EXECUTIVE SUMMARY

1. Background

A strategic initiative **'Bringing Green Revolution in Eastern India' (BGREI)** to develop high potential Eastern Region of the country for food grain production has been initiated since 2010-11. The programme is being implemented as a sub-scheme of Rashtriya Krishi Vikas Yojana (RKVY) in seven eastern states namely Assam, Bihar, Chhattisgarh, Jharkhand, Odisha, Uttar Pradesh (Eastern) and West Bengal. The objective of the programme is to increase the productivity of rice based cropping system in the resource rich eastern region by intensive cultivation through promotion of recommended agriculture technology and package of practices by addressing the underlying constraints of different agro-climatic sub-regions. Most of the activities taken up under BGREI programme during 2010-11 are short term strategies that are crop specific and development oriented. The programme for 2011-12 include a bouquet of three broad categories of interventions, viz., Block demonstrations of rice and wheat, asset building activities for water conservation and utilization such as construction of shallow tube wells, dug well/bore wells and distribution of pump sets, drum seeders, zero till seed drills and site specific activities for facilitating the petty works such as construction/renovation of field/irrigation channels/electric power supply for agriculture purposes, institutional building for inputs supply etc. In order to sustain the productivity gain, a total of 269 block demonstration of rice, each of 1000 hectares was proposed to be implemented in five agro-ecological sub-regions namely rainfed uplands, rainfed low lands (shallow low land, medium, deep water) and irrigated rice (traditional, hybrid). The objective of the demonstration was to improve seed replacement rate (SRR), promote line sowing/planting coupled with promotion of plant nutrient and plant protection technologies. It was proposed to promote hybrid rice technologies in 40 units of 1000 hectares each. Every farmer in these units was to be encouraged to take up at least 0.40 hectare under hybrid rice. In case of wheat,

emphasis on use of zero till seed drills was proposed to be conducted. Package of practices proposed under the demonstrations includes provision of seed, sowing operation, seed treatment and weedicide.

2. Rationale of Evaluation Study of BGREI

Being enthused by the overwhelming response to BGREI program at all the levels in the BGREI states and the prospects of crop production reported to have surpassed all the previous records of rice production in the Crop Division of the Department of Agriculture & Co-operation decided to conduct the "End-term Evaluation of BGREI Programme."

In above backdrop the Crop Division of the Ministry of Agriculture, Government of India has assigned this study to be undertaken in all the seven BGREI states through Agro-Economic Research Centres located in these states. Accordingly Agro-Economic Research Centre for Bihar & Jharkhand, T M Bhagalpur University, Bhagalpur has undertaken this study in Bihar and Jharkhand states. Now the programme has completed its two years of implementation by the terminal year of 11th Five Year Plan (2011-12), so it is high time to conduct the study with a view to assess the actual performance of the programme during the implementation both at the macro and micro levels. This would help the concerned states to devise the strategic action plan in conformity with the identified constraints at the grass root levels.

3. Objectives of the Study

i. *To observe crop response to promoted technologies.*
ii. *To evaluate impact of various interventions of Block demonstrations to drive growth in the yield of rice and wheat.*
iii. *To identify gaps, if any, between recommended, promoted and implemented technologies.*
iv. *To explore effectiveness of technical backstopping, and;*
v. *To examine the effectiveness of the provision of progressive farmers and SDA staff entrusted with BGREI Programme.*

4. Data base and Research Methodology

Considering the diversity in rice production across the districts, five districts representing each of the five agro-ecological regions in both the states were selected for obtaining farmers' response about the programme. Farm household survey was conducted with the help of structured schedule.

The study is exclusively focused on evaluation of Block Demonstrations of rice to the extent possible besides understanding the planning and implementation strategies adopted by the states. The sample units of demonstrations have been selected from 5 rice ecologies namely; rainfed uploads, rainfed shallow low land, rainfed medium deep water rainfed deepwater and irrigated. At the first stage of sampling, one district is selected from each of the five rice ecologies considering the concentration of demonstrations in the district. In the second stage, one representative block of one block demonstration is selected following the same procedure. At the third stage, total number of 10 beneficiaries and 5 non-beneficiaries are selected at random from each selected block. In sum a total of 50 beneficiaries and 25 non-beneficiaries spread over 5 selected BGREI districts from each of the two states are covered in the study.

5. Limitations

i. The sample size is not adequate besides being unequal representation between beneficiary and non-beneficiary respondents.
ii. Initial timeline of the study during which the field work completed was too short for such an exhaustive study.
iii. Sourcing of secondary data from all the concerned was not equal.
iv. The study was launched very late in Bihar & Jharkhand states due to late deployment of field personnel that too for very short period (35 days).
v. The Centre also needs capacity of research faculties and infrastructure building in adoption of modern techniques of evaluation.
vi. Farmers' presumptions prevail in collection of data due to lack of recording of information and data related to agricultural operations, etc.

6. Rainfall and Growth in Area, Production and Yield of Rice and Wheat in Bihar & Jharkhand

6.1 Bihar

6.1.1 A Brief Profile of the State

Bihar is the third most populous state in India with a population of 10,38,04,637 persons {(Census – 2011 (P)}, contributing 8.58 per cent to total population of the country. Out of the total population 52.20 per cent are male and 47.80 per cent female. The state is a densely populated region, with no less than 11.02 persons living per sq. km of its area, which is much above the national average (3.82 persons/sq km). About 41.40 per cent of the population lived below poverty line (Planning Commission in 2004-05).

Traditionally, Bihar's economy is dominated by the agricultural sector. The state has a geographical area of 93.60 lakh hectares. Bihar falls in the riverine plane of the Ganga basin area. Because of the topographical nature, the proportion of total land put to agricultural use here is high as compared to other states of India. In 2008-09 the area under forest was at 6.60 per cent and the area under non-agricultural use at 17.80 per cent. The area under net sown area is 59.60 per cent. Cropping intensity is 1.38 per cent. The total irrigated area is 49.20 hectares that accounts for about 88.00 per cent of the net sown area. But the irrigation efficiency of MMI schemes was 42.50 per cent in 2010-11.

6.1.2 Rainfall

The quantum of rainfall and its distribution are positively correlated with agricultural production. The yearly actual rainfall during 2010-11 & 2011-12 was 943.4 mm and 1226.0 mm respectively in Bihar. However, it is 861.1 mm in 2010-11 and 1128.2 mm in 2011-12 in BGREI districts whereas in NFSM districts these were 968.3 mm and 1323.7

mm respectively. It reveals that in BGREI districts, it is lower than the states actual rainfall whereas that of higher in NFSM districts during 2010-11 & 2011-12.

6.1.3 Area Production and Yield of Rice Crop in BGREI Districts

The Compound Growth Rate (CGR) of rice area in BGREI districts showed decline of (-) 3.00 per cent in 2010-11 and (-) 2.00 per cent in 2011-12 and that of in NFSM districts were (-) 1.20 per cent in 2010-11 and (-) 0.10 per cent in 2011-12. These were (-) 0.50 per cent in 2010-11 and (-) 0.20 per cent in 2011-12 in all-India and (-) 2.40 per cent and (-) 1.30 per cent respectively in Bihar. As regards the CGR of rice production in BGREI districts, it indicates a decline of (-) 5.10 per cent in 2010-11 and increase of 1.60 per cent in 2011-12. The CGR of rice production in NFSM districts were (-) 0.30 per cent and an increase of 8.80 per cent in 2010-11 & 2011-12 respectively These were at all-India level 0.30 per cent and 1.30 per cent and in Bihar (-) 3.80 per cent and 3.70 per cent in 2010-11 and 2011-12 respectively. The CGR of rice yield in BGREI districts was (-) 2.10 per cent in 2010-11 and 3.60 per cent in 2011-12 whereas that of 0.90 per cent and 9.00 per cent respectively in NFSM districts. However, these figures were 0.90 per cent and 1.50 per cent in 2010-11 and 2011-12 at all-India level and (-) 1.40 per cent and 5.10 per cent in Bihar. It reveals that decline in CGR of rice area is higher in BGREI districts compared to Bihar & all-India figures. In case of CGR of rice production during 2010-12, it has increased in BGREI districts, Bihar state and all-India level too. But it higher in the state followed by BGREI districts and all-India level.

6.1.4 Area, Production and Yield of Wheat Crop in BGREI Districts

The CGR of wheat area in BGREI districts reveals exponential growth of 3.10 per cent during Rabi 2010-11, which came down to 2.50 per cent in Rabi 2011-12 but that of in NFSM districts, Bihar state and all-India level is much lower in both the years The CGR of wheat production in BGREI districts indicates exponential growth of 4.10 per cent during Rabi 2010-11 which came down to 4.00 per cent in Rabi 2011-12 but that of in

NFSM districts and Bihar state is higher in both the years. The CGR of wheat yield in BGREI districts indicates exponential growth of 7.60 per cent during Rabi- 2010-11, which came down to 6.50 per cent in Rabi 2011-12 but that of in NFSM districts, Bihar state and all-India is much lower.

6.2 Jharkhand

6.2.1 A Brief Profile of the State

Jharkhand state was carved out from Bihar in 2000. It has a geographical area of 79.71 lakh hectare with a population of 329.66 lakh (Census-2011 (P), contributing 2.72 per cent of total population of the country. Out of the total population 51.36 per cent are males and 48.64 per cent females. The population density is 414 persons per square km. Jharkhand are mostly rural with 78.00 per cent of the state's population residing in villages. According to NSSO 61st round (2004-05) and Planning Commission, the incidence of poverty is estimated at 40.3 per cent in the state, as compared to national average of 27.5 per cent. Population of the state consists of about 28 per cent scheduled tribes, 12 per cent scheduled castes and 60 per cent others. Out of the total geographical area 28.08 per cent are net sown area, 29.20 per cent forests, and 8.60 per cent is in non-agricultural uses. The percentage of irrigated area is about 9 per cent and the cropping intensity is 116 per cent. The state comes under agro-climatic zone – VII and in zones XII & XIII as per agro-ecological characteristics of the country.

6.2.2 Rainfall

There is enormous variability in rainfall pattern over time and space impacting agriculture production adversely in Jharkhand state. The state receives rainfall of about 1200-1500 mm/annum. The yearly actual rainfall in Jharkhand is 806.1 mm and 1190.8 mm respectively. However, it is 751.6 mm in 2010-11 and 1287.6 mm in 2011-12 in BGREI districts whereas that of 792.4 mm and 1093.9 mm in NFSM districts respectively.

6.2.3 Area, Production and Yield of Rice Crop in BGREI Districts

The CGR of rice area in BGREI districts showed a decline of (-) 15.00 per cent during 2010-11, which further slowed down to (-) 6.80 per cent in 2011-12 due to deficient and erratic distribution of rainfall in the state. The CGR of rice area in NFSM districts, Jharkhand state and all-India level showed decline in both the years These figures are (-) 9.10 per cent and (-) 3.00 per cent in NFSM districts, (-) 12.30 per cent and (-) 5.10 per cent in Jharkhand state and (-) 0.50 per cent and (-) 0.2 per cent at all-India level during the years 2010-11 & 2011-12. The CGR of rice production in BGREI districts showed reduction of (-) 13.00 per cent during 2010-11, which came down to (-) 3.60 per cent in 2011-12. In NFSM districts, these figures were (-) 5.90 per cent and 1.50 per cent whereas that of in Jharkhand state was (-) 9.90 per cent and (-) 1.40 per cent respectively. But the CGR of rice yield in BGREI districts indicated an increase of 2.40 per cent and 3.50 per cent in 2010-11 and 2011-12 respectively. In case of NFSM districts, Jharkhand state and at all-India level, these have also increased in both the years but the increase is higher in NFSM districts and Jharkhand state compared to BGREI districts.

7. Variability in APY of Rice and Wheat in BGREI and NFSM Districts in Bihar & Jharkhand

To analyze the comparative scenario of Area, Production and Yield in BGREI and NFSM districts prevailing in Bihar & Jharkhand states, the relevant data has been presented in table No. 1. It could be seen from the referred table that BGREI districts are more vulnerable in terms of area, production and yield deceleration as compared to NFSM districts. This clearly reveals that NFSM programme has greater sustainability in all three aspects viz., area, production and yield as compared to BGREI districts. The reasons for area production and yield deceleration in rice may be due to deficient and erratic distribution of rainfall, floods and drought besides increasing land use for non-agricultural purposes. In table No. 2, the relevant data on APY of wheat crop for Bihar state have been presented. It reveals that sustainability aspect in wheat cultivation in

BGREI districts of Bihar is stronger especially in wheat production in NFSM districts, which may be the impact of greater national level concerns.

Table No. 1: CGR of Area, Production & Yield of Rice Crop in BGREI & NFSM Districts during 2010-11 & 2011-12 in Bihar & Jharkhand States (Base year QE: 2009-10)

State	2010-11*			2011-12*		
	BGREI Districts	NFSM Districts	Whole State	BGREI Districts	NFSM Districts	Whole State
AREA						
Bihar	(-) 3.0	(-) 1.2	(-) 2.4	- (2.0	(-) 0.1	(-) 1.3
Jharkhand	(-) 15.0	(-) 9.1	(-) 12.3	(-) 6.8	(-) 3.0	(-) 5.1
PRODUCTION						
Bihar	(-) 5.1	(-) 0.3	(-) 3.8	1.6	8.8	3.7
Jharkhand	(-) 13.0	(-) 5.9	(-) 9.9	(-) 3.6	1.5	(-) 1.4
YIELD						
Bihar	(-) 2.1	0.9	(-) 1.4	3.6	9.0	5.1
Jharkhand	2.4	3.4	2.8	3.5	4.6	3.9

*Source: Extrapolated from *Final estimates **4th Advance estimates, DES, MoA, GoI.*

Table No. 2: CGR of Area, Production & Yield of Wheat Crop in BGREI & NFSM Districts during 2010-11 & 2011-12 in Bihar (Base Year QE : 2009-10)

State	2010-11*			2011-12*		
APY	BGREI Districts	NFSM Districts	Whole State	BGREI Districts	NFSM Districts	Whole State
Area	3.1	0.4	1.3	2.5	0.4	1.1
Production	4.1	5.2	4.8	4.0	5.1	4.7
Yield	7.6	4.7	3.5	6.5	4.7	3.6

*Source: Extrapolated from *Final estimates ** 4th Advance estimates, DES, MoA, GoI.*

8. Results & Discussion

8.1 Structure of the BGREI Programme in 2010-11 & 2011-12

The component and intervention specific structure of BGREI Programme in both the states are as below:

Table No. 3: Component Specific Structure of BGREI Programme during the year 2010-11 based on percentage share in total expenditure in Bihar & Jharkhand.

Sl.	Components	Bihar	Jhakhand
1	Crop demonstrations	30.5%	1.2%
2	Induced Agricultural Inputs supply	27.0%	1.3%
3	Farmers & Staff trainings, Farmers fair, farmers study visits.	4.6%	0.5%
4	Water asset building	17.9%	89.3%
5	Improved farm equipments & machinery.	0.0%	7.5%
6	Seed multiplication	0.0%	0.2%
7	Soil amelioration	11.8%	0.0%
8	e-pest surveillance	0.0%	0.0%
9	Soil & water resources conservation	0.0%	0.0%
10	Sugarcane Industry Department	6.8%	0.0%
11	Contingencies	1.4%	0.0%
12	Monitoring	0.0%	0.0%
Total		100%	100%

Table No. 4: Intervention specific composition of BGREI program during the Year: 2011-12 in Bihar & Jharkhand *(In %).*

Sl.	State	Block Demonstrations	Water Asset building	Site specific activities	Total
1.	Bihar	61.80	38.20	0.00	100.00
2.	Jharkhand	30.90	0.00	69.10	100.00

8.2 Performance Index of Technical Backstopping

As per the Situational Agricultural Survey – 2003 (NSS Report No 499/2003), the extent of accessing technical knowhow from all the sources was 40.00 per cent, whereas in 2011-12, 55.00 per cent of BGREI beneficiaries as revealed from the study, have availed the technical knowhow of agriculture from different sources. The agency specific access to technical backstopping under BGREI in 2011-12 in both the states may be seen in table below:

Table No. 5: Consolidated Performance Index (%) of Agency Specific access to Technical Backstopping under BGREI in 2011-12 in Bihar & Jharkhand.

SN	Parameter	Bihar	Jharkhand
1.	Extension Worker	70	28
2.	Progressive Farmers	11	62
3.	Krishi Vigyan Kendra	19	10
4.	State Agricultural University	00	00

Source: Field Survey - 2012

The findings of this study are also in agreement with regards to the observation that there was regional difference in accessing information to the observation made in earlier NSSO study.

8.3 Change in Cropping Intensity

There has been increase in cropping intensity in respect of BGREI beneficiaries in both the states, which may be seen in table below:

Table No. 6: Change in Cropping Intensity in BGREI districts in Bihar & Jharkhand in 2011-12 over 2010-11.

Type of farmers	Cropping intensity (%)		Extent of change	Remarks
	2010-11	2011-12		
State: Bihar				
Beneficiary	159.16	162.48	3.32 (2.09%)	Marginal increase
Non-beneficiary	158.64	160.44	1.80 (1.13%)	Marginal increase
State: Jharkhand				
Beneficiary	140.52	144.18	3.66 (2.6%)	Marginal increase
Non-beneficiary	149.21	147.42	-1.79 (-1.2%)	Marginal decrease

Source: *Field Survey-2012,* ***Marginal increase:*** *Below 3%,*
Significant increase: *Above 3% to 25%; and* ***Marginal decrease:*** *up to below -3%.*

8.4. Yield Gap in Rice

The yield gap analysis in rice crop among beneficiaries and non-beneficiaries reveals that wide gap exists in both the states. The calculation of yield gap is normally done on the basis of yield obtained on the farmers' field or farmers yield and the potential yield of some particular varieties. Table below presents the yield gap in both the states:

Table No. 7: Yield gap in paddy compared with farmers' yield and Potential yield in Bihar.

Crop	Potential yield (kg/ha)	Beneficiaries		Non-beneficiaries	
		Actual yield (KG/ha) (2011-12)	Yield gap	Actual yield (KG/ha) (2011-12)	Yield gap
State: Bihar					
Kharif Paddy	7000	3870	-31.30 (-44.71%)	3449	-3551 (-50.73%)
State: Jharkhand					
Kharif Paddy	5200	2979	-2221 (-42.71%)	2177	-3023 (-58.13%)

Source: *Field Survey-2012.*

NB: *i. Potential Yield has been considered of rice varieties in Bihar --- DRH – 775 & MTU- 1010.*

ii. Potential Yield has been considered of rice varieties in Jharkhand – Birsa Dhan- 108 & BPT-5204.

iii. Yield gap is given in absolute terms (i. e. Kg/ha) as well as per cent gap.

8.5 Concentration Ratio of Block Demonstration Clusters of Rice

The concentration ratio of demonstration clusters of rice at different levels has been computed on the basis of 1,000 ha size of clusters to assess the outreach of the crop production technology. The size of each demonstration was uniformly 0.40 ha throughout the State. Bihar State had followed *"Dispersed"* approach instead of cluster approach. All the demonstrations organized in Bihar State were SRI demonstration devoid of ecological consideration. The concentration ratios of the demonstration clusters in Jharkhand state in respect of blocks (0.39), Gram Panchayats (0.069) and villages (0.0212).

8.6 Perception of Beneficiaries

The farmers' views were obtained on the BGREI program in terms of its adequacy in meeting their needs for rice & wheat cultivation covering the aspects namely; adequacy of supply of agriculture inputs for Block demonstrations of rice and wheat, program rating as a whole, delivery of technical backstopping and which agency guided the best,

preference for sourcing of agricultural inputs and problems faced in marketing of agriculture produce. The responses so gathered are presented in table No. 8.

Table No. 8: Perception Profile of BGREI beneficiaries about the programme (%) in Bihar & ` Jharkhand

State	Supply of Inputs		Programme rating			Technical backstopping	Who guided the best					Preference for Source of Inputs			Problems in Marketing	
	Adequate	Inadequate	Poor	Average	Good		KVK	SAU	CRRI	SDA	PF	Licensed dealers	Coop Society	SDA Outlets	Transportation, etc.	Lower Price than MSP
Bihar	60	40	00	42	58	72	8	00	00	70	22	100	00	00	44.00	72.00
Jharkhand	62	38	00	42	58	80	12	00	00	50	38	100	00	00	14.94	28.36

Source: Field Survey - 2012

8.7 Determination of the impact of inputs on total yield

In order to determine the impact of various inputs on total yield, an analysis has also been made to find out the factors determining yield of paddy. For this purpose, multiple regression exercise was carried out. Yield per hectare has been taken as *"dependent variable"* and the *"predictor (independent) variables"* including both continuous and dummy variables. The continuous variables are value of seeds used per hectare, value of micro-nutrients used per hectare and other costs (inclusive of fertilizers, plant protection chemicals etc.) per hectare. The dummy variables include ecological dummies for rainfed upland, rain-fed medium, rainfed deep water and irrigated ecology. The state wise impact of inputs in to the total yield of paddy is given below in table 9.

Table 9: Determination of the impact of inputs in the total yield of paddy in *Kharif* - 2011 in Bihar & Jharkhand

Factors/Interventions	Summary of multiple regression	
	Bihar	**Jharkhand**
R^2	**0.203**	**0.303**
Adjusted R^2	**0.120**	**0.231**
SE of Estimate	**269.282**	**192.094**
Dependent Variable: Yield (Kg/ha.)		
Coefficients of independent variable:		
Constant	3239.284	2385.034
Costs of Seed per hectare(Rs.)	-0.173	-0.323
Costs of Micro-nutrients per hectare (Rs.)	0.377	0.090
Other Costs per hectare (Rs.)	0.034	0.032
Dummy for rainfed Upland ecology	-214.19	104.137
Dummy for rainfed shallow low land ecology	-52.426	12.616
Dummy for rainfed medium deep water ecology	-5.828	92.809
Dummy for rainfed Deep Water ecology	57.269	-77.886
Dummy for HYV Irrigated ecology	-	-
Dummy for Irrigated –hybrid ecology	-	-
Dummy for Irrigated-Traditional ecology	-	-

Source: *Estimated from Field data*

8.7.1 Bihar

The predictor variables for variation in yield rate (table- 9) found statistically significant are meant for micro-nutrients and other costs, both showing a direct relationship with productivity (both significant at 0.05 levels). Micro-nutrients per hectare have a positive coefficient suggesting that higher the value of micro-nutrients used per hectare, higher the productivity. This implies that provision of micro-nutrients under the program has significantly contributed to increased yield of paddy. At the same time the significant positive coefficient of costs other than seeds and micro-nutrients (tagged here as 'other costs') in turn indicates that there is much scope for further application of other inputs in cultivation. It should be noted that no other predictor variable has shown significant impact on productivity, including the dummy variables introduced for specific ecological regions. This indicates that variation in ecology does not have significant impact on the productivity. The implication has been that the program should focus more on proper distribution and application of micro-nutrients for the improvement of productivity of the crops.

8.7.2 Jharkhand

The predictor variables of 'other costs' are found statistically significant; suggesting that higher use of other inputs other than seed and micro-nutrient result in higher levels of productivity. This however does not establish the affectivity of the BGREI program through its intervention in seed and micro-nutrient provisions. At the same time, all the ecological dummies turned out to be statistically insignificant accompanying with varying degrees of the coefficients. This confirms that ecological variation in Jharkhand does not have any significant impact on the productivity of the crop (table 9).

8.8 Progress of Financial Utilization under BGREI during 2011-12

The overall utilization of funds in 2011-12 was 73% in Bihar and 97% in Jharkhand.

8.9 Monitoring status of the program by CRRI, Cuttack

Monitoring of BGREI program for extending technical backstopping was decided to be carried out by the nominated scientists of ICAR-SAU formations under overall

supervision of CRRI-Cuttack. The outcome of the field visits based on the reports received from ICAR-SAU formations is presented below in table 10.

Table 10: Field visits undertaken by the Scientists of ICAR-SAU during 2011-12 in Bihar & Jharkhand

Sl.	State	Total districts	Number of districts visited by ICSR-SAU		
			CRRI	SAUs	Total
1.	Bihar	29	1	Not Reported	1
2.	Jharkhand	17	3	Not Reported	3

Source: BGREI cell, DAC, GoI;

8.10 Monitoring by Central Steering Committee (CSC)

The staff members of BGREI Cell have visited the 19 BGREI districts in Bihar out of 20 districts during *Kharif* -2011 and 09 districts in Jharkhand out of 17 districts (table 11).

Table 11: Field visits by BGREI Cell for monitoring of BGREI program during Kharif – 2011 in Bihar & Jharkhand.

Sl. No.	State	*Kharif*-2011		
		Total districts	Visited districts	% visited districts
2.	Bihar	20	19	95%
4.	Jharkhand	17	9	53%

**Some BGREI components across all the districts in Chhattisgarh State.*
Source: BGREI Cell, DAC, GoI.

8.11 Conclusion

- Significant increase in grain yield of rice has been witnessed in the Block Demonstrations under BGREI;
- BGREI program has narrowed down the yield gap across rice ecologies;
- Water asset building component under BGREI Program has resulted in increased Cropping Intensity;
- Progressive farmers proved the most viable link between Extension machinery and linked beneficiary farmers;
- Technical backstopping was largely extended by State Extension Workers;
- Farmers perception gathered during the study revealed that BGREI program was one of the best programs in terms of adequacy of Input package/technology dissemination, and;
- Problem of marketing of harvested produce and low market prices still persists.

9. Policy Suggestions

9.1 Bihar

i. The state has high potential for yield enhancement of rice, so seeds and technology should be made available as per the suitability of agro-ecologies of the region/sub-regions. ***(Attn.: Directorate of Agriculture, Government of Bihar).***

ii. Irrigational infrastructure in the state requires transformation. Irrigational facilities should be given in a way to ensure access of water to all farms. ***(Attn.: Dept. of Water Resources & Department of Agriculture, Government of Bihar).***

iii. Agriculture marketing is a big challenge in the state. It should be looked here on priority basis. There is urgent need to develop the rural agriculture markets to urban agri-marketing centres. ***(Attn.: Dept. of Agriculture, Govt. of Bihar).***

iv. Delivery of recommended agri-inputs should be made available in time. ***(Attn.: Directorate of Agriculture, Govt. of Bihar).***

v. Package of practices as prescribed under BGREI programme must be attended. ***(Attn.: Directorate of Agriculture, Govt. of Bihar &KVKs of the respective districts).***

vi. There is need of co-ordination for technical back stopping between KVK, ATMA & District/Block Extension machineries. ***(Attn.: Directorate of Agriculture, Government of Bihar).***

vii. Coverage in terms of area and number of beneficiaries under the BGREI programme should be expanded and increased. ***(Attn.: Directorate of Agriculture, Government of Bihar).***

viii. Greater emphasis on site specific interventions should be given. ***(Attn: Directorate of Agriculture, Government of Bihar).***

ix. Use of conoweeder, drum seeder and other implements should be promoted. ***(Attn.: Directorate of Agriculture & Directorate of Extension, Government of Bihar).***

x. There is need for capacity building of progressive and beneficiary farmers. ***(Attn.: Directorate of Agriculture, Government of Bihar).***

xi. There is need of improvement in monitoring, evaluation and documentation.
(Attn. BGREI Cell, Dept. of Agriculture, Government of Bihar)

9.2 Jharkhand

i. The state has large potential of yield enhancement of rice. In view of its potentiality inputs like seeds and technology should be made available as per the suitability of agro-ecologies of the region/sub-regions. ***(Attn.: Directorate of Agriculture, Government of Jharkhand).***

ii. Timely delivery of recommended agri-inputs under BGREI programme should be ensured in one go. ***(Attn: Directorate of Agricuture, Govt. of Jharkhand).***

iii. There is need to establish co-ordination between the BGREI programme implementing agencies to ensure the quality of deliverables. ***(Attn.: BGREI Cell, Dept. of Agriculture, Government of Jharkhand).***

iv. Use of implements made under the BGREI programme should be promoted. ***(Attn.: Directorate of Agriculture, Government of Jharkhand).***

v. Coverage in terms of area and number of beneficiaries under the BGREI programme should be expanded and increased respectively. ***(Attn.: Directorate of Agriculture, Government of Jharkhand).***

vi. Infrastructure created under water asset building should be functional. Some disputes were found in course of field survey, which should be settled with for smooth functioning of the scheme. ***(Attn.: Directorate of Soil Conservation, Dept. of Agriculture, Govt. of Jharkhand).***

vii. Strengthening of co-ordination for technical backstopping between KVK, ATMA and State extension functionaries is required. ***(Attn.: Directorate of Agriculture, Government of Jharkhand).***

viii. Improvement in monitoring, evaluation and documentation is urgently needed. ***(Attn.: Directorate of Agriculture, Government of Jharkhand).***

ix. Problem of marketing of agriculture produces still persists in the state, which should be suitably addressed. ***(Attn.: Department of Agriculture, Government of Jharkhand).***

x. Irrigational water available at the field/micro level should be utilized by way of connecting their sources with to crop fields. ***(Attn.: Dept. of Water Resources & Directorate of Soil Conservation, Govt. of Jharkhand).***

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