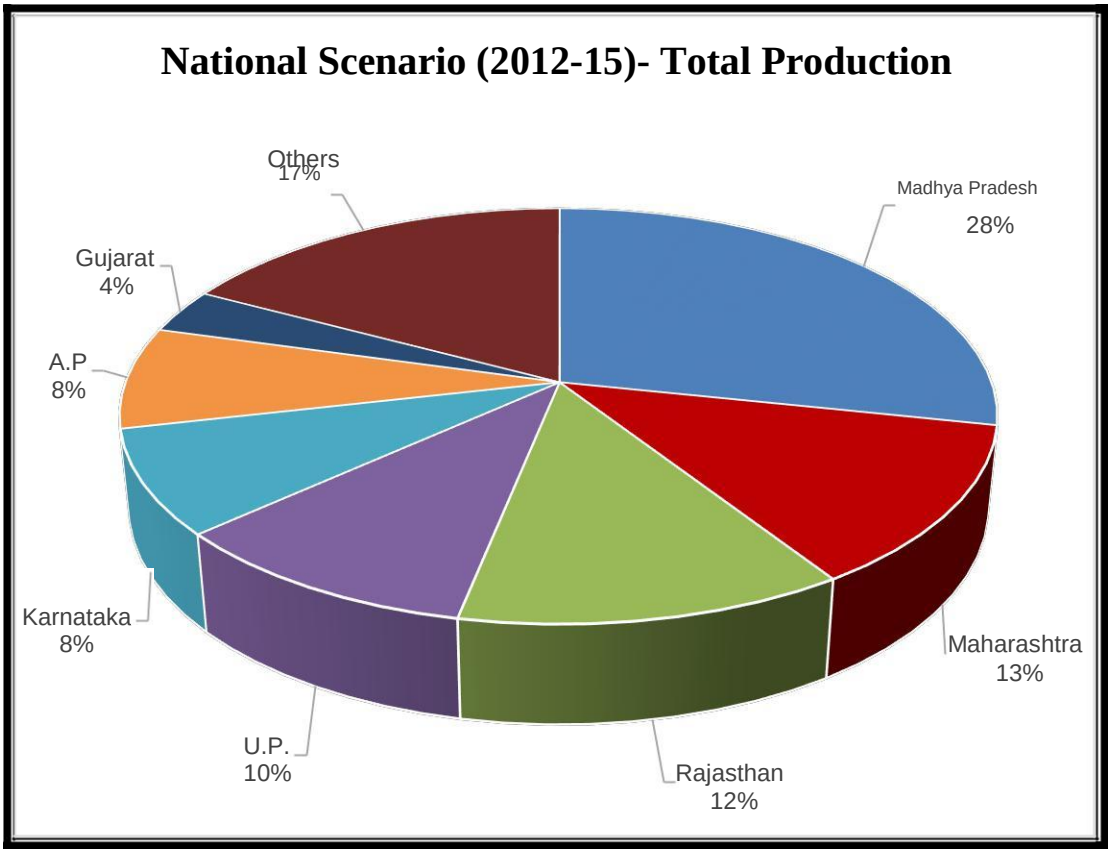
A= lakh ha, P= Lakh Tonnes, Y= Kg/ha)

States	Tenth Plan	% to Country	Eleventh Plan	% to Country	*Twelfth Plan	% to Country
A.P	19.709	8.775	19.758	8.241	16.28	6.65
	12.085	9.054	14.488	10.362	13.78	7.50
	613	103	733	126	846	
Bihar	6.502	2.895	5.790	2.415	5.07	2.07
	4.951	3.709	4.976	3.559	4.93	2.68
	761	128	859	147	972	
Chhattisgarh	9.055	4.032	8.519	3.553	8.42	3.44
	4.522	3.388	5.121	3.663	5.86	3.19
	499	84	601	103	696	

States	Tenth Plan	% to Country	Eleventh Plan	% to Country	*Twelfth Plan	% to Country
Gujarat	8.035	3.577	8.490	3.541	6.79	2.77
	5.138	3.849	6.744	4.824	6.00	3.27
	639	108	794	136	884	
Haryana	1.739	0.774	1.681	0.701	1.19	0.49
	1.260	0.944	1.330	0.951	0.95	0.51
	725	122	792	136	792	
Jharkhand	2.744	1.222	4.009	1.672	5.90	2.41
	1.718	1.287	3.096	2.214	5.84	3.18
	626	105	772	132	991	
Karnataka	20.782	9.253	24.088	10.047	24.70	10.09
	7.824	5.861	12.108	8.660	14.13	7.70
	376	63	503	86	572	
Madhya prd.	43.271	19.266	47.748	19.916	54.68	22.33
	31.457	23.566	35.979	25.733	49.20	26.79
	727	122	754	129	900	
Maharashtra	35.320	15.726	35.650	14.870	34.31	14.01
	19.982	14.970	24.836	17.763	21.83	11.89
	566	95	697	119	636	
Orissa	7.012	3.122	8.279	3.453	8.01	3.27
	2.809	2.105	3.881	2.776	4.21	2.29
	401	67	469	80	526	
Punjab	0.391	0.174	0.226	0.094	0.63	0.26
	0.317	0.237	0.194	0.139	0.55	0.30
	811	136	858	147	867	
Rajasthan	31.774	14.147	40.513	16.898	36.91	15.07
	12.959	9.709	19.569	13.997	21.40	11.65
	408	69	483	83	580	
Tamilnadu	5.451	2.427	5.972	2.491	7.98	3.26
	2.192	1.642	2.338	1.672	5.22	2.84
	402	68	391	67	654	
U.P.	27.310	12.159	23.579	9.835	22.33	9.12
	22.368	16.757	19.832	14.185	17.62	9.60
	819	138	841	144	789	
West bengal	2.320	1.033	1.864	0.777	2.69	1.10
	1.749	1.311	1.466	1.049	2.33	1.27
	754	127	787	135	866	
All India	224.601		239.747		244.87	
	133.483		139.815		183.63	
	594		583		750	

Twelth plan is the Ave. of 2012-13 to 2015-16) & 2015-16 APY is the Third Advance Estimates


National Scenario (2012-15)- Total Area
Others
17%
Madhya prd.
23%
Chhattisgarh
3%
A.P
7%
U.P.
9%
Rajasthan
16%
Karnataka
10%
Maharashtra
15%


National Scenario (2012-15)- Total Production
Others
17%
Madhya Pradesh
28%
Gujarat
4%
A.P
8%
Karnataka
8%
Maharashtra
13%
U.P.
10%
Rajasthan
12%

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

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) Mini Mission III- (TBOs)

6.1. CROP-WISE AREA UNDER IRRIGATION

(Area- lakh ha)

Crops	Area (2014-15)				
	Normal	**Irrigated**	**% Irrigation**	**Rainfed**	**% Rainfed Area**
Cereals					
Paddy	20.24	5.57	27.5	14.67	72.5
Jowar	2.05	0.02	1.0	2.03	99.0
Maize	10.98	0.21	1.9	10.77	98.1
Bajra	2.67	1.67	62.5	1.00	37.5
Kodo & Others	1.91	0.01	0.5	1.90	99.5
Pulses					
Tur	5.79	0.06	1.0	5.73	99.0
Urad	9.32	0.07	0.8	9.25	99.2
Moong	1.93	1.21	62.7	0.72	37.3
Kulthi & Others	0.14			0.14	100.0
Oilseeds					
Soybean	59.06	0.23	0.4	58.83	99.6
Groundnut	2.36	0.20	8.5	2.16	91.5
Sesamum	3.65	0.09	2.5	3.56	97.5
Niger & Others	0.80				
Commercial Crops					
Cotton	5.47	3.25	59.4	2.22	40.6
State Total	**126.35**	**12.59**	**10.0**	**112.98**	**89.4**

6.2 RESERVOIR STATUS/RIVER

a) RIVERS : GAUGE STATION

S. No.	Name of the River	Gauge Station	Danger Point (in Meter)
1.	Narmada	Barman Ghat	323.00
		Sethani Ghat	293.83
		Mortakka	163.98
2	Tons	Patehra	137.43
		Maihar	323.90
3	Ken	Pandwan	96.75
4	Chambal	Nagda	460.90
		Barkheda	417.80
5	Parvati	Maksudangarh	409.96
6	Betwa	Neemkheda	431.50

b) RESERVOIRS:

S. No.	Name of the Reservoir (Districts)	*LGL (in Meter) (July 25th, 2016)	*FRL (in Meter)
1.	Bargi (Jabalpur)	418.95	422.76
2.	Tawa (Hoshangabad)	352.98	355.397
3.	Barna (Raisen)	338.10	348.55
4.	Indirasagar (Khandwa)	258.39	262.13
5.	Omkarshwar (Kharogone)	190.85	196.60
6.	Bansagar (Shahdol)	336.05	341.64
7.	Sanjay Sarovar (Seoni)	515.70	519.38
8.	Rajeev Sagar (Balaghat)	333.50	344.40
9.	Gandhi Sagar (Mandsour)	392.33	399.89
10.	Manikheda (Shivpuri)	320.05	346.25
11.	Gopi Krishna Sagar (Guna)	421.00	434.00
12.	Mahi (Jhabua)	441.00	451.50
13.	Kerwa (Bhopal)	509.53	509.93
14.	Kolar (Sehore)	453.75	462.20

* LGL- Length Gauge Level, FRL- Full Reservoir Level

6.3 Budget Allocation: CS/CSS

RKVY – 2015-16 (Pattern of Assistance 60:40)

(Rs in Crore)

Particulars	Allocation	Total
Normal RKVY	439.330	**439.330**
AFDP	1.610	**0.808**
Grand Total	**440.940**	**440.138**

6.4 RKVY 2015-16 - UTILIZATION STATUS

(Rs in Crore)

SN	Sector	Allocation	Utilization
1	Agriculture	120.958	120.958
2	Agri. Engineering	58.631	58.631
5	Animal husbandry	38.063	38.063
6	Horticulture	23.524	23.524
7	Fisheries	3.686	3.686
	Total	**244.862**	**244.862**

6. 5 CSS: BUDGET & EXPENDITURE – 2015-16

(Unit: lakh ha)

S.No.	Scheme Name	Proposed	Allocation	Expenditure	% to Allocation
1	Pradhan Mantri Sinchai Yojna	540.12	510.00	510.00	100.00
2	Agri. Tech. Management Agency	7216.02	7216.01	7216.01	100.00
3	Paramparagat Krishi Vikas Yojna	4711.12	4711.12	46+45.77	98.61
4	Beej Gram Yojna	1890.71	1732.13	1605.99	92.72
5	Rastriya Krishi Vikas Yojna	31110.00	31110.00	24273.20	78.02
6	National Food Security Mission	26657.62	26656.24	17776.69	66.69
7	Soil Health Card	1035.80	1032.66	602.10	58.31
8	National Oilseed & Oilpalm Mission	6801.95	6801.75	3257.60	47.89
9	Sub Mission on Rainfed Area Development	2619.48	2619.39	1046.14	39.94
10	Sub Mission on Farm Water Management	1058.39	1044.32	85.05	8.14

6. 6 Production Scenario: Plan analysis (XIth - XIIth Plan)

(Area Lakh ha, Prod. Lakh tonnes, Yield kg/ha)

Crops	Districts/ State	XI Plan (2007-08 to 2011-12)			XII Plan (2012-13 to 2014-15)			% Share in XII Plan			Increase/decrease over XI Plan (%)		
		A	P	Y	A	P	Y	A	P	YI	A	P	Y
Kharif Crops													
A. Cereals													
Paddy	MP	15.90	16.57	1042	19.88	30.81	1550	4.56	2.92	64	25.03	85.94	49
	All India	436.48	972.42	2228	435.82	1055.59	2422				-0.15	8.55	9
Jowar	MP	4.57	5.89	1289	2.53	4.41	1743	4.39	8.33	190	-44.64	-25.13	35
	All India	73.42	69.70	949	57.69	52.91	917				-21.42	-24.09	-3
Bajra	MP	1.72	2.79	1622	2.01	3.74	1861	2.71	4.15	153	16.86	34.05	15
	All India	91.23	92.02	1009	74.09	90.15	1217				-18.80	-2.03	21
Maize	MP	8.49	11.32	1333	9.48	16.91	1784	10.53	7.23	69	11.66	49.38	34
	All India	83.78	197.78	2361	89.99	233.97	2600				7.42	18.30	10
Co. Cereals	MP	2.55	0.74	291	0.69	0.27	386	5.90	1.45	25	-72.85	-63.93	33
	All India	13.00	20.41	1570	11.75	18.51	1575				-9.58	-9.29	0
Small millet	MP	2.79	0.84	301	1.95	0.90	462	28.95	21.77	75	-30.11	7.14	53
	All India	8.75	4.54	519	6.74	4.13	614				-22.98	-8.99	18
B. Pulses													
Arhar	MP	4.06	2.56	631	5.05	5.11	1012	13.17	17.08	130	24.38	99.61	60
	All India	37.89	26.64	703	38.35	29.92	780				1.21	12.31	11
Urd	MP	5.61	1.95	348	6.86	2.99	436	25.54	19.97	78	22.33	53.35	25
	All India	23.48	9.90	422	26.87	14.99	558				14.44	51.41	32

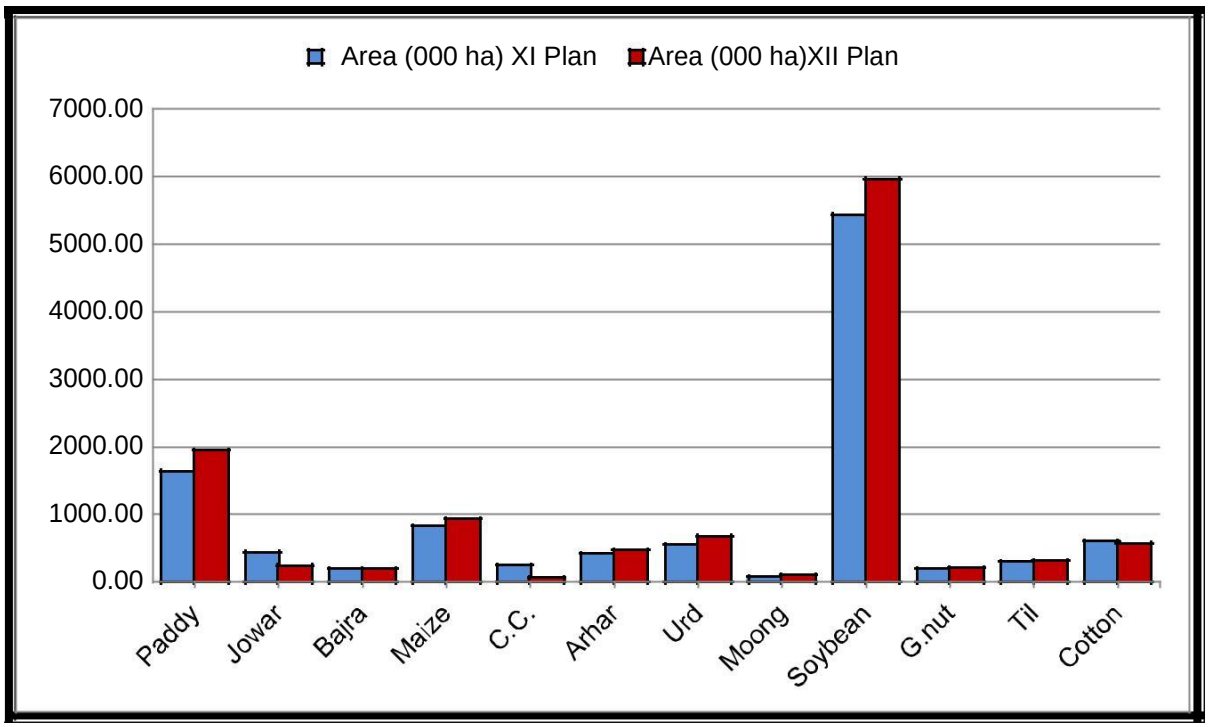
Moong	MP	0.83	0.26	312	1.10	0.47	429	4.47	4.36	97	32.19	82.04	38
	All India	25.50	9.18	360	24.56	10.83	441				-3.69	17.97	22
Kulthi (Horse Gram)	MP	0.22	0.17	783	0.18	0.25	1345	7.89	23.36	296	-16.05	44.29	72
	All India	4.37	1.72	394	2.31	1.05	455				-47.14	-38.95	15
C. Oilseeds													
Soybean	MP	54.44	61.89	1137	59.62	67.53	1133	52.86	50.91	96	9.52	9.11	0
	All India	95.68	111.58	1166	112.79	132.64	1176				17.89	18.88	1
Ground nut	MP	2.00	2.68	1339	2.15	3.41	1586	3.76	4.73	126	7.39	27.24	18
	All India	49.02	57.20	1167	57.14	72.05	1261				16.58	25.95	8
Sesamum/Til	MP	3.05	1.37	449	3.20	1.70	531	18.91	24.29	128	4.92	24.09	18
	All India	19.07	7.38	387	16.92	7.00	414				-11.27	-5.12	7
Niger/ Ramtil	MP	1.15	0.24	211	0.81	0.29	358	26.56	29.29	110	-29.32	19.83	70
	All India	3.82	1.06	278	3.05	0.99	325				-20.24	-6.95	17
Cotton	MP	6.11	9.28	1518	5.79	11.60	2002	4.71	3.30	70	-5.23	24.98	32
	All India	104.73	280.76	2681	123.10	351.50	2855				17.54	25.19	7

Crops	Districts/ State	XI Plan (2007-08 to 2011-12)			XII Plan (2012-13 to 2014-15)			% Share in XII Plan			Increase/decrease over XI Plan (%)		
		A	P	Y	A	P	Y	A	P	YI	A	P	Y
RABI CROPS													
A. Cereals													
Wheat	MP	39.26	95.31	2428	58.52	174.83	2988	19.20	18.85	98	49.06	83.43	23
	All India	286.36	843.62	2946	304.82	927.65	3043				6.44	9.96	3
Barley	MP	0.74	0.99	1336	0.70	1.04	1487	10.24	6.04	59	-5.02	5.72	11
	All India	6.56	15.04	2292	6.86	17.28	2520				4.53	14.90	10
B. Pulses													
Gram	MP	28.08	26.11	930	28.84	30.12	1044	40.58	35.39	87	2.72	15.33	12
	All India	82.18	72.42	881	71.07	85.10	1197				-13.52	17.51	36
Lentil	MP	5.71	2.35	411	5.19	3.36	648	37.56	31.27	83	-9.04	43.37	58
	All India	14.64	9.60	656	13.82	10.76	779				-5.60	12.08	19
Lathyrus	MP	0.53	0.36	683	0.45	0.32	708	9.05	8.81	97	-15.31	-12.21	4
	All India	6.32	3.84	608	4.92	3.58	728				-22.15	-6.77	20
Peas	MP	2.09	0.81	388	2.58	2.25	871	29.91	25.48	85	23.47	177.34	125
	All India	7.31	6.58	900	8.63	8.82	1022				18.06	34.04	14
C. Oilseeds													
Rapeseed /Mustard	MP	7.22	7.69	1065	7.73	8.82	1141	11.88	11.09	93	7.06	14.69	7
	All India	61.01	68.85	1128	65.04	79.53	1223				6.60	15.51	8
Linseed	MP	1.19	0.46	387	1.10	0.56	509	37.29	38.62	104	-7.56	21.74	32
	All India	3.80	1.57	413	2.95	1.45	492				-22.36	-7.68	19
Commercial Crops													
Sugarcane	MP	0.55	21.95	40055	0.82	34.60	42195	1.63	0.99	61	49.64	57.63	5
	All India	47.14	2976.41	63146	50.45	3508.91	69548				7.04	17.89	10

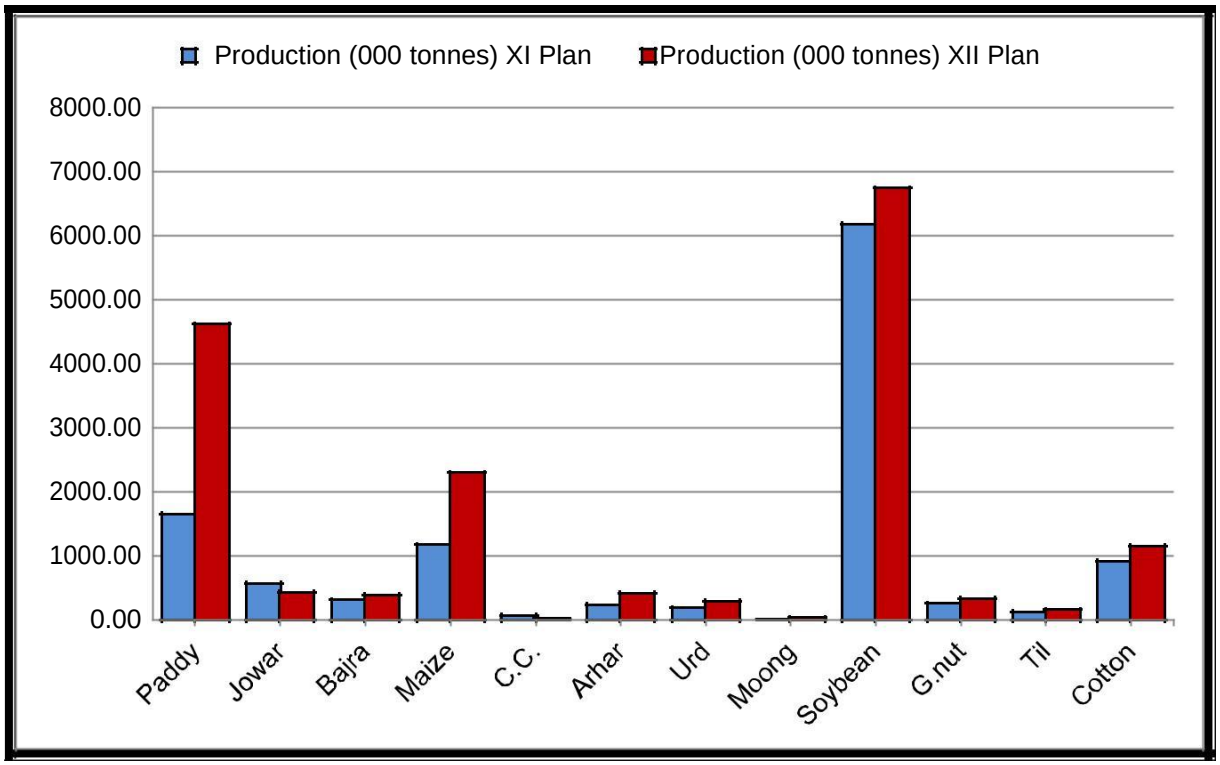
Impact Analysis: The comparative analysis of the two Plan period reveal that the NFSM launched during 11th Plan has paid dividends in the productivity of Paddy ***which was 135% higher during the 12th Plan*** (2012-13 to 2014-15) over its previous five year Plan in M.P. Similarly, the productivity of wheat, gram, lentil and peas were also increased 21%, 12%, 58% & 125% respectively during 12th Plan from the 11th Plan.

It is relevant to record that the arhar and gram productivity during the first 03 years of 12th Plan for the state was higher i.e. 52 % and 12% than the all India levels of 780 & 937 kg/ha respectively. M.P. recorded 890 kg/ha in arhar and 1044 kg/ha in gram.

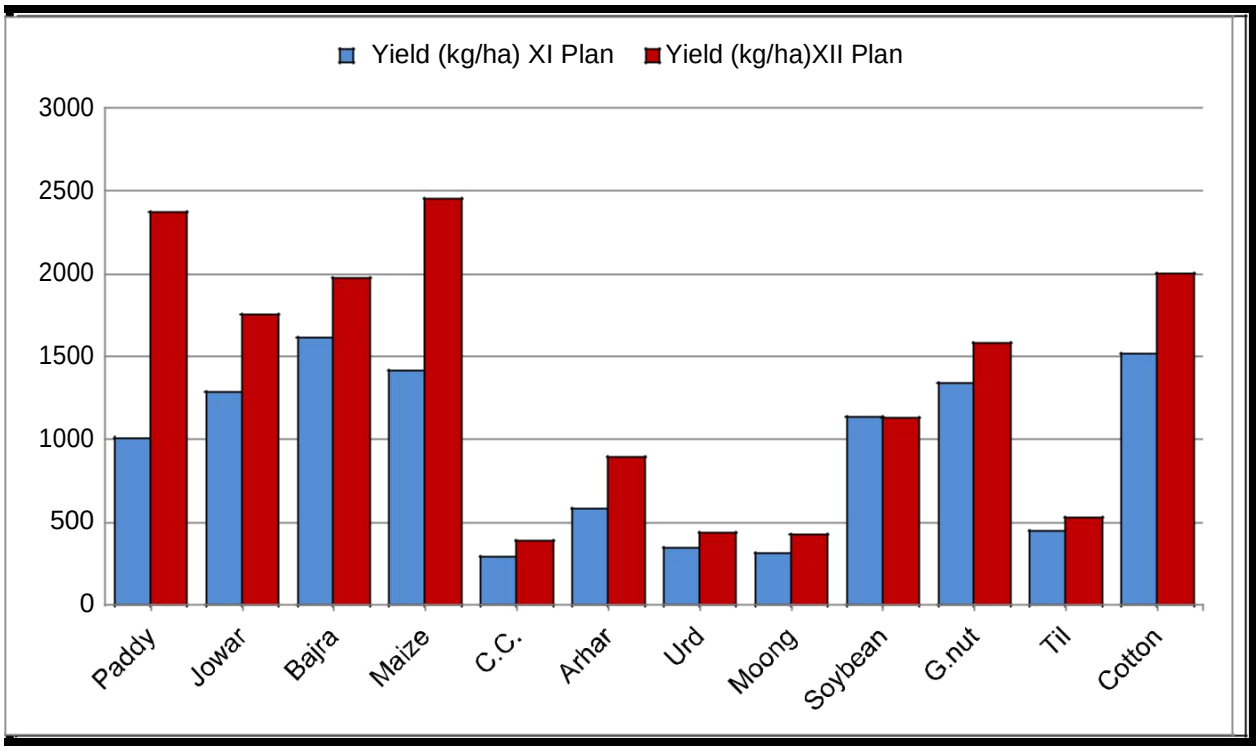
Kharif Crop Scenario: XI th & XII th Plan



Crop Coverage : Pre-NFSM (XI th Plan) and Post - NFSM Period (XII th Plan)

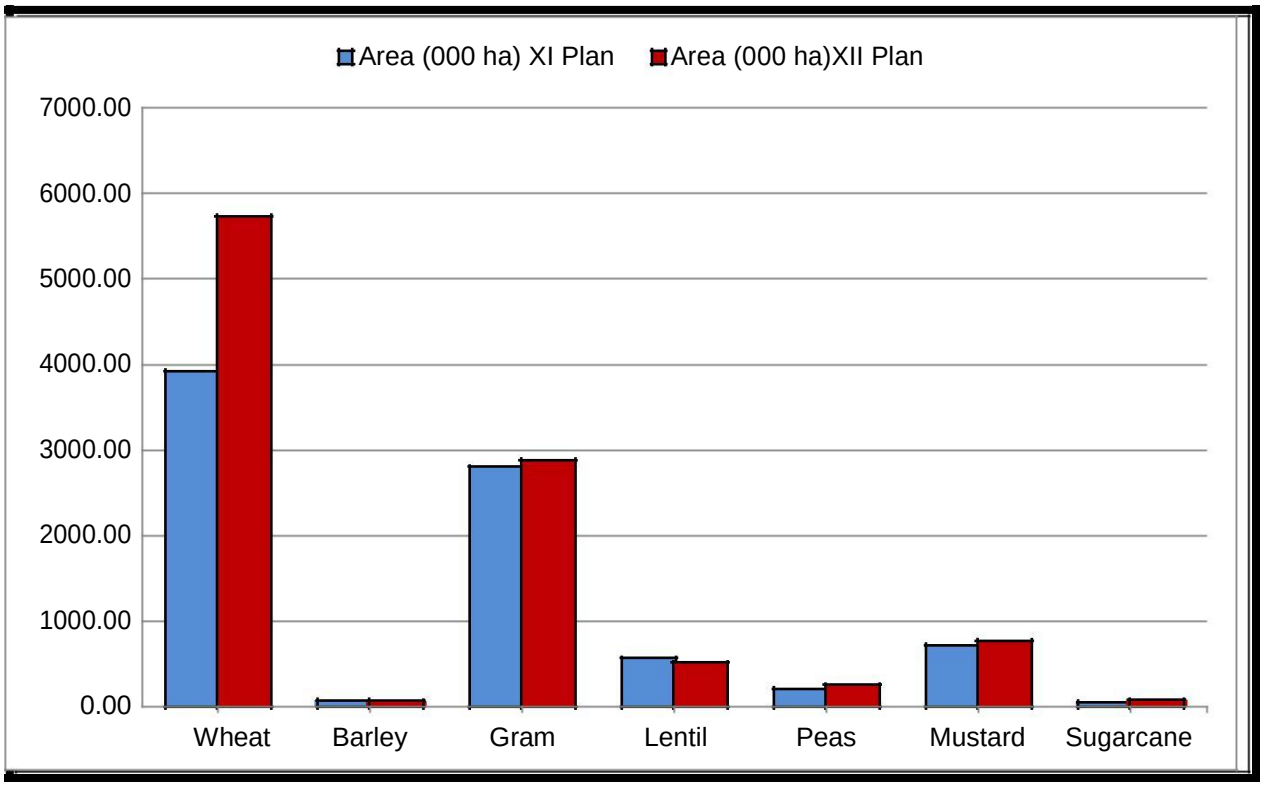


Production: Pre-NFSM (XI th Plan) and Post NFSM Period (XII th Plan)

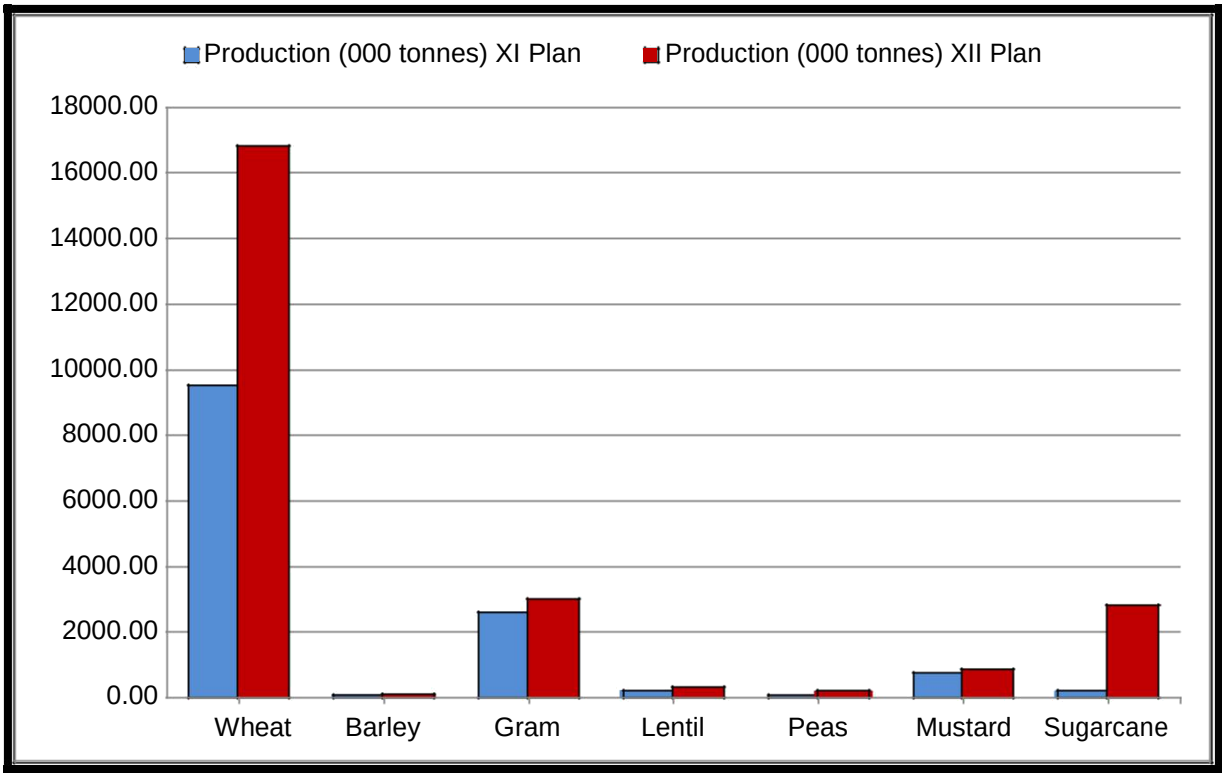


Yield: Pre-NFSM (XIth Plan) and Post - NFSM Period (XIIth Plan)

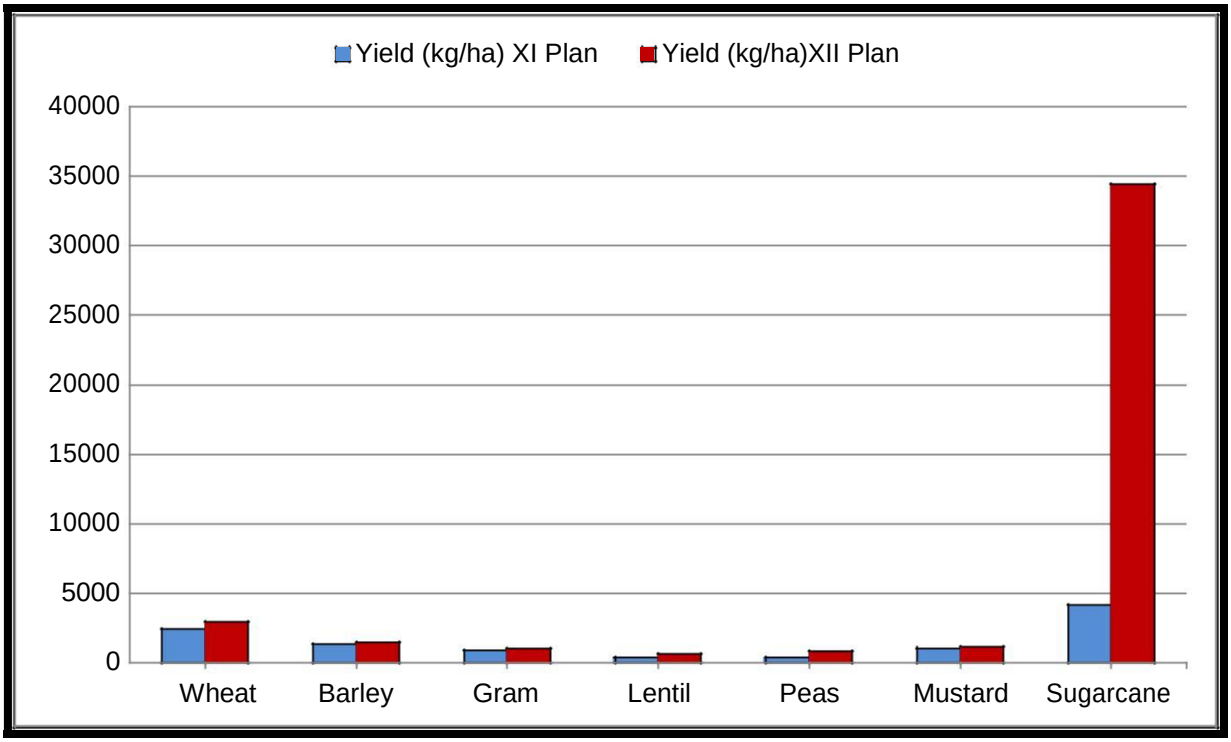
Rabi Crop Scenario: XIth & XIIth Plan



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



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



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

6. 7 Crop Scenario (Kharif & Rabi): 2014-15

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

S.No.	Crop	Area (lakh ha)		Production(Lakh T)		Yield (Kg/ha)	
		DES	SDA	DES	SDA	DES	SDA
1	Paddy	21.53	21.43	36.25	54.29	1684	2534
2	Sorghum	2.20	2.20	3.77	3.73	1714	1699
3	Maize	11.32	11.32	20.26	25.31	1790	2236
4	Arhar	5.21	5.21	5.11	5.11	981	981
5	Urd	8.82	8.61	4.37	4.27	495	496
6	Moong	2.61	1.55	1.24	0.70	476	451
7	Soybean	55.78	55.64	56.53	63.48	1013	1141
8	Wheat	55.60	59.94	141.82	184.68	2551	3081
9	Bajra	2.25	2.25	4.45	4.44	1978	1970
10	Small Millets	1.23	1.34	0.72	0.76	585	566
11	Barley	0.43	0.43	0.54	0.54	1256	1251
12	Gram	28.53	28.53	29.64	29.64	1039	1039
13	Rapseed & Mustard	7.16	6.66	7.17	6.70	1001	1006
14	Linseed	1.15	1.11	0.59	0.60	513	541
15	Groundnut	2.31	2.29	3.41	3.65	1476	1595
16	Sesame	3.59	3.59	1.53	1.86	426	517
17	Cotton	5.74	6.31	17.50	12.39	3049	1963
18	Sugarcance	1.11	1.09	50.82	45.31	45784	41682

Source-DES, M/A (4th Advance) / SDA-4th Advance Estimate

6. 8 Crop Coverage: 2015-16

(A-Lakh ha, P-Lakh M.Tons, Y-Kg/ha)

Kharif Crop	2015-16 (2nd Forecast)		
	A	P	Y
Paddy	20.24	52.31	2584
Jowar	2.05	4.10	2000
Bjara	2.67	6.33	2371
Maize	10.98	31.06	2829
Kodo-kutki	1.30	1.05	808
Other (Ragi & Small Millets)	0.50	0.32	640
Total Cereals Kharif	**37.74**	**95.17**	**2522**
Tur	5.79	5.78	998
Urad	9.32	3.37	362
Moong	1.93	0.41	212
Kulthi	0.14	0.04	286
Total Pulses Kharif	**17.18**	**9.60**	**559**
Groundnut	2.36	3.12	1322
Soybean	59.06	38.40	650
Sesame	3.65	1.97	540
Niger Seed	0.8	0.26	325

(A-Lakh ha, P-Lakh M.Tons, Y-Kg/ha)

Kharif Crop	2015-16 (2nd Forecast)		
	A	P	Y
Total Oilseeds Kharif	**65.87**	**43.75**	**664**
Jute	0.06	0.06	1000
Mesta	0.02	0.01	500
Total Jute & Mesta	**0.08**	**0.07**	**875**
Cotton (T)	5.47	12.53	2291
Total Foodgrain Kharif	**54.92**	**104.77**	**1908**
Total Kharif Crops	**126.34**	**161.12**	**1275**

(A-Lakh ha, P-Lakh M.Tons, Y-Kg/ha)

Rabi Crop	2015-16 (1st Advance Forecast)		
	A	P	Y
Wheat	51.84	148.8	2870
Barley	0.97	0.96	990
Total Cereal Rabi	**52.81**	**149.76**	**2836**
Gram	30.17	30.54	1012
Peas Lentil	4.50	6.55	1456
Teora	5.46	3.75	687
Other Pulses Rabi	0.10	0.05	500
Total Pulses Rabi	**40.23**	**40.89**	**1016**
Rapeseed & Mustard	0.01	0.05	5000
Linseed	6.17	6.47	1049
Safflower	1.16	0.4	345
Castor	0.10	0.05	500
Total Oilseeds Rabi	**7.44**	**6.97**	**937**
Sugarcane (Gur)	0.05	0.02	400
Total Foodgrain Rabi	**93.04**	**190.65**	**2049**
Total Rabi Crops	**100.53**	**197.64**	**1966**

6. 9 Financial Progress

a) Allocation & Expenditure: 2015-16

(Rs in Lakh)

Name of Crop/ Scheme	Unspent Balance (31.11.2015)	Allocation	Release	State share	Expenditure (up to Nov., 15)
Paddy	436.22	1916.95	479.25	479.25	522.29
Wheat	1406.24	4813.00	1203.25	1203.25	1000.26
Pulses	4655.86	23276.40	5594.10	5594.10	6532.35
Coarse Cereals	1100.29	1971.29	342.25	342.25	186.50
Commercial- Sugarcane, Cotton	13.20	40.16	9.00	9.00	4.80
Addln. Pulses Prog.	8789.15	11500	5750.00	5750.00	2710.85
Total	**16400.96**	**43517.80**	**13377.85**	**13377.85**	**10957.05**

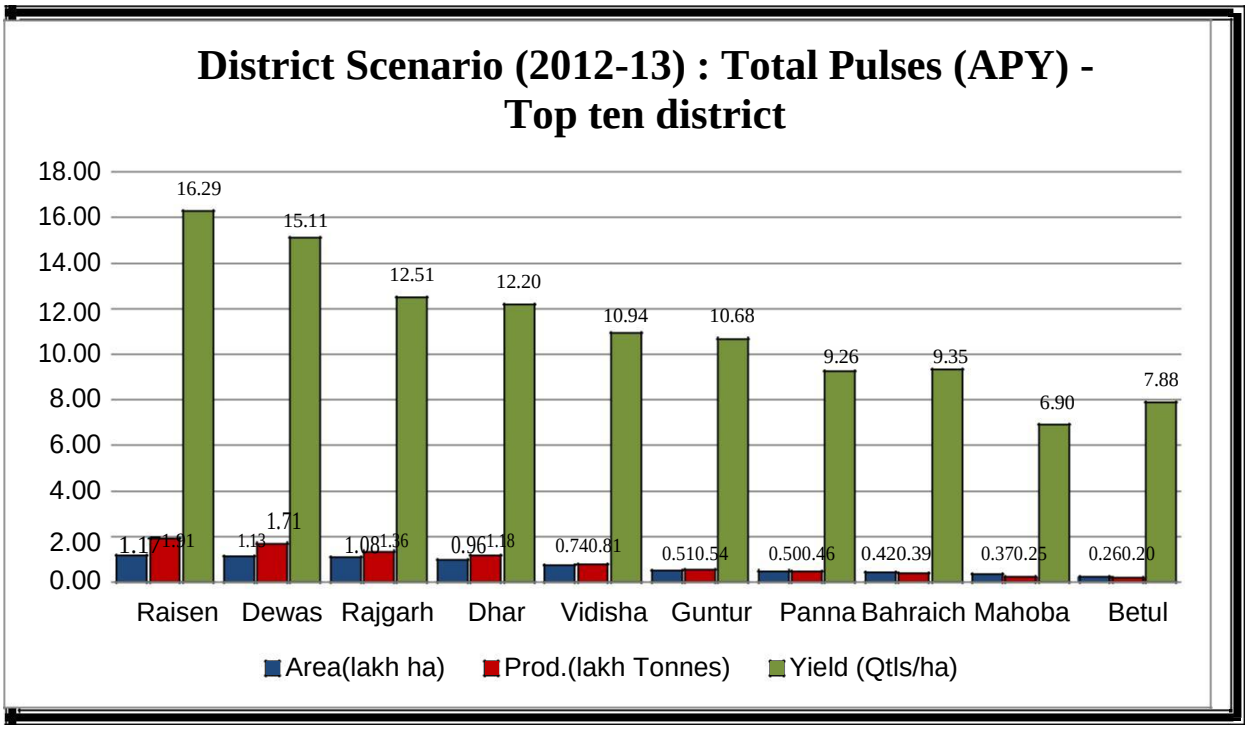
Details of physical and financial progress is at Annexure –I

6. 10 District scenario (2003-04) – Potential districts

The micro analysis at district level was also carried out and presented in **table 1.13**. The intra-state analysis revealed that Raisen district of Madhya Pradesh had the highest production with 0.50 per cent share to India followed by dewas of MP (0.49 %) and Rajgasrh of MP (0.47 %) Inrespect of area coverage, District-wise area, production and yield of top ten districts of India in respect of production are presented below which contributed 3.07 % and 4.81 % of area and production of the country.

Table 12. Top potential districts (2012-13) (APY) – Total pulses

Name of District	State	Area (lakh ha)		Prod. (lakh Tonnes)		Yield (Kg/ha)	
		Area	% to India	Prod.	% to India	Yield	YI
Raisen	M.P.	1.172	0.50	1.909	1.04	1629	207
Dewas	M.P.	1.129	0.49	1.707	0.93	1511	192
Rajgarh	M.P.	1.083	0.47	1.355	0.74	1251	159
Dhar	M.P.	0.965	0.42	1.177	0.64	1220	155
Vidisha	M.P.	0.738	0.32	0.808	0.44	1094	139
Guntur	A.P.	0.505	0.22	0.540	0.29	1068	136
Panna	M.P.	0.497	0.21	0.461	0.25	926	118
Bahraich	**U.P.**	0.420	0.18	0.392	0.21	935	119
Mahoba	U.P.	0.366	0.16	0.253	0.14	690	88
Betul	M.P.	0.257	0.11	0.202	0.11	788	100
Total above		**7.133**	**3.07**	**8.804**	**4.81**	**1234**	**157**
All india		**232.32**		**183.15**		**788**	



CHHATISGARH

Agro-climatic zones (Nos.)	03
Geographical area (lakh ha)	138
Forest cover (lakh ha)	63.53 (46%)
Net Cultivable area (lakh ha)	47.75 (35%)
Fallow land(lakh ha) (2012-13)	5.27
Gross Cropped Area (lakh ha)	64.26
Area sown more than once (lakh ha)	9.87
Cropping Intensity (%)	135
Gross Area under Irrigation (lakh ha)	16.48
Net Area under Irrigation (lakh ha)	14.15 (30%)
Average rainfall (mm)	1334
Farm families (lakh)	37.36
Small & marginal farmers (%)	80

6.11 Crop Growth Analysis: Pre and Post NFSM Plan (XIth –XIIth Plan)

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

S. No.	Crops	Districts / State	2007-08 to 2011-12			2012-13 to 2014-15			% 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	CG	37.27	52.23	1402	37.98	64.49	1698	8.72	6.11	70	1.93	23.46	21
		All India	436.48	972.42	2228	435.82	1055.59	2422				-0.15	8.55	9
2	Jowar	CG	0.05	0.06	1180	0.05	0.04	728	0.09	0.07	79	0.89	-37.77	-38
		All India	73.42	69.70	949	57.69	52.91	917				-21.42	-24.09	-3
4	Maize	CG	1.03	1.61	1567	1.13	2.22	1959	1.26	0.95	75	10.16	37.73	25
		All India	83.78	197.78	2361	89.99	233.97	2600				7.42	18.30	10
5	Coarse Cereals	CG	1.65	0.35	212	1.21	0.27	221	10.33	1.45	14	-26.45	-23.50	4
		All India	13.00	20.41	1570	11.75	18.51	1575				-9.58	-9.29	0
6	Small millet	CG	2.82	2.05	727	2.47	2.55	1031	36.69	61.67	168	-12.29	24.38	42
		All India	8.75	4.54	519	6.74	4.13	614				-22.98	-8.99	18
7	Total Cereals	CG	42.82	56.31	1315	42.86	69.57	1623	7.12	5.10	72	0.09	23.55	23
		All India	615.42	1264.85	2055	601.98	1365.11	2268				-2.18	7.93	10
B.	**Pulses**													
1	Arhar	CG	0.55	0.27	497	0.52	0.32	623	1.36	1.08	80	-5.70	18.20	25
		All India	37.89	26.64	703	38.35	29.92	780				1.21	12.31	11
2	Urd	CG	1.09	0.31	284	1.00	0.32	320	3.17	1.75	55	-8.26	3.23	13
		All India	30.56	14.78	484	31.56	18.30	580				3.27	23.82	20
3	Moong	CG	0.16	0.04	250	0.20	0.04	200	0.66	0.28	43	25.00	0.00	-20
		All India	33.07	13.37	404	30.52	14.34	470				-7.71	7.26	16
4	Kulthi	CG	0.56	0.17	304	0.47	0.16	340	10.38	7.51	72	-16.07	-5.88	12
		All India	5.21	2.40	461	4.53	2.13	470				-13.05	-11.25	2
5	Total Pulses	CG	2.36	0.79	336	2.19	0.84	385	2.09	1.31	63	-7.26	6.29	15
		All India	106.73	57.19	536	104.96	64.69	616				-1.66	13.11	15

C.	**Oilseeds**													
1	Soybean	CG	0.93	0.92	995	1.06	1.02	960	0.94	0.77	82	14.68	10.57	-4
		All India	95.68	111.58	1166	112.79	132.64	1176				17.89	18.88	1
2	G.nut	CG	0.29	0.38	1349	0.26	0.36	1416	0.45	0.50	112	-10.41	-5.96	5
		All India	49.02	57.20	1167	57.14	72.05	1261				16.58	25.95	8
3	Sesamum /Til	CG	0.21	0.07	354	0.18	0.05	286	1.08	0.74	69	-11.56	-28.57	-19
		All India	19.07	7.38	387	16.92	7.00	414				-11.27	-5.12	7
4	Niger/ Ramtil	CG	0.70	0.12	173	0.65	0.12	179	21.15	11.65	55	-8.07	-4.84	4
		All India	3.82	1.06	278	3.05	0.99	325				-20.24	-6.95	17
5	Total Oilseeds	CG	2.12	1.50	708	2.15	1.55	722	1.13	0.73	64	1.23	3.19	2
		All India	167.58	177.22	1058	189.90	212.68	1120				13.32	20.01	6

RABI CROPS

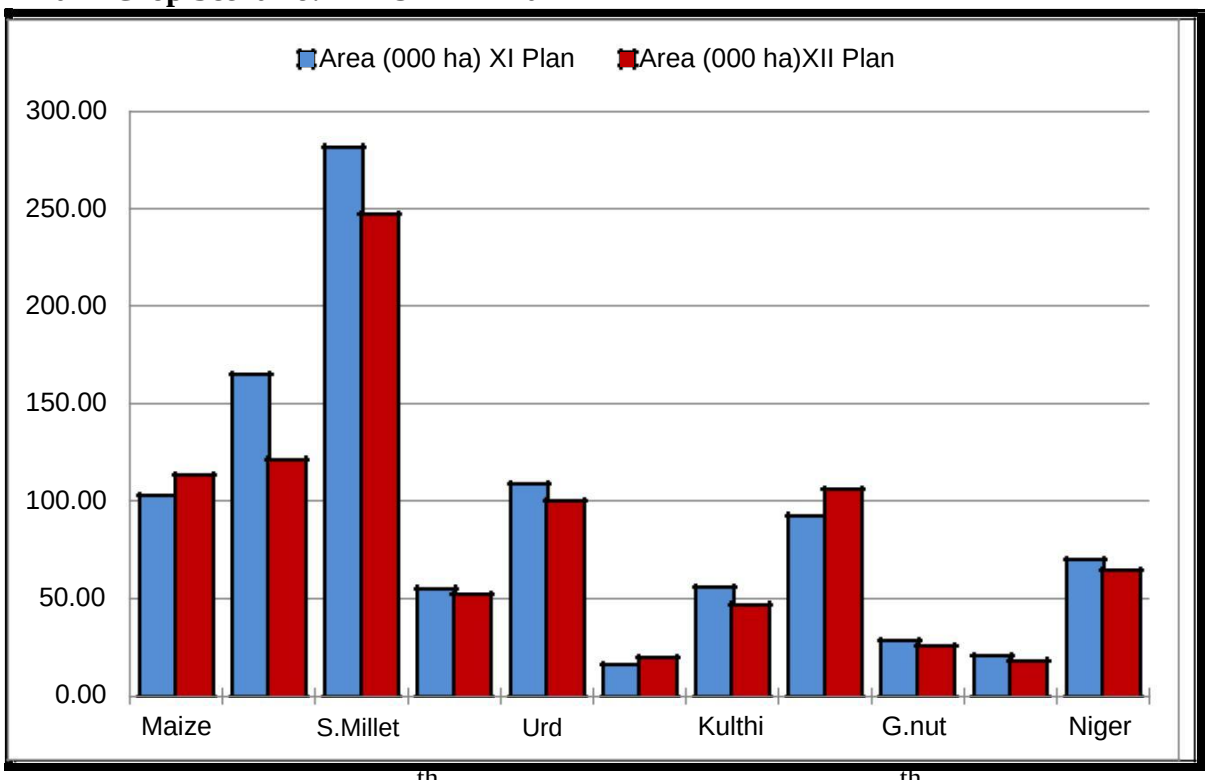
(A= lakh ha, P= lakh tons, Y= kg/ha)

S. No.	Crops	Districts / State	2007-08 to 2011-12			2012-13 to 2014-15			% 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	1.01	1.37	1363	0.33	0.15	45	-2.18	19.47	22
		All India	286.36	843.62	2946	304.82	927.65	3043				6.44	9.96	3
2	Barley	CG	0.03	0.03	833	0.03	0.03	1013	0.37	0.15	40	-18.80	-1.28	22
		All India	6.56	15.04	2292	6.86	17.28	2520				4.53	14.90	10
3	Total Cereals	CG	1.06	1.17	1107	1.03	1.40	1354	0.33	0.15	45	-2.67	19.01	22
		All India	292.93	858.66	2931	311.68	944.93	3032				6.40	10.05	3
B	**Pulses**													
1	Gram	CG	2.44	2.22	908	2.75	2.63	957	3.09	3.09	100	12.47	18.57	5
		All India	82.18	72.42	881	88.80	85.10	958				8.06	17.51	9
2	Lentil	CG	0.16	0.05	322	0.09	0.03	327	0.67	0.28	42	-40.37	-39.33	2
		All India	14.64	9.60	656	13.82	10.76	779				-5.60	12.08	19
3	Lathyrus	CG	3.39	1.99	589	3.55	2.12	598	72.08	59.20	82	4.67	6.25	2
		All India	5.16	3.42	663	4.92	3.58	728				-4.65	4.68	10
4	Peas	CG	0.16	0.06	352	0.26	0.14	539	2.99	1.57	53	62.55	148.92	53
		All India	7.20	6.24	867	8.63	8.82	1022				19.86	41.35	18
5	Total Pulses	CG	6.14	4.32	703	6.64	4.92	740	5.72	4.54	79	8.13	13.89	5
		All India	109.18	91.68	840	116.17	108.26	932				6.40	18.08	11
C	**Oilseeds**													
1	Rapeseed /Mustard	CG	0.53	0.22	409	0.48	0.25	520	0.73	0.31	42	-9.95	14.44	27
		All India	61.01	68.85	1128	65.04	79.53	1223				6.60	15.51	8
2	Linseed	CG	0.45	0.14	301	0.30	0.10	340	10.01	6.92	69	-34.54	-26.23	13
		All India	3.80	1.57	413	2.95	1.45	492				-22.36	-7.68	19
	Total Oilseeds	CG	0.98	0.35	359	0.77	0.35	451	1.14	0.43	38	-21.25	-1.23	25
		All India	64.81	70.42	1087	67.99	80.98	1191				4.91	15.00	10
D	Sugarcane	CG	0.10	0.26	2491	0.12	0.31	2704	0.23	0.01	4	11.65	21.20	9
		All India	47.14	3257.87	69118	50.45	3508.91	69548				7.04	7.71	1

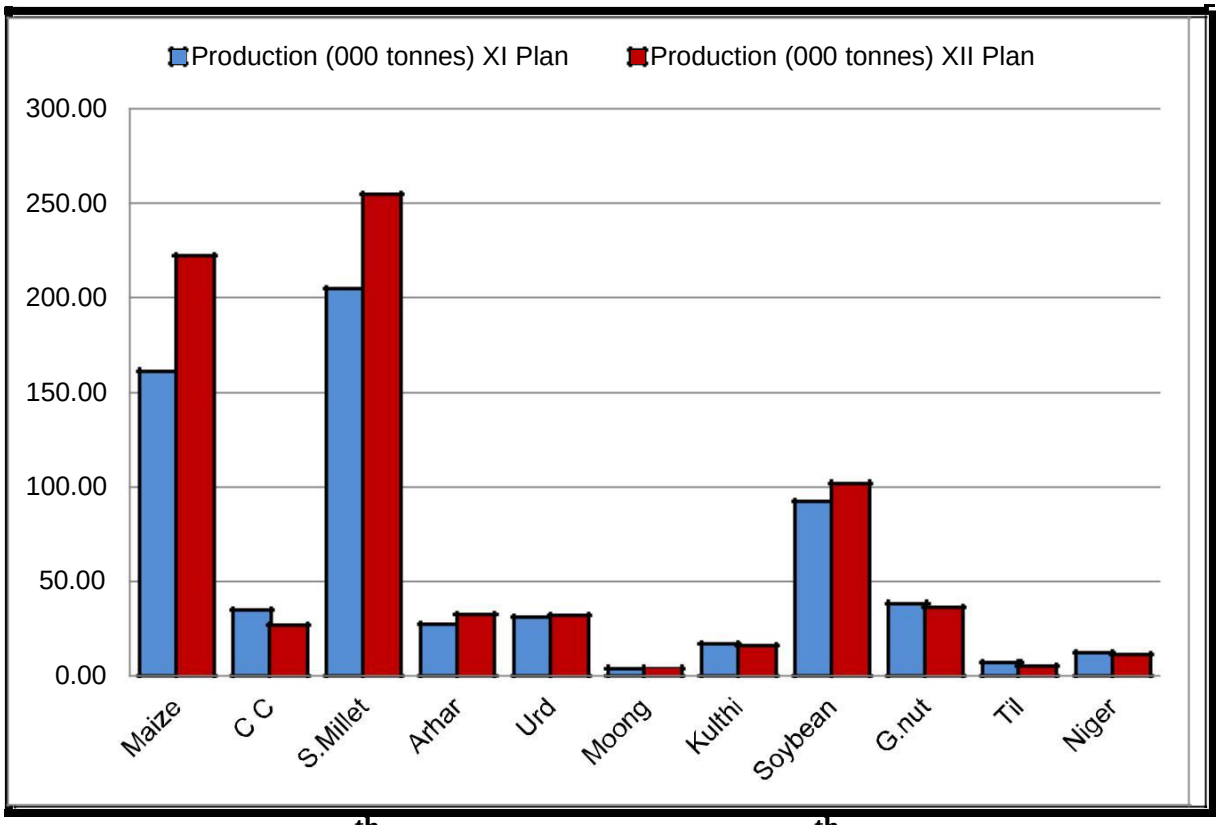
Source: DEC, Ministry of Agri. , DAC&FW, New Delhi

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 21% higher during the 12th Plan*** (2012-13 to 2014-15) over its previous five year Plan in C.G. Similarly, the productivity of arhar, urd, wheat, barley, gram, peas, musturd & linseed were also increased 22%, 25%, 13%, 22%, 5%, 53%, 27% & 13% respectively during 12th Plan from the 11th Plan. A quantum jump has been recorded in 12th Plan under field pea where productivity level of 539 kg/ha could be realized over the 11th Plan productivity of 352 kg/ha which is more than 53%.

Kharif Crop Scenario: XIth&XIIth Plan

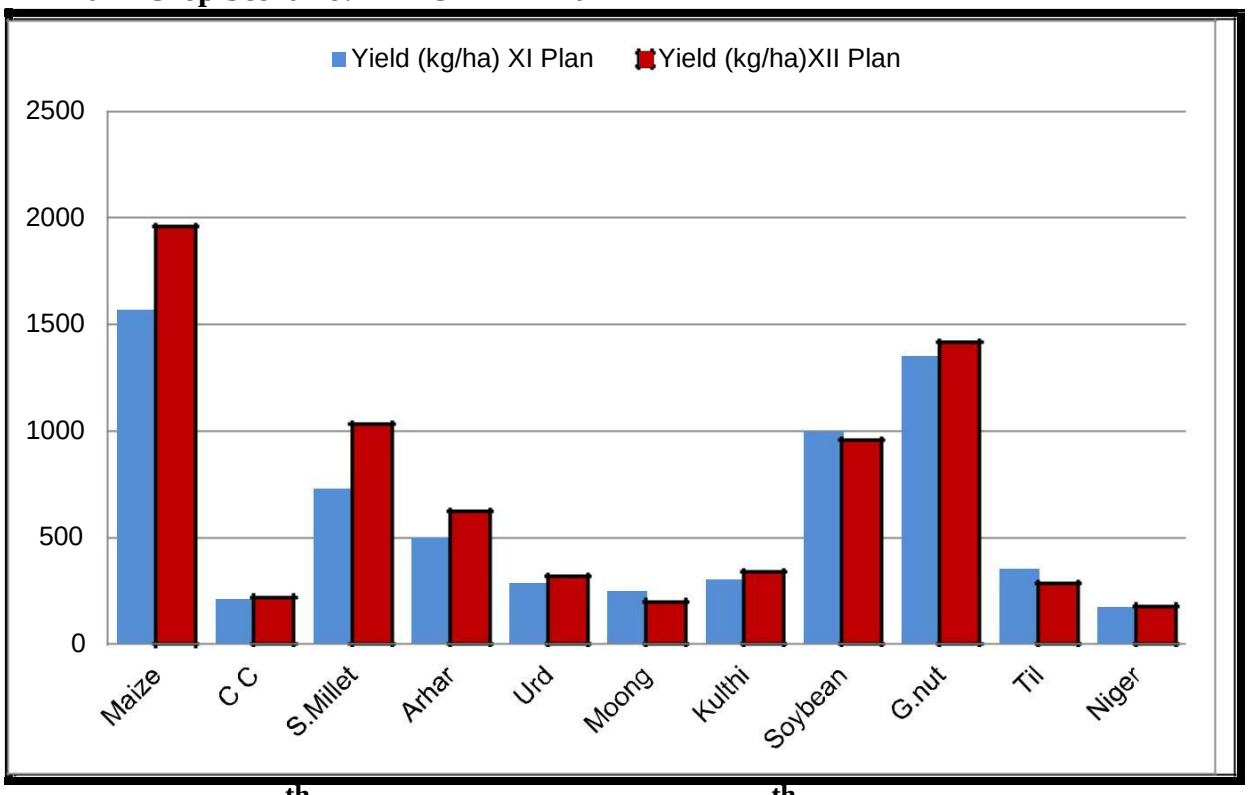


Crop Coverage : Pre-NFSM (XIth Plan) and Post - NFSM Period (XIIthPlan)



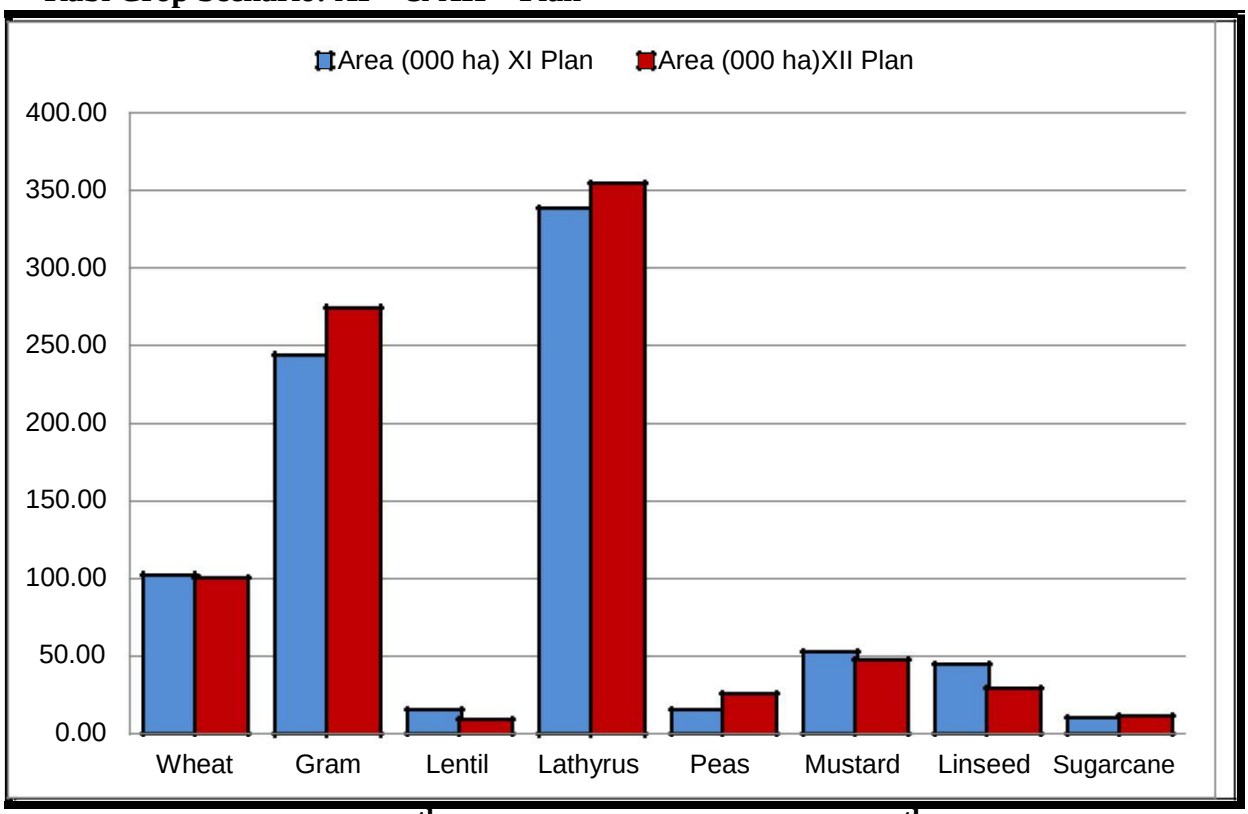
Production: Pre-NFSM (XIthPlan) and Post NFSM Period (XIIthPlan)

Kharif Crop Scenario: XIth & XIIth Plan

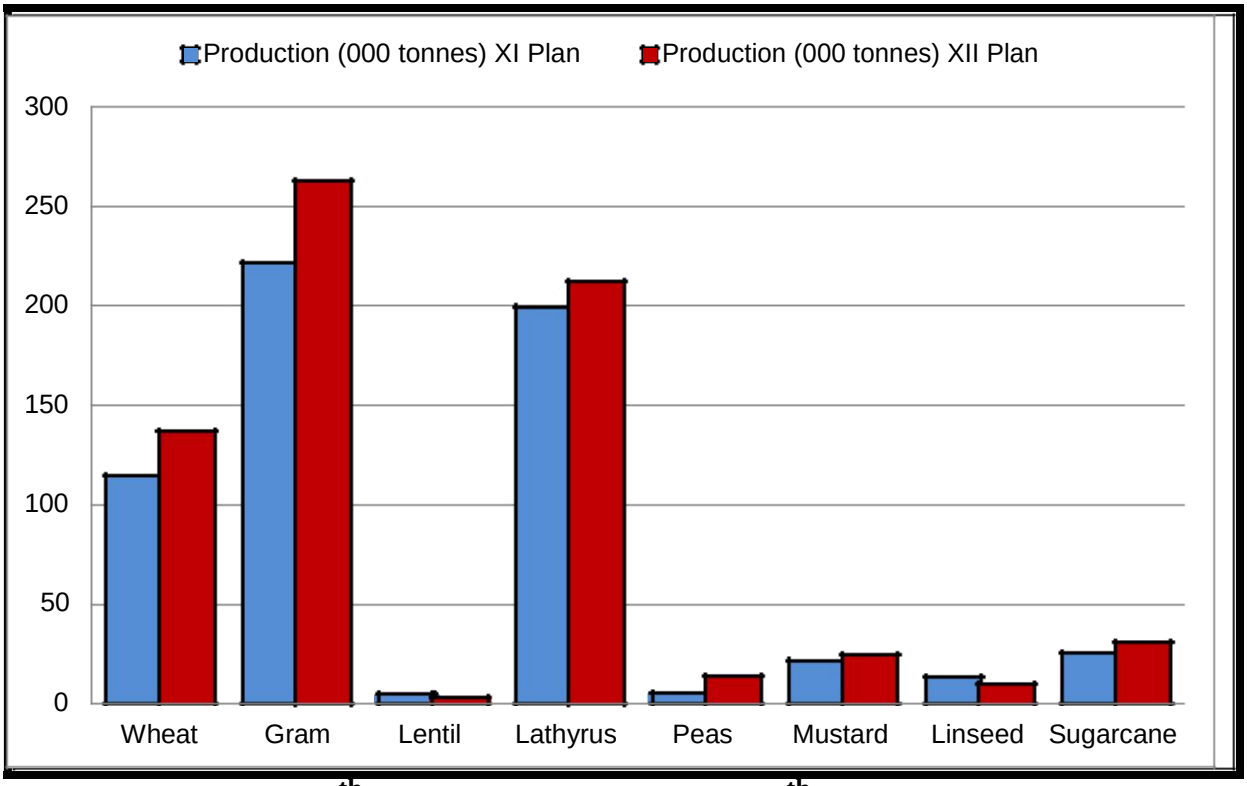


Yield: Pre-NFSM (XIth Plan) and Post - NFSM Period (XIIth Plan)

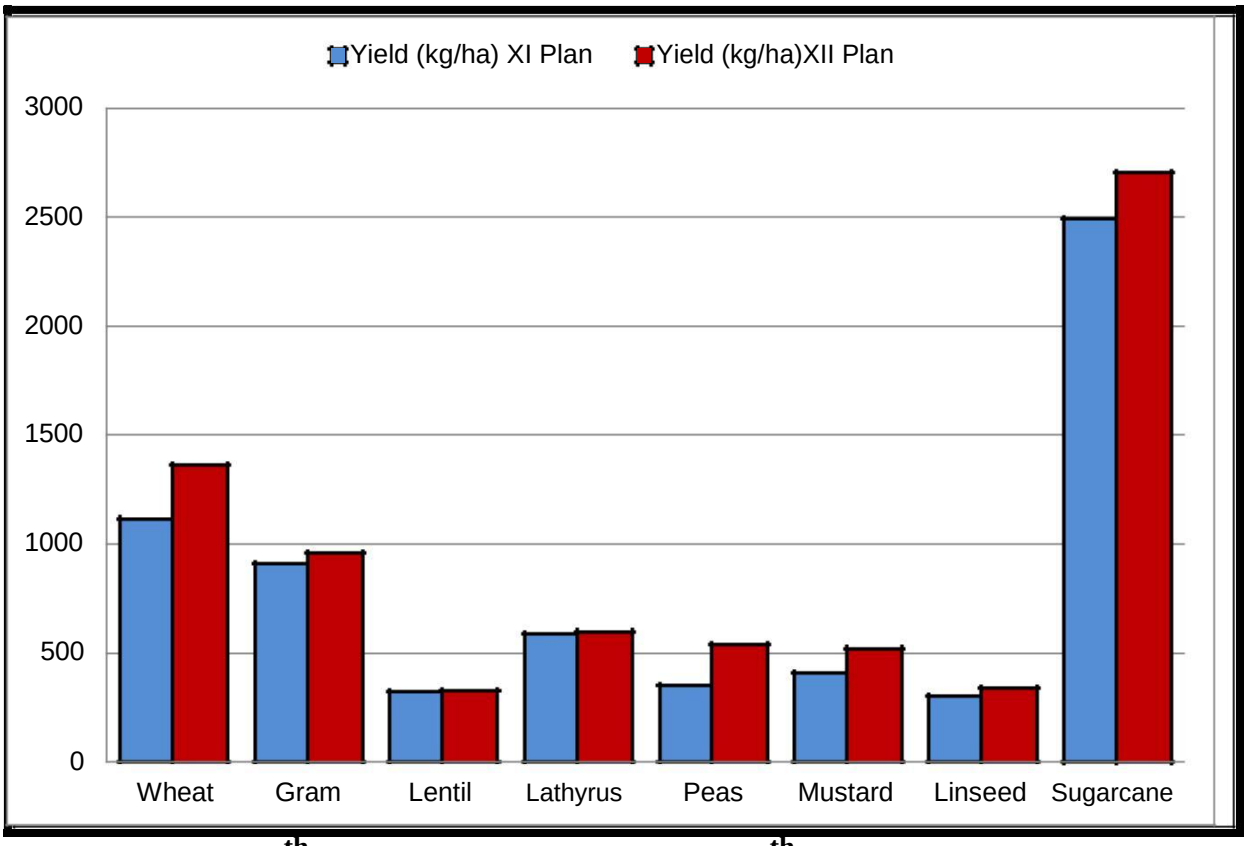
Rabi Crop Scenario: XI th& XIIth Plan



Crop Coverage : Pre-NFSM (XIthPlan) and Post - NFSM Period (XII thPlan)



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



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

6.12 Crop Scenario: 2014-15

Crop	Area (lakh ha)		Production (Lakh tons)		Yield (kg/ha)	
	DES	SDA	DES	SDA	DES	SDA
Paddy	38.08	36.92	60.21	76.81	1581	2080
Maize	1.22	2.20	2.30	4.10	1885	1861
Arhar	0.53	1.31	0.35	0.89	660	679
Urd	1.01	1.65	0.31	0.75	307	453
Moong	0.23		0.04		174	
Soybean	1.06	1.47	0.84	1.86	792	1265
Wheat	1.04	1.77	1.36	2.61	1308	1475
Gram	2.81	3.56	2.90	4.06	1032	1140
Lathyrus	3.38	3.58	1.89	2.36	559	659
Peas	0.48	0.46	0.31	0.27	646	587
Rapeseed/Mustard	0.46	1.45	0.23	0.86	500	593
Sugarcane	0.13	0.28	0.34	0.78	2615	2786

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

6.13 NFSM: FINANCIAL PROGRESS

6.13.1 Allocation & Expenditure: Till February (2015-16)

(Rs In Lakh)

S. No.	Name of Crop/ Scheme	Allocation/ Target	Release	Expenditure (upto February)
1	Paddy	7224.00	1806.01	3351.20
2	Pulses	4274.22	1068.55	1538.10
3	Additional Pulses	1654.44	827.21	205.74
3.	Coarse Cereals	194.00	48.50	90.03
	Total	**13346.66**	**3750.27**	**5185.07**

Details of physical and financial progress is at Annexure –I

NLMT -2015-16

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 Crores. 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 2015-16.

A. NFSM

State	Season	Districts covered	Date	Report Submission
MP	Kharif 2015	Rewa, Sidhi & Satna	August, 17th - 20th	6th November 2015
	Rabi 2015-16	Shivpuri, Ashoknagar & Guna	February, 25th -26th	6th May 2016
CG	Kharif 2015	Raigarh, Jaspur & Ambikapur	September 08th -11th	6th November 2015
	Rabi 2015-16	Surajpur, Balrampur & Koriya	March, 16th -18th	6th May 2016

B. BGERI

CG	Kharif 2015	Balod, Kanker & Dhamtari	September 21st -23rd	6th November 2015

7.1 Madhya Pradesh: NLMT-NFSM Kharif 2015

7.1.1 Observations

1. Programme Coordinator of KVK- Rewa informed that they were not aware of the 80 ha paddy demonstrations under NFSM-paddy allotted by State Department of Agriculture.
2. In Rewa district Moong crop had heavy infestation of Yellow Vein Mosaic, Jassids, hairy caterpillar, the seed was broadcasted, none of the recommended package, nor technical advisory was followed to recommend IPM measures etc.
3. For improving the yield by adoption of modern practices and also to minimize the cost towards various agricultural operations, Rewa District implement the "Yantra Doot" scheme in selected villages. A total of eight Custom Hiring Centers under RKVY scheme are operational in the district.
4. To know the availability of soil nutrients, the soil testing laboratory exists in the district but most of them are underutilized. In Rewa only 15 samples are only being analyzed per day at the district level.
5. The organisation of targeted cluster demonstrations, both CSBD and sole crop suffered or conducted much delayed in the visited district. The procedural delay in allotment of both physical and financial allocation by the State NFSM HQ to the districts has been the major cause. Such situations is in all the districts of the State. The kahrif targets were issued on 17^{th} July by the state HQ whereas the sowing season starts in the month of IInd fortnight of June or the onset of mosoon, whichever is earlier.
6. Lack of campaigning on NFSM, absence of demonstration display boards, banners, etc. systematic documentation on cluster demonstration, Input use, Crop based technological skill training etc have been a major observation in Rewa district. The apathy of DFSMEC, may be attributed to this fact. The team could not avail the opportunity to have a wrap-up meeting with the District Collector/DFSMEC.
7. Transplanted rice and DSR have been badly affected by delay and deficit rains (>50%) during Kharif season in the visited districts. To reclaim such situations, adaptation strategies viz. supplemental irrigation facilities with MIS at critical stage, short duration cultivars and timely sowing of rice is highly recommended for harvesting good yield.
8. In Sidhi district, Cluster demonstrations with limited input management, conducted on paddy, maize, mungbean, and pigeonpea were visited by team, the demonstrations were found excellent. The district Collector and the Chairman DFSMEC also had an interactive wrap-up meeting with the team and stake holders.
9. Wrap-up meeting with Chairman, DFSMEC-NFSM and District Collector Sidhi has been very faithful. Various issues on scheme implementation, prevalent and recommended high

yielding pulses/other crop verities and strategy to enhance SRR etc are discussed with stake holders.

10. Demonstration of Pigeon pea (Variety-TJT-501) by transplanting method is in good establishment condition. The effect of nipping was also observed as the crop was healthy and with good bio-mass.
11. In village Sirmaour- block Rewa (farmer Lalmani Shukla) the cluster demonstration on blackgram (variety- Azad urd 1) was visited. Delayed sowing has resulted poor plant population, heavy infestation of Yellow Vain Mosaic (white fly vector) and weeds. In fact such demonstration may not be treated as organised one. It did not follow any scientific recommendations.
12. Observed very poor paddy demonstration conducted by SRI method due to faulty practices/practices not applied as per the norms made for the same.
13. Krishi Vigyan Kendras (KVK) are the major source of the farmers of the district of all the Technology transfer and for the new techniques of agriculture practices. In this way the KVK, Satna has conducted demonstration in a very scientific mode and covered all crops viz vegetables, fruit crops, nurseries, **pigeonpea + soybean using raised bed system for soybean crop** with latest technologies.
14. MTU 1010 is midland farming variety but it was put under lowland situations under NFSM demonstration in Satna and Rewa. The state, based on the experience should shift it to proper farming situations as per crops requirement.
15. Hybrid rice 6444 is taken in large area, expecting 30 q/acre yields. Here the farmers are concerned on restricted procurement policy per unit area need to revisit as hybrid growers may be discouraged by limitation in purchasing system.
16. WGL 32100 rice variety with seed as-input provided under poor soil depth, up land situation for the DSR demonstration, is not suitable such situation. In-fact, as per the land situation proper crop planning and selection of short duration improved paddy or other crop cultivar with complete package should have been planned. Hybrid cultivars should be demonstrated under advanced and resource rich eco-situation following the basic principles of soil/moisture conservation in light soils, rainfed and plateau zone.
17. 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 germinates in next the next kharif.

18. Transplanting of rice manually is becoming very expensive, equipments like paddy transplanter etc. need to be popularised.
19. Interaction with large number of chickpea growers have revealed sufferings due to non-remunerative prices during 2013-14 and 2014-15 @ Rs. 2300-2400 per quintal (against Rs. 3100/Qtls MSP), in addition to crop loss in the preceding season due to excessive rains, insect/pest etc.
20. Farmers are switching over to second crop after Wheat. Moongbean during spring/summer, with critical irrigation, is the preferred option. Appropriate variety /quality seeds and proper IPM techniques with availability and advocacy of quality pesticide stall remains a big issue to be addressed under NFSM.
21. Urdbean is cultivated without following recommended package of practices with very old variety T 9. New varieties like *KU 96-3, Pant U 30, RBU 38 and PDU 1* with recommended technology package should be the part of NFSM demonstration.
22. Traditionally the Paddy–Pea, Paddy-Chickpea, Paddy-Lentil cropping system is shifting to Paddy-Wheat cropping system, is gaining popularity due to continuous occurrence of frost during last 3-4 years.
23. The concept of Cropping System Based Demonstration (CSBD) is not amply clear amongst the district/block level functionaries especially in Satna districts. The district has, therefore, not proposed the targets for such demonstration. The guidelines of organizing at least 30% demonstration under this category is with the very basic objectives of targeting *problematic soils (saline/alkaline/acidic), water logging, mono-cropping and extremely rainfed areas* with poor mechanization/ no mechanization, therefore, seems to be defeated.

    The participation in cluster demonstration by NGO, KVK etc. are negligible or nil the Team recommends the participatory approach in organization of demonstrations. CSBD may also be given to Extension Directorate of SAU to standardize the cropping pattern.
24. Team observed unavailability of early variety seeds, also the varieties within 10 years of notification in Paddy, Pulse and Coarse Cereals under NFSM.
25. Chemical or eco-friendly weed management is most important but lack of knowledge, poor extension work in district like Rewa and Satna at this front is accumulating problems to this menace. Commonly used weedicides are 2, 4-D, Bispyribac-sodium, Fenoxaprop-p-ethyl (whipsuper) in the area.
26. Wilt, a major constraint of pulses. The local farmers have informed about the Non-availability of micro nutrients in the local market, sub-standard pesticides inputs etc.

27. Active involvement of district PMT is necessary for effective implementations of NFSM programme. Proper programme planning is required by involving SAUs in deciding the technologies to be demonstrated by considering socio-economic status, availability of natural resources and marketing of produce. Training and visit component (crop based/season based training) need impetus, may also be included under this programme, the information of ongoing activities must also be displayed in the village Panchayat building.

Suggestions

1. There is need to introduce inter-crop with transplanted pigeon pea 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.
2. The infestation of weeds in the soybean crop can be controlled by applying the quantity of 2-2.5 litre Glyphosate per ha controlling all types of weeds. Seed treatment by sodium molybdate @2g kg^{-1} seed may also helpful for the same purpose.
3. The loss to soybean in the state has encountered due to deficient/scanty rains, poor drainage/water logging at the time of flowering/pod formation in low lying area and heavy infestation of whitefly, yellow mosaic. Technology with variable inputs can overcome the yield barriers. Promotion of ridge and furrow method of soybean cultivation, pigeon pea-soybean inter-cropping etc need to be propagated vigorously.
4. Farmer's perception of use of more fertilizer to get the bumper crop yield ,need to be changed by advocating /demonstrating balanced fertilizer on the basis of soil testing report and demonstrating use of the green manure crop i.e. Dhaincha (*Susbenia aculata* and *rostata*) for sustained the soil life.
5. Need of popularization of *Dharwad* technique of arhar cultivation as introduced in intercrops with the other crops. Such technique is proving very useful for low land /marginal farmers to get more yields in the small piece of land.
6. Scarcity of land, labours and capital with the pressure of more demand of food for ever increasing population can only be rectified by use of low cost farm implements and labour saving implements. Hence the team recommend toincrease *Yantra Doot* villages so that poor farmers can execute various agricultural operations economically.
7. Organic farming may be one of the best alternatives for tribal district like Sidhi, Mandla and Dindori where fertilizer consumption is observed to be very low.
8. *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.

9. The SAU may be advised to standardize the cropping system round the year, based on varietal selection, of *rice-fieldpea-wheat-moong/urd cropping* to accommodate the sowing time and management of crop duration based on the available agro-resources.
10. The Team has a critical observation on the guidelines of conducting the demonstrations which prescribes to organize the cluster demonstration in comparison to its control. The Team is of the opinion that neither it is followed nor it seems to be practically possible. It is therefore, suggested that suitable modification on this may be made in consultation with ICAR at the level of the Head Quarter.
11. The NFSM-Pulses interventions may be pursued in the command areas to explore the potential of urd and mung. Similarly, the area and productivity potential of chickpea and lentil may be harnessed with suitable varieties and production.
12. Use of wilt resistant cultivars of pulses, inclusion of short duration variety of paddy to increase cropping intensity, seed treatment of pulses with *Trichoderma*, mandatory follow-up of IPM in place of sole dependency on pesticides, is strongly recommended.
13. There is wide scope of cultivation of Mungbean in Kharif and summer season. Improved varieties of mungbean viz. PDM 11, Pusa 9531, HUM 1and TJM 3 need to be popularised.
14. On Coarse Cereals /Millets, there is need of identification of niche areas, bridging yield gaps through availability of quality seeds of promising location specific varieties both grain and fodder varieties/hybrids; streamlining seed production; listing the best management practices etc.;
15. Development of varieties/hybrids with better re-generative capacity under drought condition, breeding of millet varieties with high Omegas-3 amino acids may be taken up by the ICAR/SAU.
16. Special focus on minor millets with wide publicity to capitalize the virtues of millets as C 4 plants, nutritional superiority, amenability for climate change etc.
17. Harvesting, threshing and pre-processing (de-husking) of small millet being labour intensive, need attention of the CIAE/ CIPHET (ICAR) for development of suitable machines to help and reducing the cost of cultivation, output and value addition to fetch better prices.
18. Introduction of suitable high yielding varieties, introduction of soil and water conservation techniques, crop rotation, crop diversity, organic farming and introduction of mechanized farming is the urgent need for sustainable agriculture. Wild rice eradication, soil amendment, integrated pest management for insect, diseases & weeds are the production constraints lacking in the demonstration, it should be considered.
19. Farmers are showing interest in adopting novel techniques in Agriculture. Mode of input availability and present system of govt. subsidy should be simplified, quality assurance of inputs and their availability should be provided in the form of demonstration kit. GPS data of beneficiaries plot may be given for all the field demonstration programmes in their respective official documents for its authenticity and verification.

20. Potential increase in area under irrigation by way of intervention of efficient water application tools (Sprinkler, pipes, pumpsets, raingun) need to be compiled in order to evaluate the impact of these interventions. The subsidy benefits under the interventions of efficient water application tools, including 3 HP electric pumps is still not given to farmers and need to be extended to all categories of farmers on pro-rata basis.
21. 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.*
22. Shelves of *local initiatives*, specialized project, market support & value chain integration etc. which are nil. These are the activities which may emerge from DFSMEC and should be a part of the Annual Action Plan.
23. For wider publicity and long lasting impact of demonstrated activities (cluster/implements, variety) display of flexi boards both at village panchayat buildings and demonstration site, is highly recommended**.**
24. Hybrid maize was seen in upland which was dense and overlapped. Standard practices of agronomical measures such as line sowing, earthing-up at 30 DAS with balance fertilizer doses etc need to be recommended by SAUs to realise the potential cob size and cob yield.
25. Herbicides (weedicides) are well known among farmers but with limited knowledge, the Team therefore recommends to organize a good number of demonstrations on available herbicides use (other than regular) as continuous use of same herbicides create tolerance in weeds and hence replacement after every 2-3 years, should be the strategy under state NFSM plan.
26. The state Mission's has suggested on inter-componential change flexibility at the level of 30% from the existing 20% so as to intervene on inter-location specific requirements in a districts.
27. Bench mark surveys, cent percent soil testing of identified cluster plots, and timely availability of test report be ensured. Lacking these, it hampers the very purpose of applying micronutrients. Implements were given to farmers as Cono-weeder and SRI marker for using in fields. No conservation agriculture has been adopted for longer period of sustainability.
28. 10% limited (cap) allocation against total budget for machinery has been observed as scarce and defeat very purpose of farm mechanization and RCT. This should have been at least 20%.

MADHYA PRADESH: NLMT -NFSM RABI 2015-16

OBSERVATIONS

1) ***The total seasonal rainfall*** during the current SW monsoon (14.06.2015 to 30.09.2015) was 823.1 mm which is 13% less as against the state's normal rainfall of 949.1 mm. As per the data, 5 districts received. Excess, 23 normal and 23 received deficit rainfall.
2) ***The winter rains/showers were received*** in some districts of the state during last week of October, 2015. (28^{th} -29^{th}). During the ***3^{rd} week of January good winter showers have been received across the state.*** The day & night temperatures have also declined, however, at the end of February the rabi crops especially wheat and pulses improved in whole the state due congenial temperature from January 15^{th} to February 15^{th} , 2016. It further helped in proper grain filling. The weather however, again became abnormal beginning March and hail storm with rain was observed in various pockets in state.
3) The normal area under Rabi crops is about 85 lakh ha. Wheat is a major Rabi cereal crop occupying 48% of the total normal area. This year, as per the WWWR (Weekly Weather Watch Report), wheat has been planted in 56.34 lakh ha which is 4% less against the targeted area of 58.70 lakh ha. The pulses has been planted in 40.77 lakh ha which is 10 % higher against the targeted area of 36.98 lakh ha. Rabi crops have been sown in an area of 106.66 lakh hectares which is also above the normal (85.14 lakh ha) as well as targeted area (105.36 lakh ha).
4) Spatial variation, less rainfall, early recession of SW monsoon associated with higher than the desired temperature regime during October onward may be attributed to delayed rabi crop sowing including wheat and pulses sowing this year. The rainfed regions usually opt for early sowings of crops including wheat during October on residual moisture. But this year there has been reports of replanting of early sown wheat due to poor or no germination owing to soil moisture stress and higher temperature.
5) Major wheat varieties grown in M.P. are - Sujata, C-306, HI-1531 (Harshita), HI1500 (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), MP 1203, MPO 1215, HD 4672 (Malaw Ratna).
6) Major rabi pulses varities grown in M.P. are- Chickpea (***Desi-*** JG16, JG 63, JAKI 9218, JG 130 ***Kabuli-*** KAK 2, JGK-1, JGK-2), Lentil- JL-3 (Sagar Masara), JL-1, IPL 81 (Noori), Local variety (non descriptive), Pea- Prakash (IPFD 1-10), KPMR-400 (Indra), Malviya Matar (HUDP 15).
7) Usually for almost all the visited cluster demonstrations organized in the sample districts, it is observed that the Demonstration Registers were not maintained / shown by any of the districts. The National Monitoring Team, therefore, could not ascertain the procurement / receiptof the exact quantities of prescribed inputs as well as their utilization in consonance to targets of Cluster Demonstrations allocated and reported as organized by the districts.
8) The Documentation details on technological recommendations / interventions on laying out a demonstration, such as size of the cluster, soil fertility status, soil types, no. of ploughings, preceding crop (var.) grown, yield performance / CCE results in the Cropping System Based Demonstration (CSBD), inter-culture operations, IPM practiced and number of varieties used in a cluster, varietal characteristics of the crop variety demonstrated, existing variety

(ies) for control etc have not been maintained / recorded by any of the districts. This observation stands non-compliant.

9) On asking the record for inspection by Team Members, the RAEO, shown the only available document i.e. "Input distribution register". This register also did not have any mention / remark of the supervisory officer to physically monitor / visit the demonstration plot.
10) In general, the "Control Plots" both for the varieties or technology, were either not maintained or identified for comparison, similarly field days and trainings were not organized.
11) The Team has noticed a poor or no involvement of ZRS/ SAUs, ATMA, KVKs and reputed NGOs and other line departments in execution of the scheme in general and in organization of a certain percentage of demonstrations, in particular.
12) The Team could also not conclude the equitable distribution of benefits of the scheme in quantitative terms to beneficiaries under Special Component Plan (SCP) (16%), Tribal Sub-Plan (TSP) (8%), SMF (33%), Women (30%), **as such records were not maintained/shown by the DDAs.**
13) As mandatory for physical verification of all demonstrations / components viz; JD-2%, DDA-5%, ADA (scheme)-10%, SADO-25%, ADO-50% and RAEO-100%, the Members could not come across to such details, neither the state HQ nor the DDAs in sample districts provided such documents.
14) CSBD were generally reported as not conducted in visited districts and observed poor performance of production and protection technologies, lack of quality demonstrations, under sole crops at many a sites, may be attributed to ad-hoc and weak monitoring mechanism and lack of documentation at all levels. The observation stands non-complaint as ATRs for earlier NLMT reports still awaits.
15) Skill development component such as organisation of **orientation training programme**, **dates/days of field day organized** during the **reproductive phase / grain filling stage of crop, season long trainings** (02 in each season) etc., was reported as not organized in district Ashoknagar. However in Shivpuri & Guna CSBD training were reported as organised but the fact is that when no CSBD were conducted how these training could be organized. Non of the visited farmers confirmed to have undergone such training. The very basic objective of technology transfer is defeated when the demonstrations do not integrate the skill development components.
16) Involvement of District Consultants/TA NFSM in monitoring and conduct of demonstration was noticed in district Shivpuri with least involvement in other.
17) The prescribed guidelines to erect display boards for wide publicity and extension of message were generally missing and it had a mixed performance.
18) Appropriate Lay-out of cluster demonstration was also lacking at the sites visited by Team. Although these demonstration sites were not randomly selected by Team but decided by DDAs. **(The team was devoid of detailed commodity wise/district beneficiary list to randomly select the site of their choice).**
19) The NFSM- funded FLDs allocated to SAU/KVKs/NGOs etc were not in the notice of the DDAs. The Team is of the opinion that the FLDs, either given to NGOs or KVKs should be widely publicized and here also the laid down criteria of organizing FLDs such as

assessment of soil fertility status, Agronomic recommendations, IPM and maintenance of control plot etc should be holistically followed.

20) Most of the farmers are not aware of the names of descript/recommended pulse varieties of Mung, Urd, Pigeonpea and Lentil. Non-descript varieties of lentil in Ashoknagar, Shivpuri and Guna and other adjoining parts are being grown.New trend of crop diversion under pea was observed in Shivpuri.
21) It is observed that micronutrient Boron (B) is being supplied as blank recommendation without any soil test report.
22) Man-animal conflict/wild animals attack on crops have been reported from districts/block adjoining forest area at many a places, prospects of summer pulse programme has been reported as badly affected due to stray cattles/open grazing, apart from other natural resource issues.
23) Cluster demonstrations of Chickpea (JAKI 9218) were seen in Isagarh block of Ashoknagar district. The crop was affected with wilt, plants are tall & sown late (1^{st} week of December, 2015) as compared to the farmers field crop.
24) Under Farm Mechanisation, Multi-Crop-Thresher provided under NMAET. Year of distribution and the Scheme under which it is provided, however, not mentioned. Multi-Crop-Thresher, Straw reaper, combine harvesters etc are gaining popularity.
25) There is mis-match in prescribed per hectare demonstrations cost norms and the expenditure in input cafeteria provided to the beneficiaries. The farmers share has also been charged. Team has opined that the prescribed demonstrations cost of Rs. 7500/- should reach for the demonstration and the beneficiaries only.
26) The Light Traps have been reported as distributed @ Rs. 1800/- per unit. This amount has been deducted from Rs. 7500/- (the per ha demo. cost). The Team could not come across the physical installation of this equipment. Further feasibility of electrical Light Trap reach of electricity wire at each farm, quality of bulbs, the maintenance etc. issues were also pointed out.
27) Cluster demonstration of Wheat variety HI-1531 in Barodia village of district Ashoknagar was visited. Three irrigation were provided but performance was poor. Weeds like Hirankhuri, Jangli Jai and Mustard observed in demo plot.
28) Team also visited KVK Shivpuri. The On-Farm-Trials (OFT) of KVK to demonstrate Wheat, Musturd, Chickpea, Lentil, Linseed etc. were seen. KVK has also taken seed production programme of Chickpea variety JG-6, was found satisfactory. Integrated farming with fisheries, poultry, dairy, fruits and crops approach was appreciable. This KVK has good Liaison with SDAs but cluster demonstration of wheat and gram under NFSM allocated by DDA were not conduct.
29) Cluster demonstration of Chickpea variety JAKI 9218 in village Manipura, Block-Kolaras district Shivpuri was visited. Crop performance was poor due to water scarcity. Cluster demo. of Wheat variety GW 366 was also seen. Crop condition was good.
30) In Village Anantpur, **Straw-reaper** and in village Budha Dongar **Reaper-Cum-Binder** was seen which were provided under RKVY-2014-15. Beneficiary farmer of Reaper cum Binder was happy and earned Rs. 80000/- last year. It has given very good employment apart from economy of scale.

31) Cluster demonstration of Chickpea variety JG-16 was seen in Guna block of Guna district. Demo plot was undulating, sowing operation adopted across the slope which is useful for soil and water conservation. Inputs like Rhizobium culture, Molybedenum, PSB, Trichoderma and light trap were provided. Crop condition was good.
32) In village Torea (Guna), seed production of pea for private companies is popular. Team interacted with farmers involved in seed production programme of pea. Farmers are shifting towards [pea cultivations by diverting chickpea due to wilt/natural calamity etc. They also fetch better prices in pea.
33) Shri. Ganga Ram (Mob. 9770021988) farmer has taken Seed production Programme of pea (Var.-Arkil) for private companies under Non-NFSM Programme. He obtained the yield @ 40 qtls/ha. The quality of seed was very good. The crop was sown on Oct. 6-7 Feb.15. The Seed rate was 1 qtls/ha @ (Rs. 8000/qtls). The seed would be sold as per MoU @ Rs. 3500/qtls. The other cost of cultivation was DAP 23 bags @ (Rs. 1000/qtls), Urea 01 bags @ (approx..Rs. 300/-) The crop was sown Single box seed drill provided under NFSM.
34) Wheat cluster demonstration under NFSM programme with variety HI 8663 was visited in village Behataghat of Guna district. Crop condition was good and the programme is register for seed production. Rouging was adviced to the farmer.
35) Wheat and Chickpea demonstrations were not organised by NGO/KVK under Innovative component of NFSM programme. However DDAs allotted FLDs to concerned district KVK in visited district.
36) Team also interacted with beneficiaries of Irrigation pipe, Seed drill and Sprinkler set, provided under NFSM.
37) In visited districts it was observed that area under coriander increased this year due to less rainfall.
38) Team has concluded that the demonstrations were delayed organized due to delay in input delivery.
39) The entire area was suffering from water scarcity due to deficit rainfall subsequently less availability of water for irrigation.
40) Wheat variety WH-147 replaced with HD 2932, HI 1544, MP 1202 GW 322 & GW 366 in visited areas. Farmers reported a problem of **root aphid in wheat** as an emergence issue for the last two years.
41) Most of the area under dwarf varieties showed 5% mixture of tall varieties in visited districts. Hence short training of seed production may bring great change in farmers saved seed and their quality.
42) Farmers are not using seed cum fertilizer drill due to lack of awareness, mostly they are using single box seed drill where seed and further is mixed together which is affecting the germination of seed.
43) The farmers are not taking interest for lentil cultivation due to non availability of quality seed, wilt problem, institution support is required for boosting lentil cultivation.
44) Major varieties in visited area are Soybean-JS 9305, JS 9560, JS 335 & NRC 7, Mustard-JM 3, Laxmi & Pusa bold, Groundnut- GG 20, Blacgram- Ajad 2, T 9 & PU 31, Chickpea-JAKI 9218, JG 315 & JG 130, Wheat- HD 2932, HI 1544, HI 1531, GW 366 & GW 322.

45) Nine Seed Production Societies in Shivpuri districts taken seed production programme of various crops since last three years and fulfil the requirement of seed this area.

RECOMMENDATIONS/SUGGESTIONS

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.

1. To combat the situations arising out of deficient rainfall, lowering water table and increase in numbers of gray zone areas /blocks, two days orientation workshop for district level functionaries may be organized with Borlaug Institute of South Asia Centre, (BISA-CIMMYT), Lakhanwada, Jabalpur (M.P.) (www.irri.org; www.csisa.cimmyt.org).
2. Agricultural implement subsidy programme need more budget to propagate ferti-cum-seed-drill and other RCT among farmers. Problem of fertilizer chocking in pynes may be resolved at the level of CIAE/Directorate of Engineering.

   Farm implement beneficiaries, especially foe implements with > 40,000/- subsidy, should be mandatorily encouraged to formation of User Groups involving 7-11 farmers to enhance the level of mechanization and also to bring the SMF groups to benefit with higher amount of subsidised implements like Rotavator, Straw-Reaper-Cum-Binder etc.
3. 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.
4. The seed grower societies may be facilitated and advised to get seed indent of appropriate crop/varieties. 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.
5. 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.
6. The R.C.T. Tools beneficiaries be motivated to formulate a Machinery User's Group of 10-15 farmers extending benefits to SMF on Custom Hiring basis.

   The detail of programme should be exhibited / written over the implements, and impact assessment of farm mechanization should also be done in the subsequent years by the DDAs and state for making success story/documentation. It is observed that no impact assessment has been conducted by any of the district at the behest of district Agriculture Officer.
7. 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.
8. GPS data of beneficiaries plot may be given for all the field demonstration programmes in their respective official documents for its authenticity, verification and wider publicity.

9. The information on Programme/activity/list of beneficiaries must be displayed in the Panchayat Bhavan/ other common place. This observation also awaits ATR.
10. Farmers and field level extension worker should be educated about seed indent system so the appropriate seed can be made available to the farmer well in time.
11. Suitable orientation training is required for district/block level extension worker on conduction, supervision and Monitoring of cluster demonstration programme.
12. Documentation of Programme (Demonstration) should be in a common format for all the district consisting of all information like Name of beneficiaries, crop cafeteria, supply of inputs, field day organised Input distribution, Field operations, Monitoring and supervision and Crop Cutting Experiments, so that this information may be utilized in future.
13. Looking to the bright future of Farm Mechanization, implement repairing and maintenance training programme may be organized at the village level so that minor maintenances can be done locally and someone may get expertise in this field and opt this as a profession.
14. 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.
15. The cluster demonstration beneficiaries should also be motivated and facilitated for taking seed production programme of their demonstration plot.
16. Permanent display board should be erected at the cluster demonstration site with all relevant information.
17. Necessary improvement in seed cum fertilizer seed drill is required for solving the chocking problem of fertilizer.
18. The training programmes under NFSM were not organized in Ashoknagar and the reason told that no advance provided by treasury which may not be justified reason. In Shivpuri and Guna training programme organised but beneficiaries of cluster demonstration not benefitted. One orientation training before the crop season and another as field day should have been organized. Otherwise these demonstrations cannot be rated as demo organised. The funds utilized under such incomplete demonstration may be audited as "not properly utilized".
19. 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.
20. Ridge bed planting of lentil and use of sprinkler for irrigation may be reduced wilt problem in lentil.
21. Misconceptions of farmers & extension workers about the irrigation system as flood irrigation is more profitable as compare to sprinkler irrigation in their soil type. Need to be change farmers mind set through extension. It should be well established facts through demo.
22. 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.
23. Potential increase in area under irrigation by way of intervention of efficient water application tools (Sprinkler, Pipes, Pumpsets, Rain gun) need to be compile in order to evaluate the impact these interventions.
24. There is urgent need of impact evaluation by NCIPM for each district on the efficacy utility, practicability and quality of Electric Light Trap over Solar Light Traps by cost cuttings on NFSM Cluster demonstration component of Rs. 7500/- per hectare.

25. District-wise farmers share taken due to difference in input cafeteria an overall impact on quality of cluster demonstrations owing to this diversion an use of the savings may be obtained from the state for further assessment and future planning of such central scheme.
26. The state may also provide the details on total hectares of cluster demonstration on wheat, pulses etc. registered with SSCA for seed production.
27. 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.
28. Single box seed drills should be replaced by double box seed drill (Seed-cum-fertilizer drill).

CHHATISGARH: NLMT-NFSM KHARIF 2015

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 Samleswari, Indira Barani Dhan-1, Chandrahasni introduced in intercropping with Arhar in upland rainfed condition.
3. Paddy varieties PKV-HMT, IGKV-12444, IGKVR-2, IGKVR-1, NDR-8002, Karma Mashuri introduced in Cropping System Based Demonstration (CSBD).
4. There is ample scope to establish pulses in rice fallow lands. Uniform/Single types of nutrients have been distributed (eg. ZnSo4, FeSo4 & Sulphur) whereas the varied eco-situations such as low land or upland always vary in their available soil nutrients status. which shows that it's a blanket recommendation without Soil Test Report.3
5. In situ Soil Moisture Conservation technology has been adopted through BBF.
6. Farmers received inputs but lack awareness about the technology, seed rate, fertilizer doses and variety under demonstration in Jashpur and Ambikapur district.
7. The farmers generally do not prefer tur as sole crop but preferring to grow as intercrop. Local initiative in visited districts are Power tiller, Reaper and Construction of godowns etc. The achievement under local initiative however, is nil in visited districts. The poor progress is also observed at state level under local initiatives.
8. 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.
9. Manual Transplanting of rice is becoming very expensive, equipments like paddy trans-planter etc. need to be popularised.
10. The participation in cluster demonstration by NGO, KVK etc. are negligible or nil. The team recommends the participatory approach in organization of demonstrations.
11. Team observed unavailability of early variety seeds, also the varieties within 10 years of notification in Paddy, Pulse and Coarse Cereals under NFSM.
12. Other initiatives in visited districts like Value chain integration of small producers, assistance of custom hiring centres and marketing support for pulses and millets is nil in visited districts and disappointing state level.
13. Display boards were found installed properly at each cluster demonstration with all necessary information like date of sowing, area, variety, inputs, number of farmers etc mentioned.
14. Team interacted the women farmer *Smt. Neela Devi Ratre Village-Ranbhatha Block-Pussore* , a paddy cluster beneficiary who is too much interested in new technology.Such farmers may be prepared as extension agents.
15. ***Kelo group*** started organic farming three year back as informed that farmers are adopting new agro-techniques (organic farming) for achieving higher yield of paddy but accreditation of organic produce and its marketing has become a bottle neck.
16. About 6930 women are benefitted through various training during 2015-16 resulting in coverage of 1340.22 ha fallow land for cultivation by women farmers in Ambikapur district.

17. Seed production programme of paddy crops taken by 586 Women Self Help Group in 1805.4 ha during 2015-16 in Ambikapur district. Women groups are working very well, so it can be promoted in all districts.
18. During 2015-16, a total of 1866 soil samples were sent for analysis by DDA, Jashpur, results to these are still awaited.Thus the demonstrations have been conducted without soil test based fertilizer recommendation.
19. ***Interacted with beneficiaries of FLD-Rice*** Shri Baidnath Karav, Amrit Karav, and others Village- Narbadapara, Block- Ambikapur. They informed that only 5 kg seed was provided to them, other inputs were arranged by them at their level. The field day was was also not organized till date.
20. ***Visited another cluster of FLD-Rice*** area in 10 acre under Hybrid Rice KRH-4 sown in line transplanting. Crop condition was good. Blast occurrence was noticed. Average Tillers 10-15 per plant. With similar status of input, even the demonstration display board was not put at the site.
21. Shri Rajesh Chauksey, SMS (Soil Science) and Mrs. Rajani Dharmendra Agashe SMS (Extension), KVK, Ambikapur informed that the FLD not conducted as per guideline due to release not received till today.

SUGGESTION/RECOMMENDATIONS

1. More attention need to be given on inclusion of new varieties under seed chain, organization of seed production programme, formulation of seed rolling plan for next five years.
2. Recently released varieties/pre-released varieties should be given preference under seed distribution, demonstration etc.
3. Team realized the benefits of FPO and suggested to popularize it in a big way.
4. To increase the production of the pulse and cereal crops, irrigation facilities should be increased through Farm Ponds, Sprinkler sets and drip irrigation systems. Promotion of mechanised farming such as ridge and furrow, BBF etc.
5. In rural area, construction of godown for storage, value addition facilities like cleaning/grading. Dal mills, processing plants etc. need special promotion to fetch good prices, economic benefits & increasing the living standard.
6. The Planning of demonstration should be done well in advance. The package of practices for new varieties should be provided to field functionaries with wide publicity.
7. The nutrient/micronutrients etc. should be soil test based, recommended time of irrigation, proper layout, sowing of test as well as check variety at the same time, need to be given more attention during the organization of demonstrations.
8. The staff involved under National Food Security Mission needs further improvement in terms of their skill upgradation in laying out demonstrations although few demonstrations were found more than satisfactory/in good shape
9. Team observed enthusiasm among staff and farmers during the visit. However, it requires intensification.
10. The team feels that strict and frequent monitoring at state/district level is essential for ensuring the flow of fund & interactions so as to increase effective TOT to targeted beneficiary.

11. The vacant posts of District Consultant, Technical Assistants provided under scheme needs to be filled up immediately.
12. The scheme has time bound targeted objectives, so more attention need to be given at Head Quarter as well as district level on implementation of the scheme to fulfil the same. The DFSMEC meetings should be held regularly and the DC who is also the Chairman of the NFSM DFSMEC, should have a wrap-up meeting with the NLMT.
13. Promotion of local scented land races (Dubraj sel.1, Badshabhog sel 1, Tarunbhog sel-1 released by SVRC in 2015, should be emphasised in organic farming. And also promotion of organic poha by local bold seeded rice variety (Chepti gurmatiya & Barhasal).
14. SHGs especially women's can be encouraged for organic farming. Team realised that the involvement of women in agriculture increase self confidence of women's and decrease wine consumption in visited village of Ambikapur as benefits of schemes given to women's farmers on priority basis.
15. There is need to promote Oilseed crop like ground nut in light soil in Ambikapur and Jashpur district.Simlarly Potato seed production programme can be taken at *Main Pat* area of Ambikapur district.
16. Only recommended varieties / Hybrids should be used in demonstrations.Nutrient rich cereals and pulses viz., high Zn and Fe varieties developed recently, should be incorporated under such demonstrations.
17. Under SRI demonstrations all recommended practices should be followed carefully. Similarly, according to land situation and infestation of insect/pest resistance varieties, drought tolerant variety of **Red Rice**., India's 1st high zinc variety developed by IGKV, Raipur, etc. should be incorporated under NFSM demonstrations.
18. Seed is the major and basic input of agriculture as supply of quality seed not only increases the yield but also checks the disease and pest infestation etc. Each varietal demonstration should be registered in seed production programme.
19. Pure seed can also be produced in self pollinated crops in NFSM/other demonstrations.
20. There is need to introduce inter crop with pulses-pigeon pea to increase production of pulses to provide a cushion for risk bearing capacity against the crop loss due to natural calamities at one side and to enhancing the soil productivity on the other.
21. Farmer's perception of use of more fertilizer to get the bumper crop yield ,need to be changed by advocating /demonstrating balanced fertilizer on the basis of soil testing report and demonstrating use of the green manure crop i.e. Dhaincha (*Susbenia aculata* and *rostata*) for sustained the soil life.
22. Organic farming may one of the best alternatives for visited tribal districts like, Ambikapur, Raigarh and Jashpur where fertilizer consumption is observed to be very low.
23. *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.
24. On Coarse Cereals /Millets, there is need of identification of niche areas, bridging yield gaps through availability of quality seeds of promising location specific varieties both grain and fodder varieties/hybrids; streamlining seed production ;listing the best management practices etc.;

25. Labour is the main problem in visited areas, need attention of the CIAE/ CIPHET (ICAR) for development of suitable machines to help and reducing the cost of cultivation, output and value addition to fetch better prices.
26. Introduction of suitable high yielding varieties, introduction of soil and water conservation techniques, crop rotation, crop diversity, organic farming and introduction of mechanized farming is the urgent need for sustainable agriculture. Wild rice eradication, soil amendment, integrated pest management for insect, diseases & weeds are the production constraints lacking in the demonstration, it should be considered.
27. Farmers are showing interest in adopting novel techniques in Agriculture. Mode of input availability and present system of govt. subsidy should be simplified, quality assurance of inputs and their availability should be provided in the form of demonstration kit. GPS data of beneficiaries plot may be given for all the field demonstration programmes in their respective official documents for its authenticity and verification.
28. Potential increase in area under irrigation by way of intervention of efficient water application tools (sprinkler, pipes, pumpsets) need to be compiled in order to evaluate the impact of these interventions. The subsidy benefits under the interventions of efficient water application tools, including 3 HP electric pump, is not given to farmers and need to be extended to all categories of farmers on pro-rata basis.
29. 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.*
30. For wider publicity and long lasting impact of demonstrated activities (cluster/implements, variety) display of flexi boards both at village panchayat buildings and demonstration site, is highly recommended**.**
31. Herbicides (weedicides) are well known among farmers but with limited knowledge, the Team therefore recommends to organize a good number of demonstrations on available herbicides use (other than regular) as continuous use of same herbicides create tolerance in weeds and hence replacement after every 2-3 years, should be the strategy under state NFSM plan.
32. The earlier popular *Rice-lathyrus cropping system* is now diverting to *rice-gram system.* Lathyus 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 r*ecommended dose of fertilizers to harness (15-20 q/ha) yield potential in rice- gram sequence.

Wrap-up meeting

1. The Team also had a wrap-up meeting with Shri. S. R. Verma, Director NFSM at Bilaspur on 11.09.2015.
2. To establish and sustain the SRI cultivation and pigeon- pea- bund cultivation in the state, the SAU may be advised to devise the technology package modified package of SRI suited to C.G.
3. State in view of varied Agro-eco-situations of Chhattisgarh.
4. The parallel district level / block level extension functionaries like ATMA, DDA, KVK need to conduct participatory mode of Demonstration. Reputed NGOs may also be given the participation in TOT activities under NFSM.
5. The future need of Resource conservation technologies need Mechanism, CHC, is the need of the hour for CG state.

6. Ensuring seed rolling plan and availability of quality seeds of wilt resistant cultivars of pulses, inclusion of short duration varieties of paddy and Mid to early variety of pigeonpea to increase cropping intensity, seed treatment of pulses with *Trichoderma*, mandatory follow-up of IPM in place of sole dependency on pesticides, is strongly recommended.
7. 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.;
8. In rice, the System of Rice Cultivation under SRI need suitable agronomic modification for varied Agro-eco-situations (AES) of Chhattisgarh. The contiguous fields with high outer bunds, flooded with water have a system of drainage continuously from one field to other involving whole Rice area. The Technique of SRI need suitable adjustment for Chhattisgarh conditions. It was observed that under SRI spacing was little wider (25 X 25cm) which need to be according to the varieties with high tillers.
9. Research attempts needed for improved package of practices, width of bunds, spacing, seed rate, IPM etc to sustain the bunding system of pigeonpea cultivation.
10. Introduction of suitable high yielding varieties, introduction of soil and water conservation techniques, crop rotation, crop diversity, organic farming and mechanized farming should be considered for sustainable agriculture.
11. The SAUs may be advised to ***''standardize the cropping systems''*** round the year, based on varietal selection, of *rice-fieldpea-wheat-moong/urd cropping* to accommodate the sowing time and management of crop duration based on the available agro-resources.
12. SRI cultivation technique of paddy, with varied AES in all the 03 Agro-climatic Zones of the state, need suitable modifications in consultation with the IGKVV, Raipur (CG) SAUs. The input cafeteria prescribed for cluster demonstrations under NFSM should specific and may also differ from one Agro-eco-situation (AES) to other.
13. To sustain the bund cultivation of Pigeonpea, the conduct of cluster demonstration need a perfect standardization with the help of SAUs/KVKs for each districts. The package of practices, standard width/ size of bunds, seed rate, method of sowing and most suited time/sowing window need to be worked out. August sown pigeonpea crop encounter with moisture stress to adversely affect production.
14. To control prominent weed such as *Saccharum spontanem, Ageratum conzoidos, Pathenium hysterophorus, Eclipta alba, Blunia oxidenta, Ocimum sanctum, Commelina bengalensis, Cleome viscose,* pre-& post emergence weedicide should be demonstrated effectively.
15. In view of Farmers' intent to go for novel techniques in Agriculture, more aggressive extension transfer and IT enable technology transfer and information system is the demand of the time. GPS data of beneficiaries plot may be given for all the field demonstration programmes in their respective official documents for its authenticity and verification.
16. Economics of cost of cultivation both from the existing and latest technology should be worked out. Cost:Benefit ratio of rotavator, power tiller, paddy transplanter and other such high cost machineries should be regularly brought out by state Directorate of Engineering/IGKVV, Raipur. The documentation of best practices, with reduced input costs should be published under NFSM for further replication across the state/country to motivate the farmers.

17. GPS data of beneficiaries plot may be given for all the field demonstration programmes in their respective official documents for its authenticity and verification and the name of scheme and relevant description should be written over the implements.
18. The NFSM programme should be replicated in KVK & NGO for comparison. Involvement of Village Panchayat is useful in deciding the cluster demonstration site.
19. The organic growers in the state may be facilitated in terms of the accreditation, marketing and strengthening of the organic manures, vermin-compost preparation and skill up-gradation etc.
20. 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.*
21. Under **local initiatives** Godown, Reaper & Power tiller have been distributed, processing, value addition, control of wild animal menace etc should also be thought of under this component.
22. Economics of SRI cultivation in Chhattigarh such as cost of cultivation, total production etc. should be studied at the end of demonstration to ensure sustainability of the system, as also to conclude its suitability for Chhattisgarh.
23. Under **local initiative** to promote value addition/processing by giving mini dal mills to SHG/FIG may be taken up to increase livelihood through enhanced processing activities with custom hiring component and uplift the socio-economic status of tribal farmer.
24. The state Mission's Director has suggested on inter-componential change flexibility at the level of 30% from the existing 20% so as to intervene on inter location specific requirements in a districts.
25. About 80% farmers in the state small & marginal and average land holding is below 0.4 ha Criteria for subsidy may be reduced from 0.4 ha to 0.2 ha. The team suggested diversified cropping and integrated farming system should be adopted in the visited districts as well as in the state so that risk minimizing in agriculture and more employment generate in this sector.
26. Soil testing kit permitted in programme where soil testing facility not available subject to complete authenticity, accuracy in results, economic viability and feasibility. As 150000 soil sample testing capacity is required and only testing capacity available 90000 in the state.
27. Subsidy limit amount permitted in place of subsidy limit Rs or 50% of the cost which is less.

CHHATISHARH: NLMT-NFSM RABI 2015-16

OBSERVATIONS

1. Coverage and production during Kharif and Rabi 2014-15 are given at Para No.6.2.
2. State has received actual rainfall at 1008.9 mm against the normal of 1317.0 mm. The visited Sarguja division has received 838.92 mm rainfall against 1510.0 mm i.e. deficit rainfall.
3. Visited division comes under Northern Hills Agro-climatic zones, the topography is undulated, normal rainfall is high (1510 mm) against the state's average (1317 mm), but, irrigation is only 11 %. It means agriculture is totally depends on monsoon. Major soils are Alfisol (29%), Vertisol (28%), Inceptisols (28%), Entisol (13%) & Alluvial soil (2%).
4. Net sown area of visited division is about 8.35 lakh hectare, which is, 29 % of geographical area & 17.5% of state net sown area. Cropping Intensity is 135%.
5. In general poor/stunted plant growth was observed of almost all Rabi crops Gram, Wheat, Lentil, Pea, Mustard, Linseed in almost all visited district due to uneven rains. Nov. to Mid Dec. sown crops were at harvesting and threshing stage i.e. Field pea, Linseed, Mustard and Lentil have been observed in the field. Late sown crop of Lentil, Gram, Wheat and Linseed were at maturity/harvesting stage.
6. The team interacted with the farmers and also all KVKs In-charge to see the FLDs. At KVK-Korea/Surajpur/ Balrampur. They informed that the following major technology/interventions have been adapted in conduction of FLDs on Chickpea, Field Pea, Mustard & Rapeseed and Linseed.

Field Pea	**Chickpea**
Line sowing/Zero till drill	Line sowing
Bio Fertilizer Application: *Rhizobium& PSB @ 5 gm per kg seed* Bio-agent application: Trichoderma @10 gm per kg seed	Bio Fertilizer Application: *Rhizobium& PSB @ 5 gm per kg seed* Bio-agent Application : Trichoderma@ 10 gm/kg seed
Pre-emergent herbicide application: Pendimethalin 30 EC @ 750 ml per acre	Pre-emergent herbicide application: Pendimethalin 30 EC @ 750 ml per acre
Variety - Paras	Variety - JG-11
Date of sowing - 20 oct - 15 Nov.2015	Date of sowing - 15 Oct –15 Nov. 2015
Linseed	**Mustard**
Line sowing with seed cum fertilizer drill/Zero till drill	Line sowing with seed cum fertilizer drill
Bio Fertilizer Application: *Azotobacter& PSB @ 5 gm per kg seed*	Bio Fertilizer Application: *Azospirillum& PSB* @ 5 gm per kg seed Bio-agent Application: Pseudomonas @10 gm per kg seed
Bio-agent Application: Pseudomonas@ 10 gm/kg Pre-emergent herbicide Application:seed Pendimethalin 30 EC @ 750 ml per acre	Pre-emergent herbicide application:Pendimethalin 30 EC @ 750 ml per acre
Variety - Kartika, JLS-9	Varieties - C.G. Sarson, RH-749, Bharat Sarson-2
Date of sowing - 25 Oct. - 25 Nov.2015	Date of sowing - 30 Oct - 20 Nov.2015

7. The Team also visited, NFSM & NMOOP funded FLDs conducted by KVKs (Korea, Ambikapur/Surajpur & Balarampur) during NLMT visit. The demonstrations conducted by

KVKs are satisfactory, as providing all inputs to beneficiaries and proper guidance in time. However, publicity and more awareness is required.

8. In field pea demonstrations, admixture noticed in the variety of Vikas for plant type. Whereas, other variety Paras, found genetically pure in all the visited demonstrations.
9. Farmers of visited area have used Azadaractin (Neem based insecticide) against stem borer, gall midge and BPH on rice in Kharif season and sucking pests like aphid, thrips and pod borers on pulses in rabi season. As this insecticide is not much more effective in managing these pests, use of IPM module with need based chemical insecticides i.e. Carbofuron 3G @ 33 kg/ha against stem borer and gall midge and Imidacloprid 200 SL @ 600 ml/ha for BPH in rice whereas, in pulses Profenophos 50 EC @1.5 lit/ha against pod borers have been suggested to the farmers.
10. In most of the cases at the time of visit, district/block officials/staff could not show documentation related to beneficiaries and details of demonstration/implement etc. NLMT felt the poor awareness level of farmers' beneficiaries and non-beneficiary and also grass root level officials/staff.
11. Cropping System based Cluster demonstration of Chickpea var. JAKI- 9218 (DOS-6th Dec., 2015) with IPM package in District-Korea, Block-Baikunthpur, Village-Bhunde was visited by Team. Farmer Shri Ashok Kumar informed that the previous crop was paddy. The crop was sown through the seed drill after treating with culture. Crop was at flowering stage and in good condition. However, crop may not exploit full potential due to delayed sowing..
12. Cluster demonstrations of Field Pea var. Vikas grown after paddy variety DRH-2 District-Korea, Block- Baikunthpur, Village- Bhunde, was observed by the Team. Crop sown by line sowing through seed drill after seed inoculation with culture, using micro-nutrient. Sowing date was 10th Dec., 2015 and crop at maturity stage. ***Weeds observed in demo-field are Chenopodium album and Jangali jai (Avenafatua).***
13. Farmer Shri Raj Kumar informed to team that he used first time seed drill for sowing, and green pod sold in market. He told that he has applied lime for soil pH correction and PSB for seed treatment. For weed control he also has practiced pre-emergence weedicide, however, he was not able to tell the name of weedicide.
14. Another demonstration also visited in Block-Manendragarh of field pea var.–Paras. Farmer Shri Rai Singh told that he applied all inputs given under demonstration. Crop was at maturity & ready to harvest.
15. Cluster Demonstration of Linseed variety-JLS-9 under NMOOP was visited in same village in 5 hectare. Farmer informed that the inputs other than the seed were not provided at sowing time hence demonstration could not be executed properly. Crop was in poor condition, many weeds observed in demo plot. Crop was at maturity stage.
16. Cluster demonstration on intercropping Pigeonpea with Groundnut with 1:4 ratio. Crop already harvested. Farmers are happy as they got good yield from both the crops. ***In the Village-Parsagudhi, District-Balrampur 140 farmers in cluster mode planted pigeonpea intercropped with groundnut in 1:4 ratio and found it profitable.***
17. Front Line Demo. of Field pea variety-Paras conducted by KVK, District-Korea Block-Baikunthpur, Village- Khada visited by the Team. Crop sown during the2nd week of November

month. One irrigation applied by sprinkler method in the last week of December. At the time of visiting crop has been harvested. Display board not installed in demo. plot. Farmer Shri Balram Prasad informed that he has applied the fertilizer based on soil test. He used zero till seed drill for sowing of field pea.

18. Front Line Demonstration of Chickpea var. JG 11 conducted by KVK, Korea visited by the Team. In village Nagar Block- Baikunthpur 10 acres chickpea demonstrations were found conducted integrating important technological interventions like soil test based fertilizer application, seed treatment with fungicides, PSB, culture and application of pre-emergence weedicide etc. A farmer Deepak Sharma told that a field day was also organized on increasing pulses and oilseed production. Sowing time was 1st week of November. Crop was sown by line sowing method. Display board was not installed in demo. plot. At the time of monitoring, crop was at maturity stage, expected yield 12 qtls/ha.
19. Front Line Demonstration of Mustard var.-Bharat Sarson/CG Sarson 2 (RH 749), conducted by KVK-Korea, Block-Baikunthpur, Village-Dakapara. DOS was mid. November. Treated seed was sown by line sowing method. Crop at maturity stage, expected yield 15 qtls/ha.
20. Front Line Demo. of Mustard variety Bharat/CG Sarso 2 (RH 749), conducted by KVK, Ambikapur /Surajpur visited by the Team. DOS-28th Oct., 2015.Display board not installed in demo. plot. Treated seed was sown by line sowing method. All inputs provided under programme like Pendymethylin, DAP, Insecticide etc. Crop at maturity stage, expected yield 17 qtls/ha.
21. Front Line Demo. of Chickpea variety JAKI 9218 conducted by KVK, Balrampur, Village– Parasgudhi, visited by the Team. Sowing in the month of 1st week of December. Treated seed was sown by line sowing method. Overall crop expression was good. Display board installed in demo. plot. 10 Pheromone traps were installed for monitoring purpose in 03 acre, which are not sufficient, as per recommendation (20-25/ha). No Pheromone traps were installed in remaining demo. area. Beneficiary informed that they applied seed 40 kg/acre due to germination problem in acidic soil. Also visit Linseed FLD var. Kartika (JLS-9) *Crop at flowering stage to capsule stage.*

FARM MECHANIZATION

1. Farm mechanization is picking-up in the state. Rotavator, Plough, Leveller etc. provided financial assistance of NFSM/RKVY, are also going for custom hiring at the level of beneficiaries. However, in Sarguja division, no seed drill available with the farmers even they have 10-12 tractors in a village.
2. In District Surajpur (Block-Surajpur, Village-Manpur), the NLMT visited one of the Multi-crop thresher machinery beneficiary Shri Abdul Gaffar. He got Rs. 40,000 subsidy (Total cost 1.75 lakh) under NFSM-Pulses during 2015-16. Farmer was very happy and expected he will recover total cost within 01 year as using on rent basis. Team also saw other implement Rotavator in Kurva village in same block & district. Farmer Shri Bal Naryan Dubey told that total cost of Rotavator was 85,000 & subsidy was 35,000 got through ***DBT.*** On implements not mentioned scheme & other details.

3. A Mini Rice Mill with the 80% financial support from State Government is established by Roshni Self Help Group in village Vidhma (Rajpur) was visited and found remunerative as explained by the **Group *President Smt. Dhaneswari Marawi.***

LOCAL INITIATIVES

1. Under Local Initiative component of NFSM (Rice and Pulses) - Construction of 50 Metric tonnes of godown on 50% subsidy or maximum up to Rs. 1.50 lakh financial assistance (storage structure) provision made by state department.

PREREQUISITE FOR AN IDEAL SEED GODOWN STRUCTURE:

Plinth: The plinth shall be generally kept about 80 cm above the finished ground level. The platform should be provided with an outward slope of 1 in 40 in order to prevent the rain water from getting inside the godowns through the doors. The platforms shall be preferably covered.

Drainage: Suitable drainage arrangements such as surface or underground drains to drain the rain water from the storage premises shall be made. Steel rat guards fitted to drain pipes and other attachments to the building should be at least one metre above ground level.

Doors: A door shall be provided preferably opposite each alleyway. The doors shall normally be steel rolling shutters. The doors shall be not less than 2.45 m X 1.83 m.

Ventilation: The ventilators shall be fixed 15 cm below the top edge of the wall measured from inside the godown. In longitudinal walls two steel ventilators should be necessary.

Strips: Hard metal strips should be fitted to the bottom edges of all wooden doors and their frames, and vulnerable windows should be protected with tight wire netting screens in hard metal frames.

Rat burrow fumigation: Put tablets of Aluminum Phosphide in each hole and burrow and block that hole by mud mixture to make it airtight.

i. Visited Seed Godown constructed under local initiative of NFSM–Pulses. Shri. Rajju Ram, Block-Surajpur, Village-Kailashpuri informed that subsidy received 1.50 lakh in his account through DBT (Direct Benefit Transfer).

ii. Visited Seed Godown constructed under local initiative of NFSM–Pulses. Shri. Lakhan Lal Rajwade, Village-Junapara, Block-Baikunthpur informed that total cost involved 2.0 lakh and subsidy received 1.5 lakh in his account through DBT (Direct Benefit Transfer). Also visited another Seed Godown of Shri. Baijnath Singh, Village-Salhi, Block-Manendragar was under construction. Cost incurred till visit 3.5 lakh. Project not completed. Norms of Godown was not followed by the beneficiary as he has constructed four rooms instead of hall and also not followed the rat protection, ventilation & doors.

Therefore, such type of farmers is not eligible for getting subsidy/govt. support, who are not follow the instruction for Godown construction.

C. **Kisan Gosthi**

iii. In all the visited districts Kisan Gosthis were also organised to have a feed back of farmers both under NFSM and Non NFSM beneficiary categories.

iv. In Village–Bhunde and Junapara Block–Baikunthpur, District-Korea, interactions in the Kisan Gosthi have revealed that the farmers not having seed drill for sowing even 9-10 tractors have in visited village. Farmers informed that they got subsidy in account through DBT. Most of the farmers/beneficiaries having account in in RRB & Cooperated Banks, Net connectivity not available in these banks however, subsidy transfer to the bank through demand draft by DDAs along with list of beneficiaries given to concerned bank. About 70

% farmers having KCC. Some policy to control stray cattle was major demand of farmers. Generally farmers grown safe seeds of old varieties.

v. In Village-Baghima, Block-Rajpur, District-Balrampur, about 30 farmers participated in the discussion, progressive farmers explained their views and problems in the sector. The Gosthi was followed by visit of Mini Rice Mill. The beneficiaries farmers belonging to nearby villages had brought views about the intercropping pigeonpea with groundnut is in 1:4 found profitable. All beneficiaries of cluster demonstration were happy. They also informed that the Tube wells are not success this year due to deficient rains. Inter-cropping is popular viz. Pigeonpea + Tomato and Pigeonpea + Soybean intercropping is in practice.

D. **Wrap up meeting**

i) The Joint Director Agriculture has fixed up a meeting of NLMT with the Collector and District Magistrate of Surajpur district, where in Collector being the Chairman of District Executive Committee of NFSM expressed his deep concern in executing NFSM programme in the district. Further, he informed that the district administration is promoting organic farming and small vegetable garden around schools which are being maintained by students themselves. He also has emphasized to introduce integrated farming system approach in Surajpur district.

ii) Team briefed about the visit feedback like lack of awareness, poor record maintenance, less adoption of improved technology even farmers not using seed drill, scope of intercropping of pigeonpea with paddy and other crop and organic farming need integrated approach for sustainable agriculture development in the district. Field pea, Mustard, Lentil should be popularized in place of gram. Infrastructure about soil testing lab.

iii) On completion of visit a Wrap-up meeting was held in the office of Joint Director of Agriculture, Sarguja, Government of Chhattisgarh. The meeting was attended by all personal of NLMT, besides all 05 district officer/officials of Sarguja division. However, NLMT visited only 03 districts.

iv) In concluding meeting at the end of NLMT visit with the Joint Director Agriculture in the presence of DDAs and ADAs Dr. Shivhare shown concerned on the following points:

Lack of awareness of improved agricultural technologies. Introduction of seed drills in the districts.
Integrated approach of KVK and State Agriculture Department.
Proper display/publicity of government schemes and programme.
Distribution of extension literature at massive level.
Strengthening of water conservation programme to increase cropping intensity. Intercropping for environmental risk management.

Intrusion of farm machineries in a larger mode.

Economics of all the technologies need to be developed and highlighted. Replace of old varieties with newer.

RECOMMENDATIONS / SUGGESTIONS

1. The real need of the state like CG, with maximum rice fallow potential, is perfect standardization of utera/relay crop technology for different district including their blocks on Agro-Eco-Situation (AES) basis. **The crops like Linseed, Mustard and Urd have been a relay practice traditionally and are being taken by farmers.** The Team has noticed that there is an urgent need of Research/extension efforts on this count. Availability of Certified seeds of these crops of recommended varieties and identification of niche area is strongly recommended. The programme may be taken under Local Initiative component also.
2. It is true that Surguja Division has undulating rolling topography with light textured acidic soil. Region receives high rains but has limited irrigation facilities particularly for *Rabi* crops resulting low cropping intensity. Hence, for increasing productivity and cropping intensity call for continuous attempts for water conservation and its utilization. Provisions are made under NFSM Rice and Pulses for resource conservation and efficient water application tools that to be utilized by the farmers.
3. There is a lot of scope for pulses and oilseeds (being less input consuming and high return/high value crops) crops in *Kharif* as well as in *Rabi* season. Since soils are acidic therefore, application of lime should be encouraged and crops like fieldpea, lentil, linseed and mustard in *Rabi* season, urid and pigeonpea in *kharif* season should be promoted. Intercropping of pigeonpea with rice under rainfed upland ecosystem needs promotion.
4. It is observed that weeds are a major problem in most of the fields. There is need to train the farmers for proper management of weeds as about 30% yield is observed loss due to weed only. Weeds are major constraints in pulses cultivation also, there is urgent need to have an effective post emergence herbicide.
5. Newly developed production technology of Chickpea with promising varieties needs to be demonstrated among the farmers. Other varieties like RVG 202 and RVG 203 which are high yielder, resistance to multiple diseases should be demonstrated in these areas. There is a lot of scope of increasing chickpea cultivation.
6. Farmers should be motivated for adoption of the seed drill, zero tillage, Broad Bed Furrow Planter (BBFP), Precision farming and MIS for water use efficiency.
7. There is a lot of scope of increasing area under double cropping with pulses in Rice based cropping system of Chhattisgarh. Rice fallow can be converted into Rice followed by chickpea, lentil, wheat, linseed and pea, if suitable production technology/variety is given to the farmers.
8. Rice, followed by mungbean / urdbean in utera followed by wheat/chickpea can be promoted under irrigated conditions.
9. Small and marginal farmers should be targeted more under NFSM activities along with rich and large farmers. Seed drill, Zero till seed drill & happy seeder should essentially be made available to the farmers. This will be highly helpful in establishment of Rabi crops in the visited division and state successfully.

10. Popularization of new variety of **Chickpea** (JG 16, RVG 202, RVG 203); **Lentil** (JL3, DPL 62 (Sheri), IPL 316, 814, RVL 31); **Pea** (Indira Matar-4); **Mungbean** (Pairi, TARM 2, Pusa Vishal, Pragya Mung); **Urd** (Pant U 31); **Linseed** (Indira Alsi-32 (RLC-81), Kartika (RLC 16), Deepika (RLC 78) not only need to be popularised but seeds production programme of these varieties should also be organised.
11. Poor farmers are still growing their own old traditional varieties of Lentil, Mungbean / Urdbean needs to be replaced with new varieties. Dissemination of pulse production technology in state is very poor and requires more attention for maximization of yield of pulses in rice based cropping system.
12. Chickpea cultivation with traditional practices is an old practice, interventions of good technologies coupled with trainings will only boost-up the productivity of this crop. It is therefore, advised that serious efforts are needed to provide full recommended package in conduction of the demonstration.
13. The DFSMEC is therefore necessarily need to be sensitized in districts. Apathy of district Administration towards Centrally Sponsored Schemes on agriculture sector may defeat the sole purpose of DFSMEC, and thus the whole scheme.
14. A mis-conception on spreading Bathua weeds while using certified seed of gram, need clarification by extension staff. The fact of the matter is that sufficient moisture and frequent irrigation under Rice based cropping system give rise to the germination/survival of bathua (*Chenopodium album*).
15. The extension functionaries need effective orientation/training on weed occurrence phenomenon and its control methodology. Similarly to control thrips infection, **Curacron (Propenophos) @ 1.5-2 litre/ha** was being used by the faremers but it was not giving effective result. IGKVV recommended insecticide i.e. **2% DAP solution + Emidachlor (Confidor)** a highly systemic insecticide to control all sucking pest need to be demonstrated.
16. Small farmers are fully convinced with the advantages of farm mechanization, however, due to poor resource base and financial constraints they are not in position to match farmers share in such type of programmes. The state may provide top-up subsidy from state plan to support these farmers.
17. Safe and scientific storage structure/godowns at domestic levels needs to be implemented as per guidelines as major rodent problem should be taken care. The state local initiatives may also target distribution of Metal bins of different capacities ranging between 2-10 quintals.

    In response of monitoring feedback DDA, Koriya issued explanation letter to SADO, Baikunthpur, copy of issued letter is enclosed.
18. Interactions with University scientists have revealed that lot of state specific deliverable technologies are available eg. Zero tillage wheat cultivation, Rabi Pigeonpea, Indira Field Pea, Moong varieties etc. These technologies are needed to be propagated and transferred to farmers field under the ongoing development programmes.
19. The details on the allocation of FLDs for all crops such as number of demonstrations, crops, budgetary allocation and organizing agency etc. should be known to the State Nodal Officer for better coordination with Research organizations in getting the benefits of the demonstrated technologies. Presently, the State Department of Agriculture, including DDAs are not aware of such programmes.

CHHATISGARH: NLMT-BGREI KHARIF 2015

Observations:

1. The District Level Monitoring Team has not been formulated in the visited districts.
2. During the visit certain observations were brought to the notice of SDA. A letter has been issued to BGREI districts for follow up action vide State Deptt. of Agriculture's letter No. Hari. Kra. /2015-16/387 Raipur dated 23.09.2015 at Annexure- VII (Copy enclosed). 10.3. As per advice of NLMT, about disease/insect-pest infestation a team of two scientists, from IGKVV, Raipur was deputed for inspection of disease and insects and their control in cluster demonstration of paddy in Balod district.
3. Paddy variety Durgeshwari (IGKVR-2) and PKVHMT has been given in cluster demonstration in Balod district. Attack of fungal disease was noticed.
4. Generally, the paddy crop condition was good under irrigated condition in Balod district with 40% of cultivated area under irrigation. However, due to long dry spell after 15 July to mid of September, crop is adversely affected under direct line sowing (DSR).
5. **Panicles** of Durgeshwari variety of Paddy crop has been attacked by fungal disease and it was observed that approx. 5–8% grains/panicle are chaffy and discoloured. Hence, monitoring by Plant Pathologist has been suggested to control the disease.
6. Summer rice area of about 3000 ha is reported to be gradually converted in Rabi Maize in Kanker district.
7. A Godown, constructed during 2014-15 with a subsidy of Rs. 1.50 lakh at a total expenditure of Rs. 4 lakh in village of Bundeli, (Dondiluhara block, district Balod) under NFSM Scheme was also visited. The Godown is being used for storage of paddy grains and fertilizers and is providing very useful for farmers.
8. About 20-25 % farmers use Lehi method of Paddy cultivation during kharif season in Kurud block in Dhamtari district. The farmers perceived that Lehi method give 8-10 days early maturity advantage.
9. A Minor Irrigation Tank (M.I.T.) with a total cost of Rs.24.86 lakh constructed during 2014-15 in village Charra, (Block Kurud, district Dhamtari) was visited. The catchment area is 10-12 hectare and connected area of 25 ha for irrigation as well as for use for animals and it is very useful for recharge of underground water.
10. Only 5 soil testing laboratories have been reported to be functioning in the state which are not sufficient for testing.
11. Seed Production programme of newly released varieties (<10 years old) is not being organized in the State, whereas there is shortage of seeds of paddy varieties within 10 years of notification.
12. The Agriculture Department has informed that out of 183 tehsils, 93 tehsils has been declared as drought this year.
13. The Display board has been installed on cluster demonstration along with requisite information.
14. Crop Coverage during Kharif 2015 and likely production prospects are given under Para 6.2.
15. No perspective plan was prepared for any of the check dam, Minor Irrigation Tank (MIT) area which is otherwise a pre-requisite for any of the soil and water conservation activity/programme, both as mid-term and long term strategies this point was highlighted during the previous NLMT also.

Recommendations /Suggestions:

1. Only newly released and resistant varieties of paddy should be recommended for next Kharif season for demonstration.
2. Soil testing both for micro and macro nutrients should be mandatory requirement to be followed before demonstration for balance dose.
3. District Level Monitoring Team (DLMT) need to be formulated and activated in the BGREI districts, involving the KVK Scientists.
4. Seed and other inputs for Rabi Season may be supplied in time for Cropping System Based demonstration.
5. For the last 02 years, the apathy of CRRI, Cuttak towards their monitoring of the BGREI in Chhattisgarh State being not nominating and sending their representation may be brought to the notice of DG, ICAR as the institution is not sensitised to provide a feed back.
6. A perspective plan, constitution of **water user committee** and number of diesel/electric pump-sets etc. needed should be a mandatory document before selection of site of check dam/Minor Irrigation Tank (MIT). These components should also be the part of construction estimate so as to increase the cropping intensity or other allied activities to enhance the livelihood of the people and sustain the development efforts.
7. The assets created under BGREI and implements machineries distributed should be properly popularised by erecting cement/GI sheet board at the site of infrastructure and by putting permanent sticker/marker on machinery indicating name of scheme, subsidy and year of execution etc.
8. The soil conservation functionaries should be advised to mandatory preparation of documents of the base line survey on the agronomic or other allied activities, socio-economic status of the beneficiaries of check dam/MIT area and the proposed cropping system or dove-tailing of the on-going programmes on Agriculture, Animal Husbandry, Dairying, Horticulture, Fisheries etc. in consultation with the agricultural extension functionaries.

ONGOING RESEARCH PROJECTS 2015-16

RESEARCH PROJECTS PULSES

S. No.	Name	Duration	Implementing Agency	Financial Outlay
1.	"Enhancing Lentil Production for Food, Nutritional Security & Improved Rural Livelihoods	2010-11 to 2012-13	ICARDA	2.70
2.	Enhancing grasspea production for safe human food, animal feed, and sustainable rice based production system in India	2011-12 to 2012-13	ICARDA	3.62
3.	Pre-breeding and genetic enhancement in breaking yield barriers in lentil and Kabuli chickpea and lentil through DAC–ICARDA-ICAR collaboration	2010-11 to 2014-15	ICARDA/IIPR	3.14 (2010-11 & 2011-12)
4.	Generation advancement and development of new genotypes through pre-breeding in Lentil and Kabuli Chickpea	2013-14 to 2016-17	ICARDA	2.96
5.	Enhancing lentil production in Eastern and Northern states for safe human food, animal feed, and sustainable rice based production system in India	2013-14 to 2015-16	ICARDA	3.90
6.	Enhancing grasspea production in Eastern and North Eastern states for safe human food, animal feed, and sustainable rice based production system in India	2013-14 to 2015-16	ICARDA	3.00

ADAPTIVE RESEARCH PROJECTS ON PULSES UNDER NFSM-PULSES:

Rs. in Lakh

S.No.	Name	Duration	Implementing Agency	Financial Outlay
1.	Development of suitable technology for increasing production of pulses in rice fallow	2014-15 to 2016-17	OUAT, Bhubaneshwar	80.37
2	Enzymatic Pretreatment in the processing of Pigeonpea	2014-15 to 2016-17	JAU, Junagarh (Gujarat)	59.50
3	Identification of salt tolerant chickpea varieties for coastal regions of Gujarat	2014-15 to 2016-17	NAU,Navsari, Gujarat,	28.71
4	Quality Seed Production for Higher Productivity of pulses through farmers participatory programme in Shiwalik foothills of Jammu region	2014-15 to 2016-17	SKUAST, Jammu & Kashmir	48.96

WORKSHOP/CONFERENCE/BRAINSTORMING/TRAININGS/MEETINGS SPONSORED/ORGANIZED BY DPD

Organization/Institute	Duration	Topic
CRDE-KVK, Ichhawar, Sehore, M.P.	7th -8th Oct., 2015	Production & Protection Technologies of Pulses Crops.
KVK-Raisen, Bhopal, M.P.	28th -29th Oct. 2015	
ICAR-CIAE, Bhopal, M.P.	3rd - 4th Feb., 2016	Pulses Development: Challenges and Opportunities in Central and Southern States.
IIPR-Kanpur, U.P.	9th-10th Feb.,2016	Promotion of pulses in nontraditional niches: summer cultivation.

WORKSHOP/CONFERENCE/ TRAININGS/MEETINGS/PARTICIPATION

Name	Organization/Institute	Duration	Purpose
Dr. A. K. Tiwari (Director)	NACS-New Delhi	7th -8th April,2015	To attend National workshop at NACS
	New Delhi	8th April, 2015	To attend the Review meeting of CDDs
	Ranchi, Jharkhand	22st-24th May, 2015	To participate Annual Group Meet on *Kharif* Pulses *(*Pigeonpea MULLaRP)"Developmental Issues including FLDs"
	PAU, Ludhiana -Punjab	30th Aug.-1st Sept. 2015	To attend the brainstorming meeting on promotion of pulses.
	New Delhi	21st Sept., 2015	To attend the CDDs Review Meeting.
	NASC- New Delhi	22nd -23rd Sep., 2015	To participate in National Conference on Agriculture for Rabi campagion-2015 NASC.
	CRDE-KVK, Ichhawar, Sehore, M.P.	7th -8th Oct., 2015	Production & Protection Technologies of Pulses Crops.
	KVK-Raisen, Bhopal, M.P.	28th -29th Oct. 2015	
	KVK, ICAR-CIAE, Bhopal, M.P.	15th Oct., 2015	Scientist Advisory Meetings at KVK-CIAE, Bhopal
	IIPR, Kanpur, U.P.	28th -29th Nov., 2015	To participate group meet on MULLaRP, Arid Legumes: ***An Account of Development Efforts***
	CRDE-KVK-Sehore, M.P.	12th Dec., 2015	*Krishik Sanghosthi*, Soil Health Card Campaign.
	KVK-Ujjain, M.P.	18th-19th Dec., 2015	Training programme of state extension functionaries.
	ICAR-DSR, Indore, M. P.	25th Dec. 2015	To attend the Soybean Kisan Mela at DSR

Name	Organization/Institute	Duration	Purpose
Dr. A.K. Tiwari (Director)	SIEAT, Bhopal, M.P.	18th Jan., 2016	Training programme for skill development & up gradation of technical knowledge of NSC staff.
	RAK, Collage Sehore, M.P.	23rd Jan., 2016	To Participation in one day Workshop on Tracking Improved cultivars adoption of Lentil in M.P.
	CIAE, Bhopal, M.P.	3rd to 4th Feb., 2016	Participation of two days National Seminar on "Pulses Development: **Challenges and Opportunities in Central and Southern States"**
	IIPR- Kanpur, U.P.	8th Feb., 2016	Tracking Improved cultivars adoption of Lentil in U.P.
	IIPR- Kanpur, U.P.	9th-10th Feb., 2016	To attend Workshop at Kanpur on Brain Storming Meeting on *"Promotion of pulses in nontraditional niches: summer cultivation*
	Sherpur, Sehore, M.P.	18th Feb., 2016	*Kishan Maha Sammelan-2016* ***(Prime Minister Programme)***
	RAK college, Sehore	23rd Feb., 2016	*Dalhan Diwas*, under India Morocco Food Legume Initiative Project (IMFLIP)
	RAK College, Sehore	24th Feb., 2016	Inugration ceremony of ICAR-IIPR, Bhopal & Bio-tech lab.
	Directorate of Agri. , Raipur, C.G.	17th March, 2016	BGREI, NFSM & Other Mission Proogramme Review Meeting.
	New Delhi	31st,March, 2016	Meeting of pulses Seed Minikits at Krishi Bhavan.
Dr. A.K. Shivhare (AD)	Vidhan Sabha Parishad, Bhopal	23rd -24th Sept., 2015	To attend workshop on Good Practices in Rural Development Sector under "Sansad Adarsh Gram Yojna".
	CRDE-KVK, Ichhawar, Sehore, M.P.	7th -8th Oct., 2015	Production & Protection Technologies of Pulses Crops.
	KVK-Raisen, Bhopal, M.P.	28th -29th Oct. 2015	
	KVK, ICAR-CIAE, Bhopal, M.P.	15th Oct., 2015	Scientist Advisory Meetings at KVK-CIAE, Bhopal
	SIEAT, Bhopal, M.P.	25th Oct., 2016	Training programme on " ICT in Agriculture Extension Management."
	ICAR-DWSR, Jabalpur-M.P.	14th -22nd Dec., 2015	To attend MTC on weed management in DWSR
	CIAE, Bhopal, M.P.	3rd - 4th Feb,2016	Participation of two days National Seminar on "Pulses Development: Challenges and Opportunities in Central and Southern States"
	IIPR- Kanpur, U.P.	8th Feb. 2016	Tracking Improved cultivars adoption of Lentil in U.P.
	IIPR- Kanpur, U.P.	9th -10th Feb.,2016	To attend Workshop at Kanpur on Brain Storming Meeting on *"Promotion of pulses in nontraditional niches: summer cultivation*
	Sherpur, Sehore, M.P.	18th Feb., 2016	*Kishan Maha Sammelan-2016* ***(Prime Minister Programme)***
	IEHE-Bhopal, M.P.	08th - 14th March.,2016	To attend Training programme on Analytical Tools & Techniques for Research.

Name	Organization/Institute	Duration	Purpose
Shri. Vipin Kumar (AD	PAU- Ludhiana, Punjab	1st -2nd Sept.,2015	To attend meeting on Rabi Pulses- Brain Storming Session.
	CRDE-KVK, Ichhawar, Sehore, M.P.	7th -8th Oct., 2015	Production & Protection Technologies of Pulses Crops.
	KVK-Raisen, Bhopal, M.P.	28th -29th Oct. 2015	
	ICAR-IISS, Bhopal-M.P.	14th -22nd Dec.2015	To attend MCT soil heath card at IISS, Bhopal
	CIAE, Bhopal, M.P.	3rd - 4th Feb,2016	Participation of two days National Seminar on "Pulses Development: Challenges and Opportunities in Central and Southern States"
	JNKVV- Jabalpur	28th Feb.2016	To attend workshop on FLDs .
Dr. A. L. Waghmare (STA)	PAU- Ludhiana , Punjab	1st -2nd Sept.,2015	To attend meeting on Rabi Pulses- Brain Storming Session.
	NASC- New Delhi	22nd -23rd Sep., 2015	To participate in National Conference on Agriculture for Rabi campagion-2015 NASC.
	KVK, ICAR-CIAE, Bhopal, M.P.	15th Oct., 2015	Scientist Advisory Meetings at KVK-CIAE, Bhopal
Shri. Sarju Pallewar (SI)	CRDE-KVK, Ichhawar, Sehore, M.P.	7th -8th Oct., 2015	Production & Protection Technologies of Pulses Crops.
	KVK-Raisen, Bhopal, M.P.	28th -29th Oct. 2015	
	CIAE, Bhopal, M.P.	3rd - 4th Feb, 2016	Participation of two days National Seminar on "Pulses Development: Challenges and Opportunities in Central and Southern States"
	IIPR- Kanpur, U.P.	8th Feb. 2016	Tracking Improved cultivars adoption of Lentil in U.P.
	IIPR- Kanpur, U.P.	9th -10th Feb.,2016	To attend Workshop at Kanpur on Brain Storming Meeting on *"Promotion of pulses in nontraditional niches: summer cultivation*
Ashwini Bhoware (TA)	ICAR-DSR, Indore – M.P.	06th -15th Sep,2015	To participate MTC at DSR and FLDs visit KVK
	CRDE-KVK, Ichhawar, Sehore, M.P.	7th -8th Oct., 2015	Production & Protection Technologies of Pulses Crops.
	KVK-Raisen, Bhopal, M.P.	28th -29th Oct. 2015	
	CIAE, Bhopal, M.P.	3rd to 4th Feb,2016	Participation of two days National Seminar on "Pulses Development: Challenges and Opportunities in Central and Southern States"

Name	Organization/Institute	Duration	Purpose
Shri. Sateesh Dwivedi (TA)	ICAR-DSR, Indore –M.P.	06th -15th Sep,2015	To participate MTC at DSR and FLDs visit KVK
	CRDE-KVK, Ichhawar, Sehore, M.P.	7th -8th Oct., 2015	Production & Protection Technologies of Pulses Crops.
	KVK-Raisen, Bhopal, M.P.	28th -29th Oct. 2015	
	ICAR-IISS, Bhopal- M.P.	14th -22nd Dec.2015	To attend MCT soil heath card at IISS, Bhopal
	CIAE, Bhopal, M.P.	3rd to 4th Feb,2016	Participation of two days National Seminar

INTER-MINISTRIAL CENTRAL TEAM VISIT

Dr. A.K. Tiwari (Director)

State	Districts	Duration	Team Member
CG	Raipur, Gariaband, Rajnandgaon, Dhamtari	28th Oct. -01 Nov., 2015	To Assessment of Drought Situation in CG Kharif 2015.
MP	Rewa, Shahdol	8th – 9th Nov., 2015	To Assessment of Drought Situation in MP Kharif 2015.

NLMT MP & CG

Name	Visited Districts	Duration	Purpose
Dr. A. K Tiwari (Director)	Rewa, Satna, Singroli, Sidhi	16th -20th Aug.2015	NFSM NLMT -Kharif 2015 Monitoring visit.
	Ashoknagar, Guna , Shivpuri	25th -26th Feb.,2016	NFSM NLMT MP- Rabi 2015-16
Dr. A.K. Shivhare (AD)	Rajgarh, Jaspur, Ambikapur	08th - 11th Sep.,2015	NFSM-NLMT CG Kharif 2015 to monitoring of Mission Implementation and Crop Scenario.
	Ashoknagar, Guna , Shivpuri	25th -26th Feb.,2016	NFSM NLMT MP- Rabi 2015-16
	Koriya, Balrampur, Surajpur	16th -18th March 2016	NFSM-NLMT C.G.- Rabi 2015-16 and FLD visit under NFSM and NMOOP-
Shri. Vipin Kumar (AD)	Durg, Balod, Kanker, Dhamtari	21st -23th Oct., 2015	NLMT- BGERI Monitoring of mission Implementation and Crop Scenario in CG
Shri. Sateesh Dwivedi (TA)	Sidhi, Satna, Rewa	17th -18th Aug.2015	NFSM-NLMT MP- Kharif 2015 to monitoring of Mission Implementation and Crop Scenario.

FIELD VISIT FOR MONITORING OF CS/CSS

Dr. A.K. Tiwari (Director)

State	Visited State /District	Duration	Purpose
MP	Hoshangabad	16th -17th .May, 2015	To Coordinate with Dr. D.P. Malik during field visit.
MP	Sehore	16th Sept., 2015	To monitor the FLDs of RAK College of Agriculture.
MP	Sehore	12th Dec., 2015	Krishak Sanghosthi, SHC campaign, FLD visit
MP	Ujjain	18th -19th Dec., 2015	To participate two days training, field visit (FLDs/ NFSM- Demonstration)
MP	Rewa , Sidhi	28th Dec., 2015	Field visit (FLDs/ NFSM- Demonstration)
MP	Bhopal, Sehore	16th Jan.,2016	Filed visit to assessment of temperature on Wheat crop.
M.P.	J.N.K.V.V., Jabalapur	19th, Feb, 2016	Large Scale Multi-location IPM Demonstarions in field crops under NFSM Pulse -2015-16
M.P.	R.A. K. College of Agri. Sehore	2nd March, 2016	To Monitor the ICARDA's Project " Generation advancement and development of new genotypes through pre breeding in Lentil and Kabuli Chickpea"

Assistant Director (Dr. A. K. Shivahare)

States	Visited Districts	Duration	Purpose
MP	Hoshangabad , Harda	15th -17th July,2015	Monitoring of mission Implementation and Crop Scenario in MP
MP	Bhopal	19th Sep.,2015	To monitor the STLs under CSS
MP	Jabalpur, Katni	19th -20th Oct.,2015	Monitor of rainfall deficit district and status Rabi Crop.
MP	Katni , Panna	23rd -25th Dec., 2015	Rabi FLD visit KVK under NFSM and NMOOP conducted by KVK- Katni & Panna.
MP	Bhopal	4th Jan.,2016	Verification of particular of farmer awarded KKA year 2013-14.
MP	Vidisha	16th Jan.,2016	Monitoring of CSS and impact assessment of prevailing high temperature to wheat crop
CG	Koriya, Balrampur , Surajpur	16th -18th March, 2016	FLD visit under NFSM and NMOOP conducted by KVK- Koriya, Balrampur & Surajpur.

Assistant Director (Shri Vipin Kumar)

States	Visited Districts	Duration	Purpose
MP	Sagar, Damoh	15th -17th July,2015	Monitoring of mission Implementation and Crop Scenario in MP
MP	Bhind, Morena	19th -20th Oct.,2015	Monitor of rainfall deficit district and status Rabi Crop.
MP	Rewa, Satna	22th -23 Oct.,2015	Monitor of rainfall deficit district and status Rabi Crop.
CG	Durg	4th Jan.,2016	Verification of particular of farmer awarded KKA year 2013-14.

MP	Hoshangabad	15th Jan.2016	Monitoring of CSS and impact assessment of prevailing high temperature to wheat crop
MP	Ujjain	18th -22nd Jan.,2015	To under taken survey and collection primary and secondary information under study Soybean YMV kharif 2015
CG	Durg, Dhamtari , Raipur	9th - 11th March 2016	Field visit rabi FLD KVK and project on enhancing Grass pea production under NFSM-ICARDA/IGKVV

Senior Technical Assistant (Dr. Arvind Waghmare)

States	Visited Districts	Duration	Purpose
MP	Gwalior, Morena	15th -17th July,2015	Monitoring of mission Implementation and Crop Scenario in MP
MP	Dewas	27th Aug,2015	Monitoring of mission Implementation and Crop Scenario in MP
Panjab	Ludhiana	1-3rd Sept.,2015	To attend Brain Storming meeting PAU, Ludhiana.
MP	Sehore	16th Sep., 2015	To monitor the FLDs on Soybean, Urd, Tur Crop.
Odisha	Kalahandi, Ganjam, Denkanel	28th -30th Sep., 2015	To monitor activities of NMOOP as Member NLMT -2015

Statistical Investigator (Shri. Sarju Pallewar)

States	Visited Districts	Duration	Purpose
MP	Raisen	15th July,2015	Monitoring of Implementation of CDP under – NFSM, NMOOP and other CSS Kharif-2015
MP	Guna , Ashoknagar	24th -26th Aug,2015	Monitoring of mission Implementation and Crop Scenario in MP
CG	Durg, Kanker, Dhamtari, Raipur	27th -31st July,2016	Monitoring of Implementation of CDP under – NFSM, NMOOP and other CSS Kharif-2015
MP	Shivpuri	14th Sept., 2015	To Monitor of FLDs of KVK, Kharif-2015
MP	Indore	19th Sept., 2015	To monitor the STLs under CSS
MP	Shahdol	19th -20th Oct., 2015	Monitoring of mission Implementation and Crop Scenario in MP
MP	Chhindwara	11th -13th Jan., 2016	To under taken survey and collection primary and secondary information under study Soybean YMV kharif 2015

Technical Assistant (Ashwini Bhoware)

States	Visited Districts	Duration	Purpose
MP	Indore	14th -15th July,2015	Monitoring of mission Implementation and Crop Scenario in MP
MP	Dhar, Barwani	24th -26th Aug,2015	Monitoring of mission Implementation and Crop Scenario in MP
MP	Ratlam, Ujjain	23th -24th Nov.2015	Monitoring of Implementation and CSS and Status of Current Rabi Crop sowing in MP.
MP	Sagar	16th Jan.2015	Monitoring of CSS and impact assessment of prevailing high temperature to wheat crop

MP	Betul	10th – 12th Feb.2016	To under taken survey and collection primary and secondary information under study Soybean YMV kharif 2015

Technical Assistant (Shri. Sateesh Dwivedi)

State	Visited district	Duration	Purpose
MP	Shahdol , Umaria	13th -17th July,2015	Monitoring of mission Implementation and Crop Scenario in MP
MP	Rewa, Singroli, Sidhi, Satna	17th -22th Aug,2015	Monitoring of mission Implementation and Crop Scenario in MP
MP	Sagar, Damoh	19th -20th Oct,2015	Monitor of rainfall deficit district and status Rabi Crop
MP	Panna, Chhatarpur	26th -27th Nov.2015	Monitoring of Implementation and CSS and Status of Current Rabi Crop sowing in MP.
MP	Tikamgarh	11th -12th Jun.,2015	Monitoring of Implementation and CSS and Status of Current Rabi Crop sowing in MP.
MP	Dewas	16th Jan.2015	Monitoring of CSS and impact assessment of prevailing high temperature to wheat crop

9. Staff Position (As on 10.04.2016)

Sl. No	Post	Posts sanctioned	Posts filled	Posts vacant	Post vacant since
1.	Director	1	1	Nil	
2.	Joint Director	3	1*	02	19.06.1996/16.01.2014/01.03.2015
3.	Asstt. Director	1	1	Nil	-
4.	Admn. Officer	1	1	Nil	-
5.	Sr. Tech. Asstt.	4	1	3	@ 25.04.2008 /19.10.2013/05.11.2016
6.	Stat. Investigator	1	1	Nil	
7.	Accountant	1	Nil	1	27.04.2014
8.	Jr. Hindi Translator	1	Nil	1	19.6.1996
9.	Stenographer G-II	1	Nil	1	19.6.1996
10.	Stenographer G-III	2	Nil	2	19.6.1996/23.01.2007
11.	Sr. Stat. Clerk	1	Nil	1	19.6.1996
12.	U.D.C.	2	1	1	23.05.2010
13	L.D.C.	4	1	3	# 19.6.1996 (1)/17.2.2005 (1)/ 14.12.2009
14	Staff Car Driver (Ordinary Grade)	1	1	Nil	-
15	MTS	4	1	3	19.6.1996 / 25.8.1999/01.03.2005
	Total	**28**	**10**	**18**	

*- One Assistant Director is drawing the salary against the vacant post of Joint Director. @- For one post interview held on March, 18, 2016 by SSC, Raipur and interview of second post could not conduct due to non receipt of application under PH category. # one offer appointment is under process

FINAL EXPENDITURE OF DPD, BHOPAL

F.No.2-5/2012-DPD

Directorate of Pulses Development, Bhopal

Major Head/Sub-head/Object head as in the Detailed Demands for Grants 2015-16	BE 2015-16	RE 2015-16	Final Expenditure	Excess (+) / Saving w.r.t.		%age of savings	
				BE 2015-16	RE 2015-16	BE 2015-16	RE 2015-16
Major Head:2401-Crop Husbandry 05-Directorate of Pulses Dev.							
050001-Salary	55,00,000	47,42,000	47,40,879	(-) 7,59,121	(-) 1,121	13.80	0.02
050006-Medical	2,00,000	1,00,000	35,000	(-) 1,65,000	(-) 65,000	82.5	65
050003 O.T.A.	15,000	10,000	6,787	(-) 8,213	(-) 3,213	54.75	32.13
050011 T.A.	5,00,000	4,00,000	3,51,338	(-) 1,48,662	(-) 48,662	29.73	12.16
050013 O.E. (Non-Plan)	9,85,000	9,48,000	9,48,000	(-) 37,000	0	3.75	0
Total	**72,00,000**	**62,00,000**	**60,82,004**	**(-) 11,17,996**	**(-) 1,17,996**	**15.52**	**1.90**

CONFERENCE/WORKSHOP

NFSM-PLAN EXPENDITURE-2015-16

(Rs. in Lakh)

Programme/ Project	**ATR**	**Allocation**	**Expenditure**	**Remark**
Trainings- 02	KVK-Sehore ***(Oct., 08th -09th, 2015)*** KVK-Raisen ***(Nov., 04th -05th, 2015)***		0.80	***Organized***
Seminar/ Workshop -02	I St-ICAR-CIAE, Bhopal ***(Feb.,03rd -04th, 2016)*** II nd-ICAR-IIPR, Kanpur ***(Feb., 09tn -10tn, 2016)***		4.50/6.00 Fund insufficient	***Organized*** Proceedings under process Summery Reports submitted
G2C		3.00	0.26	
Publicity/printing material				Proposal under progress
Contingency/ POL etc.				
Total		**11.30**	**5.56**	**(Unspent Rs. 5.74 lakh)**

FUND REQUIREMENT OF HONORARIUM, CONVEYANCE ALLOWANCE & TOUR FOR TAs IN DDs DURING 2016-17

No. of T.As sanctioned – 02
No. of T.As available as on date – 02

1. Smt. Ashwini Bhoware
2. Shri Sateesh Dwivedi

(Amount in Rupees)

Head	U.B. as on 01.04.15	Fund released by DAC 2015-16	Total Fund Available 2015-16	Fund Utilized 2015-16	U.B. as on 01.04.15	Gross requirement 2016-17	Net requirement 2016-17
1	2	3	4=(2+3)	5	6=(4-5)	7	8=(7-6)$
Honorarium	-Nil-	600000	600000	598333	1667	600000**	598333
Conveyance Allowance	-Nil-	36000	36000	35900	100	36000	35900
Travelling Allowance, etc.	16596	33404	50000	26832	23168	50000	26832

** Gross requirement 2016-17 (for 12 months – April, 2016 to March, 2017)

*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 2015-16. i.e. column 8=(7-6)

Hindi Workshop & Meeting

Hindi Meeting (Quaterly)

S.No.	Dates
1	22.06.2015
2	15.09.2015
3	23.12.2015
4	19.03.2016

International Yoga Day (2015-16)

1st International Day	21.06.2015

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

Annexure-1

DIRECTORATE OF PULSES DEVELOPMENT, BHOPAL

ANNUAL PROGRESS OF NATIONAL FOOD SECURITY MISSION (NFSM)-PULSES DURING 2015-16

ALL INDIA STATE-WISE FUND ALLOCATION, UNSPENT BALANCE, RELEASE, TOTAL FUND AVAILABLILITY AND UTILIZATION

S.N.	NAME OF THE STATE	Allocation (Admin Approval)	Release												Fund Utilized	Unspent Balance	% Utilized	Reported upto
			1st				2nd				Total							
			Gen.	SC	ST	Total	Gen.	SC	ST	Total	Gen.	SC	ST	Total				
1	A. Pradesh	4260.25	986.85	207.09	84.37	1278.31	682.62	511.32	84.37	1278.31	1669.47	718.41	168.74	2556.62	3423.00	-866.38	133.89	March.,16
2	Arun. Pradesh	344.02	30.27	0.52	55.21	86.00	30.25	0.48	55.15	85.88	60.52	1.00	110.36	171.88	172.00	-0.12	100.07	Sep. 15 #
3	Assam	4584.52	924.93	79.08	142.12	1146.13	399.53	165.73	0.00	565.26	1324.46	244.81	142.12	1711.39	0.00	1711.39	0.00	**
4	Bihar	274.23	1029.61	194.14	11.24	1234.99	225.02	41.97	0.00	266.99	1254.63	236.11	11.24	1501.98	0.00	1501.98	0.00	**
5	Chhattisgarh	4274.22	604.80	123.95	339.80	1068.55				0.00	604.80	123.95	339.80	1068.55	2707.62	-1639.07	253.39	March.,16
6	Gujarat	1639.67	328.00	29.82	62.15	419.97				0.00	328.00	29.82	62.15	419.97	980.94	-560.97	233.57	March.,16
7	Haryana	658.72	165.83	39.66	0.00	205.49				0.00	165.83	39.66	0.00	205.49	0.00	205.49	0.00	**
8	Jharkhand	3566.73	139.56	26.60	59.30	225.46	607.06	254.02	0.00	861.08	746.62	280.62	59.30	1086.54	1223.11	-136.57	112.57	Dec.,15 #
9	Karnataka	9590.05	2221.33	466.13	189.91	2877.37	1511.13	849.73	0.00	2360.86	3732.46	1315.86	189.91	5238.23	6672.39	-1434.16	127.38	Feb.,15 #
10	MP	18646.65	3608.20	850.30	1135.60	5594.10					3608.20	850.30	1135.60	5594.10	10682.62	-5088.52	190.96	March.,16
11	Maharashtra	18443.32	3730.17	470.3	410.36	4610.83	2521.71	758.60	294.96	3575.27	2609.91	762.52	342.84	8186.10	6687.61	1498.49	81.69	Dec.,15 #
12	Manipur	560.00	88.20	3.92	47.88	140.00	78.01	14.11	47.88	140.00	84.12	14.34	86.54	280.00	0.00	280.00	0.00	**
13	Meghalaya	100.00	6.11	0.23	38.66	45.00	4.21	0.15	26.55	30.91	6.77	0.15	70.49	75.91	0.00	75.91	0.00	**
14	Mizoram	133.90	2.56	0.00	43.94	46.50	2.10		36.04	38.14				84.64	55.00	29.64	64.98	March.,16
15	Nagaland	858.41	0.00	0.00	93.31	93.31					0.00	0.00	93.31	93.31	324.49	-231.18	347.75	Dec.,15 #
16	Odisha	2072.95	739.02	256.02	41.46	1036.50					739.02	256.02	41.46	1036.50	2961.33	-1924.83	285.70	March.,16
17	Punjab	343.10	64.01	26.02	0.00	90.03					64.01	26.02	0.00	90.03	0.00	90.03	0.00	**
18	Rajasthan	37271.14	3948.85	967.52	708.77	5625.14					3948.85	967.52	708.77	5625.14	11248.60	-5623.46	199.97	Dec., 15 #
19	Sikkim	480.74	83.41	12.02	24.76	120.19					83.41	12.02	24.76	120.19	0.00	120.19	0.00	Feb.15 #
20	Tamil Nadu	3020.00	604.00	143.45	7.55	755.00	578.10	137.30	7.23	722.63	1182.10	280.75	14.78	1477.63	0.00	1477.63	0.00	Oct. 15 #
21	Tripura	266.00	34.25	11.57	20.68	66.50	24.68	21.14	20.68	66.50	58.93	32.71	41.36	133.00	0.00	133.00	0.00	**
22	Uttar Pradesh	9112.24	2154.10	576.79	2.73	2733.62	583.56	426.06	0.00	1009.62	2737.66	1002.85	2.73	3743.24	1605.11	2138.13	42.88	Dec.15 #
23	West Bengal	1072.70	180.36	58.02	13.87	252.25	130.88	75.25	12.00	218.13	998.50	257.32	86.17	470.38	504.34	-33.96	107.22	Jan.16 #
24	Telangana	4495.65	867.62	182.07	74.17	1123.86	654.17	380.92	0.00	1035.09	670.64	386.62	0.92	2158.95	2412.24	-253.29	111.73	Dec.,15 #
25	H.P.	92.34	16.47	5.70	0.92	23.09	17.38	5.70	0.00	23.08	82.89	11.81	8.76	46.17	0.00	46.17	0.00	**
26	J&K	321.50	65.51	6.11	8.76	80.38					85.55	19.36	3.24	80.38	85.86	-5.48	106.82	May,15 #
27	Uttarakhand	432.61	85.55	19.36	3.24	108.15					85.55	19.36	3.24	108.15	0.00	108.15	0.00	**
	Total	**126915.65**	**22709.57**	**4756.39**	**3620.76**	**31086.72**	**8050.41**	**3642.48**	**584.86**	**12277.75**	**26932.90**	**7889.91**	**3748.59**	**43364.47**	**51746.25**	**-8381.78**	**119.33**	

Annexure-2

Directorate of Pulses Development, GOI, Bhopal

1. Crop-Wise and State-Wise Rabi Crop Coverage Week Ending 11.02.2016

(Area: Lakh ha)

Sl.No	Crops	Normal Area (DES)	Area Covered							Change over (+/-)					
			Avg. of 2010-2014	2015	2014	2013	2012	2011	2010	Avg. of 2010-2014	2014	2013	2012	2011	2010
1	Gram	87.722	92.176	88.885	86.136	103.420	93.349	89.707	88.269	-3.291	2.749	-14.535	-4.464	-0.822	0.616
2	Lentil	14.835	15.327	13.517	15.036	15.401	15.181	15.536	15.480	-1.809	-1.518	-1.884	-1.664	-2.019	-1.963
3	Fieldpea	9.058	10.133	9.860	10.419	10.361	10.580	9.846	9.460	-0.273	-0.559	-0.501	-0.720	0.014	0.400
4	Kulthi	2.140	4.911	4.260	5.131	4.777	4.967	4.872	4.810	-0.652	-0.872	-0.517	-0.707	-0.612	-0.550
5	Urdbean	7.514	7.734	9.648	9.148	10.113	7.724	6.296	5.390	1.914	0.500	-0.465	1.924	3.352	4.258
6	Moongbean	8.694	6.847	7.888	8.290	7.965	6.645	5.357	5.980	1.041	-0.401	-0.077	1.243	2.531	1.908
7	Lathyrus	4.990	4.252	3.911	4.033	4.092	4.078	4.468	4.590	-0.342	-0.122	-0.182	-0.168	-0.558	-0.680
8	Other Rabi Pulses	3.988	9.242	8.698	9.176	10.089	9.041	9.804	8.102	-0.544	-0.478	-1.391	-0.343	-1.106	0.596
1	Gram	87.722	92.176	88.885	86.136	103.420	93.349	89.707	88.269	-3.291	2.749	-14.535	-4.464	-0.822	0.616
2	Lentil	14.835	15.327	13.517	15.036	15.401	15.181	15.536	15.480	-1.809	-1.518	-1.884	-1.664	-2.019	-1.963
3	Fieldpea	9.058	10.133	9.860	10.419	10.361	10.580	9.846	9.460	-0.273	-0.559	-0.501	-0.720	0.014	0.400
4	Kulthi	2.140	4.911	4.260	5.131	4.777	4.967	4.872	4.810	-0.652	-0.872	-0.517	-0.707	-0.612	-0.550
5	Urdbean	7.514	7.734	9.648	9.148	10.113	7.724	6.296	5.390	1.914	0.500	-0.465	1.924	3.352	4.258
6	Moongbean	8.694	6.847	7.888	8.290	7.965	6.645	5.357	5.980	1.041	-0.401	-0.077	1.243	2.531	1.908
7	Lathyrus	4.990	4.252	3.911	4.033	4.092	4.078	4.468	4.590	-0.342	-0.122	-0.182	-0.168	-0.558	-0.680
8	Other Rabi Pulses	3.988	9.242	8.698	9.176	10.089	9.041	9.804	8.102	-0.544	-0.478	-1.391	-0.343	-1.106	0.596
TOTAL		**138.941**	**150.624**	**146.667**	**147.369**	**166.218**	**151.565**	**145.886**	**142.081**	**-3.957**	**-0.702**	**-19.551**	**-4.898**	**0.781**	**4.586**

Normal Area- Ave. of 2009-10 to 2013-2014 (DES)

1. State - wise detailed area coverage is attached in Excel file.

2. Input supply (Reported states)

(i) Power : Normal

ii) Diesel: Normal

(iii) Irrigation water: --

(iv) Fertilizer: Normal

(v) Seed: Normal –

3. Diseases & Pests:NIL

4. Damage due to calamity: -

5. Signification information: Sowing of Rabi pulses is almost completed and achieved more than the normal of 138.941 lakh ha. The overall deficit in Rabi pulses in current year is about 0.702 lakh ha against last year coverage of 147.369 lakh ha. Major shortfall has been in lentil about 1.519 lakh ha, Kulthi 0.871 lakh ha and moong 0.402 lakh ha against the last year coverage. However, significant area increased under gram about 2.749 lakh ha against the last year coverage of 86.136 lakh ha.

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1. Madhya Pradesh: Season-Rabi Crops (2015-16) Coverage on Week Ending 11.02.2016

As on 11.02.2016

Area in Lakh ha

Sl No	Crop	Normal Area (SDA)	Target Area 2015 (SDA)	Avg. of (2010-2014)	Area Covered						Avg. of (2010-2014)	Change over (+-)				
					2015	2014	2013	2012	2011	2010		2014	2013	2012	2011	2010
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	Wheat	40.780	58.700	52.246	56.340	58.670	57.920	51.800	49.430	43.410	4.094	-2.330	-1.580	4.540	6.910	12.930
2	Others	0.800	0.440	1.016	1.070	1.250	1.020	0.910	0.970	0.930	0.054	-0.180	0.050	0.160	0.100	0.140
Total Cereals		**41.580**	**59.140**	**53.262**	**57.410**	**59.920**	**58.940**	**52.710**	**50.400**	**44.340**	**4.148**	**-2.510**	**-1.530**	**4.700**	**7.010**	**13.070**
3	Gram	26.490	28.600	32.300	30.170	29.390	34.820	32.990	32.230	32.070	-2.130	0.780	-4.650	-2.820	-2.060	-1.900
4	Lentil	5.290	5.300	5.702	5.460	5.130	5.630	5.760	6.220	5.770	-0.242	0.330	-0.170	-0.300	-0.760	-0.310
5	Pea	1.970	2.620	2.882	4.500	2.930	3.260	3.030	2.820	2.370	1.618	1.570	1.240	1.470	1.680	2.130
6	Others	0.570	0.460	0.686	0.640	0.800	0.620	0.890	0.540	0.580	-0.046	-0.160	0.020	-0.250	0.100	0.060
3	Gram	26.490	28.600	32.300	30.170	29.390	34.820	32.990	32.230	32.070	-2.130	0.780	-4.650	-2.820	-2.060	-1.900
4	Lentil	5.290	5.300	5.702	5.460	5.130	5.630	5.760	6.220	5.770	-0.242	0.330	-0.170	-0.300	-0.760	-0.310
5	Pea	1.970	2.620	2.882	4.500	2.930	3.260	3.030	2.820	2.370	1.618	1.570	1.240	1.470	1.680	2.130
Total Pulses		**34.320**	**36.980**	**41.570**	**40.770**	**38.250**	**44.330**	**42.670**	**41.810**	**40.790**	**-0.800**	**2.520**	**-3.560**	**-1.900**	**-1.040**	**-0.020**
Total Foodgrain		**75.900**	**96.120**	**94.832**	**98.180**	**98.170**	**103.270**	**95.380**	**92.210**	**85.130**	**3.348**	**0.010**	**-5.090**	**2.800**	**5.970**	**13.050**
7	Rapeseed/Mustard	7.020	6.790	7.888	6.250	6.740	8.140	8.110	8.030	8.420	-1.638	-0.490	-1.890	-1.860	-1.780	-2.170
8	Linseed/ Others	1.300	1.650	0.778	1.170	1.170	1.210	0.000	0.000	1.510	0.392	0.000	-0.040	1.170	1.170	-0.340
9	Others	0.372	0.000	0.568	0.000	0.000	0.000	1.290	1.550	0.000	-0.568	0.000	0.000	-1.290	-1.550	0.000
Total Oilseeds		**8.692**	**8.440**	**9.234**	**7.420**	**7.910**	**9.350**	**9.400**	**9.580**	**9.930**	**-1.814**	**-0.490**	**-1.930**	**-1.980**	**-2.160**	**-2.510**
Sugarcane		**0.550**	**0.800**	**0.742**	**1.060**	**1.190**	**0.710**	**0.770**	**0.590**	**0.450**	**0.318**	**-0.130**	**0.350**	**0.290**	**0.470**	**0.610**
Total Area Rabi		**85.142**	**105.360**	**104.808**	**106.660**	**107.270**	**113.330**	**105.550**	**102.380**	**95.510**	**1.852**	**-0.610**	**-6.670**	**1.110**	**4.280**	**11.150**

Normal Area- SDA

Crop Condition = N - Normal, S-Satisfactory, P-Poor, MS- Moisture stress, NR-Not Reported

2. Chhattisgarh: Season-Rabi Crops (2015-16) Coverage on Week Ending 11.02.2016

As on 08.02.2016

Area in Lakh ha

Sl No	Crop	Normal Area (SDA)	Target Area 2015 (SDA)	Avg. of (2010-2014)	Area Covered						Avg. of (2010-2014)	Change over (+-)				
					2015	2014	2013	2012	2011	2010		2014	2013	2012	2011	2010
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	Wheat	1.570	1.600	1.641	1.584	1.695	1.564	1.670	1.617	1.658	-0.057	-0.111	0.020	-0.086	-0.033	-0.074
2	Paddy	2.090	1.000	0.790	0.777	0.717	1.245	0.786	0.767	0.435	-0.013	0.060	-0.468	-0.009	0.010	0.342
3	Jowar	0.070	0.050	0.060	0.043	0.046	0.045	0.054	0.080	0.076	-0.018	-0.003	-0.002	-0.011	-0.037	-0.033
4	Maize	0.570	0.850	0.325	0.670	0.376	0.501	0.357	0.229	0.162	0.345	0.294	0.169	0.313	0.441	0.508
5	Others	0.000	0.000	0.005	0.000	0.000	0.000	0.000	0.000	0.027	-0.005	0.000	0.000	0.000	0.000	-0.027
Total Cereals		**4.300**	**3.500**	**2.821**	**3.074**	**2.834**	**3.355**	**2.867**	**2.693**	**2.358**	**0.252**	**0.240**	**-0.282**	**0.207**	**0.381**	**0.716**
6	Gram	3.560	3.600	3.540	3.567	3.448	3.926	3.768	3.413	3.144	0.027	0.119	-0.359	-0.201	0.154	0.423
7	Lentil	0.270	0.300	0.262	0.236	0.268	0.253	0.230	0.268	0.292	-0.027	-0.032	-0.017	0.006	-0.032	-0.056
8	Peas	0.460	0.500	0.468	0.475	0.468	0.493	0.467	0.453	0.458	0.007	0.007	-0.018	0.008	0.022	0.017
9	Kulthi	0.310	0.400	0.278	0.259	0.284	0.283	0.286	0.270	0.267	-0.019	-0.025	-0.024	-0.027	-0.011	-0.008
9	Urd	0.150	0.150	0.127	0.100	0.106	0.118	0.105	0.153	0.154	-0.028	-0.006	-0.019	-0.005	-0.054	-0.055
10	Moong	0.250	0.300	0.204	0.230	0.243	0.185	0.165	0.225	0.200	0.027	-0.013	0.045	0.065	0.005	0.030
12	Lathyrus	3.410	3.500	3.587	3.096	3.333	3.382	3.438	3.783	4.001	-0.491	-0.237	-0.286	-0.342	-0.687	-0.905
13	Others	0.040	0.000	0.084	0.059	0.065	0.053	0.107	0.102	0.095	-0.026	-0.007	0.006	-0.049	-0.044	-0.037
Total Pulses		**8.450**	**8.750**	**8.550**	**8.021**	**8.215**	**8.693**	**8.566**	**8.667**	**8.611**	**-0.530**	**-0.195**	**-0.672**	**-0.545**	**-0.646**	**-0.590**
Total foodgrains		**12.750**	**12.250**	**11.372**	**11.094**	**11.049**	**12.048**	**11.433**	**11.360**	**10.969**	**-0.278**	**0.045**	**-0.954**	**-0.339**	**-0.266**	**0.125**
14	Rapeseed/Mustard	1.400	1.500	0.728	1.267	1.351	1.410	1.421	1.432	1.557	-0.167	-0.084	-0.143	-0.154	-0.165	-0.290
15	Linseed	0.670	0.700	0.325	0.498	0.631	0.627	0.651	0.708	0.817	-0.189	-0.133	-0.129	-0.153	-0.210	-0.319
16	Sesamum	0.030	0.050	0.018	0.024	0.025	0.024	0.017	0.009	0.016	0.006	-0.001	0.000	0.007	0.015	0.008
17	Sunflower	0.100	0.150	0.117	0.066	0.042	0.194	0.182	0.064	0.101	-0.051	0.024	-0.128	-0.116	0.002	-0.035
18	Groundnut	0.270	0.250	0.154	0.234	0.140	0.227	0.214	0.100	0.088	0.080	0.093	0.007	0.020	0.134	0.146
19	Safflower	0.060	0.100	0.067	0.057	0.068	0.058	0.089	0.046	0.074	-0.010	-0.011	-0.001	-0.032	0.011	-0.017
20	Others	0.050	0.000	0.040	0.039	0.043	0.043	0.034	0.035	0.044	-0.001	-0.004	-0.004	0.005	0.004	-0.005
Total Oilseeds		**2.580**	**2.750**	**2.516**	**2.1846**	**2.3004**	**2.583**	**2.608**	**2.394**	**2.697**	**-0.332**	**-0.116**	**-0.398**	**-0.423**	**-0.209**	**-0.512**
21	Sugarcane	0.230	0.300	0.160	0.157	0.241	0.197	0.179	0.092	0.090	-0.003	-0.084	-0.040	-0.022	0.065	0.067
22	Others	1.740	1.700	1.517	1.422	1.518	1.569	1.523	1.422	1.554	-0.095	-0.096	-0.147	-0.101	0.000	-0.132
Total area Rabi		**17.300**	**17.000**	**15.565**	**14.858**	**15.109**	**16.397**	**15.743**	**15.268**	**15.310**	**-0.658**	**-0.251**	**-1.540**	**-0.886**	**-0.411**	**-0.201**

1.0 CROP-WISE AND STATE WISE-COVERAGE Week Ending 15.10.2015 (Final)

Sl.No	Crops	Normal Area (DES)	Normal Area of Corr. Week (2009-13)	Area Covered						Change over (+-)					
				2015	2014	2013	2012	2011	2010	Normal Area of Corr. Week	2014	2013	2012	2011	2010
1	2	3	4	9	10	11	12	13	14	15	16	17	18	19	20
1	Arhar (Tur)	39.054	38.683	38.061	36.338	38.660	32.339	35.141	38.640	-0.622	1.723	-0.599	5.722	2.920	-0.579
2	Urdbean	23.736	24.579	28.596	25.705	24.121	25.013	22.851	23.984	4.017	2.892	4.475	3.583	5.745	4.612
3	Moongbean	24.215	23.439	25.876	21.440	24.061	20.127	22.503	25.555	2.437	4.436	1.815	5.749	3.373	0.321
4	Kulthi	2.843	1.058	1.079	1.085	1.105	1.506	1.102	0.280	0.021	-0.006	-0.026	-0.427	-0.023	0.799
5	Other Kharif Pulses	18.336	21.949	22.006	18.326	21.381	20.373	25.729	23.767	0.057	3.680	0.625	1.633	-3.723	-1.761
	TOTAL	**108.184**	**109.709**	**115.619**	**102.894**	**109.328**	**99.358**	**107.326**	**112.226**	**5.910**	**12.725**	**6.291**	**16.261**	**8.293**	**3.393**

Normal Area- Ave. of 2009-2010 to 2013-2014 (DES)

1. MADHYA PRADESH: SEASON-KHARIF CROPS (2015-16) COVERAGE ON WEEK ENDING 15.10.2015 (Final)

Sl No	Crop	Target-2015 (SDA)	Normal Area (DES) (2009-13)	Normal Area of Corresponding Week (2012 to 2014)	Area Covered (SDA)				Difference over				% coverage over	
					2015	2014	2013	2012	Normal of Corresponding Week	2014	2013	2012	Normal	last year
1	Rice	21.60	17.046	18.863	20.240	21.530	18.430	16.630	1.377	-1.290	1.810	3.610	118.74	94.01
2	Sorghum	2.20	3.607	2.783	2.050	2.200	2.640	3.510	-0.733	-0.150	-0.590	-1.460	56.83	93.18
3	Bajra	2.20	1.773	1.967	2.670	2.250	1.880	1.770	0.703	0.420	0.790	0.900	150.59	118.67
4	Small Milletes	2.17	2.462	2.100	1.910	2.160	1.950	2.190	-0.190	-0.250	-0.040	-0.280	77.58	88.43
5	Maize	11.50	8.478	9.873	10.980	10.550	10.030	9.040	1.107	0.430	0.950	1.940	129.51	104.08
Total Coarse Cereals		**39.67**	**33.366**	**35.587**	**37.850**	**38.690**	**34.930**	**33.140**	**2.263**	**-0.840**	**2.920**	**4.710**	**113.44**	**97.83**
6	Red Gram	5.90	4.758	5.433	5.790	5.520	5.320	5.460	0.357	0.270	0.470	0.330	121.69	104.89
7	Black Gram	8.90	5.725	7.203	9.320	8.620	6.400	6.590	2.117	0.700	2.920	2.730	162.79	108.12
8	Green Gram	1.60	0.871	1.317	1.930	1.670	1.120	1.160	0.613	0.260	0.810	0.770	221.58	115.57
9	Other Kharif Pulses	0.15	0.183	0.190	0.140	0.180	0.190	0.200	-0.050	-0.040	-0.050	-0.060	76.50	77.78
Total Kharif Pulses		**16.55**	**11.537**	**14.143**	**17.180**	**15.990**	**13.030**	**13.410**	**3.037**	**1.190**	**4.150**	**3.770**	**148.91**	**107.44**
10	Groundnut	3.40	2.031	2.277	2.360	2.350	2.230	2.250	0.083	0.010	0.130	0.110	116.20	100.43
11	Soybean	56.50	57.838	59.630	59.060	56.970	63.800	58.120	-0.570	2.090	-4.740	0.940	102.11	103.67
12	Sunflower	0.00	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00	
13	Sesame	2.75	2.739	3.050	3.650	3.610	2.860	2.680	0.600	0.040	0.790	0.970	133.26	101.11
14	Other Kharif Oilseeds	0.85	1.013	0.610	0.800	0.320	0.730	0.780	0.190	0.480	0.070	0.020	78.97	250.00
Total Oilseed		**63.50**	**63.623**	**65.567**	**65.87**	**63.25**	**69.62**	**63.830**	**0.303**	**2.620**	**-3.750**	**2.040**	**103.53**	**104.14**
15	Sugarcane	0.0	0.658	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00	
16	Cotton	6.2	6.178	6.227	5.470	6.390	6.210	6.080	-0.757	-0.920	-0.740	-0.610	88.54	85.60
17	Jute & Mesta	0.0	0.041	0.000					0.000	0.000	0.000	0.000	0.00	
Total Kharif Crops		**125.92**	**114.704**	**121.523**	**126.370**	**124.320**	**123.790**	**116.460**	**4.847**	**2.050**	**2.580**	**9.910**	**110.17**	**101.65**

Normal Area- Ave. of 2009-2010 to 2013-2014 (DES), SDA: State Department of Agriculture

2. CHHATTISGARH: SEASON-KHARIF CROPS (2015-16) COVERAGE ON WEEK ENDING 15.10.2015 (Final)

Sl No	Crop	Normal Area (DES) (2009-13)	Normal Area of Corresponding Week (2012 to 2014)	Area Covered (SDA)				Difference over				% coverage over	
				2015	2014	2013	2012	Normal of Corresponding Week	2014	2013	2012	Normal	last year
1	Rice	37.468	37.058	37.038	37.560	36.786	36.829	-0.021	-0.522	0.252	0.209	98.85	98.61
2	Sorghum	0.053	0.130	0.000	0.000	0.391	0.000	-0.130	0.000	-0.391	0.000	0.00	#DIV/0!
3	Bajra	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	#DIV/0!	#DIV/0!
4	Small Milletes	1.432	0.866	0.687	0.880	0.829	0.890	-0.179	-0.193	-0.142	-0.203	47.97	78.06
6	Maize	1.055	2.163	2.110	2.215	2.312	1.963	-0.054	-0.105	-0.202	0.147	199.97	95.25
7	**Total Coarse Cereals**	**40.008**	**40.218**	**39.8344**	**40.6549**	**40.318**	**39.682**	**-0.384**	**-0.821**	**-0.484**	**0.152**	**99.57**	**97.98**
8	Red Gram	0.544	1.297	1.262	1.220	1.337	1.333	-0.034	0.042	-0.075	-0.071	232.04	103.47
9	Black Gram	0.990	1.566	1.451	1.550	1.568	1.581	-0.115	-0.099	-0.117	-0.130	146.61	93.64
10	Green Gram	0.093	0.236	0.240	0.229	0.260	0.220	0.004	0.011	-0.020	0.020	257.96	104.99
11	Other Kharif Pulses	0.505	0.396	0.202	0.399	0.310	0.480	-0.194	-0.197	-0.108	-0.278	40.00	50.61
12	**Total Kharif Pulses**	**2.132**	**3.496**	**3.1556**	**3.3976**	**3.475**	**3.614**	**-0.340**	**-0.242**	**-0.319**	**-0.458**	**148.01**	**92.88**
13	Groundnut	0.274	0.547	0.576	0.519	0.553	0.568	0.029	0.057	0.023	0.008	210.18	110.88
14	Soybean	1.055	1.441	1.406	1.214	1.579	1.530	-0.035	0.192	-0.174	-0.124	133.24	115.77
15	Sunflower	0.013	0.019	0.001	0.004	0.002	0.050	-0.018	-0.003	-0.001	-0.049	7.69	27.78
16	Sesame	0.194	0.392	0.334	0.340	0.407	0.428	-0.057	-0.006	-0.073	-0.094	172.37	98.35
17	Other Kharif Oilseeds	0.674	0.646	0.457	0.652	0.557	0.730	-0.189	-0.195	-0.100	-0.273	67.77	70.10
18	**Total Oilseed**	**2.210**	**3.044**	**2.7738**	**2.7288**	**3.099**	**3.306**	**-0.271**	**0.045**	**-0.325**	**-0.532**	**125.51**	**101.65**
19	Sugarcane	0.104	0.000					0.000	0.000	0.000	0.000	0.00	#DIV/0!
20	Cotton	0.002	0.000					0.000	0.000	0.000	0.000	0.00	#DIV/0!
21	Jute & Mesta	0.014	0.000					0.000	0.000	0.000	0.000	0.00	#DIV/0!
22	**Others**	**0.000**	1.372	1.344	1.260	1.487	1.370	**-0.028**	**0.084**	**-0.143**	**-0.026**	**#DIV/0!**	**106.70**
23	**Total**	**44.350**	**48.131**	**47.1082**	**48.0413**	**48.379**	**47.972**	**-1.022**	**-0.933**	**-1.270**	**-0.864**	**106.22**	**98.06**

Annexure-3

Directorate of Pulses Development
Govt. of India, Bhopal

Annex-A

(I) **National Workshop on "Pulses Development: Challenges and Opportunities in Central and Southern States" Date: February 3-4, 2016-Summary recommendation /Action Points regarding.**

ICAR-Central Institute of Agriculture Engineering, Bhopal in collaboration with the Directorate of Pulses Development, Bhopal organized a two days National Workshop on "Pulses Development: Challenges and Opportunities in Central and Southern States" to commemorate the year 2016 as 'International Year of Pulses'. The workshop was held during February 3rd-4th, 2016 at ICAR-CIAE, Bhopal and attended by more than 100 participants from different stake holders from Madhya Pradesh, Chhattisgarh, Gujarat, Maharashtra, Tamil Nadu, Telangana, Karnataka, Andhra Pradesh, Rajasthan and International and National Organization like ICRISAT, ICARDA, STC, CWC, ICAR-CIAE, ICAR-IIPR, ICAR-IISS, ICAR-CAZRI, ICAR-CRIDA, CSIR-CFTRI, Mahabeej, ICAR-ATARIs, State agriculture Universities, KVKs, Department of Agriculture of different states and Department of Agricultural Engineering, Bhopal, Directorate of Different Crops under DAC&FW, GoI etc.

The Annual production of about 18.32 million tonnes, is not sufficient to cater to the domestic demand of 22.42 million tonnes. The pulses requirement for the year 2030 is estimated to be 32 million tonnes; to meet the requirement, an annual growth rate of 4.2 % in production of pulses is therefore, necessary.

Major actionable points are given below:

i) Abiotic Stress/Moisture Stress due to prevailing of droughts or long dry spell, coupled with inadequate irrigation facilities in and rising temperatures need a district-wise micro-irrigation system plan (MIS Plan) and implementation of Pradhan Mantri Krishi Sinchai Yojna (PKSY) in mission mode ***(Action - States/ RFS division /NRAA, DEC&FW).***

ii) In view of limited availability of high quality seeds, poor SRR, Varietal Replacement Rate (VRR) and poor Varietal Diversification Rate (VDR), 10 years district specific seed rolling plan may be prepared during the current year of IYOP 2016 ***(Action - States/ICAR-IIPR/NSC/Seed Division of DAC&FW).***

iii) Tur, Green, Black Gram and Horsegram are difficult to mill whereas, lentil , Peas, Bengalgram and Soybean are easy to mill pulses. To minimize quantitative and qualitative losses during dehulling, small and medium scale pulse processing units to empower the rural/small scale sector, these machineries may be distributed under the ongoing

Development Programme i.e. NFSM-Pulses, RKVY. This will attract the farmers to fight malnutrition, fatch better prices and creating employment/ grinding of organically produce dhal. ***(Action - States/DAC&FW/ICAR-CIAE/CFTRI/ICAR-IIPR).***

DHAL MILLS & THEIR AVAILABILITY

Dhal Mill	**Capacity/hour**	**Source of Availability**
Hand-operated pulses dehusker	20-25 kg/h	CFTRI, Mysore Webmail: www.cftri.com
Mini Dhal mill	100-150 kg/h	
Versatile Dhal Mill	250-300 kg/h	
Modern Dhal Mill	1 TPH	
Mini Versatile Dhal Mill	100-150 kg/h	
CIAE Dhal mill	100 kg/h	ICAR-CIAE, Bhopal
IIPR Mini Dhal Mill	75-125 kg/h	ICAR-IIPR, Kanpur
Pant Dhal Mill	100-150 kg/h	G.B. Pant Agri. University, Pantnagar, Uttarakhand

iv) High occurrence of insect pest is a major challenge. The NCIPM studies have revealed 40-60 % damage in pigeonpea due to pod borer and 10-15 % due to wilt. Similarly, in gram this damages 10-90% (Pod Borer Complex) and 20-25% Due to Wilt/Root Rot. With the affective IPM the yield of pulses may be increase substantially ***(Pigeonpea -44%, Mung-> 40 %, Urdbean > 48%, Gram > 23% and Lentil 25%).***

Projectile mode IPM demonstrations may be organized in potential districts to harness the production potential. The State Agricultural Universities, KVKs, NCIPM and these ICAR Zonal Research Stations may be given collaborative project underNFSM-Pulse/RKVY.***(Action-States/NCIPM/ATARI/SAUs/ICAR-IIPR/DPD).***

v) A sizable portion of Area under pulses being with the SMF land holders, that too in rainfed regions, are resource poor and can not afford the machineries. This region have a very limited sowing window and need mechanization throughout the crop period. Large scale Custom Hiring Centers may be established/ strengthened with district-wise targets to facilitate mechanization.

The machinery/implements under CSS should also be mandated with the users group to be constituted by the individual beneficiaries for big machinery having subsidy of more than Rs. 10,000/-. ***(Action -SDA/Director Engineering States/ Machinery and Crop Division of DAC&FW, ICAR-CIAE).***

vi) The existing yield gaps in Tur (Early duration-37% , Medium duration-71%); Mungbean (Kharif 73 %, Rabi-143 %); Urdbean (Kharif 68%, Rabi-51%); Gram (54%) and Lentil (59%) is a major challenge.

Quality demonstration both by the states and ICAR (Including ATARI) need to be organized with full transparency, soil test based micro-nutrient applications and only need based quality inputs. ***(Action-States/SDAs/SAUs/ ATARI/ CDD/ NGOs/ DAC&FW).***

vii) Quality inputs, especially micronutrients and pesticides (both organic and chemicals), Shortage of labour, competition from other commercial crops, lack of domestic level milling facility, high level of dust pollution in existing pulse milling industries, lack of scientific storage facility/technology and knowledge of fumigation at domestic level, strategies for effective branding and marketing of products should also need attention to address the pulse sector holistically***.(Action-States/ DAC&FW).***

Summary recommendation/Action Points on report on Brain storming session on *"Promotion of pulses in nontraditional niches: summer cultivation"* Dated 9th -10th, 2016- regarding.

ICAR-IIPR, Kanpur in collaboration with the Directorate of Pulses Development, Bhopal organized a two days Brainstorming Session on "Promotion of pulses in nontraditional niches: summer cultivation" as an event to commemorate the year 2016 as "International Year of Pulses". The Brainstorming Session was held during February 9-10, 2016 at ICAR-IIPR, Kanpur and attended by 119 participants from all stakeholders including scientists, farmers, extension personnel, policy makers from U.P., M.P., Rajasthan, Karnataka, West Bengal, Punjab, Delhi, J&K, Telangana and national organizations like ICAR-ATARI, Jodhpur, Ludhiana, Kanpur, Jabalpur, Bangalore, Kolkata, ICAR-NCIPM, New Delhi, National Seed Corporation, Private Seed Entrepreneurs, State Agricultural Universities, Department of Agriculture of different states, ICAR-NBAIM, Mau, KVKs and Directorates of different crops under DAC, **Ministry of Agriculture and Farmers Welfare, GoI.**

- **Session stressed on micro-irrigation, mechanization, creation of village level seed hubs and effective IPM strategy for promotion of pulses in summer cultivation.**
- **Besides inaugural session, there were four technical sessions in which 3-5 deliberations were made by subject matter specialists on topical themes followed by panel discussions by member experts which led to the following recommendations:**

Technical Session I : Development Efforts

1. Short duration pulses has assumed importance in increasing area under pulses in non-traditional niches like spring/summer/rabi and rice fallow cultivation. Mungbean area in non-traditional niches has steadily increased over the years from the level of 6-3 lakh hectare in 2005-06 to 1.05 million hectare in 2013-14. There is ample scope , if technological (improved varieties, irrigation scheduling, weed management, IPM, innovations in mechanized cultivation) developmental (microirrigation, mechanization, biofertilizers, quality seeds) and policy (provision of seed hubs, bio-agents production units, custom hiring for mechanized planting and harvesting, crop insurance etc.) efforts are oriented towards promotion of short season pulses in non-traditional niches. A policy paper need to be developed on the basis of discussion in two days brainstorming session. *(Action - States/DAC&FW/ICAR).*
2. There is need to document the area under summer pulses. The delineation of area under spring and summer is required separately as both are parts of different cropping systems. Spring crops are cultivated after the harvest of potato, mustard, vegetable pea. However, the summer pulses are grown after harvest of wheat in northern India and after harvest of second crop of rice in new delta area of Tamil Nadu and other areas of southern peninsula. *(Action - States/DDG (Crop Science), ICAR/DAC&FW/DES).*
3. Like summer pulses, there is need to promote spring cultivation as it has obvious advantage of reduced risk of MYMV in spring. Mungbean with spring sugarcane can be promoted in eastern U.P. and Bihar. *(Action- States/ ICAR-IIPR/DAC&FW).*

4. Since wheat varieties are grown in delayed planting in certain niches and are harvested late, the short season window is further reduced. Therefore, there is need to **develop mungbean** varieties maturing in 50-55 days. (Action-SAUs/DDG (Crop Science), ICAR)/ ICAR-IIPR).
5. The area under irrigation in M.P. in canal command area has increased and thus facilitating summer mungbean cultivation in M.P.. There is need to develop suitable cultivars of mungbean for M.P. (*Action-SAUs/SDA(M.P.)/ DDG (Crop Science), ICAR / ICAR-IIPR).*

6. In Uttar Pradesh, summer pulses are facing competition with some more remunerative crops like summer Bajra, groundnut, mentha and maize. There is need to develop appropriate technologies and varieties to make summer pulse cultivation profitable and sustainable. *(Action- SAUs (CSAU-Kanpur)/NDAU, Faizabad/Banda Agriculture Univ U.P./ Modipuram Agriculture Univ., Meerut /States/ ICAR-IIPR/DAC&FW).*
7. Large scale demonstrations with improved new varieties of summer pulses are required and seeds so produced during first year of demonstrations may be used for subsequent years to bring further large area under demonstrations. A suitable mechanism has to be evolved. The specific provisions are also required to monitor and visit of these demonstrations. *(Action-States/NSC/Seed Division/DAC&FW/ICAR-IIPR).*
8. Raised bed planting in some areas emerged as an important planting technique which economizes the quantity of water/irrigations. This need to be upscaled through demonstrations further. *(Action – SDA /Directorate of Engg./States/Machinary Division, GoI).*

9. There is need to develop small scale entrepreneurship at village level for processing and value addition to make summer pulses cultivation profitable and competitive with other crops. *(Action-States/CFTRI /DAC&FW).*

Session II : Technical Innovations

1. For summer mungbean cultivation there is an urgent need to develop farmer's friendly literature on "package and practices of summer mungbean", "Management of flower drops in summer and spring mungbean "and" Integrated management of insect pests in summer/spring mungbean cultivation".***(Action-ICAR-IIPR/DPD/DG (Crop Science), ICAR /SAUs).***
2. Micro-nutrients as 'Pulse Wonder' application should be promoted in summer mungbean for enhancing yield. ***(Action-States/SAUs/DAC&FW).***
3. Zero or conservation tillage should be promoted for timely sowing of summer pulses and enhancing yield. ***(Action–States/Directorate of Engg./ICAR-CIAE/CRIDA/DAC&FW).***

4. Economic threshold level of major insect-pests of summer pulses should be clearly defined. Need was also felt for development of an effective IPM modules for effective and economical management insect-pests in summer pulses.***(Action-NCIPM/SAUs/ DAC&FW /ICAR-IIPR).***

5. Date of sowing is very critical in the management of yellow mosaic disease and time of harvesting . The house felt that the sowing should not be delayed beyond the 1st week of April so that the harvesting should not coincide with early onset of monsoon. The delayed sowing in summer favour the high incidence of YMD at later stage of the crop.***(Action-States/ATARI/SAUs).***

6. Using resistant cultivars against YMD is the best, cheap and preferred method. The cultivars developed must have high level of resistance against YMD and they should be tested in all the three seasons particularly for YMD resistance. (***Action-DDG (Crop Science), ICAR/ ICAR-IIPR).***

7. There is no insecticide available which have the label claim for the use in mungbean cultivation. Efforts should be made for obtaining label claim of the insecticides used in summer/spring cultivation of mungbean.***(Action-NCIPM/ICAR-IIPR/ DDG (Crop Science), ICAR).***

8. Punjab Agricultural University has developed a formulation (consortia) of Rhizobium and PSB which is being used in mungbean cultivation. It has been recommended that they should develop a proposal for the establishment of small scale production unit of the formulation and submit it to DAC for funding.***(Action-States/PAU/ICAR-IIPR/ DAC&FW).***

9. In case of farm mechanization, need was felt for the development of combine harvester mechanization package for summer pulses. (***Action-States/Machinary Division of DAC&FW).***

Session III : Success Stories: Farmers' Perspectives

1. Participatory seed model has been successful and by adopting this seed model several seed societies are producing seed of pulses in Uttar Pradesh, Madhya Pradesh and West Bengal. This concept needs to be popularized to cater seed need at village level. ***(Action-States/NSC/DAC&FW).***

2. Farmers' innovations in mechanization for pulses need dues attention. The system of arranging convenient mechanized spray of insecticide in pigeon crop intercropped with soybean as devised by the farmer requires validation, institutionalization and up scaling for summer pulses also.***(Action-ICAR-CIAE/Machinary Division of DAC&FW).***

3. The success story of summer pulses need to be documented and popularized in other six states of the country where the summer cultivation is practiced***.(Action-ICAR-IIPR/DPD/States).***

4. The use of compost in pulses confirmed the reduction of harmful fauna thereby improving the crop productivity. The easy to prepare and use method for such compost may be popularized by the related agencies.

Session IV : Policy perspectives: Mission approach

1. **For promotion of summer pulses, a special campaign may be planned with the identification of target areas and convergence of several provisions of different schemes of SMAM, NFSM, RKVY etc. (Action-States/DAC&FW).**

2. Up scaling the seed hubs in the potential districts for ensuring the seed demand of pulse crops in the country. Safe storage structures for Mungbean seeds need to be popularized on the models of community seed bank. ***(Action-States/ICAR-CIAE/CIPHET/DDG (Engg.), ICAR/DAC&FW).***

3. Delayed planting and late harvest of wheat left a small window for summer cultivation. In view of sustaining the cereal based cropping system, timely planting of wheat need to be ensured.

4. Showcasing of technologies with standard package of practices for summer cultivation need be made through publication of farmer's friendly literature, demonstrations and displaying documentary. Intercropping with spring sugarcane offers the potential for promotion of mungbean

in eastern and western part of Uttar Pradesh and Bihar which could also be harnessed through farmers' persuasion and awareness programmes. ***(Action-States/SAUs/ICAR-IIPR/DPD/DAC&FW).***

5. Mechanization in mungbean cultivation is a potential area for improving the system's efficiency.Use of combine harvester and thresher needs testing, adaptation and popularization.
6. Uninterrupted power supply for critical irrigation support is required in the areas of summer pulses.
7. Stray cattle and Blue bull menace is serious constraints in cultivation of summer pulses. This issue needs to be addressed properly. *(Action-States/Forest Department).*

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(II) Training on "Production and protection technology of pulses"

Two days Training of farmers/ farmers groups/FPOs was organized by CRDE- Krishi Vigyan Kendra, Sewania, District- Sehore on 08 -09 October, 2015. In this programme 52 participants were presented and shared their experiences, knowledge and innovative idea's during inaugural session. The programme was inaugurated by Hable Sri Shailendra Patel, M.L.A., Ichhawar and Dr. A. K. Tiwari, Director, Directorate of Pulses Development, GOI, Bhopal along with scientists from R.A.K. Collage of Agriculture, Sehore, scientists from Krishi Vigyan Kendra, Sehore and targeted stake holders. In the inaugural function Sri Jainendra Kumar Kanaujia, Head, Krishi Vigyan Kendra, Sewania, Sehore welcomed to guests and delegates. He also explained the role of Krishi Vigyan Kendra's in Agriculture development.

Dr. A. K. Tiwari, Director, Directorate of Pulses Development, GOI, Bhopal told about the present scenario of Pulses crop in India as well as in Madhya Pradesh. He also explain the role of pulses in human diet and strategy to mitigate the challenges in changing scenario of Agriculture. Chief Guest of function Hable Sri Shailendra Patel, M.L.A., Ichhawar presented his inaugural address and expressed about role of various agencies involved in development of Agriculture as well as pulses. He emphasized about role of improved technologies market linkages and value addition of pulses. He advised to house we all together can reduce the challenges of pulse production. He also said farmers must use the improved technology which not only enhance productivity but also reduce the production cast. The inaugural function ended with vote of thanks presented by Dr. Upesh Kumar, Scientist, Krishi Vigyan Kendra, Sehore.

After that technical session were organized as per Training schedule. Total 9 technical lectures were delivered in two days training programme. In the last day field visit was also organized in which method of Soil sampling and seed treatment was demonstrated. During the training more emphasis was given on sharing the experience and knowledge among Scientists, Officers and farmers. The farmers were trained on improved varieties, INM, IPM, Best Found

Technologies of Pulses production, role of Micro Nutrients, Agronomical measures of pulses crops and value addition. The farmers were provided technical literature for further reference.

After each technical session a discussion with expert was also done for deleting confusion over technology.

The highlighted action points of the Training Programme are as under -

Technical :

- Use of improved varieties which are resistant against various diseases and high yield potential.
- Broad Bed Furrow method of crop sowing.
- Seed Treatment with fungicide and inoculation with Rhizobium and P.S.B.
- Integrated Plant Nutrient Management as per Soil Test Value.
- Use of Molybdenum in chickpea @1gm./kg. seed as seed treatment.
- Integrated Management of Insects and diseases.
- Incorporation of Pulses crops in cropping system for maintaining soil health.
- Judicious use of irrigational water through use of micro irrigation system.

Administrative :

- Assured availability of Breeder seeds as per demand of seed societies.
- Technical Assistant was expected from seed societies.
- Farmers producer organization willing regular technical support from developmental department and Krishi Vigyan Kendra.
- More credit support was expected from seed societies and Farmer Producer Company.
- Remunerative prices are the prime demand of pulse growing farmers.
- Regular technical support/ capacity building is necessary for getting the latest information on pulses development and technological improvement.
- Financial support for establishing processing units at village level.

Researchable :

- Development of high yielding and short duration varieties of pigeon pea.
- Wilt resistant varieties of pulses crop.
- Seedling device of pulses crops as intercrop.

Annexure-4

EFFECTIVE IMPLEMENTATION & MONITORING OF NFSM PULSES: INTERVENTION-WISE SUGGESTION ON THE BASIS OF MONITORING

S. No.	Item	Constraints	Suggestion Modification/ Measures
1	Production/purchase of Breeder Seed	• Non-involvement of CDDs in finalization of Indent by the seed division. • Non-involvement of districts officer in indenting of breeder seed by the state. • Non-lifting of breeder seed by the state. • Indenting of older/phase-out varieties by the state.	• Involvement of CDDs in finalization of seed indenting at National level. • Involvement of District Officer at State level. • Subsidy/repayment of breeder seed to ICAR/SAU directly at Headquarter level. • Inclusive of newly released variety for Breeder Seed Production.
2	Production of Foundation Seed	• Proper coordination between the SDA and SSC in organization of foundation seed programme. • Non-involvement of district officer in organization of production of foundation seed.	• Proper Coordination need to be ensured between SDA & SSC level.
3	Production of Certified Seed	• Improper Coordination of District Officer and SSC at district level. • Penetration of production subsidy to farmers.	• Subsidy penetration should ensured by the State for smooth implementation of component of seed production.
4	Distribution of Certified Seed	• Inadequate availability of Certified Seed.	• The State should pay more attention on production of Certified Seed rather than distribution to proper upon the SRR.
5	Seed Minikit	• Non distribution of minikits to real cultivars. • Treat as distribution not demonstrated.	• The Seed minikit should be distributed to real cultivators & should be implemented as demonstration rather than distribution.
6	Block Demonstration	• Not giving preference to regional problem of the crop.	• Demonstration should laid out as per the agro-eco situation/ need of the region.
7	IPM-Demonstration	• Bio-agent production/ implementation improper at field level.	• Proper implementation of bio-agent.
8	FLD	• Non Coordination of SDA & ICAR	• Proper Coordination between the SDA & ICAR for penetration of technology amongst the farmer.

S. No.	Item	Constraints	Suggestion Modification/ Measures
9	Plant Protection	• Use of Chemical/insecticide at higher side in most of the states.	• Need based chemicals/ insecticides should be implemented.
10	Rhizobium/NPV/PSB	• Less production of Rhizobium/NPV/PSB in most of the states.	• Due to less cost of Rhizobium culture afford the cost of Rhizobium, there is no need for Rhizobium.
11	Sprinkler set/Pipes	• Price of differ from market rate.	• The subsidy norms should be based on Actual Cost available in market.
12	Training		• Allocation of training to KVKs / NGOs etc., for better partnership/quality.
13	Innovative measures	• Implemented the routine component under this measures.	• Need to implemented based on Agro-ecological problems faced by the states.
14	Staff & Contingency	• Non revival of the post sanctioned under the component.	• Need approval every year by the TMOP Division.
15	Involvement of Private Sector	• No involvement of Private Sector in programme implementation.	• Need to be incorporate the Private Sector in Seed production, training, Demonstration etc. • Involvement of Private Sector is necessary for Value Chain Integration.

Annexure-5

State-wise Area under Kharif & Rabi Pulses-2015-16 (Area :000" ha)

	Tur	Gram	Urad			Moong					Pulses		
State	Kharif	Rabi	Kharif	Rabi	Total	Kharif	Rabi	Total	Other Kharif Pulses	Other Rabi Pulses	Kharif	Rabi	Total
A P	220.0	472.0	44.0	403.0	447.0	52.0	159.0	211.0	50.0	42.0	366.0	1076.0	1442.0
Assam	6.0	2.0		60.0	60.0		14.0	14.0		75.0	6.0	151.0	157.0
Bihar	21.28	60.9	15.1		15.1	10.8	150.1	160.9	10.9	237.1	58.1	448.1	506.2
Chhattisgarh	66.8	287.8	95.3	3.8	99.1	9.8	5.8	15.6	43.5	304.6	215.4	602.0	817.4
Gujarat	228.0	117.0	64.0	9.0	73.0	104.0	37.0	141.0	23.0	24.3	419.0	187.3	606.3
Haryana	5.0	48.0	1.5		1.5	9.4		9.4	0.7	11.0	16.6	59.0	75.6
H P	0.1	0.4	8.7		8.7	0.3		0.3	7.6	12.6	16.7	13.1	29.8
J & K		**0.2**			0.0	1.4	0.1	1.5	19.5	2.2	20.9	2.4	23.2
Jharkhand	193.7	164.2	94.9		94.9	24.9		24.9	34.2	97.6	347.7	261.9	609.5
Karnataka	725.0	1350.0	78.0	5.0	83.0	318.0	4.0	322.0	177.0	148.0	1298.0	1507.0	2805.0
Kerala	0.2	1.0			0.0			0.0	0.2	0.1	0.4	1.1	1.5
M P	579.0	3017.0	932.0	3.0	935.0	193.0	55.0	248.0	15.0	1003.0	1719.0	4078.0	5797.0
Maharashtra	1039.0	1441.0	280.0		280.0	385.0		385.0	118.0	93.0	1822.0	1534.0	3356.0
Odisha	138.3	38.9	73.9	3.0	76.9	86.0	160.7	246.7	129.2	130.0	427.4	332.6	760.0
Punjab	2.6	4.0	2.0		2.0	5.7	39.2	44.9		6.8	10.3	50.0	60.3
Rajasthan	12.2	1066.9	298.7		298.7	1364.0		1364.0	1155.9	62.5	2830.8	1129.4	3960.2
Tamil Nadu	60.2	4.9	40.2	377.0	417.2	32.7	218.1	250.8	72.3	122.8	205.4	722.8	928.2
Telangana	248.0	63.0	24.0	7.0	31.0	99.0	11.0	110.0	3.0	13.1	374.0	94.1	468.1
Uttar Pradesh	265.0	352.0	570.0	44.0	614.0	46.0	51.0	97.0		589.0	881.0	1036.0	1917.0
Uttarakhand	4.0	1.0	15.0		15.0			0.0	26.0	17.0	45.0	18.0	63.0
West Bengal	2.1	28.0	64.0	11.0	75.0	1.5	55.6	57.1	1.0	177.5	68.6	272.1	340.7
Others	9.8	3.9	9.8	6.5	16.3	4.0	1.5	5.6	30.3	61.1	54.0	73.1	127.1
All India	**3826.3**	**8524.2**	**2711.1**	**932.3**	**3643.5**	**2747.5**	**962.1**	**3709.6**	**1917.3**	**3230.4**	**11202.1**	**13648.9**	**24851.1**

Source: DES, Min. of Agri. & FW, New Delhi, IIIrd Advance Estimates

State	State-wise Production of Kharif & Rabi Pulses-2015-16 (Production: 000 tones)												
	Tur	Gram	Urad			Moong			Other Kharif Pulses	Other Rabi Pulses	Pulses		
	Kharif	Rabi	Kharif	Rabi	Total	Kharif	Rabi	Total			Kharif	Rabi	Total
A P	129.0	478.0	31.0	345.0	376.0	18.0	132.0	150.0	24.0	25.0	202.0	980.0	1182.0
Assam	5.0	1.0		36.0	36.0		9.0	9.0		56.0	5.0	102.0	107.0
Bihar	30.0	71.2	13.5	0.0	13.5	7.6	93.8	101.4	10.0	260.8	61.2	425.8	487.0
Chhattisgarh	41.2	282.9	28.8	1.0	29.8	4.5	1.3	5.8	15.0	185.3	89.5	470.5	560.0
Gujarat	238.0	135.0	39.0	6.0	45.0	51.0	21.0	72.0	11.0	18.5	339.0	180.5	519.5
Haryana	5.0	42.0	0.6		0.6	4.8		4.8	0.3	10.4	10.7	52.4	63.1
H P	0.0	0.4	11.0		11.0	0.1		0.1	3.1	42.1	14.2	42.5	56.7
J & K		**0.1**			0.0	0.5	0.1	0.6	7.7	1.9	8.3	2.1	10.3
Jharkhand	173.2	173.5	72.1		72.1	18.4		18.4	16.8	98.3	280.4	271.8	552.2
Karnataka	294.0	787.1	18.0	2.0	20.0	48.0	1.0	49.0	86.0	69.0	446.0	859.1	1305.1
Kerala	0.4	1.0			0.0			0.0	0.4	0.1	0.8	1.1	1.9
M P	578.0	3265.0	410.0	2.0	412.0	78.0	23.0	101.0	5.0	804.4	1071.0	4094.4	5165.4
Maharashtra	561.1	746.4	58.0		58.0	72.0		72.0	36.0	44.0	727.1	790.4	1517.5
Odisha	123.9	30.2	24.4	1.2	25.6	19.4	64.28	83.7	58.7	77.9	226.4	173.5	399.9
Punjab	2.6	4.8	1.1		1.1	4.9	32.4	37.3		6.8	8.6	44.0	52.6
Rajasthan	6.7	999.9	114.6		114.6	596.9		596.9	354.8	87.3	1073.0	1087.3	2160.2
Tamil Nadu	58.6	3.2	30.7	293.3	324.0	25.4	104.7	130.1	31.3	68.6	145.9	469.8	615.7
Telangana	103.0	48.0	12.0	3.0	15.0	49.0	6.0	55.0	1.0	5.6	165.0	62.6	227.6
Uttar Pradesh	238.0	370.0	229.3	24.0	253.3	20.9	34.0	54.9		657.0	488.2	1085.0	1573.2
Uttarakhand	3.0	0.8	9.0		9.0			0.0	25.0	14.0	37.0	14.8	51.8
West Bengal	3.1	33.0	44.0	10.5	54.5	1.4	39.3	40.7	0.7	189.8	49.2	272.6	321.8
Others	7.6	3.6	6.3	4.8	11.1	2.6	0.8	3.4	26.2	81.4	42.7	90.6	133.3
All India	**2601.3**	**7477.0**	**1153.3**	**728.8**	**1882.1**	**1023.2**	**562.7**	**1585.9**	**713.1**	**2804.1**	**5491.0**	**11572.7**	**17063.6**

Source: DES, Min. of Agri. & FW, New Delhi, IIIrd Advance Estimates

State	State-wise Yield of Kharif & Rabi Pulses-2015-16 (Yield: Kg/ha)												
	Tur	Gram	Urad			Moong			Other Kharif Pulses	Other Rabi Pulses	Pulses		
	Kharif	Rabi	Kharif	Rabi	Total	Kharif	Rabi	Total			Kharif	Rabi	Total
A P	586	1013	705	856	841	346	830	711	480	595	552	911	820
Assam	833	500		600	600		643	643		747	833	675	682
Bihar	1410	1169	897		897	707	625	630	916	1100	1053	950	962
Chhattisgarh	617	983	302	263	301	459	224	372	345	608	416	782	685
Gujarat	1044	1154	609	667	616	490	568	511	478	761	809	964	857
Haryana	1000	875	400		400	511		511	486	945	647	888	835
H P	250	1023	1262		1262	265		265	413	3330	852	3254	1907
J & K		542				381	1286	425	397	875	396	864	444
Jharkhand	894	1057	759		759	738		738	490	1007	806	1038	906
Karnataka	406	583	231	400	241	151	250	152	486	466	344	570	465
Kerala	1818	931							2667	1000	2162	938	1240
M P	998	1082	440	667	441	404	418	407	333	802	623	1004	891
Maharashtra	540	518	207		207	187		187	305	473	399	515	452
Odisha	896	776	330	400	333	226	400	339	454	599	530	522	526
Punjab	1000	1200	550		550	860	827	831		1000	835	880	872
Rajasthan	548	937	384		384	438		438	307	1398	379	963	545
Tamil Nadu	973	648	762	778	776	776	480	519	433	559	710	650	663
Telangana	415	762	500	429	484	495	545	500	333	429	441	665	486
U P	898	1051	402	545	413	454	667	566		1115	554	1047	821
Uttarakhand	750	760	600		600				962	824	822	820	822
W B	1476	1179	688	955	727	933	707	713	700	1069	717	1002	945
Others	773	930	643	737	680	637	531	608	864	1331	791	1239	1049
All India	**680**	**877**	**425**	**782**	**517**	**372**	**585**	**428**	**372**	**868**	**490**	**848**	**687**

Source: DES, Min. of Agri. & FW, New Delhi, IIIrd Advance Estimates.

Annexure-6

Recommended varieties of chickpea/characteristics

CHICK PEA (GRAM)

Variety	Source	Year of Release/ Notification	Area of adoption Zone/State	Ave. yield (Q/ha)	Days to maturity	Remarks
RSG-44	RAU, Durgapura	1991	Rajasthan	20-23	135-150	Tol. to drought and frost, double podded
KPG-59 (Uday)	CASUAT	1992	**NWPZ** (Punjab, Haryana, Delhi, North Rajasthan & West U.P., Bihar & West Bengal).	20.0	135-140	Tolerant to root rot & wilt stunt. Tolerant to pod borer. Bold seeded.(**late sown)**
Bharati (ICCV-10)	ICRISAT	1992	**SZ** (A.P., Karnataka, Orissa & Tamilnadu) **CZ** (MP,Maharashtra,Gujarat).	18-20	95/-100	Resistant to *Fusarium* wilt & dry root rot.
Sadabahar	CSAUAT	1992	Uttar Pradesh	21-23	145-150	Tolerant to wilt.
Pusa-372 (BG-372)	IARI	1993	**NEPZ** (East UP, Bihar, WB). **NWPZ** (Punjab, Haryana, Delhi, Rajasthan **CZ** (MS & Gujarat). (late sown)	21-23 14.0 14-15	135-150	Moderately resistant to wilt, blight & root rot., Small seed, light brown
Sweta (ICCV-2)	ICRISAT	1993	Maharashtra, A.P	12-13	80-90	**Kabuli gram variety**. Resistant to wilt & Botrytis grey mould.
Pusa 329	IARI	1993	**NWPZ** (Punjab, Haryana, Delhi, North Rajasthan & West U.P).	21-23	145-155	Moderately resistant to Wilt, bold seeeded
Vijay (Phule G-81-1-1)	MPKV	1994	**CZ** (MP,Maharashtra,Gujarat).	19-21	105-110	Resistant to wilt, Tolerant to terminal moisture stress.
Pragati (K-3256)	CSAUAT	1994	Uttar Pradesh.	17-20	140-150	Tolerant to wilt.
Vardan (GNG-663)	RAU, Sriganga-nagar	1995	**NWPZ** (Punjab, Haryana, Delhi, North Rajasthan & West U.P).	22-25	150-155	Resistant to wilt.
GPF-2 (GF-89-36)	PAU	1995	**NWPZ** (Punjab, Haryana, Delhi, North Rajasthan & West U.P).	21-23	152	Resistant to wilt & tolerant to Ascochyta blight. Seed yellowish brown
Pusa-362 (BG-362)	IARI	1995	**NWPZ** (Punjab, Haryana, Delhi, North Rajasthan & West U.P).	23-24	145-150	Tolerant to wilt, Bold seeded.
KWR-108	CSAUAT	1996	**NEPZ** (East Uttar Pradesh, Bihar, West Bengal).	20-23	130-135	Resistant to wilt, Seeds are dark brown and small.

Variety	Source	Year of Release/ Notification	Area of adoption Zone/State	Ave. yield (Q/ha)	Days to maturity	Remarks
JG-218	JNKVV	1996	Madhya Pradesh.	18-19	115-120	Early maturing, Tolerant to wilt.
Vishal (Phule G-87207)	MPKV	1996	**CZ**(MP,Maharashtra,Gujarat).	20.00	110-115	Resistant to wilt, Tolerant to pod borer, Early maturing.
Alok (KGD-1168)	CSAUAT	1996	**NWPZ** (Punjab, Haryana, Delhi, North Rajasthan & West U.P).	19-21	140-150	Med. Bold, Res. to Wilt & Root rot
Pant G-186	GBPUAT	1996	Uttar Pradesh	18-20	135-140	Tolerant to wilt & late sown. Small seeded
Hirwa Chaffa (AKGS-1)	PKV	1996	Maharashtra	15-17	105-110	Green seeded
Samrat (GNG-469)	RAU, Sriganga-nagar	1997	**NWPZ** (Punjab, Haryana, Delhi, North Rajasthan & West U.P).	20-22	145-150	Res.to Ascochyta blight. Tol. to wilt and root rot. Suitable for rainfed and irrigated areas.
Pusa-391 (BG-391)	IARI	1997	**CZ** (MP,Maharashtra,Gujarat).	17-18	110-120	Moderately resistant to wilt & root rot. Bold seeded. Light brown
PDG-3 (GF 89-133)	PAU, Ludhiyana	1997	Punjab	15-17	160-165	Tolerant to pod borer.
Karnal Chana-1 (CSG 8962)	CSSRI, Karnal	1997	**NWPZ** (Punjab, Haryana, Delhi, North Rajasthan & West U.P).	22-25	140-147	Recommended for salt affected areas; Wilt resistant.
DCP-92-3	IIPR	1997	**NWPZ** (Punjab, Haryana, Delhi, North Rajasthan & West U.P).	19-20	145-150	Lodging and wilt resistant. Yellowish brown and medium bold seeds. Suitable for high fertility and excessive moisture conditions.
JGG-1	JNKVV	1997	Madhya Pradesh	13-15	120-125	Seed pink
(BG-1003) (Pusa Kabuli)	IARI	1999	**NEPZ** (East Uttar Pradesh, Bihar, West Bengal).	17-19	140-150	White bold seeded, tolerant to wilt.
JG-11	ICRISAT/PKV/JNKVV	1999	**SZ** (Orissa, Karnataka, A.P. & Tamilnadu)	15-17	95-100	Resistant to wilt, moderately resistant to root rot. Bold seeded
Guj. Gram-1	GAU	1999	**CZ**(MP,Maharashtra,Gujarat)	17-22	115-120	Wilt resistant, Dark brown, medium bold.

Variety	Source	Year of Release/ Notification	Area of adoption Zone/State	Ave. yield (Q/ha)	Days to maturity	Remarks
Dharwad Pragati (BGD 72)	IARI	1999	**CZ(**MP,Maharashtra,Gujarat)	25-30	115-120	Resistant to wilt & root rot, bold seeded
CO-3	TNAU	1999	Tamilnadu	9-11	80-85	Bold seeded, Resistant to wilt & Collar rot
CO-4	TNAU	1999	Tamilnadu	9-11	80-85	Bold seeded
JG-322	JNKVV	1999	Madhya Pradesh	18-20	110-115	Suitable for wilt prone areas.
WCG-2 (Surya)	Meerut Uni.	1999	Uttar Pradesh	20-25	135-150	Res.to rot, tol. to stunt & dry root rot
L-551 (Kabuli)	PAU	1999	Punjab.	18-20	135-140	Wilt tolerant.
Gujarat Gram 2 (GCP-107)	GAU	1999	Gujarat	22-24	95-100	Tolerant to wilt and bold seeded
Pusa Chamatkar (G 1053) kabuli	IARI	1999	**NWPZ** (Punjab, Haryana, Delhi, Nor Rajasthan & West U.P)	17-19	140-150	Tolerant to wilt
Gujarat Gram-4 (GCP-105)	GAU	2000	**NEPZ** (East U.P., Bihar, West Bengal).	18-20	135-130	Resistant to wilt. Seeds are dark brown.
PKV Kabuli-2 (KAP 2)	PKV	2000	**CZ (**MP, CG, MS, Gujarat)	17-18	125-130	Bold seeded
SAKI-9516 (Jawahar G 16)	JNKVV	2001	**CZ (**MP, Maharashtra, Gujarat)	18-20	110-120	Resistant to wilt.
Vaibhav (RG 2918)	IGKV	2001	Chhattisgarh	14-15	110-115	Seeds wrinkled and bold
Kranti (ICCC-37)	ICRISAT	2001	Andhra Pradesh	16-20	90-100	Resistance to Wilt & Dry root rot
WCG-10 (Pant G-10)	GBPUAT	2001	Maharashtra, Haryana, U.P.	21-25	147	Resistant to root rot, Mod. Resis. To stunt virus, wilt and dry root rot
Haryana Kabuli 1 (HK- 89-131)	CSSHAU	2002	Haryana	20	142	Resistant to wilt
Virat (Kabuli)	MPKV	2002	Maharashtra	20	108-118	Resistant to wilt

CHICK PEA

Variety	Source	Year of Release/ Notification	Area of adoption Zone/State	Ave. yield (Q/ha)	Days to maturity	Remarks
JG-130 (Jawahar gram)	JNKVV	2002	Madhya Pradesh	15-16	110-115	Bold, Res.to wilt.
Jawahar Gram-1(JGK 1)	JNKVV	2002	**CZ**- M.P., Maharashtra, Gujarat, Bundel khand region of U.P.	15-18	110-115	Mod. Resistant to wilt
Vihar(Phule G-95311)	MPKV	2002	Karnataka, A.P., TN, Orissa	16-18	90-100	Seed Bold, Resistant to wilt
Anubhav (RSG 888)	RAU	2003	Punjab, Haryana, Delhi, North Rajasthan & West U.P).	20-22	130-135	For rainfed, Moderately resistant to wilt & root rot
Pusa 1088	IARI	2003	Delhi	25-30	Med. early	Res. to wilt and root rots diseases.
Pusa 1103	IARI	2004	Delhi	19-23	Early	Resistant to root diseases.
Pusa 1105	IARI	2004	Delhi	25-30	Med. early	Mod. Resistant to root diseases.
Anuradha	Research station, Berhanpur	2004	West Bengal	22-25	120-130	Mod. Resistant to wilt.
Haryana Kabuli Chana 2 (HK 94 134)	CCS HAU	2004	U.P and Bihar	14	138	Resistant to wilt, Collor rot, dry root rot.
Asha (RSG 945)	ARS, Duragapura	2005	Rajasthan	17	75-80	Mod. Res. to dry root rot and wilt.
PGC-1 (Pratap Channa-1)	ARS, Banswara	2005	Rajasthan	12-14	90-95	Mod. Resistant to wilt & pod borer.
Arpita (RSG-895)	RAU, Bikaner	2005	Rajasthan	14	125-130	Mod. Res. to dry root rot, wilt & B.G.M.
Haryana Chana-5 (H 96-99)	HAU, Hisar	2005	Haryana	20	Medium	Res. to *Fusarium* wilt and root rots
Aadhar (RSG-963)	ARS, Duragapura	2005	Raj, Hary, Punjab, Delhi parts of J & K, Uttranchal and U.P	16-17	125-130	Mod. Resis. To Wilt, Dry root rot, B.G.M. & Collor rot, pod borer, & Nematodes
Himachal G-2	CSKHPKVV	2006	CZ	19	187	Resis. to Wilt, root rot & color rot, tolerant to Ascochyta Blight

CHICK PEA

Variety	Source	Year of Release/ Notification	Area of adoption Zone/State	Ave. yield (Q/ha)	Days to maturity	Remarks
JAKI -9218	PDKV, Akola	2006	CZ	18-20	93-125	Resistant to wilt, root rot, color rot
Abha (RSG-973)	ARS Durgapura	2006	Rajasthan	15-16	120-125	Moderate resistant to wilt, dry root rot
Abha (RSG-807)	ARS Durgapura	2006	Rajasthan	18	120-125	Moderate resistant to dry root rot
Himachal chana-2 (HK-94-134)	CSK HP	2006	Himachal Pradesh	19	Medium	Resistant to wilt, Moderately resistant to root rot & collar rots, tolerant to ascochyta blight
Digvijay	MPKV	2006	Maharashtra	19	105-110	Resistant to fusarium wilt
JG-63	JNKVV	2006	MP	20-25	110-120	Resistance to Wilt, Dry root rot & Mod. Resis. To Collor rot & *Helicoverpa* Species.
Akash (BDNG-797)	MPKV	2007	Maharashtra	15-16	102	Resistant to wilt, tolerant to pod borer
Rajas (Phule-G-9425-9)	MPKV	2007	Punjab, Haryana, Uttaranchal, Delhi, Rajasthan and Jammu	18	136	Resistant to *fusarium* wilt
JGK-2	JNKVV	2007	M.P.	15	95-110	Resistant to collar rot, root rot, Mod. Res.to wilt and dry root rot
Lam shanaya(LBeG 7)	ANGRAU	2007	M.P.	20-25	90	Tolerant to Wilt and rot condition
JGK-3 (JGK 19)	JNKVV	2007	M.P.	14-15	92-121	Resistant to wilt
Jawahar Gram 226 (JG 226)	JNKVV	2007	M.P.		112-115	Resistant to wilt and root rot complex
GNG 421 (Gauri)	ARS, Sri Ganga Nagar	2007	Rajasthan	18	127-160	Tolerant to dry root rot, stunt and wilt
GNG 1488 (Sangam)	ARS, Sri Ganga Nagar	2007	Rajasthan	18	99-157	Tol .to dry root rot and stunt
RSG 991(Aparna)	ARS, Duragapura	2007	Rajasthan	12-15	130-135	Mod. Res. to dry root rot, wilt, collar rot
RSG 896 (Arpan)	ARS, Duragapura	2007	Rajasthan	12-15	130-135	Mod. Res. to dry root rot, wilt, pod borer

CHICK PEA

Variety	Source	Year of Release/ Notification	Area of adoption Zone/State	Ave. yield (Q/ha)	Days to maturity	Remarks
RSG 902 (Aruna)	ARS, Duragapura	2007	Rajasthan	15-20	130-135	Mod. Res. to dry root rot, wilt, pod borer
JAKI 9218	PDKV	2008	Maharashtra	18-20	93-125	Resistant to *fusarium* wilt, root rot and collar rot
GNG 1581 (Ganguar)	ARS, Srigan-ganagar	2008	NWPZ	24.00	127-177	Resistant to water logging condition
WCG 3 (vallabh colour chana)	SVBPUAT, Meerut	2008	Uttar Pradesh	19-21	175	Bold seeded, protein content 22.8 %.
JG 6	JNKVV	2008	M.P.	20.00	103-132	Resistant to fusarium wilt and moderate resistant to dry root, Tolerantto pod borer
Pusa 2024	IARI	2008	Delhi	25-28	145	Moderately resistant against soil borne diseases and drought
BGD 103	UAS	2009	Karnataka	11-13	95-100	Resistant to fusarium wilt
JG 14	JNKVV	2009	M.P.	20-25	113	Moderate resistant to wilt, dry root and pod borer
Shubra (IPCK 2004-29)	IIPR	2009	CZ	21.00	104-108	Moderate resistant to wilt, escape terminal moisture stress and heat
Ujjawal (IPCK 2004-29)	IIPR	2010	CZ	20.00	103-111	Moderate resistant to wilt and tolerant to BGM, escape terminal moisture stress and heat
Phule G 0517	MPKV	2010	M.S., M.P., Karnataka	18.00	105-110	Tolerant to fusarium wilt, 59.4g/100 seed weight
Pant Kabuli chana 1	GPBUAT, Pantnagar	2010	Uttarakhand	30.00	120-122	Resistant to Botrytis grey mould
PKV Kabuli 4	PDKV	2010	Maharashtra, Madhya Pradesh	15-16	100-110	Moderately resistant to fusarium wilt dry rot and Botrytis grey mould
Gujarat Junagarh Gram 3 (GJG 0207)	JAU, Junagarh	2010	Gujarat	15.00	98-100	Moderately resistant to wilt and tolerant to pod borer
GPF 2	PAU	2010	NWPZ	22.00	134-163	Plants grow erect with thick stem resistant in lodging
MNK 1	UAS, Raichur	2011	Karnataka, A.P., Odisha, and Tamil Nadu	13.00	95-110	Moderately resistant to wilt

CHICK PEA

Variety	Source	Year of Release/ Notification	Area of adoption Zone/State	Ave. yield (Q/ha)	Days to maturity	Remarks
RSG 974 (Abhilasha)	ARS,Duragapura	2010	Rajasthan		130-135	Moderately resistant to wilt, dry root rot BGM and sterility mosaic
Raj Vijay Kabuli gram 101 (JSC 42)	RVSKVV	2012	Madhya Pradesh	15-20	90-110	Resistant to fusarium wilt and moderate tolerant to pod borer
Raj Vijay gram 201 (JSC 40)	RVSKVV	2012	Madhya Pradesh	20-25	95-113	Resistant to fusarium wilt
HK 4 (HK 05-169)	CCSHAU	2012	NEPZ	15.00	136	Resistant to wilt, bold seeded
Raj Vijay Kabuli gram 202	RVSKVV	2012	CZ	18-20	105	Suitable for late sown condition in paddy/cotton/soyabean-chickpea cropping system
Raj Vijay Kabuli gram 203	RVSKVV	2012	CZ	19-20	100	Moderately resistant to wilt, dry root rot
PBG -5	PAU, Ludhiana	2012	Punjab	17.00	160-165	Resistant to ascochyta blight disease
PKV harita (AKG 9303-12)	PDKV	2012	Vidarbha region of Maharashtra	12-18	106-110	Bold seeded, tolerant to wilt and drought, useful for culinary purpose
GJG 0809	Junagarh	2013	NHZ	16.0	157	Irrigated, medium brown colour attractive seed (21.5 g/100 seed), mod.
GNG 1958	Sriganga nagar	2013	**NWPZ (**Punjab, Haryana, Delhi, North Rajasthan, West U.P).	26.8	145	Irrigated, suitable for normal sown irrigated condition. It matures in 145 days. It has brown seed colour with 25.4 g
GNG 1969	Sriganga nagar	2013	**NWPZ**	22.0	146	Irrigated, suitable for normal sown irrigated condition.
CSJ 515	Durgapura	2013	**NWPZ**	24.0	135	Irrigated, small brown colour seed (17.0 g/100 seed), mod. Resis. to dry root rot, and tolerant to ascochyta blight and BGM.
GLK 28127	Ludhiana	2013	**NWPZ**	21.0	149	Irrigated, large seeds (36.0 g/100 seeds), light yellow or creamy colour with irregular owl head.
Raj Vijay Kabuli gram 202	RVSKVV, Gwalior	2014	CZ	18-20	105	Late sown condition in paddy/ cotton/ soyabean-chickpea cropping system.

NHZ-North Hilly Zone (H.P.,J.K & U.P.hills*)*, CZ- Central Zone (MP.,Maharashtra, Chhattisgarh, Gujarat) , SZ- South Zone (A.P., Karnataka, Tamil nadu, Orissa) NEPZ-North East plane Zone (East Uttar Pradesh, Bihar, Jharkhand, West Bengal).NWPZ- North West Plane Zone (Punjab, Haryana, Delhi, West UP & North Rajasthan) , Res.= Resistant, Tol.= Tolerant, Mod.= Moderately, BGM- Botrytis grey mould

PIGEONPEA (TUR)

Variety	Source	Year of Release/ Notification	Area of adoption Zone/State	Ave. yield (Q/ha)	Days to maturity	Remarks
BSMR-175	MAU	1991	Maharashtra	11-12	165-170	White seeded, res. to Sterility Mosaic & Wilt
JA-4	JNKVV	1991	Madhya Pradesh	16-18	180-200	Tolerant to wilt & SMD
Birsa Arhar 1	BAU	1992	Bihar	10-15	180-200	Wilt Resistant
Gujarat Tur-100	GAU	1992	Gujarat.	16-18	120-135	Tolerant to wilt &SMD white, bold-seeded.
Vamban 1	TNAU	1993	Tamil Nadu	8-10	95-100	Suitable for inter cropping with Peanut
Asha (ICPL-87119)	ICRISAT	1993	**CZ&SZ** (M.P., Maharashtra, Gujarat, Karnataka, Andhra pradesh, Orissa, Tamilnadu).	16-18	160-170	Resistant to wilt & SMD, Bold seeded., Indeterminate
Pusa-855	Central	1993	**NWPZ (**Punjab, Haryana, Delhi, North Rajasthan, West U.P).	24-25	145-150	Plant Indeterminate, Medium bold seeded.
Pusa-9	IARI	1993	**NEPZ (**East Uttar Pradesh, Bihar, West Bengal).	22-26	210-248	Tolerant to Alternaria & SMD, Tall & bold- seeded, Suitable for pre-rabi.
CO-6	TNAU	1993	Tamil Nadu	8-10	170-180	Tolerant to Pod borer. Indeterminate
Sharad (DA 11)	RAU, Dholi	1993	Bihar	18-20	240-250	Alternaria blight & Sterility Mosaic Resistant
Sarita (ICPL 85010)	ICRISAT	1994	A.P.	10-12	130-140	Determinate.
TS-3	UAS, Gulberga	1995	Karnataka	14-16	180-190	White, bold seeded, res. to Wilt
AL-201	PAU	1995	Punjab.	15-16	140-150	Indeterminate variety.
Durga(ICPL84031)	ICRISAT	1995	Andhra Pradesh.	8-10	120-125	Determinate.
Jawahar (KM-7)	JNKVV	1996	**CZ** (MP,Maharashtra & Gujarat **SZ** (Orissa, Karnataka, A.P. & Tamilnadu).	18-20	173-180	Tolerant to wilt & Phytophthora blight. Seeds dark brown

PIGEONPEA (Continue)

Variety	Source	Year of Release/ Notification	Area of adoption Zone/State	Ave. yield (Q/ha)	Days to maturity	Remarks
BSMR-736	MAU	1996	Maharashtra	12-18	180-185	Resistant to wilt and SMD. Brown seeded. Indeterminate
Narendra Tur-1 (NDA-88-2)	NDUAT	1997	Uttar Pradesh.	20-22	240-260	Resistant to SMD and tolerant to wilt and Phythopthora blight.
Amar (KA 32-1)	CSAUAT	1997	Uttar Pradesh.	16-20	250-270	Compact, res. to SMD. Tol. to wilt, Seed brown
H 82-1(Paras)	CCSHAU	1998	Haryana	15-20	133-145	Indeterminate
Malviya Vikalp (MA-3)	BHU	1999	**CZ** (M.P., Maharashtra, Gujarat).	20-22	178-162	Spreading, Constricted Pod, resistant to pod fly.
Azad (K 91-25)	CSAUAT	1999	U.P. & Bihar	20-22	250-260	Wilt Tolerant, Sterility Mosaic Resistant
AKT-8811	Akola	2000	Maharashtra	13-14	145-150	Indeterminate
Laxmi (ICPL-85063)	ICRISAT	2000	Andhra Pradesh	18-20	160-200	Pre-rabi
Vaishali (BSMR-853	MAU	2002	Maharashtra	16-17	165.170	Resistant to wilt and SMD.
Sel-31	ARS, Gulbarga	2002	Karnataka	12	100-110	Irrigated command areas wherever double & multiple cropping system is being in practices
Pusa-992	IARI	2002	Haryana, Punjab, U.P., Rajasthan	18-20	130-140	Indeterminate
MA-6	BHU	2002	Central & Eastern U.P.	20-23	248-267	Late, Spreading type
Pusa 991	IARI	2003	Delhi	16-20	140	Tolerant to wilt, Phytophthora blight and SMD
Pusa-992	IARI	2004	Haryana, Punjab, Delhi, Western UP and Rajasthan	17	119-162	Tolerant to SMD and wilt

PIGEONPEA (Continue)

Variety	Source	Year of Release/ Notification	Area of adoption Zone/State	Ave. yield (Q/ha)	Days to maturity	Remarks
GT-101	GAU	2004	Gujarat	13	Early	Tolerant to wilt and SMD
Malviya chamatkar (MAL-13)	BHU	2005	UP & W.B.	27-29	226-271 (Kh) 189-248 (Pre–rabi)	Moderately resistant to wilt and SMD, Recommended for Kharif and pre-Rabi seasons.
VL Arhar-1	VPKAS, Almora	2006	Uttarakhand	19	150	Res.to wilt, Alternaria leaf blight and rot
CORG-9701	TNAU	2006	Tamil Nadu, Karnataka, A.P., Orissa	11	120-130	Tol. to wilt, Sterility Mosaic & phytophthora blight, Tol. to pod borer & pod fly
Amol (BDN 708)	ARS Badnapur	2007	Maharashtra	15	160-165	Moderate resistant to wilt & sterility mosaic, Tolerant to pod borer & pod fly
Vipula	MPKV	2007	Maharashtra	16	145-160	Resistant to *Fusarium wilt*, Moderate resistant to sterility mosaic disease
Lam-41	ANGRAU	2007	A.P.	12	Medium	Tolerant to *Helicoverpa* pod borer
Jawahar (JKM-189)	JNKVV	2007	M.P.	21	116-124	Res. to wilt, Moderately resistant to sterility mosaic and Phytopthora blight
GTH-1* (SKNPCH-10)	SDAU	2007	Gujarat	18	135-145	No incidence of sterility mosaic disease
TT-401	BARC	2007	M.P., MS Gujarat & CG	16	138-156	Tolerant to pod borer & tolerant to wilt
Pusa 2002	IARI	2008	Delhi	17	110-150	Sowing to first week of June, suited for double cropping system, tolerant to moisture stress
Pant Arhar 291 (PA 291)	GBPAUT	2008	Uttarakhand	17	140-150	Early maturing, tolerant to phytophthora blight and pod borer

PIGEONPEA (Continue)

Variety	Source	Year of Release/ Notification	Area of adoption Zone/State	Ave. yield (Q/ha)	Days to maturity	Remarks
PAU 881 (AL 1507)	PAU	2008	Pun., Har., Western UP and plains of Uttarakhand	16-18		Early maturing
NDA 2	NDUA&T	2008	U.P., Bihar, WB, Assam & Jharkhand	25-28	240-260	Long duration, resistant to SMD and pod borers
TJT 501	BARC & ZARS, Khargone	2009	CZ	18	135-183	Tol.to SMD, wilt and phytophthro. Tol. to pod borer and pod fly
BRG 2	UAS, Bangalore	2009	SZ	12-16	175-185	Moderately tolerant to wilt, SMD and pod borer
Surya (MRG-1004)	ARS Madhira	2009	Andhra Pradesh	20-22	166-180	Tolerant to Macrophomina stem canker/wilt
TS-3R	ARS, Gulbarga	2011	Karnataka	11-17	150-160	Kharif and late sown cropping system res. to wilt
Anand grain Tur 2 (AGT 2)	AAU	2012	Gujarat	16	175-180	No severe disease was observed
BDN 711 (BDN2004-3)	ARS Badanapur	2012	Maharashtra	15-23	150-160	Mod. resistant to wilt and SMD

*** Hybrid;** Res.= Resistant, Tol.= Tolerant, Mod.= Moderately, SMD= Sterility Mosaic Disease

MOONG

Variety	Source	Year of Release/ Notification	Area of adoption Zone/State	Ave. yield (Q/ha)	Days to maturity	Remarks
ADT-3	TNAU	1991	Tamil Nadu	10.7	65-70	Tolerant to YMV. Seed small
Co-5	TNAU	1991	Tamil Nadu	9.0	70-75	Tolerant to YMV. Seed small
MUM-2	Meerat University	1992	Punjab, Haryana, Delhi & West UP	12.0	60-70	Res. to YMV, small seeded, early
BM-4	MAU	1992	M.P., Maharashtra, Gujarat.	10-12	65	Early, Tol.to YMV and PM, **Bold Seeded**
Phule M 2	MPKV	1992	Maharashtra	6.9	65	Tolerant to YMV, early, small seed
AKM-8803	PKV	1992	Maharashtra.	10.5	65-70	Tolerant to YMV. Seed small
Narendra Mung-1	NDUAT	1992	Uttar Pradesh.	10.0	60-70	Tolerant to YMV.
AKM-8803	PKV	1992	Maharashtra.	10.5	65-70	Tolerant to YMV.
Asha	CCSHAU	1993	Haryana.	12.0	75-80	Tolerant to YMV.
TARM-2	BARC/PKV	1994	Maharashtra.	9.5	65	Tolerant to PM.
Pusa-9072	IARI	1995	**SZ** (KN, A.P., Orissa, TN (Rabi).	8-10	65-75	Tolerant to Powdery Mildew. **Rabi**
Warangal-2 (WCG-2)		1995	Andhra Pradesh.	14.0	65-70	Suitable for all Season, Tolerant to YMV
Madhira-295	ANGRAU	1995	Andhra Pradesh.	14.0	65-70	Tolerant to YMV
LGG-407 (Lam 407)		1995	Andhra Pradesh.	14.0	70-75	Tolerant to YMV.
JM-721	JNKVV	1996	Madhya Pradesh.	12.4	70-75	Tolerant to PM.
ML-613	PAU	1996	Punjab.	13.0	84	Res. to YMV, Bacterial leaf spot and Pod- leaf spot. Seed med. bold
SML-134	PAU	1996	Punjab.	11.0	68	For **summer/spring**.
PDM-84-178		1996	Andhra Pradesh.	8.1	65-70	Tol. to YMV & PM, **suitable for summer** and early kharif.

Variety	Source	Year of Release/ Notification	Area of adoption Zone/State	Ave. yield (Q/ha)	Days to maturity	Remarks
TARM-1	BARC/PKV	1997	Maharashtra.	8-12	85	Res.to PM, **Suitable for Rabi**. Small seed
Pant Mung-4	GBPUAT	1997	Eastern UP, Assam, Bihar, W.B	7.5	68	Resistant to YMV.
HUM-1	BHU	1999	Gujarat, MS, MP, TN, KN	8-9	60-65	Res. to YMV, **Summer season**
CO-6	TNAU	1999	Tamil Nadu	10.0	65	Suitable for all season, Resistant to YMV.
Pusa-9531	IARI	2000	M.P., Maharashtra, Gujarat, Punjab, Haryana, Delhi, West UP	10-12	60	Res. to YMV, Tolerant to Jassids and whitefly, **suitable for summer.**
Pusa Vishal	IARI	2000	**NWPZ**(Punjab,Haryana,Delhi, West UP, North Rajasthan)	11.0	62	Res. to YMV, Tol.to Jassids and whitefly, **suitable for summer, very bold seeded** (6 g/100 seed)
LAM-460	ANGRAU	2001	Andhra Pradesh	12.0	70-75	Tolerant to YMV
PDM 139	IIPR	2001	Uttar Pradesh.	12-15	50-60	**Summer season,** Mod.Res. to YMV
Ganga-8 (Gangotri)	RAU, Sri Gang Nagar	2001	**NWPZ**(Punjab,Haryana, Delhi, West UP, North Rajasthan)	9.2	72	**Kharif,** tolerant to stem fly and pod borer.
OUM-11-5	OUAT	2002	**SZ** (Karnataka, AP, Orissa, TN).	7.0	62	**Kharif,** Moderately resistant to diseases
Malviya Jagriti (HUM-12)	BHU	2003	U.P., Bihar, Jharkhand, W.B.	11-12	66	Mod. Res. YMV, CLS, **Summer Season**
IPM 99-125	IIPR	2004	**NEPZ** (Eastern UP, Bihar,W.B.).	10.0	66	Res. To YMV, **Summer Season**
TM 99-37	BARC	2005	**NEPZ** (Eastern UP, Bihar, W.B.).	11.0	65	Mod. Res. To YMV, **Summer**
COGG 912	TNAU	2005	**SZ** (Karnataka, A.P, Orissa, TN).	8.0	62	Res. To YMV, CLS, **Kharif**
Kamdeva (OUM 11-5)	OUAT	2004	**SZ** (Karnataka, A.P, Orissa, TN)	8.0	46-69	Mod. Rest. To PM, MYMV & CLS
Muskan (MH-96-1)	CCS HAU	2004	Haryana	15.0	70-75	Resistant to YMV, Anthracnose and Leaf Crinkle
Ganga-1 (Jamnotri)	ARS, Sri Ganga Nagar	2004	Rajasthan	14	76	Mod. Res. to YMV, CLS, PM, anthracnose, Bacterial leaf blight, Macrophomina & web blight & Rhizopus, Moderate tolerant to white fly and jassids

Variety	Source	Year of Release/ Notification	Area of adoption Zone/State	Ave. yield (Q/ha)	Days to maturity	Remarks
Shalimar Moong-1	SKUAST	2005	J & K	9	105-115	Res. To leaf spot, pod blight
BM-2002-1	ARS, Badnapur	2005	Maharashtra	10-12	65-70	Moderate resistant to PM
HUM 16 (Malviya Jankalyani)	BHU	2006	**NEPZ** (Eastern UP, Bihar, W.B.).	14-16	55-58	Summer, Resistant to YMV, Root Knot and Lea Crinkle
Tromday pesara (TM-96-2)	ANGRAU	2006	Andhra Pradesh	6	69-73	Rabi & summer, Res. To PM and Cercospora leaf spot
Tromday Jawahar M-3 (TJM-3)	JNKVV	2006	MP	8-10	61-75	Kharif & summer, Resistant to YMV, PM and Rhyzoctonia root rot
SML 668	CSKHPKV, palampur	2007	North Hills sub-tropical zone	11-12	75-85	Under irrigated condition in summer as contigen crop or intercrop in sugarcane , resistant to anthracnose, cercospora leaf spot & YMV
Satya	CCSHAU	2008	NWPZ	16-17	70	suitable for kharif
KM 2241	CSAUAT	2008	North Hills zone of the country in timely sown condition	9.00	65-70	Resistant to MYMV, suitable for kharif
IPM 2-3	IIPR, Kanpur	2009	Rajasthan, Punjab, and Jammu region	10.00	70-72	Resistant to MYMV, large seed, suitable for kharif and spring
Pusa 0672	IARI	2009	Jammu & Kashmir, Manipur and Tripura	16.00	52-103	Resistant to MYMV, suitable for kharif
Madhira Pesara 347	ARS, Madhira	2009	Andhra Pradesh	12.00	60-70	Tolerant to crecospora, Leaf spot and Anthracnose
KKM 3	ARS, Kathalagere	2009	Karnataka	8-9	62	Moderately tolerant to Powdery Mildew and YMV and Pod borer
Pairy Mung		2010	MP,CG	9-10	60-65	Commonly used by farmer
Basanti	CCSHAU	2010	Haryana	15-17	65	Resistant to MYMV, suitable for kharif and spring
VBN (Gg) 3	NPR, VAMBAN	2010	Tamil Nadu	8-9	65-70	Moderately resistant to Powdery Mildew

Variety	Source	Year of Release/ Notification	Area of adoption Zone/State	Ave. yield (Q/ha)	Days to maturity	Remarks
MH 125	CCSHAU	2010	Haryana	12.00	64	Resistant to MYMV, Leaf crinkle, web blight, Anthracnose, moderately resistant to cercospora leaf spot
PKVAKM 4 (AKM 9904)	PDKV	2011	Karnataka, Tamil Nadu and Odisha	10-11	57-80	Tolerant to PM, suitable for kharif
PKV green gold	PDKV	2011	Maharashtra	10-11	57-80	Tolerant to PM, suitable for kharif
IPM 02-14	PDKV	2011	AP, Karnatana, Tamill Nadu and Odisha	10-12	62-70	Resistant to MYMV, large seed, suitable for summer
KM 2195 (swati)	CSAUAT	2012	Uttar Pradesh	10-12	65-70	Resistant to MYMV, cercospora leaf spot, web bligh and Anthracnose, suitable for kharif
MH 421	CCSHAU	2012	Haryana	12.00	60	Non-shattering, resistant to YMV, suitable for kharif spring & summer
BM 2003-2	ARS,BADNAPUR	2012	Maharashtra	8-11	65-70	Green shiny special features : bold grain, long pod with prominent constriction

Res.= Resistant, Tol.= Tolerant, Mod.= Moderately, YMV= Yellow Moasaic Virus, CLS= Cercospora leaf Spot, PM= Powdery Mildew, BLS- Bacterial leaf spot, BLB- Bacterial leaf blight

URD

Variety	Source	Year of Release/ Notification	Area of adoption Zone/State	Ave. yield (Q/ha)	Days to maturity	Remarks
Teja (LBG-20)	ANGRAU	1991	Andhra Pradesh	14.0	70-75	Tol. To YMV
Vamban-1	TNAU	1991	Tamil Nadu.	8.0	65-70	Tol. To YMV
ADT-4	TNAU	1991	Tamil Nadu.	8-9	65-70	Tol. To YMV
ADT-5	TNAU	1991	Tamil Nadu.	8.0	65-70	Tol. To YMV, dwarf & erect
Basant Bahar (PDU-1)		1991	All India except South & HillZone	12-13	70-80	**Spring,** Tolerant to YMV
Prabha (LBG 402)	ANGRAU	1991	Karnataka, Andhra Pradesh, Orissa, T.N.	10.8	78	**Rabi,** seed bold & dull black
TPU-4	BARC/MAU	1992	MP, Maharashtra & Central part of Rajasthan	7.5	75	Plant erect, medium tall. seed bold & dull black
TAU-2	BARC/PKV	1993	Maharashtra	10.0	70	seed bold & purplish black
Narendra Urd-1 (NDU-88-8)	NDUAT	1993	Uttar Pradesh.	10.0	60-70	Resistant to YMV, Black, medium bold seeded.
LBG-611	ANGRAU	1995	Andhra Pradesh.	14.0	85-90	Resistant to wilt.
WBU-108	BCKV	1996	Punjab, West UP, Rajasthan, Karnataka, A.P. TN).	12	85	Tolerant to YMV, **kharif**
Mush-338	PAU	1996	Punjab.	9.0	85-90	Tolerant to YMV. seed bold
Mash-414	PAU	1996	Punjab.	9.6	72	Tolerant to root rot. **Spring**
Birsa Urd-1	BAU	1996	Bihar.	11.0	80	Tolerant to YMV.
Melghat (AKU-4)	PKV	1996	Maharashtra.	10.0	93	Tolerant to stress, for **rabi season**.
KBG-512	TNAU	1997	Tamilnadu.	7-8	70-75	Tolerant to Stemfly, pods hairy.
Vamban-2	TNAU	1997	Tamilnadu.	12	70	Tolerant to YMV & drought.
KU-301	CSAUAT	1998	TN, Orissda, A.P. & Karnataka	12	70	Res. To YMV, **Rabi Season**
TU-94-2	BARC	1998	Karnataka, Andhra Pradesh, Orissa, Tamilnadu.	15.0	69	High yielding & YMV resistant early, **rabi season**
Azad Urd-1 (KU-92-1)	CSAUAT	1999	UP, Bihar, WB.	10.0	80	**Spring,** Res. To YMV
WBG-26	ANGRAU	1999	Karnataka, A.P. Orissa, TN	10	70	Res. to PM

Variety	Source	Year of Release/ Notification	Area of adoption Zone/State	Ave. yield (Q/ha)	Days to maturity	Remarks
Barkha (RBU-38)	RAU,Bansawar	1999	MP, Maharashtra & Central part of Rajasthan	12.0	75	**Bold seeded**,Res. to Cercospora leaf spot
IPU-94-1 (Uttra)	IIPR	1999	Punjab,Haryana, West UP, North Rajasthan, Gujarat, Bihar, W.B.	11-12	85	Resistant to YMV, **kharif season**.
Shekhar 2 (KU-300)	CSAUAT	2001	Punjab, Haryana, Delhi, West UP & North Rajasthan)	11-12	70	Resistant to YMV, **spring season**.
NDU 99-3	NDAUT	2003	**NHZ**	9.5	85	Res. To YMV, **Kharif Season**
KU 96-3	CSAUAT	2003	**CZ** (MP, MS & Gujarat)	8.0	73	Res. To YMV, **Kharif Season**
Goutam (WBU-105)	Research station, Berhanpur	2004	West Bengal	13-15	69-90	Resistant to YMV, Mod. Res. To Cercospora leaf spot
Shekhar 3 (KU 309)	CSAUAT	2004	U.P	10	66-84	Kharif, Resistant to YMV, leaf crinkle, CLS
Mash 1008	PAU	2004	Punjab	12	72	Early, Resistant to MYMV & leaf Crinkle virus
Gujarat urd-1	SDAU	2004	Gujarat	12	late	Late, Moderately resistant to PM & CLS
AKU-15	PDKV	2006	Maharashtra	10-12	65-83	Kharif, Tolerant to PM
Lam 709	ANGRAU	2006	Andhra Pradesh	14	Medium	Tolerant to YMV
Sulata (WBU109)	PORS Beahanpur	2008	UP, Bihar, WB, Assam & Jharkhand	15-16	80-83	Resistant to MYMV, spring season
Pant Urd 31	Central	2008	UP, Tripura, Rajasthan, Odisha,CG,Bihar,AP,Uttara.	15	75-80	Resistant to YMV,
Pant Urd 40	Central	2008	Rajasthan,Uttarakhand	14-15	70-75	Short duration variety
Prasad	Central	2008	UP, T N, Odisha	12-14	60-65	Short duration variety,
VBN (BG)5	Tamil Nadu	2009	TN,	14	60-65	Short duration variety,
Madhra Minumu 207	ARS, Madhira	2009	MS,MP & AP	13	75-80	Tolerant to YMV & stress. Suitable for Kharif, Rabi & Summer
IPU 02-43	IIPR, kanpur	2009	AP, Odisha, Karnataka, Tamil Nadu,Assam	9-11	75	Resistant to MYMV, and PM, kharif season.
KU 99-21	CSAUT, Kanpur	2009	Punjab, Haryana, Western UP and plains of Uttarakhand	10-11	70-75	Kharif season.
Variety	**Source**	**Year of Release/ Notification**	**Area of adoption Zone/State**	**Ave. yield (Q/ha)**	**Days to maturity**	**Remarks**

Mash 479 (KUG 479)	PAU, Ludhiana	2010	Punjab, Haryana, Western UP and plains of Uttarakhand	12.00	82	Resistant to MYMV and PM spring season
UPU 00-31 (Himachal Mash 1)	CSKHPKV, Palampur	2010	Low hill subtropical zone in kharif season (H.P.)	14-16	75	Resistant to Anthracnose, YMV and Leaf Crinkle and Tolerant to CLS and PM, lister Beetle and Hairy Caterpillar.
Mash 114	Punjab	2010	Irrigated areas of Punjab state	9.0	70-75	Resistant to MYMV
LAM Minimum752	ANGRAU	2010	Andhra Pradesh	15	75-82	Resistant to wilt and YMV
CO 6 (COBG 653)	TNAU, Coimbatore	2011	AP, Odisha, Karnataka, Tamil Nadu	8-10	65-70	Resistant to MYMV and PM, sparing
Mash 391 (LU 391)	PAU, Ludhiana	2011	AP, Odisha, Karnataka, Tamil Nadu	8.00	71	Resistant to MYMV, Leaf Crinkle virus, Cercospora leaf spot, Anthracnose and Powdery mildew, spring season
UH 1 (uh 04-06)	CSSHAU	2011	Haryana	11.0	73	Resistant to YMV, kharif season.
VBN (BG) 7 (VBG04-008)	TANU, Coimbatore	2012	AP, Odisha, Karnataka, Tamil Nadu	8.00	63-90	Resistant to MYMV and PM
VBN 6	NPRC, Vamban	2012	Tamil Nadu	9.00	69	Resistant to YMV
Vishwas (NUL-7)	Nirmal seeds, pachora (MS)	2012	Maharashtra, Gujarat, M.P., Chhattisgarh, UP,& Rajasthan	10.00	69-73	Tolerant to major disease

NHZ- North Hilly Zone ((H.P.,J.K & U.P.hills), CZ- Central Zone (MP.,Maharashtra, Chhattisgarh, Gujarat) , SZ- South Zone (A.P., Karnataka, Tamil nadu, Orissa) NEPZ-North East plane Zone (East Uttar Pradesh, Bihar, Jharkhand, West Bengal). NWPZ- North West Plane Zone (Punjab, Haryana, Delhi, West UP & North Rajasthan) Res.= Resistant, Tol.= Tolerant, Mod.= Moderately, YMV= Yellow Moasaic Virus, CLS= Cercospora leaf Spot, PM= Powdery Mildew.

LENTIL

Variety	Source	Year of Release/ Notification	Area of adoption Zone/State	Ave. yield (Q/ha)	Days to maturity	Remarks
JL 1	JNKVV	1991	MP	8.0	120-125	Early, Tolerant to wilt, **Seed bold**
Sapana (LH 84-8)	CCSHAU	1991	**NWPZ** (Punjab, Haryana, Delhi, West UP)	15.0	135-140	Tolerant to Rust & Bold Seeded
VL Masoor 4	VPKAS	1991	Uttaranchal	12.5	168	Tolerant to wilt & Rust, **Small seeded & black.**
Pant lentil-4 (PL-81-17)		1993	**NWPZ** (Punjab, Haryana, Delhi, West UP, North Rajasthan)	16.0	140-145	Resistant to Rust & tolerant to wilt.
Lens-4076	IARI	1993	**NWPZ** (Punjab, Haryana, Delhi, UP) **CZ** (MP, Maharashtra)	14.0	130-135	Tolerant to wilt & Rust. **Seed bold**
DPL-15 (Priya)	IARI	1995	**NWPZ** (Punjab, Haryana, Delhi, West UP)	15-18	130-135	Tolerant to wilt & Rust, **bold seeded.**
Pusa Vaibhav (L-4147)	IARI	1996	**NWPZ (**Punjab, Haryana, Delhi, West UP.)	20-24	130-135	Resistant to Rust & Tolerant to wilt, **small seeded**.
Garima (LH-84-6)	CCSHAU	1996	Haryana.	15-20	135-140	Tolerant to Rust, wilt & Blight. **bold seeded.**
Narendra Masoor-1	NDAUT	1997	Uttar Pradesh.	14.0	125-130	Resistant to Rust & Tol. to wilt.
DPL-62 (Sheri)	IIPR	1997	**NWPZ (**Punjab, Haryana, Delhi, West UP.)	17.0	130-135	Resistant to Rust & wilt, **bold seeded.**
Subrata	BCKV	1998	West bengal	12-18	120-125	Tolerant to Rust, **bold seeded.**
JL-3	JNKVV	1999	**CZ** (MP, Maharashtra)	15-19	115-120	Tolerant to wilt, **bold seeded**.
VL Masoor 103	VPKAS	2000	Uttaranchal	12-14	1645	Tolerant to Rust, **small seeded.**
Noori (IPL-81)	IIPR	2000	**CZ** (MP, Maharashtra)	17-18	110-120	Tolerant to Rust, wilt, **bold seeded**
Pant Lentil-5	GBPUAT	2001	Uttaranchal	15-18	135	Resistant to Rust, **bold seeded**.
Malaviya Vishwanath (HUL 57)	BHU	2005	Eastern and Central U.P., Bihar, Jharkhand, West Bengal and Assam	14.0	130	Resistant to rust & wilt, **small seeded.**

Variety	Source	Year of Release/ Notification	Area of adoption Zone/State	Ave. yield (Q/ha)	Days to maturity	Remarks
KLS 218	CSAUAT	2005	**NEPZ (**East Uttar Pradesh, Bihar, West Bengal).	14-15	125-130	Tolerant to Rust, wilt, **small seeded**
VL-Masoor-507	VPKAS, Almora	2006	J&K, H.P., Uttaranchal, North Eastern Hills	10-12	140-209	Resistant to wilt
Haryana Masoor-1 (LH-89-48)	CCSHAU	2006	Haryana	14	138	Moderate resistant to all disease
VL Masoor 125	VPKAS, Almora	2006	Uttarakhand	19-20	115-117	Resistant to wilt
VL Masoor 126 (VL-126)	VPKAS, Almora	2007	Uttarakhand, H.P., J&K and North Eastern Hills	12-13	126-212	Resistant to GM and Moderately resistantto wilt and rust
IPL-406 (Angoori)	IIPR	2007	Punjab, Haryana, North Rajasthan, Plains of Uttarakhand and Western UP	17	120-155	Resistant to rust and wilt
Pusa Masoor 5 (L-45994)	IARI	2008	Delhi	17-18	120-128	Resistant to rust moderately resistant to pod borer
Moitree WBL 77	PORS, Berhampore	2009	East UP, Bihar, Jharkhand, Assam & WB	15	117	Resistant to wilt and grey mould
Shekhar Masoor 2 (KLB-303)	Shekhar Masoo 2 (KLB-303)	2009	Uttar Pradesh	14	128	Moderately resistant to wilt and rust
Shekhar Masoor 3 (KLB-320)	Shekhar Masoo 2 (KLB-303)	2009	Uttar Pradesh	14	128	Moderately resistant to wilt and rust
Pant Lentil 7 (PL 024)	GBPUAT	2010	Punjab, Haryana, UP	15	147	Resistant wilt to rust & pod borer
Pant Lentil 8 (PL 063)	GBPUAT	2010	Punjab, Haryana, Plains of Uttarakhand , Western UP, Delhi and Rajasthan	15	135	Mod. Resistant to rust and wilt. Resistant to pod borer

Variety	Source	Year of Release/ Notification	Area of adoption Zone/State	Ave. yield (Q/ha)	Days to maturity	Remarks
Pant Lentil-6 (PL-02)	GBPUAT	2010	Uttarakhand ,	11	125-145	Resistant to rust. Wilt, Ascochyta Blight and Tolerant to pod borer
VL Masoor -129	VPKAS, Almor	2010	Uttarakhand ,	9.0	151	Resistant to wilt and root rot and no infestation of pod borer
VL Masoor 133 (VL133)	VPKAS, Almor	2011	Uttarakhand ,	11	150	Resistant to wilt, root rot and rust
VL Masoor 514 (VL514)	VPKAS, Almor	2011	Uttarakhand ,	10	149-159	Moderately resistant to wilt and root rot disease. Tolerant to pod borer
LL 931	PAU	2012	Punjab	12-13	146-147	Resistant to lentil rust. Tolerant to pod borer

CZ- (MP.,Maharashtra, Chhattisgarh, Gujarat) , SZ- (A.P., Karnataka, Tamil nadu, Orissa) NEPZ-North East plane Zone (East Uttar Pradesh, Bihar, Jharkhand, West Bengal). NWPZ- North West Plain Zone (Punjab, Haryana, Delhi, West UP & North Rajasthan) Res.= Resistant, Tol.= Tolerant, Mod.= Moderately,

FIELD PEA

Variety	Source	Year of Release/ Notification	Area of adoption Zone/State	Ave. yield (Q/ha)	Days to maturity	Remarks
JP-885	JNKVV	1992	**CZ** (MP, Maharashtra & Gujarat)	21.0	120-140	Resistant to PM.
KFP-103 (Shikha)	CSAUAT	1993	**NWPZ** (Punjab, Haryana, Delhi, West UP & North Rajasthan)	15-20	130-140	Resistant to PM.
DMR-7 (Alankar)	IARI	1996	**NWPZ** (Punjab, Haryana, Delhi, West UP & North Rajasthan)	20-25	115-135	Resistant to PM.
Uttra (HFP-8909)	CCSHAU	1996	**NWPZ** (Punjab, Haryana, Delhi, West UP & North Rajasthan)	20-25	120-140	Resistant to PM., dwarf
Sapna (KPMR-1441)		1997	Uttar Pradesh.	20-25	120-130	Resistant to PM. dwarf
Jayanti HFP-8712	CCSHAU	1998	Haryana	20-25	120-140	Res,. to PM., **Bold Seeded**
Swati (KFPD-24)	CSAUAT	1999	U.P.	25-30	110-125	Resistant to PM. & tolerant to rust Dwarf, escapes leaf minor
Malviya Matar-15 (HUDP-15)	BHU	1999	**NEPZ** (East UP, Bihar, West Bengal). **NHZ**	25-30	110-130	Resistant to PM., rust and leaf miner
DDR-23 (Pusa Prabhat)	IARI	2000	**NEPZ** (East UP, Bihar, W.B).	15.0	95-115	Extra early, Resistant to PM
Ambika	IGKV	2000	**CZ** (MP, Maharashtra & Gujarat)	15-20	100-125	Resistant to PM, Tall Plants
DDR-27 (Pusa Panna)	IARI	2001	**NWPZ** (Punjab, Haryana, Delhi, West UP & North Rajasthan)	18.0	100-115	Very early, Resistant to PM
Indra (KPMR-400)	CSAUAT	2001	**CZ** (MP, Maharashtra & Gujarat)	20.0	105-115	Dwarf type, Resistant to PM
Shubhra (IM-9101)	IGKV	2001	Chhattisgarh	15-20	90-95	Resistant to PM

Variety	Source	Year of Release/ Notification	Area of adoption Zone/State	Ave. yield (Q/ha)	Days to maturity	Remarks
Jay(KPMR-522)	CSAUAT	2001	**NWPZ** (Punjab, Haryana, Delhi, West UP & North Rajasthan)	23.0	120-140	Dwarf type, Resistant to PM
Adarsh (IPF 99-25)	IIPR	2004	**CZ** (MP, Maharashtra & Gujarat)	23	110-115	Resistant to Powdery Mildew
Vikas (IPFD 99-13)	IIPR	2005	H.P., Maharashtra, C.G., Gujarat & Bundel khand region of U.P.	23	102	Resistant to PM and tolerant to rust
Prakash (IPFD-1-10)	IIPR	2006	M.P., C.G., Maharashtra, Gujarat, Bundel khand region of UP, J&K, H.P. and Uttarakhand	21	94-121	Resistant to PM and tolerant to rust
Paras	IGAU, Raipur	2006	Chhattisgarh	18-24	92-119	Resistant to powdery mildew
Pant P-14	GBPUAT	2006	Uttarakhand	15-22		Resistant to rust and powdery mildew
VL-Matar-42	VPKAS, Almora	2007	Eastern U.P., Bihar, Jharkhand, East Bengal, Assam	20	108-155	Resistant to PM, Moderate resistant to rust
Hariyal (HFP-9907B)	CCSHAU	2007	Punjab, Haryana, Rajasthan, Delhi, Western U.P.	17-20	128	Resistant to PM & tolerant to rust
Pant Pea -25	GBPUAT	2007	Uttarakhand	18-22	125-128	Resistant to PM &Mod. Resistant to rust
HFP -9426	CCSHAU Hisar	2008	Irrigated areas of Haryana	20	135	Res. To PM and tolerant to root rot. Mod. Resistant to nematodes.
Pant Pea -42	GBPUAT	2008	Western UP, Northern Rajasthan, Punjab, Haryana and plains of Uttarakhand	22	113-149	Resistant to powdery mildew and mod. Resistant to pod borer and stem fly
Swarna Tripti	ICAR,RS, Plandu, Ranchi	2008	Jharkhand, Bihar, & WB.	25	65-70	Resistant to rust and powdery mildew. tolerant to pod borer
Vivek Matar -10 (VP101)	VPKAS, almora	2008	Uttar Pradesh & Uttarakhand	72-98 (pods)	120-130	Mod. Resistant to PM, white rot, wilt & leaf blight. Less incidence of pod borer

Variety	Source	Year of Release/ Notification	Area of adoption Zone/State	Ave. yield (Q/ha)	Days to maturity	Remarks
Pant p 13	Central	2008	Western UP,Rajasthan	24-26	110-115	Resistant to powdery mildew
GOMATI (TRCP-8)	ICAR NHE Regional centre, Lembuherra	2010	Uttarakhand Hills, Jammu & Kashmir and North Eastern states	22-24	87-97	Suitable for late sown condition resistant to PM. tolerant to pod borer and stem fly
Aman (IPF 5-19)	IIPR	2010	Punjab, Haryana. Plains of Uttarakhand west UP, Delhi and Parts of Rajasthan	22	124-137	Res. To PM and tolerant to rust. Mod. resistant to pod borer and stem fly
IPF 4-9	IIPR, Kanpur	2011	Suitable to irrigated areas	17	129	Resistant to powdery mildew and mod. Resistant to pod borer and stem fly
VL Matar 47 (VL47)	VPKAS, Almora	2011	Uttarakhand	14.0	142-162	Resistant to wilt , Rust and powdery mildew
Dantiwada Field pea 1 (SKNP 04-09)	S.D.Agri. university ,	2011	Uttar Pradesh, Bihar, Jharkhand, and West Bengal.	17.0	98-123	Resistant to powdery mildew

Res.= Resistant, Tol.= Tolerant, Mod.= Moderately, PM= Powdery Mildew,

Horse gram

Variety	Source	Year of Release/ Notification	Area of adoption Zone/State	Ave. yield (Q/ha)	Days to maturity	Remarks
KS 2	RAU	1991	Rajasthan	6-7	80-85	Early maturing, seed brown
Palem 1	ANGRAU	1998	A.P	10-12	80-85	Early maturing, Semi-spreading
Palem 2	ANGRAU	1998	A.P	8-9	100-105	Med. maturing
Arja Kulthi 21 (AK-21)	MPUAT (Bhilwara)	1998	Rainfed areas of NW parts	8-9	70-105	Early maturing
Paiyur 2	TNAU	2001	**SZ** (Karnataka, AP, Orissa, TN).	8-9	100-106	For Sept- Oct sowing
PHG 9	UAS	2001	**SZ** (Karnataka, AP, Orissa, TN).	7-9	100-105	Semi spreading thick foliage
Pratap Kulthi -1 (AK 42)	MPUAT	2005	Rajasthan, Gujarat, M.P. Haryana	10-12	83-87	Protein 30% lush green foliage with wax deposition
VL Gahat-8	VPKAS, Almora	2007	Uttarakhand	12	92-106	Resistant to anthracnose and stem root
VL Gahat-10	VPKAS, Almora	2007	Uttarakhand	10	110-115	Resistant to YMV & root rot and leaf spot.
GPM 6	AICRP, Bijapur	2008	Karnataka	8-9	120-130	Resistant to YMV, moderately resistant to Rhizoctonia root rot
VL Gahat 15	VPKAS, Almora	2009	Northern India	5-6	95-105	Resistant to Anthrocnose and leaf spot
VL Gahat 19	VPKAS, Almora	2010	North Zone	5	88-94	Multiple disease resistance to important disease
CRIDA 1-18 R	CRIDA, Hyderabad	2009	Karnataka, AP and TN	8	72-102	Tolerant to YMV, powdery mildew, leaf blight, and root rot
CRIDALATHA (RHG 4)	CRIDA	2010	South Zone	8.0	72-110	Tolerant to YMV, powdery mildew, leaf blight, and root rot & mites
Indira kulthi 1 (IKGH 01-01)	IGKV	2010	Chhattisgarh	7.0	92	Up lands under rainfed condition with sowing time of august 15 onwards
Gujarat Dantiwada Horsegarm-1(GHG-5)	SDAU, SK Nagar	2012	Gujarat, Rajasthan, Uttrakhand, Jharkhand, UP & Maharashtra	5-6	89-100	Resistant to root rot, moderately resistant to PM, Collar rot, Cercopsora leaf spot and leaf blight.

SZ- South Zone (A.P., Karnataka, Tamil nadu, Orissa) ; NWPZ- North Western Plane Z

Cowpea

Variety	Source	Year of Release/ Notifi.	Area of adoption Zone/State	Ave. yield (Q/ha)	Days to maturity	Remarks
Gujarat Cowpea-3	GAU	1990	**CZ** (MP, Maharashtra & Gujarat)	12-14	65-85	Seed bold, amber colour
V-240	IARI	1993	All Zones	14.0	80	Tall, Indeterminate, seed red
Vamban - 1	TNAU	1997	Tamil Nadu	9.5	65	Erect, dwarf, seed white
Gujarat Cowpea-4	GAU	1999	Gujarat	8-5	80-90	Seed bold, amber colour
KBC-2	UAS	2001	Karnataka	9.5	95-105	Semi-determinate, seed light brown
RC-101	TNAU	2001	Rajasthan	8.5	85-90	Early, Determinate, seed white
CO-6	TNAU	2001	Tamil Nadu	14.0	85-90	Early, bold seeded
V 578 (Pusa sampada)	IARI	2004	Delhi	12		Early, Resistant to yellow mosaic virus
CL-367	PAU	2006	Punjab	12	95-100	Tolerant to YMV
RCP-27 (FTC-27)	RAU	2006	Rajasthan	6-13	69-79	Resistant to YMV
UPC 622	GBPUAT	2007	Uttarakhand Assam, U.P., M.P., J & k, H.P., Punjab, Raj., Har., WB., Odisha, Bihar, and Jharkhand	4-5	145-150	Tolerant to drought resistant to YMV, Anthracnose, root/collar rot and bacterial leaf blight, Aphids, leaf Miner, flea beetle, pod borer/bugs and root knot nematode & bruchids.
Khalleshwari	IGKV, Raipur	2007	Chhattisgarh	6-7		RRF in rabi with restricted irrigations and rainfed upland in kharif season
Swarna Harita (IC285143)	ICAR Res. Station,	2008	Assam, U.P., M.P., Kerla, A.P., Punjab, Raj., WB., Odisha, Jharkhand, CG., and TN.	60-150(Pods)	75-90	Resistant to rust and mosaic viral disease & tolerant to pod borer.
Kashi Kanchan (VRCP 4)	IIVR, Varanasi	2008	Punjab, UP, Bihar, Jharkhand, Orisha, CG, MP, AP	150-175(Pods)	50-55	Reistant to golden mosaic virus, *Pseudo-cercospora cruenta* diseases,
UPC 628	GBPUAT	2010	Punjab, UP, Bihar, Jharkhand, Orisha, CG, MP, WB,MS	3.5-4.0	145-150	Iriigated Summer, and rainfed condition,Medium late variety

IT – 38956-1	UAS,GKVK, Bangalore	2009	Karnataka	10-12	80-85	Rainfed areas of eastern dry region
Hisar Cowpea 46 (HC 98-46)	CCSHAU	2009	Haryana	10	65-70	Resistant to YMV
Pant Lobia -1	GBPUAT	2010	Uttarakhand, UP	20	130-135	Moderately resi. to Aphids, Thrips, Bruchids & other field pests. Suitable for spring ,summer and Kharif season
UPC 628	GBPUAT	2010	Uttarakhand, HP, J&K, Punjab, Harya., Raj.,UP, MP, CG, Bihar, Jharkhand, WB, Odisha, Assam, Gujrat & MS	350-400 (Pods)	145-150	Tolerant ot drought and other edephic /abiotic stresses, reis. To YMV, Anthacnose/leaf blight, Aphids, Semilooper, Flea Beetle/Defoliators, Pod borer/bugs & Root knot nematode , tolerant to storage Beevil
HIDRUDAYA	ORARS, Kerela	2010	Kerela	10-11	50-55	Tolerant to leaf rust, Aphids, Pod borer & American Serpentine leaf minor, summer season
C 519 (Himachal Lobia 11)	CSKHPKV, Palampur	2010	Himachal Pradesh	15-16	80-85	Resistant to Cercospora leaf spot, YMV, Low hills, Sub-tropical zone under rainfed condition in kharif
PKB 4	UASGKVK, Banglore	2012	Karnataka	11-13	80-85	Resistant to Bacterial leaf blight, Rust & Pod borer, suitable for early kharif season
PKB 6	UASGKVK, Banglore	2012	Karnataka	10-12	80-85	Resistant to Bacterial leaf blight, Rust & Pod borer, suitable for late kharif and summer season

CZ- Central Zone (MP.,Maharashtra, Chhattisgarh, Gujarat), SZ- South Zone (A.P., Karnataka, TN, Orissa)

Annexure-7

District-wise/crop-wise Area, Production and Yield with varietal status of Pulses in Madhya Pradesh

District	Crop	Area (000 ha)	Prod. (000 Tonnes)	Yield (Kg/ha)	Prevailing varieties	Recommended varieties
Seoni	Pigeonpea	15.87	16.54	1042	ICPL 87, JKM 7	ICPL 87119, JKM 7, JA 4
	Urdbean	6.57	1.40	213	PDU 1, PU 35, T-9, JU 2	PU 30, KU 96-3, PDU 1
	Moongbean	0.50	0.13	267	HUM 1, Pusa Vishal, Desi Mung	JM 721, TARM 1, HUM , HUM 6
	Chickpea	48.30	40.80	845	JG 11, JG 63, JG 74	JG 14, RVG 203, JG 130
	Lentil	21.71	10.71	494	JL 1, JL 3	JL-1, JL-3, JLS 1
	Peas	9.73	4.97	510	Arkel, Azad 1,2 & 3	JP-885, KPMR-400, Azad 1,2& 3
	Total Pulses	**111.91**	**79.42**	**710**		
Mandla	Pigeonpea	6.09	3.63	595	Local Variety (Lal tur)	TJT 501, ICPL 87119 (Asha)
	Urdbean	1.80	0.50	278	PU 35, PDU 1, JU 1	PU 30, KU 96-3
	Moongbean	23.70	10.23	432	PDM 139, Pusa Vishal JM 721	JM 721, TARM 1, HUM 1, HUM 6
	Chickpea	10.07	6.40	636	JG 315, JG 11, JG 63	JG 322, JG 14, JG 63
	Lentil	23.70	10.23	432	JLS 1 & 2	JL-1, JL-3, Lens 4076
	Peas	25.13	6.17	245	Batri	KPMR 400, Prakash (IPFD 1-10), Arkel
	Total Pulses	**69.45**	**28.09**	**405**		
Dindori	Pigeonpea	6.01	2.04	340	TJT 501, Asha (ICPL 87119)	TJT 501, ICPL 87119 (Asha), BSMR-175
	Urdbean	3.73	1.13	304	LBG 20	PU 30, KU 96-3
	Moongbean	39.38	20.80	528	-	HUM 1, HUM 6
	Chickpea	9.17	4.63	505	JG 218, Ujjain 21, JG 315	JG 63, JG 11
	Lentil	39.38	20.80	528	-	IPL 81 (Noori), L-4076, HUL 57
	Peas	9.87	4.70	476	Local Batri	Vikas (IPFD 99-13), Ambika, Matar-42
	Total Pulses	**68.26**	**33.31**	**488**		
Narsinghpur	Pigeonpea	43.82	48.03	1096	ICPL-87119, TJT-501, ICPL-85063	ICPL-85063, TJT-501, No.-148
	Urdbean	10.14	3.97	391	PDU 1, T-9, JU-3	PDU-1, T-9
	Moongbean	2.27	1.00	441	PDM 139, K 851, HUM-16	PDM-139, K-851, HUM-16
	Chickpea	109.63	114.80	1047	JG 315, JG 218, JG 322, JG 16, Gulabi	JG-315, JG 74, JG 63, JG 16
	Lentil	33.80	20.33	602	JL-3, L 4076, K-75	JL-3, L 4076, K-75
	Peas	12.50	9.37	749	JM-1 ,2 & 3, Desi Batri, Arkel	JM-1, JM-2, JM-3, Arkel
	Total Pulses	**214.22**	**198.36**	**926**		

District	Crop	Area (000 ha)	Prod. (000 Tonnes)	Yield (Kg/ha)	Prevailing varieties	Recommended varieties
Sagar	Pigeonpea	12.54	5.83	465	TJT 501, ICPL 87119, ICPL 87	JA 4, ICPL 87 (Pragati), JKM 7
	Urdbean	25.14	8.63	343	Pant U-35	PU 30, KU 96-3, VB 3
	Moongbean	3.47	0.90	260	Pusa Vishal, PDM 139	JM 721, HUM 1, Pusa Vishal
	Chickpea	177.60	168.97	951	JG 130, KAK 2, JG 218	JG 63, JG 130, KAK 2, JGG 1
	Lentil	43.38	21.63	499	Kala Masara, JL 3	JL-1, JL-3, PL-8
	Peas	14.23	8.00	562	Arkel, Azad -1	Adarsh (IPFD 25), JM 6, JM 3
	Total Pulses	**280.65**	**216.69**	**772**		
Damoh	Pigeonpea	22.79	16.93	743	ICPL-87119, ICPL-87, Laxmi	ICPL-87119, Laxmi, JA-4, KM-7
	Urdbean	24.70	9.33	378	T-9, JU-3, PDU-35	TPU-4, PDU-1,
	Moongbean	0.70	0.23	333	K-851, HUM-12, PDM-139	JKM-189, TJM-3, PDM-139
	Chickpea	136.87	106.27	776	JG-315, JG-322, JG-63, JG-74	JG-63, JAKI-9218, JG-130, JG-11
	Lentil	24.19	13.47	557	JLS-1, K-75, JL-3	JL-3, PL-4, L-4076
	Peas	13.20	7.03	533	Arkel, JM-1, JP-885	Ambika, Prakash, Arkel
	Total Pulses	**223.15**	**159.79**	**689**		
Panna	Pigeonpea	14.52	7.43	512	Pusa 33, No. 148, JA 4	JKM 189, ICPL 87, ICPL 87119(Asha)
	Urdbean	12.97	4.80	370	PU-35, LBG-20, Shekhar 2	PU 30, KU 96-3
	Moongbean	2.23	0.93	418	TJM-3, K-851,	JM 721, TARM 1, HUM 1, HUM 6
	Chickpea	89.03	74.53	837	JG-315, JG-130, ICCV-37	Vishal, JG 14, RVG 203
	Lentil	38.55	23.88	619	JL-3, DPL62	PL-4, K-75
	Peas	21.37	16.50	772	Vikas, KPMR-400	Pea-1, JM-3
	Total Pulses	**178.70**	**128.09**	**716**		
Tikamgarh	Pigeonpea	0.17	0.00	28	ICPL 87, ICPL 87119, Jagriti	JKM-7, Asha, TJT 501
	Urdbean	81.47	16.63	204	PU-35,RBU-38,LBG-20, Shekhar	PU 30, PU 19, KU 96-3
	Moongbean	5.23	1.30	248	PU 35, HUM 1	HUM 1, HUM 6, LGG 460
	Chickpea	22.20	14.87	670	Dollar chana, JG 130, JG 63	JG 14, RVG 202, RVG 203
	Lentil	4.56	1.25	275	JL 3, DPL 15	IPL 81 (Noori), IPL 406, L 4076
	Peas	8.97	4.77	532	Arkel	Rachna, Ambika, Prakash, KPMR 522 (Jai)
	Total Pulses	**122.69**	**38.9**	**345**		

District	Crop	Area (000 ha)	Prod. (000 Tonnes)	Yield (Kg/ha)	Prevailing varieties	Recommended varieties
Chhatarpur	Pigeonpea	12.35	3.18	258	ICPL-87119 (Asha), ICPL-88039, Desi	TJT-501, JKM-7, UPAS 120, Asha
	Urdbean	71.33	21.03	295	PU-35,RBU-38,LBG-20, Shekhar	PU-35, PU-30, Azad-2
	Moongbean	8.13	2.13	262	TJM-3, K-851,	PDM-11, HUM-16, Meha, PDM-139
	Chickpea	89.93	92.77	1032	JG-315, JG-322, JG-130, ICCV-37	JG-16, JG-11, JG-14, JG-130
	Lentil	9.07	2.75	303	JL-3, DPL62	JL-3, DPL-62, DPL-15
	Peas	16.20	8.33	514	Vikas, KPMR-400	Adarsh, Prakash, JP-885, KPMR-522
	Total Pulses	**207.95**	**130.43**	**627**		
Rewa	Pigeonpea	34.36	12.56	366	ICPL 87, ICPL 151, Pusa 33, No 148	ICPL 87119, ICPL 87, TJT 501,ICPL 151, No. 148
	Urdbean	12.33	4.03	327	Pant U-35, T-9	PU 30, KU 96-3, Mash 338
	Moongbean	4.07	0.93	230	HUM 1, Pusa Vishal	HUM 1, HUM 6, LGG 460, Pusa 9531
	Chickpea	52.93	55.00	1039	JG 218, JG 130, JG 63	JG 12, ICCV 2, JG 14
	Lentil	39.58	12.41	314	Pant L - 8, JL-3	L 4076, IPL 316, HUL 57, JL-3
	Peas	0.87	0.40	462	Pea-1, Arkel	JM 54, Arkel, JP -885, Azad(P-1)
	Total Pulses	**146.74**	**86.54**	**589**		
Sidhi	Pigeonpea	21.72	6.71	309	TJT 501, ICPL 87119	ICPL 151, ICPL 87119, JKM 189
	Urdbean	4.83	1.80	372	Pant U 35, LBG 20	PU 30, KU 96-3, Mash 338, RBU 38
	Moongbean	2.53	0.83	329	HUM 1, HUM 12	HUM 1, HUM 6, LGG 460
	Chickpea	24.13	15.63	648	JG 130, JG 16 , JG 63	JG 14, JG 322, JG 63, KAK 2
	Lentil	5.47	2.93	536	Malika, JL 3	PL 639, JL 1, JL 3, K-75, RVL-31
	Peas	0.80	0.33	417	Pea -1	Ambika (IM 9102), KPMR 400, KPMR 522, JM 6
	Total Pulses	**60.45**	**28.68**	**474**		
Singroli	Pigeonpea	19.15	22.20	1159	Asha, Pragati, Jagriti	TJT 501, Pusa 33, JKM 7
	Urdbean	6.47	2.60	402	Desi Urd,T-9	PU 30, KU 96-3, Mash 338, RBU 38
	Moongbean	0.20	0.10	500	K 851, Pusa Vaisakhi	TARM 1, HUM 1, HUM 6, LGG 460
	Chickpea	15.63	24.13	1544	JG 11, JG 14, JG 130	JG 322, KAK 2, JG 16
	Lentil	3.98	3.41	856	JL 3	L 4076, IPL 81 (Noori), JL -3
	Peas	0.87	0.87	1000	Arkel	Pea -1, Azad, Jawahar Matar 1
	Total Pulses	**46.49**	**53.40**	**1148**		

District	Crop	Area (000 ha)	Prod. (000 Tonnes)	Yield (Kg/ha)	Prevailing varieties	Recommended varieties
Satna	Pigeonpea	32.28	7.37	228	Chaiti, Bahar	ICPL-87119, JKM-189,JKM 7, JA 4
	Urdbean	22.67	4.40	194	Bhadeli Desi Urd	Pant U-31, AU-86, LBG-20
	Moongbean	4.50	0.87	193	Bhadeli Mung (desi)	Samrat, Meha, K-851, JM-721
	Chickpea	83.57	42.83	513	JG-315, Vijay, Chana (Desi)	JG-11, JG-63, JG-14, JG-322
	Lentil	37.09	11.29	304	BPL-62, Kali Masur	JL-1, JL-3, PL-8
	Peas	4.10	1.47	358	Desi Matar	Arkel, JM-3, JM-2
	Total Pulses	**184.20**	**68.25**	**371**		
Shahdol	Pigeonpea	12.97	6.80	525	ICPL 87119, NO-148, Pusa 33, JA 4	ICPL 87119, TJT 501, JKM 7
	Urdbean	7.37	3.67	498	T-9,	JU1, JU-2, Pant U-31
	Moongbean	0.30	0.20	667	K 851, M-1, M-6	HUM-1, HUM-12, TJM-3
	Chickpea	7.90	6.30	797	JG-315, JG-130, JG-218, JG-74	Raj Vijay201, JG-315
	Lentil	1.53	1.23	802	K-75, JL-1, JL-3	JL-1, JL-3, JM-15
	Peas	1.07	0.83	781	Arkel, JP-885, Rachna	Arkel, Indra (KPMR-400), KPMR 522
	Total Pulses	**85.33**	**19.20**	**225**		
Anuppur	Pigeonpea	6.60	3.22	488	ICPL 87119, Bahar	BSMR 175, ICPL 87119, JKM 7
	Urdbean	2.80	1.37	488	T-9, PDU 1	PU 30, KU 96-3
	Moongbean	0.03	0.00	0.00	K 851	TARM 1, HUM 1, HUM 6, LGG 460
	Chickpea	6.07	3.07	505	Ujjain 21, JG 130, JG 74	JG 322, JG 130, JG 63, JG 14, KAK 2
	Lentil	20.23	9.35	462	K-75, JL 3	JL-3, JL-1, K-75, L-4076
	Peas	2.37	1.20	507	Arkel, Rachna	JM-2, JM-3, Ambika, Rachna
	Total Pulses	**38.57**	**55.12**	**1429**		
Umaria	Pigeonpea	11.57	3.52	304	ICPL 87, ICPL 87119, JKM 7	ICPL 87119, JKM 7, ICPL 87, ICPL 151, Pusa 33
	Urdbean	3.43	0.57	165	LBG 20, T-9, PDU-1	PU 30, KU 96-3, Mash 338
	Moongbean	0.07	0.00	0.00	HUM 1	HUM 1, HUM 6, LGG 460
	Chickpea	8.43	4.83	573	Ujjain 21, JG 14, JG 16	JG 322, |JG 130, JG 63
	Lentil	5.97	3.06	514	Desi Masur, JL 3	JL-3, IPL 81 (Noori), IPL 406
	Peas	2.47	1.13	459	Arkel, Batri, Azad 2	Adarsh, Rachna, Ambika, JM-3
	Total Pulses	**31.94**	**13.12**	**411**		

District	Crop	Area (000 ha)	Prod. (000 Tonnes)	Yield (Kg/ha)	Prevailing varieties	Recommended varieties
Indore	Pigeonpea	0.57	0.30	526	ICPL 87, ICPL 87119, TJT 501, JKM 7	ICPL 87119, BSMR 175, JKM 7
	Urdbean	0.10	0.00	0.00	LBG 20, T-9	KU 96-3, LBG 23, LAM 623, LBG 685
	Moongbean	0.10	0.00	0.00	HUM 12	HUM 1, HUM 6, TJM 3, K-851
	Chickpea	62.73	76.93	1226	JG 218, JAKI 9218, JG 315	JG 322, KAK 2, JG 63, JG 14
	Lentil	0.30	0.11	355	JL 1, Kala Masara	IPL 81 (Noori), JL-3, JLS-3
	Peas	0.80	0.27	333	Arkel, JM 2	Pea-1, JM-3, JM-6
	Total Pulses	**64.61**	**76.84**	**1189**		
Dhar	Pigeonpea	3.48	2.50	718	JKM 189, ICPL 87119 (Asha)	TJT 501, ICPL 87119 (Asha), BSMR 175
	Urdbean	5.80	2.57	443	T-9, Local variety	RBU-38, KU 96-3, LAM 623
	Moongbean	6.20	3.60	581	HUM 1, Pusa Vishal	JM 721, TJM 3, HUM 1, HUM 6
	Chickpea	99.17	112.67	1136	JG 130, JG 16, JG 322, KAK 2	JG 322, JG 130, KAK 2, JGK 3, RVKG 101, RVG 202
	Lentil	0.27	0.20	758	-	JL-1, PL-4, RVL-31
	Peas	1.43	0.77	535	-	Arkel, Rachna, IPFD 1-10
	Total Pulses	**120.01**	**123.58**	**1029**		
Jhabua	Pigeonpea	2.48	1.35	543	ICPL 87, Laxmi, TJT 501, JKM 7	BSMR 736, JA 4, JKM 7
	Urdbean	8.87	4.20	474	Shekhar, T 9, LBG 20	RBU-38, KU 96-3, LAM 623
	Moongbean	0.43	0.17	385	K 851, JM 721, Pusa vaisakhi	HUM 1, TARM 2, K-851, JM 721
	Chickpea	19.13	14.30	747	JG 74, JG 14, JG 63, JAKI 9218, JGK 3	JG 16, JG 218, JG 130, JG 11
	Lentil	0.00	0.00	0.00	JL 3, IPL 81	JL-1, JL-3, IPL-81, L-4076
	Peas	0.20	0.13	667	Arkel, Ambika, Rachna	KPMR 400, Vikas (IPFD 99-13)
	Total Pulses	**31.95**	**20.52**	**642**		
Khargone	Pigeonpea	14.19	6.52	459	Asha (ICPL-87119), JKM-189	TJT-501, BSMR-175
	Urdbean	3.23	0.80	247	Shekhar 2	JU-3
	Moongbean	7.27	1.93	266	HUM-12, HUM-16	Pant Mung-3, HUM-1
	Chickpea	13.93	12.57	902	JG-130, JG-11, JG-218	Vishal, JAKI-9218
	Lentil	0.04	0.003	87	-	-
	Peas	0.07	0.00	0.00	Arkel	Ambika, Prakash, Matar-42
	Total Pulses	**39.1**	**15.83**	**404**		

District	Crop	Area (000 ha)	Prod. (000 Tonnes)	Yield (Kg/ha)	Prevailing varieties	Recommended varieties
Barwani	Pigeonpea	4.46	2.11	475	ICPL 87119, JKM 7, JA 4	JA 4, ICPL 87, ICPL 87119 (Asha)
	Urdbean	6.83	4.90	717	PDU 1, T-9	LAM 623, LBG 685
	Moongbean	5.47	3.10	567	Pusa Vaishaki, JM 4	TJM -3, HUM 1, TARM 2
	Chickpea	4.83	5.13	1062	JG 11, JG 130, JG 315	JG 11, JG 322, JG 130
	Lentil	0.00	0.00	0.00	JL 3, IPL 81 (Noori), L 4076	JL-1, JL-3, IPL 81, RVL 31, HUL-57
	Peas	0.00	0.00	0.00	Malviya Matar- 15,	KPMR 400, KPMR 522, JM-6
	Total Pulses	**24.69**	**15.83**	**641**		
Khandwa	Pigeonpea	9.18	6.23	678	Asha (ICPL 87119), TJT 501, JA 4	TJT 501, JKM 7 ICPL 87119 (Asha)
	Urdbean	2.50	0.70	280	JU 3	LAM 623, LBG 685, KU 96-3
	Moongbean	2.30	0.60	261	PDM 139, HUM 12	HUM 1, TARM 2, K-851, Pusa Vishal
	Chickpea	18.60	23.97	1289	JG 11, JG 16, JG 315, KAK 2	JG 322, JG 130, RVG 203, RVG 201, PKV 4
	Lentil	0.74	0.31	414	JL 3	JL-3, IPL 81 (Noori), IPL-406
	Peas	0.73	0.33	455	Arkel, Desi Batri	Adarsh (IPFD 99-25), Arkel, Malviya Pea-15
	Total Pulses	**34.85**	**32.29**	**926**		
Burhanpur	Pigeonpea	3.50	3.51	1003	ICPL-87119 (Asha), ICPL 87, JKM 7	JKM 7, ICPL 87119(Asha)
	Urdbean	1.50	0.53	356	-	-
	Moongbean	0.60	0.20	333	PDM 139, Pusa Vishal	Pusa 105, HUM 1, HUM-12
	Chickpea	3.37	3.57	1059	JG 130, JG 11, Vishal, Vijay	JG-64, JG-322, JAKI-9218, KAK-2
	Lentil	0.01	0.01	731	Desi Masur,	JL-3, L-4076
	Peas	0.00	0.00	0.00	Arkel	Arkel
	Total Pulses	**8.98**	**7.82**	**870**		
Alirajpur	Pigeonpea	2.84	1.14	401	ICPL 87, Asha, TJT 501	ICPL 87119, TJT 501, ICPL 87119(Asha)
	Urdbean	53.73	22.50	419	LBG 20	LAM 623, LBG 685, KU 96-3
	Moongbean	1.43	0.47	326	PDM 139	HUM 1, TARM 2, K-851, Vishal, JM 721
	Chickpea	9.07	6.50	717	JG 16, JG 130	JG 16, JG 218, JG 11, JG 130
	Lentil	0.00	0.00	0.00	Kala Masara, JL 3	PL-639, IPL 81, JL 1, JL 3
	Peas	0.00	0.03	0.00	Arkel	Adarsh, Prakash (IPFD 1-10), Ambika
	Total Pulses	**75.20**	**34.44**	**457**		

District	Crop	Area (000 ha)	Prod. (000 Tonnes)	Yield (Kg/ha)	Prevailing varieties	Recommended varieties
Ujjain	Pigeonpea	1.35	0.77	569	ICPL 87, Laxmi, TJT 501, JKM 7	ICPL 87119, TJT 501
	Urdbean	2.13	0.80	375	Shekhar, T 9, LBG 20	LAM 623, LBG 685, KU 96-3
	Moongbean	0.27	0.10	375	K 851, JM 721, Pusa Baisakhi	Vishal, K-851, JM 721, HUM 1
	Chickpea	176.27	154.30	875	JG 74, JG 14, JG 63, JAKI 9218, JGK 3	JG 322, JG 64,JG 16, KAK 2
	Lentil	0.23	0.10	429	JL 3, IPL 81	K-75, JLS-3
	Peas	0.63	0.27	421	Arkel, Ambika, Rachna	Adarsh (IPFD 99-25), Arkel, Rachna, JM-3
	Total Pulses	**180.88**	**156.33**	**864**		
Mandsaur	Pigeonpea	1.00	0.52	525	ICPL 87, Laxmi, TJT 501, JKM 7	JKM 7, ICPL 87119 (Asha), TJT 501
	Urdbean	14.23	8.07	567	Shekhar, T 9, LBG 20	TPU 4, LBG 23, LBG 685, KU 96-3
	Moongbean	0.70	0.30	429	K 851, JM 4, JM 721, Pusa Baisakhi	K-851, TARM 2, Pusa Vishal
	Chickpea	38.60	39.90	1034	JG 74, JG 14, JG 63, JAKI 9218, JGK 3	JG 322, JAKI 9218, KAK 2, JGK 1, PKV 4
	Lentil	2.93	1.75	598	JL 3, IPL 81	JL-3, IPL 81 (Noori)
	Peas	0.33	0.20	600	Arkel, Ambika, Rachna	Adarsh, Prakash, Ambika
	Total Pulses	**57.79**	**50.74**	**878**		
Neemuch	Pigeonpea	0.51	0.24	469	ICPL 87, Laxmi, TJT 501, JKM 7	ICPL 87119 (Asha), TJT 501
	Urdbean	3.80	1.60	421	Shekhar, T 9, LBG 20	TPU 2, LAM 623, LBG 685
	Moongbean	0.10	0.00	0.00	K 851, JM 721, Pusa Baisakhi	K-851, TARM 2, Vishal
	Chickpea	18.30	20.93	1144	JG 74, JG 14, JG 63, JAKI 9218, JGK 3	JG 322, JAKI 9218, KAK 2, JG 412, JGK 1, PKV 4
	Lentil	0.46	0.34	729	JL 3, IPL 81	JL-3, IPL 81 (Noori)
	Peas	0.10	0.07	667	Arkel, Ambika, Rachna	Adarsh, Prakash, Ambika
	Total Pulses	**23.27**	**23.17**	**995**		
Ratlam	Pigeonpea	1.16	0.93	797	Asha, TJT-501, JKM-7	ICPL-87119,BSMR-175
	Urdbean	6.53	4.70	719	TAU 1, T-9,	JU- 2 & 3, KU-91-2 (Azad Urd 1)
	Moongbean	0.87	0.73	846	V 44, Pusa Baisakhi HUM-1 &12	HUM-1 & 12, TJM-3
	Chickpea	75.57	56.07	742	Vishal, JG 11, JAKI 9128	JG-218, JG-16, JAKI-9218, KAK-2
	Lentil	0.84	0.50	599	JL-3, Desi Moong	ML-337, J-45, IPL-316
	Peas	1.53	1.57	1022	Arkel Matar	Arkel Matar
	Total Pulses	**86.49**	**23.17**	**267**		

District	Crop	Area (000 ha)	Prod. (000 Tonnes)	Yield (Kg/ha)	Prevailing varieties	Recommended varieties
Shajapur	Pigeonpea	2.66	1.10	413	ICPL 87, Laxmi, TJT 501, JKM 7	ICPL 87119 (Asha), TJT 501
	Urdbean	2.33	0.57	243	Shekhar 2, T 9, LBG 20	TPU 4, LBG 23, LAM 623, LBG 685
	Moongbean	0.53	0.13	250	K 851, JM 721, Pusa Baisakhi	K-851, TARM 2, Vishal
	Chickpea	141.17	100.83	714	JG 74, JG 14, JG 63, JAKI 9218, JGK 3	JG 322, JAKI 9218, KAK 2, JGK 1, PKV 4
	Lentil	10.82	4.40	407	JL 3, IPL 81	JL-4, PL-639, IPL 81 (Noori)
	Peas	0.60	0.27	444	Arkel, Ambika, Rachna	Azad Pea 3, Ambika
	Total Pulses	**158.11**	**107.30**	**678**		
Aagar*	Pigeonpea	0.00	0.00	0.00	ICPL 87, Laxmi, TJT 501, JKM 7	ICPL 87119 (Asha), TJT 501
	Urdbean	0.00	0.00	0.00	Shekhar, PDU 14, T 9, LBG 20	TPU 2, LBG 23, LAM 623, LBG 685
	Moongbean	0.00	0.00	0.00	K 851, JM 4, JM 721, Pusa vaisakhi	K-851, TARM 2, Vishal
	Chickpea	0.00	0.00	0.00	JG 74, JG 14, JG 63, JAKI 9218, JGK 3	JG 322, JAKI 9218, KAK 2, JG 412, JGK 1, PKV 4
	Lentil	0.00	0.00	0.00	JL 3, IPL 81, RVM 2	JMS-1, JL-4, PL-639, IPL 81 (Noori)
	Peas	0.00	0.00	0.00	Arkil, Ambika, Rachna	AP 3, PSM 3, Ambika
	Total Pulses	0.00	0.00	0.00		
Dewas	Pigeonpea	6.21	3.82	615	ICPL 87-119, ICPL 87, TJT 501	ICPL 87119, JKM 189, BSMR 175
	Urdbean	0.17	0.03	200	Shekhar 2, T 9, LBG 20	PDU-1, LAM 623, LBG 685
	Moongbean	0.20	0.03	167	Pusa Vishal	JM 721, K-851, HUM 1
	Chickpea	127.67	139.80	1095	KAK 2, JG 130, JG 218	JG 322, JG 218, JG 130, JGK 3, KAK 2, Shubhra
	Lentil	0.17	0.13	797	JL 3, IPL 81	JL-3, PL-8, RVL-31, PL-639
	Peas	1.00	0.70	700	Arkel, Ambika, Rachna	JP 885, JM-54, Arkel
	Total Pulses	**135.58**	**157.06**	**1158**		
Morena	Pigeonpea	7.49	7.88	1052	ICPL 87119, TJT 501	ICPL 87119, TJT 501, JA 4
	Urdbean	0.53	0.27	500	PDU 1, T-9	LAM 623, LBG 685, KU 96-3
	Moongbean	0.47	0.23	500	PDM 139, Pusa Vaishal	JM 721, TJM 3, HUM 1, TARM 2
	Chickpea	7.13	8.41	1179	JG 218, JG 315, JAKI 9218	JG 16, JG 322, JG 130, RVG 201, JAKI 9218
	Lentil	0.87	0.51	592	JLS-1, JL-3	JL-3, JL-2, RVL-31, IPL 81 (Noori)
	Peas	0.80	0.57	708	Rachna, Arkel	JM-3, Matar-42, JP 885
	Total Pulses	**17.45**	**17.94**	**1028**		

District	Crop	Area (000 ha)	Prod. (000 Tonnes)	Yield (Kg/ha)	Prevailing varieties	Recommended varieties
Sheopurkalan	Pigeonpea	1.63	1.35	831	ICPL-87119 (Asha)	BSMR 175, JKM 189
	Urdbean	1.70	0.93	549	T-9, Desi	KU 96-3, PDU-1, LAM 623, LBG 685
	Moongbean	0.40	0.23	583	TJM-3, K-851	TJM 3, HUM 1, TARM 2
	Chickpea	10.77	15.81	1469	JG-315, JG-63, JG-218, JG-322	JG 130, JG 322, JAKI 9218, JG 14, RVG 203
	Lentil	0.08	0.05	716	Malika Masur	PL-4, JL-3, HUL 57
	Peas	0.00	0.00	0.00	Rachna, Arkil, Azad 2	Adarsh (IPFD 99-25), Prakash, JM-2, Matar-42
	Total Pulses	**99.23**	**91.84**	**925**		
Bhind	Pigeonpea	4.95	3.44	694	Laxmi, Upas-120, BSMR-736	ICPL87119, TJT-501
	Urdbean	1.03	0.30	290	T-9, U-35,Shekhar-2	JU-3, JU-86, PU-30
	Moongbean	1.63	1.03	633	HUM-2, K-851, PDM-139	JM-721, TJM-3, TM-99
	Chickpea	19.50	25.91	1329	JG-11, JG-315, JG-74	JG-16, JG-11, JAKI-9218
	Lentil	5.83	3.47	596	JLS-1, JL-3	JL-3, JL-1, RVL-31
	Peas	3.10	3.67	1183	Rachna, Arkel	AP-3, JM-6
	Total Pulses	**36.05**	**37.82**	**1049**		
Gwalior	Pigeonpea	0.75	0.30	398	ICPL-87119 (Asha)	CORG-7, ICPL-87119, LRG-41
	Urdbean	5.10	1.70	333	T-9, Desi	LBG-685, LBG 23
	Moongbean	0.30	0.13	444	TJM-3, K-851	K-851, HUM 1, HUM 12
	Chickpea	17.77	26.98	1519	JG-315, JG-63, JG-218, JG-322	JAKI-9218, JG-315, JG218
	Lentil	1.11	0.46	420	Malika Masur	HUL-57, Pusa-5
	Peas	2.33	1.17	500	Rachna, Arkel, Azad 2	Rachna, Arkel, Jawahar Matar 1
	Total Pulses	**27.35**	**30.75**	**1124**		
Shivpuri	Pigeonpea	1.32	0.45	339	ICPL 87119 (Asha), Laxmi	JKM 7, TJT 501
	Urdbean	20.64	6.90	334	T-9, Desi	PDU-1, KU 96-3, LBG 23, RBU-38
	Moongbean	4.77	1.60	336	TJM 3, K-851	TJM -3, HUM 1, TARM 2
	Chickpea	65.60	80.20	1223	JG 130, JG 322, JAKI 9218	JG 130, JG 322, JAKI 9218, RVG 202
	Lentil	5.13	1.83	356	Malika Masur, K-75	PL 639, JL 1, K-75, RVL 31
	Peas	1.77	0.87	491	Arkel, Azad 1	Adarsh (IPFD 99-25), JP 885
	Total Pulses	**99.23**	**91.84**	**925**		

District	Crop	Area (000 ha)	Prod. (000 Tonnes)	Yield (Kg/ha)	Prevailing varieties	Recommended varieties

District	Crop	Area (000 ha)	Prod. (000 Tonnes)	Yield (Kg/ha)	Prevailing varieties	Recommended varieties
Guna	Pigeonpea	1.58	0.70	444	Lal Tur, JA 4	TJT 501, JKM-189, Asha, RVICPH 2671
	Urdbean	4.23	2.47	583	PDU 1	PDU-1, KU 96-3, RBU-38, LBG 685
	Moongbean	0.60	0.30	500	K -851	JM-721, TJM-3, HUM-1, TARM -2
	Chickpea	80.57	106.45	1321	JG 130, JG 315, JAKI 9218	JG 130, JG 322, JAKI 9218, RVG 202
	Lentil	1.19	0.88	735	IPL 81 (Noori)	JL 4, JL 3, K-75, Pl-8, L-4076
	Peas	0.20	0.17	833	Adarsh, Arkel	Adarsh, Arkel, JP 885
	Total Pulses	**88.81**	**111.14**	**1251**		
Ashoknagar	Pigeonpea	0.90	0.45	506	TJT 501, ICPL 87119 (Asha)	RVICPH 2671, RVA 28, JKM 7, TJT 501
	Urdbean	52.04	17.57	338	PDU 1, T-9	RBU-38, KU 96-3, PDU-1
	Moongbean	1.07	0.47	438	PDM 139	JM 721, TJM 3, HUM 1, TARM 2
	Chickpea	115.77	136.45	1179	JG 130, JG 315, JAKI 9218	JG 322, JAKI 9218, RVG 202
	Lentil	22.12	21.79	985	JL 3, PL 8	K-75, IPL-406, IPL 81, L-4076
	Peas	1.83	1.13	618	Arkel, Azad 2 & 3	KPMR 400, JP-885, Azad 2, Prakash
	Total Pulses	**194.23**	**178.28**	**917**		
Datia	Pigeonpea	0.97	0.44	453	-	-
	Urdbean	8.07	2.13	264	T-9	JU-2, PDU-1, PU-30, PU-19
	Moongbean	1.37	0.47	341	Pusa Baisakhi, JM-721, PDM-139	PDM-139, TJM-3
	Chickpea	21.45	27.28	1272	JG-315	JG-11, JG-130. JG-218
	Lentil	3.50	2.34	668	Mallika (K-75)	JL-3, Mallika, IPL-316
	Peas	23.97	38.93	1624	Rachna	Prakash, Vikas (IPFD 99-13), JM-6
	Total Pulses	**59.37**	**71.62**	**1206**		
Bhopal	Pigeonpea	2.43	2.09	860	JA-4, JKM-7, ICPL-87119, Prabhat	ICPL-87119, ICPL-87119, ICPL-151
	Urdbean	0.30	0.10	333	JU-2, JU-3, Pant U-30	VB-3, PU-30, KU-96-3, LBG-20
	Moongbean	0.30	0.10	333	Pusa Baisakhi, PDM-11, HUM-12	TMB 37, TJM-3, JM-721, HUM-1
	Chickpea	32.53	41.27	1268	KAK-2,JG-130,11,16&135, Ujjain-21	JG-14, 226, 6, 63 & Vishal, ICCV-2
	Lentil	2.53	2.89	1141	JL-3	Lens-4076, JL-3, IPL-81 (Noori)
	Peas	0.97	0.43	448	Arkel, KPMR-400	KPMR-400, Arkel, Adarsh (IPFD 99-25)
	Total Pulses	**39.30**	**47.15**	**1199**		

Sehore	Pigeonpea	11.52	5.28	459	JKM 189, ICPL 87, TJT 501	JKM 189, ICPL 87, TJT 501
	Urdbean	0.47	0.17	357	JU 3, Uttra	JU 3, Uttra
	Moongbean	0.27	0.03	125	HUM 12, HUM 16, PDM 139	HUM 12, HUM 16, PDM 139
	Chickpea	104.98	104.38	994	JG 16, JG 315, JG 11, JG 130	JG 16, JG 315, JG 11, JG 130
	Lentil	2.90	2.24	773	JL 1, JL 3	JL 1, JL 3, RVL 31, HUL 57
	Peas	1.23	0.57	459	Arkel, Rachna	Arkel, Rachna, JM-3
	Total Pulses	**124.16**	**113.34**	**912**		
Raisen	Pigeonpea	31.48	14.23	452	TJT-501,ICPL-87119,Upas-120	ICPL 87119 (Asha), TJT 501, JA-4
	Urdbean	2.93	0.60	205	JU-2, JU-3, PDU-1, Shekhar 2	VB 3, PU 30, KU 96-3
	Moongbean	1.03	0.23	226	K-851, PDM-1,PDM-139,HUM-1	JM 71, HUM 1, Pusa Vishal
	Chickpea	128.05	139.91	1093	JG-322, JG-16, JG-63, JG-315	RVG 202,JG 322,JG 130,Vishal, JGK 3,KAK 2
	Lentil	19.33	11.71	606	JLS-1, JLS-3, K-75, Mallika	K-75, L-4076, JL 3
	Peas	7.90	7.03	890	Arkel, Azad-1, Prakash, KMPR-400	Arkil, Malviya Pea 15
	Total Pulses	**197.49**	**180.95**	**916**		
Vidisha	Pigeonpea	3.18	1.85	582	TJT-501,ICPL-87119, JA-4, Upas-120, Malvi Chamatkar	TJT-501,ICPL-87119, JA-4
	Urdbean	50.27	27.20	541	JU-2, JU-3, PDU-1, Shekhar	JU-2, JU-3, PDU-1
	Moongbean	0.97	0.37	379	K-851, PDM-1,PDM-139,HUM-1	HUM-1, TJM-3, PDM-139
	Chickpea	174.85	169.88	972	JG-322, JG-16, JG-63, JG-315	JG-16, JG-63, JAKI-9218, JG-226
	Lentil	43.15	23.11	536	JLS-1, JLS-3, K-75, Mallika	JLS-1, JLS-3, IPL-81
	Peas	5.07	3.00	592	Arkel, Azad-1, Prakash, KMPR-400	Arkel, Azad P-1, KMPR-400
	Total Pulses	**284.82**	**230.76**	**810**		
Rajgarh	Pigeonpea	2.58	1.57	609	ICPL-87119, ICPL-85063, TJT-501, JKM-189, JA-4	JA-4, ICPL-87119, ICPL-85063, TJT-501, JKM-189,
	Urdbean	2.90	1.23	425	T-9, JU-2, JU-3, TPU-4	JU-2, JU-3, TPU-4, JU-88
	Moongbean	0.83	0.33	400	HUM-12 &16, HUM-1,K-851	HUM-12 &16, JM-1, HUM-1
	Chickpea	109.75	131.35	1197	JG-322,11, 16,11, 130, KAK-2	JG-16, Vijay Jg-11, JG-218, JGK-1
	Lentil	9.60	7.13	743	JL-1,K-75, JL-3, Desi Masur	JL-1,K-75, JL-3, IVL-31
	Peas	1.73	1.27	731	Arkel, KPMR-400, Pusa Pragati	Arkel, Azad Pea 3, Pragati, JM-6
	Total Pulses	**127.39**	**142.88**	**1121**		

Note- Area, Production and yield -Average from 2011-12 to 2013-14 ; *- Newly carved district

Chhattisgarh

S. No.	Districts	Name of Pulse Crop	Area (In 000 ha)	Prevalent Varieties	Recommended Varieties (ICAR/SAUs)
1.	**Raipur**	Pigeonpea	0.45	Asha, UPAS-120, LRG-41	Rajeev Lochan, TJT-501
		Urdbean	0.88	TAU-1, Shekhar	Azad Urd-3, TU-94-2
		Moongbean	0.37	HUM-1, SML-668, K-851	HUM-1, Pragya
		Chickpea	7.03	JG-74, JG-14, Vishal	JG-74, JG-14, Vishal
		Lentil	1.70	K-75, JL-3	Pant Lentil-7, 8, JL-3
		Peas	1.75	IP-885, Prakash, Arkel, Rachna	Rachna, Prakash, Arkel
		Lathyrus	22.38	Prateek, Ratan	Mahatiwada, Prateek
		Other Pulses	0.00		
		Total Pulses	**34.56**		
2.	**Baloda Bazar**	Pigeonpea	5.29	Asha, LRG-41	LRG-41, BSMR-863
		Urdbean	2.24	TU-94-2, T-9	PU-31, PU40 Indira Urd-1
		Moongbean	1.19	K-851, Pusa Vishal	HUM-12, HUM-16
		Chickpea	10.07	JG-74, ICCV-2, Vaibhaw, Vijay, Vishal	JG-11, JG-74, Vaibhaw
		Lentil	1.95	IPL-81, K-75	Lens-4076, DPL-62
		Peas	4.65	Arkel, Rachna	Vikash, Prakash, Aparana
		Lathyrus	38.70	Prateek	Mahatiwada
		Other Pulses	0.00		
		Total Pulses	**64.09**		
3.	**Gariyaband**	Pigeonpea	4.80	Asha, LRG-41	MAL-13, UPAS-120
		Urdbean	5.61	PU-31, TAU-2, TAU-1	TAU-2, TAU-1
		Moongbean	10.02	HUM-1, SML-668, K-851	HUM-12, HUM-16, Pairy Moong
		Chickpea	2.21	JG-14, JG-63, JAKI-9218	JAKI-9218, BG-391
		Lentil	0.98	-	-
		Peas	2.36	Prakash, Arkel	IP-885, Arkel
		Lathyrus	7.95	-	-
		Other Pulses	4.10		
		Total Pulses	**38.03**		

S. No.	Districts	Name of Pulse Crop	Area (In 000 ha)	Prevalent Varieties	Recommended Varieties (ICAR/SAUs)
4.	**Mahasamund**	Pigeonpea	0.91	Asha, UPAS-120	BSMR-736, UPAS-120
		Urdbean	11.64	TAU-1, T-9	PU-31, TPU-4, TAU-1, TU94-2
		Moongbean	4.56	HUM-1, K-851	HUM-12, HUM-16, SML-668
		Chickpea	1.02	JG-74, JG-14, Vaibhaw	JAKI-9218, BG-391
		Lentil	0.00	-	-
		Peas	0.62	Ambika, Arkel, Rachna	Pant Pea-25, Ambika
		Lathyrus	5.33	-	-
		Other Pulses	0.47		
		Total Pulses	**24.55**		
5.	**Dhamtari**	Pigeonpea	3.71	Asha, Laxmi	Laxmi, BDN-708, Rajiv Lochan
		Urdbean	0.56	T-9, TU-94-2	T-9, TU-94-2
		Moongbean	0.35	HUM-1, K-851, Pusa Vishal	HUM-16, Pragya
		Chickpea	7.04	JG-74, JG-11, Vijay	JAKI-9218, BG-391
		Lentil	0.46	K-75, JKL-3	Pant Lentil-7, 8 , Lens-4076
		Peas	1.08	-	-
		Lathyrus	16.90	-	-
		Other Pulses	0.21		
		Total Pulses	**30.31**		
6.	**Durg**	Pigeonpea	2.01	Asha, Laxmi, UPAS-120	UPAS-120, BDN-711, Asha, LRG41
		Urdbean	0.38	TAU-1, TU-94-2	TPU-4, PU-30
		Moongbean	0.19	HUM-1, K-851, Pusa Vishal	HUM-12, HUM-16, SML-668
		Chickpea	16.68	JG-74, JG-11, Vijay	JAKI-9218, Vaibhaw, Digvijay
		Lentil	1.38	-	-
		Peas	0.17	-	-
		Lathyrus	12.90	Prateek, Ratan	Mahatiwara, Prateek
		Other Pulses	0.01		
		Total Pulses	**33.72**		

S. No.	Districts	Name of Pulse Crop	Area (In 000 ha)	Prevalent Varieties	Recommended Varieties (ICAR/SAUs)
7.	**Balod**	Pigeonpea	3.27	Asha, ICPL-87	ICPL-87, ICPL-151, TJT-501
		Urdbean	4.37	T-9, TU-94-2, TAU-1	Azad Urd-3, TU-94-2
		Moongbean	1.10	-	-
		Chickpea	11.63	JG-74, JG-11, Vaibhaw, Vishal	JG-74, JG-11, Vaibhaw, Vishal
		Lentil	2.08	-	-
		Peas	0.81	Arkel, Rachna	Vikash, Prakash, Aparna
		Lathyrus	39.86	-	-
		Other Pulses	0.83		
		Total Pulses	**63.95**		
8.	**Bemetara**	Pigeonpea	2.85	Asha, Laxmi	ICPH-8, Rajeev Lochan, LRG-41, Asha
		Urdbean	0.29	-	-
		Moongbean	0.09	-	-
		Chickpea	84.89	JG-74, JG-11, Vaibhaw	JG-74, JG-11, Digvijay
		Lentil	2.88	K-75, JL-3	Pant Lentil-7, 8, JL-3
		Peas	0.32	-	-
		Lathyrus	15.03	-	-
		Other Pulses	0.00		
		Total Pulses	**106.35**		
9.	**Rajnandgaon**	Pigeonpea	14.88	Asha, Laxmi	GT-100, PDN-711, MAL-13, TJT-501
		Urdbean	8.87	TAU-1, Shekhar, TAU-94-2	PU-30, PU-31
		Moongbean	3.41	HUM-1, K -851	HUM-12, HUM-16, SML-668
		Chickpea	72.95	JG-74, JG-11	Digvijay, Vishal
		Lentil	3.42	K-75, JL-3	Pant Lentil-7, 8, JL-3
		Peas	1.79	Prakash, Arkel	Pant Peas-25, Arkel, IP-885,
		Lathyrus	31.16	Prateek, Ratan	Mahatiwara, Prateek
		Other Pulses	4.59		
		Total Pulses	**140.95**		

S. No.	Districts	Name of Pulse Crop	Area (In 000 ha)	Prevalent Varieties	Recommended Varieties (ICAR/SAUs)
10.	**Kawardha**	Pigeonpea	10.72	Asha, Laxmi, UPAS-120	ICPH-8, Rajeev Lochan, LRG-11
		Urdbean	1.62	TAU-1, TAU-94-2	PU-2, PU-31 TAU-94-2
		Moongbean	0.19	-	-
		Chickpea	74.90	JG-74, JG-11, JG-226	JG-74, JG-11, Digvijay, Vishal
		Lentil	2.78	-	-
		Peas	0.77	Prakash, Rachna	IP-885, Rachna
		Lathyrus	2.80	-	-
		Other Pulses	0.00		
		Total Pulses	**93.78**		
11.	**Bilaspur**	Pigeonpea	3.69	Asha, Laxmi	MAL-13, UPAS-120, Rajeev Lochan
		Urdbean	1.66	TAU-1 TAU-94-2, Azad Urd-3	PU-31 TAU-94-2
		Moongbean	0.31	HUM-1, HUM-2	HUM-12, HUM-16
		Chickpea	4.82	JG-74, JG-14, Vijay	JG-63, JG-74, Digvijay, JAKI-9218
		Lentil	0.75	-	-
		Peas	1.66	Prakash, Arkel, Aparna	Prakash, Parash
		Lathyrus	32.52	-	-
		Other Pulses	1.06		
		Total Pulses	**46.47**		
12.	**Mungeli**	Pigeonpea	2.53	Asha, Laxmi, UPAS-120	Rajeev Lochan, LRG-41
		Urdbean	0.16	TAU-1 TAU-94-2, Azad Urd-3	TAU-1, Azad Urd-3
		Moongbean	0.09	K-851, HUM-1	HUM-12, HUM-16, HUM-1
		Chickpea	27.00	JG-130, JG-226	JG-11, JG-74, Digvijay, Vishal
		Lentil	0.83	-	-
		Peas	0.47	-	-
		Lathyrus	56.67	Prateek, Ratan	Mahatiwara, Prateek
		Other Pulses	0.10		
		Total Pulses	**87.75**		

S. No.	Districts	Name of Pulse Crop	Area (In 000 ha)	Prevalent Varieties	Recommended Varieties (ICAR/SAUs)
13.	**Janjgir**	Pigeonpea	1.60	Asha, Laxmi, , LRG-41	Rajeev Lochan, LRG-41, Asha, UPAS-120
		Urdbean	1.95	TAU-1, Azad Urd-3	TAU-1 TAU-94-2, Azad Urd-3, PU-31
		Moongbean	0.99	HUM-2, HUM-1, Pusa Vishal	HUM-12, HUM-16, Pairy Moong
		Chickpea	0.66	JG-11, JG-74	JG-11, JG-74, Digvijay
		Lentil	0.06	-	-
		Peas	0.36	Arkel	Prakash, Arkel
		Lathyrus	19.19	Prateek, Ratan	Mahatiwara, Prateek
		Other Pulses	0.07		
		Total Pulses	**24.88**		
14.	**Korba**	Pigeonpea	2.39	UPAS-120, Laxmi, Asha	Asha, Laxmi, , LRG-41, UPAS-120
		Urdbean	4.86	TU-9, TAU-94-2	TAU-1 TAU-94-2, Azad Urd-3, PU-31
		Moongbean	0.66	K-851, HUM-1, Pusa Vishal	HUM-12, HUM-16, SML-668
		Chickpea	0.91	JG-11, JG-74, Vaibhaw	JAKI-9218, BG-391, JG-74
		Lentil	0.12	-	-
		Peas	0.77	-	-
		Lathyrus	13.32	-	-
		Other Pulses	4.13		
		Total Pulses	**27.16**		
15.	**Raigarh**	Pigeonpea	8.97	Asha, Laxmi, UPAS-120	Asha, Laxmi, , LRG-41, UPAS-120
		Urdbean	32.87	TU-1, TAU-94-2, Shekhar	PU-40, Azad Urd-3, PU-31
		Moongbean	8.90	K-851, HUM-1, SML-668	HUM-12, HUM-16, Pragya
		Chickpea	3.00	JG-216, JG-63, JG-11	JAKI-9218, Digvijay, JG-74
		Lentil	1.27	-	-
		Peas	5.60	IP-885, Prakash, Arkel, Vikash	Vikash, Prakash, Aparna
		Lathyrus	6.20	-	-
		Other Pulses	17.31		
		Total Pulses	**79.06**		

S. No.	Districts	Name of Pulse Crop	Area (In 000 ha)	Prevalent Varieties	Recommended Varieties (ICAR/SAUs)
16.	**Jashpur**	Pigeonpea	8.80	Mal-13, BDN-711, Asha, UPAS-120	
		Urdbean	23.25	T-9, TAU-94-2, Mash-479	PU-30, PU-31, TAU-94-2
		Moongbean	0.04	HUM-1, Pusa Vishal	HUM-12, HUM-16, Pusa Vishal
		Chickpea	5.31	JAKI-9218, JG-11	JAKI-9218, JG-74
		Lentil	0.56	-	-
		Peas	3.76	Arkel, Pant Pea-43	Shubhra, Prakash, Arkel
		Lathyrus	3.08	Mahatiwara, Prateek	Mahatiwara, Prateek
		Other Pulses	2.97		
		Total Pulses	**46.88**		
17.	**Sarguja**	Pigeonpea	7.39	Asha, UPAS-120	Asha, UPAS-120, PRAGATI
		Urdbean	5.66	T-9, TAU-1	TAU-1, Azad Urd-3
		Moongbean	0.30	HUM-1, K-851	HUM-1, HUM-12, K-851
		Chickpea	3.67	Vijay, Vishal	JG-74, Vijay, Digvijay
		Lentil	2.10	-	-
		Peas	3.05	-	-
		Lathyrus	0.21	-	-
		Other Pulses	2.86		
		Total Pulses	**25.24**		
18.	**Surajpur**	Pigeonpea	7.32	Asha, Laxmi, UPAS-120	Asha, BSMR-736, UPAS-120
		Urdbean	6.54	T-9, TAU-1	TAU-1, Azad Urd-3
		Moongbean	0.49	HUM-1, K-851	HUM-1, HUM-12, K-851
		Chickpea	3.31	JG-74, Vijay, Vishal	JG-11, JG-74, Digvijay, Vishal
		Lentil	0.83	JL-1, JLS-3	Pant Lentil-7 & 8, JL-3
		Peas	2.02	Arkel, Rachna	Rachna, Prakash, Arkel
		Lathyrus	0.85	-	-
		Other Pulses	2.22		
		Total Pulses	**23.56**		

S. No.	Districts	Name of Pulse Crop	Area (In 000 ha)	Prevalent Varieties	Recommended Varieties (ICAR/SAUs)
19.	**Balrampur**	Pigeonpea	10.40	Asha, UPAS-120	Asha, UPAS-120
		Urdbean	7.41	TAU-1, Azad Urd-3	PU-30, PU-31, TAU-1
		Moongbean	0.26	Pusa Vishal, SML-668	HUM-12, Pusa Vishal
		Chickpea	5.24	JG-74, JG-14, Vaibhaw, Vishal	JG-74, JG-14, Vaibhaw, Digvijay
		Lentil	1.82	JL-1, JLS-3	Pant Lentil-7 & 8, JL-3
		Peas	2.74	IP-885, Arkel, Rachna	Rachna, Prakash, Arkel
		Lathyrus	0.15	-	-
		Other Pulses	2.84		
		Total Pulses	**30.69**		
20.	**Koriya**	Pigeonpea	12.51	Asha, Laxmi, UPAS-120	Asha, BSMR-736, UPAS-120
		Urdbean	9.25	T-9, TAU-94-2	PU-30, PU-31, TAU-94-2
		Moongbean	1.29	Pusa Vishal, HUM-1	HUM-12, Pusa Vishal, HUM-16
		Chickpea	4.42	JG-31, JG-4	JAKI-9218, JG-14, JG-74
		Lentil	2.11	K-75	Pant Lentil-7 & 8, JL-3
		Peas	3.73	Prakash, Arkel	Rachna, Parash, Arkel
		Lathyrus	2.55	Prateek, Ratan	Mahatiwara, Prateek
		Other Pulses	6.10		
		Total Pulses	**41.96**		
21.	**Jagdalpur**	Pigeonpea	1.90	Asha, Laxmi, UPAS-120	IRG-41, BSMR-863, BDN-708
		Urdbean	8.83	TAU-1, TAU-94-2	PU-30, PU-31, TAU-94-2, PU-40
		Moongbean	0.55	SML-668, HUM-16	HUM-12, SML-668, HUM-16
		Chickpea	1.67	JG-14, JG-74, JG-11	JAKI-9218, JG-6
		Lentil	0.11	-	-
		Peas	0.98	Aman, Prakash, Arkel	Prakash, Arkel
		Lathyrus	0.17	-	-
		Other Pulses	5.18		
		Total Pulses	**19.39**		

S. No.	Districts	Name of Pulse Crop	Area (In 000 ha)	Prevalent Varieties	Recommended Varieties (ICAR/SAUs)
22.	**Kondagaon**	Pigeonpea	0.86	Asha, Laxmi, LRG-41	Asha, Mal-13, PRAGATI
		Urdbean	12.10	T-9, TAU-94-2	Azad Urd-3 TAU-94-2
		Moongbean	0.55	HUM-1, K-851	HUM-1, K-851
		Chickpea	2.88	JAKI-9218, JG-14, JG-74, JG-11	JAKI-9218, JG-6, JG-14
		Lentil	0.17	-	-
		Peas	1.79	Arkel	Arkel, Ambika
		Lathyrus	1.47	-	-
		Other Pulses	3.58		
		Total Pulses	**23.40**		
23.	**Naryanpur**	Pigeonpea	1.10	Asha, Laxmi, UPAS-120	Asha, Laxmi, UPAS-120
		Urdbean	6.00	TAU-1, T-9, PU-30	T-9, PU-30, PU-31
		Moongbean	0.25	Pusa Vishal, K-851	HUM-12, K-851, HUM-16
		Chickpea	1.25	JAKI-9218, JG-14, JG-63	JAKI-9218, JG-315
		Lentil	0.02	JLS-3	JLS-3
		Peas	0.46	Vikash, Parash	Prakash, Arkel
		Lathyrus	0.12	Prateek, Ratan	Mahatiwara
		Other Pulses	3.70		
		Total Pulses	**12.90**		
24.	**Dantewada**	Pigeonpea	0.40	Asha, UPAS-120	Asha, UPAS-120
		Urdbean	0.71	T-9, TAU-94-2	Azad Urd-3, TAU-94-2
		Moongbean	0.43	HUM-1, K-851	HUM-1, K-851
		Chickpea	0.20	-	-
		Lentil	0.00	-	-
		Peas	0.06	-	-
		Lathyrus	0.00	-	-
		Other Pulses	1.75		
		Total Pulses	**3.50**		

S. No.	Districts	Name of Pulse Crop	Area (In 000 ha)	Prevalent Varieties	Recommended Varieties (ICAR/SAUs)
25.	**Sukma**	Pigeonpea	0.55	Asha, Laxmi	Asha, UPAS-120
		Urdbean	1.17	T-9, TAU-94-2	Azad Urd-3, TAU-94-2
		Moongbean	1.03	HUM-1, K-851	HUM-1, HUM-12, Pusa Vishal
		Chickpea	0.08	JG-11, JG-74	JG-315, JG-74
		Lentil	0.00	-	-
		Peas	0.00	-	-
		Lathyrus	0.00	-	-
		Other Pulses	1.61		
		Total Pulses	**4.44**		
26.	**Bijapur**	Pigeonpea	0.21	Asha, Laxmi	Asha, Laxmi
		Urdbean	0.98	T-9, TAU-94-2	Azad Urd-3, TAU-94-2
		Moongbean	1.03	HUM-1, Pusa Vishal	HUM-16, HUM-12, K-851
		Chickpea	0.16	JG-11, JG-4	JAKI-9218, JG-11, JG-4
		Lentil	0.00	-	-
		Peas	0.03	Arkel	Arkel, Ambika
		Lathyrus	0.00	-	-
		Other Pulses	0.92		
		Total Pulses	**3.15**		
27.	**Kanker**	Pigeonpea	2.13	Asha, Laxmi	Asha, LRG-41
		Urdbean	8.43	PU-31, TAU-1, TAU-2	TPU-4, PU-30, Azad Urd-3
		Moongbean	6.55	HUM-1, HUM-12, Pairy Moong	HUM-1, HUM-12, K-851, HUM-16
		Chickpea	3.52	Vijay, JG-315, JG-4	Digvijay, Vaibhaw, JG-63, JG-74, JG-4
		Lentil	0.65	-	-
		Peas	6.34	IP-885, Rachna	Paras
		Lathyrus	8.71	-	-
		Other Pulses	8.73		
		Total Pulses	**45.06**		

Note: The above information as per received from concerned State Department of Agriculture

Annexure-8

Report of the Visit of Inter-Ministerial Central Team to Madhya Pradesh in the wake of drought-kharif-2015

1.0 On the situation caused by unprecedented drought condition, the Government of Madhya Pradesh submitted a memorandum to the Government of India requesting for sanctioning special package and financial assistance of Rs. 4220.39 crore for drought mitigation measures for the Kharif season 2015 Appendix- III and V of Memorandum on financial assistance and status of SDRF Account for 2015-16 is enclosed at **Annexure-I.** The State's guidelines/criteria of declaration of drought and calamity is at **Annexure-II.**

1.1 Responding to memorandum, the Drought Management Division, Department of Agriculture, Cooperation and Farmers Welfare, Ministry of Agriculture vide OM No. 14-2/2015-DM dated 3rd November, 2015 constituted an Inter-Ministerial Central Team (IMCT) for assessment of the situation in the wake of current drought and recommending financial assistance to the State Government for drought mitigation measures under the National Disaster Response Fund (NDRF).

1.2 The current year SW Monsoon was activated on 14th June, 2015. The total seasonal rainfall received during the period from 1st June to 30th Sept., 2015 was 823.1 mm which is 13% less against the state's normal rainfall of 949.1 mm. As per the rainfall data, 5 districts received excess, 23 normal and 23 received deficit rainfall. However, the distribution of rainfall was uneven with spatial variation. Unfortunately, even the district /tahsils where total rainfall was not deficient, due to long dry spell kharif crops have been affected.

1.3 Many Districts of Eastern, North-Eastern and South Eastern Madhya Pradesh experienced shortage of rainfall during the current season. The Government of Madhya Pradesh in its original Memorandum has declared 141 Tahsils in 22 districts as drought affected and also affected due to insect pest attack and yellow mosaic virus in soybean and urd and mung. Of these 40 districts 18 districts were in the category of insect pest and disease were crop loss was reported more than 33%. Further, as per the Supplementary Memorandum dated 15th Nov., 2015 the total number of districts declared as affected are now 44. The financial assistance sought has accordingly been revised to Rs. 4821.64 Crore from its original demand of Rs. 4220.39 Crore.

1.4 Major kharif crops of state viz., soybean, paddy, mung and urd have been affected. As a consequence of drought and insect pest infestation/YMV, anticipated production of soybean is 38 lakh MT, against an expected production target of 77 lakh MT. Similarly, the production of urd and mung is only to be 3.37 Lakh MT and 0.41 lakh MT against an expected production of

4.75 Lakh MT and 0.87 lakh MT respectively. The harvesting of paddy has started; its production and productivity is also likely to be affected, disappointing the state's target for paddy.

2.0 Composition of the IMCT

S. No.	Ministry/Deptt. /Sector	Name of Representative/ Member
1	Drought Management Division, DAC & FW	Shri. Amitabh Gautam, JS, Team Leader
2.	Crop Division, Deptt. of Agriculture & Cooperation	Dr. A.K. Tiwari, Director, DPD
3.	Finance (Department of Expenditure)	Shri. A.S. Parmar, AD
4.	NITI AYOG	Manas Choudhary, DA (Fisheries)
5.	Ministry of Drinking Water & Sanitation	Shri. A.K. Shivastav, AD
6.	Ministry of Rural Development	Dr. U. Sarangi, US
7.	Department of Food & Public Distribution	Shri. Vivek Kumar, DGM (QC), FCI
8.	Department of Animal Husbandry, Dairying & Fisheries	Dr. R.G. Bhembal Assist. Commissioner

3.0 Central Financial Assistance Sought

Vide Original Memorandum dated 23rd October, 2015, the State Government had projected a demand of central assistance of Rs.4220.39 Crore to undertake drought mitigation measures. Further on November 15, 2015 the Govt. of M.P. has submitted a revised Memorandum for an additional assistance of Rs. 601.25 Crore. Thus a total of Rs.4821.64 Crore has so far being the rived projected demand:

3.1 Sector-wise financial assistance sought:

(Rs. In Crores)

Sl. No	**Item**	**Relief Claimed as per SDRF Norms**		
		Original Memo.	**Revised Memo. (Addit. Propo.)**	**Total**
I	AGRICULTURE i) Crop loss (Rainfed, irrigated, and perennial) :			
	a) Input subsidy to farmers having land holding upto 2 hectares **(SMF)**	1440.75	339.42	1780.02
	b) Input subsidy to farmers having more than 2 hectares of land holding **(OSMF)**	950.35	262.11	1212.46
Sub Total (Input subsidy)		**2391.10**	**601.53**	**2992.48**
2	NAIS (National Agriculture Insurance Scheme)	770.00		770.00
3	DRINKING WATER			
	a) Provision of emergency supply of drinking water in rural areas.	250.50		250.50
	b) Provision of emergency supply of drinking water in urban areas.	46.80		46.80
	Sub Total	**297.30**		**297.30**
4	Rural Development / Employment (MGNREGA)	762.00		762.00
Total (sub Total of 1 to 4)		**4220.4**		**4821.78**

4.0 Drought Assessment/INDICATORS:

4.1 To assess the drought, the major drought indicators have been identified from the type and impact of the drought situation which is on the overall Environment and Economy thereby impacting the societal consequences.

4.2 **The environmental indicators include:** rainfall, water level in reservoirs and other surface storage system, ground water depth/water table and soil moisture. A normal rainfall succeeding a few years of drought would not wipe out the cumulative effect of earlier droughts. Similarly, a long dry spell at the critical physiological stages of crop plant (viz. germination, vegetative, tillering, panicle initiation, flowering, pod/ ear formation, milking, grain filling etc.) also affect the factor productivity.

4.1 **On Economic and social front,** data relating to trends in agricultural commodity prices, corresponding mandi arrivals, land distribution, cropping pattern, change in cropping calendar, sown area , productivity of crop and productivity of milch animals etc. have been kept in view.

5.0 District-wise/ Month-wise Rainfall Analysis : The district-wise status of rainfall for the entire South West monsoon season (1st June to 30th September, 2015), both progressive and cumulative precipitation is analysed as under:

5.1 Month June, 2015: Rainfall pattern

Rainfall Category	**Rainfall Month of June, 2015**	
	No. of Districts	**Name of the District**
Excess (≥20%)	24	Balaghat, Mandla, Dindori, Chhatarpur, Indore, Dhar, Jhabua, Alirajpur, Khargone, Badwani, Khandwa, Ujjain, Mandsaur, Ratlam, Dewas, Shajapur, Agar, Morena, Bhopal, Sehore, Raisen, Vidisha, Rajgarh, Betul
Normal (-19 to +19%)	17	Katni, Jabalpur, Chhindwara, Seoni, Narsinghpur, Sagar, Damoh, Rewa, Satna, Umaria, Neemach, Sheopurkala, Gwalior, Shivpuri, Guna, Ashoknagar, Hoshangabad
Deficit (-20 to -59%)	09	Panna, Tikamgarh, Sidhi, Singroli, Shahdol, Anuppur, , Bhind, Datia, Harda
Scanty (> - 60)	01	Burhanpur

5.2 Month July 2015: Rainfall pattern

Rainfall Category	**Rainfall Month of July, 2015**		**Cumulative Rainfall from 1st June 31th July, 2015**	
	No. of Districts	**Name of the District**	**No. of Districts**	**Name of the District**
Excess (≥20%)	18	Indore, Dhar, Jhabua, Alirajpur, Ujjain, Mandsaur, Neemach, Agar, Ratlam, Dewas, Shajapur, Sehore, Gwalior, Guna, Bhopal, Raisen, Rajgarh, Harda	17	Indore, Dhar, Jhabua, Alirajpur, Ujjain, Mandsaur, Neemach, Guna, Ratlam, Dewas, Shajapur, Agar, Gwalior, Bhopal, Sehore, Raisen, Rajgarh
Normal (-19 to +19%)	14	Jabalpur, Chhindwara, Rewa, Narsinghpur, Tikamgarh, Satna, Shahdol, Umaria, Datia, Bhind, Khandwa, Ashoknagar, Vidisha, Hoshangabad	20	Chhindwara, Jabalpur, Mandla, Datia, Dindori, Narsinghpur, Satna, Bhind, Chhatarpur, Rewa, Umaria, Vidisha, Khargone, Badwani, Khandwa, Harda, Morena, Ashoknagar, Hoshangabad, Betul

Deficit (-20 to -59%)	19	Katni, Balaghat, Seoni, Mandla, Dindori, Sagar, Damoh, Panna, Chhatapur, Sidhi, Singroli, Anuppur, Khargone, Badwani, Burhanpur, Morena, Shivpuri, Sheopurkala, Betul	14	Katni, Balaghat, Seoni, Sagar, Damoh, Panna, Tikamgarh, Sidhi, Singroli, Shahdol, Anuppur, Burhanpur, Sheopurkala, Shivpuri,
Scanty (> - 60)	0	Nil	0	Nil

5.3 Month August 2015: Rainfall pattern

Rainfall Category	**Rainfall Month of August, 2015**		**Cumulative Rainfall from 1st June to 31th Aug., 2015**	
	No. of Districts	**Name of the District**	**No. of Districts**	**Name of the District**
Excess (≥20%)	05	Chhindwara, Khandwa, Burhanpur, Harda, Betul	11	Indore, Dhar, Khandwa,Ujjain, Mandsaur, Ratlam, Dewas, Agar, Shajapur, Guna, Rajgarh,
Normal (-19 to +19%)	19	Seoni, Mandla, Damoh, Singroli, Satna, Umaria, Indore, Khargone, Vidisha, Neemach, Dewas, Agar, Shajapur, Shivpuri, Guna, Ashoknagar, Bhopal, Rajgarh, Hoshangabad,	25	Chhindwara, Seoni, Mandla, Dindori, Narsinghpur, Singroli, Satna, Umaria, Jhabua, Alirajpur, Khargone, Badwani, Burhanpur, Neemach, Gwalior, Shivpuri, Sehore, Ashoknagar, Datia, Bhopal, Raisen, Vidisha, Hoshangabad, Harda, Betul
Deficit (-20 to -59%)	23	Jabalpur, Katni, Balaghat, Dindori, Narsinghpur, Sagar, Panna, Tikamgarh, Chhatarpur, Rewa, Sidhi, Anuppur, Dhar, Badwani, Ujjain, Madsaur, Morena, Sheopurkala, Bhind, Gwalior, Datia, Sehore, Vidisha,	15	Jabalpur, Katni, Balaghat, Sagar, Damoh, Panna,Tikamgarh, Chhatarpur, Rewa, Singroli, Shahdol, Anuppur, Morena, Sheopurkala, Bhind,
Scanty (> - 60%)	04	Shahdol, Jhabua, Alirajpur, Ratlam	0	Nil

5.4 Month September 2015: Rainfall pattern

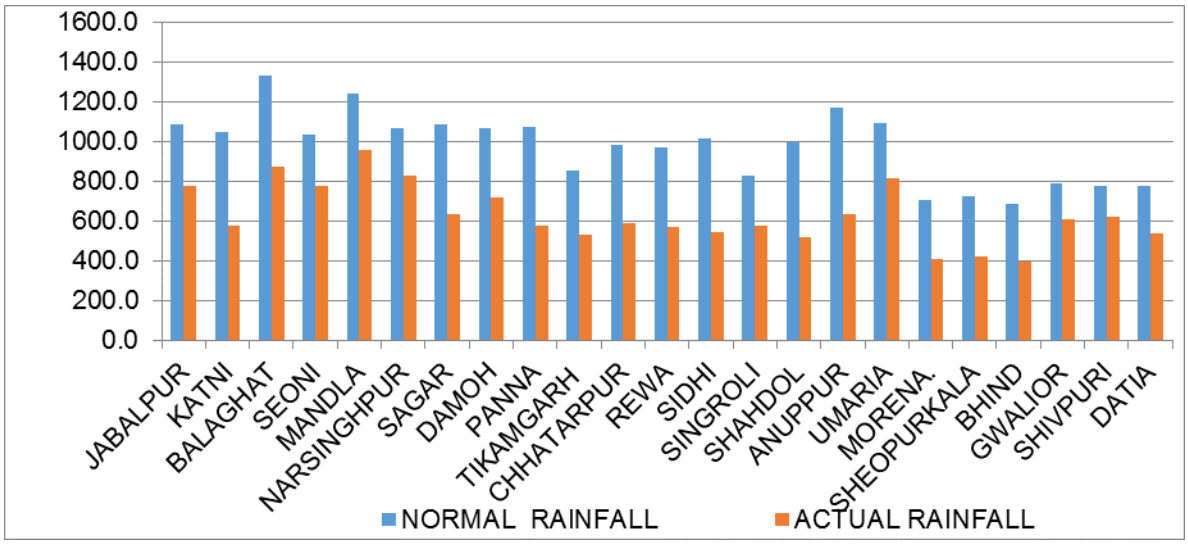
Rainfall Category	**Rainfall Sept., 2015**		**Progressive Rainfall (1st June to 30th Sept., 2015)**	
	No. of Districts	**Name of the District**	**No. of Districts**	**Name of the District**
Excess (≥20%)	0	Nil	05	Indore, Ujjain, Ratlam, Shajapur, Rajgarh
Normal (-19 to +19%)	01	Badwani	23	Chhindwara, Dindori, Satna, Dhar, Jhabua, Alirajpur, Sehore, Khandwa, Khargone, Badwani, Burhanpur, Mandsaur, Neemach, Dewas, Agar, Guna, Raisen, Ashoknagar,Bhopal, Vidisha, Hoshangabad, Harda, Betul
Deficit (-20 to -59%)	13	Katni, Balaghat, Mandla, Chhindwara, Dindori, Satna, Dhar, Alirajpur, Khargone, Khandwa, Betul, Burhanpur, Vidisha,	23	Jabalpur, Katni, Balaghat, Seoni, Mandla, Narsinghpur, Sagar, Damoh, Panna, Tikamgarh, Chhatarpur, Rewa, Sidhi, Singroli, Anuppur, Shahdol, Umaria, Morena, Sheopurkala, Bhind,

				Gwalior, Shivpuri, Datia,
Scanty (> - 60%)	37	Jabalpur, Seoni, Sagar, Narsinghpur, Damoh, Panna, Tikamgarh, Sidhi, Chhatarpur, Rewa, Singroli, Shahdol, Anuppur, Umaria, Indore, Jhabua, Ujjain, Mandsaur, Neemach, Ratlam, Dewas, Shajapur, Agar, Morena, Sheopurkala, Bhind, Gwalior, Shivpuri, Guna, Ashoknagar, Datia, Bhopal, Sehore, Raisen, Rajgaarh, Hoshangabad, Khargone	0	Nil

5.5 *In the month of June, 09 districts were under deficient and 1 under scanty rainfall category. During July, 19 district were rainfall deficient but 14 districts were under cumulative deficient categories. In the month of August 23 districts were deficient and 04 districts under scanty, but cumulative rainfall from June to August show that 15 districts fall in the deficient rainfall category.*

In the month of September, 13 districts were rainfall deficient, 37 scanty. The overall cumulative seasonal South-West monsoon from June-Sept. culminated in to 23 districts as rainfall deficient.

5.6 Rainfall in the deficient districts: Period 1st June to 30th Sept. 2015



6.0 Visit of the IMCT (Nov. 8-10, 2015)

The Inter-Ministerial Central Team headed by Shri. Amitabh Gautam, Joint Secretary, Govt. of India, Deptt. of Agricutlure, Cooperation and Farmer Welfare arrived in Bhopal on Nov. 8th, 2015 and had a briefing meeting and discussed the methodology for assessment of the situation .

6.1 In consultation with the Principal Secretary (Revenue Department & Relief Commissioner) and Principal Secretary (Agriculture) Madhya Pradesh, the visit itinerary was finalized to cover-up large affected area under reports, the 03 sub groups as under Table-2 visited the State during Nov.8-10th , 2015.

Team/Sub-group	Name of the team members in the sub-groups	Division/ Districts covered	Villages
Team/ Sub-group -1	Shri Amitabh Gautam, JS, DAC&FW, Dr. A. K. Tiwari, Director (Pulses), (DAC&FW)/Crop Division Shri Vivek Kumar, DGM (QC) FCI Shri Varun Awasthi, Dy. Relief Commissioner, State Nodal)	(Shahdol & Rewa Division) Sahdol,Umaria Anuppur & Sidhi	Aswari Malmathar Gobardeeh Tendua Panwar Baghelan
Team/ Sub-group -2	Shri Manoj Tiwari (Team Leader), CWC Dr. U Sarangi, MORD Dr. R. G. Bhembal, DAHD & F	(Rewa Division) Satna, Rewa	Barakala, Guluwa,Powaia, Raghunathpur, Dewara, Nadhu, Hardi, Masuriha, Arjunpur Paikan
Team/ Sub-group -3	Shri M. Chaudhary, NITI AYOG (Team Leader) Shri A. K. Shrivastav Shri A. S. Parmar, MoF. Deptt. of Expenditure	(Sagar, Jabalpur, Bhopal Division) Sagar, Damoh, Panna, Katni, Vidisha	Zhillah, Batiavada, Rajauli, Madiya, Piparia , Turka,Lohri Sarkhadi, Kuberia , Mahantpur Raipura, Badgaon, Gurji Kalan

7.0 Observations of the team

Summary report of all the three sub-groups, based on the field visit, interactions with the farmers, district collectors, other concerned stake holders, and wrap-up discussion with the Chief Minister and Chief Secretary and also informations/documents provided by the Government of Madhya Pradesh, the sector-wise account of the assessment is as follows:

7.1 Agriculture

7.1.1 Total Geographical Area of the M.P. state is 307.56 lakh ha of which net cultivated area is 158.72 lakh ha (51.60%), The net sown area of the state is 154.55 lakh ha with double cropped area at 77.78 lakh ha. Thus the gross cropped area is 232.33 lakh ha at 150% cropping intensity. Net irrigated area is 85.5 lakh ha with gross irrigation in 89.65 lakh ha, remaining 60% is rainfed.

7.1.2 Normal area under Kharif crop in the state is 121 lakh ha. Major Kharif crops are paddy, Soybean, Pigeonpea, Urdbean, Mungbean, Maize, Jawar and Sesame etc. The State took an ambitious programme of 126 lakh ha of Kharif sowing in the current year, about 59 lakh ha

coverage has been reported as covered under soybean crop which is 102% against the state's normal area of 57.84 lakh ha. The major Soybean varieties grown in the state are JS 95-60, JS 93-05, JS 335, NRC 7 etc. Variety JS-95-60 occupies maximum area, but this year due to unavailability of seed, JS-335 also occupied a sizable area.

7.1.3 The normal sowing time for Kharif pulses such as Arhar, Mung, Urd is 25th June to 15th July, for Soybean 15th June to 15th July and for Paddy it is between 10th June to 15th August. Delayed monsoon in paddy areas hampered the sowing and transplanting of paddy whereas, the erratic rainfall in soybean, urd and mung areas adversely affected these crops both due to erratic rains and heavy infestation of white fly /other insect pest and YMV. Harvesting of soybean has been completed between 10th-31st October, urd between Sept. 15th to Oct.15th and mung within Aug. 20th to Sept. 15th. Harvesting of Paddy has also started from 20th Sept. and likely to be completed by 2nd fortnight of December.

7.1.4 During the month of June and July continuous rains in different parts of Malwa region, the major soybean area adversely affected the inter-culture operations, therefore, heavy insect pest infestation especially the white fly and Yellow Mosaic Virus (YMV) etc., the state conducted a joint survey of soybean affected area and extension functionaries were swung into action.

7.1.5 The long dry spells and uneven dispersal of rainfall in the current season has severely affected the productivity of soybean, urd and mung. The yellow mosaic virus and white fly damaged these crops to a large extent in several districts.

7.1.6 Soybean crop loss was severe in the visited districts and almost 60-70 percent loss was seen and reported in the districts. Crop Cutting Experiments (CCE) indicated about 10- 20 % crop yield. The loss of crop in some cases was enormous and farmers were not even in a position to put labour for cutting of standing failed crop.

7.1.7 Arrival of Soybean crops in the visited mandies Satna and Rewa districts was also assessed. During the visit to Mandies for FY 2014-15 and 2015-16. On enquiry, it was informed that the arrival figures for FY 2014-15 with that of FY 2015-16 were less for Soybean in Satna Mandi. However, in Rewa Mandi the arrival in FY 2015-16 for Soybean was higher than FY 2014-15 (in month of October, 2015). On enquiry about such increase, it was informed by District Collector, Rewa that this was due to mainly old stock of FY 2014-15 coming to Mandies.

7.1.8 The paddy productivity is likely to be much less than the expected production. As per estimates, the total loss in production of kharif crop is likely to be 57 lakh MT on an expected production of 192 lakh MT. The estimated crop loss in rupee terms on this account (calculated as per MSP) will be Rs. 13,846 crores.

7.1.9 Prolonged dry spell of 20 days and more, deficient and erratic rainfall, early recession of

SW monsoon, day and night temperature regime has affected the critical physiological stages of kharif crops such as germination, vegetative, tillering, spike initiation, flowering, pod formation/ear formation, grain filling, milking stage.

7.1.10 The Crop Cutting Experiments (CCE) for Mung, Urd and Soybean have already been completed whereas, for early and mid duration, paddy varieties, > 80 % CCEs are done.

7.1.11 The anticipated production of Soybean, as per the crop cutting experiments, during current kharif is likely to be 38 Lakh MT which is 39 Lakh MT less than the First production Forecast. The productivity in the state is expected to be 6.50 qtl./ha. The productivity loss in majority of the districts is more than 50 %. Similarly, urd production is also affected, the production is expected to be 3.37 Lakh MT which is 1.38 Lakh MT less than First Forecast. Similarly productivity loss in mung is also reported. Cultivation of paddy under different Eco-system i.e. upland, midland and lowland etc. suffered due to moisture stress. The productivity of paddy is expected to decline by 20-25% than the state normal yield levels (16 qtl./ha). The expected production of paddy is around 41.39 Lakh MT in place of 52.31 Lakh MT as in the First Forecast reported by the State. The continued higher temperatures during the critical physiological stage may further add to this loss.

7.1.12 Affect on Rabi Crop Prospects: 2015-16

The Rabi crop area in the State was 110 lakh ha during 2013-14 and 106 lakh ha in 2014-15. The current Rabi crop targets 2015-16, has also been reduced to 101 lakh ha due to severe soil moisture stress. Crop-wise details are given as under:

RABI CROPS	Area (lakh ha)		
	Normal	Target	Revised Target
Wheat	40.78	58.70	55.85
Barley	0.80	0.44	0.42
Total Cereals	**41.58**	**59.14**	**56.27**
Gram	26.49	28.60	29.30
Lentil	5.29	5.30	5.02
Peas	**1.97**	2.62	2.65
Total Pulses	**34.32**	**36.98**	**36.97**
Rabi Foodgrains	**75.90**	**96.12**	**93.24**
Rapeseed/Mustard	7.02	6.79	5.77
Linseed	1.30	1.65	1.54
Total Rabi Oilseeds	**8.32**	**8.44**	**7.31**
Sugarcane	0.55	0.80	0.68
Total Rabi Crops	**84.77**	**105.36**	**101.23**

7.2 Drinking Water:

7.2.1 In the affected districts mostly the drinking water is provided through hand pumps. There are very few piped water supply schemes in these areas and most of them were found to be defunct/non-functional. The PHED has informed of inadequate maintenance of these schemes by the Gram Panchayats.

7.2.2 The interactions with the villagers and panchayat members, has however, revealed that many of the incomplete schemes were handed over to the village panchayats for running and maintenance.

7.2.3 The yield of the hand pumps in these areas was less and the supply of drinking water was inadequate. This has happened as the water table in the areas had gone down due to drought and low/inadequate rainfall and there has been inadequate recharge of ground water.

7.2.4 However, as on the date of visit, the situation has not reached an alarming stage where drinking water was required to be transported and supplied to the village population through tankers. However, the district officials and the villagers have given to understand the team that if the situation of drought continued as such they would have to transport/supply drinking water through tankers from the month of January –February, 2016 onwards.

7.2.5 At present the drinking water to villagers is being provided through tube wells and hand pumps. With scanty rainfall and lowering of ground water table the problem of availability of drinking water is likely to aggravate with passage of time.

7.2.6 It was further reported that there were requirement of riser pipes as the water level is lowering in these districts. The problem was more acute in Satna district. In this regard, Collector had issued necessary instructions restricting to have new tube wells.

7.2.7 It was reported that anticipated drought preparedness measures had been taken like construction of check dams etc., and necessary instructions had been issued by the state/ district authorities in this regard.

7.3 MoRD/ MGNREGA

The team is convinced that the drought affected districts, especially the Tribal division of Shahdol and Rewa and part of Jabalpur, need the additional Mandays to agricultural labourers from the existing 100 days to 150 days.

8.0 Wrap-up meeting with Chief Minister and Chief Secretary:

8.1 The IMCT had a wrap-up meeting on Nov. 10th with the Hon'ble Chief Minister of Madhya Pradesh and the Chief Secretary, Govt. of M. P. The HoDs and Principal Secretary's of various departments also participated. The team was appraised of various drought mitigation measures initiated to provide relief to the farming communities.

8.2 **The initiatives include:** One day special State Assembly Session on November 4, 2015 to deliberate on farmers distress in the wake of drought and likely policy decisions to cope-up with the situation, thereby, provisioning a sum of Rs. 8000 Crore under Relief Package; curtailing of Govt. expenditure @15% to strengthen farmers welfare; to wave off electricity bills; rescheduling of short term agricultural loan to mid-term; to relax the recovery of institutional crop/ agricultural loans and directives to District Collectors to

keep a vigil on Sahukars/ Private Money Lenders for not yielding pressure to recover loan amount; repair and installation of new transformers to facilitate come-up irrigation for ensuing Rabi crops; timely/quick completion of Crop Cutting Experiments (CCE) of Soybean, Paddy and Urad to facilitate quick settlement of reimbursement of crop insurance to the farmers etc.; deputation of State Cabinet Members and All India Services officers to visit drought–hit districts between Oct. 25th to 27th, 2015, to assess the crop damage, status of drinking water, both for humans and animals as also to monitor the implementation status of different Central sector and State run Social and Development Schemes and the relief measures on the spot.

8.3 Central assistance and Special Package for Cooperative Sector

8.3.1 Interest Subvention on the loan amount distributed to farmers at 0% interest rescheduled from short term to medium term (MT) conversion has been requested for the farmers where crop loss is 33% to 50%. ***An amount of Rs. 330 Crores have been sought. Similar Interest Subvention of Rs. 440 Crores has been requested for the farmers of the area where crop loss is above 50%.***

8.3.2 Additional Refinance of Rs. 1400 Crores by NABARD on the standard terms of subsidy by Govt. of India to the State Govt. (@ 4.5%) has been requested by State Govt. The state has converted short term crop loans to MT to the tune of Rs. 4000 Crore which were distributed by DCCB during, Kharif 2015. Now, the NABARD will refinance only 60% of this loan, the share of State Govt., State Cooperative Banks and District Central Cooperative Banks (DCCB) is fixed at 15%, 10% and 15% respectively.

8.3.3 Request for immediate release of Central share towards Crop Insurance for the current Kharif 2015 to settle the crop insurance claims.

8.3.4 The Chief Minister has also raised his concern on a very poor amount of Rs. 5 to 50 under crop insurance settlement to an individual farmer (based on his crop area insured etc.) and opined to have a policy decision to a respectable minimum amount of at least Rs. 1000 to an individual farmer.

8.3.5 To immediate release of second instalment under RKVY.

8.3.6 To regularize /updation of 100 to 150 days work and roaster generation issue by the MORD.

8.3.7 It was also informed that a task force of experts to develop a Short Term, Mid-Term/ Long Term strategy to suggest crop diversification suggestion has been constituted and a one day deliberation on this aspects was held in "Krishi Manthan" on October 31st 2015 /development of allied sectors including Animal Husbandry and Dairying, Horticulture/Fisheries.

9.0 Recommendations

9.1 Agriculture: According to the report submitted by the state through Memorandum, field observations of IMCT during visits and additional/ revised information received from state during visits, the IMCT is convinced that the farmers have suffered losses to the tune of more than 33% to 100% for agricultural crops.

9.1.1 Therefore, apart from recommending funds under NDRF, IMCT suggest certain other recommendations, necessary to be opted as a drought mitigation measures through the ongoing development intervention under NFSM, NMOOP, RKVY , MIDH, NMSA and NMAAET etc.

9.1.2 Long-term plan to cope drought are necessary for drought prone areas which can be done by expert technical team including water conservation measures.

9.1.3 Programme for Construction of farm ponds, percolation tanks, minor irrigation tanks and development of watersheds should be implemented in all drought affected districts for recharging the ground water and protective irrigation during dry spell in the state.

9.1.4 Cropping pattern should be changed, less water guzzling crops like pulses, millets, oilseeds, horticultural crops etc. need to be promoted as crop diversification strategy.

9.1.5 As per the norms and as per the illustrative list of activities identified as of an immediate nature like repair of pipeline stand posts, restoration of damaged stand posts including replacement of damaged pipeline with new, repair of pump machines linking overhead reservoirs and water pumps including damaged intake structure Rs.1.5 lakhs per scheme can be given as immediate assistance.

9.2 Drinking Water

9.2.1 There are 1,27,552 habitations in all the 51 districts of the State . Out of these the State government has reported that 24238 habitations have been strongly affected by drought for which measures will have to be taken to provide drinking water. This will be achieved by digging additional tube wells and providing risers pipes in the existing tube wells and during acute summer months transportation of water to some of these settlement will also be required, as requested in the memorandam.

9.2.2 The State has demanded a total of Rs.297.30 crores of which Rs.46.80 crores will be required in urban areas and Rs.250.50 crores would be for rural areas.

9.2.3 As per the revised items and norms of assistance from the State Disaster Response Fund (SDRF) and the National Disaster Response Fund (NDRF) for the period 2015-2020 dated 8th April, 2015 , the provision with regard to drinking water supply is as below :

Items	Norms of Assistance
RELIEF MEASURES	

Provision of emergency supply of drinking water in rural areas and urban areas	As per actual cost, based on assessment of need by SEC and recommended by the Central Team (in case of NDRF), up to 30 days and may be extended upto 90 days in case of drought. Depending on the ground situation, the State Executive Committee can extend the time period beyond the prescribed limit subject to that expenditure on this account should not exceed 25% of SDRF allocation for the year.
INFRASTRUCTURE	
Drinking Water	Regarding repairs of damaged drinking water schemes, the eligible damaged drinking water structures will be eligible for assistance @ Rs.1.5 lakh/damaged structure.

9.2.4 Illustrative list of activities identified as of an immediate nature under drinking water supply, includes:

(i) Public stand posts.

(ii) Damaged stand posts including replacement of damaged pipe lengths with new pipe lengths.

(iii)Repair of damaged pumping machines, leaking overhead reservoirs and water pumps including damaged intake – structure.

Items/Particulars	Norms of assistance will be adopted or immediate repair
Drinking water scheme	Up to 1.50 lakh/unit

9.2.5 The demand of the State Government for funds for transportation of drinking water through tankers cannot be considered at this stage as water supply through tankers have not yet started and are anticipated to start only from the month of January and – February, 2016, the time from which the State Govt. anticipates that it would have to supply drinking water to rural population through tankers as the situation would become very acute by then.

9.2.6 However, as per supplementary information, the state has checked out 807 villages; where tankers have to be deployed and anticipates an expenditure of Rs. 5.86 Crore.

9.2.7 Under rural drinking water supply schemes a scarcity proposed of the state government under Table 2- A propose to cover 23403 habitation. A total of 1175 power pumps are proposed to be installed at a total cost6 of Rs. 23.50; 5279 numbers of hand pump to be repaired/ riser pipes to be laid out for an amount of Rs. 2.65 Crore. Similarly, for hand pumps and power pumps, a total of Rs. 43.46 Crore have been requisitioned.

9.2.8 National Rural Drinking Water Programme

The Ministry of Drinking Water and Sanitation runs a scheme named National Rural Drinking Water Programme (NRDWP) through which financial and technical assistance is provided to the States to provide drinking water to the rural population of the country. The scheme has various components like Programme, Support, Sustainability, Water Quality Monitoring and Surveillance, Operations and Maintenance under it. NRDWP is a Centrally Sponsored Scheme and under the guidelines for flexi funds within Central Sponsored Schemes at least 10 per cent of the Plan budget can be used for taking up activities as per the requirement of the State (MOF- Deptt of Expenditure OM F -55(5)/PF II/2011 dated 6th January , 2014). As such the State Govt. of Madhya Pradesh can use this fund for taking up mitigation activities with regard to drinking water supply in the State in view of drought in the State. As reported by the State on the Integrated management information system (IMIS) of the Ministry a total of 109.14 crore is lying with the State as on date. 10 per cent of this can be used for drinking water in the State for relief measures in view of drought.

9.2.9 15 per cent of the NRDWP (Programme) fund can be used for taking up O&M activities. This fund can be utilized for repair/rejuvenation of damages handpumps / piped drinking water supply schemes.

9.2.10 NRDWP (Natural Calamity) : 2% of the NRDWP funds are retained by the Ministry to be used for providing assistance to States /UTs to mitigate drinking water problems in the rural areas in the wake of natural calamities. Of a total of Rs.75.92 crores made available under this component in FY2015-16 , Rs. 6.53 crores have been spent and a balance of Rs. 69.39 crore is available with the Ministry. The state of MP can be provided assistance from this component as per the decision of HLC.

9.3 MGNREGA – Employment

Proposals for a revision of LB, if required, may be submitted by the state in the same format and following the same procedure as for original LB. Based on an assessment of demand for employment, potential for providing employment on ongoing works and other factors, the Empowered Committee Chaired by Secretary, Department of Rural Development will take a decision on the proposal of revision of LB.

The proposal for enhancing employment days from 100 to 150 days in the notified drought affected tehsils of Madhya Pradesh has been received in the Ministry and is under examination. On approval of the same, the funds will be provided to the state as per agreed to Labour Budget (LB) from where they will continue to meet the expenditure on account of providing employment up to 100 days and also for the increased number of days in notified areas.

Item	Details of Financial Assistance sought

	by the State (Rs. in Crores)
Provision for 50 days of additional mandays to Agricultural workers in drought affected areas under MGNREGA	762.00

10.0 SUMMARY RECOMMENDATION OF FINANCIAL ASSISTANCE UNDER NDRF NORMS

Based on the above report, the Central Team makes following recommendations as assistance under NDRF:

10.1 Financial Assistance under NDRF

(Rs. in crore)

S. No.	Items	Funds requested by the state	Funds recommended by IMCT			Remarks
I	AGRICULTURE i) Crop loss (Rainfed, irrigated, and perennial) :					
	a) Input subsidy to farmers having land holding up to 2 hectares **(SMF)**	1780.02	Drought districts	Other districts	Total	
			662.11	1117.91	1780.02	
	b) Input subsidy to farmers having more than 2 hectares of land holding **(OSMF)**	1212.32	648.44	1030.23	1678.67	
	Sub Total (Input subsidy)	**2992.34**	**1310.55**	**2148.14**	**3458.69**	
2	NAIS (National Agriculture Insurance Scheme)	770.00				Non NDRF norms
3	DRINKING WATER					
	a) Provision of emergency supply of drinking water in rural areas.	250.50				
	b) Provision of emergency supply of drinking water in urban areas.	46.80				
	Sub Total	**297.30**				
4	Rural Development / Employment (MGNREGA)	762.00				
	Total (sub Total of 1 to 4)	**4821.64**	**1310.55**	**2148.14**	**3458.69**	

10.2 Central Assistance and Special Package for Cooperative Sector

(a) Towards Interest subvention on the loan amount rescheduled from short-term to long term; and Additional Re-finance of Rs. 1400.00 crore through NABARD; immediate release of 2nd instalment under RKVY, immediate release of Central share towards Crop Insurance for the current Kharif 2015 to settle the crop insurance claims. To regularize /updation of 100 to 150 days work and roaster generation issue by the MORD.

The Team is constrained to recommend these provision under para 10.2, as these do not fall in the category of Items and Norms of assistance under SDRF and NDRF. However, these aspects, may be viewed by the concerned departments in the interest of agrarian community of the state.

Government of M.P. Guidelines for declaration of an area as drought affected

The State Government has fixed the following guidelines/criteria in the year 2007 for declaring an area as drought affected:

i. If the shortfall of rainfall for the period from 15th June to 30th September is 25 % or more in a tehsil then the entire tehsil is declared as drought affected;

or

ii. If the Aanawari based on crop cutting experiment is less than 50 paise in 25% or more of the total number of villages in a tehsil then the entire tehsil, is declared as drought affected ,

or

iii. If the Aanawari based on crop cutting experiment is less than 50 paise is less than 25% of the total number of villages in a tehsil but if a cluster of 10 or more contiguous villages has Aanawari less than 50 paise, then that cluster is declared as drought affected;

or

iv. If sowing of Rabi crop is 30 % less than average sowing in 25% or more out of total number of villages in a tehsil, then entire tehsil is declared as drought affected;

or

v. If the sowing of Rabi crop is 30% less in less than 25% of total villages of a tehsil, but if in a cluster of 10 or more contiguous villages Rabi sowing is less than 30% of average sowing,then that cluster of villages is declared as drought affected.

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Annexure 8.2

INTER-MINISTERIAL CENTRAL TEAM FOR ASSESSEMENT OF SITUATION CAUSED BY DROUGHT AND SCARCITY SITUATIONS, 2015-CHHATTISGARH

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Responding to the Memorandum "on the situation caused by drought and scanty situation in Chhattisgarh during the months from June, 2015 to September 2015" an Inter-Ministerial Central Team lead by Shri R. K. Singh, Joint Secretary (Seed), Government of India, Ministry of Agriculture and Farmers Welfare and Team Leader made an on-the-spot assessment during 29-31st , October, 2015.

2. A preliminary meeting to finalize itinerary and to discuss salient features of the Memorandum was held under the Chairmanship of Team Leader on 29-10-2015 in Raipur. Subsequently, two subgroups, constituted as under, visited the locations/spots:

Sub-group	Districts	Members
I	Gariaband, Rajnandgaon, Dhamtari	Shri R.K.Singh, Joint Secretary & Team Leader, Dr. A. K. Tiwari, Director, DPD, Bhopal, Dr. Brajesh Shrivastav, Consultant (MD WS), Shri P.S.Chakraborty, Deputy Secretary (AHD), Shri Sumit Goyal, Assistant Director (Min. of Power).
II	Korea (Baikunthpur), Bilaspur, Korba, Raigarh	Dr. Ramanand, SRO (NITI AYOG), Shri B.K.Mishra Assistant Director (MoF), Shri R.K.Makkar, US(MoRD), Shri Rakesh Tuteja, SE(NBO).

3. On arrival, a briefing Meeting for the benefit of the Central Team was convened at Raipur (Chhattisgarh) on 29.10.2015 under the Chairmanship of Shri Ajay Singh, ACS & APC, Government of Chhattisgarh. The wrap-up discussion was held on 31st October, 2015 under the Chairmanship of Shri Vivek Dhand, Chief Secretary, Government of Chhattisgarh, participated by the HODs/PS of various Departments of Government of Chhattisgarh.

A. AGRICULTURE

i. The normal onset of Monsoon in Chhattisgarh, i.e. 2nd week of June, was generally well, the state received first monsoon rains on last week of June, 2015. During the current South West monsoon year the month-wise state average rainfall has been as June 256 mm, July 261.3 mm, August 286.4 mm, September 201.2 mm and October 4 mm.
ii. Thus a total rainfall of 1004.9 mm has been registered till 30th September 2015 as against the average annual rainfall of 1272.9 mm during the corresponding period of last year 2014 with its average at 1132.7 mm. Thus there has been a short fall of 21% against the preceding year and 11% against state's average rainfall.
iii. The major shortfall has been in the month of July which was 41% and 31% against the preceding year and state's average rainfall respectively.
iv. In the month of October the rains received were 5% only both of the state's normal (75.3 mm) and its preceding year 2014 (78.3 mm).
v. The kharif sowing target was 48.20 lakh hectare against which 47.06 lakh hectare has only been sown so far, which is 98% of the target.
vi. Of the total 47.06 lakh ha coverage under Kharif, in the state, about 83% area was covered under Cereals (Paddy 78%), pulses (7%), oilseeds (6%) and others (4%). Rice and Maize are the major cereal, Arhar and Urid/Mung are major pulse and Soybean, Grou ndnut, Niger and Seasmum are the major Oilseed crops grown during kharief season.
vii. Overall 17% & 15% rainfall is deficit on the basis of state's average and preceding year average from June to October.
viii. Jashpur, Rajnandgaon, Dhamtari and Gariaband districts come under high rain deficit areas during the season under report till October, 2015.

ix. Rice is the main crop of this state and is grown under upland, midland and low land agro-eco situation.

x. About 35% area is under irrigation and remaining 65% is rain dependent.

xi. About 70 % rice area is under direct seeding, 10% is under Lehi system and 20% is under transplanting. Lehi (germinated seed) and transplanting system of rice cultivation is prevalent mostly in the irrigated regions whereas the maximum area under direct seeding (DSR) is rain dependent.

xii. As regards the overall scenario of crop, in most of the area 75% crop had recovered due to September rains and 25% has suffered due to erratic and low rainfall.

xiii. Among the different maturity group of rice early and medium duration crop had mostly succeeded and late maturing variety (140 days) had suffered.

xiv. This year the pest problem was comparatively low therefore the paddy areas with irrigation facilities are likely to give better and normal yields owing to good photo period during this crop season. There has also been a good harvest of soybean and present situation of Pigeonpea crop is also satisfactory

xv. Rice Panicle Mite is observed as an emerging problem in this area due to rise in temperature levels in this area during the crop season.

xvi. Due to delayed and erratic monsoon, critical agricultural operations like – sowing, transplantation, weeding, etc. have been delayed, resulting in arrest of vegetative growth of the crops. This has been further aggravated by poor tillering and branching which are the major yield attributing characters of the crops. The upland areas and non command areas have been affected. The upland paddy with no irrigation facilities could not reach to tillering stage and vanished.

xvii. Against a target of 11.25 lakh hectare, transplantation could be done only on 10.57 lakh hectare (94%). Similarly, *biyasi* (inter-culture operation) could take place only in 6.64 lakh hectare of land as against 26.16 lakh hectare resulting in the productivity loss.

xviii. The major 5 river basins and the reservoirs, the prime source of canal irrigation and *Nistari Talab* could also not reach to its half of the capacity.

xix. Overall position of water availability in the State's reservoirs for the current season is 4129.041 M.Cum. as against last season's 7064.582 M. Cum. whereas the total capacity of the reservoirs is 7609.613 M. Cum. Priority shall be assigned to drinking water purposes and the remaining thereof shall be used for irrigation.

xx. The team visited Villages Kodovettar, Mainpur-2, Rampur, Madanpur, Vindrananavagarh, Paragaon, Tupainga, Ghatait, Block- Gariaband District-Gariband and Village- Dhavalpur, Vardula, Adgadi, Jarideech Block-Mainpur District- Gariband.

xxi. The team visited Villages Khaprikala, Hardi, Kasari Block-Dongagarh, Sukuldaihan, Dhangaon, Bagtarai, Dharampur Block-Rajnandgaon, Gatapar, Damri, Madarkuli, Raingakthera, Pavantara, Block- Khairagarh District-Rajnandgaon.

xxii. The team also visited Village Magarload, Kumahada, Maradapoti, Block-Nagri Distict Dhamtari.

xxiii. To avoid the distress amongst the farmers in the coming season and re-pay of crop loans owing to non-payment/refund of the crop loan, there is urgent need to find alternate measures/institution/agency (NABARD etc) to come forward to finance Apex Bank which in turn could re-finance the Cooperative banks to maintain the flow of funds to help the farmers to avail the crop loan/inputs.

xxiv. Poor veterinary services in the area need to be strengthened. Custom Hiring Centers (CHC) needs to be strengthened and convergence with on-going Centrally Sponsored Schemes at the district level Agriculture Technology Management Agency (ATMA), especially on mechanization front. This will not only ensure procurement of need based farm machineries but also ensure the sustainability of the infrastructure created under CHCs.

xxv. In view of the earlier drought like situations during 2000-01, 2002-03, 2004-04 and 2009-10 and recurrence of the calamities such as drought in recent past, a long-term comprehensive

agricultural policy involving the allied sectors, may be prepared for drought prone districts. There is need to strategically intervene in the existing cropping pattern by adopting the cropping-system-approach and integrated farming, strengthening of allied sectors like Animal Husbandry & Dairying, Fishries, Sericulture, Horticulture, Processing and Value addition and Branding etc.

xxvi. The team recommends to aggressively promote the crop diversification of water guzzling crop like paddy with that of rainfed preferential leguminous/pulse crops, oilseeds crops; discouraging summer paddy cultivation; promoting direct seeded rice cultivation (DSR) etc. The district-wise contingency plan focusing on rainfed agriculture conservation agriculture and crop diversification prepared by IGKVV, Raipur may be fine-tuned both as a short-term and long-term measures. The team also recommended adopt integrated farming system approach.

xxvii. A strong synergistic approach in Technology Transfer and implementation of NFSM, BGREI, MIDH, RKVY, NMSA etc by all stake holders viz. Department of Agriculture, KVKs, SAUs, is suggested.

2. Assistance under NDRF Norms:

i. The state's Memorandum/Survey reveal that the drought affected the Kharif crops, badly impacting 19.99 lakh hectare paddy area in 25 districts which is 44% of the total kharif coverage. Out of 19.99 lakh has 60% area belong to small & marginal farmers and remaining with other farmers. The actual loss in yield can only be ascertained once the harvesting is over and crop cutting results are obtained.

ii. On the basis of the assessment of the situation in the 22 districts due to present calamity causing hardship to farming community and landless farmers/share croppers, the Team recommends the following financial assistance.

iii. The Team is however, of the view that the state may be additionally supported under the on-going centrally sponsored schemes of National Food Security Mission (Pulses, Wheat, Rice, Coarse cereals, commercial crops), RKVY, NMOOP, ATMA, NHM, etc.

iv. The Input subsidy in the Agriculture sector is given in Table 1.

Item	**Area (ha)**	**Assistance Norms (Rs./ha)**	**Eligibility for assistance under NDRF (Rs. Crore)**
A. Damage/loss with small & marginal farmers (SMF)	1202859	6800/-	817.94
i. Rainfed	-	13500/-	-
ii. Irrigated	-	18000/-	-
iii. Perennial	795962	6800/-	541.25
B. Damage/loss to other than SMF - **instant calamity**	-	13500/-	-
i. Rainfed	-	18000/-	-
ii. Irrigated	-	(up to 2 ha)	-
iii. Perennial	-	6800/-	-
C. Damage/loss to other than SMF- **successive calamity**		13500/-	-
i. Rainfed		18000/-	
ii. Irrigated			
iii. Perennial			
Total	1998821		**1359.19**

The Team recommends a total input assistance to the tune of Rs. 1359.19 Crores in the crop sector subject to the actual loss in yield to be ascertained once the harvesting is over and crop cutting results are obtained.

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Annexure-9

Study on yield advantage under line sowing v/s broadcasting in direct seeded rice in Chhattisgarh Conducted by Directorate of Pulses Development, Bhopal

Abstract:

Paddy is one of the most important cereal crops in the country. Chhattisgarh occupies a prominent place in paddy cultivation. The state's share to national paddy area and production is 8.61% and 6.30% respectively. Chhattisgarh is the paddy dominated mono-cropped state with more than 80 per cent kharif cultivable area under paddy. Direct seeded rice (DSR)- Line sowing & Broadcasting, transplanting, system of rice intensification (SRI) etc. are the main methods of sowing of paddy. About 70 per cent farmers go for direct seeding of paddy by broadcasting method in Chhattisgarh. The yield levels of the state are very low at 1766 kg/ha compared to national average of 2416 kg/ha, and much below the potential yield of 2910 kg/ha.

The two Centrally Schemes of National Food Security Mission (NFSM) and Bringing Green Revolution in Eastern India (BGREI) with critical development interventions are under implementation since 2007-08 and 2010-11 respectively in Chhattisgarh state. Both the schemes, through various development interventions, have the objectives to enhance the production and productivity of paddy in the state. The improved technologies also include the method of sowing of paddy. Line sowing/transplanting is being promoted under NFSM and BGREI which gives higher yield compared to broadcasting.

In this context, a study was undertaken to evaluate the yield and other advantages of line sowing over broadcasting method of planting. The study was undertaken in two districts of Chhattisgarh i.e. Raipur covered under NFSM and Balod where BGREI is operational. One block of each district was identified for the study. A total of 64 farmers were covered from both the districts, covering 32 farmers (16 beneficiary & 16 non-beneficiary) from each district. These respondents were from all socio-economic categories viz. General, OBC, SC & ST and further classified into marginal, small, medium and large farmers based on land holdings.

The study revealed that the average increase in paddy yield was about 20 % under the line sowing method over the broadcast method of paddy planting. The per hectare net return was more under line sowing as compared to the broadcasted method of sowing. The cost of production per quintal was less in line sowing method of paddy cultivation i.e, Rs 545.33/ qtl. & Rs.517.36/qtl over the broadcast method of paddy cultivation i.e. Rs. 619.30/qtl & 550.81 Rs/qtl in Raipur and Balod district respectively. Thus, the findings reveal higher Cost Benefit ratio under line sowing method i.e.1:2.71 &1:2.87 in comparison to broadcast method i.e. 1:1.24 &1:2.71 in Raipur and Balod district respectively.

The farmers opined that the yield advantage of about 5-10 quintals/ha and saving in seed at 20-45% under line sowing method over the broadcasted paddy is remarkable. Most of the farmers also opined the other advantages of the line sowing DSR method such as good germination of seeds, easy pest management, nutrient management, application of plant protection chemicals, inter-culture practices like weeding, hoeing etc. and a comparatively less infestation of pests and diseases in the crop due to proper crop geometry and management.

However, the broadcasting method of sowing of paddy under DSR is still prevalent and being adapted in Chhattisgarh owing to limited window of sowing time, large number of operational holdings with the SMF to afford seed drills; poor access to custom-hiring of seed drills, and deep traditional wisdom of farmers to grow paddy with "Biyasi" operations.

Study on yield advantages under line sowing v/s broadcasting in Direct Seeded Rice

1. Background

Paddy is one of the most important food grain crops in the country. The total area under paddy cultivation has been 44.14 million hectares in the country during 2013-14 which is 64 per cent of kharif food grain area. The total production of paddy is 106.64 million tonnes which constituted 83 per cent of total kharif food grain production (128.69 MT) in the country during 2013-14. The national productivity of paddy is 2416 kg/ha**.** In Chhattisgarh, the area under paddy cultivation has been 3.80 million during 2013-14 with the production at 6.72 million tonnes realised at levels 1766 kg/ha. The per cent share of the state in all India area and production of paddy has been 8.61% and 6.30%.

Scope of the study

Chhattisgarh is the paddy dominated mono cropped state where more than 80 per cent area is covered under paddy during kharif season. The area under irrigated paddy is only about 26 per cent. During the year under study an area of 37.56 lakh ha was under paddy cultivation. Of this, 26.88 lakh hectares was planted by the direct seeding method i.e. DSR which is about 72% and remaining 28% area was under transplanted paddy. Further under DSR methods, about 80% is sown by broadcasting of DSR whereas about 20% under line sowing. The yield level is low compared to the average yield of FLD and national average yield of paddy. Poor seed germination, weed infestation, infestation of pests and diseases and imbalance application of fertilizers etc. are the inhibiting factors. Looking to these facts, the present study aimed at to compare the advantages of line sowing with that of the traditional broadcasting method. National Food Security Mission (NFSM) and Bringing Green Revolution in Eastern India (BGREI) are under implemented since 2007-08 and 2010-11 in Chhattisgarh state. Under both the schemes rice is covered with main objective to enhance the production and productivity by use of improved technologies. The broadcasting method of sowing paddy is still prevalent and being adapted in Chhattisgarh. The line sowing/transplanting is being promoted under NFSM and BGREI which gives higher yield compared to broadcasting. In this context, a study was undertaken to evaluate the yield and other advantages of line sowing over broadcasting.

2. Objectives

Followings were the objectives of the study:

i. Yield advantage of line sowing v/s Broadcasting in direct seeded rice,
ii. Weed management under line sown and broadcast direct seeded rice,
iii. Fertilizer management under line seeded and broadcasted rice and
iv. Varietal preferences under line seeded rice.

3. Methodology:

3.1 Selection of Districts

District Raipur under NFSM and district Balod under BGREI scheme, were selected for the study in consultation with the state department of agriculture. The primary and secondary data related to socio-economic indicators like irrigation, infrastructure, implements, improved technologies including method of paddy sowing (viz. line sowing vis-a-vis broadcasting etc.) were collected to assess the yield advantage and other objectives of the study.

3.2 Selection of Blocks

Raipur district has four blocks namely Dharsiwa, Tilda, Abahnpur and Arang. On the basis of higher area covered under direct seeded rice cultivation Dharsiwa block was selected.

Similarly, of the 5 blocks of Balod district viz Gunderdehi, Balod, Dondi, Dondilohara and Gurur, block Gunderdehi was selected for study.

3.3 Selection of Respondents

In the two selected blocks, 16 paddy growers from each block were selected and interviewed for obtaining their experience, views and information regarding method of sowing of paddy, line sowing vis-a-vis broadcasting. Thus, a total of 32 beneficiaries (16 each from Raipur and Balod district) were interviewed and in interacted different selected villages practicing planting of paddy by line sowing under the interventions of Centrally Sponsored Scheme of NFSM and BGREI for crop development. The similar number i.e. 32 (16 each from Raipur and Balod district) respondents/farmers of non-beneficiary category were randomly selected in both blocks. The details of respondents are given in table 1

Table 1. The details of beneficiaries and non-beneficiaries in Raipur and Balod districts

S. No.	District	Block	Panchayat	Villages	Beneficiary farmers (Line sowing)	Non-Beneficiary farmers (Broadcasting)	Total
1	Raipur (NFSM)	Dharsiwa	Barbanda	Matiya	07	08	15
				Barbanda	06	03	09
				Tore	02	04	06
			Dondekhurd	Dondekhurd	01	01	02
Sub-total					**16**	**16**	**32**
2	Balod (BGRE)	Gunderdehi	Sakrod	Sakrod	08	08	16
			Gandai	Naharpara	07	05	12
				Gandai	01	03	04
Sub-total					**16**	**16**	**32**

3.4 Data Collection and Analysis

During the field visit, structured formats and Participatory Rural Appraisal (PRA) methods were used to collect primary data. The secondary data has been collected from DES and State Department of Agriculture, Government of Chhattisgarh. Standard statistical tools have been applied for the analysis and presentation of the results.

4. Agro-climatic features of selected districts

The total geographical area of Chhattisgarh is 137.90 lakh ha of which cultivable area is 46.77 lakh ha. About 80 per cent of the population is engaged in agriculture about 43 per cent of the arable land is under cultivation. Paddy is the principal crop and therefore of Chhattisgarh is known as rice bowl of Central India.

4.1 Land use statistics of the state and selected districts

The detail information about the land use pattern of the state and selected districts study area is presented in **Annexure I**. The details of selected districts are given below:

(i) Raipur district

The total geographical area of the district is 2.89 lakh ha of which 1.68 lakh ha is the net sown area. Paddy was sown in 1.55 lakh ha, 1.24 lakh ha direct seeded rice, of which 0.075 lakh ha was under line sowing and remaining 1.165 lakh ha was broadcasted. The distribution of land holding is given in **Table 2**.

Table 2: Distribution of land holdings of: Raipur district

Particulars	Marginal (< 1 ha)	Small (1-2)	Medium (2-4)	Large (>4 ha)	Total (pooled)
Cultivated land (ha)	92980	35887	19574	14682	**163123**
Average rainfed area	20850	8047	4389	3293	**36579**
Irrigated area (ha)	72130	27839	15185	11390	**126544**
% Cultivated land	57	22	12	09	**100**
Total area (ha)	**92980**	**35887**	**19574**	**14682**	**163123**

Source: State Department of Agriculture, Raipur

(ii) Balod district

The total geographical area of Balod is 3.52 lakh ha of which 1.83 lakh ha is under cultivation. Paddy was sown in 1.69 lakh ha, 1.45 lakh ha direct seeded rice, of which 0.13 lakh ha was under line sowing and remaining 1.32 lakh ha was broadcasted. The distribution of land holding is given in **Table 3**.

Table 3: Distribution of land holdings: Balod district

Particulars	Marginal (< 1 ha)	Small (1-2)	Medium (2-4)	Large (>4 ha)	Total (pooled)
Cultivated land (ha)	106545	45925	22044	9185	183699
Average rainfed area	49952	21530	10335	4307	86124
Irrigated area	56594	24390	11710	4881	97575
% Cultivated land	58	25	12	5	100
Total area	**106545**	**45925**	**22044**	**9185**	**183699**

Source: State Department of Agriculture, Balod.

4.2 Area, Production and Productivity

The area production and productivity of kharif rice and Rabi/summer rice and selected districts of Chhattisgarh is given in **Table 4**.

Table 4: Area, Production and Productivity of Paddy (State and study districts 2011-12 to 2013-14)

(Area-000 ha, Production-000 tons, Yield-Kg/ha)

Season	2011-12			2012-13			2013-14*		
	Area	Production	Yield	Area	Production	Yield	Area	Production	Yield
Raipur									
Rice Kharif	154.54	509.98	3299	154.92	509.55	3289	158.60	525.00	3310
Rice Rabi/Summer	18.74	68.96	3679	24.64	90.94	3690	18.00	69.33	3851
Total	**173.28**	**578.94**	**3341**	**179.56**	**600.49**	**3344**	**176.60**	**594.33**	**3365**
Balod									
Rice Kharif	169.69	610.88	3600	169.21	641.30	3790	168.79	706.38	4185
Rice Rabi/Summer	8.67	32.50	3748	13.09	48.42	3700	8.19	36.85	4500
Total	**178.36**	**643.38**	**3607**	**182.30**	**689.72**	**3783**	**176.98**	**743.23**	**4162**
State	**3777.00**	**6030.00**	**1599**	**3780.00**	**6610.00**	**1746**	**3800.00**	**6720.00**	**1766**

*Provisional data

Source: DES, GOI, Directorate of Agriculture, Government of Chhattisgarh.

5. Results and Discussion

Based on the collected data, discussions with farmers, staff and others, the main results summarised below:

5.1 Yield advantage of Line sowing v/s. Broadcasting

Raipur-The findings reveal that the improved technologies were adapted in the demonstrated plot as compared to the plots where farmers have used the traditional sowing method i.e. broadcasting. The increase in productivity of the crop may be attributed to the use of improved technology on demonstrated plots as compared to the check plots with the non-beneficiaries farmers. The details of adoption of technologies are given in **Annexure II**. Yield levels of paddy realised under both the methods of planting i.e. line sowing method demonstration vis-a-vis broadcasting method is given in **Table 5.** Method of sowing, application of quality seeds, weed management, recommended doses of integrated nutrients and its management and micro nutrients in the fields of demonstrations organized under the NFSM & BGREI crop development scheme, the average yield of paddy was 52.37 quintal/ha compared to the check plot where it is only 41.75 quintal/ha which is 20.27 per cent less than the yield of test plot (line sowing method). It establishes that the technology adapted at the demonstration plots is significantly better than the traditional method of paddy cultivation by non-beneficiaries group.

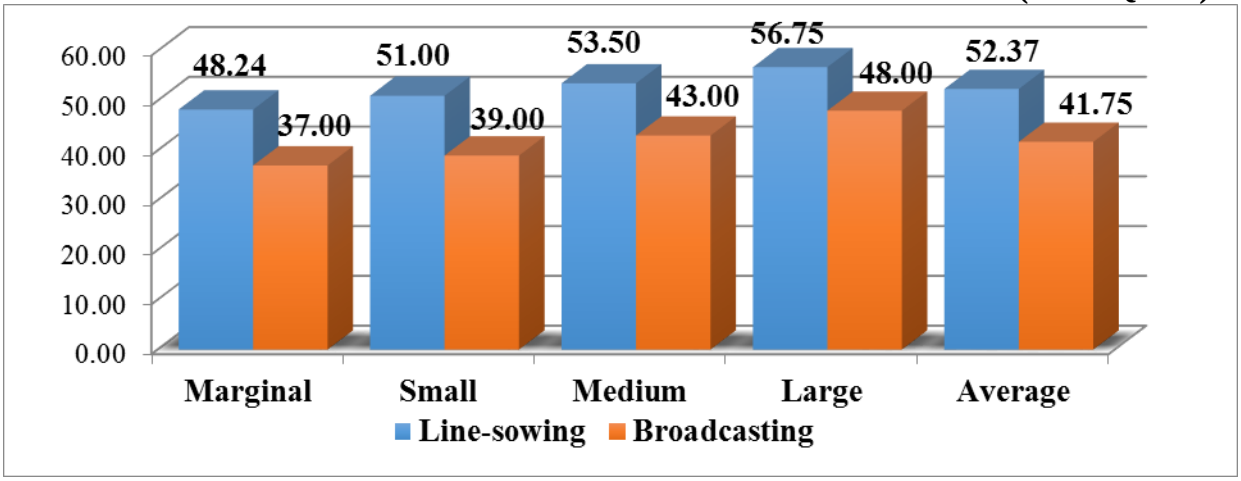
Table 5: Yield advantage of paddy at the farmer's field in Raipur district

(Yield-Qtl/ha)

S. No.	Particulars	Marginal	Small	Medium	Large	Average
1.	Line-sowing	48.24	51.00	53.50	56.75	**52.37**
2.	Broadcasting	37.00	39.00	43.00	48.00	**41.75**
Yield gap across the farms		11.24	12.00	10.50	08.75	**10.62**
Percent yield gap		**23.30**	**23.52**	**19.62**	**15.41**	**20.27**

Figure 1: Paddy Yield under line sowing and broadcasting method at sampled farms district Raipur

(Yield-Qtl/ha)



Balod- Yield of paddy under both the methods of sowing under DRS i.e. line sowing vis-a-vis broadcasting check plot is given in **Table 6**. Due to application of quality of seed, fertilizer and micro nutrients in the field of demonstration, the yield was 55 quintal/ha compared to using traditional practices check plot (broadcasted method) with only 44 quintal/ha i.e. 20 per cent less than the improved method of line sowing plots. It shows that all the recommended interventions and technologies adopted at the demonstration plots and also these have paid dividends over the traditional method of paddy cultivation. The details of adoption of technologies are given in **Annexure V**. It may be suggested that farmers of the surrounding villages should visit the demonstration in order to increase the horizontal diffusion of such technology.

Table 6: Yield advantage of paddy at the farmer's field in Balod district

(Yield-Qtl/ha)

S. No.	Particulars	Marginal (Gen, OBC, SC, ST)	Small (Gen, OBC, SC, ST)	Medium (Gen, OBC, SC, ST)	Large (Gen, OBC, SC, ST)	Average (Gen, OBC, SC, ST)
1.	Line-sowing	50.61	53.75	56.00	58.00	**55.00**
2.	Broadcasting	39.00	41.00	46.00	49.00	**44.00**
Yield gap across the farms		11.61	12.75	10.00	09.00	**11.00**
% yield gap to line sowing		**22.94**	**23.72**	**17.85**	**15.51**	**20.00**

Figure 2: Paddy Yield under line sowing and broadcasting method at sampled farms district Balod

(Yield-Qtl/ha)

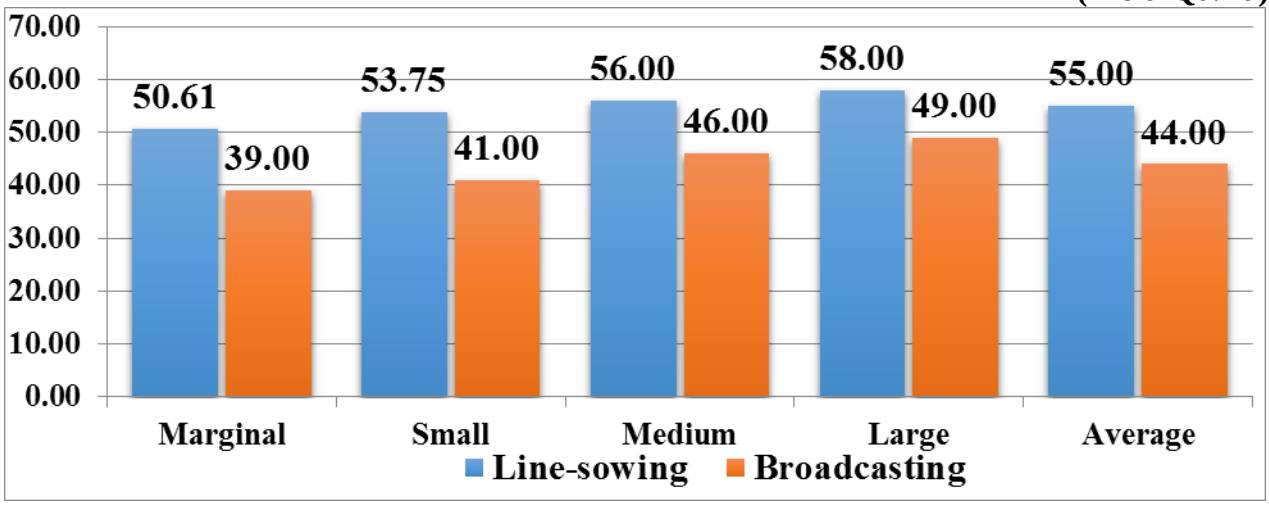


Table 7: Economics of production under line sowing and broadcasting method

Particulars	Raipur		Balod	
	Line sowing	Broadcasting	Line sowing	Broadcasting
Cost of cultivation (Rs./ha)	28558.97	25856.17	28242.57	24097.86
Production (Qtl./ha)	52.37	41.75	55	44
Cost of production (Rs./qtl.)	545.33	619.30	517.36	550.81
Gross return (Rs./ha)	77427.20	62605.76	81097.96	65446.25
Net return (Rs./ha)	48868.23	36749.59	52855.39	41348.99
CB ratio	1:2.71	1:2.42	1:2.87	1:2.71

It is concluded that the average increase in paddy yield was about 20 % under the line sowing method over the broadcast method of paddy planting in both the district. The per hectare gross return and net return has also been realised more under line sowing as compared to the broadcasted method of sowing in both the districts. The per quintal cost of production has also been recorded less in line sowing method of paddy cultivation i.e, Rs 545.33/ qtl. & Rs.517.36/qtl. over the traditionally broadcast method of paddy cultivation which was Rs. 619.30/qtl & Rs.550.81 /qtl in Raipur and Balod district respectively.

Thus, the finding reveal higher cost benefit ratio under line sowing method i.e.1:2.71 &1:2.87 in comparison to broadcast method i.e. 1:1.24 &1:2.71 in Raipur and Balod district respectively.

Figure 3: Cost of cultivation (Rs./ha)

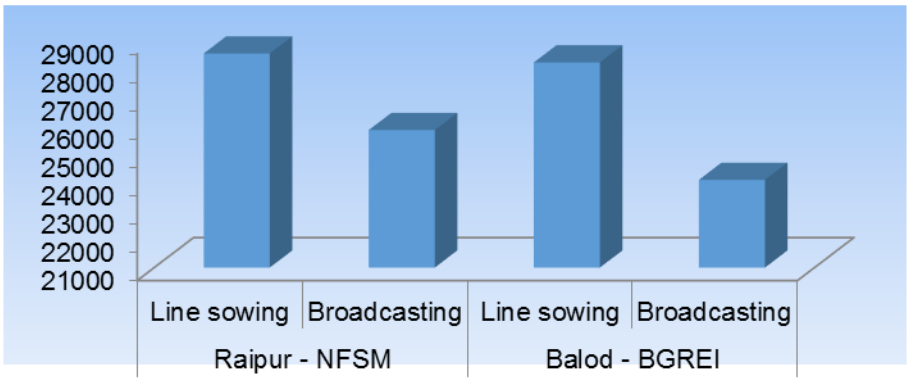


Figure 4: Cost of production (Rs./qtl.)

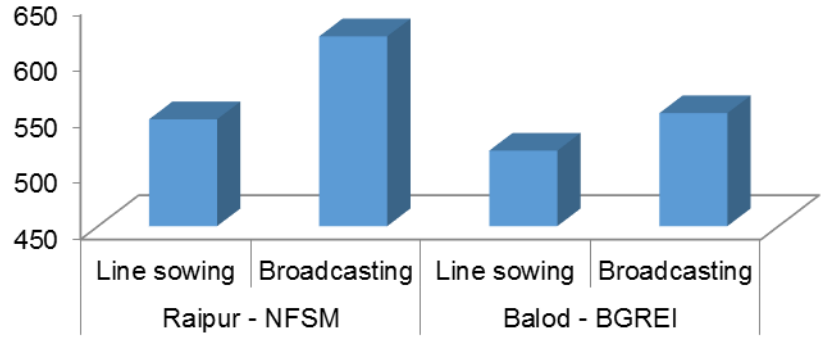
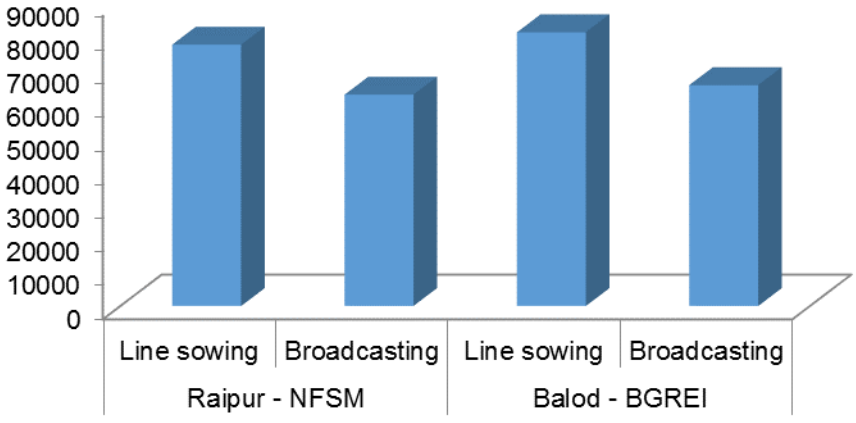
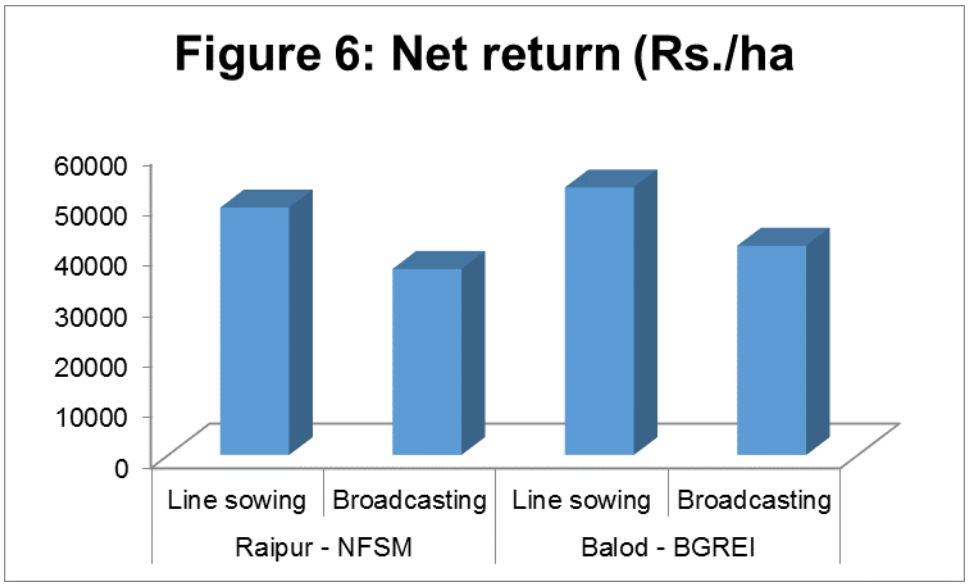
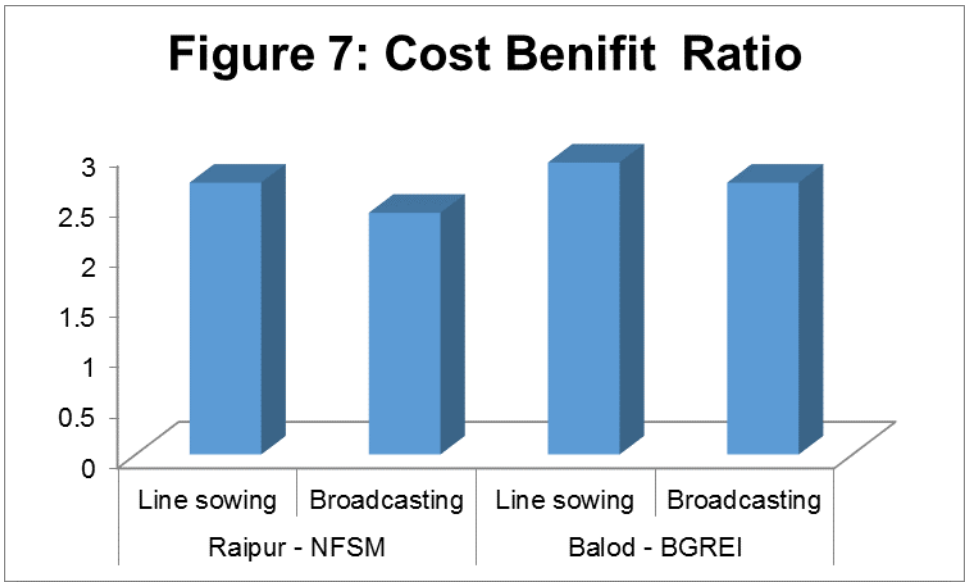


Figure 5: Gross return (Rs./ha)







5.2 Weed management under line sowing v/s broadcasting method

Raipur (NFSM) - The occurrence of major weeds at the farmer's field is given in **Annexure III**. Weeds are major crop competitor to suppress the growth of main crop. Annuals, perennials, broad leaves and grasses were observed in the paddy field. Sanwa, motha and dub grass are the common and major weeds reported by almost all the farmers. The average number of weeds intensity is observed as 6 which varies from 5 at medium farms to 6.50 at small farms under line sown paddy. Similarly, the average weed intensity was 6.13 numbers which varies from 4.60 at small farms to 5.20 at marginal farms in the broadcasted paddy fields. The farmers opined easy inter-culture practices like weeding, hoeing etc. in the line sowing DSR method.

The cost of weed management is found less under line sowing about 6% over broadcasting method. It is also observed that the less labour requirement about 15% in line sowing over the traditional broadcasting method. The details are given in **Table 8.**

Table 8: Economics of weed management in paddy cultivation in Raipur district

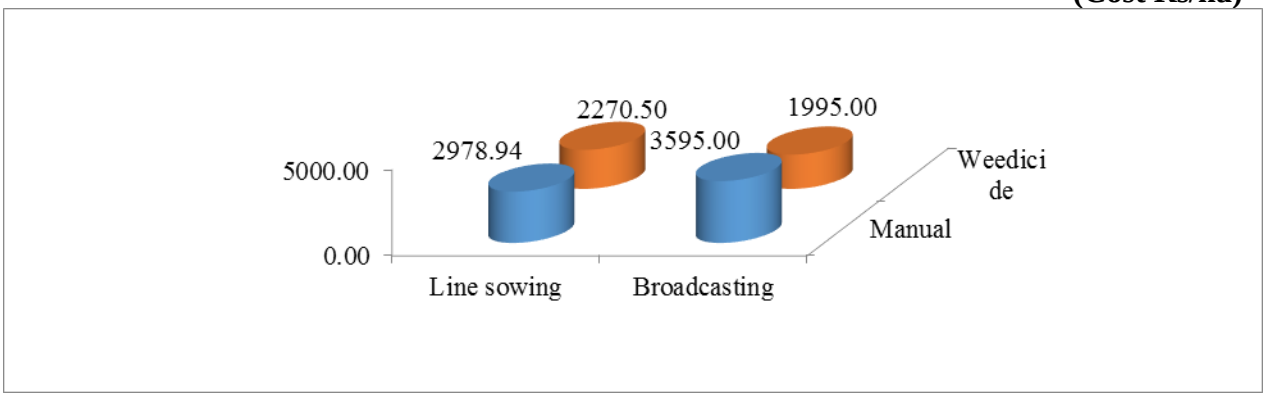
(Cost Rs/ha)

SN	Particulars	Line sowing					Broadcasting				
		Marginal	Small	Medium	Large	Average	Marginal	Small	Medium	Large	Average
1	Manual Weeding	2425.74	2910.00	3405.00	3175.00	**2978.94 (56.75)**	3525.00	3917.50	3812.50	3125.00	**3595.00 (64.31)**
2	Weedicide	1408.00	2308.00	2708.00	2658.00	**2270.50 (43.25)**	1375.00	1985.00	2010.00	2610.00	**1995.00 (35.69)**
Total/Average		**3833.74**	**5218.00**	**6113.00**	**5833.00**	**5249.44**	**4900.00**	**5902.50**	**5822.50**	**5735.00**	**5590.00**

Note: Figures in the parenthesis indicate percentages to the total

Figure 8: Economics of weed management in paddy cultivation in Raipur district

(Cost Rs/ha)



Balod (BGREI)- The major weeds occurrence at the farmer's field of Balod district is given in **Annexure VI.** The weeds of various nature i.e. annuals, perennials, broad leaves and grasses were observed in the paddy field. Sanwa, motha, dub grass and gajar ghas were the common and major competition to both the paddy fields. The average weeds intensity was observed at 4.31 numbers which varied from 3.25 at medium farms to 5 at small and marginal farms in the paddy line sowing field. Similarly, the same figure was observed as 4.94 numbers which varies from 4.25 at small farms to 5.75 at marginal farms in the broadcasting paddy field in Balod district.

The cost of weed management is found less under line sowing about 3% over broadcasting method. It is also observed that the less labour requirement about 43% in line sowing over the traditional broadcasting method. The details are given in **Table no 9.**

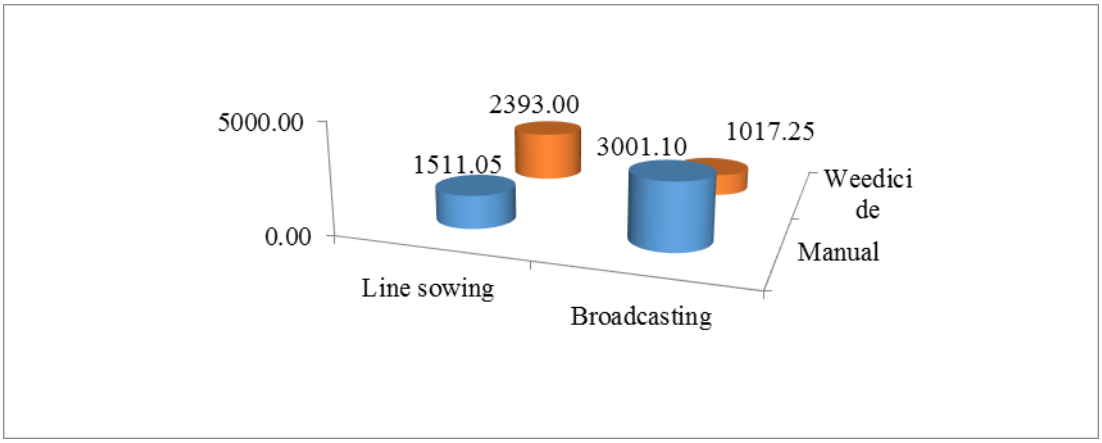
Table 9: Economics of weed management in paddy cultivation in Balod district

(Cost Rs/ha)

S. No.	Particulars	Line sowing					Broadcasting				
		Marginal	Small	Medium	Large	Average	Marginal	Small	Medium	Large	Average
1.	Manual Weeding	2189.19	1755.00	2250.00	250.00	**1511.05 (38.70)**	2926.93	3187.50	3590.00	2300.00	**3001.10 (74.68)**
2.	Chemical control	1768.00	2368.00	2343.00	3093.00	**2393.00 (61.30)**	1450.00	868.00	800.00	950.00	**1017.25 (25.32)**
Total/Average		**3957.19**	**4323.00**	**4793.00**	**3343.00**	**3904.05**	**4376.93**	**4055.50**	**4390.00**	**3050.00**	**4018.35**

Figure 9: Economics of weed management in paddy cultivation in Balod district

(Cost Rs/ha)



It is concluded that the hectare less cost towards weed management and labour requirement has exhibited the superiority and advantage of line sowing method of paddy cultivation over the traditional and prevalent broadcast method in both the districts viz Raipur (NFSM) and Balod (BGREI). The farmers of both the districts were of the considered opinion that the inter-culture operations like weeding, hoeing and use of weedecide etc. can easily and effectively be performed under the improved method of line sowing of the Direct Seeded Rice (DSR).

5.3 Fertilizer management under line sowing v/s broadcasting method.

Raipur (NFSM)-The comparative fertilizer consumption pattern under line sowing and broadcasting method at sampled farms is presented in **Table 10.** The table reveals that the DAP, Urea, SSP and MOP are four major fertilizers which were applied by the farmers as 128.96 kg, 196.43 kg, 19.48 kg and 48.05 kg per hectare respectively in the demonstrated paddy cultivation in line sowing which is equivalent to 113.44 kg N, 62.11 kg P and 28.83 kg K. Similarly, the application of these fertilizers in the field of broadcasting method of paddy is observed as 137.76 kg D.A.P. 190.82 kg Urea, 27.21 kg SSP and 53.74 kg MoP per hectare to the paddy crop which is equivalent to 112.57 kg N, 67.72 kg P and 32.24 kg K.

Table 10: Fertilizer application in paddy cultivation at the farmer's field in district Raipur

S. N.	Name of fertilizer	Line sowing				Broadcasting			
		ertilizer (in kg) Per ha	Nutrients (in kg)			Fertilizer (in kg) Per ha	Nutrients (in kg)		
			N_2	P_2O_5	K_2O		N_2	P_2O_5	K_2O
1.	DAP	128.25	23.08	58.99	-	137.76	24.80	63.57	-
2.	UREA	196.43	90.36	-	-	190.82	87.78	-	-
3.	SSP	19.48	-	3.12	-	27.21	-	4.35	-
4.	MOP	48.05	-	-	28.83	53.74	-	-	32.24
5.	Zinc	25.00	-	-	-	-	-	-	-
Total			**113.44**	**62.11**	**28.83**		**112.57**	**67.72**	**32.24**

Balod (BGREI)- The comparative fertilizer consumption pattern in line sowing and broadcasting method at sampled farms is presented in **Table 11**. The DAP, Urea, SSP and MOP have been used by the farmers as 131.44 kg, 194.81 kg, 35.71 kg and 42.86 kg per hectare respectively, which is equivalent to 113.28 kg N, 66.20 kg P and 25.71 kg K. under line sowing. Similarly, the application of these fertilizers under broadcasting method of paddy was observed at 129.21 kg DAP, 195.13 kg Urea, 28.09 kg SSP and 38.95 kg MoP per hectare respectively, which is equivalent to 113.02 kg N, 63.93 kg P and 23.37 kg K.

Table 11: Fertilizer consumption in paddy cultivation at the farmer's field in district Balod

S	Fertilizer	Line sowing	Broadcasting

N		Fertilizer (in Kg.) Per ha.	Nutrients (in Kg.)			Fertilizer (in Kg.) Per ha.	Nutrients (in Kg.)		
			N_2	P_2O_5	K_2O		N_2	P_2O_5	K_2O
1.	DAP	131.44	23.67	60.49	-	129.21	23.26	59.44	-
2.	UREA	194.81	89.61	-	-	195.13	89.76	-	-
3.	SSP	35.71	-	5.71	-	28.09	-	4.49	-
4.	MOP	42.86	-	-	25.71	38.95	-	-	23.37
5.	Zinc	25.00	-	-	-	-	-	-	-
Total			**113.28**	**66.20**	**25.71**		**113.02**	**63.93**	**23.37**

It is concluded that no remarkable difference in application of fertilizer and their doses but higher yield obtained from line sowing method which is attributed to method of planting and use of micronutrients i.e. zinc sulphate.

5.4 Varietal preferences under line sowing direct seeded rice

The detailed varietal preferences from the beneficiary farmers from both the districts under NFSM (Raipur) and BGREI (Balod) were obtained by discussion. Farmers desired that the varieties should be according to specific area of the districts. According to the opinion expressed by farmers during consultation, the varietal preferences are as under:

i. Variety provided should be of short duration so that next crop can easily be sown in time.
ii. Variety should respond to the particular soil condition of the locality of the area.
iii. Variety should respond to the nutrient availability/deficiency of the area.
iv. Variety should be tolerant to insect pest & diseases.
v. Variety should be tolerant to water stress conditions, and
vi. Variety should be tolerant to the lodging.

6. Farmers Perception about the technology/interventions under NFSM & BGREI

Raipur (NFSM)-The perception of beneficiaries for line sowing technology/intervention of paddy cultivation under NFSM project is given at **Annexure IV**. About 62.50 per cent farmers expressed growing of direct seeded rice in rows for last 1-2 years while remaining 37.50 per cent were already using this technique of sowing for the last 2-4 years. About 75 per cent farmers informed that under line sowing method 40-45 per cent less seed is required while 25 per cent farmers informed a seed saving of 20-40 per cent over the traditional broadcast method. About the yield advantage in line sowing method, farmers recorded over yield advantage of about 5-10 quintals/ha. About 62 to 87 per cent farmers informed other advantages of the line sowing method such as good germination, easy and effective application of plant protection chemicals in the crop and less infestation of pests and diseases. All beneficiary respondents acknowledged that line sowing technology was most favourable with regards to weed control in future. About 90 per cent of non-beneficiary farmers who practiced traditional broadcasting method of sowing, however, satisfied with the seed germination and recorded up to 90% germination ability.

Balod (BGREI)- The perception of beneficiaries about the line sowing technology/intervention of paddy cultivation under BGREI project is presented in **Annexure VII**. This analysis is on the basis of sixteen beneficiary farmers who are benefited under the project. About 50 per cent farmers informed of planting paddy in rows from last 1-2 years, the remaining 50 per cent were using seed drills/ line sowing for the last 2-4 years. 100 per cent farmers were of the view that 40-45 per cent less seed is required under line sowing over that of traditional method of sowing. The farmers also harvested about 5-10 quintal more yield. Other benefit of this improved planting technique are good germination of seeds, easy application of plant protection chemicals in the crop and less infestation of pests and diseases.

6.1: Perception of non-beneficiaries about the performance of paddy germination under broadcasting method

Raipur-Performance of seeds germination under broadcasting method in NFSM district Raipur is given in **Table 10**. It is evident that 90 per cent farmers are satisfied with the germination ability aspect. More than 80 per cent farmers perceived the germination in the range of 75 - 90 per cent. The germination percentage in the range of 60-75% is perceived by the 18 per cent farmers in this method. Due to scattered sowing of seed may be the reason behind lack of very good germination (<90%) which clearly indicate for low yield comparatively to the line sowing method at farmers field.

Table 10: Performance of paddy seeds germination in broadcasting method in Raipur district

S. No.	Particulars	Marginal	Small	Medium	Large	Total
A.	**Seed germination performance (N=16)**					
1.	Very good	-	-	-	-	-
2.	Good	03	04	04	04	**15 (93.75)**
3.	Poor	01	-	-	-	**01 (06.25)**
Total		**04**	**04**	**04**	**04**	**16 (100.0)**
B.	**Seed germination percentages (N=16)**					
1.	<50%	-	-	-	-	-
2.	50-60%	-	-	-	-	-
3.	60-75%	02	01	-	-	**03 (18.75)**
4.	75-90%	02	03	04	04	**13 (81.25)**
5.	>90%	-	-	-	-	-
Total		**04**	**04**	**04**	**04**	**16 (100.0)**

Note: Figures in the parenthesis indicate percentages to the total.

Balod- Performance of paddy seeds germination under broadcasting method is given in the **Table 11**. It indicates that 81 per cent farmers were satisfied with the performance of seed germination, while poor seed germination was perceived by 18 per cent farmers. About percentages germination of 75 per cent farmers perceived the seed germination under the range of 75 - 90 per cent. The germination percentage in the range of 60-75% is perceived by 25.00 per cent farmers.

Table 11: Performance of paddy seeds germination in broadcasting method

S. No.	Particulars	Marginal	Small	Medium	Large	Total
A. Seed germination performance						
1.	Very good	-	-	-	-	-
2	Good	03	02	04	04	**13 (81.25)**
3	Poor	01	02	-	-	**03 (18.75)**
Total		**04**	**04**	**04**	**04**	**16 (100.0)**
B. Seed germination percentages						
1	<50%	-	-	-	-	-
2.	50-60%	-	-	-	-	-
3.	60-75%	01	02	01	-	**04 (25.00)**
4.	75-90%	03	02	03	04	**12 (75.00)**
5.	>90%	-	-	-	-	-
Total		**04**	**04**	**04**	**04**	**16 (100.0)**

Note: Figures in the parenthesis indicate percentages to the total number of farmers.

7. Conclusion and Recommendations

Based on findings, feedback and suggestions received from the paddy growers of the study districts of Chhattisgarh regarding technological interventions of method of sowings viz DSR-Line sowing v/s DSR-Broadcasting under the on-going Centrally Sponsored Crop Development Schemes of NFSM-Rice and BGREI and adoption of technology at farmers' field, the major conclusion and recommendations are summarized below:

7.1 Conclusion

- The survey and discussions have revealed that the paddy growers in Chhattisgarh are traditionally accustomed to DSR-broadcasted method of paddy sowings to opt "Biyasi" (ploughing paddy crop field after 30-45 DAS sowing in standing water). Traditionally the state's farmers find the broadcast as the quickest and cheapest method of sowings where no skilled labourers are required. The farmer perceives that the paddy sowings by this method can be followed in moist condition also and the "Biyasi" is useful for better secondary and tertiary root-system development, to realise higher yields.
- Further, disadvantages to the traditional system of sowing were concluded as high per hectare seed requirement, staggered and un-uniform heavy crop competition within crop plant and amongst weeds owing to non-maintenance of plant to plant and row to row spacing fallowed by labour intensive weed management.
- Only the farmers with large operational holdings and endowed with rich- resources like machineries, labours, irrigation facilities etc, practice the transplanting method of paddy cultivation in a limited area.
- The line sowing method has been found economical over that of broadcasting owing to less per hectare seed requirement and cost of weed management.
- Weed has been found as a major yield limiting factor in the paddy. The weed management can be done properly under line sowing as compared to broadcasting method. Integrated Weed Management (IWM), i.e. combination of mechanical, chemical & manual weeding operation could be possible.
- The cost of weed management under line sowing was also found less at 3- 6% with the reduced labour requirement 15-45% over the traditional broadcast method.
- The increase in productivity could be attributed to increased Nutrient use Efficiency (NuE) under Line sowing method owing to proper placement of seeds and fertilizers and reduced competition amongst weeds and rice plants.
- The study also revealed the limiting factors in adoption of the improved method of line sowing method as:

  narrow sowing window, unavailability of sowing implements, non availability of seed drills, absence of custom-hiring centres, > 80% operational holdings with SMF categories to afford mechanization, farmers traditional preference and deep-rooted faith of paddy cultivation through broadcast involving "Biyasi".

7.2 Recommendations

- Awareness campaign for popularisation of Line sowing need to be aggressively pursued. To make the farmers believe in the improved method of line sowing, the cluster demonstrations should be organised widely following all the recommended quality parameters. A good number of nearby farmers/villages should be assembled for field days.
- The sowing implements like seed-cum-fertilizer drill, both tractor and bullock drawn may be made available to SMF at affordable prices under the Resource Conservations Tools (RCT) interventions as also through Custom Hiring Centres.

- The season long training need to be mandatorily organised and frequency of training programs in each season should be increased in order to improve the learning about the aspects like soil health, INM, IPM and weed management.
- Invariably, the Control Demonstration plot should also be maintained for comparison and building the farmers' confidence.
- Improved and labour saving implements should be made available at affordable price in order to solve the scarcity of labour, reduce the cost of cultivation and time taken in the operations.
- It is suggested that the yield obtained and technology used at demonstration plots may extended widely to the non-beneficiary farmers so that more number of farmers switch from broadcasted cultivation to improved line sowing technology.
- The small bullock drawn/manual implements at affordable price should be promoted to complete the time bound operations like sowing, weeding and harvesting by small farmers. It will not only reduce the time and cost but will also improve the productivity of crop.

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Annexure I

LAND USE STATISTICS OF THE STATE AND SELECTED DISTRICTS

S. N.	Items	Raipur	Balod	Chhattisgarh

i) **Land use statistics**				
1.	Geographical Area (Lakh ha)	2.89	3.52	137.70
2.	Net Sown Area (Lakh ha)	1.68	1.83	47.74
3.	Net Sown Area (Kharif) (Lakh ha)	1.62	1.80	47.68
4.	Total Rainfall (mm) January to November	1117.30	1266.50	1327.00
ii) **Rainfall during Kharif season (mm)**				
	May	00.0	00.0	0.00
	June	00.0	73.08	276.80
	July	102.70	485.54	404.60
	August	638.80	294.78	353.00
	September	868.70	303.80	150.60
	October	1117.30	109.30	178.60
	November	00.0	0.00	0.00
Average Rainfall of the district (mm)		**1117.30**	**1266.50**	**1363.60**
iii)**Area Coverage Kharif (000 ha)**				
	i. Rice	158.60	168.80	3687.58
	ii. Maize	0.46	0.71	225.85
	iii. Pulses	0.87	5.20	355.99
	iv. Oilseeds	0.46	0.87	322.01
iv) **Area of Rice under different ecologies (000 ha)**				
	i. Upland direct seeded Rice	65.046	14.24	0.00
	ii. Shallow Water Rice (0-25 cm)	39.400	28.55	0.00
	iii. Medium deep water Rice (25-50cm)	54.163	28.41	2454.50
	iv. Total area under Rainfed Paddy	36.579	71.21	0.00
	Vii Area under irrigated paddy	126.544	97.57	1347.60
v) Varieties under cultivation				
	i.Upland direct seeded Rice	Swarna, IR-64, MTU-1010, BPT-5207	MTU-1010, IR-64, MTU-1001, Swarna, BPT-5204, Mahamaya, HMT	Swarna, IR-64, MTU-1010, BPT-5207, Karma Mahsuri
ii.	Shallow water Rice (0-25 cm)	-	-	-
iii.	Midium deep water (25-25 cm)	-	-	-
iv	Drought affected paddy	-	-	-
vii	Irrigated paddy (Kharif)	IR-36, IR-64, Mahamaya MTU-1010		IR-36, IR-64, Mahamaya, MTU-1010, KRH-2
vii.	Irrigated paddy (Rabi)	Swarna, Mahamaya, IR-36		Swarna, Mahamaya, IR-36

Source: State Department of Agriculture, Raipur/Balod

Annexure II

Technology adoption at the sampled farms of Raipur district

S. N.	Technological aspects in Agriculture	Total No. Farmers

		Test plot (N=16) (Line sowing)		Check plot (N=16) (Broadcasting Method)	
		Yes	**No**	**Yes**	**No**
1.	**Summer ploughing:**				
	(a) 2-3	12 (75)	04 (25)	14 (87.50)	02 (12.50)
	(b) 3-4	04 (25)	12 (75)	02 (12.50)	14 (87.50)
2.	**Ploughing during sowing main field**				
	a. Cultivator	16 (100)	-	16 (100)	-
	b. Rotavator	-	-	-	-
3.	**Rice Variety:**				
	a. Sah-bhagi	16 (100)	-	-	-
	b. Swarna	-	-	16 (100)	-
4.	**Seed quantity applied (In Kg)**				
	a. 60 Kg/ha	16 (100)	-	-	-
	b. 120-150 Kg/ha	-	-	16 (100)	-
5.	**Seed treatment**	02 (12.50)	14 (87.50)	-	16 (100)
6.	**Weed management**				
	a. Manual	16 (100)	-	12 (75)	04 (12.50)
	b. Weedicide	16 (100)	-	13 (81.25)	03 (18.75)
7.	**Use of hand hoe for weeding in rows**	-	16 (100)	-	16 (100)
8.	**Major disease occurrence**				
	a. Sheath blight	06 (37.50)	10 (62.50)	10 (62.50)	06 (37.50)
	b. Blast	07 (43.75)	09 (56.25)	11 (68.75)	05 (31.25)
	Use of fungicide in disease control, If yes, give names				
	a. Propiconozole	06 (37.50)	10 (62.50)	05 (31.25)	11 (68.75)
	b. Current	-	-	04 (25)	12 (75)
	c. Suraksha	06 (37.50)	10 (62.50)	05 (31.25)	11 (68.75)
9.	**Name of major insects and other insects etc**				
	a. Stem borer	07 (43.75)	09 (56.25)	10 (62.50)	06 (37.50)
	b. Aphids	06 (37.50)	10 (62.50)	08 (50)	08 (50)
	c. Brown leaf hopper	03 (18.75)	13 (81.25)	02 (12.50)	14 (87.50)
10.	**Use of insecticides in insect/pest control, If yes, give names:**				
	a. Curt-off	03 (18.75)	13 (81.25)	04 (25)	12 (75)
	b. Flera	03 (18.75)	13 (81.25)	-	-
	c. Chloropy-ripos	06 (37.50)	10 (62.50)	06 (37.50)	10 (62.50)
	d. Azadiractin	16 (100)	00	08 (50)	08 (50)
	e. Nuvan	04 (25)	12 (75)	07 (43.75)	09 (56.25)
12.	**Use of bio-pesticides, if yes, give names**				
	(a) Babariya basiana	16 (100)	-	-	-
Indicate frequency of application of PP chemicals					
	(a) 0-2 time	05 (31.25)	11 (68.75)	03 (18.75)	13 (81.25)
	(b) 2-4 time	11 (68.75)	05 (31.25)	13 (81.25)	03 (18.75)
13.	**Fertilizer topdressing: First**				
	. Interval-25-30 DAS	16 (100)	-	16 (100)	-
	. Interval-50-60 DAS	16 (100)	-	16 (100)	-
14.	**Harvesting**				
	. Manual	01 (6.25)	15 (93.75)	04 (25)	12 (75)
	. Machine	15 (93.75)	01 (6.25)	12 (75)	04 (25)

Note: - Figures in the parenthesis indicate percentages to the total no. of farmers in test plot and check plot

Annexure III

Major weeds in the paddy field at sampled farms for (Gen, OBC, SC, ST) in Raipur district

Sl	Classification of weeds		Line sowing					Broadcasting				
			Marginal	Small	Medium	Large	Average (Per farm)	Marginal	Small	Medium	Large	Average (Per farm)
1.	Annuals	Kanwa-Keni	02	01	02	02	**1.75**	01	02	01	02	**1.50**
		Chouka	01	02	00	01	**1.00**	02	00	02	01	**1.25**
		Mirchivan	01	00	00	02	**0.75**	00	00	00	01	**0.25**
2.	Perennials	Motha (*Cyprus rotandas*)	03	04	04	02	**3.25**	04	04	04	04	**4.00**
3.	Broad leaves	Aloo van (*Alternailhea triardra*)	03	01	00	00	**1.00**	01	03	01	03	**2.00**
		Badori (*Ischeamum lugosum*)	02	03	02	02	**2.25**	03	02	03	02	**2.50**
		Spiny Amaranth (*Amaranths spinous*)	01	03	03	03	**2.50**	03	03	03	01	**2.50**
4.	Grasses	Sanwa (*Echinochloa colona*)	04	04	04	04	**4.00**	04	04	04	04	**4.00**
		Dube grass (*Cynodon doctylon*)	03	04	02	03	**3.00**	04	02	03	03	**3.00**
		Parthenum grass (*Parthenium hysterophorus)*	02	04	03	03	**3.00**	04	03	04	03	**3.50**
Average (Per farm)			**5.50**	**6.50**	**5.00**	**5.50**	**6.00**	**5.20**	**4.60**	**5.00**	**4.80**	**6.13**

Note: Figures are weed occurrence at the farmer's field

Annexure IV

Farmers' observation on the performance of line-sowing of paddy cultivation under NFSM scheme in Raipur district

S. N.	Enquiries made	Perception received (N=16)	
		Yes	No
1.	Whether they have grown direct seeded rice in rows for the first time?	00	16 (100)
	If no, paddy sowing in line from		
	a. Last 1-2 years	10 (62.50)	
	b. 2-4 years	06 (37.50)	
2.	Whether less seed is required for line sowing than broadcasting?		
	If yes, how much per cent less		
	a. 20-40%	04 (25)	
	b. 40-50%	12 (75)	
3.	Whether there is any problem in availability of seed drill/Zero till seed drill?	00.0	16 (100)
4.	Whether you have got any yield advantage by growing line seeded rice?	16 (100)	0
5.	What is the main advantage of direct seeding in line sowing?		
	a. Higher yield advantage	16 (100)	
	b. Good germination of seeds	10 (62.50)	
	c. Less seed is required in this method	16 (100)	
	d. Easily application of plant protection chemicals in the crop	14 (87.50)	
	e. Less infestation of pests and diseases in the crop	12 (75)	
6.	What is the yield difference with broadcast rice?		
	a. 5-10 qtl.	12 (75)	
	b. 10-20 qtl.	04 (25)	
7.	Do you think technology is better with regards to weed control in future?	16 (100)	0
9.	Whether sprayer is available for spraying weedicides?	16 (100)	0
10.	Whether weedicides are available in nearby market?	16 (100)	0
11.	What is the main problem of direct seeding in line-sowing?	00.0	16 (100)
12.	Do you think direct seeding in line will require new variety than broadcast rice?	10 (62.50)	06 (37.50)
13.	Will you do direct seeding in the next season?	16 (100)	0
14.	Whether you face any problem in direct seeding of rice in line?	00.0	16 (100)
15.	Do you think this method of direct seeding in line is profitable?	16 (100)	0
16.	Whether fertilizer used as basal has advantage?	10 (62.50)	06 (37.50)

Note: Figures in the parentheses indicate percentages to the total number of farmers

Annexure V

Technology adoption at sampled farm of Balod district

S. N.	Technological aspects in Agriculture	Total No. Farmers	
		Test plot (N=16)	Check plot (N=16)

		(Line sowing)		(Broadcasting Method)	
		Yes	**No**	**Yes**	**No**
1.	**Summer ploughing:**				
	a. 2-3	12 (75)	04 (25)	12 (75)	04 (25)
	b. 3-4	04 (25)	12 (75)	04 (25)	12 (75)
2.	**Ploughing during sowing main field**				
	a. Cultivator	16 (100)	-	16 (100)	-
3.	**Rice Variety:**				
	a. MTU-1010	16 (100)	-	-	-
	b. Swarna	-	-	16 (100)	-
4.	**Seed quantity applied (In Kg)**				
	a. 60 Kg/ha	16 (100)	-	-	-
	b. 120-150 Kg/ha	-	-	16 (100)	-
5.	**Seed treatment**	10 (62.50)	06 (37.50	-	16 (100)
6.	**Weed management**				
	a. Manual	11 (68.75)	-	16 (100)	00 (00)
	b. Weedicide	05 (31.25)	-	05 (31.25	11 (68.75)
7.	**Use of hand hoe for weeding in**	-	16 (100.0)	-	16 (100)
8.	**Major disease occurrence**				
	a. Sheath blight	04 (25)	12 (75)	10 (62.50)	05 37.50)
	b. Blast	04 (25)	09 (75)	11 (68.75)	05 (31.25)
9.	**Use of fungicide in disease control, If yes, give names**				
	a. Propiconozole	06 (37.50)	10 (62.50)	05 (31.25)	11 (68.75)
	b. Current	-	-	04 (25)	12 (75)
	b. Surakcha	06 (37.50)	10 (62.50)	05 (31.25)	11 (68.75)
10	**Name of major insects and other insects etc**				
	a. Stem borer	07 (43.75)	09 (56.25)	12 (75)	04 (25)
	b. Aphid	05 (31.25)	11 (68.75)	08 (50)	08 (50)
11	**Use of insecticides in insect/pest control, If yes, give names:**				
	a. Flera	03 (18.75)	13 (81.25)	-	-
	b. Chloropyripos	06 (37.50)	10 (62.50)	06 (37.50)	10 (62.50)
	c. Azadiractin	16 (100)	00	08 (50)	08 (50)
	d. Nuvan	04 (25)	12 (75)	07 (43.75)	09 (56.25)
12.	**Use of bio-pesticides, if yes, give names**				
	a. *Babariya basiana*	16 (100.0)	-	-	-
	Indicate frequency of application of PP chemicals				
	a. 0-2 time	05 (31.25)	11 (68.75)	03 (18.75)	13 81.25)
	b. 2-4 time	11 (68.75)	05 (31.25)	13 (81.25)	03 (18.75)
13.	**Fertilizer topdressing: First**				
	a. Interval-25-30 DAS	16 (100)	-	16 (100)	-
	b. Interval-50-60 DAS	16 (100)	-	16 (100)	-
14.	**Harvesting**				
	a. Manual	12 (75)	04 (25)	12 (75)	04 (25)
	b. Machine	04 (25)	12 (75)	04 (25)	12 (75)

Note: - Figures in the parenthesis indicate percentages to the total no.of farmers.

Annexure VI

Major weeds in the paddy field at sampled farms of Balod district for (Gen, OBC, SC, ST)

S.N	Classification of weeds		Line sowing					Broadcasting				
			Marginal	Small	Medium	Large	Average (Per farm)	Marginal	Small	Medium	Large)	Average (Per farm)
1.	Annuals	Kanwa-Keni	02	01	00	00	**0.75**	01	02	01	02	**1.50**
		Chouka	01	02	00	01	**1.00**	02	00	02	01	**1.25**
		Mirchivan	01	00	00	02	**0.75**	00	00	00	01	**0.25**
2.	Perennials	Motha (*Cyprus rotandas*)	03	04	04	02	**3.25**	04	04	03	04	**3.75**
3.	Broad leaves	Aloo van (*Alternailhea triardra*)	02	01	00	00	**0.75**	01	00	01	00	**0.50**
		Badori (*Ischeamum lugosum*)	02	00	00	01	**0.75**	03	02	03	02	**2.50**
		Spiny Amaranth (*Amaranths spinous*)	00	00	00	00	**0.00**	00	00	00	00	**0.00**
4.	Grasses	Sanwa (*Echinochloa colona*)	04	04	04	04	**4.00**	04	04	02	04	**3.50**
		Dube grass (*Cynodon doctylon*)	03	04	02	03	**3.00**	04	02	03	03	**3.00**
		Parthenum grass (*Partheniu m hysterophorus)*	02	04	03	03	**3.00**	04	03	04	03	**3.50**
Average (Per farm)			**5.00**	**5.00**	**3.25**	**4.00**	**4.31**	**5.75**	**4.25**	**4.75**	**5.00**	**4.94**

***** Weeds occurrence at the farmer's field.

Annexure VII

Farmers' observation on line-sowing of paddy under BGREI in Balod district

S. No.	Question Asked	Perception received (N=16)	
		Yes	No
1.	Whether they have grown direct seeded rice in rows for the first time?	0	16 (100)
	If no, paddy sowing in line from		
	c. Last 1-2 years	08 (50)	
	d. 2-4 years	08 (50)	
2.	Whether less seed is required for line sowing than broadcasting?		
	If yes, how much per cent less		
	c. 20-40%	0	
	d. 40-50%	16 (100)	
3.	Whether there is any problem in availability of seed drill/Zero till seed drill?	12 (75)	04 (25)
4.	Whether you have got any yield advantage by growing line seeded rice?	16 (100)	0
5.	What is the main advantage of direct seeding in line sowing?		
	f. Higher yield advantage	16 (100)	
	g. Good germination of seeds	12 (75)	
	h. Less seed is required in this method	16 (100)	
	i. Easily application of plant protection chemicals in the crop	12 (75)	
	j. Less infestation of pests and diseases in the crop	12 (75)	
6.	What is the yield difference with broadcast rice?		
	c. 5-10 qtl.	14 (87.50)	
	d. 10-20 qtl.	02 (12.50)	
7.	Do you think technology is better with regards to weed control in future?	16 (100)	0
9.	Whether sprayer is available for spraying weedicides?	16 (100)	0
10.	Whether weedicides are available in nearby market?	16 (100)	0
11.	What is the main problem of direct seeding in line-sowing?	00.0	16 (100)
12.	Do you think direct seeding in line will require new variety than broadcast rice?	08 (50)	08 (50)
13.	Will you do direct seeding in the next season?	16 (100)	0
14.	Whether you face any problem in direct seeding of rice in line?	0	16 (100)
15.	Do you think this method of direct seeding in line is profitable?	16 (100)	0
16.	Whether fertilizer used as basal has advantage?	10 (62.50)	06 (37.50)

Note: Figures in the parenthesis indicate percentages to the total number of farmers.

Annexure-10

Directorate of Pulses Development,

Government of India
Ministry of Agriculture & Farmers Welfare
Deptt. Agri., Cooperation & Farmers Welfare
Bhopal -462004

Dated: 19.01.2016

Sub:-Report on Impact assessment of prevailing high temperature on Wheat crop - Madhya Pradesh State (Ref.: Ministry's e-mail Letter dated 14th January, 2016.)

1 Wheat Crop Scenario

1.1 In Madhya Pradesh the rabi crops are grown in an area of about 85.00 lakh ha. Wheat is a major rabi cereal crop occupying 48% of the total normal area. This year, as per the WWWR (Weekly Weather Watch Report), wheat has been planted in 50.93 lakh ha which is 15% less against the targeted area of 58.70 lakh ha. So far, the rabi crops have been sown in an area of 98.24 lakh hectares.

1.2 Spatial variation, less rainfall, early recession of SW monsoon associated with higher than the desired temperature regime during October onward may be attributed to delayed wheat sowing this year. The rainfed regions usually opt for early sowings of crops including wheat during October on residual moisture. But this year there has been reports of replanting of early sown wheat due to poor or no germination owing to soil moisture stress and higher temperature.

1.3 Major varieties grown in M.P. are - Sujata, C-306, HI-1531 (Harshita), HI1500 (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), MP 1203, MPO 1215, HD 4672 (Malaw Ratna).

2. Sowing Time

2.1 ***Early sown*** i.e. ***end of Oct. to 10th Nov***. with limited irrigation. During this period the maximum temperature remained high i.e. between 29^0C to 33^0C. The crop sown during this period has faced the seedling mortality, However, plant population was compensated with high seed rate, a traditional practice under rainfed situation. This crop is seen with poor tillering and also forced heading at certain locations. The total area under early sown condition is much less. The vegetative growth is affected resulting short spikes were the yield may adversely affect.

2.2 ***Timely sown*** i.e. ***15th Nov. to 30th Nov. with full irrigation***. The area under this category is more than 50%. The temperature during this period were high i.e. beyond 29^0C at time of sowing. The high seed rate compensated the plant population and tillering. However, the crop is at boot stage in most of the areas.

2.3 ***Late sown*** i.e ***December sowing***. This area comes in the command belt. The farmers have already used at least two irrigation till date which have reduced the soil temperature. However, such temperature regime had been experienced during the previous three years also but the state could harvest a record production. Provided, the decrease in temperature and winter rains, the productivity loss may only be upto 10 %.

3. Recommended/practiced irrigation schedule for wheat crop

S. No.	Physiological Stages	Period (DAS)	Irrigation schedule	Remark

1	Sowing & germination		-	i) Due to deficit rainfall and prevailing soil moisture stress and higher temperature, crop need more frequently irrigation. ii) Early sown wheat observed physiological adjustment even before 10-15 days flowering and milking stage.
2	Crown Root Initiation (CRI)	21	Ist	
3	Late Tillering	42	IInd	
4	Late Jointing	60	IIIrd	
5	Flowering	80	IVth	
6	Milking Stage	95	Vth	
7	Dough Stage	115	-	

4. Rainfall & Temperature Status

4.1 ***The total seasonal rainfall*** during the current SW monsoon (14.06.2015 to 30.09.2015) was 823.1 mm which is 13% less as against the state's normal rainfall of 949.1 mm. As per the data, 5 districts received. Excess, 23 normal and 23 received deficit rainfall.

4.2 ***The winter rains/showers were received*** in some districts of the state during last week of October, 2015. (28th -29th). Thereafter, the light showers have been experienced after 15th January.

Between Jan. 17th to 19th good winter showers have been received across the state. As on the date of reporting, cloudy weather prevails all across the state. The day & night temperatures have also declined, the standing wheat crop may compensate the losses up to maximum extent with the existing congenial weather.

4.3 The plant physiology of wheat require a temperature regime between 22^{0}C -28^{0}C for better growth from vegetative to reproductive/dough stage viz., ***germination 22^{0}C-23^{0}C, tillering-20^{0}C, heading/flowering-24^{0}C, Milk stage- 24^{0}C-25^{0}C & dough stage/maturity 25^{0}C-28^{0}C.***

4.4 As per the Metrological data the temperature during October & November have been between 29^{0}C to 33^{0}C. During December also the temperature regime has been higher as against the temperature requirement of 22^{0}C to 28^{0}C for better harvest of the wheat crop.

4.5 During 1st fortnight of this January, the temperature has been between 15^{0}C to 28^{0}C. The change in weather is being observed from 15th January onward.

5. Reservoir Status

Water levels in Major Reservoirs of MP (As on 19.01.2016)

S. No.	Name of Reservoir /district	FRL (Meter)	Water Level (Meter)	Live Capacity In FRL (MCM)	Live Capacity In (MCM)	% Live Storage
1	Bargi (Jabalpur)					
2	Tawa (Hosangabad)	355.39	347.86	1944.18	800.61	41
3	Barna Dam (Raisen)	348.55	343.71	455.80	168.63	36
4	Bansagar (Shahdol)	341.64	334.70	5429.60	2417.37	44
5	Sanjay Sarovar (Seoni)	519.38	517.05	410.00	301.17	73
6	Rajeev Sagar (Balaghat)	344.40	336.70	254.68	37.90	14
7	Gandhi Sagar (Mandsour)	399.89	396.50	6607.42	4655.83	70
8	Manikheda (Shivpuri)	346.25	333.50	834.83	258.38	30
9	Pagara Tank (Morena)	199.33	186.04	120.54	4.26	3

10	Mahi Main (Jhabua)	451.50	448.10	135.60	75.09	55
11	Halali (Vidisha)	459.61	455.64	252.13	84.81	33
12	Kolar (Sehore)	462.20	443.71	265.00	38.18	14
13	Tigra Dam (Gwalior)	225.55	222.59	124.29	73.36	59
14	Mahan Dam (Sidhi)	322.00	319.31	100.13	65.82	65
15	Harsi Dam (Gwalior)	264.93	261.77	192.67	119.53	62

(Source: MPWRD, Bhopal, M.P.)

6. Observations of field visit

- 05 districts namely viz. Bhopal, Sehore, Vidisha, Hoshangabad, Dewas and Sagar were field visited by this CDD. Brief observation on the scenario of crop is as under:
- The crop condition is normal in the command areas. However, the early sown wheat crop is with stunted growth, less tiller, with physiological adjustments advancing 10-15 days flowering and milking stage.
- The farmers and extension functionaries have given to understand that soil moisture stress and prevailing higher temperature regime shall have an yield reduction of 10-15% in early and late sown wheat.
- Farmers with poor & Nil source of irrigation has also informed regarding repeated sowing of wheat due to higher temperature during the first fortnight of October.
- Due to prevailing higher temperatures, the recommended irrigation schedule has also been advanced at 4-5 days in command areas, to maintain the soil moisture. The rainfed farmers however, have provided only one irrigation after 20-25 days of sowing owing to limited available irrigation water source with them.
- Early sown wheat has r stunted growth. Less effective tillers (25-30%) , late jointing stage (Booting) advanced to 10-12 days, small size spikelet, less biomass (10-15 %) in late sown crop in comparison to timely sown.
- Wheat crop has been observed at various physiological stages from main stem leaf, tillering, stem elongation, booting, heading & flowering etc.

It is concluded that the overall crop situation of wheat has been affected due to moisture stress and prevailing higher temperature above the normal during the current Rabi in most parts of Madhya Pradesh leading to moisture stress.

High temperatures during December and its continuance during January, the critical crop period for wheat may lead to early maturing/force maturity in rainfed areas, thereby a reduction of yields. Due to unusually dry and warm winter, the wheat production in Madhya Pradesh may tentatively be affected by 10-15%. The recent winter showers on Jan., 18^{th} -19^{th} , are definitely most beneficial for standing crop. In the coming days, if temperature remains favorable with some winter showers in the wheat growing pockets, the anticipated loss to yield may be compensate to some extent.

Field Visit Images


Bhopal Division


District Sehore


District-Sagar


District Vidisha

Annexure-11

Study on assessment of causes of outbreak of YMV and estimation of yield losses in soybean during Kharif – 2015 in Madhya Pradesh

A. K. Tiwari[1], A. K. Shivhare[2], Vipin Kumar[3] and J.P. Singh[4]

1. Background

Soybean has a prominent place among the important seed legume of the world and pronounced as miracle bean. It contains about 40 per cent protein, 20 % oil with balanced essential amino acids, rich in poly-unsaturated fatty acids, specially omega 6 and omega 3 fatty acids, 6-7% minerals, 5-6 % crude fibre and 17-19 % carbohydrates **(Chauhan and Joshi, 2005).** Soybean contributes 25% of the global vegetable oil production and about two thirds of the world's protein concentrate for livestock, poultry and fish.

India occupies foremost position in global soybean scenario, accounting for about 11 per cent of area and 4.3 per cent production **(FAO, 2013).** Soybean has changed the economic scenario of farmers in Madhya Pradesh, Maharashtra and part of Rajasthan. An ever highest production of about 14.67 million tonnes was recorded with a coverage of 10.84 million ha during Kharif 2012, which attributed to highest area coverage of about >12 million ha during Kharif 2013. However, production was declined due to untimely heavy rains at the time of maturity during Kharif – 2013. Similarly, area coverage and production of soybean suffered continuously during Kharif 2014 and Kharif 2015 due to delayed / deficit rainfall, infestation of YMV and long dry spell at seed filling stage. MP contributes >50% both of area and production of soybean in India. Mainly because of short duration (90-105 days) with high net return, it has been widely accepted by the farmers. Approximately, 45 % of total cropped area of M.P. is occupied by soybean during Kharif season. Soybean production was more drastically declined during Kharif- 2015 due to excess rains at vegetative phase, long dry spell at seed filling stage and infestation of YMV and other insect pest.

The Yellow Mosaic Virus (YMV) disease, caused by Gemini virus and transmitted by white fly (*Bemisia tabacci*) is the most important disease of soybean. Infestation of YMV could be visualised in the form of yellow spots, which are either scattered or produces in indefinite bands along the major veins of soybean leaves.

Infestation of Yellow Mosaic in Soybean

[1.] Director, [2.] & [3] Assistant Director, DPD, Bhopal and [4] National Consultant (NMOOP), DAC&FW

Some time severe mottling and crinkling of leaves are also seen. Leaves of severely infected plants become yellow when they are young. Affected plants bear less flower and pods. Besides India, it is prevalent in Sri Lanka, Bangladesh, Pakistan and Thailand. The economic loss caused by YMV disease is 30-50%; however, it may go up to as high as 80% in extreme cases (**Nene, 1972).** It was first observed in North India in early 1970s but was never seen in alarming proportions in Central India. Its expansion towards central India, a soybean bowl, may be fatal to the soybean industry in general and to the SMF soybean growers in particular. Major soybean varieties grown in the central India have been found susceptible to YMV. YMV is transmitted by white fly; therefore, control of this disease is indirectly related to the control of its vector. Its chemical or cultural control has not been found to be economical and environmental friendly. Only deployment of genetic resistance has been proved the way of its control or management.

2. Scope of the Study

Soybean cultivation, which was introduced as an oilseed crops in late 60s, has now occupied first position both in terms of area and production of oilseeds and 2nd position in terms of vegetable oil. There have been sporadic incidence of YMV in the past as well but severe infestation of YMV observed during Kharif-2015, may be a threat for soybean cultivation in the state. The State Department of Agriculture has reported yield losses up to 40% in soybean. Accordingly, a study has been conducted on causes of outbreak of YMV and estimation of yield losses in soybean during Kharif-2015.

3. Objectives

Study aims to make a field assessment of causes of outbreak of YMV and estimation of yield losses in soybean during Kharif-2015. Since the crop had already been harvested, findings are based on the feedback of the soybean growing farmers and secondary data. The major objectives of the study were as under:

- To find out the causes of outbreak of YMV.
- To determine the yield loss in soybean during 2015.
- To find out the reasons of yield loss in soybean during 2015.
- To examine the extent of adoption of recommended technology of soybean production/ knowledge level of farmers.
- To understand farmers perception about YMV.

4. Methodology of Study

The detail methodological framework is presented in this section. The whole procedure was divided into sampling procedure and collection of primary and secondary information. Each main part again described under its sub-sections to understand the procedure for ultimate selection of soybean growers in the study area. The sampling procedure to consider the district, block, villages and respondents is indicated under the following sub-sections.

4.1 Selection of districts

Three districts *viz*., Chhindwada, Ujjain and Betul of Madhya Pradesh were selected for the study in consultation with the Department of Agriculture, Cooperation and Farmers Welfare, GoI and State Department of Agriculture, where yield losses due to YMV were reported by the state.

4.2 Selection of blocks

Two blocks in each district(total 6 blocks) *viz.*, Mohkhed and Chhindwara blocks in Chhindwada district, Mahidpur and Tarana blocks in Ujjain District and Betul and Amla blocks in Betul district

of Madhya Pradesh were identified for the study. The selections of these blocks were made in consultation with the State Department of Agriculture of the concerned districts.

4.3 Selection of villages

Two villages were selected in each block (12 villages) and 10 soybean growing farmers from each village, totalling to 120 farmers were selected for the study.

Table 1: Details of blocks, villages and soybean growing farmers

S. No.	District	Selected Blocks	No. of Selected Villages	No. of selected farmers
1.	Chhindwara	Chhindwara	02	20
		Mohkhed	02	20
Sub-total		**02**	**04**	**40**
2.	Ujjain	Mahidpur	02	20
		Tarana	02	20
Sub-total		**02**	**04**	**40**
3.	Betul	Betul	02	20
		Amla	02	20
Sub-total		**02**	**04**	**40**
Grand-Total		**06**	**12**	**120**

4.4 Data Collection

Broadly the data required for the study has been divided in to two parts i.e. primary and secondary information.

4.5 Primary Data

The primary information has been collected by direct interview with soybean growers of selected villages/ blocks/districts. Structured well designed, schedule and questionnaire were used for the purpose. The information collected from soybean growers consist variety of soybean sown by the farmer, date of sowing , date of infestation of YMV observed by farmer, stage of crop when YMV occurred, degree of infestation (Heavy/ moderate/ low), spread of YMV(whether uniform or sporadic), effect of YMV on plant growth (stunted/excess growth), soybean yield recorded in heavily infested plots and plot without infestation, frequency of YMV infestation during last 10 years, Major insect / pest observed other than YMV. The farmers feedback about the causes of outbreak of YMV and technology aspects is given in ***Annexure – I, (a), (b), (c) and (d) respectively.***

4.6 Secondary data

The secondary data has been collected from state Department of Agriculture, Government of Madhya Pradesh at state and district level. The land use statistics of the sample districts is given in **Table 2.**

Table 2: Land use statistics of selected districts

(Area: Lakh ha)

Particulars	**Chhindwara**	**Ujjain**	**Betul**
	Area	**Area**	**Area**
Geographical Area	11.84	6.10	10.08
Net Sown Area	5.11	5.01	4.31
Total Cropped Area	7.52	8.82	5.66
Double Cropped Area	2.41 (32.05%)	3.81 (43.20%)	1.77 (31.27%)
Net Irrigated Area	2.20 (43.05%)	3.48 (69.46%)	1.65 (38.28%)
Forest Cover	1.88	0.03	2.83
Cropping Intensity (%)	140	176	137
Average Rainfall (mm)	1000.00	906.2	1083.9
Major Crops of the district			
Kharif crops	Soybean, Maize, Cotton Arhar& Paddy	Soybean & Maize	Soybean, Maize ,Paddy, Tur
Rabi crops	Wheat , Gram	Wheat & Gram	Gram, Wheat

Source: State Department of Agriculture, Chhindwara/Ujjain/Betul

The details of secondary data of weekly temperature & rainfall from June to September for last 05 years in respect of Chhindwara, Ujjain and Betul districts is given in **Annexure-II ,** ***(a), (b) and (c) respectively.*** Area, production and productivity of Kharif & Rabi crops during last five years of Chhindwara Ujjain and Betul districts is given in **Annexure-III ,** ***(a), (b) and (c) respectively.***

4.7 Analysis: The simple analytical tools used in study i.e. mean, average, absolute & relative change.

4.8 Limitation of the study: Some of the following limitations may or may not affect the findings of the study up to some extent. These limitations are as under:

- The whole study is based on the survey conducted after the harvest of the crop and the information provided by the farmers, usually lowers side has been taken in to consideration.
- The study could not get the benefit of the experience/response of the major stake holders from ICAR (ICAR-DSR, Indore) and SAUs (JNKVV, Jabalpur & RVSKVV, Gwalior).
- The inferences have been drawn on the basis of past average yield of soybean of concerned districts.

5. Results and discussion

The results and discussion are based on the demographic features of the soybean growers, cost on resource economy, objective-wise analysis are described as under:

5.1. General demographic features of sample farmers

The general characteristics of the sample households given in **Table- 3** indicates 22.50%, 27.50%, 25.83% and 24.17% share of marginal, small, medium and large farmers in Chhindwara, Ujjain and Betul districts of Madhya Pradesh respectively. The average per farm total cultivated area is observed 3.81 ha, 4.20 ha and 4.40 ha in Chhindwara, Ujjain and Betul districts respectively along with 4.14 ha as an overall average. An average area of each selected farmers under soybean is estimated as 2.60 ha, 3.00 ha, and 2.90 ha in the sample districts of Chhindwara, Ujjain and Betul respectively with an overall average of 2.83 ha. This indicates that about 75% of total cultivable area is used for soybean cultivation in the sample districts. An average area of 60% of the farmers holding is under assured irrigation.

Table 3: Demographic features of soybean growers of sampled districts

S No	Particulars	**Chhindwara**	**Ujjain**	**Betul**	**Overall**
A.	**Number of respondents**				
(a)	Marginal	09	11	07	27 (22.50)
(b)	Small	11	09	13	33 (27.50)
(c)	Medium	07	11	13	31 (25.83)
(d)	Large	13	09	07	29 (24.17)
Total Number of Farmers		**40**	**40**	**40**	**120 (100)**
B.	**Average land classification (in ha)**				
1.Land Holding		3.81	4.20	4.40	4.14
2. Net Cultivable area		3.20	4.00	4.25	3.82
3. Area under soybean		2.60	3.00	2.90	2.83
4.Irrigated area		2.60	2.30	2.58	2.49
5.Un -irrigated area		1.21	1.90	1.82	1.64
Percentage irrigated area of land holding		**68.00**	**55.00**	**59.00**	**60.00**
1.Canal		00	06	05	**11 (6.51)**
2.Tubewell		12	20	22	**54 (31.95)**
3. Wells		26	19	22	**67 (39.64)**
4.Tank		15	10	12	**37 (21.89)**
Irrigation from diff. sources		**53**	**55**	**61**	

Note: Figures in the parentheses indicate the percentage to total numbers.

5.2.Causes of outbreak of yellow mosaic disease and yield losses in soybean

Yellow mosaic disease (YMD) is major constraint in yield improvement in soybean, mungbean and urdbean. The aetiological virus causing YMD is begomovirus of the family Geminiviridae. This virus is transmitted by whitefly *Bemisia tabaci*, a sucking pest. The normal sowing time for soybean is 15th June to 15th July. The farmer feedback about the causes of outbreak of YMV given in Annexure-1(a) and ***Annexure – 1 (b)*** indicates maximum infestation of YMV at the stage of 25-50 day after sowing (DAS). The same period also witnessed heavy rainfall between mid of July to mid of August in sample districts. Heavy rains also affected the inter-culture operations leading to heavy infestation of weeds. Hot and humid weather coupled with excess growth of crops and also weeds provided a congenial environment for faster multiplication of white

fly and other insect and pest in soybean. Some farmers also reported that the field where summer moong was taken prior to soybean also contributed in increased infestation of white fly and pest complex. Lack of effective system of "Pest Surveillance" also contributed in severe infestation of YMV in the sample district. The farmers who have used ridge-furrow or BBF had less infestation of white fly.

Long dry spells from last week of June to first fortnight of July, 2015 and further second fortnight of August to September, 2015 and uneven dispersal of rainfall in the Kharif, 2015 has severely affected the productivity of soybean. Lack of awareness among farmers about the adoption of recommended doses of pesticides and their timely application was also recorded.

5.3 Estimation of yield losses due to YMV infestation at sample districts

Based on the objective of the study, farmers/villages/blocks/districts with heavy infestation of YMV were selected. Actual yield of soybean obtained by the farmers from YMV infested plot at sampled farms presented in **Table 4**. The actual yield of soybean at farmer's field in the sample districts were estimated to be 1.38 Qtl. /ha, 1.97 Qtl./ha and 1.08 Qtl./ha at in Kharif, 2015 as against the normal district average (5 years) yield (DAY) of 16.95 Qtl./ha, 12.59 Qtl./ha and 10.01 Qtl.//ha and DAY of 8 qtl./ha, 6.37 qtl./ha and 1.67 qtl. / ha of Kharif 2015 in districts Chhindwara, Ujjain and Betul respectively. This indicates an average yield reduction of 89 %, and 72% against the normal district average (5 years) yield and Kharif – 2015 respectively. Since, 60% of land holding of sample farmers is covered under irrigation, chances of damage due to long dry spell are limited. Therefore, the higher yield losses in soybean in the sample districts may be attributed to multiple factors including higher vegetative growth with more plant population, infestation of YMV, other insect pest and long dry spell.

Table: 4 Actual yield received by the farmers at soybean YMV infested field

(Yield: Quintal/ha)

S. No.	Sampled Districts	Actual Yield at YMV infested plot	Normal District Average Yield* (DAY)	DAY Kharif – 2015	% Yield loss	
					Over Normal DAY (5 yrs. Avg.)	Over DAY (Kharif - 2015)
1	Chhindwara	1.38	16.95	8.00	92	83
2	Ujjain	1.97	12.59	6.37	84	69
3	Betul	1.08	10.01	1.67	89	35
Overall Average		**1.48**	**13.18**	**5.35**	**89**	**72**

* Normal District average yield: five year average (2010-11 to 2014-15), SDA, MP

5.4 Variety-wise yield losses in soybean in sample districts

Data pertaining to yield of different varieties of soybean infested by YMV in selected districts is given in **Table 5.** The yield data of same variety compared with other varieties shows very small differences due to at par infestation of YMV in the different varieties. The study indicates that the variety JS 95-60 occupied maximum area in the selected districts. Major varieties namely JS-95-60, JS-335 and JS-93-05 suffered with heavy yield losses of >60% against DAY of Kharif – 2015.

Table: 5 Yield losses under different varieties of soybean at YMV infested field

(Yield: Quintal/ha)

Varieties	Chhindwara		Ujjain		Betul		Mean
	Actual Yield	% yield loss	Actual Yield	% yield loss	Actual Yield	% yield loss	% yield loss

JS-95-60	1.48	-81	1.98	-69	0.98	-41	64
JS-335	1.39	-83	1.91	-70	1.15	-31	61
JS-93-05	1.19	-85	2.00	-69	0.94	-44	66

5.5 Economics losses due to infestation of YMV

The economics of soybean production at sampled farms is presented in **Table 6.** Cost of cultivation of soybean is estimated Rs.20,200/- Rs.1,9700/- and Rs.19,900/- in Chhindwara, Ujjain and Betul districts respectively with an average cost of Rs.19,333/- per ha. It shows that the cost of cultivation is almost at par with the average cost across the sample districts. The higher cost of cultivation attributes to higher cost of seeds, fertilizer, PP measures and mechanical operations of sowing and harvesting. Heavy infestation of YMV resulted into heavy yield losses. The yield of soybean was reduced to 1.97 Qtl. /ha in Ujjain followed by 1.38 Qtl. /ha in Chhindwara and 1.08 Qtl./ha in Betul district. The average gross return with this level of yield comes to Rs.5910/- per ha in Ujjain followed by Rs.4,140/- per ha in Chhindwara and Rs. 3,240/- per ha in Betul districts. The average input-output ratio varied from 1:0.30 in Ujjain, 1:0.20 in Chhindwara and 1:0.16 in Betul districts. Thus, the soybean farmers suffered on an average a loss of >Rs. 15000/- per ha.

Table: 6 Economics of soybean production at sampled farms

Particulars of operation	Chhindwara	Ujjain	Betul	Overall Average
Input cost (Rs/ha)	20200	19700	19900	**19933**
Yield (Qtl./ha)	1.38	1.97	1.08	**1.48**
Average price (Rs/quintal)	3000	3000	3000	**3000**
Gross return (Rs/ha)	4140	5910	3240	**4440**
Net return (Rs/ha)	-16060	-13790	-16660	**-15493**
Input-output ratio	1: 0.20	1:0.30	1:0.16	**1:0.22**

5.6 Farmer's perceptions / knowledge about adoption of recommended technologies of soybean production.

District wise information in respect of adoption of recommended technology of soybean production *i.e.* modalities of soil health analysis, preparatory tillage, Integrated nutrient management, recommended promising cultivars of soybean, seed treatment, time and method of sowing, intercultural/hoeing, method and frequency of irrigation, integrated weed management and integrated pest management is given in ***Annexure –I (c).*** Overall perception and adoption level of technologies is given in ***Annexure – I (d).***

A perusal of data in ***Annexure-I (d)*** shows that remarkably high proportion of the respondents (83 %) possessed knowledge about modalities of soil health analysis and 64 % respondents adopted modalities of soil health analysis. 76 % farmers have knowledge about recommended promising cultivars of soybean but 63 % farmers adopted recommended cultivars. 88 % farmers know about time, method & improved machines of soybean harvesting & threshing, whereas, 59 % only adopted these recommendations. Similarly, 39 % farmers have knowledge about reliable source of improved agriculture machines but 22 % farmers only adopted. It is concluded that the remarkable

gap observed between knowledge and adoption level of technology at farmers field.

5.6 Farmer's perception about infestation of YMV in soybean

Perception of farmer's perspective on the soybean YMV in selected district of M.P. is given in the ***Annexure- I (d)*** shows that 69.17 % farmers perceived heavy, 25 % farmers perceived moderate and only 5.83 % farmers perceived presence of white fly population in soybean. As regards, approximate date of infestation of YMV was observed by the farmer 73 % farmers and 27 % farmers perceived occurrence of YMV at 50 days and 30 days after sowing respectively. None of them perceived occurrence of YMV at 75 days after sowing. Perceptions of farmers about stage of crop when YMV occurred, 52 % farmers perceived at flowering stage and 48 % farmers perceived at pod filling stage. Seed treatment in soybean was adopted by only 44% respondents and other control measures of YMV were adopted by 83% farmers but no innovative method for control of YMV was adopted by the sample farmers.

It is concluded that knowledge & adoption level of selected farmers about the control of YMV and recommended practices is low as IWM and IPM resulting the yield loss due to YMV during Kharif 2015.

6. Suggestions / Recommendations

Based on the findings of the study and feedback from the farmers the following suggestions / recommendations are made:

6.1. Strengthening of "Pest Surveillance Mechanism", capacity building of field functionaries / farmers and issue of timely advisories to the farmers.

6.2. Adoption of crop cafeteria including YMV resistant varieties, crop rotation, improved planting method like Broad-Bed-Furrow (BBF), Ridge-Furrow (R&F) and inter-cropping.

6.3. Use of YMV resistant varieties of soybean like JS-20-29, JS-20-69, RKS-24 and JS-97-52 recommended for the State.

6.4. Seed treatment with Thiram 2gm + Carbendazim 1gm per kg of seeds.

6.5. Control of white fly with the spray of thiamethoxam 25WG@100 gm 500 ltr. Water / ha.

6.6. Control of white fly and other sucking pest/ Thrips etc. with community based approach.

6.7. To discourage indiscriminate use of pesticides, this causes insurgence of white fly.

6.8. To maintain optimum plant population, balance use of fertilizers based on soil health card.

7. References

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Annexure-12

Directorate of Pulses Development, GOI, Bhopal
Ministry of Agriculture & Farmers Welfare, GOI
Bhopal-462004 (MP)

To

The Joint Secretary (Crops)
Government of India
Ministry of Agriculture and Farmers Welfare
Department of Agriculture & Cooperation
Krishi Bhavan, New Delhi 110001

Sub.: Report on incidence of YMV and insect-pests infestation under soybean crop in Madhya Pradesh state- Reg.

Reference: telephonic conversation dated August 28 & September 04, 2015.

Sir,

In the State of MP, during current Kharif season, against a total Kharif coverage of 126.37 lakh ha, as on 3.9.2015 approx 59.06 lakh ha is under Soybean crop. The area covered in the state is 102.10% of the state's Normal soybean area of 57.84 lakh ha.

2. The physiological stage of the crop in different districts based on the dates of sowing is from flowering to pod formation and pod filling stage.

3. The major varieties grown in the state are JS 9560, JS 9305, JS 335, NRC 7 etc. Variety JS-9560 is in maximum area.

4. Continuous rains in differ parts of Malwa area (Dewas, Indore, Sehore etc.) from 19th July to 18th August, 2015 affected the inter-culture operations including the prophylactic IPM measures. The insects like blue beetle, white fly, stem fly, gram semi-looper and Girdle beetle etc. are the major insects. The farmers have also sprayed Trizophos 40 EC @ 0.80 litre per ha, Chloropyriphos 20 EC @ 1.5 litre per ha, Profenophos 50 EC @ 1.25 litre per ha etc.

5. The Directorate also visited in the districts of Hoshangabad, Harda, Sagar, Damoh, Raisen, Shahdole, Umaria during July, 2015 and Rewa, Sidhi, Satna, Indore, Ujjain, Dewas, Sehore, Guna, Ashoknagar, Shajapur etc. recently during August.

..2/-

The field report during July was normal for almost all the crops. The recent observations during August has recorded the reports of flower drops, due to continuous rains, YMV, sucking pests, girdle beetle, semi-looper, *Helicoverpa* etc. However, the intensity of infestation in the visited area was found below ETL, except some pockets where suitable control measures were adopted by the farmers.

6. On September 3-4, 2015, field visit in District Bhopal and Raisen has revealed that the pest complex including collar rot and YMV is visible and this may affect the yield levels.

7. The State Department of Agriculture, as per their preliminary report as on 28.08.2015 has indicated an area of about 1.09 lakh has (1.85%) infested due to YMV (vector white fly) and about 1.58 lakh ha (2.68%) due to other insect-pests. The Division-wise detail on infestation is as under **Table 1**.

The State Agriculture Department has informed that Joint survey Team comprising Agriculture Department + Revenue Department has been assigned to carry out survey on actual loss in affected districts, the detailed report would follow accordingly.

Table 1 : Division-wise infested area

(Area: 000 ha)

S. N.	Division	Area Sowing	Area infested due to YMV		Area infested due to Pest		% area infested of total sowing	Village Affected
			Area	%	Area	%		
1	Jabalpur	214.70	38.33	**17.85**	3.81	**1.78**	19.63	
2	Sagar	541.50	15.72	**2.90**	25.01	**4.62**	7.52	215
3	Rewa	135.50	0.72	**0.53**	-	**-**	0.53	
4	Sahdole	25.40		**0.00**	-	**-**	0.00	
5	Indore	888.60	8.12	**0.91**	22.37	**2.52**	3.43	787
6	Ujjain	1830.50	16.77	**0.92**	86.69	**4.74**	5.65	
7	Gwalior	549.90	10.20	**1.85**	-	**-**	0.00	109
8	Morena	44.10		**0.00**	-	**-**	0.00	
9	Bhopal	1102.20	12.30	**1.12**	19.22	**1.74**	2.86	674
10	Hosangabad	501.50	7.26	**1.45**	1.40	**0.28**	1.73	
State		**5904.40**	**109.42**	**1.85**	**158.49**	**2.68**	**4.54**	

Annexure-13

Directorate of Pulses Development,
(Department of Agriculture, Cooperation & Farmers Welfare)
Bhopal-462004 (MP)

Summary-Field visit report for the period July-September-2015

S. N.	Name of visiting Officials	District Visited	Scheme/Programme reviewed	Observations & Suggestions
1.	Dr. A. K. Shivhare Assistant Director	Hoshangabad & Harda (July, 15-17)	NFSM, RKVY, NMOOP & NMSA	*Area under summer moong has been reduced to 24000 ha due to non availability of irrigation water from canal as lining work is going on in the canals. *Records were not provided by concern field staff/officials for verification of implements. It is suggested that name of scheme, year etc. should be mentioned on implement *More demand of rotavator, seed drill and sprinkler set. *Cluster demonstration not conducted due to delayed Administrative approval.
2.	Shri Vipin Kumar Assistant Director	Sagar & Damoh (July, 15-17)	NFSM, RKVY, NMOOP & NMSA	*Implements subsidy has not been released to the beneficiary farmers in the month of March, 2015 for 2014-15. * Lentil Variety L-4594 (C-1) recorded 14 Quintal per ha yield in demonstration field in comparison to local variety with 5 quintal per ha in village Mukarampur, Block Khurai. *The Administrative approval for implementation of the NFSM scheme during 2015-16 has been received too late on i.e on 16.07.2015, will hamper kharif programme.
3.	Shri Sarju Pallewar Statistical Investigator	Raisen July, 15	NFSM, RKVY, ATMA	*Delayed rains has increased the sowing of urd & Moong crops *Beneficiary farmers were well apprised with all the CSS schemes running in the district and requested for continuation of the same.
		Durg, Kanker & Dhamtari (Chhattisgarh) July, 26-31	NFSM, RKVY, ATMA, NMOOP, BGREI	*As per farmer's perception, the effective benefits of farm machinery, reduced the cost and increase their crop yield over the traditional method. *There is no any shortage of inputs like Urea, DAP, MOP and seed and planting material as reported by the DDA of the district. *The assistance received under Godown (NFSM) has restricted distress sale & helped to got remunerative price. *Visited IPM based ATMA scheme Demonstration wherein beneficiaries provided the pheromone trap (10 no per acre) and crop is free of chemical fertilizers.

S. No.	Name of visiting Officials	District Visited	Scheme/Programme reviewed	Observations & Suggestions
4.	Ashwini Bhoware TA-NFSM	Indore July, 14-15	NFSM, NMOOP, ATMA, RKVY	*Soybean and Pigeon pea demonstrations were observed affected by Yellow Vein Mosaic &Bacterial Blight (at below ETL) & suggested to use of resistance varieties like NRC 37, JS 20-29, JS 20-34 etc.. *No display board was installed at the demonstration site, suggested for the same. *Honorarium of Technical Assistant of PMTs is pending since (**March 2014 to date of visit).**
5.	Sateesh Dwivedi TA-NFSM	Shahdol & Umaria July, 13-17	NFSM, NMOOP, ATMA, RKVY	*Demand for Reaper and Cono weeder reported in the district. *Farm School & Kishan Mela has been conducted by SDA at crop season.
6.	Shri Sarju Pallewar Statistical Investigator	Ashoknagar & Guna August, 24-26	NFSM, NMOOP, ATMA, RKVY, NMSA	*About 75% of urd crop damaged due to infestation of Yellow Mosaic Virus (YMV), (White Fly vector). Farmers were advised to use certified seeds. *Farmers informed that various soil and water conservation structures created under NMSA scheme very utilizable, due to this they are able to irrigate their Rabi crops of nearby area surrounded by the structures.
7.	Dr. A. K. Shivhare Assistant Director	Ambikapur (CG) September, 11	FLD on Rice	*FLD on NFSM-Rice conducted in 30 acres. Two varieties of hybrid rice KRH-4 and Indira Sona was given to farmers @ 5 Kg of seed for line transplanting on 26.06.2015. *Average Tillers were 10-15 per plant. Crop was at tillering stage. No demonstration board is observed on site. Infestation of blast observed in some fields. *Interacted beneficiaries informed that only 5 kg seed was provided to them, other inputs were arranged by farmers at their own level. No field day was organized till the date of visit.
8.	Dr. A. K. Tiwari Director Dr. A. L. Waghmare Senior Technical Assistant	Sehore (September, 14)	FLD on Intercropping with Pigeon pea, soybean & Urd bean	*Soybean FLDs were at maturity to harvesting stage, Cluster approach adopted, recommended inputs used. *Pigeon pea variety ICPL-88039 demonstrated under FLDs which was in vegetative to flowering stage, only seed was provided under demonstration. No other inputs were provided. *Urd bean varieties TJM 3 & RBU-38 demonstrated under FLD, recommended inputs used, Crops at maturity to harvesting stage.

S. N.	Name of visiting Officials	District Visited	Scheme/Programme reviewed	Observations & Suggestions
9.	Shri Sarju Pallewar Statistical Investigator	Shivpuri September, 14	FLD on Pearl millet	*FLDs field were not at road side/farmers approaching area, organized in the very interior area failed to fulfil the criteria of FLDs. *Only 2 Kg hybrid seed (86M88) was provided to beneficiary. *Crop is at flowering to grain filling stage and facing moisture stress due to continued dry spell.
10.	Ashwini Bhoware TA-NFSM	Khandwa September, 15	FLD on Cotton	*Delay of fund allotment by ICAR to KVK-Khandwa, for FLD demonstration. *Total 20 Acre area covered in FLDs under Sole Cotton & Intercropping with Pigeonpea. *No inputs including seed provided by the KVK-Khandwa, only technical support given by the KVK.
11.	Sateesh Dwivedi TA-NFSM	Khargone September, 15	FLD on Pigeon pea	* Seed (1kg/acre) and Zinc 10 kg provided. *Total 50 Acre area covered in FLDs under Sole crop of Pigeon pea which was sown manually by the beneficiary. *Crop stage was vegetative & facing moisture stress, recommended inputs used.
12.	Dr. A. K. Shivhare Assistant Director Dr. A. L. Waghmare Senior Technical Assistant	Bhopal September, 19	Soil Testing Laboratory under CSS of Soil Health Card	*Air conditioner is required for precise analysis through Atomic Absorption Spectrometer (AAS). *Edit option should be made available in new software at data entry level. *Fertilizer recommendation is not showing in Soil Health Card. This problem needs to be rectified at programmer level.
13.	Shri Sarju Pallewar Statistical Investigator	Indore September, 19	Soil Testing Laboratory under CSS of Soil Health Card	*Strengthening of Technical staff. *Skill up-gradation training related to new software of Soil Health Card is required.

Summary-Field visit report for the month of October-November-2015

S. N.	Name of visiting Officials	District Visited	Scheme/Programme reviewed	Observations & Suggestions
1.	Dr. A K Shivhare Assistant Director	Jabalpur & Katni Oct. 19-20, 2015	Deficient rainfall situation & CSS/CS schemes viz, NFSM, RKVY, NMOOP & NMSA	*About 27% less coverage of kharif target and 21% yield reduced due to deficit rains. Major kharif crops of the districts are paddy, arhar & til. *Sowing is hampered due to deficit rains, poor soil moisture conserved and prevailing high temperature 32-35^0 C in both the districts. *Soybean crop damaged due to dry spell, YMV (Yellow Mosaic Virus) and insect –pest, about 2 to 3 quintals yield obtained in crop cutting data in Jabalpur district. *Sowing of wheat is delayed due to prevailing high temperature ranging from 32- 35^{0}C in bpth the diatricts.
2.	Shri Vipin Kumar Assistant Director	Morena & Bhind Oct. 19-20, 2015	Deficient rainfall situation & CSS/CS schemes viz, NFSM, RKVY, NMOOP & NMSA	*As on 30.09.2015 rains received 405.0 mm against the normal rainfall of the district is 706.9 mm., 78.32 % irrigated area from Rivers, Tubewells , Wells and other sources. and 21.67 % rainfed area in the district. *Major Crops of Kharif Season i.e. Bajra, Til, Paddy, Jowar, Arhar, Guar, Urd and Moong. Mostly Bajra, Til, Urd, Moong, have been harvested. *15-20 % loss in Bajra, Paddy & Til in irrigated areas and 50 % loss in rainfed area. About 80 % loss in Urd & Moong and 75 % loss in Arhar crop. *Paddy crop is normal condition in irrigated area.
3.	Shri Sarju Pallewar SI	Shahdol & Anuppur Oct. 19-20, 2015	Deficient rainfall situation & CSS/CS schemes viz, NFSM, RKVY, NMOOP & NMSA	*As on 30.09.2015 rains received 519.5 mm against the last year rain 942.0 mm in the same period and normal rains of the district 994.7 mm. *About 13% less coverage of kharif target and 50 % yield reduced due to deficit rains. *DDA/Field staff, informed some wheat area diverted to Gram, Lentil & Mustard crop this year due to less irrigation water availability in water reservoir. *Due to deficit rains in the district, more emphasis being given to less water requirement crop like Gram, Lentil, Mustard and Linseed.

S. N.	Name of visiting Officials	District Visited	Scheme/Programme reviewed	Observations & Suggestions
4.	Shri Sateesh Dwivedi (TA-NFSM)	Sagar & Damoh Oct. 19-20, 2015	Deficient rainfall situation & CSS/CS schemes viz, NFSM, RKVY, NMOOP & NMSA	* As on 15.09.2015 rains received 633.0 mm against the normal rainfall of the district is 1230.5 mm. *Soyabean crop affected by YMV after 40-45 DOS due to high temperature & long dry spell. *Major kharif crop are soybean, paddy, urd & mung. *Farmers informed the estimated soybean crop yield obtained 4 to 5 quintals per ha. *According to DDA instruction to all field extension workers for selection of farmers in rabi demonstration should be based on irrigation facility of availability on demo plot.
5.	Shri Vipin Kumar Assistant Director	Rewa & Satna Nov, 30th & Dec, 01st, 2015	NFSM, RKVY, NMOOP & NMSA	*About 83% area has been covered in Rabi season 2015-16 against the target in the district as on date. Crop condition is normal and germination of cluster demonstration of gram & wheat is good crop is under seedling stage about 22 days. * Fungal disease has been found in the variety JAKI-9218 of Gram below ETL in cluster demonstration under NFSM – Pulses in the block Rewa. The leaves start yellowing and afterwards drying. The plants to become yellowish and finally dry out. * Amount of subsidy input may be flexible to change in other inputs in the limit of Rs. 7500/- per ha in cluster demonstration under NFSM – Pulses & Wheat to reduce the farmer's share or not required the farmer's share in case of Wheat.
6.	Smt. Ashwini Bhowre TA (NFSM)	Ratlam & Ujjain Nov. 23-24, 2015	NFSM, RKVY, NMOOP & NMSA	*As on 24.11.2015, about 90% sowing of Rabi crops has been completed in the District as reported by the concerned staff in both the districts. *Visited NFSM-Pulses Cluster Demonstration (variety JAKI-9218). Crop is about 25-35 DAS and at the 2-3 branching stage found to be minor infested by the pod borer due to sudden weather change. *Due to early withdrawal of monsoon & low irrigation water availability, crops are sown delayed resulting of shorter growth of crops like wheat, gram, and oilseeds crops in the visited districts.
7.	Shri Sateesh Dwivedi (TA-NFSM)	Panna & Chhattarpur Nov. 26-27, 2015	NFSM, RKVY, ATMA	* As on 27.11.2015 about 75% sowing of Rabi crops has been completed and continued in the District as reported by the concerned staff in both the districts. Crop condition is normal and at seedling stage. *Cluster demonstration of gram (var. JAKI-9218, JG-63, JG-130) & wheat (var. GW-366, GW-322) are in critical phase need irrigation immediately. *Perception received at beneficiary side to supply/providing critical inputs timely in favour of good crop yield at demonstration field.

Annexure-14

Table 1: Division-wise brief report on status of crop loss due to rainfall/hail-storm in the month of March, 2015 in Madhya Pradesh

Division/ District	Dates of Rainfall/Hail storm		Locations/ Villages reported as affected	Crop stage and status of damage	Remark
	Rainfall	Hail storm			
Bhopal Division				• Wheat, Gram, Field pea, Lentil, Lathyrus Mustard and Linseed at maturity (10 to 15%, maturity to harvest (30 to 35%) and harvesting (30 to 35%). Threshing operations are continued. • District Rajgarh is reported with maximum damage. • Crop cutting is continued. • Quality deterioration of grains and seeds (discoloured, shrivelled, loss of lustre, germinability).	• Rabi sown area – 17.20 Lakh ha. (Cereals - 10.41 Lakh ha.) , Pulses-6.64 Lakh ha. • To assess the extent of crop damage, both to agricultural and horticultural crops, joint survey / Anavari is under way by District Collectors involving a Team represented by Deptt. of Revenue , Deptt. of Agriculture + Deptt. of Panchyati Raj+ Jan Pritinidhi.
Bhopal	March, 11 (1.0 mm) March, 12 (29 mm) March, 13 (19 mm) March, 14 (1.1mm)	March, 15	18		
Vidisha**)**		March, 14 & 15	72		
Rajgarh		March, 14, 15 & 16	361		
Raisen					
Gwalior Division					
Gwalior	March, 1 (16.2), March, 2(4.6), March, 3 (3.2), March, 8 (0.1), March, 14 (4.2), March 15 (32), March, 16 (43.6)	March, 14-15	105	• Lentil 50 % harvested. Mustard > 40% harvested in field are threshing floor. • Wheat- only 10 % harvested, remaining 90 % from grain filling to maturity to harvesting stage. • Maximum loss is reported in Gwalior & Datia. • Spices- (Coriander loss in Guna). • Location specific damage reported. • Quality of grain/seed in seed plots is likely to be diioriated • Overall production may be normal.	• Rabi coverage -12.33 Lakh ha. (Wheat -6.82, Gram- 3.04, Mustard -1.37, Field pea-0.41,Lentil 0.20 l, Barley - 0.5 akh ha.). • To assess the extent of crop damage, both to agricultural and horticultural crops, joint survey / Anavari is under way by District Collectors involving a Team represented by Deptt. of Revenue,Deptt.of Agriculture+Deptt.of PanchyatiRaj+ Jan Pritinidhi.

Gwalior Division					
Ashoknagar	March 1 (6), 2 (8.17), 3 (1.75), 4 (0.4), 15 (23.0), 16 (8.8)		45		
Shivpuri	March 1 (16.5), 15 (29.7), 16 (32.8)		96		
Datia	March, 1 (12.7), 3 (1.0), 4 (2.7), 8 (4.5), 15 (20.4), 16 (29.7)		75		
Guna	March,1 (1.5), 2 (0.9), 3.(2.4), 14 (2.2), 15 (12.4), 16 (16.8)		188		
Narmada puram					
Hoshangabad	March,14 (7.4 mm) March, 15 (15.8 mm) March, 16 (5.8 mm) (Thunderstorm)	No Hailstorm		• Early sown Wheat (November) is reported to experienced about 10 % loss due to lodging. • 90 % of the crop at maturity stage. • Harvesting will start within week. • The extent of damaged to Lentil is more than 50%. • The worst affected are 15 villages in district Betul. • The lodging in Wheat, Gram etc. is going to affect about 10% produced in terms of quality (discoloured, under sized, shrivelled, poor geminability). • However, the district of Harda and Hoshangabad are expected to record a good harvest.	• Rabi coverage - 6.85 Lakh ha. (Cereals -5.13, pulses 1.50 Lakh ha.) • To assess the extent of crop damage, both to agricultural and horticultural crops, joint survey / Anavari is under way by District Collectors involving a Team represented by Deptt. of Revenue , Deptt. of Agriculture + Deptt. of Panchyati Raj+ Jan Pritinidhi. • Summer pulses (approximately 2 Lakh hectares) proposed.
Harda	March, 14 (7.2 mm) March, 15 (12.9 mm)				
Betul	March,14 (28.4 mm) March, 15 (9.1 mm) March, 16 (2.9 mm)	March, 9-15	83		
Morena					
Morena	March 14 (44.4 mm) March 15, (17.3 mm)	March, 14-15	500	• Crops are at the maturity-harvest-threshing stage • Threshing operations going on • Gram crop in low-lying areas are affected • In general normal production / productivity expected	• To assess the extent of crop damage, both to agricultural and horticultural crops, joint survey / Anavari is under way by District Collectors involving a Team represented by Deptt. of Revenue , Deptt. of Agriculture + Deptt. of Panchyati Raj+ Jan

					Pritinidhi.

Sheopur	March 14 (39.6mm) March 15, (52.33mm)		325		
Bhind	March 14 (19.3mm) March 15, (34.7mm)		370		
Indore Division					
Indore		March, 15	49	• Grain filling to harvesting stage. • Wheat- Harvesting stage.	• Rabi coverage- 10Lakh ha. (Wheat- 6.86, Gram -2.64 lakh ha.) • To assess the extent of crop damage, both to agricultural and horticultural crops, joint survey / Anavari is under way by District Collectors involving a Team represented by Deptt. of Revenue , Deptt. of Agriculture + Deptt. of Panchyati Raj+ Jan Pritinidhi.
Barwani					
Burhanpur					
Dhar		March, 14	91		
Jhabua					
Khandwa					
Khargone					
Alirajpur					
Jabalpur Division				Wheat was in grain filling to maturity stage. Gram –Maturity to Harvesting stage. 10 to 12 % production loss is tentatively assessed. Lentil – 60% was harvested. Remaining 40% standing crop is reported as damaged by 25 to 40 %. Lodging in Wheat is likely to affect grain filling, quality of grain/ seeds and reduction in total production by 10 %.	• Rabi coverage- 16.05, Lakh ha. (Wheat-7.64,Gram-3.40, Field pea-1.13, Lentil-1.65.Mustard-0.53,Linseed-0.44,Sugarcane-0.78 Lakh ha). • Existing Productivity (in Qt./ha) - Wheat 28., Gram 9, Lentil 5. Summer pulses (approximately 0.40 Lakh hectares) proposed.
Jabalpur	March, 12-16 (60-70 mr		25		
Chhindwara	March, 12-16 (60-70 mm)		108		
Balaghat	March, 12-16 (60-70 mm)	March, 16	178		
Katni	March, 12-16 (60-70 mm)		08		
Mandla	March, 12-1(60-70 mm)		114		

Narsinghpur	March, 12-16 (60-70 mm)	March, 16	20		
Seoni	March, 16 (10.2 mm)	March, 16	186		
Dindori	March, 15-16	March, 16	14		
Rewa Division					
Rewa	March, 01 (18.20 mm) March, 15 (7.30 mm) March, 16 (8.10 mm)	Feb, 27 March, 16	59	Affected crop - Wheat, Gram, Pea, Lentil, Pigeon pea etc. • Crops are at the maturity-harvest-threshing stage • Threshing operations going on • Gram crop in low-lying areas are affected • In general normal production / productivity expected	• To assess the extent of crop damage, both to agricultural and horticultural crops, joint survey / Anavari is under way by District Collectors involving a Team represented by Deptt. of Revenue , Deptt. of Agriculture + Deptt. of Panchyati Raj+ Jan Pritinidhi.
Satna		No hailstorm reported.	8-10		
Sidhi					
Singroli					
Sagar Division					
Sagar		March 14-15	7	• Crops are at the maturity-harvest-threshing stage • Threshing operations going on • Gram crop in low-lying areas are affected • In general normal production / productivity expected	• Rabi Coverage- 14.85 Lakh ha. • To assess the extent of crop damage, both to agricultural and horticultural crops, joint survey / Anavari is under way by District Collectors involving a Team represented by Deptt. of Revenue , Deptt. of Agriculture + Deptt. of Panchyati Raj+ Jan Pritinidhi.
Chhatarpur					
Damoh					
Panna					
Tikamgarh		March 17-18	22		
Shahdol Division (Shahdol, Umaria, Anuppur)	-	-	-	• Crops are at the maturity-harvest-threshing stage • Threshing operations going on • Gram crop in low-lying areas are affected • In general normal production / productivity expected.	• Rabi Coverage – 2.17 Lakh ha. • The division is not affected due to un-timely rains /hail storm. • The overall crop situation is normal. • To assess the extent of crop damage, both to agricultural and horticultural crops, joint survey / Anavari is under way by District Collectors involving a Team represented by Deptt. of Revenue , Deptt. of Agriculture + Deptt. of Panchyati Raj+ Jan Pritinidhi

Ujjain Division					
Ujjain			138	• Crops are at the maturity-harvest-threshing stage • Threshing operations going on • Gram crop in low-lying areas are affected • In general normal production / productivity expected. • However, the quality of produce may detiorarate at damaged locations. • In Neemuch District Horticultural crops like Eisabgol, Poppy seeds, Corriander, Kalongi, Methi is adversely affected.	• Rabi coverage- 11.73 Lakh ha.(Wheat 6.78, Gram-4.95) • To assess the extent of crop damage, both to agricultural and horticultural crops, joint survey / Anavari is under way by District Collectors involving a Team represented by Deptt. of Revenue , Deptt. of Agriculture + Deptt. of Panchyati Raj+ Jan Pritinidhi.
Dewas			05		
Mandsaur			30		
Neemuch		March, 12, 14 & 16	02		
Ratlam			06		
Shajapur			44		
Agar			02		

Annexure-15

Government of India
Ministry of Agriculture & Famers Welfare
(Deptt. of Agri., Coopn. & Farmers Welfare)
Directorate of Pulses Development
Bhopal
******

SUB: ALL INDIA PULSES: CURRENT KHARIF PRODUCTION ESTIMATES AND RABI PROSPECTS- 2015-16

1. Background

India is the largest producer and consumer of pulses in the world accounting for 33 per cent of the world area and 25 percent of the total global production. Pulses can be grown under a wide range of agro-climatic conditions. Unique characteristics like high protein content (2 to 3 times more than cereals), nitrogen fixing ability, soil ameliorative properties and ability to thrive better under harsh conditions make pulses an integral part of sustainable agriculture particularly in dry land areas. Pulses are grown with rainfed conditions in marginal to sub-marginal lands.

1.1. During 1950-51, the pulses were sown in an area of 191 lakh ha with production of about 84 lakh tones achieving 441 kg/ha yield levels. The area, production and yield of Pulses was increased over period with the introduction of new varieties, technological recommendations, implementation of production programmes across the country i.e. National Pulses Development Project (NPDP-1990 to 2003-04); Integrated Scheme of Oilseeds, Pulses, Oilpalm and Maize (ISOPOM- 2004-05 to 2009-10); National Food Security Mission (NFSM-Pulses 2007-08 onwards); Accelerated Pulses Production Programme (A3P- 2010-11 to 2013-14); Special initiatives for pulses and oilseed in dry land areas-RKVY -2010-11); Integrated Development of 60000 Pulses villages in Rainfed Areas-RKVY-2011-12); Special Plan to achieve 19+ million tones of Pulses production (Kharif 2012-13). The highest ever production of more than 192 lakh tonnes was achieved during 2013-14 with increase in area (more than 252 lakh ha) and productivity (764 kg/ha).

1.1.1. However, the existing per capita availability of pulses at 42 g per day is lower the availability of 61 g per day during 1951.

2. Pulses: Availability vis-a vis Production Gap

To meet out the demand of Pulses, on an average 40 lakh tonnes of different pulses has to be imported from other countries. The major import share belongs to peas (39%) followed by lentil (17%), urd/mung (16%), pigeonpea (13%) and chickpea (12%). A negligible export of 2.55 lakh tones on an average is also made with major share of chickpea (94%) (**Table I**).

Table I: Availability of total Pulses & Production Gap (12th Plan Ave: 2012-13 to 2014-15)

(Quantity in 000 tonnes)

Crop	Year	Production	Import	Export	Total Availability	Production Gap
Pigeonpea	2012-13	3022.70	506.39	1.56	3527.53	504.83
	2013-14	3174.40	465.61	0.10	3639.91	465.51
	2014-15	2779.20	575.22	1.22	3353.20	574.00

	Average	**2992.10**	**515.74**	**0.96**	**3506.88**	**514.78**
Chickpea	2012-13	8832.50	697.63	194.91	9335.22	502.72
	2013-14	9526.30	276.13	333.80	9468.63	-57.67
	2014-15	7169.90	418.87	190.22	7398.55	228.65
	Average	8509.57	464.21	239.64	8734.13	224.57
Lentil	2012-13	1134.00	506.35	1.04	1639.31	505.31
	2013-14	1017.50	708.71	0.73	1725.48	707.98
	2014-15		816.46	7.98	808.48	808.48
	Average	**1075.75**	**677.17**	**3.25**	**1749.67**	**673.92**
Peas	2012-13	840.80	1370.82	0.57	2211.05	1370.25
	2013-14	922.90	1330.43	0.85	2252.48	1329.58
	2014-15		1951.97	3.91	1948.06	1948.06
	Average	**881.85**	**1551.07**	**1.78**	**2431.15**	**1549.30**
Urd/Moong	2012-13	3133.50	642.84	1.61	3774.73	641.23
	2013-14	3306.00	624.12	1.66	3928.46	622.46
	2014-15	3376.40	622.88	4.25	3995.03	618.63
	Average	**3271.97**	**629.95**	**2.51**	**3899.41**	**627.44**
Total Pulses	**2012-13**	**18342.50**	**3839.30**	**201.71**	**21980.09**	**3637.59**
	2013-14	**19252.90**	**3654.78**	**343.50**	**22564.18**	**3311.28**
	2014-15	**17191.30**	**4584.84**	**222.14**	**21554.00**	**4362.70**
	Average	**18262.23**	**4026.31**	**255.78**	**22032.76**	**3770.52**

Source: Ministry of Commerce & DES, Ministry of Agriculture & Farmers Welfare

2.1. Crop-wise Importing and Exporting countries

Crop	Import	Export
Pigeonpea	Myanmar, Tanzania Republic, Mozambique, Malawi, Kenya	Nepal, Canada, Israel
Chickpea	Australia, Tanzania Republic, Myanmar, Russia, USA	Pakistan, Algeria, Turkey, Srilanka, UAE, Egypt
Lentil	Canada, USA, Australia	USA, Bangladesh, Singapore, Australia
Peas	Canada, Russia, Australia, USA, Ukraine	Myanmar, Nepal, Pakistan, Srilanka
Urd & Moong	Myanmar, Australia, Tanzania Republic, Indonesia, Uzbekistan	USA, Canada, Australia, Singapore

Source: Ministry of Commerce

3. PRESENT PULSE PRODUCTION SCENARIO

3.1. The Normal area, production and productivity of Total Pulses in the country is 245.230 lakh ha, 175.17 lakh tonnes and 714 kg/ha (Ave. 2009-10 to 2013-14). Contribution of Kharif Pulses in terms of area and production is 45 per cent and 33 per cent. The Rabi/summer pulse has a major share of 55% under area and 67% of the toal pulse production. Per hectare yield of kharif pulses is 539 kg/ha and Rabi pulses at 854 kg/ha.

3.2. Major Kharif Pulses include Arhar (pigeonpea/redgram), Urdbean (Blackgram), Mungbean (Greengram), Moth, Horsegram (kulthi). Tur/arhar has a lion share of area (36%) and production (48%) followed by Urdbean and Mungbean.

3.3. Rabi/Summer season pulse crops are gram (chickpea/bengalgram), lentil (masur), Field pea (matar/batri), Urd, Mung, Rajmash etc. Gram crop has a major share under area sown (65%) and production (72%) followed by lentil and field pea.

3.4. The prominent total pulses producing states combining both Kharif + Rabi/summer are Madhya Pradesh (24.7%), Maharashtra (15.1%), Rajasthan (12.4%), Uttar Pradesh (11.8%), Andhra Pradesh (8.3%) and Karnataka (7.6%).

3.5. The 07 states ruling Kharif season production of > 84% are Maharashtra (25%), Rajasthan (15%), Karnataka (11.2%), Uttar Pradesh (10.5%), Madhya Pradesh (9.7%), Gujarat (6.9%) and Andhra Pradesh (6%).

3.6. More than 81 per cent of Rabi/summer season pulse production come from 6 states. These states are Madhya Pradesh (32.3%), Uttar Pradesh (12.5%), Rajasthan (10.9%), Maharashtra (10.2%), Andhra Pradesh (9.5%) and Karnataka (5.8%).

3.7. The top 06 gram producing states are Madhya Pradesh (39%), Rajasthan (14.6%), Maharashtra (14%), Andhra Pradesh (8.8%), Karnataka (7.2%) and Uttar Pradesh (6.8%). These together produce > 90 per cent of the total gram commodity in the country.

3.8. The major arhar producing states are Maharashtra (33.6%), Karnataka (15%). Madhya Pradesh (10.5%), Uttar Pradesh (10.1%), Gujarat (8.8%) and Andhra Pradesh (7.8%).These 06 states together contributes about 86 % per cent of Tur.

4. KHARIF PRODUCTION ESTIMATES- 2015

During present Kharif 2015, an area of 113.22 lakh ha is reported as covered under different pulses which is about 5% higher than the normal area. Reduction in sown area as compared to states' normal coverage is observed in the states of Maharashtra, Gujarat, Rajasthan and Telangana owing to erratic behaviour of monsoon. The Kharif-2015 production estimates have been compiled on the estimates provided by the major State Agriculture Departments. For Bihar and other minor states, normal yield estimates have been considered to compute production. Now, the revised current total kharif pulse production estimates is likely to be at 57.01 lakh tonnes which is 7% less than the states' own first forecast of 60.97 lakh tonnes and approx. 3 per cent more than the 1st official advance Estimates of DES (55.60 lakh tonnes), Govt. of India.

4.1. Major shortfall of about 13% under urd (blackgram) may be attributed to erratic weather, dry spell and Yellow Vein Mosaic.

4.2. As on date of the reporting, pigeonpea is at vegetative to flowering and pod formation stage. As per field visit by this Directorate, and state' report and discussion with concerned

field officials, the crop condition is quite normal. Subject to continuance of favourable weather, the crop harvest would be as per these revised estimates.

4.3. All India crop-wise estimates are summarised below (**Table II**)

Table II: All India crop-wise Kharif-2015 Estimates

S. N.	Crop	Area (lakh ha)		DES 1st Advance	States' Production (Lakh Tonnes)		Yield (kg/ha)	
		Normal	Sown		1st Est.	Revised	1st Est.	Revised
1.	Arhar	39.054	39.001	26.10	27.810	26.479	713	679
2.	Urdbean	23.736	29.105	13.70	14.956	13.058	514	449
3.	Moongbean	24.215	25.045	8.60	9.889	9.246	395	369
4.	Other Pulses	21.175	20.078	7.20	8.318	8.229	414	410
	Total Kharif Pulses	**108.184**	**113.229**	**55.60**	**60.973**	**57.012**	**538**	**503**

Normal area (Ave. 2009-10 to 2013-14)

4.4. State-wise Kharif-2015 pulse production estimates are at **Annex- I**.

5. RABI/SUMMER TARGETS -2015-16

The Rabi Pulses are grown in a Normal area of 139 lakh ha. The 2015-16 Rabi Pulse production targets fixed by Government of India (Ministry of Agriculture and Farmers Welfare) are at 130 lakh tonnes.

5.1. The revised states' Rabi Pulse targets for all rabi pulse crops together for current Rabi 2015-16 are at 155.02 lakh ha. Except the states of Bihar and other minor states almost all the states have confirmed their Rabi prospects. The states' targeted pulse area of 155 lakh ha is > 11 per cent higher than the Normal all India rabi pulse area.

We may therefore, expect a good harvest to achieve targeted total pulse production of 130 lakh tonnes during Rabi.

5.2. Crop-wise revised Rabi 2015-16 targets for area is summarised below (**Table III**)

Table III: All India crop-wise Rabi Targets 2015-16

S. N.	Crop	Area (lakh ha)		Production (Lakh Tonnes)		Yield (kg/ha)
		Normal	Target (states)	Normal	Target (GOI)	Normal
1.	Chickpea	87.724	92.799	83.516	95.000	947
2.	Urdbean	7.515	10.955	4.683	5.200	627
3.	Moongbean	8.704	9.653	4.073	6.100	515
4.	Lentil	14.835	15.387	10.371		700
5.	Peas	9.058	8.490	7.463		941
6.	Other rabi Pulses	11.250	17.736	6.486	23.700	576
7.	**Total Rabi Pulses**	**139.086**	**155.020**	**116.592**	**130.000**	**854**

Normal area, production and yield (Ave. 2009-10 to 2013-14)

5.3. State-wise Rabi-2015 pulse targets are at **Annex- II.**

Annexure-16

4.4. State-wise Kharif-2015 pulse production estimates

State/Crop	Normal Area	Area sown (Lha)	Estimates				Remarks
			Production (LT)		Yield (kg/ha)		
			1st	Revised	1st	Revised	
1. **Andhra Pradesh**							
Arhar	2.020	2.140	1.180	-	551	-	The yield of blackgram and greengram have not affected however, due to prolonged dry spell in June and July the redgram crop growth was slow and due to high rainfall after August it was recovered.
Urdbean	0.190	0.390	0.330	-	846	-	
Moongbean	0.260	0.400	0.270	-	675	-	
Other Pulses	0.14	0.350	0.290	-	828	-	
Total	**2.610**	**3.280**	**2.070**	**-**	**631**	**-**	
2. **Assam**							
Arhar	0.062					-	
Urdbean							
Moongbean							
Other Pulses		0.790	0.530		670		
Total	**0.062**	**0.790**	**0.530**	**-**	**670**	**-**	
3. **Bihar**							
Arhar	0.240	0.610	0.995	-	1631	-	
Urdbean	0.157	0.140	0.123	-	879	-	
Moongbean	0.086	0.130	0.092	-	707	-	
Other Pulses	0.119	0.130	0.032	-	246	-	
Tota	**0.602**	**1.010**	**1.242**	**-**	**1229**	**-**	
4. **Chhattisgarh**							
Arhar	0.544	1.260	0.980	0.880	777	698	
Urdbean	0.990	1.450	0.760	0.720	524	496	
Moongbean	0.093	0.240	0.140	0.110	583	458	
Other Pulses	0.505	0.200	0.180	0.180	900	900	
Total	**2.132**	**3.150**	**2.060**	**1.890**	**654**	**600**	
5. **Gujarat**							
Arhar	2.450	2.300	2.640	2.610	1147	1135	
Urdbean	0.956	0.800	0.460	0.420	575	525	
Moongbean	1.524	1.000	0.470	0.430	470	430	
Other Pulses	0.538	0.330	0.16	0.072	484	218	
Total	**5.468**	**4.430**	**3.730**	**3.532**	**844**	**797**	
6. **Haryana**							
Arhar	0.179						-
Urdbean	0.035						
Moongbean	0.134						
Other Pulses	0.041	0.220	0.180		820		
Tota	**0.389**	**0.220**	**0.180**	**-**	**820**	**-**	
7. **Jharkhand**							
Arhar	1.343	1.829	1.919	1.864	1049	1019	
Urdbean	0.861	0.971	0.858	0.447	884	460	
Moongbean	0.238	0.183	0.147	0.069	377	377	
Other Pulses	0.392	0.272	0.191	0.098	702	360	
Total	**2.834**	**3.255**	**3.115**	**2.478**	**957**	**761**	

State/Crop	Normal	Area sown	Estimates	Remarks

	Area	(Lha)	Production (LT)		Yield (kg/ha)		
			1st	Revised	1st	Revised	
8. **Karnataka**							
Arhar	7.492	7.410	3.040	-	410	-	Failure of rains during July and August in major parts of North Interior Karnataka affected the green gram and Black gram sown during June and hampered normal coverage of Redgram in Vijayapura, Raichgur Koppal, Ballari and Tumakuru districts
Urdbean	1.018	0.860	0.270	-	313	-	
Moongbean	3.056	3.260	0.570	-	175	-	
Other Pulses	2.156	1.93	0.94	-	487	-	
Total	**13.722**	**13.460**	**4.820**	**-**	**358**	**-**	
9. **Madhya Pradesh**							
Arhar	4.758	5.790	5.960	4.820	1029	832	Deficit rainfall in 23 districts. About 50% yield reduction in moong and 30% in urdbean
Urdbean	5.725	9.270	4.750	3.370	512	363	
Moongbean	0.871	1.840	0.870	0.410	472	222	
Other Pulses	0.183	0.140	0.060	0.040	428	285	
Total	**11.537**	**17.040**	**11.650**	**8.640**	**684**	**507**	
10. **Maharashtra**							
Arhar	11.898	9.730	5.330	-	548	-	Reduction in area and production owing to erratic monsoon behaviour.
Urdbean	3.788	2.540	0.640	-	253	-	
Moongbean	4.554	3.590	0.860	-	239	-	
Other Pulses	0.994	1.120	0.270	-	241	-	
Tot	**21.234**	**16.980**	**7.100**	**-**	**418**	**-**	
11. **Odisha**							
Arhar	1.380	2.050	1.950	-	951	-	-
Urdbean	1.087	3.500	1.750	-	500	-	
Moongbean	1.098	3.000	1.500	-	500	-	
Other Pulses	1.311	1.100	0.670	-	609	-	
Tot	**4.876**	**9.650**	**5.870**	**-**	**608**	**-**	
12. **Punjab**							
Arhar	0.036	0.080	0.080	-	1000	-	-
Urdbean	0.026	0.050	0.030		600		
Moongbean	0.063	0.100	0.090	-	900	-	
Other Pulses				-		-	
Tot	**0.125**	**0.230**	**0.200**	**-**	**870**	**-**	
13. **Rajasthan**							
Arhar	0.180	0.143	0.108	-	755	-	-
Urdbean	1.827	2.060	1.407	-	683	-	
Moongbean	10.111	9.655	4.536	-	470	-	
Other Pulses	13.172	11.538	3.913	-	339	-	
Total	**25.290**	**23.396**	**9.964**	**-**	**426**	**-**	
14. **Tamil Nadu**							
Arhar	0.395	0.781	0.424	-	543	-	-
Urdbean	0.469	0.887	0.212	-	528	-	
Moongbean	0.249	0.403	0.142	-	352	-	
Other Pulses	0.778	0.929	0.196	-	211	-	
Total	**1.891**	**3.000**	**0.974**	**-**	**325**	**-**	

State/Crop	Normal Area	Area sown (Lha)	Estimates				Remarks
			Production (LT)		Yield (kg/ha)		
			1st	Revised	1st	Revised	
15. **Telangana**							
Arhar	2.780	2.000	0.610	0.610	305	305	40 to 50 % yield loss
Urdbean	0.390	0.190	0.020	0.012	105	63	
Moongbean	1.290	0.870	0.090	0.055	103	63	
Other Pulses	0.03						
Total	**4.490**	**3.060**	**0.720**	**0.677**	**235**	**221**	
16. **Uttar Pradesh**							
Arhar	3.162	2.780	2.500	-	899	-	As per Rapid assessment of the deptt. of Agri. statistics and Crop Insurance.
Urdbean	5.274	5.190	2.780	-	535	-	
Moongbean	0.554	0.370	0.110	-	297	-	
Other Pulses							
Total	**8.990**	**8.340**	**5.390**	**-**	**646**	**-**	
17. **Uttarakhand**							
Arhar	0.024	0.040	0.040	0.034	1000	850	-
Urdbean	0.142	0.130	0.100	0.081	769	623	
Moongbean							
Other Pulses	0.246	0.280	0.270	0.228	964	814	
Total	**0.412**	**0.450**	**0.410**	**0.343**	**911**	**762**	
18. **West Bengal**							
Arhar	0.013						-
Urdbean	0.569	0.630	0.441	-	700	-	
Moongbean	0.012			-		-	
Other Pulses	0.010	0.050	0.045	-	900	-	
Total	**0.604**	**0.680**	**0.486**	**-**	**715**	**-**	
19. **Other states**							
Arhar	0.098	0.058	0.054	-	931	-	-
Urdbean	0.232	0.047	0.025	-	532	-	
Moongbean	0.022	0.004	0.002	-	500	-	
Other Pulses	0.563	0.699	0.535	-	765	-	
Total	**0.915**	**0.808**	**0.616**	**-**	**762**	**-**	
20. **All India**							
Arhar	**39.054**	**39.001**	**27.810**	**26.479**	**713**	**679**	
Urdbean	**23.736**	**29.105**	**14.956**	**13.058**	**514**	**449**	
Moongbean	**24.215**	**25.045**	**9.889**	**9.246**	**395**	**369**	
Other Pulses	**21.175**	**20.078**	**8.318**	**8.229**	**414**	**410**	
Total Kharif Pulses	**108.184**	**113.229**	**60.973**	**57.012**	**538**	**503**	

Lha-Lakh ha, LT- Lakh tonnes

Annex-II

5.4. State-wise Rabi-2015 pulse targets

S.N.	State/Crop	Area (lakh Ha)		Production (lakh tonnes)			Yield (kg/ha)	
		Normal	Target	Normal	Target (GOI)	Target (State)	Normal	Target
1.	**Andhra Pradesh**							
	Chickpea	4.680	4.750		8.100	5.930		1250
	Urdbean	3.490	2.750		2.000	2.230		811
	Moongbean	1.230	1.000		0.800	0.710		710
	Other Pulses	0.390	0.460		0.500	0.350		761
	Total	**9.790**	**8.960**		**11.400***	**9.220**		**1029**
2.	**Assam**							
	Chickpea	0.018		0.010	0.010		555	
	Urdbean	0.476		0.272	0.080		571	
	Moongbean	0.091		0.049	0.320		537	
	Lentil	0.250		0.147			588	
	Peas	0.255		0.172			677	
	Other Pulses	0.149		0.086	0.590		577	
	Total	**1.239**	**0.980**	**0.736**	**1.000**	**0.800**	**592**	**816**
3.	**Bihar**							
	Chickpea	0.581	1.150	0.704	0.750		1212	
	Moongbean	1.518		0.911	1.000		600	
	Lentil	1.780	2.220	1.832			1027	
	Peas	0.190	0.350	0.201			1057	
	Other rabi Pulses	0.757	1.450	0.823	2.800		1087	
	Total	**4.826**	**5.170**	**4.471**	**4.550**		**925**	
4.	**Chhattisgarh**							
	Chickpea	2.578	3.600	2.404	2.800	4.120	933	1145
	Urdbean	0.061		0.014	0.050		233	
	Moongbean	0.068		0.016	0.050		228	
	Lentil	0.145	0.300	0.046		0.150	320	500
	Peas	0.153	0.500	0.054		0.290	353	580
	Other Pulses	3.363	4.350	2.024	2.700	2.680	602	616
	Total	**6.368**	**8.750**	**4.558**	**5.600**	**7.240**	**716**	**828**
5.	**Gujarat**							
	Chickpea	1.934	1.500	2.150	1.900	1.050	1112	700
	Urdbean	0.030		0.017	0.050		556	
	Moongbean	0.534		0.320	0.400		599	
	Lentil	0.000						
	Peas	0.000						
	Other Pulses	0.253	0.100	0.109	0.250	0.120	431	1200
	Total	**2.751**	**1.600**	**2.596**	**4.400**	**1.170**	**944**	**731**
6.	**Haryana**							
	Chickpea	0.810	1.050	0.744	1.050	1.050	919	1000
	Moongbean	0.587		0.320	0.500		545	
	Lentil	0.050						
	Peas	0.010		0.012			1200	
	Other Pulses		0.100		0.150	0.120		1200
	Total	**1.457**	**1.150**	**0.987**	**1.700**	**1.170**	**677**	**1018**

S.N.	State/Crop	Area (lakh Ha)		Production (lakh tonnes)			Yield (kg/ha)	
		Normal	Target	Normal	Target (GOI)	Target (State)	Normal	Target
7.	**Jharkhand**							
	Chickpea	1.109	2.420	1.222	1.750	3.630	1102	1500
	Lentil	0.360	0.750	0.306		0.90	850	1200
	Peas	0.360	0.560	0.360		1.110	1100	1982
	Other Pulses	0.107	0.140	0.099	0.800	0.110	925	786

	Total	**1.936**	**3.870**	**1.987**	**2.550**	**5.750**	**1053**	**1485**
8.	**Karnataka**							
	Chickpea	9.298	13.510	6.024	7.200		648	
	Urdbean	0.082	0.060					
	Moongbean	0.082	0.050					
	Other Pulses	1.498	1.690	0.788	0.670		526	
	Total	**10.960**	**15.310**	**6.812**	**7.950**		**622**	
9.	**Madhya Pradesh**							
	Chickpea	31.060	29.300	32.785	35.500	31.320	1056	1060
	Moongbean	0.481		0.219	0.880		455	
	Lentil	5.710	5.020	2.728		4.130	478	823
	Peas	2.730	2.650	1.587		2.810	580	1063
	Other Pulses	0.572	0.750	0.299	4.520	0.580	492	773
	Total	**40.553**	**37.72**	**37.618**	**41.000**	**38.840**	**930**	**1029**
10.	**Maharashtra**							
	Chickpea	13.440	13.068	11.410	13.650		849	
	Urdbean	0.044		0.021			487	
	Moongbean	0.051		0.020			390	
	Lentil	0.050		0.020			400	
	Peas	0.260		0.124			478	
	Other Pulses	0.904	1.244	0.315	0.500		349	
	Total	**14.749**	**14.313**	**11.910**	**14.150**		**816**	
11.	**Odisha**							
	Chickpea	0.428	0.500	0.329	0.360	0.420	767	840
	Urdbean	0.059	3.500	0.022		1.780	373	509
	Moongbean	1.551	6.600	0.532		3.340	343	506
	Other Pulses	2.578	3.900	0.734	0.750	2.010	285	515
	Total	**4.616**	**14.50**	**1.617**	**1.630**	**7.550**	**491**	**521**
12.	**Punjab**							
	Chickpea	0.022	0.050	0.026	0.050	0.070	1181	1400
	Lentil	0.010	0.050	0.007		0.040	400	800
	Peas	0.020	0.050	0.025		0.070	1204	1400
	Other Pulses	0.164		0.135	0.200		823	
	Total	**0.216**	**0.150**	**0.193**	**0.250**	**0.180**	**893**	**1200**
13.	**Rajasthan**							
	Chickpea	14.556	14.500	12.228	14.900	12.330	840	850
	Lentil	0.330		0.316			959	
	Peas	0.066		0.100			1513	
	Other Pulses	0.770	0.500	0.080	0.200	0.600	103	1200
	Total	**15.722**	**15.000**	**12.724**	**15.100**	**12.930**	**809**	**862**
14.	**Tamil Nadu**							
	Chickpea	0.078		0.051	0.050		654	
	Urdbean	2.420	4.445	1.276	2.000	3.912	527	880
	Moongbean	1.325	1.823	0.615	1.000	1.513	464	830
	Other Pulses	0.610	1.732	0.286	0.000	1.105	469	638
	Total	**4.433**	**8.000**	**2.228**	**3.050**	**6.530**	**502**	816

S.N.	**State/Crop**	**Area (lakh Ha)**		**Production (lakh tonnes)**			**Yield (kg/ha)**	
		Normal	**Target**	**Normal**	**Target (GOI)**	**Target (State)**	**Normal**	**Target**
15.	**Telangana**							
	Chickpea	0.960	1.250		1.850	1.850	1479	1479
	Urdbean	0.130	0.200		0.180	0.180	925	900
	Moongbean	0.140	0.180		0.150	0.150	833	833
	Other Pulses	**0.160**	0.240		0.150	0.150	625	625
	Total	**1.390**	**1.870**		**2.330**	**2.330**	**1245**	**1245**
16.	**Uttar Pradesh**							
	Chickpea	5.892	5.865	5.749	6.100	7.431	976	1267
	Urdbean	0.488		0.310	0.400		636	

	Moongbean	0.370		0.283	0.350		764	
	Lentil	5.390	6.017	4.286		6.649	795	1105
	Peas	3.206	4.160	4.059		6.200	1266	1490
	Other Pulses				7.650			
	Total	**15.346**	**16.042**	**14.568**	**14.500**	**20.280**	**949**	**1264**
17.	**Uttarakhand**							
	Chickpea	0.008	0.006	0.007	0.020	0.005	875	833
	Lentil	0.130	0.110	0.101		0.090	776	818
	Peas	0.060	0.070	0.053		0.070	883	1000
	Other Pulses	0.002	0.00	0.00	0.180	0.000	000	
	Total	**0.200**	**0.186**	**0.162**	**0.200**	**0.165**	**810**	**887**
18.	**West Bengal**							
	Chickpea	0.234	0.280	0.262	0.400	0.336	1120	
	Urdbean	0.110		0.096	0.100		887	
	Moongbean	0.166		0.119	0.200		716	
	Lentil	0.600	0.920	0.532		0.920	892	
	Peas	0.116	0.150	0.129		0.180	1112	
	Other Pulses	0.307	1.080	0.269	1.150	1.224	876	
	Total	**1.533**	**2.430**	**1.407**	**1.550**	**2.660**	**918**	
19.	**All India**							
	Chickpea	**87.724**	**92.799**	**83.516**	**95.000**		**947**	
	Urdbean	**7.515**	**10.955**	**4.683**	**5.200**		**627**	
	Moongbean	**8.704**	**9.653**	**4.073**	**6.100**		**515**	
	Lentil	**14.835**	**15.387**	**10.371**			**700**	
	Peas	**9.058**	**8.490**	**7.463**			**941**	
	Other Pulses	**11.250**	**17.736**	**6.486**	**23.700**		**576**	
	Total Pulses	**139.086**	**155.020**	**116.592**	**130.000**		**854**	

***- Including targets of Telangana**

Summer Pulses Targets (2016)

S.N.	State/Crop	Area (lakh Ha)	Production (lakh tonnes)	Yield (kg/ha)
		Target	Target (State)	Target
1.	**Uttar Pradesh**			
	Urdbean	1.670	1.190	710
	Moongbean	1.410	1.270	903
	Total	**3.080**	**2.460**	798
2.	**Assam**			
	Urdbean	1.029	0.063	61
	Moongbean	0.058	0.039	672
	Total	**1.087**	**0.102**	**93**
3.	**Andhra Pradesh**			
	Urdbean	1.170	0.940	800
	Moongbean	0.280	0.200	700
	Total	**1.450**	**1.130**	**779**
4.	**Madhya Pradesh**			
	Urdbean	0.100	0.100	1050
	Moongbean	2.900	3.480	1200
	Total	**3.000**	**3.580**	**1193**
5.	**Punjab**			
	Moongbean	0.700	0.700	1000
	Total	**0.700**	**0.700**	**1000**
6.	**Haryana**			
	Moongbean	0.640	0.500	780
	Total	**0.640**	**0.500**	**780**

Annexure-16

Directorate of Pulses Development,
Government of India
Ministry of Agriculture & Farmers Welfare
Deptt. Agri., Cooperation & Farmers Welfare
Bhopal -462004

Dated: 23.10.2015

Sub:-Report on Kharif crop conditions/situation and Rabi prospects - Madhya Pradesh State
(Ref.: Ministry's Letter No. 13-3/2015-CU I dated 14th October, 2015.)

7. Kharif crop situation

7.1 In the state of M.P. monsoon activated on 14th June, 2015. The total seasonal rainfall received (14.06.2015 to 30.09.2015) was 823.1 mm which is 13% less of the state's normal rainfall of 949.1 mm. As per the data, 5 districts received excess, 23 normal and 23 received deficit rainfall.

7.2 The normal area under kharif crops is 120.82 lakh hectares. Target of 125.92 lakh hectares was proposed for kharif 2015 about 4 % more than normal. Kharif 2015 crops have been adversely affected due to prolonged dry spell of 20 days or more beginning from 3rd Sept., 2015 to 20th Sept., 2015 and last rain received on 23rd Sept., 2015. The deficit in rainfall is more than 30% in eastern and northern part of M.P. Out of 51 districts 23 districts have received less rainfall (more than 20 % deficit in rainfall). These districts include:

Jabalpur, Katni, Balaghat, Seoni, Mandla, Narsinghpur, Sagar, Damoh, Panna, Tikamgarh, Chhatarpur, Rewa, Sidhi, Singroli, Shahdol, Annuppur, Umaria, Morena, Shepurkala, Bhind, Gwalior, Shivpuri and Datia.

7.3 Due to less rainfall, early recession of monsoon and rise in October temperature, their has been substantial loss to kharif crops. It is estimated that Soybean production in the state will be only 38 Lakh MT (39 Lakh MT less than the First Forecast). The soybean productivity in the state is expected to be 6.50 Q/ha. The productivity loss in majority of the districts is more than 50 %. Similarly, Urd production is severely affected. Urd production is expected to be 3.37 Lakh MT (1.38 Lakh MT less than First Forecast). There has been more than 50 % productivity loss in moong. Paddy cultivation in 20.24 Lakh ha sown area is under tremendous moisture stress. The productivity of paddy expected to decline to 20.45 Q/ha (Which is more than 25 % productivity loss). The expected production of paddy is around 41.39 Lakh MT in place of 52.31 Lakh MT as in the First Forecast reported by the State. As the October temperatures are rising, the losses to paddy crop, which would mature in November, are going to be furthermore.

8. Rabi crop situation

The area under Rabi crop in the State in 2013-14 was 110 lakh ha and in 2014-15 was 106 lakh ha. It is estimated that Rabi crop area for 2015-16, targeted at 105.36 lakh ha. is reduced to 101 lakh ha due to severe moisture stress. Crop-wise details are given below.

2.1 Crop-wise details

Crops	Area (lakh ha)		
	Normal	**Target**	**Revised Target**
Wheat	40.78	58.70	55.85
Barley	0.80	0.44	0.42
Total Cereals	**41.58**	**59.14**	**56.27**
Gram	26.49	28.60	29.30
Lentil	5.29	5.30	5.02
Peas	**1.97**	2.62	2.65
Total Pulses	**34.32**	**36.98**	**36.97**
Rabi Foodgrains	**75.90**	**96.12**	**93.24**
Rapeseed/Mustard	7.02	6.79	5.77
Linseed	1.30	1.65	1.54
Total Rabi Oilseeds	**8.32**	**8.44**	**7.31**
Sugarcane	0.55	0.80	0.68
Total Rabi Crops	**84.77**	**105.36**	**101.23**

9. Input- Seeds: Availability status

Sufficient inputs for rabi crops are available in the State, however some shortage of seeds of Pulses & Oilseeds have been reported by the State. The crop wise Target & availability is given below.

Unit : Quantity in Quintals

Crop	Target	Availability	Shortage
Wheat	1562000	1741587	-
Barley	2000	1435	565
Gram	400000	150513	249487
Peas	30000	4268	25732
Lentil	11000	2520	8480
Total Pulses	**441000**	**157301**	**283699**
Mustard	15000	9850	5150
Linseeds	900	468	432
Total oilseeds	**15900**	**10318**	**5582**

10. Districts visited by DPD, Bhopal

Out of 23 deficit districts, this Directorate visited 8 districts viz. Katni, Jabalpur, Sagar ,Damoh, Shahdol, Anuppur, Bhind and Morena of Madhya Pradesh and remaining other deficit districts discussed over telephone. The brief observations are as below:

4.1 Katni

- As on 16.10.2015 rains received 542.7 mm against the last year rains of the same period of 611.4 mm and normal rainfall of the district is 1124.4 mm.
- About 27% less coverage of kharif target and 21% yield reduced due to deficit rains.
- Major kharif crops of the districts are paddy, arhar & til.
- Rainfed paddy totally failed due to long dry spell as last rains received by the district on 17th September, 2015.
- Two village Chapra and Uttampur, Block- Bahoriband of Katni district visited on 19th Oct. 2015. The paddy crop condition is normal in Chapra village as irrigated through tube-well. However, rainfed paddy crop in Uttampur village are totally failure due to non availability of irrigation.

- During the visit interacted with farmers and drought affected survey team of and their members in Uttampur village. They informed team verified 600 khasra of the area only crop found on 6 field and others field are cultivated due to failure of paddy crop.
- Kharif standing crop paddy at milking to dough stage, Arhar at flowering to fruiting stage, no field observed sowing of rabi crops due to moisture stress and high temperature as ranging from 32-35^0C in the visited area.
- Rabi target reduced from 1.58 lakh ha to 1.02 lakh ha due to deficit rains in the district.
- More emphasis being given to less water requirement crop like Gram, Lentil, Mustard and Linseed is suggested in meeting with Collector of the district.

4.2 Jabalpur

- As on 16.10.2015 rains received 766.3 mm against the last year rain 850.9 mm in the same period and normal rains of the district 1312.0 mm.
- 100 % target of kharif area achieved by the district.
- Soybean crop damaged due to dry spell, YMV (Yellow Mosaic Virus) and insect –pest, about 2 to 3 quintals yield obtained in crop cutting data.
- Standing paddy crop and Arhar is normal in Jabalpur block however, stunted growth in paddy observed in Umariapatan village of panagar block and also farmer informed that they could not transplanted paddy due to deficit rains.
- Paddy crop at milking to dough stage and Arhar at flowering to pod formation stage.
- Sowing of rabi crop is reported only field pea about 1200 ha however, in visited area some fields observed under gram crop which is at germination to branching stage.
- DDA, informed some wheat area diverted to Gram, Lentil & Mustard crop this year due to less irrigation water availability in water reservoir.
- Input arrangement being done by district authority however, shortage of gram seed reported.
- Sowing of wheat is delayed due to prevailing high temperature ranging from 32- 35^0C.

4.3 Shahdol

- As on 30.09.2015 rains received 519.5 mm against the last year rain 942.0 mm in the same period and normal rains of the district 994.7 mm.
- 100 % target of kharif area achieved by the district.
- Soybean crop damaged due to dry spell, YMV (Yellow Mosaic Virus).
- About 1 to 1.5 quintals yield obtained in crop cutting data.
- Standing Arhar crop is in normal condition. Stunted growth in paddy observed in some pockets.
- Paddy crop at milking to dough stage and Arhar at flowering to pod formation stage.
- Sowing of rabi crop about (100 ha) is reported under Field pea, Lentil & Niger.
- DDA/Field staff, informed some wheat area diverted to Gram, Lentil & Mustard crop this year due to less irrigation water availability in water reservoir.
- Input arrangement being done by district authority however sowing of wheat crop is delayed due to prevailing high temperature at 35^0C to 37^0C.

4.4 Anuppur

- As on 30.09.2015 rains received 635.10 mm against the normal rainfall of the district is 1174.80 mm.
- About 13% less coverage of kharif target and 50 % yield reduced due to deficit rains.
- Major kharif crops of the districts are soybean, maize, paddy, kodo-kutki, pigeonpea.
- Paddy crop severe damaged due to long dry spell as last rains received by the district on 17th September, 2015. However, crop is normal in the field where assured irrigation is available.
- Kharif standing crop paddy at milking to dough stage, Arhar at flowering to pod formation stage, no field observed sowing of rabi crops due to moisture stress and high temperature as above 32^{0}C in the visited area.
- Due to deficit rains in the district, more emphasis being given to less water requirement crop like Gram, Lentil, Mustard and Linseed.

4.5 Sagar

- As on 15.09.2015 rains received 633.0 mm against the normal rainfall of the district is 1230.5 mm.
- Soyabean crop affected by YMV after 40-45 DOS due to high temperature & long dry spell.
- Major crop of Kharif are Soyabean, Urd, Paddy, moong & Arhar,
- Arhar crop is in good condition in irrigated areas whereas, rabi crop sowing has not been started to till date.
- Reservoirs are the only source for Irrigation to rabi crop about 45.21% availability reported.
- DDA, informed some wheat area diverted to Gram, Lentil crop this year due to less irrigation water availability in water reservoir.
- DDA informed that, this year pulses crop area increase Gram, Lentil, pea etc.
- Farmers discussed on rabi season preparation, but soil moisture is very low & irrigation water source is in poor condition.
- Field Extension officers & DDA suggested to farmers for intercropping promotion by SMS and other extension technology.

4.6 Damoh

- As on 15.09.2015 rains received 735.0 mm against the normal rainfall of the district is 1246.0 mm.
- Soyabean crop is affected due to long gap in rainfall.
- Arhar crop is Flowering & pod formation stage & in good condition.
- Pre irrigation by sprinkler has been started for sowing of gram crops in some of the parts of district.
- Major kharif crop are soybean, paddy, urd & mung .
- Farmers informed the estimated soybean crop yield obtained 4 to 5 quintals per ha.
- According to DDA instruction to all field extension workers for selection of farmers in rabi demonstration should be based on irrigation facility of availability on demo. plot.

4.7 Morena

- Last rainfall received in the first week of August, 2015.
- As on 30.09.2015 rains received 405.0 mm against the normal rainfall of the district is 706.9 mm.
- 78.32 % irrigated area from Rivers, Tubewells , Wells and other sources. and 21.67 % rainfed area in the district.
- Major Crops of Kharif Season i.e. Bajra, Arhar, Guar, Til Urd and Moong.
- Arhar crop is in flowering to pod formation stage & in good condition in irrigated area.
- Farmers told 15-20 % loss in Bajra, Guar & Til and 50 % loss in rainfed area.
- Urd & Moong crop has been failed due to long dry spell.
- Pre irrigation has been started for sowing of Mustard crops in some parts.

4.8 Bhind

- Rainfall has not received from the third week of August, 2015.
- 53.63 % irrigated area from Rivers, Tubewells , Wells and other sources and 46.37 % rainfed area in the district.
- Major Crops of Kharif Season i.e. Bajra, Til, Paddy, Jowar, Arhar, Guar, Urd and Moong. Mostly Bajra, Til, Urd, Moong, have been harvested.
- 15-20 % loss in Bajra, Paddy & Til in irrigated areas and 50 % loss in rainfed area.
- 80 % loss in Urd & Moong and 75 % loss in Arhar crop.
- Paddy crop is normal condition in irrigated area.

The overall crop situation of kharif crop has been adversely affected in deficit districts. Specially soybean, urd, moong and some area of paddy. The rabi pulse and oilseeds are usually sown on residual moisture. Since, no rainfall received from 23rd September, 2015, the residual moisture is very low and temperature is high the sowing of rabi crops is likely to be affected. Sowing of oilseeds and pulses in some districts is started however, state has not yet started the reporting the area under rabi crops in weekly report. If the temperature remains high in Oct. –Nov. and if there are no winter rains in November, then the Rabi area may fall down further and adversely affect standing Kharif crops.

Annexure-17

Directorate of Pulses Development,
Government of India, Ministry of Agriculture & Farmers Welfare
Department of Agriculture, Cooperation & Farmers Welfare,
Bhopal-462004 (MP)

Report of STLs under Soil Health Card Scheme in Bhopal & Indore District of MP

As per directives visited STLs under Centrally Sponsored Soil Health Card Scheme in Bhopal & Indore district (MP). The detailed reports are given below:

1.1 Physical progress report of Soil Testing for Macro & Micro Nutrient in Indore & Bhopal District of MP: 2014-15

S. No.	District	Nutrient Type	Annual Target	Sample Received	Sample Analysed	Recommendations Send as per analysis
A. Indore						
1.	**Indore**	Macro Nutrient	15000	1620	1620	1620
		Micro Nutrient	1360	180	165	165
2.	**Other than Indore**	Macro Nutrient	-	2863	2231	2231
		Micro Nutrient	-	838	838	838
Total		Macro Nutrient	**15000**	**4483**	**3851**	**3851**
		Micro Nutrient	**1360**	**1018**	**1003**	**1003**
B. Bhopal						
Bhopal		Macro Nutrient	15000	16820	15309	15309
		Micro Nutrient	5440	1344	1399	1399

1.2: Details of Soil Health Card Distribution: April, 2015 to September 19, 2015

S. No	District	Target (Kharif)	Number Of SHCs			
			No. of sample Received in STLs	Sample Tested	Number Of SHCs Prepared and Distributed amongst Farmers	% sample tested to annual target
1	**Indore**	10909	1606	1606	1606	15
2.	**Bhopal**	10000	6955	4193	4193	39
State Total		**771000**	**305000**	**125945**	**116945**	**15**

1.2 The following of the observations are taken up (As per check list provided by DACFW)

S. No	Question Asked	Perception Received from visited STLs
1.	Whether the soil samples have been taken correctly using GPS?	GPS Facility not available Currently
2.	Whether the soil samples are stored and registered at Block level for further distribution to the Soil Testing Laboratories (STLs)?	Yes
3.	How are the soil samples being received in the STLs i.e. from Block level office or directly from extension workers?	From Both
4.	How are the soil samples being received at the district level laboratory?	Farmers & Technical Staff
5	Whether the data entry is being done in the SHC portal?	Yes

6.	Whether staffs are aware about the Portal and are trained on how to enter the information in various modules?	Yes
7.	How & by whom data entries are being done in the SHC portal?	Department Technical Staff
8.	Whether the Aadhar number and Mobile number are being entered in registration module?	Not yet
9.	What is procedure followed for distribution of SHCs to farmers, i.e in melas, through extension workers, by post or any other method?	Extension workers & directly to Farmers
10.	Is any activity starting from soil sampling to printing of SHC out sourced by State Govt?	NO

2/-

S. No	Question Asked	Perception Received from visited STLs
11.	Does the visited lab has micronutrient testing facilities, if not where are samples analysed for micronutrients?	Yes
12.	Number of farmer's trainings and soil chemist's trainings organized by the State?	Number of farmer's trainings=02 ii. Soil chemist's trainings=02
13.	Whether soil sample test based financial assistance provided to farmers for micronutrients and soil amendments?	NO
14.	Whether 1% samples being sent for random checking of soil analysis for quality improvement?	NO

(The above information as per provided by the Asstt. Soil Survey Officer of Concerned district)

1.5 Staffing Position in the STLs office

S. No.	Designation	Post Sanctioned		Post filled		Post Vacant	
A.	**Technical Staffs**	**Bhopal**	**Indore**	**Bhopal**	**Indore**	**Bhopal**	**Indore**
1	Assistant Soil Survey Officer	1	1	1	1	0	0
2	Senior Agriculture Development Officer	2	2	2	2	0	0
3	Agriculture Development Officer	2	2	0	1	2	1
4	Laboratory Assistant	2	1	0	1	2	0
B.	**Administrative Staff**						
1	Accountant	1	1	1	1	0	0
2	Assistant Grade-2	1	1	1	1	0	0
3	Assistant Grade-3	1	1	1	1	0	0
4.	Peon	1	1	1	1	0	0
5.	Chokidar	1	1	1	1	0	0
Total		**12**	**11**	**08**	**10**	**04**	**1**

1.6 Major observations/Suggestions:

On the basis of discussion with in-charge of STLs and other Officials, the following observations/suggestions are as under

1. Air conditioner is required for precise analysis through Automatic Absorption Spectrometer (AAS).
2. Data Entry Operator is required for feeding the information of Soil Health Cards (SHCs).

3. Strengthening of Technical staff.
4. Edit option should be made available in new software at data entry level.
5. Fertilizer recommendation is not showing in Soil Health Card. This problem needs to be rectified at programmer level.
6. Skill up-gradation training related to new software of Soil Health Card is required.

The programme implementation of this new scheme is now gearing up in the state.

****

SECRETARY (AGRI., COOP & FW) (SHRI. SIRAJ HUSSAIN)
Date- 5th October, 2015

SECRETARY (AGRI., COOP & FW) (SHRI. S.K. PATNAIK)
Date-18th Feb., 2016

DR. J. S. SANDHU (EX. AGRI. COMMISSIONER)

DR. S.K. MALHOTRA (AGRI. COMMISSIONER)
3rd February, 2016

Joint Secretary (Crops) - Shri. Sanjay Lohiya


भारत सरकार
INDIA

WORKSHOP PHOTOGRAPHS

Brainstorming Session on Promotion of Pulses in New niches: Summer Cultivation
February 9-10, 2016 at IIPR, Kanpur

Photo Gallery (1)

Brainstorming Session on Promotion of Pulses in New niches: Summer Cultivation
February 9-10, 2016 at IIPR, Kanpur

Photo Gallery (2)

Brainstorming Session on Promotion of Pulses in New niches: Summer Cultivation
February 9-10, 2016 at IIPR, Kanpur

Photo Gallery (3)


Brainstorming Session

ICARDA

ICARDA STAFF MEETING WITH CHIEF MINISTER (M.P.)

NLMT-NFSM: MADHYA PRADESH KHARIF 2015

Team interaction with RAWE Student in KVK at Sidhi District

Field inspection of Soybean crop in Rewa district

Interaction with seed drill beneficiary district Sidhi

Interaction with pulse demonstration benficiaries organized by Satna

NLMT-NFSM: CHHATISGARH KHARIF 2015

Display Board on paddy cluster demonstration in Village-Kunjedabri, Block-Pussuor, District-Raigarh


Team interacted with Women SHGs in Village- Khalpodi, Block-Lundra, District-Ambikapur

Team visited NFSM -Maize cluster demonstration in Village- Khalpodi, Block-Lundra, District-Ambikapur

Team interacted with Women SHGs in Village- Basajhal, Block-Batoli, District-Ambikapur

NLMT-NFSM RABI 2015-16

ASHOKNAGAR

District-Ashoknagar, Block-Ishanagar, Vilage-Barodiya ,Wheat Demo. (Var. HI1531)

District-Ashoknagar, Block-Ishanagar, Vilage-Pataie, Multi crop thresher provided under NMAET scheme 2014-15

District-Ashoknagar, Block-Ishanagar, Vilage-Pataie, Interraction with farmers

District-Ashoknagar, Block-Ishanagar, Vilage-Chandanbehta, Cluster demonstration of Chickpea (var. JAKI 9218) under NFSM

Seed Production Programme in KVK-Shivpuri on chikpea (Var. JG 11)

KVK-Shivpuri Field visit of Different cultivars of Azvine

DISTRICT-GUNA

District-Guna, Block-Guna, Vilage Taknera, Irrigation Pipe provided under NFSM

District-Guna, Block-Guna, Vilage-Behataghat ,Wheat Demo. (Var. HI 8663)

District-Guna, Block-Guna, Village Gurvaikheda , Cluster Demo. Of Chickpea Variety JG-16

District-Guna, Block-Guna, Village-Torea , ***Farmer Name- Shri. Ganaga Ram***, seed production of pea (Variety-Arkel)

NLMT-CHHATISGARH RABI 2015-16

Koriya

Cluster Demonstration of Gram (var.- JG-9218) under NFSM-Pulses
District-Korea, Block-Baikunthpur, Village-Bhunde

KVK, Front Line Demonstration of Linseed (var.- Kartika JLS-9) under NMOOP
District-Korea, Block- Manendragarh,Village-Agariabehra

KVK, FLD of Mustard (var.-CG Sarson (BBM 05-01) under NMOOP
District-Korea, Block-Baikunthpur, Village-Dakapara

KVK, FLD of Pea, var.-Paras – (Paddy after Pea) under NFSM-Pulses
District-Korea, Block-Baikunthpur, Village-Khada

Kisan Gosthi/Interaction with farmers & officials
District-Korea, Block- Baikunthpur,Village- Bhunde

Front Line Demo. of Mustard (var. Bharat/CG Sarson 2 (RH 749) under NMOOP District-Surajpur, Block-Surajpur,Village-Kharakona

Balrampur

Mini Rice Mill under IAP Scheme, Roshni Self Help Group
District-Balrampur, Block-Rajpur, Village-Baghima

KisanGosthi
District-Balrampur, Block-Rajpur, Village-Baghima

Front Line Demo. of gram (var.- JG-9218) under NFSM –Pulses
District-Balrampur, Block-Rajpur, Village- Parasgudhi

BGERI-CHHATISGARH-2015

FIELD VISIT OF OFFICER/OFFICIALS, DPD

DR. A.K. SHIVHARE (ASSISTANT DIRECTOR, DPD)

SHRI. VIPIN KUMAR (ASSISTANT DIRECTOR, DPD)

DR. A. L. WAGHMARE (STA, DPD)

SHRI. SARJU PALLEWAR (STATISTICAL INVESTIGATOR)

SMT. ASHWINI BHOWARE , TECHNICAL ASSISTANT (NFSM), DPD

SHRI. SATEESH DWIVEDI, TECHNICAL ASSISTANT (NFSM), DPD