Department for International Development

Baseline Report: Measuring Socio-economic and Bio-physical Outcomes of MGNREGS Works

March 2019

Infrastructure for Climate Resilient Growth in India (ICRG) Programme

Submitted By:

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1. About ICRG

Infrastructure for Climate Resilient Growth (ICRG) program aims at demonstrating adaptation and strengthening the resilience and livelihood security of the rural poor in India, by supporting construction of better quality and more productive infrastructure under the Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) - the world's largest government funded social protection programme. MGNREGS guarantees 100 days of unskilled wage labor on demand from the poor during lean agriculture time. The programme targets some of the poorest and most vulnerable people in the states of Bihar, Odisha and Chhattisgarh especially poor women, improving their resilience to climate induced adverse agriculture seasons and making their livelihoods more secure.

The Technical Assistance being provided at national and state levels focusses on generating evidence so as to:

- **Strengthen the capacity of the administrative and technical staff** in the state governments (Bihar, Odisha and Chhattisgarh) and local implementation agencies to better plan, build and monitor the construction of physical assets under MGNREGS
- **Building a stronger policy focus** on the design and implementation of infrastructure under MGNREGS
- **Strengthening MGNREGS systems and processes** to ensure better delivery, including the development of innovative, especially IT based, tools
- **Improving the evidence base** on how better physical assets can support livelihoods that are more resilient to flood, drought and high temperature

2. Report Objectives and Scope

Several studies point out that MGNREGA works address the underlying causes of vulnerability, such as lack of irrigation, decrease in forest cover, poverty and marginalization, and contribute to enhancing the resilience of communities that depend on such works. Despite this, the MGNREGA monitoring and information system currently does not capture these benefits accruing from the works. It merely measures inputs and outputs such as person days generated, number of assets created, expenditure etc.

With the help of a robust M&E framework and its successful on-ground implementation, ICRG intends to improve outcome level evidence base, and demonstrate how the MGNREGA programme improves socio-economic well-being of people, and simultaneously improves bio-physical parameters of their local area.

The M&E Framework developed under the ICRG program in mid-2017 was executed last year for climate resilient works (CRWs) till 2017-18. This report, drawn from the baseline data collected, attempts to benchmark the outcomes – socio-economic and bio-physical with the long-term aim that this data will be used for comparison against end-line data that will be collected later in the year.

Based on the robustness of the framework and methodology, the subsequent aim of this M&E exercise is to decide on how such an impact assessment design could be scaled up for successful adoption by Ministry of Rural Development, across the country.

3. Baseline Outcomes

Three surveys were attempted in the 432 CRW sites of 2016-17 & 2017-18. They were:

a. Socio-economic or Farmers' Survey
b. Water level in Wells Survey
c. Plantation Survey

This report presents the findings of the first two surveys. The baseline survey on plantation was not analysed because of limited number of plantation works undertaken last year to serve as a statistically significant sample for benchmarking.

A. Socio-economic Indicators

Socio-economic indicators using a Farmer's survey captured baseline data on economic wellbeing of beneficiary households by using agriculture production and productivity of the crops grown in the catchment area as proxies. The data was based on recall of respondents of occurrences in the previous year

It was completed by a sample of farmers in the catchment area of each CRW site. Survey administration was done in the 3rd quarter of 2018-19. Data entry was undertaken in December-January of 2018-19.

Sample Frame

States	Districts	Blocks	GPs	CRWs	Respondents
BIHAR	7	26	40	114	589 (38%)
CHATTISGARH	8	21	43	114	333 (22%)
ODISHA	5	31	76	123	612 (40%)
Total	20	78	159	351	1,534 (100%)

Table 1 Sample Frame – Geographical Ares, CRW and Respondents

For the socio-economic survey, a total of 78 blocks in 20 districts, were surveyed out of 103 ICRG blocks. 159 GPs were covered in these 78 blocks, the largest share coming from Odisha. Bihar and Odisha made up for about 38% and 40% respondents each, while Chhattisgarh constituted 22% of the total respondents.

A total of 351 sites were covered out of 432 planned sites in 2016-17 & 2017-18, meaning beneficiary farmers in about 80% CRWs were surveyed. Bihar and Chhattisgarh covered 114 out of 143 & 147 planned CRWs respectively, whereas Odisha covered 123 out of 142 planned sites.

Though the 3 states reached out to roughly the same number of sites; the number of respondents surveyed were different. As per the guidelines, 5 to 6 farmers were surveyed from each site in Odisha and Bihar while roughly 3 farmers were surveyed in Chhattisgarh.

Block-wise Sample (Respondents) in States

The number of respondents in the three states varied in each block, owing to the difference in the number of CRWs in each block. Figure 1, 2 & 3 presents the state-wise picture of the spread of respondents in each block.

Bihar

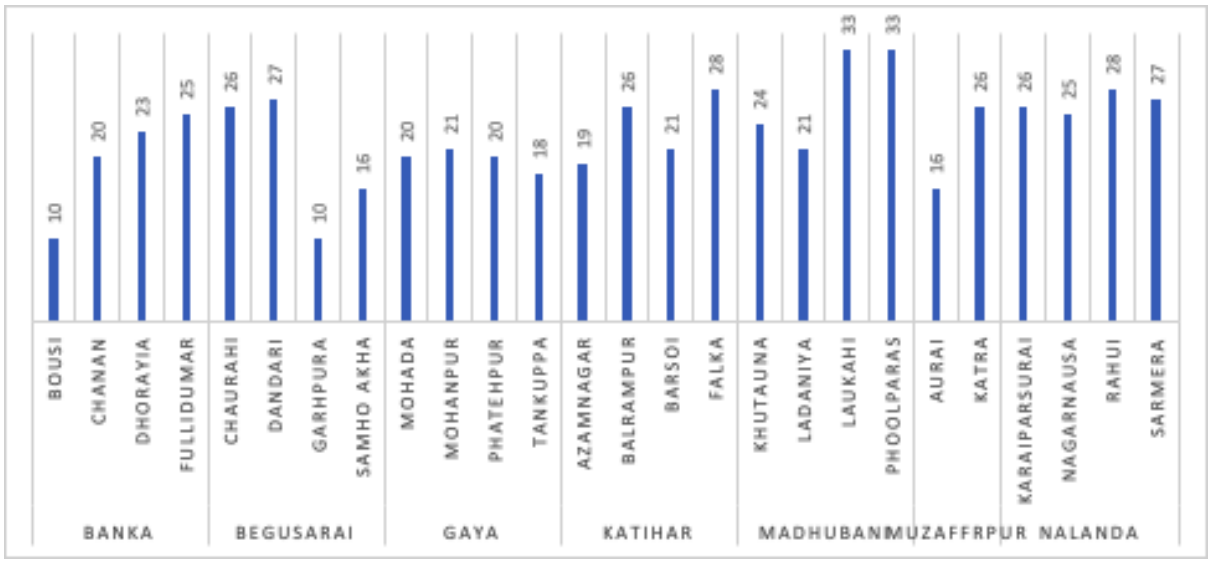

Figure 1 Bihar District & Block-wise respondent Figures

In Bihar, the number of respondents in a block ranged from 10 in Bousi in Banka district to 27 in Laukahi & Ladaniya in Madhubani district.

Chhattisgarh

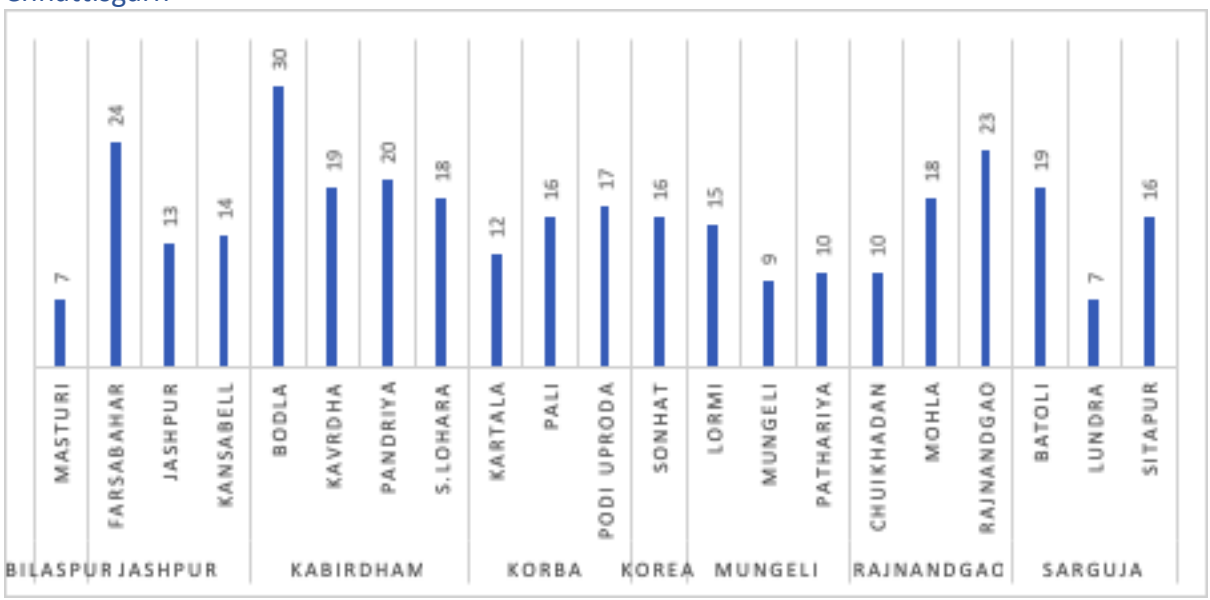

Figure 2 Chhattisgarh District & Block-wise respondent Figures

In Chhattisgarh the number of respondents ranged from 7 in Lundra block in Sarguja district to 30 in Bodla block in Kabirdham district.

Odisha

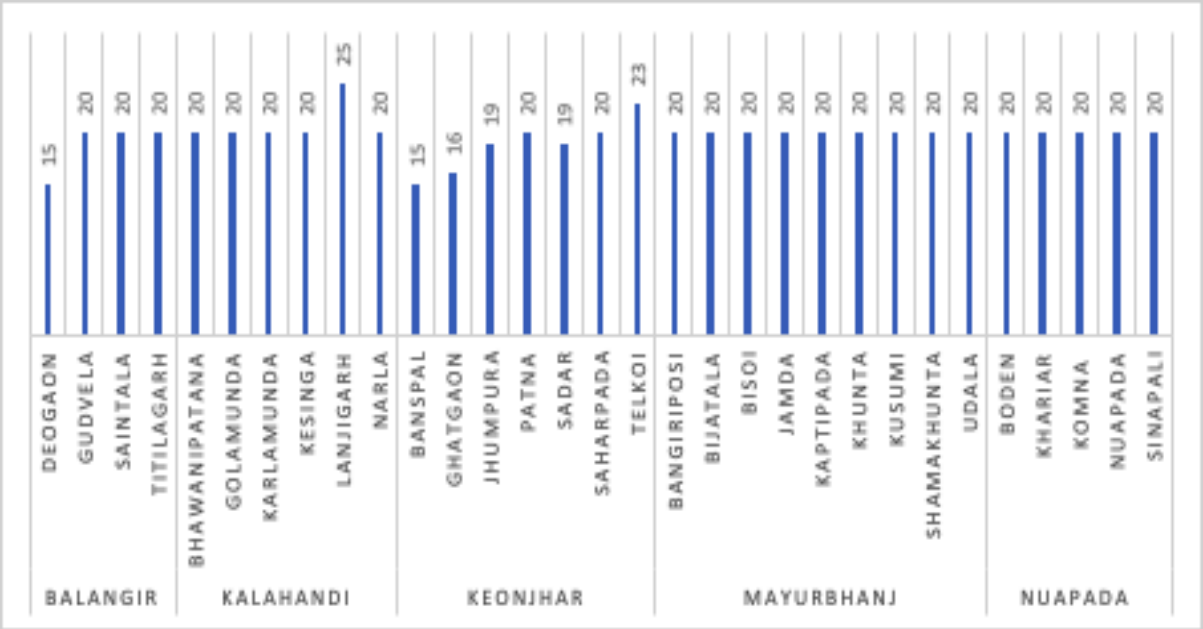

Figure 3 Odisha District & Block-wise respondent Figures

The variability in terms of number of respondents per block was much lower in Odisha, ranging from 15 in Deogaon block in Balangir district to 25 in Lanjigarh block in Kalahandi district.

Age, Gender & Caste

Majority of respondents of the sample survey were males, with a mean age of around 48 years.

Age

Row Labels	Mean Age of Respondents
Bihar	48.5
Chhattisgarh	48.3
Odisha	46.6
Grand Total	**47.7**

Table 2 State-wise Mean Age of Respondents

Gender

Row Labels	Female	Male	Total Respondents
Bihar	6.62%	93.38%	589 (100%)
Chhattisgarh	6.61%	93.39%	333 (100%)
Odisha	9.15%	90.85%	612 (100%)
Grand Total	**7.63%**	**92.37%**	**1534 (100%)**

Table 3 State-wise Gender Split of Respondents

Social Category

Row Labels	General	OBC	PVTG	SC	ST
Bihar (576)	19.27%	55.90%	0.00%	22.22%	2.60%
Chhattisgarh (332)	1.81%	30.12%	0.00%	12.35%	55.72%
Odisha (612)	1.47%	18.30%	11.93%	10.29%	58.01%
Grand Total (N=1520)	**8.29%**	**35.13%**	**4.80%**	**15.26%**	**36.51%**

Table 4 State-wise Social Category of Surveyed

In Bihar, close to 20% of the respondents were from 'General' caste, while 56% were from OBC. SCs constituted 22% of the respondents. The share of STs were less than 3%. In Chhattisgarh, STs had the biggest share at 56% while OBCs made up 30% of respondents. Only 12% of the respondents were SCs in that state. Odisha respondents were mainly STs constituting 58% share followed by OBCs at 18%. PVTG and SCs were about one-tenth of the total respondents. Overall, across all three states OBCs and STs were one-third each of the total respondents. General, PVTG and SC combined made up for the remaining one-third share.

Farmer category by landholding

The table below categorizes farmers on the basis of their land ownership in the catchment area of the CRWs in ICRG blocks. The Government of India's definition of 'marginal', 'small' and 'big' farmer has been used for the classification. They are as under:

- Marginal Farmers: Cultivators who hold less than 1 hectare i.e. 2.47 acre of land
- Small Farmers: Cultivators who hold between 1 and 2 hectares i.e. between 2.47 & 4.94 acre of land
- Big Farmers: Those who hold more than 2 hectares i.e. more than 4.94 acres of land in the catchment area of the CRW

Row Labels	**Big**	**Marginal**	**Small**
Bihar	14 (2.38%)	514 (87.27%)	61 (10.36%)
Chhattisgarh	31 (9.31%)	191 (57.36%)	111 (33.33%)
Odisha	118 (19.28%)	325 (53.10%)	169 (27.61%)
Grand Total	**163 (10.63%)**	**1030 (67.14%)**	**341 (22.23%)**

Table 5 Farmer Classification Based on Size of Landholding

Approximately 90% of respondents surveyed in the three states were marginal and small farmers. Only 10% were big farmers with landholdings more than 5 acres in the catchment area.

Landholding by state

Average landholding size

	Average landholding size (acre)		
States	**Big**	**Marginal**	**Small**
Bihar	7.80	1.02	3.74
Chhattisgarh	7.74	1.66	3.76
Odisha	9.21	1.32	4.50
Grand Total	**8.81**	**1.23**	**4.12**

Table 6 Average Landholding Size by State

The average land holding size of big farmers was 8.81 acres; of small farmers was 4.12 acres whereas 1.23 acre of marginal farmers. In Bihar, on average marginal farmers had just 1acre land. They comprised the largest group of respondents from the three states combines – roughly constituting one-third of those interviewed.

Crops Grown

The respondents were asked about the crops that they grew in Kharif, Rabi and Zaid season of 2017-18 with the responses based on respondents recall of the occurrence in the previous year. The tables and analysis below present the baseline outcomes of the three seasons.

a. Kharif Season

The respondents were asked whether they grew crops in the previous Kharif season (2017-18). Close to 97.5% farmers said they sowed one or more crops. Remainder did not grow any crop in Kharif season last year.

If a crop was grown?

State	No	Yes
Bihar	2.72%	97.28%
Chhattisgarh	2.70%	97.30%
Odisha	2.12%	97.88%
Grand Total	**2.48%**	**97.52%**

Table 7 Percentage of Farmers Growing Kharif Crops

Number of Crops Grown

BIHAR	
Blocks	**No. of crops grown**
Aurai	1.00
Azamnagar	1.00
Balrampur	1.00
Barsoi	1.00
Bousi	1.00
Chanan	1.00
Chaurahi	1.04
Dandari	1.15
Dhorayia	1.00
Falka	1.00
Fullidumar	1.00
Garhpura	1.00
Karaiparsurai	1.00
Katra	1.21
Khutauna	1.00
Ladaniya	1.00
Laukahi	1.09
Mohada	1.00
Mohanpur	1.16
Nagarnausa	1.00
Phatehpur	1.21
Phoolparas	1.03

CHHATTISGARH	
Blocks	**No. of crops grown**
Batoli	2.11
Bodla	2.33
Chuikhadan	1.00
Farsabahar	1.33
Jashpur	1.10
Kansabell	1.00
Kartala	1.00
Kavrdha	1.32
Lormi	1.20
Lundra	1.86
Masturi	1.14
Mohla	1.11
Mungeli	1.11
Pali	1.00
Pandriya	2.60
Pathariya	1.10
Podi Uproda	3.24
Rajnandgao	1.00
S.Lohara	1.39
Sitapur	2.00
Sonhat	1.00
Overall state	**1.56**

ODISHA	
Blocks	**No. of crops grown**
Bangiriposi	1.10
Banspal	3.73
Bhawanipatana	1.00
Bijatala	1.00
Bisoi	1.00
Boden	1.15
Deogaon	1.80
Ghatgaon	1.33
Golamunda	1.10
Gudvela	1.30
Jamda	1.00
Jhumpura	1.00
Kaptipada	1.10
Karlamunda	1.36
Kesinga	1.26
Khariar	1.00
Khunta	1.15
Komna	1.50
Kusumi	1.00
Lanjigarh	1.09
Narla	1.00
Nuapada	1.00
Patna	2.11
Sadar	2.00
Saharpada	1.15
Saintala	1.25

Rahui	1.00
Samho Akha	1.44
Sarmera	1.00
Tankuppa	1.00
Overall state	**1.05**

Shamakhunta	1.60
Sinapali	1.30
Telkoi	1.04
Titilagarh	1.15
Udala	1.00
Overall state	**1.28**

Table 8 State & Block-wise Number of Crops Grown

Number of crops grown was calculated by considering only those cultivators who grew at least one Kharif crop. Overall, in the Kharif season of 2017-18 the number of crops grown was highest in Chhattisgarh at 1.56 crops in the season. Pondi Uproda had the highest number of crops grown at 3.24 in that state. In Odisha in Banspal the number of crops grown was the highest at 3.73, while in Bihar the highest was in Samho Akha block at 1.44. In most of the blocks, the number of crops grown was one meaning the cultivators typically engaged in monocropping in the season

Crop Productivity

The survey captured area sown for each crop and production obtained by each respondent. Productivity was calculated at block level – total crop production in the block divided by total areas cultivated in that block.

MILLET: JWAR, BAJRA, MAIZE

Bihar, Chhattisgarh & Odisha

State & Blocks	**Total Area (acre)**	**Total Production (quintal)**	**Productivity (quintal per acre)**
Bihar			
Chaurahi	2.6	19.77	7.60
Dandari	12.64	184.8	14.62
Garhpura	4.17	83	19.90
Samho Akha	7.45	104.3	14.00
Bihar Total	26.86	391.87	14.59
Chhattisgarh			
Batoli	3.251	16	4.92
Bodla	8	16.5	2.06
Lundra	1	8	8.00
Mungeli	2	24	12.00
Pandriya	12	28	2.33
Podi Uproda	1.55	3.76	2.43
Sitapur	0.507	1.53	3.02
Chhattisgarh Total	28.31	97.79	3.45
Odisha			
Banspal	5.8	8.1	1.40
Deogaon	7.3	4.77	0.65
Jhumpura	71	553	7.79
Saintala	3	0.25	0.08
Odisha Total	87.1	566.12	6.50
Grand Total	**142.27**	**1055.78**	**7.42**

Table 9 Bihar, Chhattisgarh & Odisha – Millet Area, Production and Productivity in Kharif Season

Very little millet was grown across three states. Out of 78 blocks covered in the survey, millets such as jawar, bajra, maize, kodo was grown only in 15 blocks. In Chhattisgarh, productivity was the lowest. Average productivity of millet in Bihar was 14.5 quintals per acres, the highest productivity being in Garahpura block. In Odisha, the total area having millet crops was higher than that of Bihar, but the overall productivity was less compared to that state.

RICE

Rice was widely gown by beneficiaries of CRWs in the ICRG blocks. The table below presents block-wise data on total area cultivated (in the block), total production (in the block) and block level productivity of rice.

Bihar

State & Blocks	**Total Area (acre)**	**Total Production (quintal)**	**Productivity (quintal per acre)**
Bihar			
Aurai	26.10	258.90	9.92
Azamnagar	35.20	323.00	9.18
Balrampur	63.13	675.00	10.69
Barsoi	26.50	285.00	10.75
Bousi	7.00	43.00	6.14
Chanan	25.50	428.00	16.78
Chaurahi	0.99	15.79	15.95
Dandari	4.50	74.00	16.44
Dhorayia	53.50	654.00	12.22
Falka	43.60	704.00	16.15
Fullidumar	46.20	622.00	13.46
Karaiparsurai	33.25	406.40	12.22
Katra	8.14	163.00	20.02
Khutauna	23.50	235.00	10.00
Ladaniya	30.19	182.00	6.03
Laukahi	52.38	674.00	12.87
Mohada	26.65	291.00	10.92
Mohanpur	9.32	187.50	20.12
Nagarnausa	14.38	200.50	13.95
Phatehpur	19.14	186.00	9.72
Phoolparas	78.69	502.00	6.38
Rahui	34.98	388.50	11.10
Samho Akha	5.75	120.50	20.96
Sarmera	21.22	221.00	10.42
Tankuppa	26.44	239.00	9.04
Bihar Total	716.24	8079.09	11.28

Table 10 Bihar – Rice Area, Production and Productivity in Kharif Season

In Bihar, rice was grown in 25 out of 26 blocks. The average productivity for the state being 11.28 quintals per acre. The productivity generally ranged between 9 and 16 quintals per acres. It was lowest however for a couple of blocks – Bousi and Phoolparas where it was less than 6.5 quintals per acre.

Chhattisgarh

State & Blocks	**Total Area (acre)**	**Total Production (quintal)**	**Productivity (quintal per acre)**
Chhattisgarh			
Batoli	40.00	249.00	6.23
Bodla	50.50	310.50	6.15
Chuikhadan	27.91	167.00	5.98
Farsabahar	37.72	322.70	8.56
Jashpur	8.00	22.00	2.75
Kansabell	36.00	410.00	11.39
Kartala	23.30	228.00	9.79
Kavrdha	33.50	241.00	7.19
Lormi	29.35	357.00	12.16
Lundra	17.00	100.00	5.88
Masturi	28.00	267.00	9.54
Mohla	25.24	241.00	9.55
Mungeli	24.90	290.00	11.65
Pali	24.93	166.00	6.66
Pandriya	54.00	318.00	5.89
Pathariya	28.60	290.00	10.14
Podi Uproda	43.20	306.55	7.10
Rajnandgao	55.58	334.00	6.01
S.Lohara	40.54	192.50	4.75
Sitapur	33.88	376.00	11.10
Sonhat	23.00	140.00	6.09
Chhattisgarh Total	685.15	5328.25	7.78

Table 11 Chhattisgarh – Rice Area, Production and Productivity in Kharif Season

In Chhattisgarh, the average productivity of rice was 7.78 quintals per acre. In Jashpur productivity was the lowest at 2.75 quintals per acres. It was highest in Lormi block at 12.16 quintals per acre. In 9 of the blocks, the productivity was higher than the state average.

Odisha

State & Blocks	**Total Area (acre)**	**Total Production (quintal)**	**Productivity (quintal per acre)**
Odisha			
Bangiriposi	46.00	323.50	7.03
Banspal	19.80	85.40	4.31
Bhawanipatana	39.40	121.00	3.07
Bijatala	26.50	630.00	23.77
Bisoi	45.15	250.00	5.54
Boden	42.00	201.60	4.80
Deogaon	32.86	130.50	3.97
Ghatgaon	26.00	153.00	5.88
Golamunda	34.50	288.00	8.35
Gudvela	45.67	188.00	4.12
Jamda	35.20	807.00	22.93
Kaptipada	36.11	225.00	6.23
Karlamunda	34.00	90.00	2.65
Kesinga	16.50	86.00	5.21
Khariar	50.23	93.00	1.85
Khunta	61.15	431.00	7.05
Komna	47.78	152.50	3.19
Kusumi	53.79	1210.00	22.49
Lanjigarh	35.00	195.00	5.57
Narla	33.50	297.00	8.87
Nuapada	41.50	41.00	0.99
Patna	21.70	155.18	7.15
Sadar	12.50	125.00	10.00
Saharpada	22.75	170.00	7.47
Saintala	100.00	372.00	3.72
Shamakhunta	61.00	490.00	8.03
Sinapali	46.70	42.00	0.90
Telkoi	60.54	210.00	3.47
Titilagarh	327.00	244.00	0.75
Udala	47.50	395.00	8.32
Odisha Total	1502.33	8201.68	5.46

Table 12 Odisha – Rice Area, Production and Productivity in Kharif Season

In Odisha, productivity was highest at 22.5 quintals per acre of rice in Kusumi. The state average however, was lower than that of Bihar and Chhattisgarh. Productivity in Nuapada was the lowest at just 1 quintal per acre.

ARHAR

Arhar – a legume, was grown in one-third (25 out of 78) ICRG blocks. The table below presents block-wise data on total area cultivated (in the block), total production (in the block) and block level productivity of arhar.

Bihar, Chhattisgarh & Odisha

State & Blocks	**Total Area (acre)**	**Total Production (quintal)**	**Productivity (quintal per acre)**
Bihar			
Katra	3.0	9.00	30.00
Mohanpur	0.31	3.30	10.78
Phatehpur	1.01	6.82	6.75
Bihar Total	4.32	19.12	4.43
Chattisgarh			
Batoli	1.50	3.06	2.04
Bodla	12.50	39.00	3.12
Farsabahar	2.80	7.00	2.50
Jashpur	1.00	0.04	0.04
Kavrdha	3.65	8.50	2.33
Masturi	0.20	0.45	2.25
Mohla	3.00	1.05	0.35
Mungeli	1.00	2.00	2.00
Pandriya	15.00	36.00	2.40
Podi Uproda	8.00	13.55	1.69
Rajnandgao	6.00	1.00	0.17
Sitapur	1.53	2.51	1.64
Chhattisgarh Total	56.18	114.16	2.03
Odisha			
Banspal	1.40	3.40	2.43
Boden	1.30	1.00	0.77
Golamunda	0.50	1.00	2.00
Gudvela	1.00	0.51	0.51
Karlamunda	1.00	0.02	0.02
Kesinga	3.05	8.09	2.65
Komna	2.50	1.90	0.76
Lanjigarh	1.00	1.00	1.00
Sinapali	0.50	1.00	2.00
Telkoi	1.00	0.05	0.05
Odisha Total	14.00	17.97	1.28
Grand Total	74.50	151.24	2.03

Table 13 Bihar, Chhattisgarh & Odisha – Arhar Area, Production and Productivity in Kharif Season

Arhar was more widely grown in Chhattisgarh and Odisha as compared to Bihar. However, amongst the three states, Arhar productivity was highest in Bihar at 4.43 quintals per acre. In Chhattisgarh it was 2.03 while it was quite low in Odisha at 1.28 quintals per acre when compared to the other two states.

VEGETABLES

Bihar, Chhattisgarh & Odisha

State & Blocks	**Total Area (acre)**	**Total Production (quintal)**	**Productivity (quintal per acre)**
Bihar	Not grown		
Chhattisgarh			
Batoli	0.10	1	10.00
Farsabahar	0.60	2	3.33
Jashpur	0.40	5	12.50
Lundra	1.50	6	4.00
Podi Uproda	1.90	22.85	12.03
Sitapur	0.20	2	10.00
Sonhat	0.50	0.01	0.02
Chhattisgarh Total	5.20	38.86	7.47
Odisha			
Banspal	2.50	4.1	1.64
Deogaon	1.10	9	8.18
Karlamunda	1.00	0.05	0.05
Khunta	1.05	3.7	3.52
Komna	1.00	2.5	2.50
Patna	2.51	2.28	0.91
Saharpada	0.75	18	24.00
Shamakhunta	1.00	9	9.00
Telkoi	2.00	3	1.50
Odisha Total	17.91	51.63	2.88
Grand Total	23.11	90.49	3.92

Table 14 Bihar, Chhattisgarh & Odisha – Vegetables Area, Production and Productivity in Kharif Season

In Bihar, no vegetables were grown in the ICRG blocks. In Chhattisgarh and Odisha productivity varied depending upon the vegetables grown.

NUTS

Bihar, Chhattisgarh & Odisha

State & Blocks	**Total Area (acre)**	**Total Production (quintal)**	**Productivity (quintal per acre)**
Bihar			
Bousi	1.00	4.00	4.00
Bihar Total	1.00	4.00	4.00
Chhattisgarh			
Batoli	1.40	4.50	3.22
Bodla	2.00	4.00	2.00
Farsabahar	0.80	3.00	3.75
Jashpur	1.10	3.00	2.73
Lundra	0.50	2.00	4.00
Podi Uproda	0.12	1.17	9.75
Sitapur	2.30	6.00	2.61
Chhattisgarh Total	8.22	23.67	2.88
Odisha			
Gudvela	0.50	0.45	0.90
Karlamunda	9.50	2.20	0.23
Komna	2.25	1.90	0.84
Patna	3.20	2.78	0.87
Shamakhunta	3.00	4.00	1.33
Odisha Total	18.45	11.33	0.61
Grand Total	27.67	39.00	1.41

Table 15 Bihar, Chhattisgarh & Odisha – Nuts Area, Production and Productivity in Kharif Season

Nuts mainly ground and beetle nuts were grown in Chhattisgarh and Odisha. They were not found to be grown in significant quantities in Bihar.

b. Rabi Season

In Rabi season in the ICRG blocks of the 3 states, farmers grew crops like wheat, barley, gram, mustard and maize.

If a crop was grown?

Row Labels	No	Yes
Bihar	10.36%	89.64%
Chhattisgarh	60.36%	39.64%
Odisha	85.29%	14.71%
Grand Total	**51.11%**	**48.89%**

Table 16 Percentage of Farmers Growing Rabi Crops

Overall, however only half of cultivators grew any crop. Please refer to Table 15 for state-wise variation. At the state level, while cultivators in Bihar invariably grew a second crop last year, cultivators in Odisha mostly did not. In Chhattisgarh, roughly only 40% grew a second crop in that year.

Inter-state variations were also seen. In Falka block 40% of farmers did not do a Rabi season sowing, whereas 15 out of 26 blocks in Bihar did Rabi season sowing. In Chhattisgarh, 2 blocks did not attempt Rabi season cultivation at all. Please refer to Annexure 2 for more details.

Number of Crops Grown

Number of crops grown has been calculated for those cultivators who at least grow one Rabi crop. In the three states combined, the average number of crops grown was 1.2. And there was almost no variation at the state level in the case of number of crops grown.

State	No. of crops grown
Bihar	1.19
Chhattisgarh	1.21
Odisha	1.23
Grand Total	**1.20**

Table 17 Number of Crops Grown State-wise

BIHAR	
Blocks	**No. of crops grown**
Aurai	1.50
Azamnagar	1.00
Balrampur	1.00
Barsoi	1.00
Bousi	1.00
Chanan	1.00
Chaurahi	1.00
Dandari	1.07
Dhorayia	1.09
Falka	1.00
Fullidumar	1.00
Garhpura	1.20
Karaiparsurai	1.00
Katra	3.23
Khutauna	1.00
Ladaniya	1.00
Laukahi	1.03
Mohada	1.16
Mohanpur	1.50
Nagarnausa	1.08
Phatehpur	1.18
Phoolparas	1.37
Rahui	1.00
Samho Akha	1.13
Sarmera	1.00
Tankuppa	1.00
State Average	**1.19**

CHHATTISGARH	
Blocks	**No. of crops grown**
Batoli	1.60
Bodla	1.00
Chuikhadan	1.00
Farsabahar	1.00
Jashpur	1.00
Kansabell	1.00
Kartala	1.00
Kavrdha	1.11
Lormi	1.50
Lundra	1.25
Mohla	1.25
Mungeli	1.22
Pali	2.00
Pathariya	1.00
Podi Uproda	1.00
Rajnandgao	1.78
S.Lohara	1.00
Sitapur	1.25
Sonhat	1.00
State Average	**1.21**

ODISHA	
Blocks	**No. of crops grown**
Bangiriposi	1.00
Banspal	1.00
Bisoi	1.00
Deogaon	1.00
Ghatgaon	1.20
Jhumpura	1.00
Karlamunda	1.00
Kesinga	1.00
Khunta	1.00
Lanjigarh	1.00
Patna	1.00
Sadar	2.00
Saharpada	1.00
Telkoi	2.00
State Average	**1.23**

Table 18 State and Block-wise Number of Crops Grown

Number of crops grown in Bihar was highest in Katra, where farmers grew more than 3 crops in the season. It was around 1.5 in Aurai and Mohanpur. In Chhattisgarh, Pali and Rajnandgaon blocks grew a high number of crops. In Odisha, it was the highest in Sadar and Telkoi blocks.

Crop Productivity

The table below lists blocks where the said Rabi crop was grown, its total cultivated area in acres in the block, total production in quintals in that block and crop productivity measured in terms of quintals per acre.

WHEAT

Bihar

State & Blocks	**Total Area (acre)**	**Total Production (quintal)**	**Productivity (quintal per acre)**
Aurai	29.60	262.40	8.86
Azamnagar	20.00	125.00	6.25
Balrampur	29.50	256.00	8.68
Barsoi	19.00	161.00	8.47
Bousi	0.50	2.00	4.00
Chaurahi	2.52	36.27	14.40
Dandari	15.14	245.00	16.18
Dhorayia	36.50	161.00	4.41
Falka	15.00	157.00	10.47
Fullidumar	23.70	148.00	6.24
Garhpura	3.70	64.00	17.30
Karaiparsurai	33.25	422.40	12.70
Katra	31.10	400.00	12.86
Khutauna	23.50	141.00	6.00
Ladaniya	16.85	117.00	6.94
Laukahi	49.50	358.00	7.23
Mohada	19.65	172.00	8.75
Mohanpur	4.32	38.70	8.96
Nagarnausa	14.37	168.00	11.69
Phatehpur	13.74	119.00	8.66
Phoolparas	49.26	198.00	4.02
Rahui	34.98	388.50	11.10
Samho Akha	10.12	200.40	19.80
Sarmera	21.22	199.50	9.40
Tankuppa	24.60	120.00	4.88
Grand Total	541.62	4660.17	8.60

Table 19 Bihar – Wheat Area, Production and Productivity in Rabi Season

Productivity recorded a wide range in Bihar ranging from a low of 4 quintals of wheat production per acre in Bousi to 19.80 quintals/acre in Samho Akha. The state average of Bihar was 8.60 quintals/acre. It is also a crop that is grown in all the ICRG blocks of the state.

Chhattisgarh

State & Blocks	**Total Area (acre)**	**Total Production (quintal)**	**Productivity (quintal per acre)**
Batoli	1.50	7.50	5.00
Kavrdha	4.01	19.20	4.79
Lormi	11.55	50.50	4.37
Lundra	3.00	19.00	6.33
Mungeli	19.20	13.10	0.68
Pathariya	6.00	12.00	2.00
Rajnandgao	11.50	38.00	3.30
Sonhat	8.00	21.00	2.63
Grand Total	64.78	186.38	2.88

Table 20 Chhattisgarh – Wheat Area Production and Productivity in Rabi Season

In Chhattisgarh, the state average was much lower compared to Bihar. Wheat is also less widely grown – in only 8 out of 21 blocks of the state. In Chhattisgarh's Mungeli block, wheat productivity was particularly low at 0.68 quintals per acre only.

Odisha

State & Blocks	**Total Area (acre)**	**Total Production (quintal)**	**Productivity (quintal per acre)**
Jhumpura	6.50	62.50	9.62
Grand Total	6.50	62.50	9.62

Table 21 Odisha – Wheat Area, Production and Productivity in Rabi Season

In Odisha had only 1 ICRG block cultivated wheat. The productivity was however even better than the average for Bihar.

BARLEY

Bihar, Chhattisgarh & Odisha

State & Blocks	**Total Area (acre)**	**Total Production (quintal)**	**Productivity (quintal per acre)**
Odisha	Not grown		
Chhattisgarh	Not grown		
Bihar			
Mohanpur	0.372	1.8	4.84
Grand Total	0.372	1.8	4.84

Table 22 Bihar, Chhattisgarh & Odisha – Barley Area, Production and Productivity in Rabi Season

Barley was grown only in Mohanpur block in Bihar. Respondents in ICRG blocks of Odisha and Chhattisgarh did not grow barely at all.

GRAM

Bihar, Chhattisgarh & Odisha

State & Blocks	**Total Area (acre)**	**Total Production (quintal)**	**Productivity (quintal per acre)**
Bihar			
Dhorayia	13.5	33	2.44
Fullidumar	18.5	42	2.27
Mohada	1.75	11.5	6.57
Mohanpur	0.15	1	6.67

Phatehpur	0.3	2.5	8.33
Bihar Total	34.2	90	2.63
Chhattisgarh			
Farsabahar	1	5	5.00
Jashpur	2	0.3	0.15
Kansabell	1.03	20.02	19.44
Mungeli	4	14	3.50
Pathariya	2.5	10	4.00
Chhattisgarh Total	10.53	49.32	4.68
Odisha			
Karlamunda	2	1.5	0.75
Khunta	1.3	2.2	1.69
Lanjigarh	2	2.5	1.25
Patna	0.005	0.07	14.00
Odisha Total	5.305	6.27	1.18
Grand Total	50.035	145.59	2.91

Table 23 Bihar, Chhattisgarh & Odisha – Gram Area, Production and Productivity in Rabi Season

Gram was grown in all the 3 states – productivity being highest in Chhattisgarh. The productivity of gram varied widely in Chhattisgarh and Odisha.

MUSTARD

Bihar, Chhattisgarh & Odisha

State & Blocks	**Total Area (acre)**	**Total Production (quintal)**	**Productivity (quintal per acre)**
Bihar			
Aurai	1.32	4.80	3.64
Dandari	2.00	15.00	7.50
Dhorayia	1.50	3.00	2.00
Garhpura	0.06	1.00	16.67
Katra	24.20	131.00	5.41
Nagarnausa	10.00	2.00	0.20
Phoolparas	7.05	22.00	3.12
Samho Akha	1.00	8.00	8.00
Bihar Total	47.13	186.80	3.96
Chhattisgarh			
Bodla	1.50	0.53	0.35
Lundra	0.50	3.00	6.00
Chhattisgarh Total	2.00	3.53	1.77
Odisha			
Banspal	7.00	70.00	10.00
Khunta	1.00	2.00	2.00
Sadar	12.10	121.00	10.00
Odisha Total	20.10	193.00	9.60
Grand Total	69.23	383.33	5.54

Table 24 Bihar, Chhattisgarh & Odisha – Mustard Area, Production and Productivity in Rabi Season

Mustard – as other Rabi crops showed a very wide range of productivity at the block level. The average for the three states was 5.54 quintals per acre. In Garahpura block in Bihar, the productivity was highest amongst all the block across the three states. It was the lowest in Nagarnausa in the same

state. Odisha's productivity was high in Banspal and Sadar blocks. In Chhattisgarh, mustard is grown only in 2 blocks.

MAIZE

Bihar, Chhattisgarh & Odisha

State & Blocks	**Total Area (acre)**	**Total Production (quintal)**	**Productivity (quintal per acre)**
Bihar			
Bousi	1.00	6.00	6.00
Chaurahi	0.24	2.88	12.00
Garhpura	0.50	2.00	4.00
Mohanpur	0.12	1.00	8.33
Nagarnausa	10.00	8.00	0.80
Samho Akha	1.00	15.00	15.00
Bihar Total	12.86	34.88	2.71
Chhattisgarh			
Kansabell	1.50	3.00	2.00
Mohla	1.00	15.00	15.00
Podi Uproda	0.30	0.02	0.05
Chhattisgarh Total	2.80	18.02	6.43
Odisha			
Bisoi	0.30	0.50	1.67
Odisha Total	0.30	0.50	1.65
Grand Total	15.96	53.40	3.34

Table 25 Bihar, Chhattisgarh & Odisha – Maize Area, Production and Productivity in Rabi Season

Maize as a Rabi crop was more widely grown in Bihar as compared to the other two states. Its productivity was highest in Samho Akha block at 15 quintals per acre. In Odisha it is only grown in one block while in Chhattisgarh, it is grown in three blocks.

VEGETABLES

Bihar, Chhattisgarh & Odisha

State & Blocks	**Total Area (acre)**	**Total Production (quintal)**	**Productivity (quintal per acre)**
Bihar			
Chanan	20.30	128.00	6.31
Katra	2.05	3.00	1.46
Mohanpur	0.09	1.00	10.64
Bihar Total	22.44	141.00	6.28
Chhattisgarh			
Batoli	1.13	12.00	10.62
Farsabahar	0.60	3.00	5.00
Lormi	0.40	5.50	13.75
Lundra	2.00	30.00	15.00
Mohla	0.10	1.50	15.00
Pali	0.50	4.00	8.00
Podi Uproda	0.55	3.90	7.09
Sitapur	0.70	4.00	5.71
Chhattisgarh Total	5.98	63.90	10.69

Odisha			
Bangiriposi	6.00	48.00	8.00
Bisoi	1.35	6.25	4.63
Deogaon	1.00	5.00	5.00
Ghatgaon	0.23	14.00	60.87
Kesinga	0.10	2.00	20.00
Khunta	1.50	4.00	2.67
Sadar	3.25	32.50	10.00
Odisha Total	13.93	111.75	8.02
Grand Total	42.35	316.65	7.48

Table 26 Bihar, Chhattisgarh & Odisha – Vegetables Area, Production and Productivity in Rabi Season

Vegetables were grown as a rabi crop more widely in Chhattisgarh and Odisha than Bihar. The average productivity varied based on the type of vegetables grown such as tomato and bitter-gourd.

c. Zaid Season

States	No	Yes
Bihar (589)	95.08%	4.92% (29)
Chhattisgarh (333)	97.90%	1.80% (6)
Odisha (612)	99.02%	0.98% (6)
Grand Total (1534)	**97.26%**	**2.67%**

Table 27 Percentage of Farmers Growing Zaid Crops

In terms of crops grown in the Zaid season in 2017-18, only a very small fraction of cultivators sowed any crop. In Bihar and Odisha, it was mainly legumes – Moong and Kulthi respectively, while in Chhattisgarh it was vegetables – mostly tomato and bitter gourd. Farmers only grew one crop in Zaid season.

Cropping Intensity

Cropping intensity refers to raising of a number of crops from the same field during one agriculture year. It is expressed as. [Cropping intensity = (Gross cropped area / Net sown area) x 100]

Cropping intensity expressed as percentage, for the year 2017-18 for the three seasons together– Kharif, Rabi and Zaid are as follows:

	Gross Cropped Area	Net Sown Area	Cropping Intensity
Bihar	862.89	1496.86	57.65%
Chhattisgarh	973.89	1035.89	94.01%
Odisha	2249.49	1783.15	126.15%
Overall	4086.27	4315.91	94.68%

Table 28 State-wise Cropping Intensity

The table suggests that of the three states Bihar has the lowest intensity at around 58%. In Odisha it is 126%. The average for the three states is 95%.

Bihar

	Gross Cropped Area	Net Sown Area	Cropping Intensity
Aurai	14.72	59.52	24.73%
Azamnagar	37.05	86.20	42.98%
Balrampur	67.18	92.63	72.53%
Barsoi	33.76	45.50	74.21%
Bousi	13.88	9.50	146.12%
Chanan	29.84	45.80	65.15%
Chaurahi	3.11	6.35	48.95%
Dandari	17.89	34.28	52.20%
Dhorayia	54.83	105.00	52.22%
Falka	58.79	58.60	100.32%
Fullidumar	63.18	88.40	71.48%
Garhpura	4.14	8.43	49.17%
Karaiparsurai	32.85	77.50	42.39%
Katra	52.64	108.69	48.43%
Khutauna	23.22	47.00	49.40%
Ladaniya	26.43	47.04	56.18%
Laukahi	47.30	102.28	46.25%
Mohada	34.83	48.05	72.48%
Mohanpur	26.68	14.68	181.69%
Nagarnausa	14.20	48.75	29.13%
Phatehpur	25.74	34.50	74.60%
Phoolparas	84.49	139.40	60.61%
Rahui	34.56	69.97	49.40%
Samho Akha	11.23	25.32	44.37%
Sarmera	20.96	42.44	49.40%
Tankuppa	29.37	51.04	57.54%
Bihar Total	**862.89**	**1496.86**	**57.65%**

Table 29 Bihar: Block-wise Cropping Intensity

In Bihar cropping intensity was highest in Mohanpur at 182% and lowest in Aurai block at 24%.

Chhattisgarh

	Gross Cropped Area	Net Sown Area	Cropping Intensity
Batoli	51.50	65.27	78.90%
Bodla	80.00	104.00	76.92%
Chuikhadan	30.91	36.71	84.20%
Farsabahar	46.42	45.02	103.11%
Jashpur	21.25	12.50	170.00%
Kansabell	74.30	38.53	192.84%
Kartala	21.81	23.80	91.64%
Kavrdha	49.54	70.68	70.09%
Lormi	30.50	47.80	63.80%
Lundra	22.40	25.50	87.84%
Masturi	28.00	28.20	99.29%
Mohla	50.78	33.64	150.95%
Mungeli	24.40	51.10	47.75%
Pali	25.19	26.93	93.54%
Pandriya	80.00	81.00	98.77%
Pathariya	28.60	37.10	77.08%
Podi Uproda	60.50	62.99	96.05%
Rajnandgao	86.90	90.26	96.28%
S.Lohara	72.99	82.54	88.43%
Sitapur	54.90	40.82	134.50%

Sonhat	33.00	31.50	104.76%
Chhattisgarh total	**973.89**	**1035.89**	**94.01%**

Table 30 Chhattisgarh: Block-wise Cropping Intensity

In Chhattisgarh, the highest intensity is in Kansabel at 193%, while lowest in Lormi at 64%.

Odisha

	Gross Cropped Area	Net Sown Area	Cropping Intensity
Bangiriposi	7.20	54.00	13.33%
Banspal	14.08	40.70	34.59%
Bhawanipatana	97.32	39.40	247.00%
Bijatala	49.40	26.50	186.42%
Bisoi	17.85	48.50	36.80%
Boden	103.74	43.30	239.58%
Deogaon	74.03	42.26	175.17%
Ghatgaon	52.48	30.76	170.59%
Golamunda	92.63	37.00	250.34%
Gudvela	51.87	47.77	108.58%
Jamda	61.75	35.20	175.43%
Jhumpura	98.13	77.50	126.61%
Kaptipada	13.38	36.11	37.05%
Karlamunda	145.50	47.50	306.32%
Kesinga	119.80	26.65	449.51%
Khariar	124.07	50.23	247.00%
Khunta	22.95	66.00	34.77%
Komna	129.13	53.53	241.23%
Kusumi	86.45	53.79	160.72%
Lanjigarh	100.04	39.00	256.50%
Narla	106.70	33.50	318.52%
Nuapada	132.96	41.50	320.39%
Sadar	30.88	100.85	30.61%
Saharpada	33.59	25.61	131.18%
Saintala	196.49	103.75	189.39%
Shamakhunta	27.05	65.00	41.62%
Sinapali	115.35	47.20	244.38%
Telkoi	19.70	63.54	31.00%
Titilagarh	106.21	327.00	32.48%
Udala	18.80	47.50	39.58%
Odisha total	**2249.49**	**1783.15**	**126.15%**

Table 31 Odisha: Block-wise Cropping Intensity

In Odisha, both the state average and range between the highest and lowest is quite high. It is high in Kesinga at around 450%. In Bangiriposi it stands at 13%. In at least 7 blocks the intensity is between 30% and 40%.

B. Biophysical Indicators

Biophysical survey was conducted in the CRW sites of 2017-18. A total of 227 CRWs were covered in 128 GPs of 67 blocks. Water level was measured for pre-monsoon and post-monsoon season in 418 wells.

Water level in wells

Sample Frame

States	Districts	Blocks	GPs	CRWs	Wells
BIHAR	8	29	80	100	225
CHATTISGARH	7	17	28	34	64
ODISHA	5	21	50	93	153
Total	20	67	128	227	418

Table 32 Sample Frame – Geographical Areas, CRW and Wells

In Bihar 225 wells were surveyed from 100 CRWs, while 64 wells were covered from 34 sites in Chhattisgarh. In Odisha 153 wells were measured for their water levels from 93 CRWs. On average about 2 wells were covered in every CRW within the prescribed distance from the water harvesting structure.

Average distance from CRW

As per the survey guidelines, only those wells were selected that were within 500 meters (m) of the proposed CRW structure. The table below presents the average distance from CRW in each state.

States	**Average of distance from CRW (m)**
Bihar	201.23
Chhattisgarh	252.09
Odisha	435.25
Grand Total	**275.54**

Table 33 Average Distance of a Welll from CRW in the State

The average distance in Bihar was the lowest at 201 meters, whereas in Odisha it was 435 meters. The national average was roughly 276 meters.

Water level pre and post monsoon

Row Labels	**Pre-monsoon average of depth of water in wells (m)**	**Post-monsoon average of depth of water in wells (m)**	**Difference post and pre monsoon**
Bihar	7.06	7.93	0.87
Chhattisgarh	1.16	3.22	2.06
Odisha	1.41	3.25	1.84
Grand Total	**4.25**	**5.63**	**1.38**

Table 34 State-wise Water Level Pre & Post Monsoon

The water level in wells showed an increase in post monsoon period compared to pre-monsoon. In terms of actual difference Odisha witnessed an increase of 1.84 meters (about 6 feet). The difference in water level was highest in terms of percentage increase in

Chhattisgarh (178%) compared to Bihar (12%). In Odisha, water levels more than doubled (130%). In Chhattisgarh and Odisha, however the jump was over a small base.

Block-wise water level in wells

Tables 29, 30 & 31 shows the pre and post monsoon data block-wise in the 3 ICRG states. They also present the difference in water levels between the two seasons.

Bihar

District & Blocks	**Pre-monsoon average of depth of water in wells (m)**	**Post-monsoon average of depth of water in wells (m)**	**Difference post and pre-monsoon**
Banka			
Bausi	1.41	2.45	1.04
Chanan	1.05	2.13	1.08
Dhauraiya	1.85	2.87	1.02
Fullidumar	2.75	4.19	1.44
Begusarai			
Chorahi	27.74	28.16	0.42
Dandari	17.14	17.68	0.54
Garhpura	9.08	9.62	0.54
Samho Akha	9.61	10.11	0.5
Gaya			
Fatehpur	0.82	2.37	1.55
Mohanpur	0.58	1.29	0.71
Mohara	0.00	0.18	0.18
Tankuppa	1.65	3.34	1.69
Katihar			
Azamnagar	5.13	6.75	1.62
Balrampur	5.25	7.88	2.63
Barsoi	7.00	7.56	0.56
Falka	5.57	6.86	1.29
Madhubani			
Khutauna	13.72	13.72	0
Ladaniya	12.96	12.84	-0.12
Laukahi	19.44	19.32	-0.12
Phulparas	6.65	6.64	-0.01
Muzaffarpur			
Aurai	2.75	4.69	1.94
Bandra	1.24	2.90	1.66
Bochaha	4.43	6.85	2.42
Katra	5.20	6.81	1.61
Nalanda			
Karaipursarai	0.00	0.08	0.08
Nagarnausa	0.88	1.07	0.19
Rahui	0.29	0.34	0.05
Sarmera	6.25	6.61	0.36
West Champaran			
Madhubani	0.46	0.46	0
Sikta	2.95	2.99	0.04
Grand Total	**7.06**	**7.93**	0.87

Table 35 Bihar Block-wise Water Level in Wells Pre & Post Monsoon

In Bihar, there was a considerable block-wise difference. While in 2 blocks – Madhubani and Khatauna there has been no pre and post monsoon difference, Balrampur and Bochaha witnessed difference of around 2.5 meters in water level. In Madhubani district the difference has either been zero or negative – suggesting either poor rainfall or high usage of water before the measurement was taken.

Chhattisgarh

District & Blocks	**Pre-monsoon average of depth of water in wells (m)**	**Post-monsoon average of depth of water in wells (m)**	**Difference post and pre monsoon**
Bilaspur			
Kota	0.00	2.22	2.22
Marwahi	0.73	1.90	1.17
Jashpur			
Bagicha	0.90	2.80	1.9
Duldula	0.61	0.97	0.36
Farsabahar	1.47	2.90	1.43
Kansabel	2.59	0.92	-1.67
Kunkuri	1.85	1.74	-0.11
Kabirdham			
Kawardha	0.00	0.00	
Pandariya	1.03	3.78	2.75
Sahaspur-Lohara	2.30	2.80	0.5
Korba			
Poudi-Uprora	0.74	4.96	4.22
Korea			
Sonhat	0.75	3.70	2.95
Mungeli			
Lormi	1.60	2.38	0.78
Pathariya	2.34	3.58	1.24
Surguja			
Batauli	1.53	4.90	3.37
Lundra	0.21	4.41	4.2
Sitapur	1.50	8.70	7.2
Grand Total	**1.16**	**3.22**	2.06

Table 36 Chhattisgarh Block-wise Water Level in Wells Pre & Post Monsoon

In Chhattisgarh, the difference between pre and post monsoon water levels was quite significant in some of the blocks viz. Kota, Pandariya, Sonhat, Poudi-Uprora, Batauli, Lundra and Sitapur – all of them higher than the state average. In a couple of blocks in Jaspur district however, the difference was found to be negative.

Odisha

District & Blocks	Pre-monsoon average of depth of water in wells (m)	Post-monsoon average of depth of water in wells (m)	Difference post and pre-monsoon
Bolangir			
Gudvela	0.84	3.48	2.64
Titlagarh	0.35	2.36	2.01
Kalahandi			
Bhawanipatna	1.09	2.19	1.1
Golamunda	0.75	3.24	2.49
Karlamunda	0.35	2.56	2.21
Kesinga	0.55	2.27	1.72
Lanjigarh	0.76	1.89	1.13
Narla	0.87	3.21	2.34
Keonjhar			
Jhumpura	0.81	2.64	1.83
Keonjhar Sadar	2.85	4.67	1.82
Telkoi	1.02	2.74	1.72
Mayurbhanj			
Jamda	3.03	4.27	1.24
Jashipur	4.04	4.93	0.89
Karanjia	2.73	4.22	1.49
Sukruli	2.80	4.19	1.39
Thakurmnda	3.06	4.13	1.07
Nuapada			
Boden	4.61	5.53	0.92
Khariar	1.32	2.97	1.65
Komna	0.64	3.40	2.76
Nuapada	1.07	3.26	2.19
Sinapali	1.56	3.12	1.56
Grand Total	**1.41**	**3.25**	1.84

Table 37 Odisha Block-wise Water Level in Wells Pre-& Post Monsoon

In Odisha water levels pre and post monsoon witnessed the highest increase. In 10 out of 21 blocks, it increases more than the state mean of 1.84 meters. In 8 of the 10 blocks in fact increased by more than 200%. There was no negative change in any of the blocks.

4. Outcome Survey: Effort Description

The Baseline data collection to benchmark the outcomes involved extensive efforts at multiple levels involving a variety of activities undertaken by persons with differing skills. The table below summarizes the efforts involved in completing the various steps: data collection, data entry, collation, cleaning, analysis and report writing.

Steps	Number of CRW sites	Person*Days*CRWs	Total Person Days	Resource Type
Survey training – state level	Not Applicable		006	National M&E and NRM Expert
Collection	351	2*1*351	702	CSO Team District Engineer
Entry	351	1*42	042	District Team
Collation	Not Applicable	1*3	003	CSO State M&E Expert
Cleaning	Not Applicable	1*5	003	National M&E Expert
Analysis & report	Not Applicable	1*5	004	National M&E Expert
Total			760	

Table 38 Effort Put-in for the Baseline Outcome Survey

The table above assumes that the CRW was the unit of data collection and in the course of every visit, the CSO collected information on both socio-economic and bio-physical indicators related to a CRW. A team of two people was able to cover at least 1 CRW every day, identifying and conducting about 5-6 beneficiary interviews and taking water level measurements from 2-3 wells. In addition they also collected any plantation related data from that CRW. The data collection process also required involvement from district Engineers/NRM experts to ensure the right wells are sampled in the catchment area.

In addition to the above, the team developed the M&E framework and survey formats as a one-time exercise.

Annexure 1.

Block and district wise landholding by category – big, marginal and small

Bihar

	Landholding type					
Districts & Blocks	**Big**		**Marginal**		**Small**	
Banka						
Bousi		0.0%	9	90.0%	1	10.0%
Chanan	1	5.0%	18	90.0%	1	5.0%
Dhorayia	2	8.7%	18	78.3%	3	13.0%
Fullidumar		0.0%	14	56.0%	11	44.0%
Banka Total	**3**	**3.8%**	**59**	**75.6%**	**16**	**20.5%**
Begusarai						
Chaurahi		0.0%	26	100.0%		0.0%
Dandari		0.0%	25	92.6%	2	7.4%
Garhpura		0.0%	10	100.0%		0.0%
Samho Akha		0.0%	16	100.0%		0.0%
Begusarai Total		**0.0%**	**77**	**97.5%**	**2**	**2.5%**
Gaya						
Mohada		0.0%	13	65.0%	7	35.0%
Mohanpur	1	4.8%	20	95.2%		0.0%
Phatehpur		0.0%	18	90.0%	2	10.0%
Tankuppa		0.0%	16	88.9%	2	11.1%
Gaya Total	**1**	**1.3%**	**67**	**84.8%**	**11**	**13.9%**
Katihar						
Azamnagar		0.0%	17	89.5%	2	10.5%
Balrampur		0.0%	20	76.9%	6	23.1%
Barsoi		0.0%	21	100.0%		0.0%
Falka		0.0%	25	89.3%	3	10.7%
Katihar Total		**0.0%**	**83**	**88.3%**	**11**	**11.7%**
Madhubani						
Khutauna		0.0%	22	91.7%	2	8.3%
Ladaniya		0.0%	19	90.5%	2	9.5%
Laukahi	1	3.0%	29	87.9%	3	9.1%
Phoolparas	5	15.2%	21	63.6%	7	21.2%
Madhubani Total	**6**	**5.4%**	**91**	**82.0%**	**14**	**12.6%**
Muzaffrpur						
Aurai		0.0%	15	93.8%	1	6.3%
Katra	3	11.5%	22	84.6%	1	3.8%
Muzaffrpur Total	**3**	**7.1%**	**37**	**88.1%**	**2**	**4.8%**
Nalanda						
Karaiparsurai		0.0%	22	84.6%	4	15.4%
Nagarnausa		0.0%	25	100.0%		0.0%
Rahui	1	3.6%	27	96.4%	0	0.0%
Sarmera		0.0%	26	96.3%	1	3.7%
Nalanda Total	**1**	**0.9%**	**100**	**94.3%**	**5**	**4.7%**
Bihar Grand Total	**14**	**2.4%**	**514**	**87.3%**	**61**	**10.4%**

Chhattisgarh

	Landholding type					
Districts & Blocks	**Big**		**Marginal**		**Small**	
Bilaspur						
Masturi	1	14.3%	2	28.6%	4	57.1%
Bilaspur Total	**1**	**14.3%**	**2**	**28.6%**	**4**	**57.1%**
Jashpur						
Farsabahar	2	8.3%	16	66.7%	6	25.0%
Jashpur		0.0%	12	92.3%	1	7.7%
Kansabell	5	35.7%	2	14.3%	7	50.0%
Jashpur Total	**7**	**13.7%**	**30**	**58.8%**	**14**	**27.5%**
Kabirdham						
Bodla		0.0%	20	66.7%	10	33.3%
Kavrdha	1	5.3%	12	63.2%	6	31.6%
Pandriya	3	15.0%	6	30.0%	11	55.0%
S.Lohara	4	22.2%	6	33.3%	8	44.4%
Kabirdham Total	**8**	**9.2%**	**44**	**50.6%**	**35**	**40.2%**
Korba						
Kartala		0.0%	10	83.3%	2	16.7%
Pali		0.0%	13	81.3%	3	18.8%
Podi Uproda	1	5.9%	6	35.3%	10	58.8%
Korba Total	**1**	**2.2%**	**29**	**64.4%**	**15**	**33.3%**
Korea						
Sonhat		0.0%	13	81.3%	3	18.8%
Korea Total		**0.0%**	**13**	**81.3%**	**3**	**18.8%**
Mungeli						
Lormi		0.0%	14	93.3%	1	6.7%
Mungeli		0.0%	4	44.4%	5	55.6%
Pathariya	1	10.0%	5	50.0%	4	40.0%
Mungeli Total	**1**	**2.9%**	**23**	**67.6%**	**10**	**29.4%**
Rajnandgaon						
Chuikhadan	1	10.0%	6	60.0%	3	30.0%
Mohla	3	16.7%	12	66.7%	3	16.7%
Rajnandgaon	6	26.1%	11	47.8%	6	26.1%
Rajnandgaon Total	**10**	**19.6%**	**29**	**56.9%**	**12**	**23.5%**
Sarguja						
Batoli	1	5.3%	12	63.2%	6	31.6%
Lundra	1	14.3%	3	42.9%	3	42.9%
Sitapur	1	6.3%	6	37.5%	9	56.3%
Sarguja Total	**3**	**7.1%**	**21**	**50.0%**	**18**	**42.9%**
Chhattisgarh Grand Total	**31**	**9.3%**	**191**	**57.4%**	**111**	**33.3%**

Odisha

	Landholding type					
	Big		**Marginal**		**Small**	
Balangir						
Deogaon	6	40.0%	7	46.7%	2	13.3%
Gudvela	1	5.0%	13	65.0%	6	30.0%
Saintala	17	85.0%	1	5.0%	2	10.0%
Titilagarh	6	30.0%	4	20.0%	10	50.0%
Balangir Total	**30**	**40.0%**	**25**	**33.3%**	**20**	**26.7%**
Kalahandi						
Bhawanipatana	4	20.0%	4	20.0%	12	60.0%
Golamunda	3	15.0%	7	35.0%	10	50.0%
Karlamunda	16	80.0%	2	10.0%	2	10.0%
Kesinga	10	50.0%	4	20.0%	6	30.0%
Lanjigarh	2	8.0%	11	44.0%	12	48.0%
Narla	8	40.0%	3	15.0%	9	45.0%
Kalahandi Total	**43**	**34.4%**	**31**	**24.8%**	**51**	**40.8%**
Keonjhar						
Banspal		0.0%	15	100.0%		0.0%
Ghatgaon	1	6.3%	7	43.8%	8	50.0%
Jhumpura	4	21.1%	9	47.4%	6	31.6%
Patna		0.0%	20	100.0%		0.0%
Sadar		0.0%	16	84.2%	3	15.8%
Saharpada		0.0%	15	75.0%	5	25.0%
Telkoi		0.0%	18	78.3%	5	21.7%
Keonjhar Total	**5**	**3.8%**	**100**	**75.8%**	**27**	**20.5%**
Mayurbhanj						
Bangiriposi		0.0%	20	100.0%		0.0%
Bijatala		0.0%	20	100.0%		0.0%
Bisoi		0.0%	18	90.0%	2	10.0%
Jamda		0.0%	15	75.0%	5	25.0%
Kaptipada		0.0%	20	100.0%		0.0%
Khunta		0.0%	20	100.0%		0.0%
Kusumi		0.0%	5	25.0%	15	75.0%
Shamakhunta		0.0%	20	100.0%		0.0%
Udala		0.0%	17	85.0%	3	15.0%
Mayurbhanj Total		**0.0%**	**155**	**86.1%**	**25**	**13.9%**
Nuapada						
Boden	7	35.0%	3	15.0%	10	50.0%
Khariar	11	55.0%	1	5.0%	8	40.0%
Komna	8	40.0%	1	5.0%	11	55.0%
Nuapada	7	35.0%	4	20.0%	9	45.0%
Sinapali	7	35.0%	5	25.0%	8	40.0%
Nuapada Total	**40**	**40.0%**	**14**	**14.0%**	**46**	**46.0%**
Odisha Grand Total						

Annexure 2.

District and block-wise variation on growing of Rabi crop

Bihar

	No	Yes
Banka		
Bousi	80.00%	20.00%
Chanan	25.00%	75.00%
Dhorayia	0.00%	100.00%
Fullidumar	0.00%	100.00%
Banka Total	**16.67%**	**83.33%**
Begusarai		
Chaurahi	0.00%	100.00%
Dandari	0.00%	100.00%
Garhpura	0.00%	100.00%
Samho Akha	0.00%	100.00%
Begusarai Total	**0.00%**	**100.00%**
Gaya		
Mohada	5.00%	95.00%
Mohanpur	52.38%	47.62%
Phatehpur	15.00%	85.00%
Tankuppa	0.00%	100.00%
Gaya Total	**18.99%**	**81.01%**
Katihar		
Azamnagar	26.32%	73.68%
Balrampur	19.23%	80.77%
Barsoi	4.76%	95.24%
Falka	60.71%	39.29%
Katihar Total	**29.79%**	**70.21%**
Madhubani		
Khutauna	8.33%	91.67%
Ladaniya	0.00%	100.00%
Laukahi	0.00%	100.00%
Phoolparas	9.09%	90.91%
Madhubani Total	**4.50%**	**95.50%**
Muzaffrpur		
Aurai	0.00%	100.00%
Katra	0.00%	100.00%
Muzaffrpur Total	**0.00%**	**100.00%**
Nalanda		
Karaiparsurai	0.00%	100.00%
Nagarnausa	0.00%	100.00%
Rahui	0.00%	100.00%
Sarmera	0.00%	100.00%
Nalanda Total	**0.00%**	**100.00%**
Grand Total	**10.36%**	**89.64%**

Chhattisgarh

	No	Yes
Bilaspur		
Masturi	100.00%	0.00%
Bilaspur Total	**100.00%**	**0.00%**
Jashpur		
Farsabahar	87.50%	12.50%
Jashpur	76.92%	23.08%
Kansabell	78.57%	21.43%
Jashpur Total	**82.35%**	**17.65%**
Kabirdham		
Bodla	33.33%	66.67%
Kavrdha	0.00%	100.00%
Pandriya	100.00%	0.00%
S.Lohara	27.78%	72.22%
Kabirdham Total	**40.23%**	**59.77%**
Korba		
Kartala	91.67%	8.33%
Pali	93.75%	6.25%
Podi Uproda	82.35%	17.65%
Korba Total	**88.89%**	**11.11%**
Korea		
Sonhat	56.25%	43.75%
Korea Total	**56.25%**	**43.75%**
Mungeli		
Lormi	6.67%	93.33%
Mungeli	0.00%	100.00%
Pathariya	80.00%	20.00%
Mungeli Total	**26.47%**	**73.53%**
Rajnandgaon		
Chuikhadan	70.00%	30.00%
Mohla	77.78%	22.22%
Rajnandgaon	60.87%	39.13%
Rajnandgaon Total	**68.63%**	**31.37%**
Sarguja		
Batoli	47.37%	52.63%
Lundra	42.86%	57.14%
Sitapur	75.00%	25.00%
Sarguja Total	**57.14%**	**42.86%**
Grand Total	**60.36%**	**39.64%**

Odisha

	No	Yes
Balangir		
Deogaon	80.00%	20.00%
Gudvela	100.00%	0.00%
Saintala	100.00%	0.00%
Titilagarh	100.00%	0.00%
Balangir Total	**96.00%**	**4.00%**
Kalahandi		
Bhawanipatana	100.00%	0.00%
Golamunda	100.00%	0.00%
Karlamunda	95.00%	5.00%
Kesinga	95.00%	5.00%
Lanjigarh	96.00%	4.00%
Narla	100.00%	0.00%
Kalahandi Total	**97.60%**	**2.40%**
Keonjhar		
Banspal	0.00%	100.00%
Ghatgaon	68.75%	31.25%
Jhumpura	63.16%	36.84%
Patna	40.00%	60.00%
Sadar	0.00%	100.00%
Saharpada	70.00%	30.00%
Telkoi	95.65%	4.35%
Keonjhar Total	**50.76%**	**49.24%**
Mayurbhanj		
Bangiriposi	65.00%	35.00%
Bijatala	100.00%	0.00%
Bisoi	65.00%	35.00%
Jamda	100.00%	0.00%
Kaptipada	100.00%	0.00%
Khunta	75.00%	25.00%
Kusumi	100.00%	0.00%
Shamakhunta	100.00%	0.00%
Udala	100.00%	0.00%
Mayurbhanj Total	**89.44%**	**10.56%**
Nuapada		
Boden	100.00%	0.00%
Khariar	100.00%	0.00%
Komna	100.00%	0.00%
Nuapada	100.00%	0.00%
Sinapali	100.00%	0.00%
Nuapada Total	**100.00%**	**0.00%**
Grand Total	**85.29%**	**14.71%**

Annexure 3

SOCIO-ECONOMIC SURVEY: FARMER'S INTERVIEW

Section C. Basic information

1	**State**		**7**	**Name of the CSO mobilizer conducting the interview**	
2	**District**		**8**	**Name of CSO**	
3	**Block**		**9**	**Name of the CRW**	
4	**GP**		**10**	**ID of CRW**	
5	**Village**		**11**	**Type of work**	
6	**Date**		**12**	**ID of the respondent**	

Section D: Respondent basic information

1	Name of the respondent			2. Gender of the respondent	1. Male 2. Female
3	Age	..... Years			
4	Father name				
5	Caste of the respondent	1. SC 2. ST 3. PVTG 4. Other backward classes 5. General			
9	Respondent relationship with the owner of this land?	1. Self 2. Husband/wife 3. Mother/Father 4. Grandfather/Grandmother or great grandfather/ great grand mother 5. Previous generation uncle/aunt 6. Tiller – land on lease 7. No relation 8. Some other relation			
10	How much is your land holding in this command area	a	Own	In Ha	
		b	Leased out	In Ha	
		c	Leased in	In Ha	
		d	Total holding (a+c-b)	In Ha	
11	Category of the farmer as per land holding	1. Marginal – up to 1 ha 2. Small - 1-2 ha 3. Medium -2-4 ha 4. Large - > 4ha			
12	According to you how much area will be irrigated with this CRW (when it will be completed)? [command area]			In acre	

Section E: Production

1	Did you grow Kharif crops last year?	1. Yes **2.** No		**If yes,** How many crops cultivated in season? Write the details below. If no skip to Q3.			this
	Variable	**Name of the crop**		**Value**			
2	Cropping pattern and production near CRW in **Kharif** last cropping season	SN	Crop	Area under production in acre	Prod. in quintal	Av price per quintal last year	Price X Production
		1	Millet – jwar, bajra, kodo, maize				
		2	Rice				
		3	Arhar				
		4	Vegetables – write name				
		5	Nuts– write name				
		6	Fruit (singhada, mango, etc) – write name				
		7	Other – specify				
			Total				
3	Did you grow Rabi crops last year?	1. Yes 2. No		**If yes,** How many crops cultivated in season? Write the details below. If no skip to Q5.			this
4	Cropping pattern and production near CRW in last **Rabi** cropping season	SN	Crop	Area in Production	Prod. in Quintals	Average price per quintal	Price X production
		1	Wheat				
		2	Barley (Jaw)				
		3	Gram				
		4	Mustard				
		5	Maize				
		6	Vegetable				

			7	Fruits name				
			8	Others				
				Total				
5	Did you grow Rabi crops last year?		1. Yes 2. No		**If yes,** How many crops cultivated in season? Write the details below. If no end the questionnaire			this
6	Cropping pattern and production near CRW in last **Zayed** cropping season		S. N	Name of the crop	Area in Production	Prod. in Quintals	Average price per quintal	Price X production
			1					
			2					
			3					
			4					
				Total				

Annexure 4

Water level measurement in Wells Survey				
1	Water level in the nearest water body (Well/tube well – at least 2-3 well/tube well) Below write the name and location of the three structures (**str**) identified for measurement.			
	Name and landmark of the structure		Lat	Long
a.				
b.				
c.				
	Name of the structure	**Of Str a (in meters)**	**Of stc b (in meters)**	**Of Stc c (in meters)**
I	Parapet wall breath			
Ii	Diameter of the well			
Iii	Height of wall from ground level			
Iv A	Total depth of well from parapet wall			
Iv B	Depth of empty well from parapet wall			
Iv C	Water level in well (A-B)			