

NATIONAL LEVEL MONITORING TEAM

BRINGING GREEN REVOLUTION TO EASTERN INDIA



STATE-CHHATTISGARH

BGREI-KHARIF: 2017



सत्यमेव जयते

GOVERNMENT OF INDIA

MINISTRY OF AGRICULTURE & FARMERS WELFARE

(DEPARTMENT OF AGRICULTURE, COOPERATION & FARMERS WELFARE)

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ABBREVIATIONS

1. ADO-Agriculture Development Officer
2. AHD- Animal Husbandry Department
3. ATARI- *Agricultural Technology Application Research Institute*
4. BGREI -Bringing Green Revolution in Eastern India
5. CCR- Crop Cutting Results
6. CLR- Commissionerate of Land Revenue
7. CSBD- Cropping System based Demonstration
8. DDA-Deputy Director Agriculture
9. DES- Directorate of Economics and Statistics
10. DLMT- District Level Monitoring Team
11. DMF- District Mineral fund
12. DSR- Direct Seeded Rice
13. FLD- Frontline Demonstration
14. GM-General manager
15. GSC- General Steering Committee
16. HYVs ó High Yielding Varieties
17. IWMP- Integrated Water Management System
18. KVK- Krishi Vigyan Kendra
19. MARKFED- Marketing Federation
20. MITs- Minor Irrigation Tanks
21. NFSM- National Food Security Mission
22. NLMT- National Level Monitoring Team
23. NMOOP- National Mission on Oilseed and Oilpalm
24. NRRI- National Rice Research Institute
25. PMKSY-Pradhan Mantri Krishi Sinchai Yojana
26. RAEO- Rural Agriculture Extension Officer
27. RKVY -Rashtriya Krishi Vikas Yojana
28. SLMT- State Level Monitoring Team
29. SRI-System of Rice Intensification
30. ToT- Transfer of Technology
31. WUA-Water user Association

PREFACE

The Department of Agriculture, Co-operation & Farmers Welfare, Ministry of Agriculture & Farmers Welfare, Government of India has constituted a National Level Monitoring Team (NLMT) for monitoring of the implementation of special initiatives and interventions on crop development programme on Bringing Green Revolution to Eastern India (BGREI) activities. The BGREI is under implementation in the 07 states of Assam, Bihar, Chhattisgarh, Jharkhand, Odisha, Eastern Uttar Pradesh (Purvanchal) and West Bengal.

The Director, Directorate of Pulses Development, Govt. of India, (Deptt. of Agri., Coop. & FW), Bhopal, acts as Team leader/Convener. The other members include the Principal Scientist from ICAR-National Rice Research Institute (NRRI), Cuttack and the State Nodal officer, State Department of Agriculture, Govt. of Chhattisgarh. The NLMT undertakes the visit at least once in each Crop season to conduct i) In-depth inspection of the developmental activities/components in accordance to approved Action Plan ii) To study quantitative and qualitative achievements, impact of the delivery mechanism and its documentation with visual and video films iii) To provide concrete suggestions/recommendations for further necessary actions at the level of State Government as also for considerations at the level of Government of India.

The NLMT-Kharif 2017 was represented by Dr. K. Chattopadhyay, Principal Scientist (Plant Breeding) NRRI- Cuttack and Shri. P.C. Baghel, Joint Director and State Nodal Officer, BGREI, Chhattisgarh. The team visited four districts of two divisions and interacted with stakeholders/agencies involved in the associated in implementation of the Programme and also with a number of farmers, both in the beneficiary and non-beneficiary categories.

I am thankful to Shri Ajay Singh, Addl. Chief Secretary, APC, Shri A.K. Shrivastava, Secretary (Agri) and Shri M.S. Kerketta, Director (Agriculture), Govt. of CG for facilitating the field visit. I acknowledge the coordination of Shri P. C. Baghel, Joint Director/Nodal Officer BGREI, and C.G. for providing the relevant information/documents for benefit of the team members. I also acknowledge the sincere efforts of the Director cell and the technical officers of the Directorate of Pulses Development, Bhopal in bringing out the report publication.

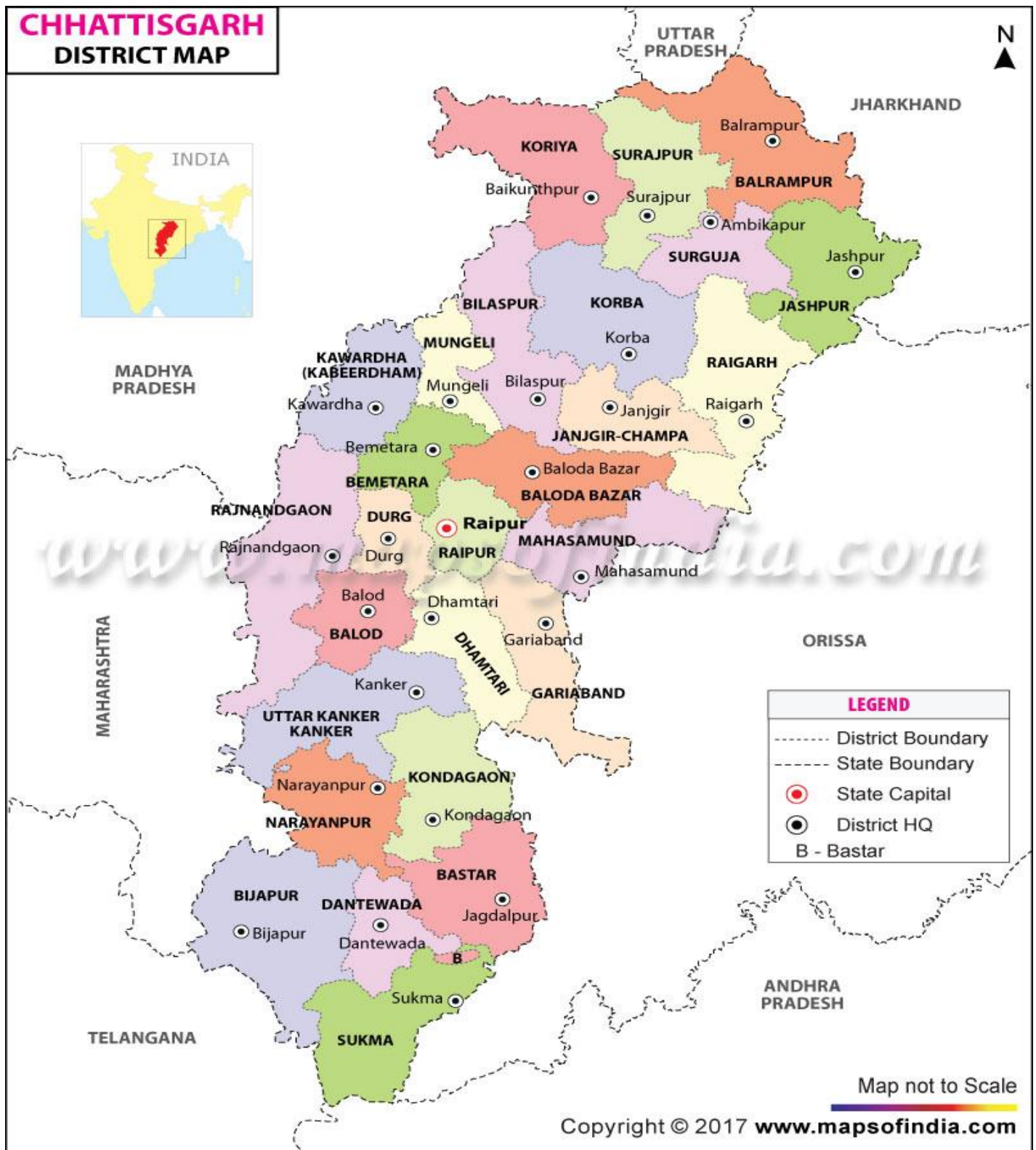
Bhopal (M.P.)
26th September, 2017

(A. K. Tiwari)
Director

AGRO-CLIMATIC ZONES OF CHHATTISGARH



DISTRICT MAP OF CHHATTISGARH



CHHATTISGARH: REPORT OF NATIONAL LEVEL MONITORING TEAM TO REVIEW IMPLEMENTATION OF BRINGING GREEN REVOLUTION TO EASTERN INDIA (BGREI) DURING KHARIF 2017.

1. BACKGROUND

- 1.1 The program of 'Bringing Green Revolution to Eastern India (BGREI)'- a lateral to Rashtriya Krishi Vikas Yojana (RKVY), is operational since 2010-11 in 07 eastern Indian states of Assam, Bihar, Chhattisgarh, Jharkhand, Odisha, Eastern Uttar Pradesh (Purvanchal) and West Bengal. The programme aims at reasonably enhancing the productivity and sustainability in rice based cropping system.
- 1.2 During 2010-11 most of the activities taken were short term strategies of Chhattisgarh, some of the States namely; Chhattisgarh, Jharkhand & West Bengal planned medium and long term strategies related to water & soil conservation such as construction of check dams, minor irrigation tanks (MITs), lift irrigation points, re-excavation of old ponds etc.
- 1.3 This program was conceptualized adopting focused approach on the **medium & long term strategies** for asset building activities relating to **water conservation and utilization in combination with the short term activities pertaining to Transfer of Technology(ToT)** of the major cereals, preferably in Non-NFSM districts.
- 1.4 The program consisted a bouquet of three broad categories of interventions, viz; (i) Block demonstrations of rice and wheat-short term strategy; (ii) Asset building activities consisting water conservation & utilization-medium term strategies and (iii) Site specific activities-both short term & medium term strategies for facilitating the petty works such as construction/ renovation of irrigation channels/electric power supply for agriculture purposes.
- 1.5 From 2015-16 the funding pattern between GOI & State has been 60:40. The inter- allocation of funds amongst 07 major interventions is *nearly 40% of the total funds for block/ cluster demonstrations, Seed distribution- 10% (HYV/Hybrids), Seed production (HYV/ Hybrids)-5% , Need based Inputs-10% (i) Micro nutrients and soil ameliorants- 5% ii) PP chemicals- 4% iii) Cropping System based training-1%,) asset building (farm machines & implements, irrigation devices)-20 %, site specific activities-10% and Marketing support (including Post-harvest Management)-5% . Monitoring at national level- 1%.*
- 1.6 Of the total block/cluster demonstrations,30% funds have been earmarked for cropping system based demonstrations (CSBD) **to be organized on stress tolerance rice varieties.**
- 1.7 During 2017-18 the All India total BGREI allocation is Rs. 707.29 crores. For Chhattisgarh the allocation is 118.30 crore (GoI-Rs. 70.98 + State -Rs. 47.32).Allocation towards rice is Rs. 111.05 crore ;wheat Rs. 7.25 crore.

2. AREA OF OPERATION

Commodity/ Crops covered	All India		Districts covered in Chhattisgarh (Nos.)	
	States (Nos.)	Districts (Nos.)		
Rice	7	106	14	Gariyaband, Mahasamund, Dhamtari, Durg, Balod, Bemetara, Janjgir, Sarguja, Surajpur, Balrampur, Kanker, Narayanpur, Jagdalpur, Kondagaon
Wheat	6	52	14	Gariyaband, Mahasamund, Dhamtari, Durg, Balod, Bemetara, Janjgir, Sarguja, Surajpur, Balrampur, Kanker, Narayanpur, Jagdalpur, Kondagaon

3. REVIEW/MONITORING MECHANISM

Level	Composition		Frequency of Meeting
Central	Central Steering Committee (CSC)	Secretary (DAC&FW)- Chairman J.S. (Crops) (DAC&FW), Member Secretary	Twice in a year
National	National Level Monitoring Team (NLMT)	Director CDDs- Convener Principle Scientist, Cuttack ó Member JDA, SDA ó Member	Once in a crop season
State	State Steering Committee (SSC)	APC/ Principle Secretary ó Chairman Director (agriculture)- Member Secretary	Quarterly
District	District Steering Committee (DSC)	DM/CDO ó Chairman DDA/DAO- Member Secretary	Thrice in a crop season (Pre-sowing, Mid-season, During harvest)

4. NLMT : COMPOSITION

S.No.	Organization	Names and Designation
i.	Government of India, Directorate of Pulses Development Deptt. of Agriculture, Cooperation & FW (Min. of Agri.& Farmer's Welfare) Vindhyachal Bhavan, Bhopal, (M.P.) (Email-dpd.mp@nic.in)	Dr. A.K. Tiwari, Director -Team leader (Mob. No.-9425010489)
ii.	ICAR-National Rice Research Institute (NRRI), Division of Crop Production, Cuttack (Odisha) (Email-krishnenducrri@gmail.com)	Dr. K. Chattopadhyay Principal Scientist, (Plant Breeding) - Member (Mob. No.- 9178248015)
iii.	Directorate of Agriculture, Govt. of Chhattisgarh, Labhandi, Raipur (CG) (Email- baghelpc@gmail.com)	Shri P.C. Baghel, Joint Director/ State Nodal Officer BGREI - Member (Mob. No. -9424213551)

5. STATE PROFILE: CG

Particulars		STATUS	
Population(Crore)		2.56 (Male- 1.29, Female-1.28)	
Population Growth (%)		22.61 ó 2011	
Forest Village		74	
Revenue Districts(Nos.)		27	
Block/ Janpad Panchayat (Nos.)		146	
Village Panchayat (Nos.)		10971	
Tehsil (Nos.)		150	
Total Village (Nos.)		20273	
KrishiUpajMandi(Nos.)		73	
Annual Rainfall (Ave.)		1296 mm (September, 2017 ó 877.90 mm)	
Land Use Pattern (Area : lakh ha)		Agricultural land use (Area - lakh ha)	
Geographical Area	138.00	Net sown area	47.75
Cultivable area	57.28 (41.53%)	Double Cropped Area	10.47
Forest area	63.15 (45.80%)	Gross cropped area	65.25
Land under non-agricultural use	10.30 (7.46%)	Kharif Area	47.75
Permanent pastures	5.25 (3.80%)	Rabi Area	17.50
Cultivable wasteland	3.51(2.55%)	Cropping Intensity	137%
Barren and uncultivable land	8.88 (6.43%)		
Current fallows	2.67 (1.93%)		
Irrigation (Area: lakh ha)		Source of Irrigation (Area : lakh ha)	
Net irrigated area	14.68	Canals	9.03 (61.55%)
Gross irrigated area	17.87	Tanks	0.43 (2.93%)
Rainfed area (to Cultivable Area)	39.41 (69%)	Open wells	0.20 (1.37%)
		Bore wells/ Tube Wells	4.28 (29.17%)
		Other Sources	0.73 (4.98%)
		Total Irrigated Area	14.67
Soil Type (Area - lakh ha)			
Alluvial Soil (Kachhar)	1.38 (2.7%)	Inceptisols (Matasi)	13.54 (26.9%)
Entisols (Bhata)	10.02 (20%)	Vertisols (Kanhar)	11.43 (22.8%)
Alfisols (Dorsa)	13.82 (27 %)	Land Classif. Total	50.19
Major Agricultural crops			
Kharif	Paddy, Pigeonpea. Soyabean, Maize,Mung, Urd, Kulthi		
Rabi	Wheat, Gram, Mustard, Safflower, Lathyrus, Field Pea, Lentil, Linseed, Groundnut		
Development Programme CSS / CS			
NFSM	NFSM-Paddy (13) ; Pulses (27); Coarse Cereals (09); PMT District- 27		
NMOOP	Mini Mission I- (Oilseeds) Mini Mission III- (TBOs)		
(*Source- ENVIS, Centre of M.P. State.)			

Note: Farm Families-37.46 lakh (80% small & Marginal farmers);> 57 % soil is medium to light Soil (i.e. Entisols, Alfisols&Inceptisols).

6. a) RAINFALL STATUS (2014-2017)

(unit- mm)

Year	June	July	August	September	October	Total	%
Avg. Rainfall	187.50	377.60	348.30	219.30	56.70	1189.40	
2014	96.10	442.80	312.50	256.50	74.80	1182.70	99
2015	256.00	261.30	286.40	201.20	4.00	1008.90	85
2016	153.80	371.20	361.50	297.80	72.30	1256.60	106
2017 (15.09.2017)	182.20	356.90	284.50	54.30	-	877.90	74

b) MAJOR RAINFALL IN RAINY DAYS : 2017

	Year- 2017								
	12 th June	03 rd July	10 th July	17 th July	24 th July	31 st July	21 st Aug	28 th Aug.	01 st Sept.
Last Year Rainfall (2016)	0	173.3	325.1	406	477.7	525	803.9	857.2	890.5
Rainfall -2017	29.5	226.5	281.3	352.0	483.1	539.1	713.3	776.8	823.6
Last 10 years Rainfall (Avg.)	37.2	221.2	292.3	375.5	468.4	546.3	785.9	845.5	882.6
% Over Avg. Rainfall	79.3	102.4	96.2	93.7	103.1	98.7	90.8	91.9	93.3

c) RAINFALL CONDITION OF DIFFERENT DISTRICTS OF CG STATE

< 40 % (Scanty)	61-80% (Deficit)	81-119% (Normal)	>120% (Excess)
-	11 Districts: Korea, Raipur, Balodabazar, Gariyaband, Bilaspur, Mungeli, Ranjnandgaon, Durg, Bemetara, Dhamtari, Kanker	12 Districts: Sarguja, Jashpur, Raigarh, Janjgir, Korba, Balod, Bastar, Kondagaon, Narayanpur, Dantewada, Bijapur	04 Districts: Surajpur, Balrampur, Kabirdham, Sukma

d) AFFECTED DISTRICTS DUE TO LOW RAINFALL

0-50 % (06 - Tehsil)	51-60% (07 -Tehsil)	61-70% (19 – Tehsil)
Raigarh – Dharamjaigad Raipur - Raipur Janjgir – Jaijpur Rajnandgaon – Chhuriya Durg - Dhamdha Balod – Gurur	Korea - Bakunthpur Balodabazar – Palari, Kasdol, Bilaigad Bilaspur – Masturi Bemetara- Saja Kanker – Durgkondal	Raigarh - Sarangad, Tamnar Raipur - Aarang, Tilda Gariyaband - Gariyaband Janjgir -Sakti Bilaspur -Kota Mungeli - Lormi, Pathriya Rajnandgaon –Dongargarh, Dongargaon Durg - Durg Bemetara – Berla, Navagad Dhamtari - Magarlod, Nagri Kanker - Bhanupratapur, Pakhanjur, Narharpur

Note: Monsoon started in the State from 12th June, 2017. The average rainfall recorded 877.90 mm upto 15st September, 2017 which is 254.80 mm less than normal rainfall 1132.70 mm.

7. CROP SCENARIO OF PADDY (2015-16 to 2016-17)

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

Description	Area		Production		Yield (kg/ha)	
	DES	CLR	DES	CLR	DES	CLR
2015-16						
BGREI Districts (14)	17.88 (48%)	19.51 (51%)	23.10 (48%)	27.33 (57%)	1291	1400
State (27)	37.09	38.23	48.02	48.02	1322	1322
2016-17						
BGREI Districts (14)	17.84 (48%)	Awaited	30.45 (52%)	Awaited	1707	Awaited
State (27)	37.45		59.05		1576	

8. CROP CUTTING RESULTS (2016-17)

Demonstration	Crop cutting result (Demo. Plot)		Crop cutting result (Control. Plot)		Gap over Control Plot	
	Production (under 5x5 mts) kg	Per ha. Production (Qtls.)	Production (under 5x5 mts) kg	Per ha. Production (Qtls.)	Actual (Qtls.)	%
Direct Seeded Rice	18.24	72.95	9.47	37.87	35.08	93
Line Transplanting	9.51	38.05	7.42	29.66	8.39	28
SRI	16.26	65.03	13.24	52.96	12.07	23
Stress Tolerance	10.45	41.80	8.80	35.21	6.59	19
Hybrid	11.93	47.74	9.75	39.00	8.74	22
Cropping System Based	9.96	39.85	8.45	33.78	6.07	18

9. ALLOCATION AND EXPENDITURE (2017-18)

(Rs in Lakh)

Allo.	Revalidation	Rel.	Total Fund Available	Expendit ure	Unspent	% Utilization against	
						total fund available	Allocation
11830	3108.5	5915	9023.5	2468.93	6554.57	27	21

10. (a) ECOLOGY WISE RECOMMENDED RICE VARIETIES FOR CG

Ecologies	Varieties Released (Within 10 years)	Recommended for promotion under BGREI
Irrigated	Chandra (120, 5.51 t), IGKVR-1 (122), GK 5022(123, 4.2t), KPH 467 Hybrid (126, 6.7t), Karma Mahsuri (127), Indira Sona (120-125, 7.0t), VNR 2245 (120-125, 7.0t), INDAM 200-017 (120-125, 6.6t), ArizeTej (HRI 169, 125, 7.0t), DRH ó 775 (127, 7.7t), 27P31(125-130, 8.0 ó 9.0t), PAC 837(130), 27P61 (Hybrid, 132), NK 16520 Hybrid (132, 6.1t), 27P61(132, 6.7t), IGKVR-2(133), PAC 8744 (130-135), Arize 6444 Gold (130-135), RNR 2354 (135), Sampada (135), 28P09 (135, 5.83t), Arize Prima (HRI-157,130-135, 6.5t), Badshahbhog Selection-1 (135, 2.93t), JKRH 3333 Hybrid(140, 5.98t), Dubraj Selection 1 (146, 3.72 t), Vishnubhog Selection-1 (146, 4.22 t), Tarunbhog Selection 1 (148, 4.07 t), CR Dhan 907 (150), Chhattisgarh MadhurajDhan 55, BS 129G (Arize 6129 Gold), Chhattisgarh SugandhitBhog, Indira Maheshwari, 27P52, 27P63, KPH ó 199, KPH ó 371, Ankur 7434, PAC 807, CO 4 (TNRH 174)	Karma Mahsuri, Arize 6444 Gold, Indira Maheshwari, Vishnu bhog Selection-1, Chhattisgarh Madhuraj Dhan 55, DRH ó 775
Aerobic	Indira Aerobic-1(118), Swarna Shreya (115, 4.55 t), CR Dhan 201 (118), Chhattisgarh Zinc Rice 1 (CGZR 1, 120, 3.77 t), DRR Dhan 45 (123, 4.23 t), Indira Barani Dhan1	Indira Barani Dhan1, Indira Aerobic-1 CR Dhan 201, Chhattisgarh Zinc Rice 1 DRR Dhan 45
Rainfed Upland	DRR Dhan 42 (IR 64 Drt I, 118),	DRR Dhan 42
Rainfed Shallow Lowland	Swarna Sub 1(145), Improved Samba Mahsuri, Jaldubi	Swarna Sub 1, Improved Samba Mahsuri,

(b) ECOLOGY WISE MANAGEMENT PRACTICES FOR RICE (ICAR-NRRI) IS GIVEN UNDER ANNEX- XIII

11. SUMMARY FIELD VISIT/ ACTIVITIES

The team visited in two divisions (Bilaspur and Sarguja) of BGREI comprising four districts of Janjgir-Champa, Sarguja, Balrampur and Surajpur between 21st- 25th August, 2017. The ICAR-NRRI representative joined the team on 23rd, August, 2017, in three districts (Sarguja, Balrampur and Surajpur). The KVK Scientists and the stake holders agencies involved in the implementation of BGREI were associated during the field visit/ interactions with the beneficiaries and farmers.

District/ Block	Village	Events organized/ activities exhibited to NLMT-BGREI	Observations/Remarks
Janjgir- Champa/ Baloda	Navapara	Cluster Demonstration Paddy- line transplanting	<ul style="list-style-type: none"> Paddy hybrid (var.- CO 4,Rashi co.); 50 ha; 56 beneficiaries. Nursery raising - 1st July; Seed rate- 15 kg/ha; Transplanting- 22nd July; only seed and PSB culture provided. Line transplanting in some field also had inspection path (1 feet / 30 cms wide at an interval of 4 m. Crop expression very good; No weed infestation; Expected yield- 70 q/ha. Other inputs of crop cafeteria viz; Weedicide, INM, IPM, Ambika paddy weeder are yet to receive as on the date of visit <i>i.e.</i> August, 21st. GM and Distt. Manager, CG State Beej and Krishi Vikas Nigam were contacted/ advised to ensure the supply of inputs immediately.
Janjgir- Champa/ Baloda	Navapara	Cluster Demonstration Paddy- line transplanting	<ul style="list-style-type: none"> The farmers, during interactions informed that they have been taking 50-55 q/ha paddy yield from improved varieties in the past, now expect to harvest about 70 q/ha from the hybrid. The DDA was advised to provide support for cultivation of pulses under NFSM and also Dal mills etc under the component of local initiatives.

District/ Block	Village	Events organized/ activities exhibited to NLMT-BGREI	Observations/Remarks
Janjgir- Champa/ Baloda	Rasota	Checkdam constructed under PMKSY- IWMP- Phase-I/III (2009- 11-12)	<ul style="list-style-type: none"> Constructed under PMKSY with Rs. 10 lakh cost. It was reported that the WUA with 10 farmers/ members has been constituted, however, the necessary details/documentation was lacking; neither the members of the WUA were available for interactions. 23 farmers are getting the benefit of the check dam and have taken paddy in 11.5 ha area for the first time. The perspective plan of the check dam site was not prepared. The team therefore directed that every watershed structure should have a benchmark survey indicating the cropping system production and productivity including the allied sectors.
	Poach	Hybrid Paddy cluster Demo. along with seed production	<ul style="list-style-type: none"> Cluster demonstrations + seed production programme was organized with <i>“Kisan Bahu Uddeshiya Sahkari Samithi”</i> involving 50 farmers (23 members + 27 other farmers). Hybrid Swarna Sub-1(140 days) demonstrated under line transplanting is with good crop stand. <i>The demonstration with Hybrid Swarna Sub-1 also targeted for seed production under BGREI, is very good attempt by the DDA in view of paucity of hybrid seed of this recommended variety in CG.</i> The inputs under crop cafeteria were not delivered at this site as well, on the day of the visit of the NLMT.
Sarguja/ KVK- Ambikapur	Khairbar	Demonstration under stress tolerant variety	<ul style="list-style-type: none"> Paddy var. <i>Chandrahasini</i> (120 days) was demonstrated under resource rich ecology (<i>Chandrahasini is a drought tolerant variety has good tillers and need less water, ample irrigation water is available at this site</i>) whereas, this area has been growing hybrid paddy with good production.

District/ Block	Village	Events organized/ activities exhibited to NLMT-BGREI	Observations/Remarks
Sarguja/ Batoli	Mangari	Multi-crop Thresher	<ul style="list-style-type: none"> • In this village, a paddy hybrid seed production programme by a private seed agency was also noticed. The DDA was advised to ensure that the seed so produced is distributed/ utilized in the same district and also that the farmer has received the benefits under seed production.
	Poksari	Check dam	<ul style="list-style-type: none"> • BGREI- 2016-17 (Cost-Rs. 14.74 lakh). • Irrigated area-13.75 lakh ha; Beneficiaries-16 nos. • The selection of site was good, the gates will be put after September, 15th. • The NLMT advised to examine/ repair the minor cracks of the plaster on the retention wall. Similarly, the guide wall which is straight to be ensured to extend at 45⁰, so that the structure is safe in upstream.
Sarguja/ Sitapur	Petla	Checkdam Kisan Goshthi/ Farmers Interaction Hybrid paddy demo	<ul style="list-style-type: none"> • BGREI-2016-17; Cost- Rs. 13.14 lakh;12.75 ha;14 beneficiaries • The selection of site and construction is very good. • The selection of site was good, the gates will be put after September, 15th. • Paddy hybrid- CORH-3 and Sahyadri, 100 ha; line transplanting; 215 beneficiary farmers; 15 kg seed/ha was provided. • Inspection path was also left.
Sarguja/ Ambikapur	Parsapali	Field Visit (Traditional Weeding practice in paddy field)	<ul style="list-style-type: none"> • Farmer- Jai kumar was doing Patela operation in DSR paddy (30-35 days old crop). This traditional practice of Patela and Biasi, to suppress the weed, need to be validated and the district/ state may issue the suitable advisory accordingly (the age of the crop, weight of the patela so used, status of moisture/ water in the field etc).
Sarguja/ Mainpat	Aamgaon	Cluster Demo- NMOOP	<ul style="list-style-type: none"> • The district is having Niger in 7500 ha area while in Balrampur it is in > 5000 ha. • The district is having Niger in 7500 ha area while in Balrampur it is in > 5000 ha. • The crop condition was very good. The non- descript variety was sown. • Crop was sown on 1st August.

District/ Block	Village	Events organized/ activities exhibited to NLMT-BGREI	Observations/Remarks
Sarguja/ Mainpat	Auradand/ Sapnadar	Innovative activities	<ul style="list-style-type: none"> • The tilling operation was going on in certain fields. On interactions with the farmers told that the sowing will start from first week of Sept to last week of Sept. The total crop duration is 70-80 days. Total Tau (Buckwheat/Kutu) area is 2150 ha in this block. The yield potential is 3 qtls/acre. • Local pigeonpea germplasm (i.e. Chaiti & Maghi) are frost resistant for Ambikapur/Sarguja • Under District Mineral Fund (DMF). The district, has proposed to develop food zone. The Tau (Buckwheat) processing plant, tomato ketchup, potato chips, Jackfruit pickle and Custard apple processing plant has been proposed. • Upland paddy which 32 % area in the district, 80 % of this area has been diverted to maize and arhar. This year Rs. 10 cr. has been proposed under the RKVY- Maize. The maize minikits have contributed a lot in this diversion.
	Auradand/ Sapnadar	Innovative activities	<ul style="list-style-type: none"> • Tau (Buckwheat) has not been explored under revenue record. This is one of the major recommendations of the NLMT. • The non-availability of minor millet seeds is a major issue. The district may be permitted to procure local germplasm to demonstrate the targets. This is highly important for millets. The DDAs may be empowered to go for local purchase. • Here the Districts may be permitted to lay out demonstration on local germplasm <i>Maghi</i>-130 days; <i>Chaiti</i>- 180 days, as well.
	Barima	KVK Cum Potato and Temperate Fruit Research Centre	<ul style="list-style-type: none"> • In this KVK the crop diversification programme was seen. Many varieties of potato were planted in the research farm. Apple, Plum, Peach and Sapota plantation was also demonstrated.

District/ Block	Village	Events organized/ activities exhibited to NLMT-BGREI	Observations/Remarks
Balrampur- Ramanujanj /Rajpur	Baghima	Hybrid Paddy demo	<ul style="list-style-type: none"> Paddy hybrid-CO-4 [100 ha (50 + 50)]; 170 beneficiaries. Under crop cafeteria only seed was provided, other inputs were not delivered by state HQ. Only one hybrid has been taken in the whole cluster instead of 3-4. Transplanting started from 15th July till date, as the rains started from 20th July. Last year DRH-775 (Hybrid), Dhanya company was taken in this area. Expected yield 70-75 qtls/ha. As discussed with the farmers, the Cost of cultivation @ Rs. 30,000/acre. Expected production is 30 qtls/ acre. Thus,the profit @ Rs. 1400/qlts of paddy rate comes to- 30 qtls X Rs. 1400= 42000 (profit Rs. 42000-30000= Rs. 12000/ acre). The pulses (Pigeonpea) were also grown on the farm pond under distribution of RKVY minikits. crop condition is good.
	Chandragarh	Checkdam	<ul style="list-style-type: none"> BGREI-2016-17, Cost-Rs. 15 lakh; 17 beneficiaries in 15 ha area. The selection of site is good made on perennial nalla. The gates will be installed after 15th Sep.
	Village-Patrapara	Check dam	<ul style="list-style-type: none"> BGREI -2016-17, Cost-Rs. 15 lakh; 18 beneficiaries in 15 ha area. The selection of site and execution was good Farmers have started taking the benefits and proposed to take IInd crop of Vegetables for the first time.
	Vill-Dignagar	MIT Seed Minikit Demo (RKVY)	<ul style="list-style-type: none"> BGREI- 2016-17, Cost- Rs. 29.82 lakh; 22 beneficiaries, irrigated area (30 ha). Selection of site and execution was very good. Approx. 5 feet water level was found, the capacity is 8 feet. Minikit demonstration of Maize Bio- 22 & 27) was good.

District/ Block	Village	Events organized/ activities exhibited to NLMT-BGREI	Observations/Remarks
Balrampur- Ramanujganj /Rajpur	Vill- Dignagar	Krishak Goshties	<ul style="list-style-type: none"> The farmers have requested for the assure price of their produce and also the availability of seeds of new varieties and quality input.
	Vill- Parsagudi + Chilmakalan	Cropping System Based Demonstration	<ul style="list-style-type: none"> Area-100 ha (50+50 ha) Paddy hybrid -Sahyadri-4 (115-120 days); 184 farmers, Arize-6444 gold (late duration , Bayer Co); line transplanting; “Saathi” Pre- emergence Herbicide is used after three days of transplanting The concept of CSBD, its planning in terms of the variety, next crop etc should be decided in consultation with KVK. The labour constraint was reported in this area and the labourers are brought from Gumla, Jharkhand (Labour charges are @ Rs. 150 per day+ 3 times meals).
	Dakwa	FLD- ATARI	<ul style="list-style-type: none"> Urd- Azad-3 was sown in 30 acre area. Seed @ 8 kg/acre + seed treatment with rhizobium has done. Sown between 12th -28th July.
	Dakwa	FLD- ATARI	<ul style="list-style-type: none"> Fund towards FLD still awaits. High seed rate was used/ plant density was high. R X R and P X P distance and other weeding operations etc should have been ensured. Physiological stage was flowering Beetles and leaf weber caterpillar was seen below ETL, no insecticide was used. The overall crop growth was comparatively poor.
Surajpur	Ajriva	Soil Testing lab SRI Demo	<ul style="list-style-type: none"> The soil testing lab of the Department is housed in KVK. RAEOs with PG Degree in Soil Science are engaged in soil testing and preparation of SHC. During 2016-17, 9923 samples (7785 grids) were analysed and 73209 SHCs were prepared and distributed. The achievement has been > 100 %. The apparatus/implements in the lab and the reagents were upto the mark and the soil testing is being done more accurately in this lab. It was informed that Rs. 54 lakhs have been sanctioned through district mining fund and this

District/ Block	Village	Events organized/ activities exhibited to NLMT-BGREI	Observations/Remarks
Surajpur	Ajriva	SRI Demo	<ul style="list-style-type: none"> lab is likely to be shifted to the new building in Surajpur (the newly carved district from Sarguja). Var. Samleshwari has been taken in large area. Last year MTU-1010 var. was demonstrated. Farmer- Shri Ram Singh and Prem were encouraged with the last year's performance/ demonstration under MTU. The transplanting was done between 27th -31st of July. Crop condition was very good. Expected yield is 70 qtls/ha.
	Nainpur	Check dam	<ul style="list-style-type: none"> BGREI-2015-16, Cost- (Rs. 9.98 lakh); 18 beneficiaries; 12 ha area. Excellent selection of site with 2 ha spreading area (ponding area) The structure is provided with gates. Water storage is sufficient. Farmer- Shri. Lallu Ram and Shri Sahe Lal informed that in the event of deficient rainfall lift irrigation is done for saving crops and growing vegetables.

12. OBSERVATIONS

- More or less the scenario under BGREI plots in respect of crop growth and establishment is satisfactory. Predominant rice varieties taken under the programme are Swarna Sub- 1, Samleshwari, Indira Barani dhan 1, Vishnu Bhog, Sahbhagi dhan, CO-4, Arize 6444 Gold, US 312 and Sayadri-4, etc. *cv- Swarna Sub-1 is preferred under SRI.*
- Only limited paddy varieties are being demonstrated in a cluster of 100 ha in the name of non-availability of varieties. The NLMT, therefore, recommends that a single cluster should have atleast 6-10 varieties. Similarly, one cluster may also represent the demonstration under different ecology.

- District level officials of CG State Beej Evam Krishi Vikas Nigam and Agro need orientation/ training for quick documentation/ preparation of bills/accurate billing for onward submission to DDAs to facilitate timely reimbursement through PFMS. The procedural fault of CGSBKV has been attributed to poor expenditure at district level.
- The quality of inputs, including machineries and equipments supplied by CG State Beej Evam Krishi Vikas Nigam need an introspection in terms of reputation of the company/manufacturer /brand and also the prevailing per unit cost in the open market. To meet quality standards and the cost and AMC issues, the DDAs may be authorized to implement/ execute the component with the PFMS/DBT mode of disbursement of subsidy. This will also ensure the accountability of DDAs at district level.
- Under crop cafeteria/Inputs, only seed was provided. The other inputs like zinc sulphate (25 kg/ha), Weedicide, IPM material and Ambika Paddy Weeder was not made available to the district during the visit period of the NLMT.
- Delayed input supply (micro-nutrient mixture, humic acid & weedicide) could not be used/affected the basic purpose of full package cluster demonstration. Input supply to the district is a regularly delayed phenomenon. Even the sowings and critical physiological stage of crops are over, resultantly later on the un-utilized inputs remain lying with the districts or else delivered to the farmers in vain. This defeat the sole purpose of the full package cluster demonstration and simply benefits the supplying agencies.
- A uniform drawing/design and checklist indicating closing/opening of gates, details of the members of the WUA/their contact nos. and the details of Nodal Officer of the SDA associated with the construction of such assets may be displayed on a permanent board at the watershed development site as well as at the panchayat bhavan. This will help in identifying the resources/ convergence of other demonstration programmes/activities in watershed areas.
- The NLMT has recommends that all check dams/stop dams/ MITs so developed under asset building component of BGREI should be converged with other schemes/ relevant components such as machineries, implements, pipelines, irrigation pumps, seeds and fertilizers so as to ensure round the year crop production programme/ AHD/Horticulture and other activities to generate income/ livelihood to the farmers.

- Farmer- Jaikumar was doing Patela operation in DSR paddy (30-35 days old crop). This traditional practice of Patela and Biasi, to suppress the weed, need to be validated and the district/ state may issue the suitable advisory accordingly (the age of the crop, weight of the patela so used, status of moisture/ water in the field etc.).
- Sarguja division has a potential of Niger 7500 ha area alone is in Sarguja while > 5000 ha area is in Balrampur District. The descript and improved varieties under NMOOP may be made available to the farmers.
- Under District Mineral Fund (DMF). The district, has proposed to develop food zone. The Tau (Buckwheat) processing plant, tomato ketchup, potato chips, Jackfruit pickle and Custard apple processing plant has been proposed.
- Upland paddy which 32 % area in the district, 80 % of this area has been diverted to maize and arhar. This year Rs. 10 cr. has been proposed under the RKVY- Maize. The maize minikits have contributed a lot in this diversion.
- Tau (Buckwheat) has not been explored under revenue record. This is one of the major observation and recommendation of the NLMT for the SDA/Revenue Department to incorporate this crop in their land records.

13. RECOMMENDATIONS/ SUGGESTIONS

- The NLMT recommended that all the KVKs may be directed to be a part of the site selection committee for laying out the demonstrations. At the same time the DDAs may also be advised to ensure the involvement/association of KVKs. Also, the DLMT should be functional and invariably be represented by the KVKs, they should not be a simple signatory.
- Under BGREI, the state has done a good work. However, the NLMT recommends that all the watershed structures (Check dam/Stop dam/MIT) should be surveyed jointly by Soil and Water Conservation Unit and ADO/RAEO in order to prepare a perspective plan for the site (such as, crops to be taken, other allied activities, organizing demonstrations under NFSM/BGREI/ other programmes/ Beej Gram Yojana etc.

- It is strongly recommended that the RAEO of the circle should be associated from the beginning of the asset building activities, especially the watershed development.
- As a part of convergence and creating awareness on the utility of watershed structures under asset building components of BGREI, the State Dept. of Agriculture may direct to organize FFS and CSBD trainings in the watershed areas, so created under asset building.
- The non-availability of minor millet seeds is a major issue. The district may be permitted to procure local germplasm to demonstrate the targets. This is highly important for millets. The DDAs may be empowered to go for local purchase.
- Local pigeonpea germplasm (*i.e.* Chaiti & Maghi) are frost resistant for Ambikapur /Sarguja.
- Here the Districts may be permitted to lay out demonstration on local germplasm Maghi-130 days; Chaiti- 180 days, as well.
- The soil testing lab of the Department working in KVK, Sarguja is likely to shifted to the new building of Surajpur. This lab is well established, managed by competent/qualified staff under the supervision of DDA, Sarguja and the KVK. Approximately 6-7 lakh rupees has been the expenditure on this lab. Therefore, this lab should not be shifted from KVK to new building of Surajpur. Alternatively the NLMT is of the opinion that the new equipments and machineries may be provided to new building of the Surajpur district.
- On 25th Aug, 2017, a review meeting was scheduled vide circular from Joint Director, Bilaspur for all five districts of Bilaspur Division. The proposed agenda was to review i) Utilization Status under NFSM/NMOOP/Other CSS ii) Progress of DBT iii) The innovative/success stories emanated from the Crop Development Programmes iv) Role of KVKs in technology back stopping v) Status of Cooperation of MARKFED, Bank, CG State Beej and KrishiVikas Nigam. Except DDA Janjgir-Champa, the other four districts did not ensure the participation/provided the information. The state Nodal officer BGREI/NFSM may review the status and submit the information to the Directorate of Pulses Development, Bhopal and NRRI, Cuttack.

(Dr. A.K. Tiwari)

Director

DISTRICT-JANJGIR-CHAMPA



Cluster Demonstration of Rice (cv- CO-4), Vill- Navapara, Block- Baloda, Date of Sowing- 1st July, 2017



Cluster Demonstration of Hybrid Rice (cv- Swarna Sub-1), Vill- Poach, Block- Baloda, Date of Sowing- 07th July, 2017



Interaction with the District Officers Vill.- Rasota, Block- Baloda



Interaction with the Farmers at Vill.-Poach, Block- Baloda

DISTRICT-SARGUJA



Visit of a Checkdam at Vill- Poksari, Block-Batoli



Traditional Weeding practice in paddy field (Patela Operation in DSR) at Vill. Parsapali, Block- Ambikapur



Demo of Sweet lime, Kinnow and Lemon at KVK Cum Potato and Temperate Fruit Research Centre



Multi-crop thresher - BGREI (Total Cost- 1,75,000 Subsidy- 40,000), Vill- Mangari, Block- Batoli

DISTRICT-SARGUJA



Paddy is being transplanted during the visit at Vill. Mangari, Block Batoli



Visit of a Check dam at Vill. Petla, Block-Sitapur



**Cluster Demonstration of rice under BGREI
(Var- Chandrahasini, 120 days), at Vill-
Khairbar, Block-Ambikapur**

DISTRICT-SARGUJA



Interaction with farmers and District officers, Vill.- Khairbar, Block- Ambikapur



Field Preparation for Buckwheat (a Pseudo-cereal) in Sarguja

DISTRICT-BALRAMPUR



**Cluster Demonstration of Rice, Var- Sahyadri-4
(Vill-Parasgudi &Chilmakala, Block- Rajpur)**



Kisan Goshthi at Vill. Dignagar, Block –Rajpur



**Visit of a MIT at Vill- Dignagar, Block-
Balrampur-Ramanujga**



**Seed Minikit Demonstration of Maize (Var. Bio-
2227) at vill. Dignagar, Block- Rajpur**

DISTRICT-BALRAMPUR



Cluster FLD of Urd at KVK, Balrampur (cv. Azad-3)



Buckwheat (Tau/Kutu) field photo 2016-17

Buckwheat (A pseudo- cereal) as weed seen during visit in Sarguja District (Grown in an area of >2000 ha by Tibetan Refugees)

DISTRICT- SURAJPUR



Visit to a Soil testing Laboratory at KVK, Surajpur (run by State Govt.)



Interaction with the technical staff at KVK, Surajpur

INPUT CAFETERIA/INTERVENTION & COST NORMS (2017-18)

A. CLUSTER DEMONSTRATION- RICE

(Rs. per ha.)

Activity/ Particular	Direct seeded rice	Line Transplanting	SRI	Stress tolerant varieties	Hybrid Rice
Seed (per ha.)	1000	700	300	700	4000
Sowing (per ha.)	380	980	1380	980	0
Seed Treating Drum (1 No. each 5 ha.)	420	420	420	420	0
Pigeonpea Plantation on Rice Bund (2.5 kg/ha.)	397	397	397	397	0
Zinc sulphate 25 kg/ ha. or any other micro nutrient as per recommendation by SAU/KVK green manure seed / bio-fertilizer	1800	1500	1500	1500	0
Weedicide (1 pre and 1 post emergence)	1200	1200	1200	1200	1200
IPM (PP chemicals/ Bio Pesticides)	1200	1200	1200	1200	1200
Ambika Paddy Weeder (1 No. each per ha.)	835	835	835	835	835
Demonstration Board, Training Materials, farmers training, field day, POL, vehicle hiring / Visit of Scientist/State Officers and other contingencies.	368	268	268	268	265
Total	7500	7500	7500	7500	7500

Note: Marginal saving of any, from an item can be utilized in other item as per genuine need restricted to the limit of 10%.

B. CROPPING SYSTEM BASED DEMONSTRATION - PULSES

Activity/Particular	In Rs./ha
Seed	2700
Weedicide	900
Rhizobium / PSB / Azetobactor / Culture / Zinc Soluble Mobilizing Bacteria	135
IPM including biopesticides, Pesticides, Pheromone traps etc as per recommendation by SAU/KVK	1000
Demonstration Board, Training Materials, Farmers Training, Field day, POL, vehicle hiring/Visit of Scientist/State Officers and Other contingencies	265
Total	5000

C. CLUSTER DEMONSTRATION - WHEAT

Activity/Particular	Demo. (Rs/ha)
Seed	2200
Bhoramdeo seed drill for line sowing(1 No. each 3 ha)	800
Sowing	800
Zinc sulphate 25 kg/ha/Sulphur 30 kg/ha/Boron 2.5 kg/ha or other micronutrients as per recommendation by SAU/KVK green manure seed/bio-fertilizer	1035
Weedicide (1 pre and 1 post emergence)	1200
IPM (PP chemicals/Bio pesticides)	1200
Demonstration Board, Training Materials, Farmers Training, Field day, POL, vehicle hiring/Visit of Scientist/State Officers and Other contingencies	265
Total	7500

ANNEXURE - II

CLUSTER DEMONSTRATION (DIFFERENT ECOSYSTEM) OF SAMPLE DISTRICTS

(Area-Hectare)

Particulars	Janjgir- Champa				Balrampur				Surajpur				Sarguja				CG State			
	Area Covered		2017-18		Area Covered		2017-18		Area Covered		2017-18		Area Covered		2017-18		Area Covered		2017-18	
	2015-16	2016-17	T	A	2015-16	2016-17	T	A	2015-16	2016-17	T	A	2015-16	2016-17	T	A	2015-16	2016-17	T	A
Rainfed Upland rice	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Shallow Low land Rice	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Irrigation ó Traditional variety	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Irrigated Hybrid	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Direct Seeded Rice	300	200	-	-	400	400	-	-	400	400	0	0	400	400	0	0	5000	5000	1000	1000
Line Transplanting	400	200	-	-	400	300	-	-	400	400	0	0	400	400	0	0	5000	5000	1000	1000
SRI	300	200	200	200	300	300	200	200	300	400	200	200	300	300	200	200	5000	5001	2000	2000
Stress Tolerant Varieties	2500	1500	600	600	1500	1400	1000	1000	1500	1700	1100	1100	1800	1600	1100	1100	21860	21266	15000	15000
Hybrid Rice	1900	750	600	600	1500	2000	1200	1200	1500	2000	1200	1200	1200	2000	1300	1300	18412	25000	15000	15000
Cropping System Based	800	500	600	600	1500	700	1200	1200	1500	600	1200	1200	1000	800	1200	1200	14900	13000	15136	15136
Total	6200	3350	2000	2000	5600	5100	3600	3600	5600	5500	3700	3700	5100	5500	3800	3800	70172	74267	49136	49136

**T- Target, A- Achievement*

PHYSICAL AND FINANCIAL PROGRESS OF BGREI – RICE DURING 2016-17 (31st March 2017)

(Rs. in lakh)

S. No.	Component	Norms	Target		Achievement		% Achiev.	
			Phy.	Fin.	Phy.	Fin.	Phy.	Fin.
1	Cluster Demonstration on Rice in different eco-system (100 ha. each)							
(i)	Direct Seeded Rice	Rs. 7,500/- per ha. (Max.)	5000	375.00	5000	343.43	100	92
(ii)	Line Transplanting	Rs. 7,500/- per ha. (Max.)	5000	375.00	5000	340.26	100	91
(iii)	SRI	Rs. 7,500/- per ha. (Max.)	5001	375.04	5001	336.28	100	90
(iv)	Stress Tolerant Varieties	Rs. 7,500/- per ha. (Max.)	21266	1594.96	21266	1498.35	100	94
(v)	Hybrid Rice	Rs. 7,500/- per ha. (Max.)	25000	1875.00	25000	1814.92	100	97
(vi)	Cropping System Based	Rs. 12,500/- per ha. (Max)	13000	1625.00	13000	1540.39	100	95
	Sub Total		74267	6219.99	74267	5873.63	100	94
2	Seed Production (Varieties < 10 years old)							
	Hybrid Rice	Rs. 5,000 per qtls (Max.) or 75%	8000	400.00	1000	0.00	13	0
	Certified Seeds	Rs. 1,000 per qtl. (Max.) or 75%	37750	377.50	56581	250.76	150	66
	Sub Total		45750	777.50	57581	250.76	126	32
3	Seed Distribution (Varieties < 10 years old)							
	Hybrid Rice	Rs. 5,000 per qtls (Max.) or 50%	5000	250.00	329	16.46	7	7
	Certified Seeds	Rs. 1,000 per qtl. (Max.) or 50%	130500	1305.00	79410	633.77	61	49
	Sub Total		135500	1555.00	79739	650.23	59	42
4	Nutrient Management and Soil Ameliorants (other than demonstration upto 2 ha.)							
	Micro Nutrient	Rs. 500 per ha.	104000	520.00	120428	518.23	116	100
	Lime	Rs. 1,000 per ha.	1000	10.00	550	5.50	55	55
	Bio-fertilizers	Rs. 300 per ha.	75000	225.00	68266	197.99	91	88
	Gypsum	Rs. 750 per ha.	3000	22.50	1250	9.38	42	42
	Sub Total		183000	778	190494	731.10	104	94
5	Integrated Pest Management							
	PP Chemicals & Bio Pesticides / Bio-Agent (Need based)	Rs. 500 per ha.	74400	372.00	72890	350.79	98	94
	Weedicides	Rs. 500 per ha.	50000	250.00	44990	222.14	90	89
	Sub Total		124400	622.00	117880	572.93	95	92
6	A. Assets building							
(i)	Borewell	Rs. 30,000/ Nos	2000	600.00	2032	598.05	102	100
(ii)	Drum seeders	Rs. 1,500 /Nos	100	1.50	0	0.00	0	0
(iii)	Seed Drills	Rs. 15,000/Nos	150	22.50	41	5.70	27	25
(iv)	Rotavater	Rs. 35,000/Nos	1049	367.15	2314	302.99	221	83
(v)	Self propelled paddy transplanter	Rs. 75,000/Nos	150	112.50	27	17.25	18	15
(vi)	Pump sets	Rs. 10,000/Nos	1500	150.00	1855	171.74	124	114
(vii)	Cono-weeder	Rs. 600/Nos	15000	90.00	27055	164.14	180	182
(viii)	Mannual Sprayers	Rs. 600/Nos	20000	120.00	11730	67.50	59	56
(ix)	Power knap sack sprayer	Rs. 3,000/Nos	2000	60.00	8801	180.77	440	301
(x)	Power weeder	Rs. 15,000/Nos	802	120.30	31	4.38	4	4
(xi)	Paddy thresher	Rs. 40,000/Nos	800	320.00	624	217.20	78	68
(xii)	Multi crop thresher	Rs. 40,000/Nos	800	320.00	576	229.43	72	72
(xiii)	Laser land leveler (for a group of 10 farmers)	Rs. 1,50,000/Nos	0	0.00	0	0.00		
	Sub Total (i to xiii)		44351	2283.95	55086	1959.15	124	86

S. No.	Component	Norms	Target		Achievement		% Achiev.	
			Phy.	Fin.	Phy.	Fin.	Phy.	Fin.
	B. Any other Agriculture Implements useful for C.G. region							
(xiv)	Power tiller (above 8 BHP) for General Farmers	40% of cost limited to Rs.60,000/-	320	192.00	92	55.66	29	29
(xv)	Power tiller (above 8 BHP) for SC/ST Farmers	50% of cost limited to Rs.75,000/-	130	97.50	176	130.66	135	134
(xvi)	Self Propelled reaper for General Farmers	40% of cost limited to Rs.50,000/-	246	123.00	132	66.02	54	54
(xvii)	Self Propelled reaper for SC/ST Farmers	50% of cost limited to Rs.63,000/-	75	47.25	167	101.13	223	214
(xviii)	MB Plough (Tractor above 35 BHP) for General Farmers	Rs.35,000/-	500	175.00	172	27.23	34	16
(xix)	MB Plough (Tractor above 35 BHP) for SC/ST Farmers	Rs.44,000/-	300	132.00	134	19.98	45	15
(xx)	Leveler Blade (Tractor above 35 BHP) for General Farmers	Rs.35,000/-	100	35.00	180	21.43	180	61
(xxi)	Leveler Blade (Tractor above 35 BHP) for SC/ST Farmers	Rs.44,000/-	45	19.80	75	7.96	167	40
(xxii)	Power weeders (engine operated above 2 BHP) tractor below 20 BHP for General Farmers	Rs.12,000/-	25	3.00	1	0.15	4	5
(xxiii)	Power weeders (engine operated above 2 BHP) tractor below 20 BHP for SC/ST Farmers	Rs.15,000/-	10	1.50	1	0.15	10	10
	Sub Total (xiv to xxiii)		1751	826.05	1130	430.37	65	52
	Grand Total (A+B: i to xxiii)		46102	3110	56216	2390	122	77
7	Site Specific							
	Construction of Checkdams on Govt. land 100% Max.	Rs. 15 lakh	97	1405.00	111	1208.26	114	86
	Construction of Minor Irrigation Tanks on Govt. land 100% Max.	Rs. 30 lakh	5	150.00	5	129.02	100	86
	Sub Total (Site Specific)		102	1555	116	1337.28	114	86
8	Post-Harvest and Marketing Support							
	Construction of Godown (500MT) on Community Basis		23	635.95		777.70	0	122
	Construction plat form for stacking of paddy (10.80M X 7.20M) on Community Basis		105	141.75			0	0
	Sub Total		128	777.70	0.00	777.70	0	100
9	Cropping System based training (04 sessions)	Rs. 14,000 per training Rs. 3,500 per session)	766	107.24	700	79.52	91	74
	Grand Total (Rice)			15501.93		12662.67		82

PHYSICAL & FINANCIAL TARGET AND ACHIEVEMENT: RICE

Month-August-2017

(Rs. in lakh)

S. No.	Component	Target		Achievement		% Achiev	
		Phy.	Fin.	Phy.	Fin.	Phy.	Fin.
1	Cluster Demonstration on Rice in different eco-system (100 ha. each)						
(i)	Direct Seeded Rice @ Rs. 7,500/- per ha. (Max.)	1000	75.00	1000	0.28	100	0.37
(ii)	Line Transplanting @ Rs. 7,500/- per ha. (Max.)	1000	75.00	1000	0.00	100	0.00
(iii)	SRI @ Rs. 7,500/- per ha. (Max.)	2000	150.00	2000	0.12	100	0.08
(iv)	Stress Tolerant Varieties @ Rs. 7,500/- per ha. (Max.)	15000	1125.00	15000	0.20	100	0.02
(v)	Hybrid Rice @ Rs. 7,500/- per ha. (Max.)	15000	1125.00	15000	127.13	100	11
(vi)	Cropping System Based @ Rs. 12,500/- per ha. (Max)	15136	1892.00	15136	157.67	100	8
	Sub Total	49136	4442.00	49136	285.40	100	6
2	Seed Production (Varieties of less than 10 years old)						
(a)	Hybrid Rice @ Rs. 5,000 per qtls (Max.) or 75%	3000	150.00	0	0.00	0	0
(b)	Certified Seeds @ Rs. 1,000 per qtl. (Max.) or 75%	40525	405.25	101772	36.53	251	9
	Sub Total	43525	555.25	101772	36.53	234	7
3	Seed Distribution (Varieties of less than 10 years old)						
(a)	Hybrid Rice @ Rs. 5,000 per qtls (Max.) or 50%	5000	250.00	658	0.00	13	0
(b)	Certified Seeds @ Rs. 1,000 per qtl. (Max.) or 50%	86050	860.50	44933	0.00	52	0
	Sub Total	91050	1110.50	45591	0.00	50	0
4	Nutrient Management and Soil Ameliorants (for maximum 2 ha.) other than demonstration						
(a)	Micro Nutrient Rs. 500 per ha.	80550	402.75	35000	71.24	43	18
(b)	Lime Rs. 1,000 per ha.	1000	10.00	500	0.00	50	0
(c)	Bio-fertilizers Rs. 300 per ha.	45000	135.00	25100	1.50	56	1
(d)	Gypsum Rs. 750 per ha.	1000	7.50	0	0.00	0	0
	Sub Total	127550	555.25	60600	72.74	48	13
5	Integrated Pest Management						
(a)	PP Chemicals & Bio Pesticides / Bio-Agent (Need based) Rs. 500 per ha.	50000	250.00	31800	76.49	64	31
(b)	Weedicides Rs. 500 per ha.	38840	194.20	14700	0.00	38	0
	Sub Total	88840	444.20	46500	76.49	52	17
6	Assets building						
(a)	Borewell Rs. 30,000	2600	780.00	373	2.55	14	0.33
(b)	Drum seeders Rs. 1,500 /-	0	0.00	0	0.00	0	0
(c)	Seed Drills Rs. 15,000/-	130	19.50	0	0.00	0	0
(d)	Rotavater Rs. 35,000	600	210.00	0	0.00	0	0
(e)	Self propelled paddy transplanter Rs. 75,000	50	37.50	0	0.00	0	0
(f)	Pump sets Rs. 10,000/-	700	70.00	0	0.00	0	0
(g)	Cono-weeder Rs. 600/-	25000	150.00	0	0.00	0	0
(h)	Mannual Sprayers Rs. 600/-	25000	150.00	4000	0.00	16	0
(i)	Power knap sack sprayer Rs. 3,000	3000	90.00	0	0.00	0	0
(j)	Power weeder Rs. 15,000	297	44.55	0	0.00	0	0
(k)	Paddy thresher Rs. 40,000	200	80.00	0	0.00	0	0
(l)	Multi crop thresher Rs. 40,000	200	80.00	0	0.00	0	0
(m)	Laser land leveler (for a group of 10 farmers) Rs. 1,50,000	0	0.00	0	0.00	0	0

(Rs. in lakh)

S. No.	Component	Target		Achievement		% Achiev	
		Phy.	Fin.	Phy.	Fin.	Phy.	Fin.
6.1	Any other Agriculture Implements useful for C.G. region						
(i)	Power tiller (above 8 BHP) for General Farmers (40% of cost limited to Rs.60,000/-)	210	126.00	0	0.00	0	0
(ii)	Power tiller (above 8 BHP) for SC/ST Farmers (50% of cost limited to Rs.75,000/-)	115	86.25	0	0.00	0	0
(iii)	Self Propelled reaper for General Farmers (40% of cost limited to Rs.50,000/-)	120	60.00	0	0.00	0	0
(iv)	Self Propelled reaper for SC/ST Farmers (50% of cost limited to Rs.63,000/-)	100	63.00	0	0.00	0	0
(v)	MB Plough (Tractor above 35 BHP) for General Farmers (Rs.35,000/-)	50	17.50	0	0.00	0	0
(vi)	MB Plough (Tractor above 35 BHP) for SC/ST Farmers (Rs.44,000/-)	20	8.80	0	0.00	0	0
(vii)	Leveler Blade (Tractor above 35 BHP) for General Farmers (Rs.35,000/-)	40	14.00	0	0.00	0	0
(viii)	Leveler Blade (Tractor above 35 BHP) for SC/ST Farmers (Rs.44,000/-)	20	8.80	0	0.00	0	0
(ix)	Power weeders (engine operated above 2 BHP) tractor below 20 BHP for General Farmers (Rs.12,000/-)	30	3.60	0	0.00	0	0
(x)	Power weeders (engine operated above 2 BHP) tractor below 20 BHP for SC/ST Farmers (Rs.15,000/-)	10	1.50	0	0.00	0	0
	Sub Total (Asset building)	58492	2101.00	4373	2.55	7	0.12
7	Site Specific						
(a)	Construction of Checkdams on Govt. land 100% Max. Rs. 15 lakh	67	990.50	0	0.00	0	0
(b)	Construction of Minor Irrigation Tanks on Govt. land 100% Max. Rs. 30 lakh	4	120.00	0	0.00	0	0
	Sub Total (Site Specific)	71	1110.50	0	0.00	0	0
8	Post Harvest and Marketing Support						
(a)	Construction of Godown (500MT) on Community Basis	-	-	-	-	-	-
(b)	Construction plat form for stacking of paddy (10.80M X 7.20M) on Community Basis	-	-	-	-	-	-
	Total	-	-	-	-	-	-
9	Post Harvest APEX BANK	36	555.25	0	0.00	-	-
9	Cropping System based training (04 sessions) Rs. 14,000 per training (@ Rs. 3,500 per session)	793	111.02	27	0.00	3.4	-
	Contingency	-	0.00	-	0.00	-	-
	Grand Total Financial (BGREI Rice)	-	10984.97	-	473.71	-	-

PHYSICAL & FINANCIAL TARGET & ACHIEVEMENT OF JANJGIR-CHAMPA: RICE
(Rs in lakh)

Components	Year 2015-16				Year 2016-17				Year 2017-18			
	Target		Achievement		Target		Achievement		Target		Achievement	
	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.
Cluster Demonstration on Rice in different eco-system (100 ha. each)												
Direct Seeded Rice @ Rs. 7,500/- per ha. (Max.)	300	22.50	300	21.2	200	15.00	200	14.22	0	0.00	0	0.00
Line Transplanting @ Rs. 7,500/- per ha. (Max.)	400	30.00	400	28.12	200	15.00	200	14.46	0	0.00	0	0.00
SRI @ Rs. 7,500/- per ha. (Max.)	300	22.50	300	21.65	200	15.00	200	14.32	200	15.00	200	0.12
Stress Tolerant Varieties @ Rs. 7,500/- per ha. (Max.)	2500	187.50	2500	185.32	1500	112.50	1500	110.45	600	45.00	600	0.20
Hybrid Rice @ Rs. 7,500/- per ha. (Max.)	1900	142.50	1900	140.45	750	56.25	750	56.12	600	45.00	600	24.00
Cropping System Based @ Rs. 12,500/- per ha. (Max)	800	100.00	800	94.32	600	75.00	600	74.36	600	75.00	600	0.17
Sub Total	6200	505.00	6200	491.06	3450	288.75	3450	283.93	2000	180.00	2000	24.49
Seed Production (Varieties of less than 10 years old)												
(a) Hybrid Rice @ Rs. 5,000 per qtls (Max.) or 75%	0	0	0	0	0	0	0	0	0	0.00	0	0.00
(b) Certified Seeds @ Rs. 1,000 per qtl. (Max.) or 75%	15000	150.00	12620	126.20	5000	50.00	13944	139.44	15000	150.00	25000	0.00
Sub Total	15000	150.00	12620	126.20	5000	50.00	13944	139.44	15000	150.00	25000	0.00
Seed Distribution (Varieties of less than 10 years old)												
(a) Hybrid Rice @ Rs. 5,000 per qtls (Max.) or 50%	1000	50.00	41.5	2.07	500	25.00	0	0	700	35.00	0	0.00
(b) Certified Seeds @ Rs. 1,000 per qtl. (Max.) or 50%	25000	250.00	30	0.25	20000	200.00	14197	141.97	12000	120.00	25000	16.52
Sub Total	26000	300.00	71.5	2.32	20500	225.00	14197	141.97	12700	155.00	25000	16.52
Nutrient Management and Soil Ameliorants (for maximum 2 ha.) other than demonstration												
(a) Micro Nutrient Rs. 500 per ha.	10000	50.00	8528	42.61	35114	175.57	35114	175.36	15000	75.00	15000	71.24
(b) Lime Rs. 1,000 per ha.	1000	10.00	0	0	250	2.5	250	2.50	0	0.00	0	0.00
(c) Bio-fertilizers Rs. 300 per ha.	5000	15.00	5000	15.00	29330	87.99	29330	87.96	9600	28.80	9600	24.00
(d) Gypsum Rs. 750 per ha.	200	1.50	0	0	1250	9.38	1250	9.38	0	0.00	0	0.00
Sub Total	16200	76.50	13528	57.61	65944	275.44	65944	275.20	24600	103.80	24600	95.24
Integrated Pest Management												
(a) PP Chemicals & Bio Pesticides / Bio-Agent (Need based) Rs. 500 per ha.	14000	70.00	12984	64.78	30880	154.40	30880	154.10	15300	76.50	15300	76.49
(b) Weedicides Rs. 500 per ha.	15000	75.00	15000	54.78	23400	117.00	23400	116.96	14000	70.00	400	6.00
Sub Total	29000	145.00	27984	119.56	54280	271.40	54280	271.06	29300	146.50	15700	82.49
Assets building												
Borewell Rs. 30,000	100	30	100	30	120	37.80	108	28.5	200	60.00	12	1.80
Seed Drills Rs. 15,000/-	10	0.15	0	0	5	0.75	0	0	2	0.30	0	0.00
Rotavater Rs. 35,000	20	3	0	0	40	14.00	38	13.3	40	14.00	0	0.00
Self propelled paddy transplanter Rs. 75,000	20	7	20	7	10	7.50	7	5.25	5	3.75	0	0.00
Pump sets Rs. 10,000/-	20	15	7	5.25	50	5.00	72	7.2	50	5.00	0	0.00
Cono-weeder Rs. 600/-	140	14	50	5	1000	6.00	0	0	1000	6.00	0	0.00
Manual Sprayers Rs. 600/-	1000	6	1000	5.93	1200	7.20	1200	7.2	4000	24.00	4000	0.00
Power knap sack sprayer Rs. 3,000	200	6	200	6	100	3.00	157	3	100	3.00	0	0.00
Power weeder Rs. 15,000	10	1.5	0	0	50	7.50	0	0	30	4.50	0	0.00
Paddy thresher Rs. 40,000	15	6	15	6	50	20.00	30	12	10	4.00	0	0.00

Components	Year 2015-16				Year 2016-17				Year 2017-18			
	Target		Achievement		Target		Achievement		Target		Achievement	
	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.
Multi crop thresher Rs. 40,000	20	8	20	8	60	24.00	42	16.8	15	6.00	0	0.00
Laser land leveler (for a group of 10 farmers) Rs. 1,50,000	1	1.5	0	0	0	0	0	0	0	0.00	0	0.00
Any other Agriculture Implements useful for C.G. region	0	0	0	0	0	0.00	0	0	0	0.00	0	0.00
Power tiller (above 8 BHP) for General Farmers (40% of cost limited to Rs.60,000/-)	6	3.6	2	1.2	10	6	5	3	5	3.00	0	0.00
Power tiller (above 8 BHP) for SC/ST Farmers (50% of cost limited to Rs.75,000/-)	2	1.5	2	1.5	10	7.5	9	6.75	10	7.50	0	0.00
Self Propelled reaper for General Farmers (40% of cost limited to Rs.50,000/-)	3	1.5	3	1.45	10	5	9	4.5	10	5.00	0	0.00
Self Propelled reaper for SC/ST Farmers (50% of cost limited to Rs.63,000/-)	4	2.52	4	2.36	5	3.15	5	3.15	5	3.15	0	0.00
MB Plough (Tractor above 35 BHP) for General Farmers (Rs.35,000/-)	12	4.2	3	0.26	20	7	3	0.35	5	1.75	0	0.00
MB Plough (Tractor above 35 BHP) for SC/ST Farmers (Rs.44,000/-)	6	2.64	8	0.96	10	4.4	11	0.92	0	0.00	0	0.00
Leveler Blade (Tractor above 35 BHP) for General Farmers (Rs.35,000/-)	5	1.75	5	0.36	5	1.75	0	0	3	1.05	0	0.00
Leveler Blade (Tractor above 35 BHP) for SC/ST Farmers (Rs.44,000/-)	3	1.32	5	0.46	5	2.2	7	0.59	3	1.32	0	0.00
Power weeders (engine operated above 2 BHP) tractor below 20 BHP for General Farmers (Rs.12,000/-)	0	0	0	0	2	0.24	0	0	0	0.00	0	0.00
Power weeders (engine operated above 2 BHP) tractor below 20 BHP for SC/ST Farmers (Rs.15,000/-)	0	0	0	0	0	0	0	0	0	0.00	0	0.00
Sub Total	1597	117.18	1444	81.73	2762	169.99	1703	112.51	5493	153.32	4012	1.80
Site Specific												
Construction of Checkdams on Govt. land 100% Max. Rs. 10 lakh	18	180.24	18	180.24	5	50.00	5	50.00	0	0.00	0	0.00
Construction of Minor Irrigation Tanks on Govt. land 100% Max. Rs. 30 lakh	0	0.0	0	0.0	0	0	0	0	0	0.00	0	0.00
Sub Total	18	180.24		180.24	5	50.00	5	50.00	0	0.00	0	0.00
Post-Harvest and Marketing Support	0	0	0	0					0	0.00	0	0.00
Cropping System based training (04 sessions) Rs. 14,000 per training (@ Rs. 3,500 per session)	35	4.90	35	4.90	35	4.90	35	4.90	0	0.00	0	0.00
Total	94050	1478.82	61882.5	1063.62	151976	1335.48	153558	1279.01	89093	888.62	96312	220.54

PHYSICAL & FINANCIAL TARGET & ACHIEVEMENT OF SARGUJA : RICE
(Rs in lakh)

Components	Year 2015-16				Year 2016-17			
	Target		Achievement		Target		Achievement	
	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.
Cluster Demonstration on Rice in different eco-system (100 ha. each)								
Direct Seeded Rice @ Rs. 7,500/- per ha. (Max.)	400	30	400	25.21	0	0.00	0	0.00
Line Transplanting @ Rs. 7,500/- per ha. (Max.)	400	30	400	24.73	0	0.00	0	0.00
SRI @ Rs. 7,500/- per ha. (Max.)	300	22.50	300	17.76	200	15.00	200	0.00
Stress Tolerant Varieties @ Rs. 7,500/- per ha. (Max.)	1600	120	1600	119.13	1100	82.50	1100	0.00
Hybrid Rice @ Rs. 7,500/- per ha. (Max.)	2000	150	2000	140.21	1300	97.50	1300	0.00
Cropping System Based@ Rs. 12,500/- per ha. (Max)	800	100	800	95.97	1200	150.00	1200	0.00
Sub Total	5500	452.50	5500	423.02	3800	345.00	3800	0.00
Seed Production (Varieties of less than 10 years old)								
(a) Hybrid Rice @ Rs. 5,000 per qtls (Max.) or 75%	0	0	0	0	0	0.00	0	0.00
(b) Certified Seeds @ Rs. 1,000 per qtl. (Max.) or 75%	4000	40	1019.6	0	5000	50.00	0	0.00
Sub Total	4000	40	1019.6	0	5000	50.00	0	0.00
Seed Distribution (Varieties of less than 10 years old)								
(a) Hybrid Rice @ Rs. 5,000 per qtls (Max.) or 50%	400	20	0	0.00	400	20.00	0	0.00
(b) Certified Seeds @ Rs. 1,000 per qtl. (Max.) or 50%	10000	100	3862	30.90	6500	65.00	0	0.00
Sub Total	10400	120	3862	30.90	6900	85.00	0	0.00
Nutrient Management and Soil Ameliorants (for maximum 2 ha.) other than demonstration								
(a) Micro Nutrient Rs. 500 per ha.	7000	35	7670	34.90	6000	30.00	0	0.00
(b) Lime Rs. 1,000 per ha.	100	1	0	0.00	0	0.00	0	0.00
(c) Bio-fertilizers Rs. 300 per ha.	3000	9	0	0.00	8000	24.00	0	0.00
(d) Gypsum Rs. 750 per ha.	200	1	0.00	0.00	0	0.00	0	0.00
Sub Total	10300	46.50	7670	34.90	14000	54.00	0	0.00
Integrated Pest Management								
(a) PP Chemicals & Bio Pesticides / Bio-Agent (Need based) Rs. 500 per ha.	2000	10	0	0.00	2000	10.00	0	0.00
(b) Weedicides Rs. 500 per ha.	2500	12.50	0	0.00	2500	12.50	0	0.00
Sub Total	4500	22.50	0	0	4500	22.50	0	0.00
Assets building								
Borewell Rs. 30,000	0	0.00	0	0	0	0.00	0	0.00
Seed Drills Rs. 15,000/-	5	0.75	0	0	0	0.00	0	0.00
Rotavater Rs. 35,000	40	14	8	0.75	0	0.00	0	0.00
Self propelled paddy transplanter Rs. 75,000	5	3.75	1	3.48	0	0.00	0	0.00
Pump sets Rs. 10,000/-	75	7.50	37	2.17	0	0.00	0	0.00
Cono-weeder Rs. 600/-	500	3.00	520	5.995	0	0.00	0	0.00
Mannual Sprayers Rs. 600/-	1000	6.00	1044	0.00	0	0.00	0	0.00
Power knap sack sprayer Rs. 3,000	50	1.50	0	0.00	0	0.00	0	0.00
Power weeder Rs. 15,000	40	6.00	0	0.00	0	0.00	0	0.00
Paddy thresher Rs. 40,000	20	8.00	0	0.00	0	0.00	0	0.00
Multi crop thresher Rs. 40,000	50	20.00	16	6.38	0	0.00	0	0.00
Laser land leveler (for a group of 10 farmers) Rs. 1,50,000	0	0.00	0	0.00	0	0.00	0	0.00
Any other Agriculture Implements useful for C.G. region					0	0.00	0	0.00

Components	Year 2015-16				Year 2016-17			
	Target		Achievement		Target		Achievement	
	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.
Power tiller (above 8 BHP) for General Farmers (40% of cost limited to Rs.60,000/-)	5	3.00	1	0.60	0	0.00	0	0.00
Power tiller (above 8 BHP) for SC/ST Farmers (50% of cost limited to Rs.75,000/-)	10	7.50	5	3.75	0	0.00	0	0.00
Self Propelled reaper for General Farmers (40% of cost limited to Rs.50,000/-)	10	5.00	13	6.18	0	0.00	0	0.00
Self Propelled reaper for SC/ST Farmers (50% of cost limited to Rs.63,000/-)	5	3.15	31	18.21	0	0.00	0	0.00
MB Plough (Tractor above 35 BHP) for General Farmers (Rs.35,000/-)	20	7.00	1	0.13	0	0.00	0	0.00
MB Plough (Tractor above 35 BHP) for SC/ST Farmers (Rs.44,000/-)	30	13.20	0	0.00	0	0.00	0	0.00
Leveler Blade (Tractor above 35 BHP) for General Farmers (Rs.35,000/-)	5	1.75	0	0.00	0	0.00	0	0.00
Leveler Blade (Tractor above 35 BHP) for SC/ST Farmers (Rs.44,000/-)	4	1.76	0	0.00	0	0.00	0	0.00
Power weeders (engine operated above 2 BHP) tractor below 20 BHP for General Farmers (Rs.12,000/-)	2	0.24	0	0.00	0	0.00	0	0.00
Power weeders (engine operated above 2 BHP) tractor below 20 BHP for SC/ST Farmers (Rs.15,000/-)	2	0.30	0	0.00	0	0.00	0	0.00
Sub Total	1878	113.40	1677	50.44	0	0.00	0	0.00
Site Specific					0	0.00	0	0.00
Construction of Checkdams on Govt. land 100% Max. Rs. 10 lakh	22	314.16	22	314.15	0	0.00	0	0.00
Construction of Minor Irrigation Tanks on Govt. land 100% Max. Rs. 30 lakh	2	60	2	45.67	0	0.00	0	0.00
Sub Total	24	374.16	24	359.82	0	0.00	0	0.00
Post-Harvest and Marketing Support	0	0	0	0	0	0.00	0	0.00
Cropping System based training (04 sessions) Rs. 14,000 per training (@ Rs. 3,500 per session)	45	6.3	45	6.3	0	0.00	0	0.00
Total	36647	1175	19798	905.36	34200	556.5	3800	0.00

**PHYSICAL & FINANCIAL TARGET & ACHIEVEMENT OF BALRAMPUR
RICE**

(Rs in lakhs)

S. No.	Components	Achievement (2016-17)	Achievement (2017-18)
		Phy.	Phy.
1	Cluster Demonstration on Rice in different eco-system (100 ha. each)		
	Direct Seeded Rice @ Rs. 7,500/- per ha. (Max.)	400	-
	(Line Transplanting @ Rs. 7,500/- per ha. (Max.)	300	-
	SRI @ Rs. 7,500/- per ha. (Max.)	300	-
	Stress Tolerant Varieties @ Rs. 7,500/- per ha. (Max.)	1400	-
	Hybrid Rice @ Rs. 7,500/- per ha. (Max.)	2000	-
	Cropping System Based @ Rs. 12,500/- per ha. (Max)	700	-
	Sub Total	5100	-
2	Seed Production (Varieties of less than 10 years old)		
	Hybrid Rice @ Rs. 5,000 per qtls (Max.) or 75%	-	-
	Certified Seeds @ Rs. 1,000 per qtl. (Max.) or 75%	-	-
	Sub Total	-	-
3	Seed Distribution (Varieties of less than 10 years old)		
	Hybrid Rice @ Rs. 5,000 per qtls (Max.) or 50%	-	-
	Certified Seeds @ Rs. 1,000 per qtl. (Max.) or 50%	-	-
	Sub Total	0	-
4	Nutrient Management and Soil Ameliorants (for maximum 2 ha.) other than demonstration		
	Micro Nutrient Rs. 500 per ha.	7000	-
	Lime Rs. 1,000 per ha.	-	-
	Bio-fertilizers Rs. 300 per ha.	1000	-
	Gypsum Rs. 750 per ha.	-	-
	Sub Total	-	-
5	Integrated Pest Management		
	(a) PP Chemicals & Bio Pesticides / Bio-Agent (Need based) Rs. 500 per ha.	2000	-
	(b) Weedicides Rs. 500 per ha.	2500	-
	Sub Total	-	-
6	Assets building		
	Borewell Rs. 30,000	-	-
	Drum seeders Rs. 1,500 /-	-	-
	Seed Drills Rs. 15,000/-	-	-
	Rotavater Rs. 35,000	20	-
	Self propelled paddy transplanter Rs. 75,000	5	-
	Pump sets Rs. 10,000/-	75	-
	Cono-weeder Rs. 600/-	500	-
	Mannual Sprayers Rs. 600/-	500	-
	Power knap sack sprayer Rs. 3,000	50	-
	Power weeder Rs. 15,000	-	-
	Paddy thresher Rs. 40,000	5	-
	Multi crop thresher Rs. 40,000	20	-
	Laser land leveler (for a group of 10 farmers) Rs. 1,50,000	-	-
	Any other Agriculture Implements useful for C.G. region	-	-
	Power tiller (above 8 BHP) for General Farmers (40% of cost limited to Rs.60,000/-)	3	-
	Power tiller (above 8 BHP) for SC/ST Farmers (50% of cost limited to Rs.75,000/-)	4	-
	Self Propelled reaper for General Farmers (40% of cost limited to Rs.50,000/-)	10	-
	Self Propelled reaper for SC/ST Farmers (50% of cost limited to Rs.63,000/-)	-	-
	MB Plough (Tractor above 35 BHP) for General Farmers (Rs.35,000/-)	-	-
	MB Plough (Tractor above 35 BHP) for SC/ST Farmers (Rs.44,000/-)	-	-
	Leveler Blade (Tractor above 35 BHP) for General Farmers (Rs.35,000/-)	-	-
	Leveler Blade (Tractor above 35 BHP) for SC/ST Farmers (Rs.44,000/-)	-	-
	Power weeders (engine operated above 2 BHP) tractor below 20 BHP for General Farmers (Rs.12,000/-)	-	-
	Power weeders (engine operated above 2 BHP) tractor below 20 BHP for SC/ST Farmers (Rs.15,000/-)	-	-
	Sub Total		
7	Site Specific		
	Construction of Checkdams on Govt. land 100% Max. Rs. 10 lakh	26	-
	Construction of Minor Irrigation Tanks on Govt. land 100% Max. Rs. 25 lakh	2	-
	Sub Total	-	-
8	Post-Harvest and Marketing Support		
		-	-
9	Cropping System based training (04 sessions) Rs. 14,000 per training (@ Rs. 3,500 per session)	40	-
	Grand Total	-	-

IRRIGATION RESOURCES (*SITE SPECIFIC*) OF SAMPLE DISTRICTS AND CHHATTISGARH STATE

1. JANJGIR-CHAMPA

Irrigation Resources	Base Year (2009-10)		2010-11 to 2016-17								2017-18	
	Nos.	Irrigated area (Ha.)	Nos.			BGREI Share (%)	Irrigated area (Ha.)			BGREI Share (%)	Target	Ach.
			BGREI	Others	Total		BGREI	Others	Total			
Check Dam	-	-	65	-	65	100	65.000	-	65.000	100	-	-
Minor Irrigation Tank (MIT)	11	81.05	23	-	23	100	271.870	-	271.870	100	-	-

2. SARGUJA

Irrigation Resources	Base Year (2009-10)		2010-11 to 2016-17								2017-18	
	Nos.	Irrigated area (Ha.)	Nos.			BGREI Share (%)	Irrigated area (Ha.)			BGREI Share (%)	Target	Ach.
			BGREI	Others	Total		BGREI	Others	Total			
Check Dam	0	0	93	0	93	100	1058.76	0	1058.76	100	0	0
Minor Irrigation Tank (MIT)	12	340.683	29	42	71	41	679.52	1447.76	2127.28	32	0	0

3. BALRAMPUR

Irrigation Resources	Base Year (2009-10)		2010-11 to 2016-17								2017-18	
	Nos.	Irrigated area (Ha.)	Nos.			BGREI Share (%)	Irrigated area (Ha.)			BGREI Share (%)	Target	Ach.
			BGREI	Others	Total		BGREI	Others	Total			
Check Dam	32	298	86	12	98	88	992	106	1098	90	-	-
Minor Irrigation Tank (MIT)	29	640	20	33	53	38	520	684	1204	43	-	-

4. SURAJPUR

Irrigation Resources	Base Year (2009-10)		2010-11 to 2016-17								2017-18	
	Nos.	Irrigated area (Ha.)	Nos.			BGREI Share (%)	Irrigated area (Ha.)			BGREI Share (%)	Target	Ach.
			BGREI	Others	Total		BGREI	Others	Total			
Check Dam	0	0	60	0	60	100	710.58	0	710.58	100	0	0
Minor Irrigation Tank (MIT)	46	1158.86	12	0	12	100	288.95	0	288.95	100	0	0

5. CG STATE

Irrigation Resources	Base Year (2009-10)		2010-11 to 2016-17								2017-18	
	Nos.	Irrigated area (Ha.)	Nos.			BGREI Share (%)	Irrigated area (Ha.)			BGREI Share (%)	Target	Ach.
			BGREI	Others	Total		BGREI	Others	Total			
Check Dam	-	-	1629	0	1629	100	21622	0	21622	100	67	0
Minor Irrigation Tank (MIT)	163	3260	283	504	787	36	7075	13100	20175	35	4	

SEED COMPONENT OF SAMPLE DISTRICTS AND CHHATTISGARH STATE

(Quantity: Qtls)

Seed Component	Janjgir- Champa				Sarguja				Balrampur				Surajpur				CG State			
	Achievement		2017-18		Achievement		2017-18		Achievement		2017-18		Achievement		2017-18		Achievement		2017-18	
	2015-16	2016-17	T	A	2015-16	2016-17	T	A	2015-16	2016-17	T	A	2015-16	2016-17	T	A	2015-16	2016-17	T	A
Production of seeds (Var. <10 yr Old)																				
Hybrid Rice	-	-	-	-	0	0	0	0	-	-	-	-	0	0	0	0	-	5000	3000	-
Certified Seeds	12620 (29)	13944 (25)	26564	15000	0	1019.6 (2)	5000	0	-	-	1000	-	0	0	1000	300	43196	56581	40525	-
Total Production	12620 (29)	13944 (23)	26564	15000	0	1019.6 (2)	5000	0	-	-	1000	-	0	0	1000	300	43196	61581	43525	0
Seed distribution (Var. <10 yr old)																				
Hybrid Rice	41.50 (7)	-	41.50	700	23.19 (4)	0	400	0	-	-	200	-	0	0	200	0	599	329	5000	-
Certified Seeds	30.00 (0.19)	14197 (18)	14227	12000	5306.3 (33)	3862 (5)	6500	0	-	-	5000	-	2500 (16)	5682 (7)	5000	5000	16086	79410	86050	-
Total Distribution	71.50 (0.42)	14197 (18)	14268.50	12700	5329.49 (32)	3862 (5)	6900	0	-	-	5200	-	2500 (15)	5682 (7)	5200	5000	16685	79739	91050	0

*T- Target, A- Achievement *Figures in the parentheses are percentage from CG.

ASSET BUILDING (IRRIGATION/INFRASTRUCTURE/MACHINERIES)

State/ District	Year	Schemes	Asset Building															
			Dug well	Bore well	Shallow tube well	Pump sets	Seed drill	Rotavator	Self Propelled Paddy Transplanter	Laser Land Leveller	Paddy Thresher	Multi Crop Thresher	Power Tiller	Power Weeder	Power Knap Sack Sprayer	Self Propelled reaper	MB Plough	Leveller Blades
Janjgir - Champa	2010-11 to 2016-17	BGREI	-	465 (5)	200 (8)	455 (13)	4 (2)	58 (2)	14 (15)	-	45 (6)	100 (7)	18 (4)	-	457 (3)	21	25 (4)	17 (3)
		Other Schemes	-	189	210	402	7	48	10	-	40	60	16	-	510	17	8	12
		Total	-	654	410	857	11	106	24	-	85	160	34	-	967	38	33	29
	2017-18	Target	-	200	-	50	-	40	5	-	10	15	15	-	100	15	3	3
		Achi	-	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sarguja	2010-11 to 2016-17	BGREI	0	0	0	68 (2)	1	12 (0.4)	4 (4)	0	0	25 (2)	8 (2)	0	0	58	1 (0.1)	0
		Other Schemes	56	478	45	1658	15	32	8	0	8	38	72	5	40	85	25	27
		Total	56	478	45	1726	16	44	12	0	8	63	80	5	40	143	26	27
	2017-18	Target	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Achi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Balrampur	2010-11 to 2016-17	BGREI	66 (13)	-	-	75 (2)	-	20 (0.73)	5 (5)	-	20 (3)	5	7 (2)	-	50 (0.4)	10	-	-
		Other Schemes	128	424	-	2061	3	31	3	-	88	2	63	30	-	170		6
		Total	194	424	0	2136	3	51	8	0	108	7	70	30	50	180	0	6
	2017-18	Target	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Achi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Surajpur	2010-11 to 2016-17	BGREI	0	0	0	192 (6)	5 (3)	40 (1.46)	5 (5)	0	1	13 (1)	24 (6)	0	708 (5)	62	0	0
		Other Schemes	10	10	257	0	2353	2	11	1	0	0	2	39	0	950	56	6
		Total	10	10	257	192	2358	42	16	1	1	13	26	39	708	1012	56	6
	2017-18	Target	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Achi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CG State	2010-11 to 2016-17	BGREI	510	9954	2500	3398	174	2737	91	-	793	1524	408	58	13867		690	504
		Other Schemes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Total	510	9954	2500	3398	174	2737	91	-	793	1524	408	58	13867		690	504
	2017-18	Target	-	2600	-	700	1097	600	50	-	200	200	325	307	-	-	70	60
		Achi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Figures in the parentheses are percentage from CG.

PRADHAN MANTRI FASAL BIMA YOJANA (PMFBY) - KHARIF-2017 AS ON 30-08-2017

S. No.	Dist. Name (No. of bank)	Loanee Farmers				Non Loanee Farmers				TOTAL			
		No. of Farmers Covered	Total Sum insured (Amt in Rs Lac)	Amount of premium received (Amt in Rs Lac)	No. of entries posted in Central Govt Website	No. of Farmers Covered	Total Sum insured (Amt in Rs Lac)	Amount of premium received (Amt in Rs Lac)	No. of entries posted in Central Govt Website	No. of Farmers Covered	Total Sum insured (Amt in Rs Lac)	Amount of premium received (Amt in Rs Lac)	No. of entries posted in Central Govt Website
1	Raipur (358)	66061	30540.45	631.25	8581	2445	929.01	18.53	26	68506	31469.46	649.79	8607
2	Baloda Bazar (83)	87092	39080.18	832.44	1297	2376	853.55	16.94	141	89468	39933.73	849.38	1438
3	Dhamtari (75)	58621	25733.75	458.8	3254	7632	2813.27	50.3	67	66253	28547.02	509.1	3321
4	Gariyaband (33)	37426	17090.81	351.14	1135	6612	2621.49	52.75	100	44038	19712.3	403.89	1235
5	Mahasamund (82)	61142	34973.61	638.4	5697	6304	3768.83	58.3	2	67446	38742.44	696.69	5699
6	Durg (204)	66424	37568.94	784	2315	2056	850.09	17.03	1	68480	38419.03	801.03	2316
7	Kabeerdham (52)	58391	31485.78	660.64	1403	2393	1009.5	18.9	82	60784	32495.28	679.55	1485
8	Rajnandgaon (112)	133749	79963.86	1488.53	12854	32389	10706	184.4	363	166138	90669.86	1672.94	13217
9	Bilaspur (182)	49326	5162.11	111.15	2422	8805	97.26	2.18	10	58131	5259.37	113.33	2432
10	Janjgir- Champa (112)	68406	6996.64	146.78	3025	2607	97.2	0.73	76	71013	7093.84	147.51	3101
11	Raigarh (115)	47372	27486.39	489.83	554	7639	585.54	12.28	60	55011	28071.93	502.11	614
12	Surguja (58)	20316	6941.09	90.17	973	13754	458.89	6.6	448	34070	7399.98	96.77	1421
13	Balrampur (36)	10999	3351.04	67.29	159	2051	106.39	1.6	114	13050	3457.43	68.89	273
14	Jashpur (58)	7662	4219.91	64.75	221	13968	1198	19.97	758	21630	5417.92	84.72	979
15	Koriya (49)	12223	2076.06	89.4	1194	1483	215.97	4	696	13706	2292.03	93.4	1890
16	Bastar (69)	13123	9426.56	172.32	4065	6063	1402.19	45.36	1990	19186	10828.75	217.68	6055
17	Bijapur (12)	5039	3860.94	77.1	18	795	300.84	6.01	141	5834	4161.78	83.11	159
18	Dantewada (27)	1721	1870.99	37.03	66	2442	859.27	16.71	678	4163	2730.26	53.74	744
19	Kanker (54)	36157	26112.56	523.24	3763	7700	1872.16	38.54	534	43857	27984.72	561.78	4297
20	Kondagaon (35)	14839	8414.56	198.02	1324	2897	639.79	14.76	1389	17736	9051.35	212.78	2713
21	Narayanpur (9)	1878	907.92	18.26	48	281	124.72	2.44	114	2159	1032.64	20.69	162
22	Balod (67)	88335	45870.11	944.28	1264	4521	1391.91	27.75	148	92856	47262.02	972.03	1412
23	Bemetara (52)	86013	44814	933.66	843	5968	2328.78	46.42	27	91981	47142.78	980.07	870
24	Korba (88)	13752	1268.61	22.9	209	2097	297.24	5.93	132	15846	1565.86	28.23	341
25	Mungeli (34)	29379	4278.7	194.29	284	1536	79.2	1.59	64	30915	4357.9	195.87	348
26	Surajpur (54)	19194	9195.13	183.79	484	730	48.39	1.07	114	19925	9243.52	184.87	598
27	Sukma (13)	1594	1334.7	27.01	84	851	222.47	4.29	404	2445	1557.17	31.3	488
Total		1096234	510025.4	10236.47	57536	148395	35877.95	675.38	8679	1244627	545900.4	10911.25	66215
Kharif (2016)		1255516				148668				1404184	696185	13315.41	

ECOLOGY WISE MANAGEMENT PRACTICES FOR RICE**A. Irrigated****A.1. Irrigated Ecologies (HYVs)**

Rice crop receives assured irrigation through different sources viz., canals, tanks, wells etc. Therefore, the productivity potential of the irrigated rice is higher and hence contributes about 55% of the total rice production in the country. In eastern India the irrigated rice area is less (20-36% of the total rice area) and has a tremendous potential of producing higher yields of 5-8 t/ha. But the potential yields are not yet achieved in farmer's fields in a large scale. To achieve this following technology need to be adopted.

Nursery management:

- Raising of the Nursery near lift irrigation points and other water sources in the middle of June and December for *Kharif* and *rabi* crops respectively.
- Selection of good seeds by preparing a salt solution of 1.06 specific gravity (60 g common salt in 1 liter water), Placing the seeds in container of the salt solution, removing the floating seeds, washing the selected seeds in fresh water and drying under shade.
- Treating the seeds with Carbendazim (Bavistin) @ 2 g/kg of dry seeds after soaking in water for 24 hours.
- Preparing 1-1.5 m wide raised nursery beds of any convenient length with provision of drains of 30 cm width between the beds and sowing of sprouted seeds on the nursery beds using a seed rate of 30-35 kg/ha.
- Apply 5 kg Urea, 10 kg SSP and 5 kg MOP with sufficient well-rotted FYM before final leveling of nursery bed for healthy seedlings.
- Keep the nursery beds moist for first few days and maintain a shallow layer of water after the seedlings are about 1 inch high.
- Apply Carbofuran (Furadan 3G) @ 1 kg a.i./ha at 15 days after seed germination.
- For machine transplant of rice, raising of seedling done in special mat nurseries or in seedling trays where 18-25 kg of good seeds per 100 m² of nursery area required for 1ha.

Land preparation

- Prepare the land well by using tractor drawn plough in optimum moisture condition.
- Allow the water in the field and then puddle the field twice followed by laddering.
- Give a gap of at least 7-8 days between initial and final puddling for better weed control and nutrient availability.
- Perfect leveling is also a must for better water management.

Stand establishment

- Planting by mid July with 20 × 15 cm spacing for long and 15 × 15 cm spacing for short and medium duration varieties in *Kharif* and mid January with 15 cm × 15 cm in *rabi* produces higher yield.
- 25-30 days old seedlings should be transplanted in puddle land with 2-3 seedlings per hill and gap filling once in 7 DAT.
- Machine transplanting is recommended as it is labor saving than manual method and is more efficient (1-2 ha/person/day vs. 0.07 ha/person/day).
- Ensure that fields are well-puddled and well-leveled.

- Drain fields and allow mud to settle for 162 days after the final puddling.
- The subsurface soil layers need to be hard enough to support the transplanting machine.
- The soil is ready when a small ϕ mark made in the puddled soil with a stick holds its shape. At this moisture level, the soil can hold the seedlings upright.
- Soil should not be so dry that it sticks to and interferes with planting parts or wheels of the transplanter.
- Load the seedling mats into the machine and transplant the seedlings at the selected machine setting.

Fertilizer management

- Apply NPK @ 80:40:40 kg/ha in wet season and 120:60:60 kg/ha in the dry season. Soil test based fertilizer application especially for P and K is preferred over blanket dose.
- Apply half of total N, entire amount of P and three fourths of K as basal after draining out the standing water but before final puddling. Top dress the remaining N in two equal splits each at 3 weeks after transplanting and at panicle initiation. Also apply remaining one fourth of K at panicle initiation.
- For better soil health apply nitrogen in the form of both organics (green manure, FYM, Azolla etc.) and chemical fertilizer (Neem coated urea) in 50:50 proportions.
- Use Leaf Colour Chart (LCC) based N application for increased N use efficiency. Apply about 57 kg of urea per hectare within 0-7 DAT as basal. Take LCC reading from 21 days after transplanting and apply 57 kg urea/ha as and when the reading is less than 3.
- Apply ZnSO_4 @ 25 kg/ha in zinc deficient soils.

Weed management

- Pre- emergence application of pretilachlor at 1.0 kg a.i./ha on 3 DAT + weeding with Twin row rotary weeder at 40 DAT.
- **Apply Bensulfuron methyl + Pretilachlor (Ready-mix) granule (Londax Power/Erase Strong @ 10 kg/ha) at 8-10 days after planting (at 2-3 leaf stage of weeds) to suppress the early emergent broad spectrum of weeds either in saturated soil or with 2-3 cm standing water after mixing with sand @ 30 kg/ha.**
- **In irrigated or favourable transplanted field with no standing water during early crop growth stage and mixed population of weeds are emerged, spray Azimsulfuron 50 DF @ 70 g/ha at 15 DAS (at 3-4 leaf stage of weeds). Spray it by mixing with 350 liters of water. Add surfactant (625 ml/ha) available with chemical for increasing the efficacy of the herbicide.**
- In absence of pre emergence herbicide application, 2,4-D sodium salt (Fernoxone 80% WP) 1.25 kg/ha dissolved in 625 litres with a high volume sprayer, three weeks after transplanting or when the weeds are in 3 - 4 leaf stage.
- Early post emergence application of Bispyribac sodium 50 g a.i. ha^{-1} (2-3 leaf stage of weeds) + Hand weeding on 45 DAT.
- Alternatively, hand weed twice at 20 and 40 days after transplanting.
- Maintain 3-5 cm of standing water in the field at the time of herbicide application for ensuring effective weed control.

Water management

- Field should be kept under saturated condition for a week after transplanting for establishment of roots and simulate growth of roots.
- After wards maintain a water level of 3-5 cm during the entire crop growth period.

- The field should be drained prior to top dressing and irrigate after 24-36 hours.
- Drain out water after 15 days from the milk formation stage.
- Water saving technology like alternate wetting and drying (ADW) should be adopted.

Plant protection

- Yellow stem borer is the major pest at initial stage of plant growth. Dip the seedling up to root in Chloropyriphos solution @ 2ml/lit of water overnight before transplanting. Apply Carbofuran granules @ 30 kg/ha at panicle initiation stage for its effective control during *Kharif*.
- Foliar spray of Imidacloprid @ 1 ml/lit or Chloropyriphos @ 5 ml/lit can be applied for Brown plant hopper, WBPH, Leaf folder and Case worm.
- If Sheath Blight appears towards panicle initiation stage, avoid N application; spray Validamycin or Sheathmar3 @ 2 ml/lit. Spray Propiconazole @ 1 ml/lit at the appearance of the disease symptoms.
- In case of appearance of BLB or BLS apply Plantomycin 0.1% or Streptocycline 0.01% along with Cupper oxychloride 0.2%. Minimum two sprays or in severe cases 3 sprays should be applied in 8 days interval.
- Use 500 liter of water/ha for spraying pesticide and keep the field bund clean to minimize disease and pest attack.

Harvesting, drying & storage

- Harvest the crop when 80% of the grains in panicles are ripened with a reaper or combine harvester.
- If harvested manually, thresh immediately after harvesting and dry gradually under shade up to 12% moisture content for seed purpose and 14% for milling.

A.2. Irrigated medium land Ecologies (Hybrids)

Rice hybrids have higher yield potential due to the phenomenon of heterosis or hybrid vigour. Hybrids can produce 7-8 t/ha, which is more than 1 t/ha over the best high - yielding varieties of similar duration. So far, in India, more than 50 rice hybrids have been developed and released for cultivation, which are suitable for irrigated and shallow lowlands. Suitable agronomic management practices are to be followed to obtain the potential yield of the hybrids.

Nursery management

- Plough the seed bed area twice when the land is dry. Impound water for four to five days. Drain excess water. Puddle the area twice or thrice. Level it by laddering.
- Prepare raised and leveled wet nursery beds of 1 m width with provision of drains of 30 cm width between the beds. Apply NPK at the rate of 500: 500: 500 g/100 m² of nursery area and 100 kg of farmyard manure (FYM) for every 100 m² of nursery area before final land preparation.
- Use 20-25 g of seeds per 1 m² of nursery area. Nursery area of 600 m² is required for one hectare of main field.
- As the test weight of the hybrid is low, 12-15 kg of hybrid rice seeds are sufficient to transplant in one hectare of land.
- Use truthfully labeled hybrid seeds. Procure fresh hybrid seeds each time only from approved seed agencies.
- As hybrid seeds are light, never use salt solution for discarding light and half-filled grains before sowing. These grains normally have good germination.
- Treat the seeds with Carbendazim (Bavistin) at the rate of 2 g/kg of dry seeds after soaking in water for 24 hours.
- Spread the treated seeds on a hard floor under shade. Cover with wet gunny bag and straw and sprinkle water 2-3 times a day. Seeds will sprout in one to two days.
- The right time for sowing seeds is mid-June for wet season and 1st week of December for dry season.
- Sow the sprouted seeds on leveled and drained wet nursery beds with no standing water.
- Irrigate with a thin film of water two to three days after sowing of sprouted seeds. Give light irrigation afterwards.
- After 15 days of seedling growth, apply Carbofuran (Furadan 3G) at the rate of 250 g/100 m² of nursery.

Land preparation

- Irrigated medium land with drainage facility is suitable for growing hybrid rice.
- Apply and incorporate 5 t/ha of FYM compost during the dry ploughing.
- Irrigate the field and puddle 7 to 10 days before transplanting to incorporate the weeds, if any. Puddle the land again and level it by laddering prior to transplanting.

Transplanting

- Uproot seedlings and dip the roots of the seedlings in Chlorpyrifos solution at the rate of 1 ml/ltr of water over night before transplanting.
- Transplant 25 to 30 days old seedlings erect at a shallow depth of 2 to 3 cm on puddled and leveled land (with no standing water) at the rate of one to two seedlings/hill with a spacing of 20 × 15 cm or 15 × 15 cm for medium and short duration hybrids.

Fertilizer Application

- Apply NPK at the rate of 100: 50: 50 kg/ha in wet season and at the rate of 120: 60: 60 kg/ha in the dry season.
- Soil test based fertilizer application especially for P and K is preferred over blanket dose.
- Apply one fourth of total N, entire amount of P and three fourths of K as basal after draining out the standing water but before final puddling. Top-dress the remaining N in three equal splits, each at three weeks after transplanting, panicle initiation and panicle emergence stages. Also apply remaining one fourth of K at panicle initiation.
- Use Leaf Colour Chart (LCC) based N application for increased N use efficiency. Apply about 87 kg of urea per hectare within 0-7 DAT as basal. Take LCC reading from 21 days after transplanting and apply 87 kg urea/ha as and when the reading is less than 3.

Irrigation and cultural practices

- Irrigate the field two days after transplanting. Maintain continuous water level to a depth up to 5 cm till mid-grain filling stage.
- Complete gap filling to replace dying plants within 7 to 10 days after transplanting.
- Weed out the rice field at least twice, once at 21 days after transplanting (DAT) and again at 42 DAT.

Plant protection

- Protect the crop from insect pests and diseases with regular monitoring of pest attacks and by following need based pesticide application as suggested for HYVs.
- While spraying pesticide, use 500 liters of water/ha in case of power sprayer. Keep the field bund clean to minimize disease and pest attack.
- Yellow Stem Borer: Rynaxypyr 20 SC @ 150 ml/ha or Triazophos 40 EC @ 1250 ml/ha or Acephate 75 SP @ 750 g/ha or Chlorpyrifos 20 EC @ 2500 ml/ha should be applied as foliar spray at brood emergence
- Leaf folder: Triazophos 40 EC @ 625 ml/ha or Thiamethoxam 25 WG @ 100 g/ha or Neem oil @ 5ml/litre of water with 2% detergent liquid
- BPH/WBPH: Imidacloprid 17.8S L @ 125 ml/ha or Thiamethoxam 25 WG @ 100 g/ha or Ethofenprox 10 EC @ 500 ml/ha or Neem oil @ 5 ml/litre of water with 2% detergent liquid.
- Gundhi bug: Apply dust formulation of Methyl parathion at the rate of 25 kg/ha or foliar spray of Ethofenprox 10 EC 2 ml/ltr.
- Bacterial leaf blight / streak: Spray with Plantomycin @ 1 g/lit of water using 500 liters of water per hectare or Streptocycline (150 mg) + Copper oxychloride 1 g/lit of water twice at an interval of 8 days.

- Blast: Spraying of Carbendazim 50 WP @ 2 g/lit or Tricyclazole 75 WP @ 0.6 g/lit of water may be done for controlling the disease. Otherwise, spraying of leaf extracts of Bael (25 g fresh leaves) or Tulsi (25 g fresh leaves) or Neem (200 g fresh leaves) per litre of water can help in reducing the incidence of disease.
- Sheath blight: Spray with effective fungicides like Sheathmar 3L (Validamycin 3L) @ 2 ml/l of water) or Rhizocin 3L (Validamycin 3L) @ 2 ml/l of water) or Contaf 5 EC (Hexaconazole 5 EC) @ 2 ml/l of water or Thifluzamide 24 SC @ 1 ml/l of water or Bavistin 50 WP (Carbendazim 50WP) 2.5 g/l of water.
- Sheath rot: Spray Carbendazim 50 WP (Bavistin) @ 2 g/lit, Propiconazole (Tilt 25 EC) @ 1ml/lit or Hexaconazole (Cantaf 5 EC) @ 1 ml/Lit.
- False smut: Spray with 0.25% Carbendazim or 0.25% Captafol or 0.4% Mancozeb twice at 7 days interval at boot leaf stage and drain out water from the field after grain formation.
- For controlling viral diseases such as tungro and grassy stunt, remove the infected plants and control the insect vector by applying Furadan at the rate of 30 g/ha.

Harvesting, drying and storage

- Drain out water from the rice field after 15 days from the milk formation stage. Harvest the crop when 80% of the grains in panicles are ripened. Dry the harvested paddy. Thresh with paddle thresher or power thresher. Clean paddy grains by winnowing. Dry gradually under shade. Store the rice in improved storage bins. For time and labour saving paddy harvesting, combine harvester/paddy reaper is recommended.

A.3. Irrigated Medium land Ecologies - System of Rice Intensification (SRI)

System of Rice Intensification (SRI), an emerging water saving technology, was developed by Fr. Henri De Laulanie, a French priest with a background in agriculture in Madagascar during 1980s. This method of rice cultivation involves the set of certain management practices for plant, soil, water and nutrient, which provide better growing conditions for rice plants especially in the root zone than those for plants grown under traditional practices. SRI appears to be a viable alternative that not only saves the inputs, but also improves soil health / quality and protects the environment sustainability. SRI technology needs less seed, water, chemical fertilizers and pesticides but yields more with large root volume, profuse and strong tillers with longer panicles, more and well-filled spikelets with high grain weight. The agro-techniques developed for SRI method of rice cultivation at National Rice Research Institute are cited below:

Six Important Practices to Follow

- Plant very young seedlings (8-12 days).
- Plant single seedlings per hill carefully and gently.
- Maintain wide spacing in a square pattern.
- Use mechanical weeding (rotary hoe).
- Keep the soil at saturation during vegetative growth phase and shallow water (2-3 cm) at flowering and grain filling stage.
- Apply organic manure or other organic amendments to improve soil quality.

Selection of Land and Land preparation

- Land selected for SRI cultivation should be well leveled.
- Fertile soil with high soil organic carbon is most suitable.
- Soils which are affected by salinity / alkalinity are not suitable for SRI cultivation.
- Prepare the land carefully by proper ploughing, puddling, leveling and raking as in conventional method.
- Keep 25-30 cm wide channels at every three meter intervals across the field.
- Make small plots for easy and efficient water management.

Seed Rate

- Five to six kilograms of pre-soaked sprouted seeds would be needed for transplanting in one hectare.

Nursery Management

- Keep the seedbed as close as possible to the main field.
- Prepare nursery beds of one-meter width of convenient length.
- Place wooden planks or bamboo slits all around the bed for support.
- Use healthy seeds, soak in water for 24 hours and leave it to germination for 24 hours.
- Level the seedbed and spread a thin layer of well-decomposed FYM on the bed.
- Broadcast the sprouted seeds sparsely and evenly.
- Apply another layer of FYM to cover the seeds.
- Mulch with paddy straw to prevent the seed from exposing to sun, rain, birds etc.

Transplanting:

- Use young seedlings of 8 to 12 days old or at two-three leaves stage.
- Remove the seedling from the nursery along with seed sac, soil and roots intact.
- Transplant seedling carefully without plunging too deep into the soil.
- Transplant seedling immediately after gently removing seedlings from the nursery bed.
- Seedlings should be placed on the ground at the appropriate point on the planting grid.
- Plant the seedling widely with row to row distance and plant to plant distance should be 10×10 inches i.e. $25 \text{ cm} \times 25 \text{ cm}$ (16 plants/m²).

Nutrient Management

- *Preparation of soil mixture:* Four (4) m³ of soil mix is needed for each 100 m² of nursery. Mix 70% soil + 20% well-decomposed pressmud / bio-gas slurry / FYM + 10% rice hull. Incorporate 1.5 kg of powdered DAP or 2 kg 17-17-17 NPK fertilizer in the soil mixture.
- *Seed Treatment with biofertilizers:* Five packets (1 kg/ha) of *Azospirillum* and five packets (1 kg/ha) of Phosphobacteria or five packets (1 kg/ha) of Azophos biofertilizers are to be mixed with water and seeds to be soaked for 4 hrs. The bacterial suspension after draining may be sprinkled in the nursery before sowing the treated seeds.
- *Pre-germinating the seeds 2 days before sowing:* Soak the seeds for 24 hrs, drain and incubate the soaked seeds for 24 hrs, sow when the seeds sprout and radical (seed root) grows to 2-3 mm long.
- *Soil application of biofertilizers:* Application of *Azospirillum* @ 2 kg and Arbuscular mycorrhizal fungi @ 5 kg for 100 m² nursery area.
- *Spraying fertilizer solution (optional):* If seedling growth is slow, sprinkle 0.5% urea + 0.5% zinc sulphate solution at 8-10 DAS.
- In highly fertile soils, instead of chemical fertilizers, application of FYM or compost @ 10 t/ha is quite sufficient as source of nutrients.
- For better soil health apply nitrogen in the form of well decomposed organic manure (FYM, Vermicompost etc.) or green manure (*Azolla*) and inorganic sources in 50:50 proportions.
- Apply N, P₂O₅, K₂O @ 60:30:30 kg/ha and 80:40:40 kg/ha in the wet and dry season, respectively.
- Under sodic soils, during rotary weeding, apply Azophosmet @ 2.2 kg/ha and PPFM as foliar spray @ 500 ml/ha.

Water Management

- Do not allow water stagnation under SRI method.
- Irrigation only to moist the soil in the early period of 10 days.
- Restoring irrigation to a maximum depth of 2.5 cm after development of hairline cracks in the soil until panicle initiation.
- Increasing irrigation depth to 5.0 cm after PI one day after disappearance of ponded water.

- Adopt alternate wetting and drying system of water management to keep the soil moist and create aerobic/anaerobic soil conditions for better nutrient mobilization by soil biota.
- Irrigate the field on the previous evening before the periodic weeding and drain out water in the morning to facilitate rotary weeder operation.

Weeding and inter-culturing

- Herbicides are not recommended under SRI method.
- Use simple mechanical rotary weeder/cono weeder to churn the soil for weed control. Do the first weeding may be required at intervals of 10-12 days till 40 days after transplanting.
- Working with rotary weeder helps in greater aeration, which results in more root growth, reduced weed competition, more oxygen and nitrogen to roots.

Pest and disease management

- Wider spacing and use of organic manures results in healthy growth of the plants and incidence of the pest and diseases in naturally low.
- Adopt preventive and / or need based plant protection measures as and when required by using some organic concoctions.
- Medicinal Matka Khad: Take 1 Kg Cow dung, 2 litres Cow urine, 1 kg neem leaf, 1 kg karanj leaf, 1 kg Calotropis leaf and 50 gm jaggery in an earthen pot, thoroughly mixed for at least one hour. The pot is covered by polyethylene cover and is kept airtight for 10 days. At every two days interval the mixture is stirred with a stick. After 10 days the mixture is filtered by a thin cloth and applied to the crop by diluting upto 40 times with water. The above extract may be sprayed by using a wide mouth nozzle or sprinkled through broom. Un- filtered matka khad may also be applied directly to the water channel.

Harvesting, drying and storage

- Drain out water from the rice field after 15 days from the milk formation stage. Harvest the crop when 80% of the grains in panicles are ripened. Dry the harvested paddy. Thresh with paddle thresher or power thresher. Clean paddy grains by winnowing. Dry gradually under shade. Store the rice in improved storage bins. For time and labour saving paddy harvesting, combine harvester/paddy reaper is recommended.

B. Rainfed Ecology

B.1. Rainfed Upland Ecologies: (Drought tolerant varieties)

Rice grows as a rainfed dry land crop in non-flooded, well-drained soil on level to steeply sloping fields. The crop is usually direct seeded and suffers from lack of moisture and inadequate nutrition. With few inputs, upland rice yields are very low but nevertheless critical to the household food security of some of the poorest people of the country. Upland rice makes up 14 percent of the country's harvested rice area and 6 percent of rice production. The uplands support millions of people, most of them at the subsistence level. Improved management practices which are needed to rehabilitate degraded uplands and transform them into sustainable agro ecosystems are presented below:

Land Preparation

- Summer ploughing during the month of March-April to control weeds like *Cyperus rotundus*.
- For dry seeding, plough the field after receipt of monsoon rain 2-3 times to get a fine tilth as the land should be properly leveled for uniform germination and crop stand.
- Make 30 cm bunds around the field to conserve rainwater.

Stand establishment

- Direct seeding is mainly recommended in rainfed upland condition where about 80kg seeds required when hand sown and sowing with country plough and 35 kg seeds required per hectare when sown by seeding drill.
- Line seeding (8-10 seeds/hill at 20 × 15 cm spacing) behind the country plough with seed rate of 80 kg/ha in second or third week of June when the cumulative rainfall reaches 60 to 70 mm

Fertilizer Management

- Application of 2-5 t/ha of well decomposed FYM at the time of final land preparation along with 60:30:30 kg of N, P₂O₅ and K₂O/ha for semi-dwarfs and 40:20:20 kg of N, P₂O₅ and K₂O/ha for semi-tall varieties could meet the nutrient requirement of rice. Nitrogen may be applied in 3 splits- half at 2-3 weeks after sowing and a quarter each at 6 & 8 weeks after sowing.
- Use Leaf Colour Chart (LCC) based N application for increased N use efficiency. Apply about 42 kg of urea per hectare within 0-14 DAS as basal. Take LCC reading from 28 days after sowing and apply 42 kg urea/ha as and when the reading is less than 3.
- Placement of whole of P and K below the seed using seed drill at the time of sowing.

Weed Management

- Cultural methods to manage weeds can begin early if pre-monsoon showers allow 1-2 ploughings. Allow first flush of weeds to germinate which can be ploughed down at final land preparation.
- Pre-emergence application of pretilachlor at 800 g a.i./ha in moist surface soil effectively controls the first thrust of grassy weeds and sedges in direct seeded rice.
- Pre-emergence application of pretilachlor at 800 g a.i./ha + one hand weeding at 30-40 DAS or Mechanical weeding with finger weeder at 15-20 DAG + one hand weeding at 30 DAG take care of most of the weeds.
- Post-emergence herbicide application of bispyribac sodium 30 g a.i./ha or Azimsulfuron 35g a.i./ha within 20 days after seeding is recommended where pre-emergence herbicides could not be applied due to dry soil conditions. Chemical weed control should be followed by mechanical weeding or light manual weeding before top dressing nitrogen.

Plant protection

- Seed treatment with chloropyriphos @ 0.75 kg a.i./100 kg seed to protect from termites.
- Dusting of malathion 10 D or methyl parathion 10 D & 25 kg/ha to control gundhi bug.
- Seed treatment with Bavistin @ 2.5g/kg of seed.
- Application of tilt @ 0.2% to control brown spot.
- Application of hinosan @ 0.1% to control blast.

Harvesting, drying and storage

- Drain out water from the rice field after 15 days from the milk formation stage. Harvest the crop when 80% of the grains in panicles are ripened. Dry the harvested paddy. Thresh with paddle thresher or power thresher. Clean paddy grains by winnowing. Dry gradually under shade. Store the rice in improved storage bins. For time and labour saving paddy harvesting, combine harvester/paddy reaper is recommended.

B.2. Rainfed lowland Rice

In eastern India comprising the states of Assam, West Bengal, Bihar, Orissa, eastern Madhya Pradesh and eastern Uttar Pradesh, rainfed lowland areas occupies more than 50 percent of the total 27.43 million hectares of rice area. The rice crop in this situation occasionally experiences deficit moisture stress in the early or terminal stages of growth but mostly excess water stress at any stage, which sometimes submerges the crop as well. This area has the total annual rainfall ranging from 1200 to 3100 mm annually and marked with saucer shaped physiography with drainage congestion causing accumulation of water to 100 cm or more which is further aggravated by floods from the heavily silted rivers. Based on the depth of water stagnation in the field, the rainfed lowland rice areas are classified into i) Shallow lowlands (0-25 cm), ii) Medium/Semi deep (25-50 cm) and iii) Deep water (50-100 cm). The crop production under these rainfed areas can be improved by adopting the following technologies.

B.2.1 Rainfed Shallow Lowlands

Nursery management:

- Adopt a seeding density of 40 g seeds/m² in nursery to produce thick, robust and healthy seedlings.
- Apply N, P₂O₅ and K₂O @ 100, 20 and 20 kg/ha for producing healthy seedlings.
- Correcting Zinc deficiency in the nursery is also beneficial.
- Seedling root dipping in Dursban (chloropyrifos) solution (0.02%) before planting helps in controlling rice whorl maggot, stem borer etc.
- Selection of good seeds by preparing a salt solution of 1.06 specific gravity (60 g common salt in 1 liter water), Placing the seeds in container of the salt solution, removing the floating seeds, washing the selected seeds in fresh water and drying under shade.
- Treating the seeds with Carbendazim (Bavistin) @ 2 g/kg of dry seeds after soaking in water for 24 hours.
- Preparing 1-1.5 m wide raised nursery beds of any convenient length with provision of drains of 30 cm width between the beds and sowing of sprouted seeds on the nursery beds using a seed rate of 30-35 kg/ha.
- Apply 5 kg Urea, 10 kg SSP with sufficient well-rotted FYM and 5 kg MOP before final leveling of nursery bed for healthy seedlings.
- Keep the nursery beds moist for first few days and maintain a shallow layer of water after the seedlings are about 1 inch high.
- Apply Carbofuran (Furadan 3G) @ 1 kg a.i./ha at 15 days after seed germination.
- For machine transplant of rice, raising of seedling done in special mat nurseries or in seedling trays where 18-25 kg of good seeds per 100m² of nursery area required for 1ha.

Land preparation

- Open the land immediately after the harvest of the previous crop, preferably with a mould-board plough.
- For direct seeded crop one or two summer ploughings after pre-monsoon showers during April-May makes the land ready for early or timely sowing.
- For transplanted crop allow the water in the field and then puddle the field twice followed by laddering. Give a gap of at least 7-8 days between initial and final puddling for better weed control and nutrient availability.

Stand establishment

- Dry direct seeding may be practiced in rainfed shallow low lands with 35 kg seeds per hectare using seed drill before onset of monsoon.
- Line seeding (8-10 seeds/hill at 20×15 cm spacing) behind the country plough with seed rate of 80 kg/ha in first week of June when the cumulative rainfall reaches 60 to 70 mm.
- In case of transplanted crop, early planting during first fortnight of July by adopting a spacing of 20×15 cm is beneficial.

Fertilizer management

- A balanced fertilizer dose of 60: 40: 40 kg N, P_2O_5 and K_2O /ha is required.
- Integrated N management involving organic sources such as dhaincha (green manure), Azolla or FYM in combination with prilled urea on a 50:50 basis ensures better and sustainable yields.
- Use of modified urea materials like neem coated urea and a urea super granule helps in improving N-use efficiency.
- Use Leaf Colour Chart (LCC) based N application for increased N use efficiency. Apply about 42 kg of urea per hectare within 0-14 DAT as basal. Take LCC reading from 28 days after transplanting and apply 42 kg urea/ha as and when the reading is less than 3 but in case of Swarna type varieties, N application may be done when the reading is less than 4.
- Apply 20-25 kg $ZnSO_4$ /ha in the main field in zinc deficient soils.

Weed management

- In direct seeded rice, pre-emergence application of pretilachlor at 800 g a.i./ha in moist surface soil effectively controls the first thrust of grassy weeds and sedges in direct seeded rice.
- Pre-emergence application of pretilachlor at 800 g a.i./ha + one hand weeding at 30-40 DAS or Mechanical weeding with finger weeder at 15-20 DAG + one hand weeding at 30 DAG take care of most of the weeds.
- Post-emergence herbicide application of bispyribac sodium 30 g a.i./ha or Azimsulfuron 35g a.i./ha within 20 days after seeding is recommended where pre-emergence herbicides could not be applied due to dry soil conditions.
- In transplanted rice, pre-emergence application of pretilachlor at 1.0 kg a.i. ha^{-1} on 3 DAT + weeding with Twin row rotary weeder at 40 DAT
- **Apply Bensulfuron methyl + Pretilachlor (Ready-mix) granule (Londax Power/Erase Strong @ 10 kg/ ha) at 8-10 days after planting (at 2-3 leaf stage of weeds) to suppress the early emergent broad spectrum of weeds either in saturated soil or with 2-3 cm standing water after mixing with sand @ 30 kg/ha.**
- **In transplanted field, spray Azimsulfuron 50 DF @ 70 g/ha at 15 days after sowing (at 3-4 leaf stage of weeds) for controlling weeds. Spray it by mixing with 350 liters of water. Add surfactant (625 ml/ha) available with chemical for increasing the efficacy of the herbicide.**
- In absence of pre emergence herbicide application, 2,4-D sodium salt (Fernoxone 80% WP) 1.25 kg/ha dissolved in 625 litres with a high volume sprayer, three weeks after transplanting or when the weeds are in 3 - 4 leaf stage.
- Early post emergence application of Bispyribac sodium 50 g a.i. ha^{-1} (2-3 leaf stage of weeds) + Hand weeding on 45 DAT.
- Alternatively, hand weed twice at 20 and 40 days after transplanting.
- Maintain 3-5 cm of standing water in the field at the time of herbicide application for ensuring effective weed control.

Plant protection

- Protect the crop from insect pests and diseases with regular monitoring of pest attacks and by following need based pesticide application as suggested for HYVs.
- While spraying pesticide, use 500 liters of water/ha in case of power sprayer. Keep the field bund clean to minimize disease and pest attack.
- Yellow Stem Borer: Rynaxypyr 20 SC @ 150 ml/ha or Triazophos 40 EC @ 1250 ml/ha or Acephate 75SP @ 750 g/ha or Chlorpyrifos 20 EC @ 2500 ml/ha should be applied as foliar spray at brood emergence.
- Leaf folder: Triazophos 40 EC @ 625 ml/ha or Thiamethoxam 25WG @ 100g/ha or Neem oil @ 5ml/litre of water with 2% detergent liquid.
- BPH/WBPH: Imidacloprid 17.8SL @ 125ml/ha or Thiamethoxam 25WG @ 100 g/ha or Ethofenprox 10 EC @ 500 ml/ha or Neem oil @ 5 ml/litre of water with 2% detergent liquid.
- Gundhi bug: Apply dust formulation of Methyl parathion at the rate of 25 kg/ha or foliar spray of Ethofenprox 10 EC 2 ml/ltr. Monitoring should be done for incidence of Blast, Sheath Blight, Bacterial Leaf Blight (BLB), Bacterial Leaf Streak (BLS) and Sheath rot in rice. If warranted, adopt the following control measures:
- Bacterial leaf blight / streak: Spray with Plantomycin @ 1g/liter of water using 500 liters of water per hectare or Streptocycline (150 mg) + Copper oxychloride 1g/litre of water twice at an interval of 8 days.
- Blast: Spraying of Carbendazim 50 WP @ 2g/litre or Tricyclazole 75 WP @ 0.6 g/litre of water may be done for controlling the disease. Otherwise, spraying of leaf extracts of Bael (25 g fresh leaves) or Tulsi (25 g fresh leaves) or Neem (200 g fresh leaves) per litre of water can help in reducing the incidence of disease.
- Sheath blight: Spray with effective fungicides like Sheathmar 3L (Validamycin 3L) @ 2 ml/l of water) or Rhizocin 3L (Validamycin 3L) @ 2 ml/l of water) or Contaf 5 EC (Hexaconazole 5 EC) @ 2 ml/l of water or Thifluzamide 24 SC @ 1 ml/l of water or Bavistin 50 WP (Carbendazim 50 WP) 2.5 g/l of water.
- Sheath rot: Spray Carbendazim 50 WP (Bavistin) @ 2 g/litre, Propiconazole (Tilt 25 EC) @ 1 ml/litre or Hexaconazole (Cantaf 5 EC) @ 1 ml/lit.
- False smut: Spray with 0.25% Carbendazim or 0.25% Captafol or 0.4% Mancozeb twice at 7 days interval at boot leaf stage and drain out water from the field after grain formation.
- For controlling viral diseases such as tungro and grassy stunt, remove the infected plants and control the insect vector by applying Furadan at the rate of 30 kg/ha.

Harvesting, drying and storage

- Harvest the crop when 80% of the grains in panicles are ripened with a reaper or combine harvester.
- If harvested manually, thresh immediately after harvesting and dry gradually under shade up to 12% moisture content for seed purpose and 14% for milling.

B.2.2. Rainfed Shallow lowland (Flash Flood prone)

In this ecology, Sub1 gene introgressed varieties can be grown. It is suitable for the shallow lowlands and medium lands, where the crop is usually affected by flash floods and submerged completely for 12-14 days during *Kharif* season. It is not recommended for the areas where the flood water comes and stays for more than 15-20 days.

Dry seed bed

- Plough the nursery field and level it properly. Make raised seed beds of 1.0 m width with convenient length, keeping a gap of 40 cm between the beds. Nearly one-tenth of the main field is required as seed bed.

Seed Selection and Seed Rate

- Prepare salt solution by dissolving 600 g of common salt in ten liters of water, which will be adequate for 30-35 kg of seeds.
- Pour the seed in the salt solution, remove the floating materials and then wash the selected seed in fresh water.
- Use a seed rate of 30-35 kg/ha for transplanting and 60-70 kg/ha for direct- seeding.

Seed Treatment

- Dry sowing: Treat the seed with Bavistin @ 2.0 g/kg of seed.
- Wet sowing: Soak the seed for 8-10 hours in a solution prepared by dissolving 1.5 g Streptocycline and 20 g Captan in 20 litre of water, which is sufficient for 10 kg of seed, and then drain the water. Dry the seeds in shade before sowing.

Sowing time

- For direct-seeding, optimal time of sowing is the first fortnight of June.
- For transplanting, sow the seeds in nursery by the 1st week of June.

Nursery Management

- Soak the seed for 24 hours, drain the water and then cover the seed with gunny bags for effective germination.
- Sowing the sprouted seeds in nursery beds and keep the beds moist for first 5-7 days.
- Maintain a thin layer of water after the seedlings are of about 2.5 cm height.
- Follow the need based application of Carbofuran @ 1.0 kg a.i./ha.
- Top dress the nursery bed with 100 kg N/ha seven days before uprooting.

Land Preparation

- Plough the land by using a tractor-drawn or bullock-drawn plough in dry condition during pre-monsoon rain or immediately after the harvest of the previous crop.
- Puddle the field twice at 7-10 days interval for better weed control and nutrient availability.
- Level the land with a leveler to maintain uniform water level throughout the plot.

Stand establishment

- Transplant the seedlings by 1st week of July at 20 × 15 cm spacing using 2-3 seedlings/hill or maintain 35-40 hills/m² for random planting.
- Gap filling should be done 7 days after transplanting. Second gap filling can be done if necessary by splitting the existing tillers.
- In case of delayed planting, follow closer spacing (15 × 15 cm) and use 5-6 seedlings per hill with higher dose of basal N application.
- In absence of nursery treatment with Carbofuran, seedling root dipping in a solution of 1 ml Chloropyriphos (20 EC) in 1 litre of water overnight before planting helps in controlling rice whorl maggot, stem borer etc.

Fertilizer Management

- Apply NPK @ 60:40:40 kg/ha. Soil test-based fertilizer application especially for P and K is preferred over the blanket dose.
- Apply half of the N, entire amount of P and two-third of K as basal and the remaining N in two equal splits at 3 weeks after transplanting and at panicle initiation. Also apply the remaining one-third of K at panicle initiation.
- If possible, the field should be drained prior to top dressing of nitrogen and then irrigated after 24-36 hours.
- Apply ZnSO₄ @ 25 kg/ha in zinc deficient soils.

Weed Management

- In transplanted rice, pre- emergence application of pretilachlor at 1.0 kg a.i. ha⁻¹ on 3 DAT + weeding with Twin row rotary weeder at 40 DAT
- **Apply Bensulfuron methyl + Pretilachlor (Ready-mix) granule (Londax Power/Erase Strong @ 10 kg/ha) at 8-10 days after planting (at 2-3 leaf stage of weeds) to suppress the early emergent broad spectrum of weeds either in saturated soil or with 2-3 cm standing water after mixing with sand @ 30 kg/ha.**
- **Spray Azimsulfuron 50 DF @ 70 g/ha at 15 days after sowing (at 3-4 leaf stage of weeds) for controlling weeds. Spray it by mixing with 350 liters of water. Add surfactant (625 ml/ha) available with chemical for increasing the efficacy of the herbicide.**

Water Management

- Keep the field under saturated condition for a week after transplanting for better seedling establishment.
- Thereafter, maintain a water level of 3-5 cm during the entire crop growth period until 15 days after milk formation stage. However, the field should be drained prior to top dressing of fertilizer and irrigate after 24-36 hours.

Insect and Disease Control

- Soak the seedlings in a solution of 1 ml Chlorpyrifos (20 EC) in 1 litre of water overnight before transplanting.
- Use Carbofuran at 30 kg/ha against stem borer and leaf folder.
- If sheath blight appears, avoid N application at panicle initiation stage. Spray Validamycin at 3.0 ml/ltr or Propiconazole (25%) at 1.0 ml/ltr in 500 ltr of water/ha after appearance of the disease symptoms or immediately after first top-dressing.
- Need based plant protection measures may be taken as specified for Shallow lowlands.

Harvesting, Drying & Storage

- Harvest the crop 30-35 days after flowering when stalks are still green to avoid grain shattering. Moisture content of paddy grain should be 20-24% at time of harvest.
- Thresh the produce immediately after the harvest and dry the grains in shade up to 12% moisture content for seed purpose and 14% for milling.
- Grains can be milled in traditional huller but for higher price use rubberized sheller for milling.

B.2.3. Rainfed Semi-deep/Deep water lowlands

Semi-deep/deep water rice varieties are grown in waterlogged condition where water remains standing with a depth of 75-100 cm for more than a month during growth period. In India, this ecology is around 5% of total rice area and mostly located in the eastern region of the country. The production and productivity from this crippled ecology is very low due to many abiotic and biotic stresses. Variety with traits like tolerance to water logging, moderate elongation ability, kneeing ability, tolerance to yellow stem borer and bacterial leaf blight and high yield are the desirable features of a genotype in this handicapped ecology.

Seed selection

- Select genetically pure seed of the variety having more than 80% germination.
- Select the seeds from a healthy crop with well filled grains free from insects and disease attack.

Land preparation

- Plough the land immediately after the harvest of wet season rice, preferably with a mould board plough.
- One or two summer ploughings after pre- monsoon rain during April-May and ploughing before sowing makes the soil to a fine tilth.
- Use rotavator to get a fine tilth for ensuring uniform germination.
- Properly level the land to get high germination, easy to control weeds and proper-crop stand.

Sowing time and stand establishment

- The optimum time of sowing is from last week of May to first week of June.
- Sowing should be done after receiving pre-monsoon rain for proper plant stand establishment before accumulation of water in the deep water rice fields.
- Dry direct seeding may be practiced in rainfed shallow low lands with 50 kg seeds per hectare using seed drill before onset of monsoon.
- Line seeding (8-10 seeds/hill at 20 x 15 cm spacing) behind the country plough with seed rate of 80 kg/ha in first week of June when the cumulative rainfall reaches 60 to 70 mm.
- Treat the seeds with Agrosan GN or Ceresan (dry) or Bavistin at the rate of 2 gm/kg of seed before sowing.
- In areas where direct sowing is not feasible due to early water accumulation, transplanting in the first fortnight of July with 4-6 seedlings per hill at 20 cm × 15 cm spacing is to be practiced.
- In case of crop failures planting with colonel tillers removed from established direct seeded crop/aged seedlings yields better. Mixed cropping of long and early duration varieties in alternate rows 15 cm apart help in increasing total yield upto 19% and acts as an insurance against crop failures.
- If there will be early flash flood and accumulation of water in the field leading to mortality of plants, gap fill the field by aged seedlings or with colonel tillers removed from the surviving plants.

Nutrient management

- Apply N: P: K at the rate of 40:20:20 kg/ha in case of poor soil fertility status (based on soil test results). Apply half N, full P and three fourths K as basal in the furrows in the line sown rice with farm yard manure at the rate of 5 t/ha.
- Apply 10 kg of N as top dressing after weeding on line sown rice and the rest N and K fertilizers at panicle initiation stage, if water recedes.

Weed management

- Spray herbicide bispyribac sodium at the rate of 30 g a.i/ha in direct seeded rice for control of major grasses, sedges and broad leaf weeds. This is a post-emergence herbicide and it can be applied after 12 days of sowing at 2- 3 leaf stage.

Plant protection

- For controlling sheath rot disease soak the seed in 0.05% to 0.1% Bavistin for 30 minutes before sowing. After raising the crop, minimize the disease by foliar spray of 0.05% to 0.1% Bavistin, 0.4 % Dithane M-45 or 0.1% Hinosan.
- Rice tungro disease is a problem in this ecosystem at times for which tungro tolerant varieties may be used.
- Apply Streptocyclin (150 mg) + Copper Oxychloride (1 g) or foliar spray of Plantomycin 1 g in one liter of water after noticing the disease.
- For controlling sheath rot disease, treat with Bavistin 50 WP 2 g/kg of seeds. In standing crop, the disease can be minimized by foliar spray of Mancozeb 2.5 g/ltr or Bavistin 2 g/ltr or Benomyl 0.5 g/ltr of water.
- Spraying for control of pests is not feasible. Use of biocontrol is preferable. Release of *Trichogramma japonica*, an egg parasite @ 50,000 numbers/ha is recommended for control of stem borer, the major pest of deepwater rice before flowering. In case the water recedes early during flowering, apply Monocrotophos @ 0.5 kg ai/ha on the basis of ETL (one moth/m²) to control stem borer.
- If water level reduces apply granular insecticides Carbofuran 3G at the rate of 33 kg/ha or foliar spray of Carbosulfan at the rate of 2 ml/ltr if moth population is observed, on the basis of economic threshold level (One egg mass/m² or 5% dead heart). Use approx 500 litre of spray solution/ha to control the pests and diseases.

Harvesting, drying and storage

Harvest the crop at 25-30 days after flowering. Thresh immediately after harvesting and dry gradually under shed up to 12% moisture content for seed purpose and up to 14% moisture for milling.

B.2.4. Coastal Saline / Inland Saline - Alkaline Ecology

Land preparation

- An initial ploughing after the harvest of wet season rice should be followed by puddling twice using non-saline water.
- In areas having salinity problem at the beginning, ponding of water before transplanting helps in leaching of soluble salts, but this practice is feasible only when adequate fresh water is available.

Seed selection and treatment

- Seed should be properly cleaned, dried and stored in air tight containers.
- Before seeding, Seeds should be dipped in 2% salt solution to remove floating materials and partially filled grains and weed seeds.
- Selected seed is then washed in fresh water, dried and treated with Bavistin at 2.0 g/kg of seed.
- 35-40 kg seeds are required to transplant one hectare of land

Nursery management

- Wet seed bed should be raised in less saline fields as far as possible. An area of 400 m² is required for transplanting one hectare of land.
- Field should be ploughed twice followed by puddling in the first fortnight of December. Seed bed of about 1.0 meter width with convenient length are then prepared with channel in between two seed beds. Pre-germinated seeds (sprouted) are sown at 30-40 g/m².
- Incorporation of well decomposed farm yard manure (FYM) or *Azolla* compost at rate of 50 q/ha during initial land preparation and application of 100 kg each of nitrogen (N), phosphorus (P₂O₅) and potash (K₂O)/ha before sowing are recommended for robust and healthy seedlings under stress situation.

Crop establishment

- Early transplanting by the first fortnight of January using 25-30 days old seedlings at 15 cm × 15 cm is recommended. Delayed transplanting significantly reduces crop yield due to increasing salinity and atmospheric temperature during the reproductive stage.
- In general 2-3 seedlings/hill are planted. Gap filling, if required should be done within 7-10 days after transplanting.

Nutrient management

- Application of urea at 80 kilogram of nitrogen/ha in three splits at 40+20+20 kg as basal, active tillering and panicle initiation stage, respectively, is recommended.
- *Azolla* dual cropping along with application of urea at 30 kilograms of nitrogen/ha as basal and 20 kilogram of nitrogen at tillering is also as effective as the recommended dose of 80 kg nitrogen as chemical fertilizer. About 10-15 kg phosphorus through single super phosphate should be applied in three equal splits at weekly intervals starting from the day of inoculation.
- Phosphorus and potassium at 40 kg/ha are recommended. In case of *Azolla* dual cropping, the phosphorus fertilizer used for *Azolla* is a part of that recommended. The left over phosphorus along with two third of potassium should be applied at final puddling. The rest one third potassium should be given along with nitrogen during final top dressing.

Weed management

- Manual weeding twice at 20-25 and 40-45 DAT controls weed effectively but it needs huge investment in labour cost.
- Spraying of early post-emergent herbicide, pyrazosulfuron ethyl at 200 g/ha during 3-5 days after transplanting controls the weed effectively. The post-emergent herbicide, Almix is found effective at 20 g/ha applied 18 -20 days after transplanting when infestation of sedges and broadleaf weeds are quite high as happened during dry season. Spraying should be done in thin film of water after draining out of excess water from crop field. The recommended dose of herbicide should be mixed in 500 litre of water for one hectare of land.

Insect-pests and disease control

- Stem borer is the most important insect-pest. Generally two broods are coming during January-February and March-April. Application of Furadan at 33 kg/ha or Cartap at 25 kg/ha twice during 20 and 50 days after transplanting protects the crop. Spraying of monocrotophos (1.5 lit/ha) or Imidachloprid (500 ml/ha) after mixing in 500 liter of water is found effective when sprayed after appearance of 1-2 yellow stem borer moths/one egg mass are found in 1.0 square meter area.
- Another important insect during dry season is brown plant hopper generally appears during the month of February-March. It can be controlled by spraying monocrotophos (1.5 lit/ha) or Imidachloprid (500 ml/ha). Spraying should be done at basal portion of the plant for effective control.

Harvesting and storage

- Do roughing at 95-100 days after transplanting, especially in seed production fields to avoid seed mixtures.
- Drain out the water from the field 15 days before harvesting to avoid lodging.
- Harvest the crop at physiological maturing stage i.e., when 80% of the grains in panicles got matured to avoid shattering loss.
- After threshing and proper cleaning, dry the grains under sun until 14% moisture content and pack it properly before storing.