



Department
for International
Development

Strategic support to RDD on planning for Water Conservation Structures in MGNREGA and Ground Water Recharge using GIS tools and Climate Change indicators

BIHAR

April 2019 – June 2019

Infrastructure for Climate Resilient Growth in India (ICRG) Programme

Submitted By:



Expanding Horizons. Enriching Lives.

IPE GLOBAL LIMITED

IPE Global House,
B - 84, Defence Colony,
New Delhi - 110 024, India
www.ipeglobal.com

In association with



1. The Context

At the start of the ICRG project, district level training and orientation of MGNREGA functionaries were organized in all the project districts separately for administrative and technical staff. The module followed by the ICRG team for these events mainly focused on the concept of climate resilient planning, designing of climate resilient works and INRM approach for better implementation of MGNREGA schemes. Subsequently in the course of the project, the ICRG Team also conducted trainings with technical functionaries of MGNREGA at district level under the State Technical Resource Team (STRT) and Block Technical Resource Team (BTRT) organized by Department. Through these trainings, the ICRG programme covered functionaries in 17 districts of the state.

The ICRG Team works closely with the Rural Development Department, Government of Bihar. In recent times, support has been given in preparing Guidelines on GIS based mapping of Natural Resources at Gram Panchayat level and trainings were done at State level with 40 selected MGNREGA functionaries on QGIS application use, mapping of assets and work planning in 3 separate rounds in January 2019.

In continuation of this, the ICRG Team sensitized 386 participants in 6 districts during ICRG-NRM workshops in 6 districts March 2019, out of which 343 were MGNREGA functionaries (88.86%). The non-MGNREGA functionaries were CSO mobilizers/Engineers and representative from ATMA. This workshop covered 126 new blocks in addition of 24 blocks of these 6 districts where ICRG is working. Inclusion of new blocks was done with the aim of disseminating the ICRG concept across the districts.

During these trainings use of Google Earth tool for GIS planning and designing of assets for MGNREGA was well appreciated by the Engineering wing and other functionaries of MGNREGA and generated much interest for further dissemination at a larger forum.

Bihar is facing a severe ground water crisis due to high rates of depletion. The phenomenon affects the whole state but is more pronounced in the districts of South Bihar that need immediate action. The ICRG Team has been identified as the key resource to support in addressing the issue. The ICRG Team was asked by the Rural Development Department to conduct training programmes and provide strategic support to MGNREGA functionaries in planning of water conservation structures and ground water recharge using GIS tools and climate indicators that would contribute to addressing the ground water problem.

The state has planned and organized a series of workshops at Divisional level for the districts of Patna Division and Magadh Division on 29th and 31st May and 03rd June. They have also planned a similar training for the Bhagalpur division on 18th June 2019. These three divisions have been selected for coverage in the first phase because they have the largest number of gram panchayats that fall in the critical and semi- critical categories. The Commissioner-MGNREGA, DDC¹'s and 350 MGNREGA functionaries of 11 districts including 9 Non-ICRG districts participated in the workshop.

¹ DDC: Deputy Development Commissioner

2. Activities undertaken

Under the strategic support to the Department on planning for water conservation structures in MGNREGA and ground water recharge using GIS tools and climate change indicators, the following were done:

- ✚ **Represent Rural Development Department in State level consultations:** As per Chief Secretary's GO's for all concerned Departments planning for Water Conservation structures in 606 critical and semi critical GP's spread across South Bihar districts, the ICRG team represented the Rural Development department in preparation of joint circular on Water Conservation measures for Bihar.
- ✚ **Liasing with Other concerned Departments:** The ICRG team represented the Rural Development Department in meeting with other prominent line Departments like PHED, Minor Irrigation, WRD and helped preparation of a joint circular on which each Department will support Water Conservation and Groundwater Recharge in the State. This will be monitored by the Chief Secretary. The Rural Development Department asked the ICRG Team to include all water conservation and recharge structures under the guidelines of MGNREGA.
- ✚ **Workshop on Water Conservation:** The ICRG Team represented the Rural Development Department in a 2 day Workshop on Water Conservation, Development and Management organized by the PHED department in Patna on 09-10th April 2019. This was the first step to prepare a joint action plan to address the depleting water situation in South Bihar. The ICRG Team along with MGNREGA Commissioner, EE's of all districts participated in the workshop. Magasassy Award Winner Mr. Rajendra Singh was the keynote speaker. The Workshop saw participation by Secretaries of all concerned Departments.
- ✚ **Divisional Level Workshops:** The ICRG Team worked with MGNREGA Commissioner and Rural Development Department to prepare an action plan and presentation and conduct Divisional level workshops for MGNREGA functionaries for planning of Water Conservation Structures. Till now 3 Divisional level workshops have been completed and the 4th Workshop is planned on 18th June 2019 for Bhagalpur division.

The main objectives of strategic support at Divisional level workshops are:

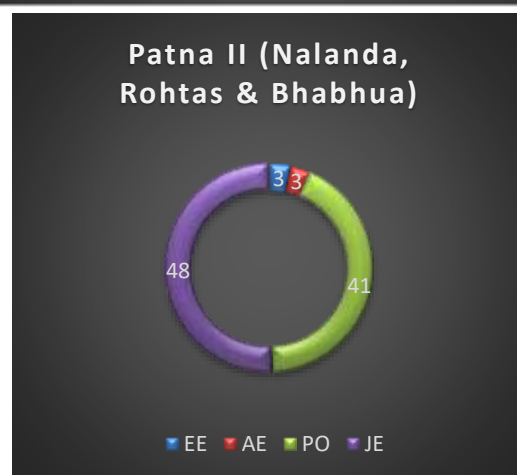
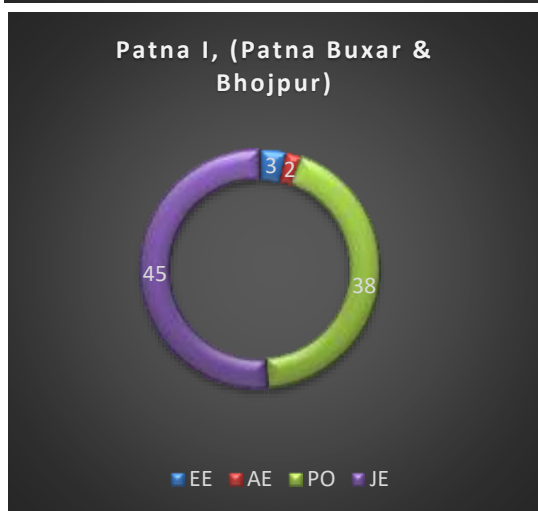
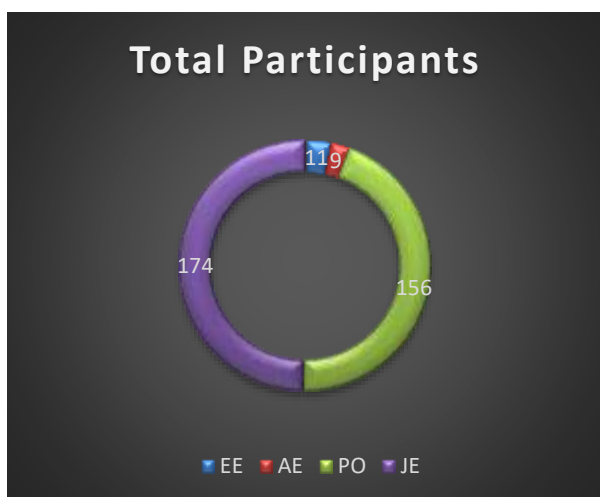
- ✚ Establishing the importance and need for NRM works and identifying the common gaps observed during field visits in planning and implementation.
- ✚ Prioritization and identification of water conservation structures for groundwater recharging under the mandate of MGNREGA using climate indicators.
- ✚ Breaking the traditional stereotypes of MGNREGA works through use of innovative tools like Climate App, Vulnerability study, Climate modelling study etc.
- ✚ Discussion and identification of best practices and cross-learning.
- ✚ Train MNGREGA functionaries on GIS tools (Google Earth/Bhuvan/QGIS), C-App use, mapping and location. Layering on cadastral map and identification of different biophysical characteristics of the area was also done.

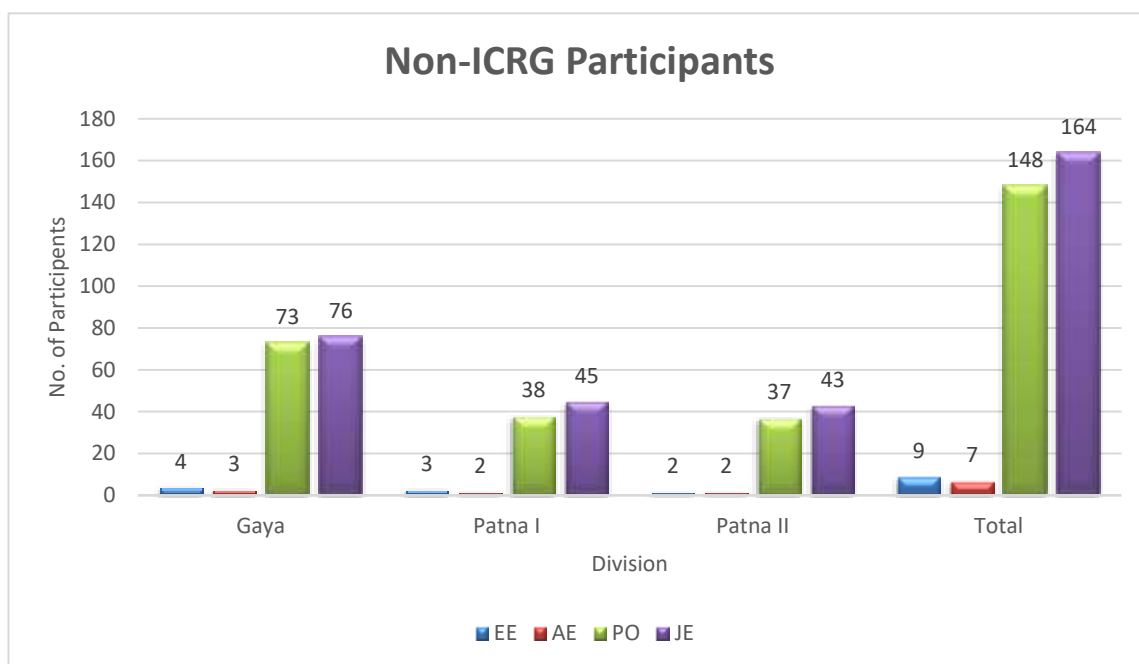
3. Profile of Trainees

Through these workshops, the ICRG Team sensitized 350 MGNREGA functionaries of 11 districts on planning for water conservation structures in MGNREGA and ground water recharge using GIS tools and Climate Change indicators. Of the 11 districts that participated in the workshops, 9 were non-ICRG districts. The participants included the Deputy Development Commissioners of Districts, Executive Engineers, Assistant Engineers, Programme Officer's and Junior Engineers. MGNREGA Commissioner, Rural Development Department-Bihar and Joint Secretary-Rural Development Department Bihar were also present in all the workshop.

326 participants were from 9 non- ICRG districts. i.e. Aurangabad, Nawada, Jehanabad, Arwal, Rohtas, Kaimur, Patna, Buxar and Bhojpur – and were trained in NRM work selection, planning and water conservation measures.

Profile of Trainees in all three Divisions





4. Workshop Sessions

The workshop content was planned in discussion with the Rural Development department with special focus on choice of the appropriate NRM structures in the participating districts that will contribute to ground water conservation/recharge. The ICRG Team used the VA toolkit, Google Earth pro designs, IEC materials and INRM manual for better understanding of the participants. The ICRG district engineers will support the MGNREGA functionaries to prepare DPRs and implementation responsibility will remain with the Rural Development department through MGNREGA.

Session I: To understand the demography of district for flood, draught and soil profiling according to agro climatic zones of the State. The discussion focused on the 3 agro climatic zones of Bihar, their characteristics, rainfall pattern, soil type and river basin system. The water profile of the state was discussed along with the irrigation system in vulnerable districts. The alarming situation of gross water availability in the state was highlighted and limitation of forest area for rejuvenating wasteland was also discussed. The scope of MGNREGA for improving soil condition recharge and conservation of water and plantations for afforestation and increase durability was discussed.

Session II: Goal of MGNREGA under NRM and use of Climate Indicators: This session discussed the importance of MGNREGA for empowerment of socially and economically disadvantaged groups to enhance their resilience. The scope of MGNREGA in NRM works and approaches to water conservation, watershed management, and rational utilization of common land through MGNREGA. The use of climate indicators in planning, designing, and engineering and convergence processes was discussed. The importance design principles of infrastructures were demonstrated.

Session III: Use of GIS tools: The final session included use of GIS tools for planning and implementation of NRM works. In this session three tools Bhuvan, Google Earth pro and QGIS was discussed. All these tools were demonstrated live in the hall, focusing on how to locate the identified structure by using coordinates, calculation of catchment and command area, elevation, inter-linkage

plan and treatment plan. The Climate App developed under ICRG was demonstrated and the communication card game and INRM manual prepared under the programme was discussed.

The session discussed the method for preparing climate resilient designs for any MGNREGA structure. All the major NRM works prototypes in the context of Bihar was discussed. A comparison of present practices vs future action was also discussed to underline the importance of climate proofing. The common gaps in these structures and how to address them were covered. Some of the key points in the context to NRM structures discussed were:

- a. **Ahar and Pyne irrigation system:** Ahar and Pyne system is a low cost irrigation system also used for drainage during floods. The calculation of water flow in the structure and actual irrigated area need to be considered while designing Ahar-Pyne system.
- b. **Check-dam:** Check-dam is the main source of irrigation in Bihar which directly impacts the farmers and reduces surface runoff. Improving the design taking into consideration climate factors and choosing the site for construction following the study of water flow was highlighted.
- c. **Pond:** Ponds are used as a multipurpose structure and for critical irrigation in the Kharif season. It is also used for ground-water recharge. In the Bihar context, the design most often misses the inlet and outlet that improves its efficiency.
- d. **Earthen dam:** This is among the most preferred NRM structures mostly in Southern Bihar region for water conservation measures and biomass generation. The freeboard designing, managing of overflow water and siltation challenges must be addressed in earthen dam construction.
- e. **Plantation:** Plantation is most important from a climate resilience perspective for increasing green cover and protection from soil erosion. The livelihood generation mechanism needs to be added in planning along with selection of plants according to varietal suitability. Also benefit sharing mechanism needs to be incorporated in planning process.

5. Participant's Suggestion and feedback

The discussion at the end of the sessions provided an opportunity for responding to questions and seeking comments on training structure and content. Most of the participants felt that the training was very useful and that they would benefit immensely. In almost all districts participants echoed that such type of training should be held more regularly for better learning and of longer duration (2 days).

Following were some other main suggestions and comments from participants:

- The process of integration of works with other Department was asked by participants. MGNREGA Commissioner suggested taking of NOC from other Departments.
- The classroom training should be followed by field demonstration.
- Some practice/training manual should be given to participants specifically on GIS mapping application for reference.
- A Technical Cell should be set up at district level for GIS application usage and dissemination.
- Some hard copies of presentation and training material can be given to participants.
- District level planning for large structures is needed to be done for greater impact. DDC will be leading in this regard.

6. Action plan

The workshop concluded with few action points and take-ways for the coming months.

- All technical functionaries will be identifying drainage lines in their respective districts and select maximum water conservation structures.
- Selection, training and grooming of technical functionaries in small groups for creation of pool of experts at local level. These pool of functionaries will be trained at district level for further dissemination of learnings in other non-ICRG blocks.
- The Executive Engineer MGNREGA and ICRG District Engineer will team up to identify and design the possible NRM works in all the blocks. Some of them will be identified for demonstration on the same model.
- District team will be liasing with the ICRG state team for technical support in climate resilient designing and suggestions incorporations in some of the best identified MGNREGA work according to District administration.
- All NRM works must be completed before monsoon season for better impact. All GPs must do water budget and planning.

Annexure-1- Details of Participants

| Sn | Division | Districts | Date | EE | AE | JE | PO | Total |
|----|----------|--|----------|----|----|-----|-----|-------|
| 1 | Gaya | Gaya, Alwar, Jehanabad, Aurangabad, Nawada | 29.05.19 | 4 | 5 | 81 | 77 | 167 |
| 2 | Patna I | Patna, Bhojpur, Buxar | 31.05.19 | 2 | 3 | 45 | 38 | 88 |
| 3 | Patna | Nalanda, Rohtas, Bhabua | 03.06.19 | 3 | 3 | 48 | 41 | 95 |
| | | | | 9 | 11 | 174 | 156 | 350 |

Annexure II: Photographs:



Inauguration by Commissioner in Gaya Division



Workshop in Gaya Division



Workshop in Patna I Division



Workshop in Patna II Division