Study No.103

End-term Evaluation Study/Appraisal in respect of the Implementation of the Bringing Green Revolution to Eastern India (BGREI) Programme

AGRO- ECONOMIC RESEARCH CENTRE
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CONTENTS

LIST OF TABLES

LIST OF FIGURE

CHAPTER-I

INTRODUCTION

1.1 Background of the Programme

Initially, the program of Bringing Green Revolution to Eastern India (BGREI) was launched in the year 2010-11 in seven (7) States of Eastern India namely; Assam, Bihar, Chhattisgarh, Jharkhand, Eastern Uttar Pradesh, Orissa and West Bengal based on strategic action plans developed by these States. 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 program during 2010-11 were short-term strategies.

The program for 2011-12 include a bouquet of three broad categories of interventions viz. (i) Block demonstrations of rice and wheat; (ii) Asset building activities for water conservation & utilization; such as construction of shallow tube wells, dug well/bore wells and distribution of pump sets, drum seeders, Zero till seed drills and (iii) Site Specific Activities for facilitating the petty works such as construction/renovation of field/irrigation channels/electric power supply for agriculture purposes and institution building for inputs supply.

In 2011-12, in order to sustain the productivity gain in major cereals, focus crops namely; rice & wheat were identified and a total of 269 block demonstration of rice, each of 1000 hectares has been proposed to be implemented in the five agro-ecological sub-regions namely; rainfed uplands, rainfed low lands (shallow low land, medium deep water, deep water) and irrigated rice (traditional, hybrid). The objective of the demonstration is to improve agronomy as a whole i.e. enhancement of seed replacement rate, field sanitation, promote line sowing/planting coupled with promotion of plant nutrient and plant protection technologies. It is proposed to promote hybrid rice technologies in 40 units of 1,000 hectares each. Every farmer in these units would be encouraged to take up at least 0.40 hectare under hybrid rice.

The programme would be completing two years of implementation by the terminal year of Eleventh Five Year Plan (2011-12). It is now high time to conduct the study, to assess the actual performance of the programme during the period of its implementation both at the macro

and micro levels. This would help the concerned states to devise the strategic action plans in conformity with the identified constraints at the grass root level. The study was undertaken keeping up the following objectives in mind.

1.2 Objectives of the Study

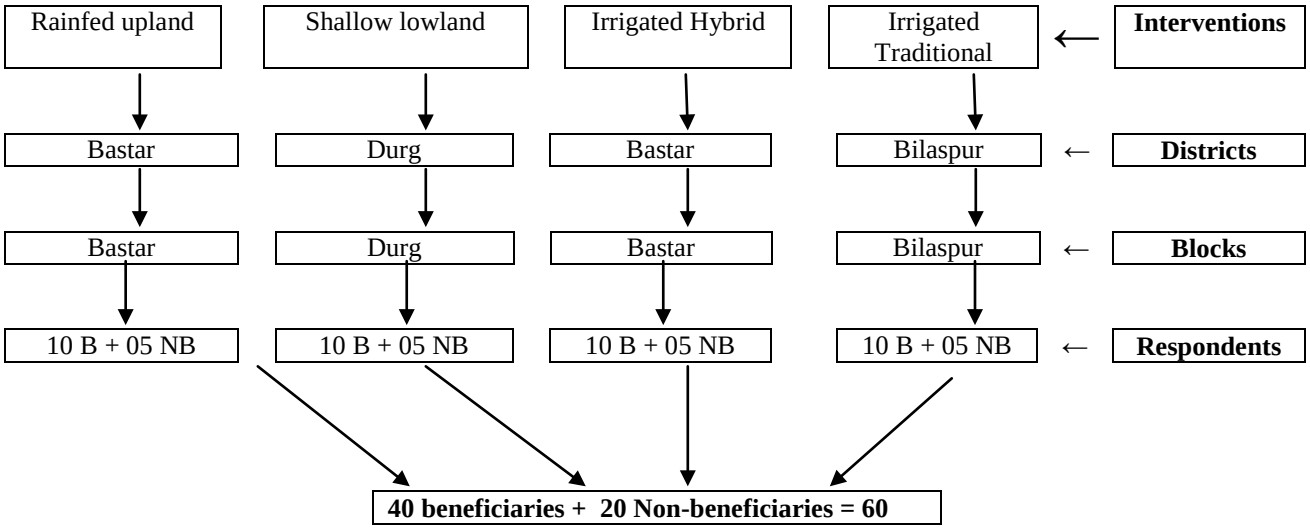
- To study suitability/correctness of technical interventions/prescriptions and approach adopted at state/district and local levels;
- To observe crop response to technology promoted;
- To make critical evaluation of administrative aspects of implementation;
- To identify status and impact of implementation of various interventions;
- To identify gaps, if any existing between recommended, promoted and implemented strategies;
- To explore effectiveness of scientific backstopping in the form of scientists deployed at the district;
- To examine the effectiveness of the provision of "Progressive farmers & SDA staff entrusted with BGREI program and paid honorarium therefore;
- To examine effectiveness of cluster approach adopted during 2011-12;
- To examine effectiveness of institutional support provided by CRRI, NGOs & BGREI cell established in DAC; and
- To examine effectiveness of monitoring mechanism (DLMTs and SLMTs) at district and State level;

1.3 Data Base and Research Methodology

The study was mainly based on the secondary data available at the state, district and block levels. However, primary level data was also collected from the sample farmers stake holders in order to capture grass root level impact of the programme.

In order to capture grass root level response from the farmers' about the programme, sample units of demonstration was selected from 3 agro-ecological sub regions namely rainfed uplands, rainfed low lands (shallow low land) and irrigated rice (hybrid, traditional). At the first stage of sampling, Bastar, Durg, Bastar and Bilaspur districts were selected from rainfed upland, shallow low land, irrigated rice (hybrid) and irrigated rice (traditional) respectively, considering the concentration of demonstrations in the district. In the second stage, Bastar, Durg, Bastar and Bilaspur blocks representative of block demonstration were selected following the same procedure. In the third stage, a total of 10 beneficiaries and 5 non-beneficiaries were selected at random from each selected blocks. In sum, a total of 40 beneficiaries and 20 non-beneficiaries spread over 4 selected districts were covered in the study as depicted below :

Methodology for selection of respondents (Stratified Random Sampling)



The details of the respondents selected in the study area under BGREI programme is presented in the tables 1.1 to 1.3.

Table 1.1: Distribution of respondents and rank position according to their level of education (Numbers)

Type of farmers	Level of education and ranking						Total
	Illiterate	Primary	Middle	Secondary/ HS	Graduate/ Technical degree	PG & above	
Rainfed Upland: District:Baster							
Beneficiary	0	2	3	4	1	0	10
Non-beneficiary	2	2	1	0	0	0	5
Shallow Low Land: District: Durg							
Beneficiary	0	0	1	6	2	1	10
Non-beneficiary	1	1	3	0	0	0	5
Irrigated Hybrid : Baster							
Beneficiary	1	0	2	5	1	1	10
Non-beneficiary	1	0	1	2	1	0	5
Irrigated Traditional : Bilaspur							
Beneficiary	0	3	2	4	1	0	10
Non-beneficiary	1	3	0	1	0	0	5
State: Chhattisgarh							
Beneficiary	**1**	**5**	**8**	**19**	**5**	**2**	**40**
Non-beneficiary	**5**	**6**	**5**	**3**	**1**	**0**	**20**
Total	**6**	**11**	**13**	**22**	**6**	**2**	**60**
Percentage to Total							
Beneficiary	**2.50**	**12.50**	**20**	**47.50**	**12.50**	**5**	**100**
Non-beneficiary	**25**	**30**	**25**	**15**	**5**	**0**	**100**
Total	**10**	**18.33**	**21.67**	**36.67**	**10**	**3.33**	**100**

Source: Field Survey

It is evident from the table 1.1 that the rank position according to their level of education was superior with beneficiary farmers as compared to non beneficiary farmers across all the interventions as well as in the State.

Table 1.2: Distribution of respondents and rank position according to their size of holding

Type of farmers	Size of holding and ranking			
	Marginal	**Small**	**Medium**	**Large**
Rainfed Upland: District:Baster				
Beneficiary	0	0	8	2
Non-beneficiary	1	3	1	0
Shallow Low Land: District: Durg				
Beneficiary	0	0	6	4
Non-beneficiary	1	3	1	0
Irrigated Hybrid : Baster				
Beneficiary	0	0	9	1
Non-beneficiary	3	2	0	0
Irrigated Traditional : Bilaspur				
Beneficiary	1	4	5	0
Non-beneficiary	0	0	3	2
State: Chhattisgarh				
Beneficiary	**1**	**4**	**28**	**7**
Non-beneficiary	**5**	**8**	**5**	**2**

Source: Field Survey

It is apparent from the table 1.2 that rank position of majority of the beneficiary farmers according to the size of holding, the majority of were under medium category (28) followed by large (7), small (4) and marginal (1) category, whereas the majority of non beneficiary farmers was more under small (8) category followed by marginal as well as medium (5) and large (2) category.

Table 1.3: Test of homogeneity of the sample farmers (Beneficiary Vs. Non-beneficiary)

Sl. No.	Particulars	Rho Value	Remarks
Rainfed Upland: District:Baster			
1.	Level of education	0.34	Heterogeneous
2.	Size of land holding	0.05	Heterogeneous
Shallow Low Land: District: Durg			
1.	Level of education	0.20	Heterogeneous
2.	Size of land holding	0.05	Heterogeneous
Irrigated Hybrid : Baster			
1.	Level of education	0.66	Homogeneous
2.	Size of land holding	0.50	Homogeneous
Irrigated Traditional : Bilaspur			
1.	Level of education	0.53	Homogeneous
2.	Size of land holding	0.35	Homogeneous
State: Chhattisgarh			
1.	Level of education	0.56	Homogeneous
2.	Size of land holding	0.80	Homogeneous

Source: Field Survey

Test of homogeneity of the sample farmers (Beneficiary Vs. Non-beneficiary) was worked out which indicates that Rho value for level of education was maximum (0.66) under irrigated hybrid followed by irrigated traditional (0.53) and rainfed upland (0.34). The overall Rho value for level of education in the State was 0.56. The Rho value for size of land holding was the highest under irrigated hybrid (0.50) followed by irrigated traditional (0.35) whereas this value was minimum (0.05) under rainfed upland as well as shallow low land. The Rho value of the State for size of land holding was 0.80.

Analysis of the Data

The mean difference and multiple regression analysis econometric models were used to analyse the data of the study (BGREI) conducted in Chhattisgarh State.

1. Mean Difference Test

The particular form is : $z = (\bar{x}_1 - \bar{x}_2) / \sigma \left(\frac{1}{N_1} + \frac{1}{N_2} \right)^{½}$

Where z = Standard Normal Variate

$\bar{x}_1$ = Mean of Series 1 (say of beneficiaries)

$\bar{x}_2$ = Mean of Series 2 (say of non-beneficiaries)

σ = Standard Deviation

N_1 = *Number* of Observations in Series 1 (say of beneficiaries)

N_2 = *Number* of Observations in Series 2 (say of non-beneficiaries)

2. Multiple Regression Analysis (Linear)

Form of Regression Model

$$Y = a + b_1 X_1 + b_2 X_2 + b_3 X_3 + b_4 X_4 + b_5 X_5 + b_6 X_6 + b_7 X_7 + e;$$

Where, Y = Yield per Hectare (productivity)

a = Constant term

$b_1 – b_6$ = Coefficients

X_1 = Costs of Micro-nutrients (imputed value in case of beneficiary farms)

X_2 = Costs of Seeds (imputed value in case of beneficiary farms)

X_3 = Other Costs (total costs *less* 1 & 2)

X_4 = Dummy for Shallow low land Ecology

X_5 = Dummy for Hybrid Ecology

X_6 = Dummy for Irrigated Traditional Ecology

e = error term

1.4 Organisation of the Study

The study was organized in three districts (Bastar, Durg and Bilaspur) of Chhattisgarh for collection of the primary data to access the participating farmers to technical backstopping, Change in cropping pattern of the sample farmers, Extent of change in cropping intensity, Extent of yield gap and Perception profiling of the beneficiary farmers. The secondary data was collected from 36 blocks and 498 mouzas of eight districts (Mahasamund, Dhamatari, Durg, Bilaspur, Jagdalpur, Narayanpur, Bijapur and Kanker) of the State. It comprises in the eight chapters namely Introduction, Profile of the State and the selected districts, Evaluation of the implementation process, Evaluation of Physical & Financial progress, Evaluation of Monitoring Process, Results & Discussions, Summary & Conclusion, Recommendations & Policy suggestions.

1.4 Limitations

The study was confined to three districts (Bastar, Durg and Bilaspur) of Chhattisgarh for collection of the primary data related to 3 agro-ecological sub regions namely rainfed uplands, rainfed low lands (shallow low land) and irrigated rice (hybrid, traditional) and limited to only 60 rice growers. The study was purely based on the memory of the respondents as they were not maintained any record of their farms. The secondary data was collected from the eight districts (Mahasamund, Dhamatari, Durg, Bilaspur, Jagdalpur, Narayanpur, Bijapur and Kanker) of the State, which were collected from different sources viz; Chhatisgarh State Statistics, District Statistics etc. and their reliability and variability were not checked by the investigator.

CHAPTER II

PROFILE OF THE STATE AND THE SELECTED DISTRICTS

2.1 Profile of the Chhattisgarh State

Chhattisgarh is one of a State in Central India. The state was formed on November 1, 2000 by partitioning 16 Chhattisgarhi speaking southeastern districts of Madhya Pradesh. Raipur is the capital of the state of Chhattisgarh, which is the 10^{th} largest State in India, with an area of 135,190 km^2 (52,200 sq mi). By population, it ranks as the 16^{th} largest State of the nation. It is an important electrical power and steel-producing state of India. Chhattisgarh produces 15% of the steel made in the country. Chhattisgarh borders by the States of Madhya Pradesh on the northwest, Maharashtra on the west, Andhra Pradesh on the south, Orissa on the east, Jharkhand on the northeast, and Uttar Pradesh on the north (Fig. 2.1). On the basis of climate & topography the Chhattisgarh state is divided into 3 agro climatic zones. The Bastar Plateau comprises of Bastar, Dantewada, Beejapur & Narayanpur districts and a part of Kanker (excluding Charama, Narharpur & Kanker Blocks). Northern parts of the state comes under "Northern Hilly Region" which comprises of Sarguja, Koriya & Jashpur Districts. Bilaspur, Raipur, Janjgeer-Champa, Raigarh, Rajnandgaon, Kawardha, Durg, Mahasamund, Dhamtari, Korba and parts of Kanker come under "Plains of Chhattisgarh".

2.1.1 Location

Chhattisgarh, the “rice bowl” of India is renowned as India’s largest mineral repository. The location of Chhattisgarh is rather strategic. Chhattisgarh is located in the heart of the country was formed by extricating 16 districts from Madhya Pradesh based on their common regional dialect Chattisgarhi. The State owes to its nomenclature to the 36 primordial princely states that were integrated to form the State. The latitudinal expanse of Chhattisgarh lies between $17^0$46' North to $24^0$05'North on one hand to the longitudinal meridian of $80^0$15' East to $84^0$20' East on the other. The divergent topography of the States is marked by the northern and southern jungle-clad hilly terrains while fertile alluvial plains cover the central portions of the state. At the state’s rim lie the Indo-Gangetic plains. The Rihand, Godavari and Indravati, Hadso, Jonk and Arpa Rivers meanders through the state whose topography is a mix of the Mahanadi river valley, the

Satpura mountain ranges as well as the Chotanagpur Palteau. The central location of Chhattisgarh and its storehouse of resources make the state one of India's most coveted locations in terms of tourism, economy, industry and employment.

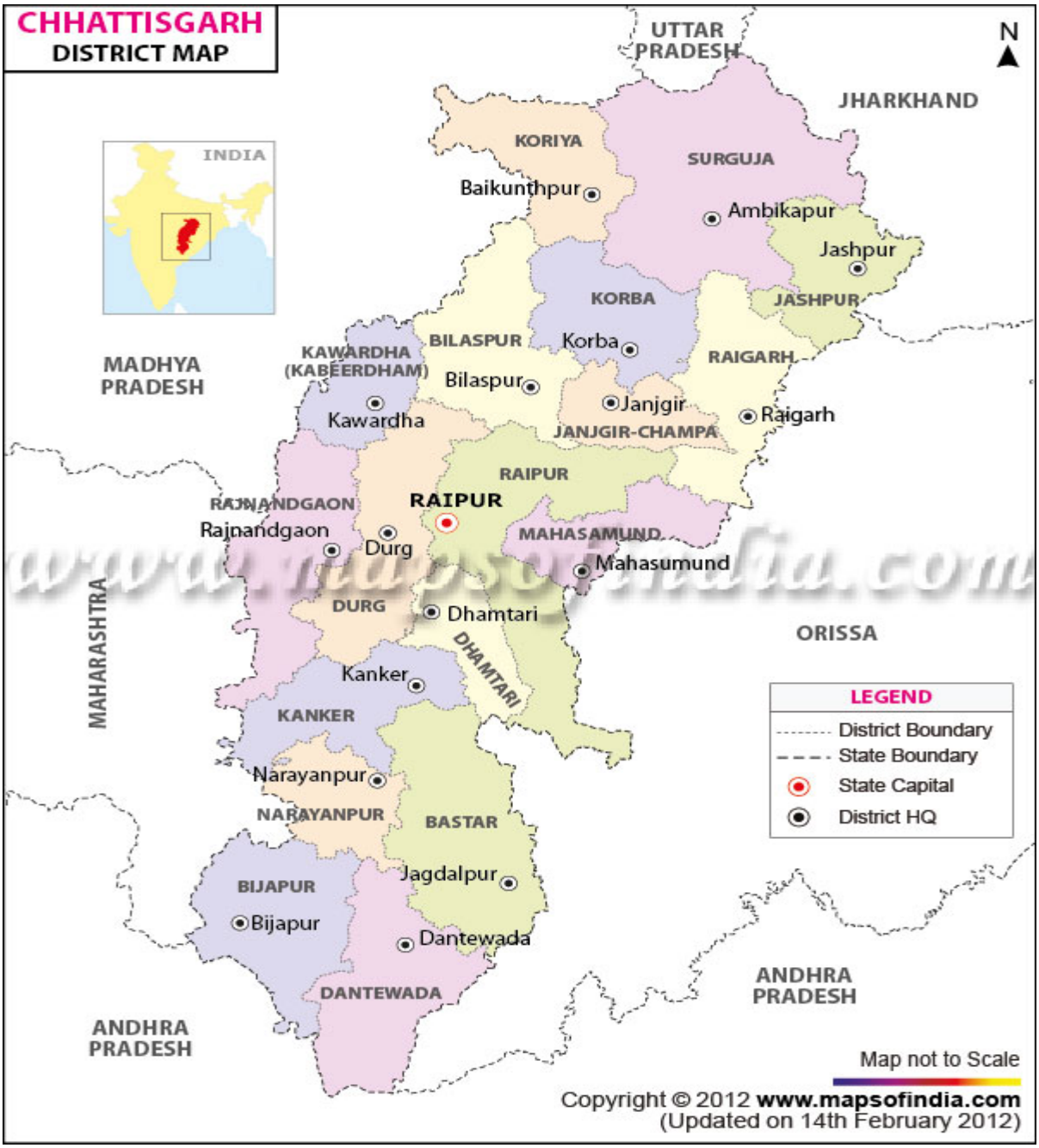


Fig . 2.1 : Map of the Chhattisgarh State

2.1.2 Climate

The Climate of Chhattisgarh is mainly tropical. It is hot and humid because of its proximity to the Tropic of Cancer and is completely dependent on the monsoon's rains. Summer in Chhattisgarh is from April to June and temperatures can reach 40°C (100°F). The monsoon season is from late June to October. Chhattisgarh receives an average of 1,292 mm (50.9 in) of rain. Winter is from November to January, and is a good time to visit. Winters are pleasant with low temperatures and lesser humidity.

2.1.3 Temperature

The temperature varies between 30^{o}C - 47 °C (86°F and 117°F) in summer and between 5°C - 25°C (41°F and 77°F) during winter. However, extremes in temperature can be obsevered with scales falling to less than 0°C to 49°C.

2.1.4 Rainfall Situation

The state receives an annual rainfall of $\leq$ 1200 m.m. annually. Out of which more than 68 per cent precipitation occurs during the main rainy season i.e. June – July and August (Table 2.1).

Table 2.1 : Rainfall pattern (mm) of Chhattisgarh (Last decade)

Month	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
January	11.2	13.8	0	26.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
February	0	5.2	29.2	31.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
March	20.6	5.7	17.7	11.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
April	12.4	3.0	18.4	4.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
May	12.8	14.1	3.4	8.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0
June	281.0	195.6	89.8	252.2	223.8	91.4	277.6	232.6	60.80	104.2	176.6
July	273.7	71.8	369.1	379.8	400.8	443.1	299.1	339.9	454.6	458.1	277.1
August	210.7	344.6	553.4	156.6	256.0	462.5	352.6	261.1	271.2	314.9	364.7
September	104.4	90.2	287.3	136.4	245.9	143.0	191.3	249.5	109.9	286.8	391.0
October	96.4	23.2	111.2	20.2	72.1	39.5	106.7	0.0	50.8	56.2	3.9
November	0.0	0.0	14.4	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
December	0.0	0.0	17.1	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	**1023.2**	**767.2**	**1511**	**1026.9**	**1198.6**	**1179.5**	**1227.3**	**1083.1**	**947.3**	**1220.2**	**1213.3**

2.1.5 Population of Chhattisgarh

The total population of the Chhattisgarh State was 2.08 crores during 2001 which continuously increased and reached to 2.55 crores in 2011. The increase in population growth was recorded as 22.59 per cent (2011) as compared (2001). The rural population was considerably higher than urban population. Rural population was 1.66 crores (2001) which enhanced to 1.96 crores (2011), similarly the urban population was also increased from 41.86 lakhs (2001) to 59.36 lakhs (2011), which reflected on density/ km^2 and it increased from 154/ km^2 (2001) to 189/ km^2 (2011). The children population (0-6 years age) was 35.55 and 35.84 lakh during 2001 and 2011, respectively. The average literacy was 64.66 per cent during 2001 which enhanced to 71.04 per cent in the year 2011. The percentage of male literacy (75.70 and 81.45 %) was appreciably higher than female literacy 55.73 per cent and 60.59 per cent during 2001 and 2011, respectively. (Table 2.2).

Table 2.2 : Population of Chhattisgarh

Description	2011	2001
Actual Population	25,540,196	20,833,803
Male	12,827,915	10,474,218
Female	12,712,281	10,359,585
Population Growth/ annum (%)	22.59	18.06
Percentage of total Population	2.11	2.03
Sex Ratio	991	990
Child Sex Ratio	964	868
Density/km2	189	154
Density/mi2	489	399
Area km2	135,191	135,191
Area mi2	52,198	52,198
Total Child Population (0-6 Age)	3,584,028	3,554,916
Male Population (0-6 Age)	1,824,987	1,800,413
Female Population (0-6 Age)	1,759,041	1,754,503
Literacy (%)	71.04	64.66
Male Literacy (%)	81.45	75.70
Female Literacy (%)	60.59	55.73
Total Literate	15,598,314	11,173,149
Male Literate	8,962,121	6,711,395
Female Literate	6,636,193	4,461,754
Rural	19603658	16648000
Urban	5936538	4186000

2.1.6 Land use Statistics

The State is spread over an area of 137.90 lakh hectares. The total reported area for land utilization was 94.37 lakh hectares or 68.43 per cent of the total geographical area. Out of the total geographical area this forest area is 63.49 lakh hectares, land not available for cultivation is 12.76 lakh hectares. The other cultivated land excluding fallow land is 12.78 lakh hectares and fallow land is 5.34 lakh hectares (Table 2.3).

Table 2.3 : Land use Statistics of Chhattisgarh Unit-Lakh ha.

Particulars	**2000-01**	**2010-11**
Geographical Area	137.9	137.9
Reported area for Land Utilization	94.11	94.37
Forests	63.02	63.49
Not available for cultivation (A+B)	**13.59**	**12.76**
(a) Area under non-agricultural uses	10.23	9.25
(b) Barren and uncultivable land	3.36	3.51
other uncultivated land excluding fallow land (A+B=C)	**12.46**	**12.78**
(a) Permanent pasture	8.53	8.59
(b) Land under miscellaneous tree crops and crops not included in Net sown area	0.57	0.68
(c) Cultivable waste land	3.36	3.51
Fallow land (A+B)	**5.09**	**5.34**
(a) Fallow land other than current fallow	2.29	2.62
(b) Current fallow	2.8	2.72

2.1.7 Cultivable area

The net area sown during 2000-01 was 47.63 lakh ha which slightly decreased during 2010-11 (46.83 lakh ha) but gross cropped area, area sown more than once, cropping intensity, net irrigated area, irrigation intensity and gross irrigated area satisfactorily increased during 2010-11 as compared to 2000-01 (Table 2.4).

Table 2.4 : Cultivable area of Chhattisgarh Unit-Lakh ha

Particulars	**2000-01**	**2010-11**
Net area sown	47.63	46.83
Gross cropped area	53.27	55.61
Area sown more than once	5.64	8.78
Cropping intensity (%)	113	121
Net irrigated area	9.84	13.23
Gross irrigated area	10.43	14.87
Irrigation intensity (%)	21	28

2.1.8 Operational land holding

The number of land holdings were 32.55 lakh during 2010-11. It is due to increase in number of marginal, small, semi-medium size land holdings and decrease in number of medium and large holdings. The data given in Table 2.5 indicates that 55 per cent farmers were under the category of marginal farmers followed by 22 and 15 per cent under small and medium category, respectively. Whereas the number of farmers were only 7 per cent under medium and lowest i.e. 1 per cent in large category. (Table 2.5).

Table 2.5 : Operational land holding of Chhattisgarh Area-Lakh Ha.

Land holding size		**2000-01**			**2010-11**		
Category	**Size (Ha.)**	**Numbers**	**%**	**Area**	**Numbers**	**%**	**Area**
Marginal	<1 ha	1746557	54	7.76	1918533	55	8.39
Small	1-2 ha.	716231	22	10.18	759702	22	10.78
Semi-medium	2-4 ha.	508423	15	13.75	517075	15	13.96
Medium	4-10 ha.	244851	8	14.11	231127	7	13.28
Large	>10 ha.	39000	1	6.43	34223	1	5.69
Total		**3255062**	**100**	**52.23**	**3460660**	**100**	**52.10**

2.1.9 Irrigational Infrastructure

The area under irrigation in kharif and rabi was 11.59 and 3.28 lakh ha, which comes to 25 and 21 per cent, respectively of the total area during 2009-10 (Table 2.6).

Table 2.6 : Season-wise coverage under irrigation (2009-10) (lakh ha.)

Crop Season	**Total area**	**Irrigated area**	**% Irrigated area**
Kharif	46.41	11.59	25
Rabi	15.43	3.28	21

Canals are the main source of irrigation covering 13 per cent of gross cropped area followed by 9 per cent by other sources (Table 2.7).

Table 2.7 : Source-wise irrigation (2009-10) (lakh ha.)

Particulars	**Wells**	**Canals**	**Tanks**	**Others**	**Total**	**Gross Cropped area**
Area (lakh ha.)	0.21	8.85	0.52	5.19	14.87	55.61
% Share to GCA	0.5	13	1	9	27	

The status of ground water was safe in 138 blocks whereas it was semi-critical in 8 blocks during all the years (Table 2.8).

Table 2.8 : Ground water status

Category	Number of blocks		
	2004	**2007**	**2010**
Safe	138	138	138
Semi-critical	8	8	8
Critical	-	-	-
Over exploited	-	-	-
Affected with saline water	-	-	-
Total number of Block assessed	146	146	146

2.1.10 : Cropping Pattern

The total production of rice and gram in the State is 7 & 3 per cent respectively of the national production while, it is 1 per cent and even less than this under other crops. The productivity of various crops in the State is lesser than the national productivity accept for gram, groundnut and soybean which is higher than the national average (Table 2.9).

a. Major Cropping system: i.e. Rice/ Maize/ Tur/ Urd/ Soybean/ Niger – Rice and Rice-Rice/ Wheat/ Gram/ Lathyrus/ Mustard/ Linseed

Table 2.9 : Area production and potential of productivity: 2010-11

Crops	Area	Production (f)			Productivity		
	(000 ha)	Total of state	National Production	%	State	National	FLD*
Rice	3702.50	6159.02	89130	7	1751	2130	3160
Wheat	110.80	126.80	80710	0	1192	2830	2145
Jowar	5.90	8.50	6980	0	1441	911	
Bajra	-	-	6500	0	-	-	
Maize	102.70	185.80	16680	1	1809	2002	
Barley	3.52	1.60	-	0	525	-	
Small Millets	128.10	26.50	-	0	207	-	
Other Cereals	-	-	-	0	-	-	
Total Cereals	**4053.52**	**6508.22**		0	**1606**	**2183**	
Gram	251.90	241.70	7350	3	959	895	1087
Pigeon pea	55.00	23.93	2550	1	435	723	
Black gram	105.60	30.20	-	0	286	-	
Green gram	15.80	4.10	-	0	260	-	
Peas	14.80	5.00	-	0	339	-	
Lentil	13.90	4.20	950	0	304	693	
Lathyrus	349.30	212.40	-	0	608	-	665
Others	49.20	14.50	-	0	285	-	
Total Pulses	**855.50**	**535.53**		0	**625**	**625**	
Groundnut	29.00	42.40	5510	1	1462	1007	
Rape & Must.	51.80	21.10	6410	0	407	1159	
Sunflower	8.05	2.89	900	0	360	607	
Soybean	106.30	124.40	10050	1	1170	1026	2451
Niger	66.70	11.50	-	0	172	-	
Sesamum	20.39	6.81	-	0	334	-	
Linseed	38.40	10.00	-	0	260	-	762
Others	-	-	-	0	-	-	
Total Oilseed	**321.54**	**212.80**		0	**662**	**955**	
Sugarcane	8.30	21.80	277750	0	2610	6609	
Potato	-	-	-		-	-	
Cotton	-	-	-		-	-	
Vegetable/Fruits	160.80	-			-	-	

2.2 Profile of the Selected Districts

The Bastar, Durg and Bilaspur districts has been selected for detail investigation related to the study

2.2.1 Bastar District

The location, topography, climate, population, land utilisation, irrigation and cropping pattern has been observed and dealt in this sub head.

2.2.1.1 Location

Bastar District is a Situated in southern part of the state of Chhattisgarh in central India. District lies between 19°12' north lattitude & 81°10' east longitude. Bastar District is bounded on the northwest side by Rajnandgaon District, on the northeast side by Dhamtari District, on the north side by Kanker District, on the south and southwest side by Dantewada District, on the east side by Nabarangpur and Koraput districts of Orissa state, and on the west side by Gadchiroli District of Maharashtra state (Fig. 2.2).

2.2.1.2 Topography

Bastar district is one of the densely populated districts of the Chhattisgarh state of India. In the year 1999 , the Bastar district has been divided into 3 districts namely Bastar, Dantewada and Kanker All these 3 districts are under Bastar Division with the divisional head quarter at Jagdalpur ,which is the district head quarter of Bastar district.

2.2.1.3 Climate

Climate of the district is of tropical type. Summer is a little bit hotter. Rise of temperature begins from the month of March and continues up to May. May is the hottest amongst other. Bastar district's annual average rainfall is 1394.53 mm. During the last ten years, maximum rains were received during the year 2010 (2144.2 mm) and the minimum (924.7 mm) during 2002.

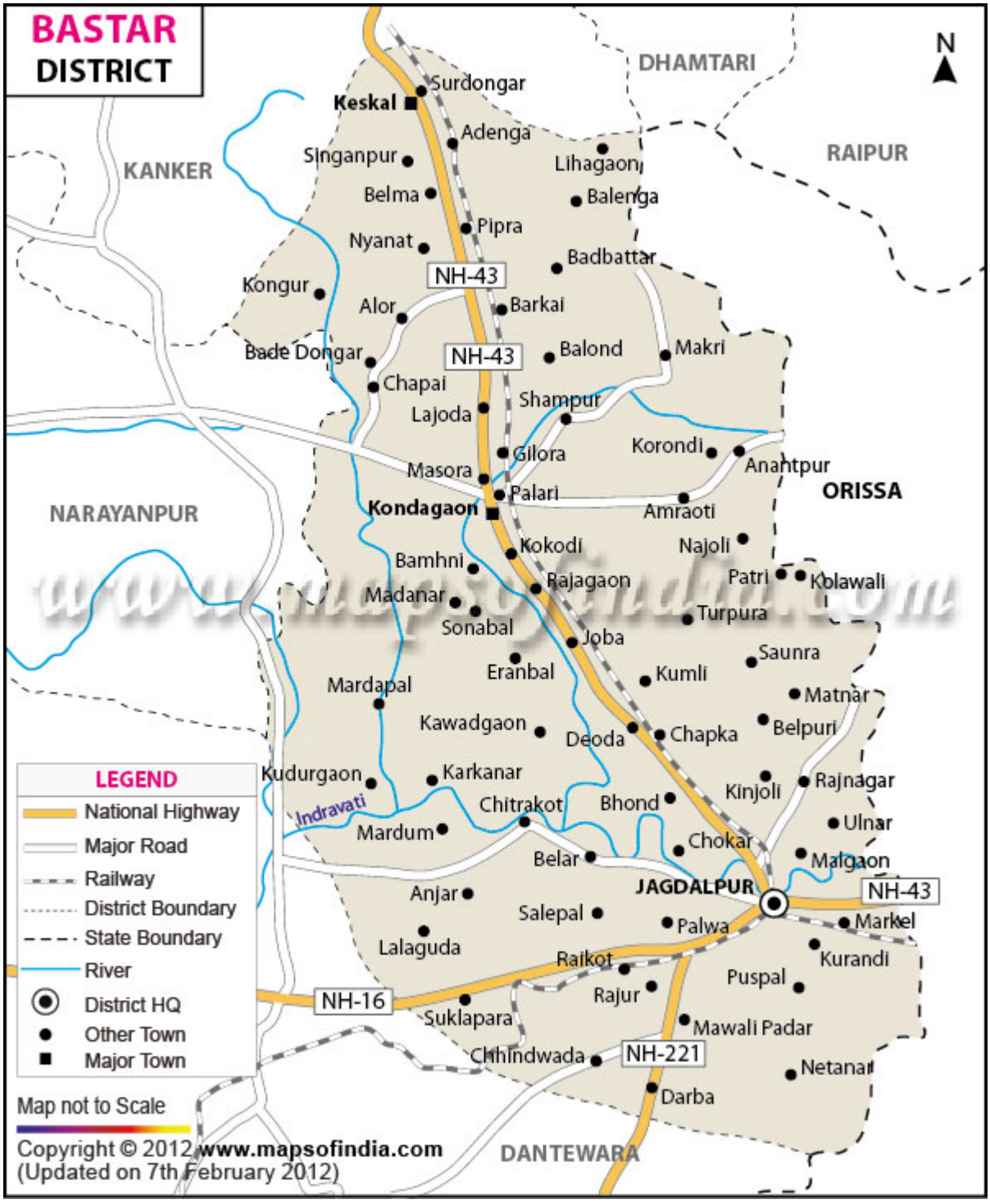


Fig . 2.2 : Map of the Bastar District

2.2.1.4 Rainfall situation

The details of rainfall received during the period from 2001 to 2010 is given in Table 2.10, which indicates great variation in its distribution from the average rainfall (1394.53 mm) of the district. The rainfall reached as high as 2144.2 mm during 2010 and went down to 924.7 mm during 2002. (Table 2.10).

Table 2.10 : Annual rainfall in Bastar District of C.G. (2001-2010)

S. No.	Year	Rainfall (mm)
1	2001	1737.5
2	2002	924.7
3	2003	1567.9
4	2004	1299.7
5	2005	1193.4
6	2006	1554.9
7	2007	1317.1
8	2008	1117.1
9	2009	1088.8
10	2010	2144.2
Average Rainfall		**1394.53**

Source – Annual statistics in Bastar District (2011)

The rainfall was lesser than the average rainfall during six years out of the 10 years data in the table (Table 2.10).

2.2.1.5 Population

The actual population of Bastar district was 11.98 lakhs during the year 2001, it increased to 14.12 lakh in 2011 which includes 6.97 lakhs male and 7.14 lakhs of female population. It shows higher ratio of female population as compared to male. The sex ratio is 1024 of female per 1000 male. The total population of the district is 5.53 per cent of the State. The average literacy is 54.94 per cent which is higher among male (65.70 %) as compared to 44.49 per cent in female. The total child population (0-6 years age) is 2.13 lakh and the sex ratio among the children is almost similar. The density of population was 140/km^2 during 2011 which increased as compared to 119/ km^2recorded in 2001, proportion wise other description were nearly similar during 2001(Table 2.11).

Table 2.11 : Population of Bastar district

Description	2011	2001
Actual Population	1,411,644	1,198,067
Male	697,359	595,779
Female	714,285	602,288
Population Growth (%)	17.83	18.18
Area Sq. Km	10,083	10,083
Density/km2	140	119
Proportion to Chhattisgarh Population (%)	5.53	5.75
Sex Ratio (Per 1000)	1024	1011
Child Sex Ratio (0-6 Age)	991	1009
Average Literacy	54.94	44.27
Male Literacy	65.70	56.75
Female Literacy	44.49	31.93
Total Child Population (0-6 Age)	212,819	210,110
Male Population (0-6 Age)	106,904	104,572
Female Population (0-6 Age)	105,915	105,538
Literates	658,587	437,362
Male Literates	387,907	278,762
Female Literates	270,680	158,600
Child Proportion (0-6 Age) (%)	15.08	17.54
Boys Proportion (0-6 Age) (%)	15.33	17.55
Girls Proportion (0-6 Age) (%)	14.83	17.52

(Source : Census report - 2011)

2.2.1.6 Land Utilization of Bastar District

Bastar district occupied an area of 1010288 hectares including 238802 hectares under forest and 36884 hectares under non-agricultural uses, which comes to 23.64 and 3.65 per cent of the total area, respectively. The net cultivates area is 31.24 per cent (315657 hectares) of the total. The double cropped area in the district is 10733 hectares making its cropping intensity to 103.41 per cent. The net irrigated area was 9592 hectares which is 3.03 per cent of the total (Table 2.12).

Table 2.12 : Land utilization of Bastar district (2011)

S. No.	Particulars	Area (hac)	Percentage to TA
1.	Total geographical area	1010288	100
2.	Forest area	238802	23.64
3.	Area under non agriculture uses	36864	3.65
4.	Uncultivated land	55613	5.50
5.	Fallow land (Old and Current fallow)	29455	2.92
6.	Net area sown	315657	31.24
7.	Double cropped area	10773	3.41
8.	Total cropped area	326430	
9.	Net irrigated area	9592	3.03
10.	Cropping intensity	103.41%	

Source: - Agriculture statistics Chhattisgarh 2011

2.2.1.7 Irrigational Infrastructure

Irrigation is one if the important input, which improve the productivity of crop. In Bastar district the total irrigated area during 2011 was 9196 hectare (Table 2.13).

Table 2.13 : Source wise irrigated area of Bastar district (area in ha)

S. No.	Source	2011			
		No.	% to total	Area	% to total
1.	Canals	15	0.22	421	4.58
2.	Tube well	1973	28.62	2184	23.75
3.	Well	2773	40.23	758	8.24
4.	Tanks	142	2.06	1442	15.68
5.	Other	1990	28.87	4391	47.75
Total		**6893**	**100.00**	**9196**	**100.00**

(Source:- Agriculture Statistics of Chhattisgarh)

Regarding the source of irrigation, canal, wells and tanks are the major sources in the district. Highest irrigated area 2184 ha (23.75%) was covered by tube wells followed by tanks 1442 ha (15.68%), wells 758 ha (8.24) and canals 421 ha (4.58%) (Table 2.13).

2.2.1.8 Cropping pattern

Paddy occupies maximum area followed by maize, kodo-kutki, urd and kulthi. Other crops like moong, groundnut, til and soybean are also grown in negligible area during kharif season. Rapeseed is being grown in maximum area during rabi season followed by gram, wheat, sugarcane, linseed and pea. The other crops like letil tiwda and sunflower have occupied very negligible area (Table 2.14).

Table 2.14 : Cropping pattern in Bastar District (2009-10)

S.No.	Crop name	Area (ha)	Production (tones)	Productivity (Kg/ha)
(A)	**Kharif crop**			
1.	Paddy	239376	401486	1677.22
2.	Jowar	554	916	1653.43
3.	Maize	20242	40570	2004.25
4.	Kodo kutki	13643	2503	183.46
5.	Arhar	906	508	560.71
6.	Moong	224	89	397.32
7.	Urd	9790	4012	409.81
8.	Kulthi	7797	2854	366.04
9.	Groundnut	13	20	1538.46
10.	Til	464	207	446.12
11.	Soybean	17	25	1470.59
	Total Kharif crop	**293026**	**453190**	**1546.59**
(B)	**Rabi Crops**			
1.	Wheat	672	1420	2113.10
2.	Pea	365	120	328.77
3.	linseed	459	133	289.76
4.	Gram	928	936	1008.62
5.	Lentil	26	8	307.69
6.	Moong	14	4	285.71
7.	Tiwra	12	10	833.33
8.	Rape seed	2318	1350	582.40
9.	Sunflower	30	6	200.00
10.	Sugarcane	471	1175	2494.69
	Total Rabi crop	**5295.00**	**5162.00**	**974.88**
	Total gross cropped area	**298321**	**458352**	**1536.44**

2.2.2 Durg District

The location, topography, climate, population, land utilisation, irrigation and cropping pattern has been observed and dealt in this sub head.

2.2.2.1 Location

Durg district is situated in the southern part of the Chhattisgarh plain.District lies between 20°54' and 21°32' north lattitude & 81°10' and 81°36' east longitude. The district is bounded by Bemetara district in the north, Rajnandgaon district in the west, Balod district in the south and Raipur district in the east. Durg district is situated in the southern part of the rich Chhattisgarh plain (Fig. 2.3).

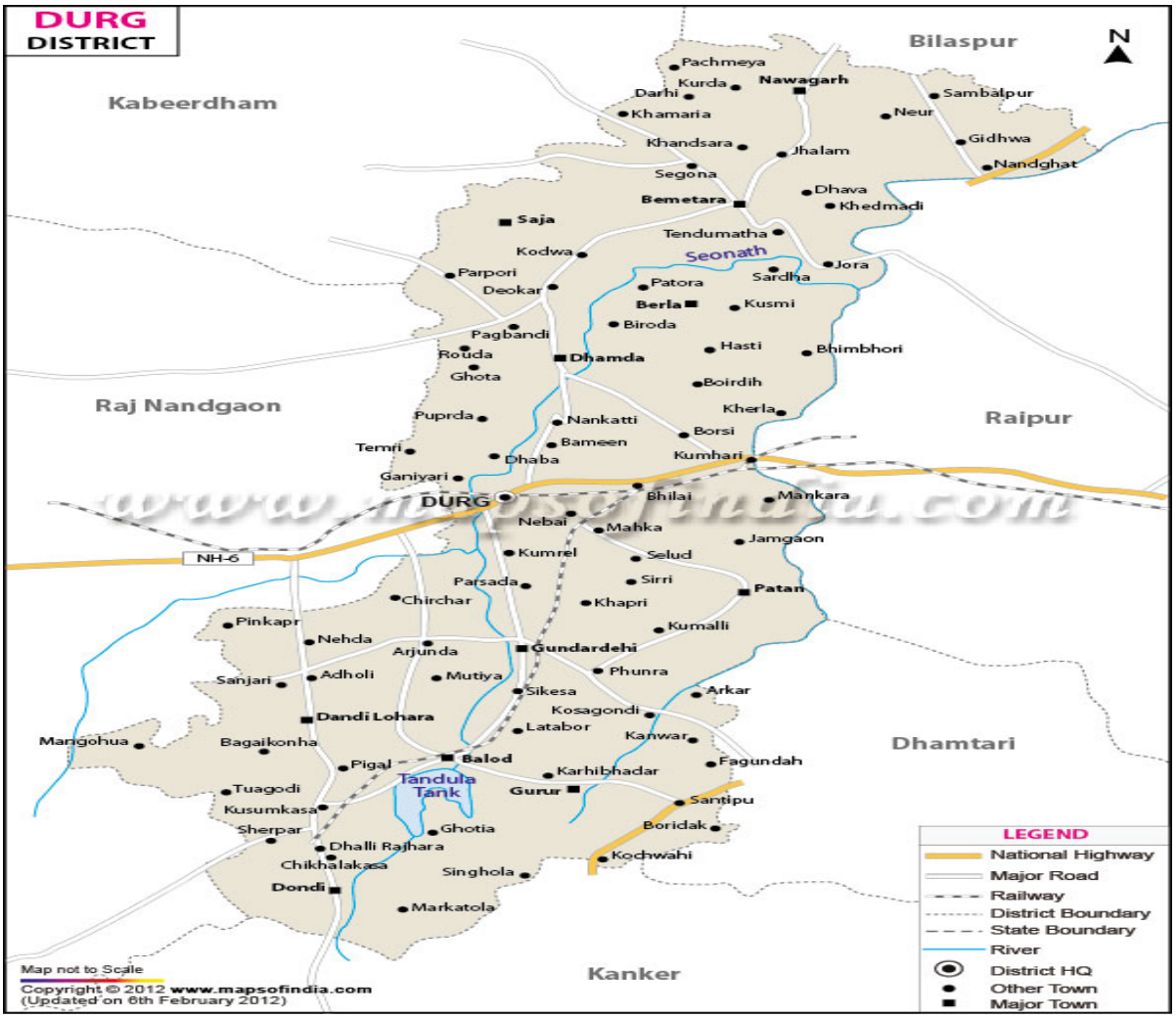


Fig . 2.3 : Map of the Durg District

2.2.2.2 Topography

Durg district is one of the densely populated districts of the Chhattisgarh state of India. Durg district is situated in the southern part of the rich Chhattisgarh plain.

2.2.2.3 Climate

Climate of the district is of tropical type. Summer is a little bit hotter. Rise of temperature begins from the month of March which continues up to May. May is hottest amongst other. Durg district's annual average rainfall is 1052 MM. During the year, most rainfall occurs during the monsoon months June to September. July is the month of highest rainfall.

2.2.2.4 Rainfall situation in Durg District

The distribution of rainfall (Year wise) of Durg district was not uniform in the last 10 years.

Table 2.15 : Annual rainfall in Durg District of C.G. (2001-2010)

S. No.	Year	Rainfall (mm)
1	2001	969.7
2	2002	782.4
3	2003	1432.7
4	2004	973.4
5	2005	1137.4
6	2006	1080.4
7	2007	1096.5
8	2008	900.4
9	2009	803.9
10	2010	1183.4
Average Rainfall		**1036.02**

Source – Annual statistics in Durg District (2011)

Based on 10 years data presented in table 2.15, the average rainfall of Durg district was 1036.02 mm. The rainfall received during different year was not similar, it had shown a large variation. However, the highest rainfall (1432.7 mm) was recorded during 2003 whereas it was the lowest (782.4 mm) during 2002. The rains received during different five years were found lesser than the average rainfall. (Table 2.15).

2.2.2.5 Population

In 2011, Durg had population of 3,343,079 of which male and female were 1,681,521 and 1,661,558 respectively. There was change of 18.95 percent in the population compared to population as per 2001. In the previous census of India 2001, Durg District recorded increase of 17.24 percent to its population compared to 1991. The initial provisional data suggest a density of population increased to 391(2011) as compared to 329 (2001). (Table 2.16).

Table 2.16 : Population of Durg district

Description	2011	2001
Actual Population	3,343,079	2,810,436
Male	1,681,521	1,417,893
Female	1,661,558	1,392,543
Population Growth	18.95%	17.24%
Area Sq. Km	8,542	8,542
Density/km2	391	329
Proportion to Chhattisgarh Population	13.09%	13.49%
Sex Ratio (Per 1000)	988	982
Child Sex Ratio (0-6 Age)	958	966
Average Literacy	79.69	75.62
Male Literacy	88.80	86.43
Female Literacy	70.51	64.64
Total Child Population (0-6 Age)	421,141	438,094
Male Population (0-6 Age)	215,065	222,866
Female Population (0-6 Age)	206,076	215,228
Literates	2,328,412	1,793,890
Male Literates	1,302,207	1,032,829
Female Literates	1,026,205	761,061
Child Proportion (0-6 Age)	12.60%	15.59%
Boys Proportion (0-6 Age)	12.79%	15.72%
Girls Proportion (0-6 Age)	12.40%	15.46%

(Source : Census report - 2011)

The population of Durg was 28.10 lakhs during 2001 and it increased to 33.43 lakhs during the year 2011 consisting 16.81 lakhs male and 16.61 lakhs of female population indicating sex ratio (per 1000) as 988 during this year as compared to 982 in 2001. In general percentage of literacy increased 79.69 % (2011) compared to 75.62 per cent (2001). However, the percentage of male literacy (86.43 & 88.80 %) was higher than female literacy (64.64 & 70.51 %) during 2001 as well as 2011, respectively. The total children population (0-6 years age) decreased in 2011 (4,21,141) compared to 4,38,094 (2001). The population of boys and girls among children was found almost similar. (Table 2.16).

2.2.2.6 Land utilization pattern

Durg occupies an area of 870180 ha, which includes maximum area of 54696 ha (62.86 % of the total) under cultivation. The double cropped area is also satisfactorily higher (239276 ha), which is 46.75 per cent of the total area indicating cropping intensity of 144 per cent (Table 2.17).

Table 2.17 : Land utilization of Durg District (2011)

S. No.	Particulars	Area (hac)	Percentage to TA
1.	Total geographical area	870180	100.00
2.	Forest area	74911	8.61
3.	Area under non agriculture uses	90995	10.46
4.	Uncultivated land	27094	3.11
5.	Fallow land (Old and Current fallow)	33207	3.82
6.	Net area sown	546961	62.86
7.	Double cropped area	239276	43.75
8.	Total cropped area	786237	90.35
9.	Net irrigated area	317433	36.48
10.	Cropping intensity	144%	-

Source: - Agriculture statistics Chhattisgarh 2011

The net irrigated area (317433 ha) is 36.48 per cent of the total area. The area under forest (74911 ha) is 8.61 per cent (Table 2.17).

2.2.2.7 Irrigational Infrastructure

Irrigation is one if the important input, which improve the productivity of crop. In Durg district the total irrigated area during 2011 was 232645 hectare (Table 2.18).

Table 2.18 : Source wise irrigated area of Durg district (area in hac.)

S. No.	Source	2011			
		No.	% to total	Area	% to total
1.	Canals	296	0.77	127224	54.69
2.	Tube well	33938	88.50	88408	38.00
3.	Well	1458	3.80	1669	0.72
4.	Tanks	306	0.80	2729	1.17
5.	Other	2351	6.13	12615	5.42
Total		**38349**		**232645**	

(Source:- Agriculture Statistics of Chhattisgarh)

Canal, wells and tanks are the major sources of irrigation in the district. The highest irrigated area covered by Canals was 127224 ha (54.59%) followed by tube wells 88408 ha (38.00%), tanks 2729 ha (1.17%)and well 1669 ha (0.72 per cent).

2.2.2.8 Cropping pattern

Paddy crop is being grown in the largest area (444.81 thousand ha) in Durg district during kharif season, hence Durg is known as Paddy district. Soybean grown only in 31.86 thousand ha was next to Paddy. Arhar, Kodo-kutki and Urd were cultivated in 5.66, 3.34 and 2.00 thousand ha area. Other crops like Jowar, Maize, Moong, Groundnut, Til and Kulthi were grown in very lesser area in kharif season (Table 2.19).

Table 2.19 : Cropping pattern in Durg District (2009-10)

S.N.	Crop name	Area (000 hac)	Production (000 tones)	Productivity (Kg/hac)
(A)	**Kharif crop**			
1.	Paddy	444.81	350.35	837
2.	Jowar	0.03	0.04	1333
3.	Maize	0.3	0.25	833
4.	Kodo kutki	3.34	0.49	147
5.	Arhar	5.66	2.8	471
6.	Moong	0.23	0.05	217
7.	Urd	2.00	0.54	270
8.	Kulthi	0.26	0.8	308
9.	Groundnut	0.43	0.79	1771
10.	Til	0.68	0.29	426
11.	Soybean	31.86	26.1	824
Total Kharif crop		**489.6**	**382.5**	**781.25**
(B)	**Rabi crop**			
1.	Wheat	24.55	23.16	943
2.	Pea	1.06	0.31	292
3.	Linseed	6.56	1.76	268
4.	Gram	101.46	98.36	969
5.	Lentil	4.83	1.45	300
6.	Moong	0.21	0.06	286
7.	Urd	1.26	0.3	240
8.	Kulthi	0.15	0.04	267
9.	Tiwra	89.53	43.54	487
10.	Rape seed	2.22	0.92	414
11.	Safflower	0.3	0.06	200
12.	Sunflower	0.25	0.17	680
13.	Sugarcane	2.98	7.6	2550
14.	Jau	0.05	0	0
Total rabi crop		235.41	177.73	754.58
Total gross cropped area		979.2	765	772.72

2.2.3 Bilaspur District

The location, topography, climate, population, land utilisation, irrigation and cropping pattern has been observed and dealt in this sub head.

2.2.3.1 Location

Bilaspur district is not only famous in Chhattisgarh but in India due to its unique characerstics of rice quality, Kosa industry and its cultural background. Bilaspur district has a major contribution in the naming "Dhan Ka Katora" for the entire Chattisgarh region The Bilaspur city is approximately 400 years old and the name "Bilaspur" has been originated from the Fisher-woman named "Bilasa". Over the years Bilaspur has developed a lot, despite several natural calamities. Bilaspur district is located in eastern part of Chhattisgarh and fall within lattitude 21°47" to 23°8" and longitude 81°14" to 83°15" .

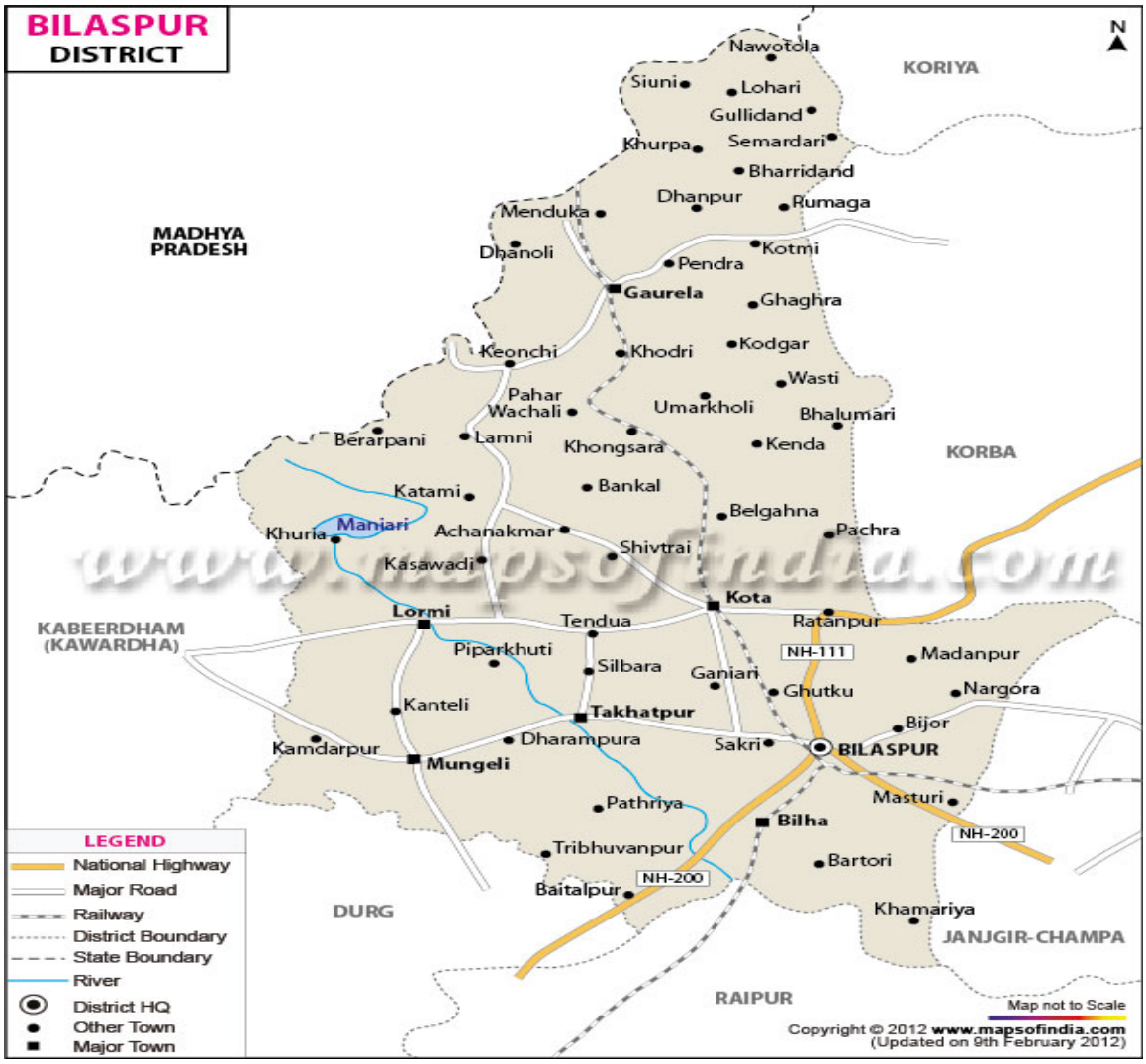


Fig . 2.4 : Map of the Bilaspur district

Bilaspur district is surrounded by Koriya district in north, Shahdol district of Madhya Pradesh in South , Raipur district in East and Korba ,Janjgir -Champa district in West. The total

area of Bilaspur is approximately 6,377 Sq.Km,after the bifurcation of old Bilaspur district is divided in three districts (New Bilaspur, Korba and Janjgir-Champa District (Fig. 2.4).

2.2.3.2 Population

Bilaspur had population of 2,662,077 of which male and female were 1,349,928 and 1,312,149 respectively (Table 2.21).

Table 2.20 : Population of Bilaspur District

Description	2011	2001
Actual Population	2,662,077	1,998,355
Male	1,349,928	1,013,875
Female	1,312,149	984,480
Population Growth/ annum (%)	33.21	17.91
Area Sq. Km	8,270	8,270
Density/km2	322	242
Proportion to Chhattisgarh Population (%)	10.42	9.59
Sex Ratio (Per 1000)	972	971
Child Sex Ratio (0-6 Age)	957	965
Average Literacy	71.59	63.51
Male Literacy	82.77	78.43
Female Literacy	60.12	48.17
Total Child Population (0-6 Age)	400,695	348,030
Male Population (0-6 Age)	204,757	177,140
Female Population (0-6 Age)	195,938	170,890
Literates	1,618,895	1,048,167
Male Literates	947,829	656,225
Female Literates	671,066	391,942
Child Proportion (0-6 Age) (%)	15.05	17.42
Boys Proportion (0-6 Age) (%)	15.17	17.4
Girls Proportion (0-6 Age) (%)	14.93	17.36

The population growth was 17.91 per cent during the year 2001 which increased to 33.21 per cent in 2011 indicating corresponding increase in density as 242/ km^2 in 2001 and 322/km^2 during 2011. The sex ratio was nearly same during oth the years. The average literacy was 63.51 during 2001 which enhanced to 71.59 in 2011. The male literacy was 78.43 and 82.77 per cent compared to 48.17 and 60.12 per cent during 2001 and 2011, respectively. The children population was 3,48,030 in 2001, it increased to 4,00,695 during 2011. The proportion of boys and girls was nearly similar during both the years. (Table 2.20).

2.2.3.3 Climate

Bilaspur district is hilly towards North and plane in South. Secondaly, the northern part of Bilaspur is quite cold and hot as person move towards Southern part. The maximum tempreture of Bilaspur district is 45^{o}C and average rainfall is 933.8 mm.

2.2.3.4 Rainfall situation

The rainfall recorded for ten year during the period from 2001 to 2010 has been presented in Table 2.20, which indicated some variation in annual rainfall as compared to its average rainfall (933.8 mm). However, the maximum rainfall of 1241.8 mm was recorded during the year 2003 and the lowest (861.1 mm) during 2002 (Table 2.21).

Table 2.21 : Annual rainfall in Bilaspur District of C.G. (2001-2010)

S. No.	Year	Rainfall (mm)
1	2001	1027.8
2	2002	861.1
3	2003	1241.8
4	2004	1028.2
5	2005	1161.3
6	2006	960.9
7	2007	1014.5
8	2008	892.8
9	2009	890.2
10	2010	1060.6
Average Rainfall		**933.8**

Source – Annual statistics in Bilaspur District (2011)

2.2.3.5 Land Utilization

Bilaspur district occupies an area of 8,56,885 ha having 25.48 per cent (2,18,338 ha) under forest, 5.24 per cent (44,909 ha) under land non-agricultural uses and 3.40 per cent (29,206 ha) as fallow land of the total area. The net cultivated area is 3.62,153 ha (42.26%) with 1,32,172 ha area under double crop making the cropping intensity of 136.49 per cent of the district. The increased cropping intensity (136.49 %) is due to 1,49,858 ha of net area under irrigation. (Table 2.22).

Table 2.22 : Land utilization of Bilaspur District (2011)

S. No.	Particulars	Area (hac)	Percentage to TA
1.	Total geographical area	856885	100
2.	Forest area	218338	25.48
3.	Area under non agriculture uses	44909	5.24
4.	Uncultivated land	15090	1.76
5.	Fallow land (Old and Current fallow)	29206	3.40
6.	Net area sown	362153	42.26
7.	Double cropped area	132172	36.49
8.	Total cropped area	494325	
9.	Net irrigated area	149858	17.49
10.	Cropping intensity	136.49%	

Source: - Agriculture statistics Chhattisgarh 2011

2.2.3.7 Irrigational infrastructure

Irrigation is one if the important input, which improve the productivity of crop. In Bilaspur district the total irrigated area during 2011 was 157188 hectare (Table 2.23).

Table 2.23 : Source wise irrigated area of Bilaspur district (area in ha)

S. No.	Source	2011			
		No.	% to total	Area	% to total
1.	Canals	136	0.49	115810	73.68
2.	Tube well	13988	50.90	24162	15.37
3.	Well	5136	18.69	7637	4.86
4.	Tanks	6324	23.01	4188	2.66
5.	Other	1895	6.90	5391	3.43
Total		**27479**	**100.00**	**157188**	**100.00**

(Source:- Agriculture Statistics of Chhattisgarh)

Canal, well and tank are the major sources of irrigation in the district. Largest area under irrigation, covered by canals was 115810 ha (73.68 %) followed by tube well 24162 ha (15.37 %), well 7637 ha (4.86 %) and 2.66 per cent by tanks which covered 4188 ha (Table 2.23).

.

2.2.3.8 Cropping pattern

Paddy crop covered significantly more area (3,29,117 ha) during kharif season followed by Arhar (4547 ha), soybean (4034 ha), maize (3577 ha) and kodo-kutki (3349 ha) while other crops covered still lesser area.

Table 2.24 : Cropping pattern in Bilaspur District (2009-10)

S.No.	Crop name	Area (hac)	Production (tones)	Productivity (Kg/hac)
(A)	**Kharif Crops**			
1	Paddy	329117	551672	1676
2	Jowar	359	479	1334
3	Maize	3577	6215	1737
4	Kodo kutki	3349	933	279
5	Arhar	4547	2112	464
6	Moong	115	22	191
7	Urd	1821	390	214
8	Kulthi	793	252	318
9	Groundnut	1544	2312	1497
10	Til	739	253	342
11	Soybean	4034	5571	1381
Total Kharif crop		**349995**	**570211**	**9435**
(B)	**Rabi Crops**			
1	Wheat	13679	17878	1307
2	Pea	936	333	356
3	linseed	366	625	1708
4	Gram	18398	18905	1028
5	Lentil	1084	294	271
6	Moong	22	6	273
7	Urd	158	36	228
8	Kulthi	4	46	11500
9	Tiwra	92179	72482	786
10	Rape seed	82	563	6866
11	Safflower	85	129	1518
12	Sunflower	20	206	10300
13	Sugarcane	332	2500	7530
14	Jau	6	3	500
Total rabi crop		**127351**	**114006**	**44170**
Total gross cropped area		**477346**	**684217**	**53605**

Tiwra was the only crop which occupied remarkably larger area (9,2179 ha) followed by gram (18398 ha) and wheat (13679 ha) during rabi season. Other crops covered very minimum area (Table 2.24).

CHAPTER-III

EVALUATION OF THE IMPLEMENTATION PROCESS

The evaluation of the programme implemented in various districts of Chhattisgarh State was done with the help of collected data on technical back stopping, crop specific structured plan and perception profiling.

3.1 Technical Backstopping

The farmers growing rainfed upland rice recorded maximum technical backstopping for various operations by identified extension workers except micro nutrient which was provided by progressive farmers to about 50 per cent farmers. KVK did not provide any technical backstopping for seed treatment and plant protection and it was found minimum for direct seeding as well as weed management (Table 3.1).

Farmers cultivating rice under shallow lowland in Durg obtained considerably more technical backstopping supervised by identified extension workers. It was nil for land preparation and weed management by progressive farmers and for micro nutrient by KVK. The number of farmers benefited by progressive farmers and KVK were found almost similar (Table 3.1).

The technical backstopping provided by identified extension workers for growing irrigated hybrid rice in Bastar was significantly higher than the farmers benefited by progressive farmers or KVK. The farmers coordinated by progressive farmers and monitored by KVK were found nearly same.

The data recorded in Bilaspur district for the farmers growing irrigated traditional rice also indicated similar trend as noted in Bastar and Durg districts. The identified extension workers gave appreciably higher technical backstopping as compared to progressive farmers and KVK. There was no technical backstopping for micro-nutrient and weed management by progressive farmers for sowing/ planting by KVK.

The data recorded on access of the participating farmers to technical backstopping in Chhatisgarh State indicated that performance index of the identified extension workers (62.5 to

82.5) was significantly higher than the progressive farmers (2.5% - 25%) and KVK (10 – 22%) in different technical backstopping. The coordination by progressive farmers was very low for weed management (1) and land preparation (3). The total number of the participating farmers coordinated by progressive farmers and monitored by KVK were found nearly similar (Table 3.1).

Table 3.1: Access of the participating farmers to technical backstopping

Technical backstopping	Farmers Reporting			Performance Index		
	Coordinated by progressive farmers	Supervised by identified extension worker	Monitored by KVK	Progressive farmer	Identified extension worker	KVK
Rainfed Upland: District:Baster						
Land preparation	1	7	2	10	70	20
Sowing/planting	2	6	2	20	60	20
Direct seeding	0	9	1	00	90	10
Seed treatment	3	7	0	30	70	00
Micro nutrient	5	2	3	50	20	30
Weed management	1	8	1	10	80	10
Plant protection	3	7	0	30	70	00
Shallow Low Land: District: Durg						
Land preparation	0	8	2	00	80	20
Sowing/planting	2	7	1	20	70	10
Direct seeding	4	5	1	40	50	10
Seed treatment	3	5	2	30	50	20
Micro nutrient	1	9	0	10	90	00
Weed management	0	8	2	00	80	20
Plant protection	1	7	2	10	70	20
Irrigated Hybrid : Baster						
Land preparation	1	7	2	10	70	20
Sowing/planting	3	6	1	30	60	10
Direct seeding	0	7	3	00	70	30
Seed treatment	2	8	0	20	80	00
Micro nutrient	4	5	1	40	50	10
Weed management	0	8	2	00	80	20
Plant protection	1	6	3	10	60	30
Irrigated Traditional : Bilaspur						
Land preparation	1	7	2	10	70	20
Sowing/planting	3	7	0	30	70	00
Direct seeding	3	6	1	30	60	10
Seed treatment	2	6	2	20	60	20
Micro nutrient	0	7	3	00	70	30
Weed management	0	9	1	00	90	10
Plant protection	1	5	4	10	50	40
State: Chhattisgarh						
Land preparation	3	29	8	7.5	72.5	20
Sowing/planting	10	26	4	25.0	65.0	10
Direct seeding	7	27	6	17.5	67.5	15
Seed treatment	10	26	4	25.0	65.0	10
Micro nutrient	10	23	7	25.0	57.5	17.5
Weed management	1	33	6	2.5	82.5	15
Plant protection	6	25	9	15.0	62.5	22.5

Source: Field Survey

3.2 Cropping Pattern

The data on change in cropping pattern of the sample farmers has been recorded for the year 2010-11 and 2011-12 (Table 3.2). It shows that Paddy is the major crop of Chhattisgarh growing during *kharif* and summer season followed by gram (*rabi)*. The area under paddy crop grown in rainfed upland as well as irrigated hybrid of Bastar district was considerably increased during the year 2011-12 compared to 2010-11 for beneficiary as well as non beneficiary farmers. The extent of change in area was found to be noticed (32.55 ha) and (4.5 ha) for beneficiary and non beneficiary farmers in 2011-12 over the year 2010-11 under rainfed upland where as it was (24.03 ha) and (3.4 ha) under irrigated hybrid. None of the farmers found to be cultivate summer paddy under rainfed upland in the year 2010-11. Sample farmers did not grow irrigated hybrid paddy during both the years.

The area of paddy cultivated under shallow low land in Durg district appreciably increased during 2011-12 as compared to 2010-11 in *kharif* as well as summer seasons. The extent of change was % (29.40 ha) and % (0.80 ha) for beneficiary and non beneficiary farmers during *kharif* and it was 25.59 ha and 0.0 ha for summer season. Sample farmers did not grow gram crop during 2010-11 and it was increased by 3.80 hectare in 2011-12 (Table 3.2).

The noticeable increase in the area of irrigated traditional paddy of Bilaspur was also recorded during the year 2011-12 in *kharif* and summer season. An extent of change in area during 2011-12 was % (12.10 ha) and % (2.70 ha) for beneficiary and non beneficiary farmers in *kharif* season where as it was % (10.90 ha) and % (4.10 ha) respectively in summer season (Table 3.2).

The data recorded on the change in cropping pattern of the sample farmers of Chhattisgarh State showed that the area under paddy crop increased considerably during 2011-12 as compared to 2010-11 in *kharif* as well as summer season. The extent of change recorded with beneficiary and non beneficiary farmers was % (98.08 ha) and % (4.60 ha) in *kharif* season and % (40.49 ha) &% (2.70 ha) in summer season. As regards gram crop it was found to increase % (3.80 ha) for beneficiary sample farmers (Table 3.2).

Table 3.2: Change in cropping pattern of the sample farmers

Seasons/Crops	Area under crops				Extent of change	
	Beneficiary		Non-beneficiary		Beneficiary	Non-beneficiary
	2010-11	2011-12	2010-11	2011-12	2011-12	2011-12
Rainfed Upland: District:Baster						
Kharif						
Paddy	13.05	45.60	5.70	10.20	32.55	4.5
Rabi						
Summer						
Paddy	0.0	4.0	0.0	0.0	4.0	0.0
Shallow Low Land: District: Durg						
Kharif						
Paddy	14.60	44.00	6.70	7.50	29.40	0.80
Rabi						
Gram	0.0	3.80	0.0	0.0	3.80	0.0
Tevda	0.0	0.0	0.0	2.0	0.0	2.0
Summer						
Paddy	0.0	25.59	0.0	0.0	25.59	0.0
Irrigated Hybrid : Baster						
Kharif						
Paddy	12.17	36.20	7.0	3.6	24.03	3.4
Rabi						
Summer						
Paddy	0.0	0.0				
Irrigated Traditional : Bilaspur						
Kharif						
Paddy	23.00	35.1	12.90	15.60	12.10	2.70
Rabi						
Summer						
Paddy	15.60	26.5	8.50	12.60	10.90	4.10
State: Chhattisgarh						
Kharif						
Paddy	62.82	160.90	32.30	36.90	98.08	4.60
Rabi						
Gram	00	3.80	00	00	3.80	00
Tevda	00	00	2.0	00	00	2.0
Summer						
Paddy	15.60	56.09	8.50	12.60	40.49	2.70

Source: Field Survey
Figure in parenthesis shows the percentage change over 2010-11

3.3 Cropping Intensity

There was found no change found in the cropping intensity of the beneficiary and non beneficiary farmers in rainfed upland as well as irrigated hybrid of bastar during both the years except beneficiary farmers of rainfed upland which slightly increased by 9 per cent only in 2011-12 over the year 2010-11. (Table 3.3).

The cropping intensity considerably increased under shallow low land in Durg district, which was 167 per cent (2011-12) and 127 per cent (2011-12) showing the extent of change by 67 per cent and 27 per cent respectively for beneficiary and non beneficiary farmers (Table 3.3).

Table 3.3: Extent of change in cropping intensity

Type of farmers	Cropping intensity		Extent of change	Remarks
	2010-11	2011-12		
Rainfed Upland: District:Baster				
Beneficiary	100	109	9	
Non-beneficiary	100	100	0	
Shallow Low Land: District: Durg				
Beneficiary	100	167	67	
Non-beneficiary	100	127	27	
Irrigated Hybrid : Baster				
Beneficiary	100	100	0	
Non-beneficiary	100	100	0	
Irrigated Traditional : Bilaspur				
Beneficiary	167	175	8	
Non-beneficiary	166	181	15	
State: Chhattisgarh				
Beneficiary	**125**	**137**	**12**	
Non-beneficiary	**132**	**134**	**2**	

Source: Field Survey

The cropping intensity of the irrigated traditional paddy in Bilaspur district was apparently higher than other district during both the years. it was 167 per cent and 166 per cent with beneficiary and non beneficiary farmers respectively during 2010-11 and 175 and 181 per cent during 2011-12. The extent of change with beneficiary and non beneficiary farmers was 8 and 15 per cent respectively.The overall increase in cropping intensity was not so remarkable with beneficiary as well as non beneficiary farmers in the State (Table 3.3).

3.4 Yield Gap

The data on extent of yield gap of paddy has been recorded for the year 2011-12 in Table 3.4. The actual yield of paddy (38.52 q/ha) found to be obtained by the beneficiary farmers was little lesser than the potential yield (45.0 q/ha) in rainfed upland of Bastar but it was found low (23.63 q/ha) than non beneficiary farmers indicating the considerably higher yield gap of 21.37 q/ha.

The actual yield of irrigated hybrid paddy with beneficiary farmers in Bastar district was found to be recorded as 45.0 q/ha of its potential yield showing the yield gap only of 2.50 q/ha

but it was higher (14.17 q/ha) than non beneficiary farmers who have obtained the actual yield of 33.33 q/ha, which was found remarkably low than the potentiality of the rice yield (Table 3.4).

The actual yield of paddy (38.9 q/ha) recorded in shallow low land by beneficiary farmers of Durg district was also found lesser than its potential yield (44.5 q/ha) indicating the yield gap of 5.59 q/ha but this yield gap was noticeably high (13.08 q/ha) than non beneficiary farmers, who received actual yield of 31.42 q/ha (Table 3.4).

Table 3.4 : Extent of yield gap of paddy.

(Yield in q/ha)

Crop	Potential yield	Beneficiary				Non-beneficiary			
		Actual yield		Yield gap		Actual yield		Yield gap	
		2010-11	2011-12	2010-11	2011-12	2010-11	2011-12	2010-11	2011-12
Rainfed Upland: District:Baster									
Kharif Paddy	45.00		38.52 (85.60)		6.48 (14.40)		23.63 (52.51)		21.37 (47.49)
Summer Paddy									
Shallow Low Land: District: Durg									
Kharif Paddy	44.5		38.91 (86.47)		5.59 (12.42)		31.42 (69.82)		13.08 (29.07)
Summer Paddy									
Irrigated Hybrid : Baster									
Kharif Paddy	47.50		45.00 (100)		2.50 (5.56)		33.33 (74.07)		14.17 (31.49)
Summer Paddy									
Irrigated Traditional : Bilaspur									
Kharif Paddy	45.50		43.48 (96.62)		1.94 (4.31)		41.19 (91.53)		4.31 (9.58)
Summer Paddy									
State: Chhattisgarh									
Kharif Paddy	**47.50**		**41.48** (92.18)		**6.02** (13.38)		**32.39** (71.98)		**15.11** (33.58)
Summer Paddy									

Source: Field Survey

Figure in parenthesis shows the percentage gap to potential yield

The beneficiary farmers growing irrigated traditional paddy in Bilaspur obtained the actual yield of 43.48 q/ha which was found to be slightly lesser than its potential yield (45.50 q/ha) and showed the yield gap of 1.94 q/ha. The actual yield obtained by non beneficiary farmers (41.19 q/ha) was found to be quite satisfactory indicating the lesser yield gap (4.31 q/ha) than other districts (Table 3.4).

The extent of yield gap of paddy in Chhattisgarh was found to be comparatively low (6.02 q/ha) of beneficiary farmers than non beneficiary farmers (15.11 q/ha). The actual yield of

paddy in the State was found to be 41.48 q/ha and 32.39 q/ha, respectively of beneficiary and non beneficiary farmers as against its potential yield of 47.50 q/ha (Table 3.4).

3.5 Perception Profiling

Perception profiling of the beneficiary was done to evaluate the perception status of the farmers on various aspects and presented in table 3.5 which indicated that adequate supply of inputs and BGREI programme was found to be high. As regards suggestions for improvement, supply of more inputs and technical guidance available got high rating. Provision of technical guidance received from SDA and expectations of the farmers regarding timely supply of input got very high rating. According to performance regarding source of inputs, cooperative society got very high rating whereas problem in supply/ availability of inputs had high rating.

Table 3.5 : Perception profiling of the beneficiary

Particulars	**As perceived by the beneficiary (%)**	**Perception status/Remarks**			
		Low (0-25)	**Medium (25-50)**	**High (50-75)**	**Very high (>75)**
1. Supply of inputs					
Adequate	95.00	Adequate supply of inputs got very high rating			
Inadequate	5.00				
2. Rating BGREI					
Poor	2.5	Good rating of BGREI programme is high			
Average	42.5				
Good	55.0				
3. Suggestions for improvements					
Provide modern implements	55.00	Supply of more inputs got high rating			
Supply of more inputs	45.00				
4. Technical guidance available from SDA/KVK/SAU/CRRI					
Yes	100	Technical guidance available got high rating			
No	00				
5. Who guided the best technical guidance					
SDA	87.50	Provision of technical guidance received from SDA got very high rating			
KVK	-				
NGO	10.00				
CRRI	-				
ADO	-				
RAEO	2.50				
Progressive farmers	-				
6. Expectation of the farmers					

In-time supply of inputs	80	Expectation of the farmers regarding timely supply of input got very high rating
Technical guidance	20	
7. Problems in supply/availability of inputs		
Yes	67.5	Problem in supply/availability of inputs is high rating
No	32.5	
8. Preference for source of inputs		
Direct from input dealer	12.50	According to preference regarding source of inputs, Cooperative society got very high rating
Cooperative society	77.50	
Agril. Dept. outlets	10	
9. Faced problem in marketing of produce		
Lack of buyer	53.33	Lack of buyer got high rating regarding problem in marketing of produce
Low price	46.66	
10. Price received (Rs./q) in 2011-12	1180	more than the MSP
11. BGREI cultural practices will be followed next season		
Yes	100	BGREI cultural will be followed by the farmers in next season got very high rating
No	00	
12. If BGREI cultural practices will not be followed, the reasons		
Lack of proper guidance	50.00	Lack of proper guidance and not different from conventional practices are the two reasons got high rating for not following cultural practices as received from BGREI programme
Not different from conventional practices	50..00	

Source: Field Survey

As regards problem in marketing of produce, lack of buyer got high rating and the price of produce received (Rs/q) was more than the MSP. Farmers assumed to follow cultural practices recommended by BGREI in the next season, and got very high rating. If the cultural practices recommended by BGREI will not be followed, the reasons will be lack of proper guidance and not different from conventional practices got high rating.

CHAPTER-IV

EVALUATION OF PHYSICAL AND FINANCIAL PROGRESS

The physical and financial progress under BGREI programme was evaluated by collecting secondary data on concentration of block demonstrations (D/C) and achievements of the targets on assets building and site specific interventions which has been presented in this Chapter.

4.1 Number of Demonstrations

Out of eighteen districts in Chhattisgarh, the BGREI project was implemented only in eight districts i.e. Mahasamund, Dhamtari, Durg, Bilaspur, Jagdalpur, Narayanpur, Bijapur and Kanker.

A total number of 35400 block demonstrations were found to be conducted in 36 blocks and 498 mouzas of eight districts of Chhattisgarh under BGREI during Kharif 2011-12. The maximum numbers of demonstrations were conducted in Bilaspur (9000) followed by Jagdalpur (8000), Mahasamund (5000) and Dhamtari (5000). The demonstrations conducted in Durg, Kanker, Narayanpur and Bijapur districts were 4200, 2200, 1000 and 1000 respectively (Table 4.1).

Table 4.1 : Number of Blocks, Gram Panchayet and Mouzas at a glance for Block Demonstrations under BGREI in kharif, 2011-12 (Up to July 2011)

Name of the districts	Number of demonstrations	Number of blocks	Number of Mouzas
Mahasamund	5000 (14.12)	05	98
Dhamtari	5000 (14.12)	05	85
Durg	4200 (11.86)	03	100
Bilaspur	9000 (25.42)	08	74
Jagdalpur	8000 (22.60)	03	55
Narayanpur	1000 (2.82)	02	11
Bijapur	1000 (2.82)	03	42
Kanker	2200 (6.21)	07	33
Total	**35400 (100)**	**36**	**498**

Source: State BGREI Cell, Government of C.G. Figures in parentheses indicate the percentage over total

4.2 Concentration of Block Demonstrations

Concentration of block demonstrations (D/C) in relation to blocks and mouzas under BGREI in *kharif* 2011-12 was worked out and noted that it varied according to the number of blocks and mouzas in each district. The concentration of the demonstration in relation to block and mouzas was found maximum in Jagdalpur (2666.67 & 145.45) district whereas it was minimum in Bijapur (333.33 & 23.81) district. The overall concentration of the block demonstration in relation block and mozas was found 983.33 and 71.08, respectively in study area in all the eight districts (Table 4.2).

Table 4.2 : Concentration of block demonstrations (D/C) in relation to blocks, gram panchayets and mouzas at a glance under BGREI in kharif, 2011-12

(Up to July 2011)

Name of the district	No. of demonstration	Concentration of D/C in relation to block (No.)	Concentration of D/C in relation to Mouzas
Mahasamund	5000.00	1000.00	51.02
Dhamtari	5000.00	1000.00	58.82
Durg	4200.00	1400.00	42.00
Bilaspur	9000.00	1125.00	121.62
Jagdalpur	8000.00	2666.67	145.45
Narayanpur	1000.00	500.00	90.91
Bijapur	1000.00	333.33	23.81
Kanker	2200.00	2200.00	66.67
Total	**35400.00**	**983.33**	**71.08**

4.3 Concentration of Block Demonstrations per Net Cropped Area

Concentration of the block demonstrations per net cropped area under BGREI during *kharif* 2011-12 was maximum in Narayanpur (0.30 ha) district followed by in Dhamtari (0.024 ha) and Jagdalpur (0.024 ha) districts, and in Bilaspur (0.019 ha) and Mahasamund (0.017 ha) districts, where as it was the lowest in Durg (0.005 ha). The overall total concentration of various eight districts was noted to be 0.015 ha (Table 4.3).

Table 4.3 : Concentration of block demonstrations (D/C) per net cropped area at a glance under BGREI in *kharif* 2011-12 **(Up to July 2011)**

Name of the district	Net cropped area (ha)	No. of demonstration	Concentration of demonstration per net cropped area (ha)
Mahasamund	297627	5000	0.017
Dhamtari	211210	5000	0.024
Durg	774611	4200	0.005
Bilaspur	480659	9000	0.019
Jagdalpur	327899	8000	0.024
Narayanpur	33503	1000	0.030
Bijapur	67457	1000	0.015
Kanker	228881	2200	0.010
Total	**2421847**	**35400**	**0.015**

4.4 Physical Target-wise Achievement of *Kharif* Rice Block Demonstrations

The total target of *kharif* (2011-12) rice block demonstrations under upland rice, shallow water rice and irrigated rice were 39000 as per BGREI programme in Chhattisgarh (Table 4.4). There was 100 per cent achievement of the physical targets under different interventions viz – 9000, 18000 and 12000 under upland rice, shallow water rice and irrigated rice respectively. The number of demonstrations conducted in different districts were found maximum in Bilaspur (9000) followed by Jagdalpur (8000), Mahasamund (5000), Dhamtari (5000), Durg (4200), kanker (2200), Narayanpur (1000), and Bijapur (1000) demonstrations.

4.5 Number of Block Demonstrations of Rice (HYV & Hybrids)

A total number of 28000 block demonstrations of rice were conducted out of which 27000 were under high yielding varieties and 1000 under hybrid rice (Table 4.5). As regards district-wise physical achievement, it was 4000 each in Mahasamund, Dhamtari and Bilaspur, 5000 each in Durg and Jagdalpur, 3000 in Kanker and 1000 each in Naraynpur and Bijapur respectively. All the block demonstrations of hybrid rice (1000) were conducted in Jagdalpur district only.

Table 4.4: Physical target-wise achievement of kharif rice block demonstrations (D/C) in CG (2011-2012)

Target as per BGREI programme		District-wise physical achievement																		Status of Achievement(100) %
Particulars	No.	Raipur	Mahasamund	Dhamtari	Durg	Rajnandgaon	Kabirdham	Bilaspur	Janjgir	Korba	Raigarh	Sarguja	Jashpur	Koriya	Jagdal pur	Narayan pur	Beejap ur	Dantew ara	Kanker	Total	
Upland rice			1000	1000	1000			1000							2000		1000		2000	9000 (23.08)	
Shallow water rice			3000	3000	4000			3000							3000	1000			1000	18000 (46.15)	
Medium water rice																				(0)	
Deep water rice																				(0)	
Irrigated			1000	1000	1000	0	0	5000	0	0	0	0	0	0	3000	0	0	0	1000	12000 (30.77)	
Total rice	39000		5000	5000	6000	0	0	9000	0	0	0	0	0	0	8000	1000	1000	0	4000	39000 (100)	100

Source: State BGREI Cell, Government of West Bengal
Figures in parentheses indicate the percentage over total

Table 4.5: Number of block demonstrations (D/C) of rice (HYV & Hybrid) and wheat by kharif, rabi and summer in CG (2011-12)

Target under BGREI		District-wise physical achievement																			Status of
Crop	No	Raipur	Mahasamund	Dhamtari	Durg	Rajnandgaon	Kabirdham	Bilaspur	Janjgir	Korba	Raigarh	Sarguja	Jashpur	Koriya	Jagdalp ur	Narayan pur	Beejap ur	Dantewa ra	Kanke r	Total	Achievement (%)
KHARIF (2011-12)																					
HYV																					
Hybrid																					
Sub-total																					
BORO (SUMMER) (2011-12)																					
HYV																					
Hybrid																					
Sub-total																					
TOTAL RICE (2011-12)																					
HYV	27000	0	4000	4000	5000	0	0	4000	0	0	0	0	0	0	5000	1000	1000	0	3000	27000 (96.43)	100
Hybrid	1000														1000					1000 (3.57)	100
Grand total	28000	0	4000	4000	5000	0	0	4000	0	0	0	0	0	0	6000	1000	1000	0	3000	28000	
RABI (2011-12)																					
Wheat																					

Source: State BGREI Cell, Government of C.G.
Figures in parentheses indicate the percentage over total

Table 4.6: Distribution of inputs under block demonstrations (D/C) of paddy under BGREI in kharif, 2011-12

(Up to July 2011)

Name of the district	No. of D/C	Seed						Zinc Sulphate		
					Certification agencies			Total Quantity (MT)	Quantity per D/C	Total Value (Rs.)
		Total Quantity (MT)	Quantity/D/C (MT)	Total Value (Rs.)	CGSSC	NSC	Total		(MT)	
Mahasamund	5000	359.13	0.07	8978250	359.13	0	359.13 (15.99)	125	0.025	4375000
Dhamtari	5000	360	0.07	9000000	360	0	360 (16.03)	125	0.025	4375000
Durg	4200	388.03	0.09	9700750	388.03	0	388.03 (17.27)	150	0.03571	5250000
Bilaspur	9000	570	0.06	14250000	570	0	570 (25.38)	225	0.025	7875000
Jagdalpur	8000	414	0.05	10350000	414	0	414 (18.43)	55.04	0.00688	1926400
Narayanpur	1000	75	0.08	1875000	75	0	75 (3.34)	25	0.025	875000
Bijapur	1000	80	0.08	2000000	80	0	80 (3.56)	25	0.025	875000
Kanker	2200	0	0.00	0	0	0	0 (0)	0	0	0
Total	35400	2246.16	0.06	56154000	2246.16	0	2246.16 (100)	555.04	0.01568	19426400

Source: State BGREI Cell, Government of CG

Table 4.7: Distribution of inputs under block demonstrations (D/C) of paddy (HYV) under BGREI in kharif, 2011-12

(Up to July 2011)

Name of the district	No. of D/C	Seed			Carbandazim			Zinc Sulphate			Pretllachlor		
		Total Qty(MT) (MT)	Qty/D/C	Total Value	Total Qty(kg) (kg)	Qty/D/C	Total Value	Total Qty(MT) (MT)	Qty/D/C	Total Value	Total Qty (Lit)	Qty/D/C	Total Value
Mahasamund	4000	319.13	0.0797825	7978250	175	0.04375	105000	1000	0.25	35000000	0	0	0
Dhamtari	4000	320	0.08	8000000	175	0.04375	105000	1000	0.25	35000000	1938	0.4845	775200
Durg	5000	388.03	0.077606	9700750	152.761	0.0305522	91656.6	1250	0.25	43750000	4322.5	0.8645	1729000
Bilaspur	4000	320	0.08	8000000	140	0.035	84000	1000	0.25	35000000	2826.5	0.706625	1130600
Jagdalpur	5000	399	0.0798	9975000	175	0.035	105000	342.4	0.06848	11984000	2575	0.515	1030000
Narayanpur	1000	75	0.075	1875000	113.75	0.11375	68250	250	0.25	8750000	3500	3.5	1400000
Bijapur	1000	80	0.08	2000000	35	0.035	21000	250	0.25	8750000	1600	1.6	640000
Kanker	3000	0	0	0	0	0	0	0	0	0	0	0	0
total	27000	1850.06	0.06852074	46251500	700	0.0259259	420000	3592.4	0.1330519	125734000	8939.5	0.3310926	3575800

Source: State BGREI Cell, Government of CG

4.6 Distribution of Inputs under Block Demonstrations of Paddy

The total quantity of 2246.16 tones of seed costing to Rs. 561.54 lakhs was distributed amongst beneficiaries in identified eight districts of Chhattisgarh State through Seed Certification Agency whereas there was found no contribution from National Seed Certification Agency in this regard (Table 4.6). There was deficiency of micronutrient (Zn) in these districts hence, distribution of 555.04 tones of zinc sulphate costing to Rs. 194.26 lakhs was also done. The maximum distribution of seed was found to be distributed in Bilaspur (570 tones) followed by in Jagdalpur (414 tonnes), Durg (388.03 tones), Dhamtari (360 tones), Mahasamund (359.13 tones), Bijapur (80 tones), and Narayanpur (75 tones). There was found nil distribution of seed in Kanker districts of Chhatisgarh.

4.7 Distribution of Inputs under Block Demonstrations of Paddy (HYV)

The distribution of inputs like seed, carbandazim, zink sulphate and Pretllachlore distributed under block demonstrations of the high yielding varieties of paddy during *kharif* 2011-12. The total quantity of 1850.06 tones of seed, 700 kgs of carbandazim, 3592.4 tones of zinc sulphate and 8939.5 litres of Pretllachlore amounting to Rs. 462.51, Rs. 4.2, Rs. 1257.34 and 35.76 lakhs respectively were distributed for 27000 demonstrations in these eight districts. The maximum expenditure was made on Zinc sulphate (Rs. 1257.34 lakhs) followed by seed (Rs. 462.51 lakhs) and Pretllachlore (Rs.35.75 lakhs). Though, the number of demonstrations were 3000 in Kanker but no any input were distributed in these districts (Table 4.7).

4.8 Distribution of Inputs under Block Demonstrations of Paddy (Hybrid)

Block demonstrations on hybrid rice (Table 4.8) were allotted to all the districts of Chhattisgarh except Jagdalpur, Narayanpur and Dantewara. Among various inputs Boron and Pretllachlore was not distributed in any district. The maximum inputs viz- seed, carbandazim and zinc sulphate were distributed in Kobra and Koriya districts only whereas distribution of seed and carbandazim were done in Raipur and seed and zinc sulphate in Jashpur. The remaining districts received only one input i.e. seed. Seed was the only input which was distributed to majority of the districts (74.4 tones), its per unit distribution comes to 0.00461 tones. The total distribution of crbandazim and zinc sulphate were 263.76 kg and 28.6 tones, respectively. It was also found that in Bikapur and Kanker districts nil input was distributed amongst the paddy growers. However, there were reported 30 and 1400 demonstrations.

Table 4.8: Distribution of inputs under block demonstrations (D/C) of paddy (Hybrid) under BGREI in kharif 2011-12

(Value in Rs.)

Name of the district	No. of D/C	Seed			Carbandazim			Zinc Sulphate			Boron			Pretllachlor		
		Total Qty	Qty/D/C	Total Value	Total Qty	Qty/D/C	Total Value	Total Qty	Qty/D/C	Total Value	Total Qty	Qty/D/C	Total Value	Total Qty	Qty/D/C	Total Value
		(MT)			(kg)			(MT)			(kg)			(Lit)		
Raipur	3000	18	0.006		210	0.07	126000	0	0	0	0	0	0	0	0	0
Mahasamund	1000	6	0.006		0	0	0	0	0	0	0	0	0	0	0	0
Dhamtari	1800	4.8	0.0026667		0	0	0	0	0	0	0	0	0	0	0	0
Durg	500	3	0.006		0	0	0	0	0	0	0	0	0	0	0	0
Rajnandgaon	500	3	0.006		0	0	0	0	0	0	0	0	0	0	0	0
Kabirdham	400	2.4	0.006		0	0	0	0	0	0	0	0	0	0	0	0
Bilaspur	1500	9	0.006		0	0	0	0	0	0	0	0	0	0	0	0
janjgir	770	0	0		0	0	0	0	0	0	0	0	0	0	0	0
Korba	300	1.8	0.006		1.26	0.0042	756	3	0.01	0	0	0	0	0	0	0
Raigarh	500	0	0		0	0	0	0	0	0	0	0	0	0	0	0
Sarguja	2200	13.2	0.006		0	0	0	0	0	0	0	0	0	0	0	0
Jashpur	1000	6	0.006		0	0	0	25	0.025	875000	0	0	0	0	0	0
Koriya	1200	7.2	0.006		52.5	0.04375	31500	0.6	0.0005	21000	0	0	0	0	0	0
Jagdalpur		0	0		0	0	0	0	0	0	0	0	0	0	0	0
Narayanpur		0	0		0	0	0	0	0	0	0	0	0	0	0	0
Dantewada		0	0		0	0	0	0	0	0	0	0	0	0	0	0
Bijapur	30	0	0		0	0	0	0	0	0	0	0	0	0	0	0
Kanker	1450	0	0		0	0	0	0	0	0	0	0	0	0	0	0
Total	16150	74.4	0.0046068		263.76	0.0163319	158256	28.6	0.0017709	1001000	0	0	0	0	0	0

Source: State BGREI Cell, Government of CG

Table 4.9: Break-up of inputs delivered at a glance under block demonstrations (D/C) in BGREI, 2011-12

(Value in Rs.)

Crop	No. of D/C	Seed		Carbandazim		Zinc Sulphate		Boron		Pretllachlor	
		Qty (MT)	Value	Qty (kg)	Value	Qty (MT)	Value	Qty (kg)	Value	Qty (Lit)	Value
KHARIF (2011-12)											
HYV	27000	1850	46251500	700	420000	3592.4	125734000	0	0	8939.5	3575800
Hybrid	16150	74.4	Not reported	263.76	158256	28.6	1001000	0	0	0	0
BORO (SUMMER) (2011-12)											
HYV	Not reported										
Hybrid											
RABI (2011-12)											
Wheat	Not reported										
Total											

Source: State BGREI Cell, Government of CG

4.9 Break-up of Inputs Delivered at a Glance under Block Demonstrations

The total inputs delivered under 27000 block demonstrations of high yielding varieties of rice were 1850 tones of seed amounting to Rs. 462.51 lakhs, 700 kg of carbanadazim (Rs. 4.2 lakhs), 3592.4 tones of zinc sulphate (Rs. 1257.34 lakhs) and 8939.5 lits of Pretllachlore (Rs. 35.75 lakhs) whereas it was 74.4 tones of seed, 263.76 kg of carbandazim (Rs. 1.58 lakh) and 28.6 tones of zinc sulphate amounting to Rs. 10.01 lakhs for hybrid rice. Boron was not distributed to any paddy growers.

4.10 Adoption of Practices by Rice Growers

All the beneficiary and non beneficiary farmers under various interventions adopted the operations of deep ploughing and land preparation indicating the extent of change by 100 per cent (Table 4.10).

Table 4.10 : Adoption of deep ploughing and land preparation at the farm level by the respondents

Sl. No.	Particulars	Beneficiary		Non-beneficiary		Extent of change (%)	
		Adopted	Not-adopted	Adopted	Not-adopted	Beneficiary	Non-beneficiary
Rainfed Upland: District:Baster							
1.	Deep ploughing	10	0	5	0	100	100
2.	Land preparation	10	0	5	0	100	100
Shallow Low Land: District: Durg							
1.	Deep ploughing	10	0	5	0	100	100
2.	Land preparation	10	0	5	0	100	100
Irrigated Hybrid : Baster							
1.	Deep ploughing	10	0	5	0	100	100
2.	Land preparation	10	0	5	0	100	100
Irrigated Traditional : Bilaspur							
1.	Deep ploughing	10	0	5	0	100	100
2.	Land preparation	10	0	5	0	100	100
State: Chhattisgarh							
1.	Deep ploughing	40	0	20	0	100	100
2.	Land preparation	40	0	20	0	100	100

Source: Field Survey

4.11 Package of Practices in Block Demonstrations at the Farm Level

The beneficiary as well as non beneficiary farmers of Bastar, Durg and Bilaspur did deep ploughing and land preparation up to the depth of 0-15 cm and raised their 100 per cent paddy crop only by transplanting under all the interventions (Table 4.11).

Table 4.11: Package of practices in block demonstrations at the farm level

Package of practices	Unit	Prescribed under BGREI programme	Adopted by the beneficiary farmer	Adopted by the non-beneficiary farmer	Gap if any (%)	
					Beneficiary	Non-beneficiary
Rainfed Upland: District: Bastar						
Deep ploughing and land preparation						
(a) 00-15 cm	Rs.	1500	1475	1068.67	1.67	27.55
(b) 25-50 cm		00	00	00	00	00
(c) 50-100 cm		00	00	00	00	00
Direct seeding						
(a) 50% direct seeding	Rs.	00	00	00	00	00
(b) 50% direct transplanted		00	00	00	00	00
(c) 100% transplanting		1500	1433.33	1150.33	4.44	19.74
Seed	Qty	80	80	73.43	0.00	8.21
Seed treatment	Qty	200	149.70	120	25.15	19.84
Zinc	Qty	25	26.61	00	-6.44	100.00
Boron	Qty	05	00	00	100.00	0.00
Weed Management						
Pretlachlor	Qty	1600	1526.9	00	4.57	100.00
Conoweeder	Rs.	361.04	361.04	312.50	0.00	13.44
Manual	Rs.					
Plant protection	Rs.	700	1421.88	465.50	-103.13	67.26
Rainfed Shallow Low Land: District: Durg						
Deep ploughing and land preparation						
(a) 00-15 cm	Rs.	1500	1500	1478.03	0.00	1.46
(b) 25-50 cm		00	00	00	00	00
(c) 50-100 cm		00	00	00	00	00
Direct seeding						
(a) 50% direct seeding	Rs.	00	00	00	00	00
(b) 50% direct transplanted		00	00	00	00	00
(c) 100% transplanting		1500	1425	1315.79	5.00	7.66
Seed	Qty	80	75.58	71.33	5.53	5.62
Seed treatment	Qty	120	149	120	-24.17	19.46
Zinc	Qty	25	25	24.66	0.00	1.36
Boron	Qty	05	00	00	100.00	0.00
Weed Management						
Pretlachlor	Qty	1600	1131.25	00	29.30	100.00
Conoweeder	Rs.	302.50	302.50	321.12	0.00	-6.16
Manual	Rs.					
Plant protection	Rs.	700	600	376.70	14.29	37.22
Irrigated Hybrid : Baster						
Deep ploughing and land preparation						
(a) 00-15 cm	Rs.	1500	1500	1428.52	0.00	4.77
(b) 25-50 cm		00	00	00	00	00
(c) 50-100 cm		00	00	00	00	00
Direct seeding						
(a) 50% direct seeding	Rs.	00	00	00	00	00
(b) 50% direct transplanted		00	00	00	00	00
(c) 100% transplanting		1500	2800	1250	-86.67	55.36

table-4.11 contd.....

table-4.11 contd..

Package of practices	Unit	Prescribed under BGREI programme	Adopted by the beneficiary farmer	Adopted by the non-beneficiary farmer	Gap if any (%)	
					Beneficiary	Non-beneficiary
Seed	Qty	1.5	1.5	1.54	0.00	-2.67
Seed treatment	Qty	60	56	46.67	6.67	16.66
Zinc	Qty	25	27.18	23.61	-8.72	13.13
Boron	Qty	05	00	00	100.00	0.00
Weed Management						
Pretlachlor	Qty	1600	00	00	100.00	0.00
Conoweeder	Rs.	465.83	465.83	345	0.00	25.94
Manual	Rs.					
Plant protection	Rs.	700	815.83	716.67	-16.55	12.15
Irrigated Traditional : Bilaspur						
Deep ploughing and land preparation						
00-15 cm	Rs.	1500	1462.5	1558.9	2.50	-6.59
25-50 cm		00	00	00	00	00
50-100 cm		00	00	00	00	00
Direct seeding						
50% direct seeding	Rs.	00	00	00	00	00
50% direct transplanted		00	00	00	00	00
100% transplanting		1500	1610	1466.4	-7.33	8.92
Seed	Qty	40	50	74.78	-25.00	-49.56
Seed treatment	Qty	25	186.25	00	-645.00	100.00
Zinc	Qty	25	25	00	0.00	100.00
Boron	Qty	05	05	00	0.00	100.00
Weed Management						
Pretlachlor	Qty	1600	1250	1005	21.88	19.60
Conoweeder	Rs.	1250	1250	757.5	0.00	39.40
Manual	Rs.					
Plant protection	Rs.	700	1003	1123.6	-43.29	-12.02
State: Chhattisgarh						
Deep ploughing and land preparation						
(a) 00-15 cm	Rs.	1500	1484.37	1383.53	1.04	6.79
(b) 25-50 cm		0	0	0	0	0
(c) 50-100 cm		0	0	0	0	0
Direct seeding						
(a) 50% direct seeding	Rs.	0	0	0	0	0
(b) 50% direct transplanted		0	0	0	0	0
(c) 100% transplanting		1500	1817.08	1295.63	-21.14	28.70
Seed	Qty	50.37	51.77	55.27	-2.78	-6.76
Seed treatment	Qty	101.25	135.23	71.66	-33.56	47.01
Zinc	Qty	25	25.94	12.06	-3.76	53.51
Boron	Qty	5	1.25	0	75.00	100.00
Weed Management						
Pretlachlor	Qty	1600	977.03	251.25	38.94	74.28
Conoweeder	Rs.	594.84	594.84	434.03	0.00	27.03
Manual	Rs.					
Plant protection	Rs.	700	960.17	670.61	-37.17	30.16

Source: Field Survey

As regards use of seed prescribed under BGREI programme, there was no gap in all the districts except rainfed shallow low land of Durg with the gap of 5.53 per cent rather it was higher under irrigated traditional in Bilaspur. The achievement under seed treatment was higher in rainfed shallow low land in Durg and irrigated traditional of Bilaspur with beneficiary farmers, it showed a gap of 25.15 per cent in rainfed upland in Bastar. The use of zinc micro

nutrient was also up to the mark under all the interventions of various districts rather it was higher in rainfed upland and irrigated hybrid of Bastar.

As regards Boron, it was neither used by the beneficiary nor by the non beneficiary farmers in all the situations except irrigation traditional in Bastar with 100 per cent achievement. The weed management practices adopted by the beneficiary farmers were fully satisfactory. Weedicide pretlachlore was used in all the districts except irrigated hybrid of Bastar. The use of conoweeder was also 100 per cent under all the interventions of different districts. The plant protection measures adopted by the beneficiary farmers were more than prescription in rainfed upland and irrigated hybrid of Bastar and irrigated traditional of Bilaspur (Table 4.11).

The overall use of maximum package of practices in Chhattisgarh were higher than prescribed under BGREI programme indicating good success of the programme in this regard (Table 4.11).

4.12 Component-wise Physical & Financial Target & Achievement in Asset Building Activities

The physical as well as financial achievement in asset building activity was maximum under purchase of pumpsets which was 75.05 per cent (Table 4.12). The physical as well as financial achievement under pump sets was 75.05 per cent. The physical achievement under shallow tube wells were 3637 (42.56 %)as against the target of 8545 and the financial achievement was 400.62 lakhs (32.84 %) against the target of Rs. 1220.00 lakhs. The physical achievement was the lowest (18.83 %) under dug well/ bore well (Table 4.12).

Table 4.12 : Component-wise physical and financial target and achievement in asset building activities in Chhattisgarh (2011-12) (Rs. in lakhs)

Component	Physical target under BGREI		Physical achievement under BGREI		Achievement (%)	
	Number	Amount sanctioned	Number	Amount utilised	Physical	Financial
Shallow tube well	8545	1220.000	3637	400.62	42.56	32.84
Pump sets	4000	40	3002	30.02	75.05	75.05
Dug well/bore well	600	180.000	113	64.698	18.83	35.94
Re-excavation of ponds	--	--	--	--	--	--
Total	**13145**	**1440.000**	**6752**	**765.52**	**51.37**	**53.16**

Source: State BGREI Cell State CG

4.13 Component-wise Physical & Financial Target & Achievement in Site Specific Activities

The physical and financial achievements under the components of support to forest dwellers (seed + fertilisers) and construction of minor irrigation tanks were 100 per cent whereas these were 61.33 and 59.59 per cent respectively under construction of check dams (Table 4.13).

Table 4.13 : Component-wise physical and financial target and achievement in site specific activities in Chhattisgarh (2011-12) (Rs. in lakhs)

Components	Programme Sanction by SLSC		Revised Sanction by State		Achievement (upto March 12)		Achievement (%)	
	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.
(a) Support to Forest Dwellers (Seed + Fertilizer)	14297	175	14297	154.08	14258	154.08	99.73	100.00
(b) Runoff management Structure								
(i) Construction of : Checkdam	48	477.9	150	1366.18	92	814.13	61.33	59.59
(ii) Construction of Minor Irrigation Tanks	20	500	32	641.64	32	641.64	100.00	100.00
Total	**68**	**1152.90**	**182**	**2007.82**	**124**	**1455.77**	**68.13**	**72.51**

Source: *Central BGREI Cell State CG

The overall total physical and financial achievements in site specific activities were 68.13 and 72.50 per cent respectively (Table 4.13).

4.14 Intervention-wise physical and financial progress at a glance

Intervention-wise physical and financial progress in BGREI programme during 2011-12 was assessed (Table 4.14 A) which indicated 100 per cent achievement of the physical as well as financial targets in conduct of rice block demonstrations under rainfed upland, shallow low land, irrigated HYV and irrigated hybrid. There was no target for hybrid maize but all the 5000 demonstrations were conducted ass per sanction by the State, its financial achievement was 297.99 lakhs against sanction of Rs. 325.00 lakhs.

The physical as well as financial achievements under asset building were found to be satisfactory under borewell/ Tube well which were 3637 and Rs. 400.62 lakhs respectively. It was very less under dug well (215) having expenditure of Rs. 64.7 lakhs against sanctions received for 600 dug wells with Rs. 153 lakhs (Table 4.14A).

Table 4.14A : Intervention-wise physical and financial progress at a glance in BGREI programme in Chhattisgarh (2011-12) (Rs. in lakhs)

S. No.	Components	Programme Sanction by SLSC		Revised Sanction by State		Achievement (upto March 12)		Balance Amt.
		Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Fin.
1	2	3	4	5	6	7	8	9
1	**Rice Block Demonstration**							
	(a) Rainfed Upland	9000	712.1	9000	558.85	9000	558.85	0
	(b) Shallow Low land	18000	1424.2	18000	1121.2	18000	1121.2	0
	(c) Irrigated - HYV	11000	753.7	11000	634.07	11000	634.07	0
	(d) Irrigated - Hybrid	1000	78.2	1000	67.46	1000	67.46	0
	Hybrid Maize	-	0	5000	325	5000	297.99	27.01
	Total Demonstration	**39000**	**2968.2**	**44000**	**2706.58**	**44000**	**2679.57**	**27.01**
2	**Assesst Building**							
(A)	Dugwell Unit Cost : Rs. 30000	600	180	600	153	215	64.7	88.3
(B)	Borewell/Tubewell	4000	1220	4000	499.62	3637	400.62	99
3	**Site Specific Needs**							
	(a) Support to Forest Dwellers (Seed + Fertilizer)	14297	175	14297	154.08	14258	154.08	0
	(b) Runoff management Structure							
	(i) Construction of : Checkdam	48	477.9	150	1366.18	92	814.13	552.05
	(ii) Construction of Minor Irrigation Tanks	20	500	32	641.64	32	641.64	0
	Total	**-**	**2552.9**	**-**	**2814.52**	**-**	**2075.17**	**739.35**
	Grand Total	**-**	**5521.1**	**-**	**5521.1**	**-**	**4754.74** **86%**	**766.36**

The progress received under site specific needs was quite satisfactory, the physical and financial achievements obtained under support to forest dwellers and construction of minor irrigation tanks were 100 per cent. Though the achievement for construction of check dams was higher than the target but considerably less as compared to the sanction received by the State which were 92 in numbers and Rs. 814.3 lakhs against sanction of 150 numbers and Rs. 1366.18 lakhs (Table 4.14 A).

The intervention-wise physical and financial progress in BGREI programme during the year 2010-11 was satisfactory except for hybrid rice demonstration in Public Private Partnership (PPP) mode which was nil (Table 4.14 B) where as it was found to be achieved 100 per cent in the year 2011-12.

Table 4.14 B : Intervention-wise physical and financial progress at a glance in BGREI programme in Chhattisgarh (2010-11)

S. No.	Particular	Revised Sanction		Achievement (2010-11)		Achievement (2011-12)		Total	
		Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.
1	2	3	4	5	6	7	8	9	10
1	Integrated Nutrition Management Balance dfertilizer kits for Rice (0.4 ha)	35000	262.5	26975	202.315	8025	60.185	35000	262.5
2	Seed+ fertilizer Kits to forest dwellers	80000	1000	72455	905.682	7445	94.318	80000	1000
3	Tractor Hire charges for Line sowing	2000	12.44	1774	12.99	-	-	2000	12.99
4	Distribution of seed minikits of pulse & oilseeds	90000	270	136640	208.303	-	-	90000	208.303
5	Construction of Checkdam	200	2000	201	1919.341	23	80.659	224	2000
6	Construction of Minor Irrigation Tanks	80	2000	99	1981.746	1	18.254	100	2000
7	Sugarcane Demonstration -0.5 ha.	2022	196.2	2041	148.745	1050	78.686	3091	227.43
8	Hybrid Rice Demonstration PPP Mode	15000	250	-	-	16150	250.98	16150	250.98
9	Subsidy to farmer for Well and Pumps as per Shakambhari Yojna norms		701.36		730.606			-	730.606
10	Administrative Expenses		22.19		16.556		5.634		22.19
	Total		**6714.69**		**6126.28**		**588.72**		**6715**
									100%

The progress was remarkably low almost under all the interventions during 2011-12 which was nil under some interventions viz; tractor higher charges for line sowing, distribution of seed through minikits of pulse and oilseeds and subsidy to farmers for well and pumps as per shakambhari yojana norms. The overall financial achievement during the year 2010-11 was Rs. 6126.28 lakhs and Rs. 588.72 lakhs in 2011-12 against sanction of Rs. 6714.69 lakhs for each year (Table 4.14 B).

Table 4.15 : Details about District Level Monitoring Committee (DLMT) at a glance in BGREI programme in West Bengal (2011-12)

District	Composition of District Level Monitoring Committee		No. of meeting
	Composition	Status	
	Not reported		

Source: State BGREI Cell, Government of Chhattisgarhp

CHAPTER V

EVALUATION OF MONITORING PROCESS

Evaluation of the monitoring process was to be done by State Level Monitoring Teams (SLMTs) and District Level Monitoring Teams (DLMTs) in the Chhattisgarh. In this regard only two meetings of SLMTs were conducted on November 12, 2010 and August 11, 2011. The agenda and proceedings of the meetings were not made available, hence unable to mention the details of these meetings.As regards DLMTs no information was made available by the State officials.

CHAPTER-VI

RESULTS AND DISCUSSION

The results of the primary data recorded on various aspects are given in this chapter, which includes size of holding, Level of education and occupation of sample farmers. It also includes the information on productivity and net return per hectare of rice at farm level and effectiveness of the progressive farmers in implementation of the BGREI programme.

6.1 Size of Holding of the Sample Farmers

The average size of holding of the sample farmers was 0.73, 1.38, 2.69 and 6.02 for marginal, small, medium and large holding farmers, respectively and the overall average size of holding was 2.70 hectare (Table 6.1).

Table 6.1: Size of holding of the sample farmers

Size of land holdings	Average size of holdings	Number of farmers	
		Beneficiary	Non-beneficiary
Marginal	0.73	1(2.5)	5(25)
Small	1.38	3(7.5)	8(40)
Medium	2.69	28(70)	5(25)
Large	6.02	8(20)	2(10)
Overall	**2.70**	**40 (100)**	**20 (100)**

Source: Field Survey, Figures in parentheses shows percentage to total

Amongst all the beneficiaries, the maximum number of beneficiary farmers (70%) had medium size of holding followed by large (20%), small (7.5%) and marginal (2.5%) size holdings. The numbers of non beneficiary farmers having small size of land holding were 40 per cent followed by 25 per cent each under marginal and medium holdings and only 10 per cent in large category (Table 6.1).

6.2 Level of Education of the Sample Farmers

The data recorded on level of education of the sample farmers indicate that 50 per cent of the beneficiary farmers received education upto higher secondary and 17.5, 15.0 & 12.5 per cent upto middle, primary and graduate level, respectively (Table 6.2). The percentage of post graduate farmers was 2.5 per cent only. Among non beneficiary farmers there was no post graduate farmer and 30 per cent of the farmers were having primary education, 20 per cent each

were middle and higher secondary, 5 per cent graduate whereas 25 per cent farmers were illiterate (Table 6.2).

Table 6.2: Level of education of the sample farmers

Level of education	Beneficiary	Non-beneficiary
Illiterate	1 (2.50)	5 (25.00)
Primary	6 (15.00)	6 (30.00)
Middle	7 (17.50)	4 (20.00)
Secondary/Higher Secondary	20 (50.00)	4 (20.00)
Graduate/Technical Degree	5 (12.50)	1 (5.00)
Post Graduate & above	1 (2.50)	0 (0.00)
Total	**40 (100)**	**20 (100)**

Source: Field Survey Figures in parentheses shows percentage to total

6.3 Occupation of the Sample Farmers

Majority (90%) of the beneficiary farmers were doing self employed farming whereas 10 per cent were engaged as agricultural labour (Table 6.3). The occupation of the 65 per cent non beneficiary farmers was agricultural labour and 35 per cent had self employed farming. Thus the beneficiary sample farmers had the advantage of having their self employment.

Table 6.3 : Occupation of the sample farmers

Occupational status	Number of farmers	
	Beneficiary	**Non-beneficiary**
Self-employed Farming	36 (90)	7 (35)
Self-employed Non-farming / Business	0	0
Salaried Person	0	0
Agriculture Labour	4 (10)	13 (65)
Non-agricultural Labour	0	0
Pensioner	0	0
Household Work	0	0
Student	0	0
Others (specify)	0	0
Total	**40 (100)**	**20 (100)**

Source: Field Survey

.

Table 6.4: Productivity and net return/ha in kharif rice at farm level (2011-12)

(Cost in Rs.)

Activity	Rainfed upland		Shallow lowland		Irrigated Hybrid		Irrigated Traditional		All Ecological Regions	
	Beneficiary	Non-beneficiary	beneficiary	Non-beneficiary	beneficiary	Non-beneficiary	beneficiary	Non-beneficiary	beneficiary	Non-beneficiary
I. Inputs delivered under BGREI										
Deep ploughing and land preparation	1900	-	2550	-	1500	-	2025	-	1993.75	-
Seeds	-	-	-	-	-	-	-	-	-	-
Seeds (benefit amount)	545.90	-	1538.90	-	320	-	1080	-	871.2	-
Seed treatment	43.50	-	172.60	-	35	-	268.2	-	129.825	-
Weed management	1985.00	-	820.30	-	-	-	827	-	1210.767	-
Micro-nutrients	-	-	-	-		-		-	-	-
Micro-nutrient (benefit amount)	1246.00	-	1467.00	-	597	-	1378	-	1172	-
Direct seeding /transplanting	1910	-	2400	-	1500	-	2270	-	2020	-
Line sowing by drum seeders	-	-	-	-	-	-	-	-	-	-
Transplanting	-	-	-	-	-	-	-	-	-	-
Plant protection	1250	-	1020	-	515	-	1444.5	-	1057.375	-
II. Inputs used at own cost										
Land preparation	-	1700	-	2220	-	1320	-	4900	-	2535
Seeds	-	1542	-	1466	-	450	-	3666	-	1781
Seed treatment	-	0.00	-	34.00	-	34	-	00	-	17
Transplanting	-	2160	-	1970	-	900	-	4520	-	2387.5
Manures	2000	980	1115	1006	890	1060	2905	4220	1727.5	1816.5
Soil amendments	-	-	-	-	-	-	900	-	900	
Micro-nutrients	-	-	-	1440	-	640	-	00	-	693.3333
Fertilizers	4385	1680	5950	5680	2370	2100	9750	11860	5613.75	5330
Bio-fertilizers	-	-	-	-	-	-	-	-	-	
Irrigation	-	-	-	-	-	-	-	-	-	
Weeding	445	630	515	470	275	240	1810	2340	761.25	920
Plant protection	-	870	-	549	-	490	-	3566	-	1368.75
Harvesting	1520	1560	1900	1880	870	990	5500	10500	2447.5	3732.5
Threshing	2240	1920	1880	1560	710	700	00	00	1207.5	1045
III. Land revenue paid	16.25	25.50	21.25	18.78	8.00	9.00	36	116.8	20.375	42.52
IV. Interest on capital paid	708.09	895.30	806.79	1130.22	375.20	698.18	1504.94	2444.60	848.755	1292.075
V. Grand total of cost per farm	20195.34	13962.8	22156.84	19424	9414.00	8562.00	31603.64	48892.00	20842.46	22710.2
VI. Cost per hectare	15534.88	6844.51	13033.44	12349.06	15730.77	12029	22057.35	15906.46	16589.11	11782.26
Cost per hectare (including benefit)										
VII. YIELD										
Grain yield rate (kg./ha)	3852.31	4820.00	3891.18	3142.48	2880	2400	5008	4820.00	3907.873	3795.62
Straw yield (qt./ha)	5.03	4.82	6.62	4.72	2.88	2.40	4.82	5.03	4.8375	4.2425
VIII. VALUE OF THE PRODUCE										
Value of Grain per farm	59094.40	56876	78057	55696	33984	28320	59094.40	56876	57557.45	49442
Value of Straw per farm	3707.11	3552.34	4875.26	3478.64	2122.56	1768.80	3707.11	3552.34	3603.01	3088.03
IX. RETURNS										
Net Return/farm excluding benefit	47156.38	54436.79	60709.35	40432.43	26560.41	22119.96	45867.07	93129.63	45073.3	52529.7
Net Return (including benefit)/farm	38275.98	54436.79	50740.55	40432.43	22093.41	22119.96	36574.37	93129.63	36921.08	52529.7
Net return/ha (excluding benefit)	36274.14	26684.7	35711.38	26954.95	41500.64	30722.17	31852.13	29849.24	36334.57	28552.77
Net Return/ha (including benefit)	29443.06	26684.7	29847.38	26954.95	34520.95	30722.17	25398.87	29849.24	29802.57	28552.77

Source: Field Survey

6.4 Productivity and Net Return/ha in *Kharif* Rice

The data on productivity and net returns/ha given in Table 6.4 shows that cost of inputs per hectare used by the beneficiary farmers was comparatively more than the inputs used by non beneficiary farmers under all the interventions. The use of more inputs by the beneficiary farmers helped them to obtain higher grain yield which ranged from 3852.31 kg/ha (rainfed upland) to 4500 kg/ha (irrigated hybrids) which was 2362.75 kg/ha to 3732.50 kg/ha under rainfed upland and irrigated traditional rice respectively. Net returns/ha were also higher with beneficiary farmers and were corresponding to the productivity/ha whereas the net returns received by non beneficiary farmers were low.

6.5 Effectiveness of the Progressive Farmers

All the progressive farmers of BGREI programme were educated and gave good response to this programme. The percentage of secondary/ higher secondary, Graduate/ technical and post graduate farmers was 45, 42.5 and 2.5 per cent respectively while it was 5 per cent each under primary and middle standard. The area of supervision per progressive farmer was 1.24 ha and number of linked farmers per progressive farmer was 1772.5. the status of availability of honoruarium received was through cheque. The progress under status of availability of drum seeder, number of farmers per unit of drum seeder and the availability in documentation of information card was zero.

Table 6.5 : Effectiveness of the progressive farmers in implementation of BGREI programme

Particulars	Responses of the progressive farmers
A. Education (%)	
Illiterate	00
Primary	05
Middle	05
Secondary/Higher Secondary	45
Graduate/Technical	42.5
Post Graduate and above	2.5
B. Area for supervision (ha) per progressive farmer	1.24
C. Number of linked farmers per progressive farmer	17.72
D. Status of availability of honorarium (%)	
Received	100
Nor received	00
E. Amount of honorarium received	21000
F. Mode of payment of honorarium	
Cash	00
Cheque	100
Online	00
G. Status of availability of Drum Seeder (%)	
Received	00
Not received	100
H. Number of farmers per unit of drum seeder	
Kharif	00
Rabi	00
Summer	00
I. Availability in documentation of Information Card	
Available	00
Not available	00

Source: Field Survey

6.6 Econometric Analysis for BGREI Study

The following econometric tools were used to analyse the data of the study (BGREI) conducted in Chhattisgarh State.

1. Mean Difference Test

The particular form is : $z = (\bar{x}_1 - \bar{x}_2) / \sigma \left(\frac{1}{N_1} + \frac{1}{N_2} \right)^{½}$

Where z = Standard Normal Variate
$\bar{x}_1$ = Mean of Series 1 (say of beneficiaries)
$\bar{x}_2$ = Mean of Series 2 (say of non-beneficiaries)
σ = Standard Deviation
N_1 = *Number* of Observations in Series 1 (say of beneficiaries)
N_2 = *Number* of Observations in Series 2 (say of non-beneficiaries)

2. Multiple Regression Analysis (Linear)

Form of Regression Model

$$Y = a + b_1 X_1 + b_2 X_2 + b_3 X_3 + b_4 X_4 + b_5 X_5 + b_6 X_6 + b_7 X_7 + e;$$

Where,
Y = Yield per Hectare (productivity)
a = Constant term
$b_1 – b_6$ = Coefficients
X_1 = Costs of Micro-nutrients (imputed value in case of beneficiary farms)
X_2 = Costs of Seeds (imputed value in case of beneficiary farms)
X_3 = Other Costs (total costs *less* 1 & 2)
X_4 = Dummy for Shallow low land Ecology
X_5 = Dummy for Hybrid Ecology
X_6 = Dummy for Irrigated Traditional Ecology
e = error term

6.6.1 Mean difference test

The mean difference test was used to analyse whether there is any difference between yield obtained by the beneficiary and non-beneficiary farmers. The mean difference test was carried out using‘t-test’ procedure based on pooled data of all categories. The results obtained under this test are as under :

Table 6.6 : Mean difference test for level of yield obtained by beneficiary and non-beneficiary farmers under BGREI study

Particulars	Yield per hectare (Kg/ha)	
	Beneficiary Farmss	Non-beneficiary Farms
N	40	20
Mean	4287.30	3740.00
SD	712.33	479.47
SE of Mean	112.63	107.21
Equal Variance	Assumed	Not Assumed
t-statistic	3.097***	3.520***
Degree of freedom	58	52.76

It is evident from the table, the test clearly brings out that the differences in yield across beneficiary (4287.30 kg/ha) and non-beneficiary (3740.00 kg/ha) farmers is highly significant at 0.01 per cent level of significance. This clearly shows that the observe difference in yield across the beneficiary and non-beneficiary farmers are true, i.e. the mean yield rate obtained by the beneficiary farmer is higher than that of the non beneficiary farmers.

6.6.2 Multiple regression analysis

The multiple regression analysis was carried out to estimate the results of predictor variables. An attempt has been made to identify the factors determining the yield of paddy. 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 micronutrient s used per hectare and other costs (inclusive of fertilizers, plant protection chemicals etc.) per hectare. The dummy variables include ecological dummies for shallow low land, Hybrid and Irrigated traditional ecologies.

Table 6.7 : Results obtained under multiple regression analysis

Model Summary	
R^2	0.747
R^2	0.557
Adjusted R^2	0.507
SE of Estimate	484.88
Dependent Variable : Yield per hectare (Kg/ha)	
Independent Variables	**Coefficients**
Constant	3099.696***
Costs of Seed per hectare (Rs.)	0.947*
Costs of Micro-nutrients per hectare (Rs.)	-0.045
Other Costs per hectare (Rs.)	-0.007
Dummy for Shallow low land Ecology	478.013**
Dummy for Hybrid Ecology	491.198***
Dummy for Irrigated traditional Ecology	462.518***

The value of R^2 (55.70%) showed that the model is validated and variables chosen are very well explained. The results indicate the overall specification of the model.

Seeds used per hectare and all ecological dummies used for shallow low land, hybrid and irrigated traditional ecologies were found statistically significant. Seed per hectare have a positive coefficient suggesting the higher the value of seeds referring to quality of seed used per hectare, higher the productivity. This implies that quality seed demonstrated under the programme has significantly contributed to the increase in productivity of crops. Hence, there is there is an urgent need to increase the seed replacement rate for enhancing the productivity in the State. Among other inputs; micro-nutrients and all other cost of inputs including fertilisers found to be negatively related to productivity, but the estimated relation did not turn out to be statistically significant. Hence, the efforts should be made to enhance the extension activities (trainings, demonstrations etc.) related to balance use of these inputs including fertilizer. All the ecological dummies turned out to be statistically significant accompanying with varying degrees of the coefficients, which confirms that the ecology has a significant impact on the productivity of the crop. The implication has been that this calls for implementing ecology specific technologies for the implementation of productivity of the crop.

CHAPTER – VII

SUMMARY AND CONCLUSIONS

Initially, the program of Bringing Green Revolution to Eastern India (BGREI) was launched in the year 2010-11 in seven (7) States of Eastern India namely; Assam, Bihar, Chhattisgarh, Jharkhand, Eastern Uttar Pradesh, Orissa and West Bengal based on strategic action plans developed by these States. 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 program during 2010-11 were short-term strategies.

The program for 2011-12 include a bouquet of three broad categories of interventions viz. (i) Block demonstrations of rice and wheat; (ii) Asset building activities for water conservation & utilization; such as construction of shallow tube wells, dug well/bore wells and distribution of pump sets, drum seeders, Zero till seed drills and (iii) Site Specific Activities for facilitating the petty works such as construction/renovation of field/irrigation channels/electric power supply for agriculture purposes and institution building for inputs supply.

In 2011-12, in order to sustain the productivity gain in major cereals, focus crops namely; rice & wheat were identified and a total of 269 block demonstration of rice, each of 1000 hectares has been proposed to be implemented in the five agro-ecological sub-regions namely; rainfed uplands, rainfed low lands (shallow low land, medium deep water, deep water) and irrigated rice (traditional, hybrid). The objective of the demonstration is to improve agronomy as a whole i.e. enhancement of seed replacement rate, field sanitation, promote line sowing/planting coupled with promotion of plant nutrient and plant protection technologies. It is proposed to promote hybrid rice technologies in 40 units of 1,000 hectares each. Every farmer in these units would be encouraged to take up at least 0.40 hectare under hybrid rice.

The programme would be completing two years of implementation by the terminal year of Eleventh Five Year Plan (2011-12). It is now high time to conduct the study, to assess the actual performance of the programme during the period of its implementation both at the macro

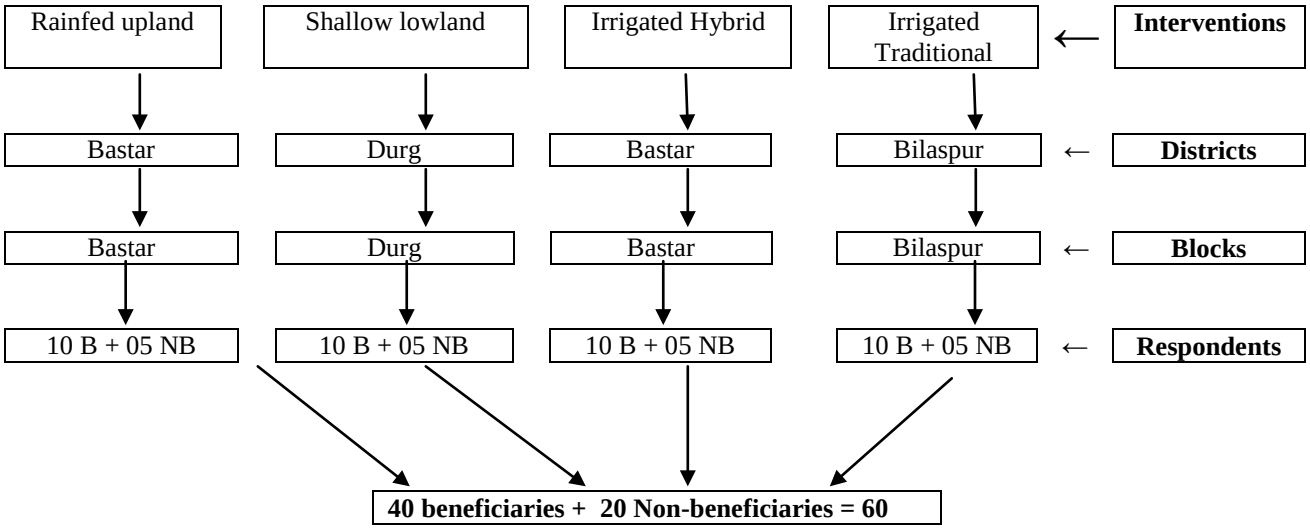
and micro levels. This would help the concerned states to devise the strategic action plans in conformity with the identified constraints at the grass root level. The study was undertaken keeping up the following objectives in mind.

- To study suitability/correctness of technical interventions/prescriptions and approach adopted at state/district and local levels;
- To observe crop response to technology promoted;
- To make critical evaluation of administrative aspects of implementation;
- To identify status and impact of implementation of various interventions;
- To identify gaps, if any existing between recommended, promoted and implemented strategies;
- To explore effectiveness of scientific backstopping in the form of scientists deployed at the district;
- To examine the effectiveness of the provision of "Progressive farmers & SDA staff entrusted with BGREI program and paid honorarium therefore;
- To examine effectiveness of cluster approach adopted during 2011-12;
- To examine effectiveness of institutional support provided by CRRI, NGOs & BGREI cell established in DAC; and
- To examine effectiveness of monitoring mechanism (DLMTs and SLMTs) at district and State level;

The study was mainly based on the secondary data available at the state, district and block levels. However, primary level data was also collected from the sample farmers stake holders in order to capture grass root level impact of the programme.

In order to capture grass root level response from the farmers' about the programme, sample units of demonstration was selected from 3 agro-ecological sub regions namely rainfed uplands, rainfed low lands (shallow low land) and irrigated rice (hybrid, traditional). At the first stage of sampling, Bastar, Durg, Bastar and Bilaspur districts were selected from rainfed upland, shallow low land, irrigated rice (hybrid) and irrigated rice (traditional) respectively, considering the concentration of demonstrations in the district. In the second stage, Bastar, Durg, Bastar and Bilaspur blocks representative of block demonstration were selected following the same procedure. In the third stage, a total of 10 beneficiaries and 5 non-beneficiaries were selected at random from each selected blocks. In sum, a total of 40 beneficiaries and 20 non-beneficiaries spread over 4 selected districts were covered in the study as depicted below :

Methodology for selection of respondents (Stratified Random Sampling)



The primary data collected on access of the participating farmers to technical backstopping indicated that performance index (62.5 to 82.5) as well as farmers reporting (23 to 33) of the extension workers was remarkably higher than the progressive farmers and KVK under all the interventions in the State. It shows that identified extension workers had good interaction with the sample farmersand their role was more effective than progressive farmers and KVK.

The data recorded on the change in cropping pattern exhibited that the area under paddy crop increased considerably during the year 2011-12 as compared to 2010-11 in *Kharif* as well as summer seasons. The extent of change under this crop recorded with beneficiary and non beneficiary farmers was 98.08 & 4.60 hectare respectively in *Kharif* season and 40.49 & 2.70 ha summer season. During *Rabi* season this change was 3.80 ha under Gram crop with beneficiary farmers only. It clearly indicates that beneficiary farmers were fully convinced to grow paddy during *kharif* as well as summer seasons and gram during *rabi.*

The increase in cropping intensity with beneficiary farmers was recorded to be 12 percent whereas it was only 2 per cent with non beneficiary farmers. Thus, the extent of change in cropping intensity was not so appreciable.

The yield gap of paddy in Chhattisgarh is comparatively lower (6.02 q/ha) with the beneficiary farmers than non beneficiary farmers (15.11 q/ha). The actual yield of paddy in the State is 41.48 q/ha and 32.39 q/ha with beneficiary and non beneficiary farmers respectively as against its potential yield of 47.50 q/ha which shows that non beneficiary farmers are not well aware with the cultivation technology of the paddy as per BGREI programme.

Perception status of the farmers recorded under perception profiling of the beneficiary farmers got high to very high rating under various perceptions. It indicates that beneficiary farmers were very sensitive towards BGREI programme.

The physical and financial progress under BGREI programme was evaluated by collecting secondary data on concentration of block demonstrations (D/C) and achievements of the targets on assets building and site specific interventions.

A total number of 35400 block demonstrations were conducted in 36 blocks and 498 mouzas of eight districts of Chhattisgarh under BGREI during *Kharif* 2011-12. Concentration of block demonstrations (D/C) in relation to blocks and mouzas under BGREI during the year was worked out and noted that it varied according to the number of blocks and mouzas in each district. The overall concentration of the block demonstration in relation block and mozas was 983.33 and 71.08 respectively in study area of the mentioned eight districts. Per net cropped area concentration of block demonstrations under BGREI during *kharif* 2011-12 in the study area of eight districts was noted to be 0.015.

The total quantity of 2246.16 MT of seed costing to Rs. 561.54 lakhs was distributed to the beneficiaries in identified eight districts of Chhattisgarh through State Seed Certification Agency whereas there was no contribution from National Seed Certification Agency in this regard (Table 4.6). There was deficiency of micronutrient (Zn). Hence distribution of 555.04 MT of zinc sulphate costing to Rs. 194.26 lakhs was also done. It helped in changing the cropping pattern and cropping intensity in the State.

As indicated in Table 4.7, the distribution of inputs like seed, carbandazim, zink sulphate and Pretllachlore was done under block demonstrations of the high yielding varieties of paddy during *kharif* 2011-12. The total quantity of 1850.06 MT of seed, 700 kgs of carbandazim,

3592.4 MT of zinc sulphate and 8939.5 litres of Pretllachlore amounting to Rs. 462.51, 4.2, 1257.34 and 35.76 lakhs respectively were distributed for 27000 demonstrations in selected eight districts. In Kanker no any input was made available.

There was 100 per cent achievement of the physical targets under different interventions viz – 9000 (23.08 %), 18000 (46.15 %) and 12000 (30.77 %) under upland rice, shallow water rice and irrigated rice respectively. The number of demonstrations conducted in different districts were 5000 each in Mahasamund and dhamtari 6000, 9000, 8000 and 4000 in Durg, Bilaspur, Jagdalpur and Kanker respectively and 1000 each in Narayanpur and Bijapur districts.

As regards district-wise physical achievement, it was 4000 each in Mahasamund, Dhamtari and Bilaspur, 5000 each in Durg and Jagdalpur, 3000 in Kanker and 1000 each in Naraynpur and Bijapur respectively. All the block demonstrations of hybrid rice (1000) were conducted in Jagdalpur district only.

The total quantity of 1850.06 MT of seed, 700 kgs of carbandazim, 3592.4 MT of zinc sulphate and 8939.5 litres of Pretllachlore amounting to Rs. 462.51, 4.2, 1257.34 and 35.76 lakhs respectively were distributed for 27000 demonstrations in selected eight districts. Maximum expenditure of Rs. 1257.34 lakhs was made on Zinc sulphate followed by 462.51 lakhs on seed and 35.75 lakhs on Pretllachlore. Though the number of demonstrations were 3000 in Kanker but no any input was made available in this district.

Seed was the only input which was distributed to majority of the districts (74.4 MT), its per unit distribution comes to 0.00461. Maximum inputs viz- seed, carbandazim and zinc sulphate were distributed to Kobra and Koriya districts only whereas distribution of seed and carbandazim was done to Raipur and seed and zinc sulphate to Jashpur. Bijapur and Kanker did not get any input for the demonstrations.

The total inputs delivered under 27000 block demonstrations of high yielding varieties of rice were 1850 MT of seed amounting to Rs. 462.51 lakhs, 700 kg of carbanadazim (Rs. 4.2 lakhs), 3592.4 MT of zinc sulphate (Rs. 1257.34 lakhs) and 8939.5 lits of Pretllachlore (Rs. 35.75 lakhs) whereas it was 74.4 MT of seed, 263.76 kg of carbandazim (Rs. 1.58 lakh) and 28.6

MT of zinc sulphate amounting to Rs. 10.01 lakhs for hybrid rice. Boron was not distributed to any crop of rice.

All the beneficiary and non beneficiary farmers under various interventions adopted the operations of deep ploughing and land preparation indicating the extent of change by 100 per cent.

The physical achievement under shallow tube wells were 3637 (42.56 %) with the financial achievement of Rs. 400.62 lakhs (32.84 %). The physical as well as financial achievement under pump sets was 75.05 per cent. The physical achievement was the lowest (18.83 %) under dug well/ bore well.

The physical and financial achievements under the components of support to forest dwellers (seed + fertilisers) and construction of minor irrigation tanks were 100 per cent whereas these were 61.33 and 59.59 per cent respectively under construction of check dams. These achievements indicate increase in irrigated area under selected districts of the State.

The physical as well as financial achievements under asset building were satisfactory under borewell/ Tube well which were 3637 and Rs. 400.62 respectively. It was very less under dug well (215) having expenditure of Rs. 64.7 lakhs against sanctions received for 600 dug wells with Rs. 153 lakhs. The progress received under site specific needs was quite satisfactory.

The progress was remarkably low almost under all the interventions during 2011-12 which was nil under some interventions viz; tractor higher charges for line sowing, distribution of seed through minikits of pulse and oilseeds and subsidy to farmers for well and pumps as per shakambhari yojana norms. The overall financial achievement during the year 2010-11 was Rs. 6126.28 lakhs and Rs. 588.72 lakhs in 2011-12 against sanction of Rs. 6714.69 lakhs for each year.

The maximum number of beneficiary farmers (70%) had medium size of holding followed by large size holding (20%) whereas marginal farmers were 2.5 per cent only. The numbers of non beneficiary farmers having small size of land holding were 40 per cent followed by 25 per cent each under marginal and medium holding.

The data recorded on level of education of the sample farmers indicate that 50 per cent of the beneficiary farmers received education up to higher secondary and 17.5, 15.0 & 12.5 per cent up to middle, primary and graduate level. Among non beneficiary farmers 30 per cent of the farmers were having primary education, 20 per cent each were middle and higher secondary, 5 per cent graduate whereas 25 per cent farmers were illiterate.

The majority (90%) of the beneficiary farmers were doing self employed farming whereas 10 per cent were engaged as agricultural labour. The occupation of the 65 per cent non beneficiary farmers was agricultural labour and 35 per cent had self employed farming. Thus the beneficiary sample farmers had the advantage of having their self employment.

CHAPTER VIII

RECOMMENDATIONS AND POLICY SUGGESTIONS

Beginning at the advent of introduction of the high yielding varieties and new hybrids of rice and other crops, the food production in India has increased manifold. But the yield gap in these crops is still wide as compared to their yield potential in Eastern India. However, the changing of pattern of growth as well as the declining of production in recent years has sent caution signal against the complacency in future food security.

Rice is the most important and main crop of Chhattisgarh State which is being growing during kharif as well as in summer seasons. It is a choice crop of the millions of poor and small farmers not only for income but also for household food security.

The access of the participating farmers to technical backstopping indicated that performance index as well as farmers reporting of the identified extension workers was remarkably higher than progressive farmers and KVK. Therefore, extension workers should be encouraged to achieve still more progress.

The area under paddy crop increased during the year 2011-12 shows the change in cropping pattern but the yield gap still exists, it should be reduced by supplying more inputs responsible for increasing crop yields. At the same time good market should be made available to the farmers for getting higher prices of their produce (more than MSP), proper guidance should be provided to them for this purpose.

The achievements of the physical as well as financial targets in conducting block demonstrations were quite satisfactory under BGREI programme in Chhattisgarh. The efforts should be made to achieve 100 per cent in all the interventions.

The seed of old and traditional varieties should be replaced with new high yielding varieties and hybrids, which is very low. Therefore seed replacement and balanced use of fertilizers should be given priority, this will definitely increase the productivity of the crops and bring the desirable change.

The inputs could not be delivered to some districts. Therefore, efforts should be made to arrange all the inputs well in advance and should be made available to the farmers well in time.

The achievements under asset building should be increased to provide prolonged advantage to the beneficiary farmers which will help them in sustained higher productivity.

The emphasis should be given to conduct more number of block demonstrations on the field of marginal and small farmers. This will help in improving the productivity of the crops of this group of farmers and changing their financial/ economic condition.

The efforts should be made to make self help groups and to introduce some more enterprises for generating self employment.