District Level Training Report
Technical Staff MGNREGA, Bihar

Infrastructure for Climate Resilient Growth in India (ICRG) Programme

June, 2017
District Level Training Report, 
Technical Staff MGNREGA, Bihar

Infrastructure for Climate Resilient Growth in India (ICRG) Programme

Submitted By:

IPEGLOBAL

In association with

June, 2017
TABLE OF CONTENTS

ABBREVIATIONS AND ACRONYMS

1 NEED FOR CLIMATE CHANGE SENSITISATION TRAINING OF MGNREGA DISTRICT AND BLOCK LEVEL TECHNICAL PERSONNEL

2 PREPARATION PRIOR TO TRAININGS
   2.1 Objectives of Technical Training:
   2.2 Learning Outcomes Expected:
   2.3 Profile of the Trainers:
   2.4 Profile of the Trainees:

3 SESSIONS, METHODOLOGY, RESPONSE AND PROCEEDINGS
   3.1 Session I:
   3.2 Session II:

4 TRAINING ASSESSMENT

5 LEARNING OUTCOMES ACHIEVED

6 PRE AND POST TRAINING ANALYSIS

7 RECOMMENDATIONS FOR THE ICRG TEAM

8 ACTION POINTS FOR THE BIHAR STATE ICRG TEAM
# ABBREVIATIONS AND ACRONYMS

<table>
<thead>
<tr>
<th>ACRONYM/ABBREVIATION</th>
<th>EXPANDED NOTATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>AE</td>
<td>Assistant Engineer</td>
</tr>
<tr>
<td>CRWs</td>
<td>Climate Resilient Works</td>
</tr>
<tr>
<td>DRDA</td>
<td>District Rural Development Authority</td>
</tr>
<tr>
<td>EE</td>
<td>Executive Engineer</td>
</tr>
<tr>
<td>ICRG</td>
<td>Infrastructure for Climate Resilient Growth</td>
</tr>
<tr>
<td>IEC</td>
<td>Information Education and Communication</td>
</tr>
<tr>
<td>INRM</td>
<td>Integrated Natural Resource Management</td>
</tr>
<tr>
<td>IINRM</td>
<td>Inclusive Integrated Natural Resource Management</td>
</tr>
<tr>
<td>JE</td>
<td>Junior Engineer</td>
</tr>
<tr>
<td>MGNREGA</td>
<td>Mahatma Gandhi National Rural Employment Guarantee Act</td>
</tr>
<tr>
<td>OVG</td>
<td>Other Vulnerable Groups</td>
</tr>
<tr>
<td>PMKSY</td>
<td>Pradhan Mantri Krishi Sichai Yojna</td>
</tr>
<tr>
<td>PO</td>
<td>Programme Officers</td>
</tr>
<tr>
<td>PRIs</td>
<td>Panchayati Raj Institutions</td>
</tr>
<tr>
<td>PRS</td>
<td>Panchayat Rozgar Sahayak</td>
</tr>
<tr>
<td>PTA</td>
<td>Panchayat Technical Assistant</td>
</tr>
<tr>
<td>SC/ST</td>
<td>Scheduled Caste/ Scheduled Tribes</td>
</tr>
<tr>
<td>SHGs</td>
<td>Self Help Groups</td>
</tr>
</tbody>
</table>
1 NEED FOR CLIMATE CHANGE SENSITISATION TRAINING OF MGNREGA DISTRICT AND BLOCK LEVEL TECHNICAL PERSONNEL IN BIHAR

The agro-climatic vulnerabilities in Bihar drastically differ in its northern and southern regions. The southern part of Bihar is mostly drought-affected while the northern region is more flood prone. The ranges of preferred NRM works under MGNREGA are also chosen keeping these vulnerabilities in mind. Further, the durability of these MGNREGA assets, depend majorly on the technical design, which should ideally be resilient to these agro-climatic shocks. Lack of drainage of these floodwaters creates the situation of water logging which leads to inefficient use of land, increase in soil salinity and damage to existing livelihoods. Waterlogged lowlands, traditionally known as chaurs in Bihar, are the saucer-shaped, topographically low-lying areas where rainwater collects and accumulates due to inadequate drainage. Over time, encroachment or obstruction of the drainage channels cause a near collapse of this drainage system, thus compounding the problems created by floods. Thus, Bihar accounts for about 10 percent of the total flood affected area in the country. In comparison, the South Bihar area is considered drought prone and has a system of indigenous traditional irrigation system, ahar-pyne that used to form the backbone of the agricultural economy of the South Bihar plains.

The scoping study to inform Infrastructure for Climate Resilient Growth (ICRG) implementation identified following agro-climatic vulnerabilities:

- Old embankments that have fallen into disrepair;
- Obstructions to traditional drainage system;
- Skewed planning of new drainage systems with respect to catchment area;
- Siltation of drainage lines that cause water logging;
- Sharp diversion of drainage lines that acquire original track during flood conditions;
- Decay of centuries old traditional ahar-pyne irrigation systems;
- Integrated management of land, water and nutrients in the non-waterlogged, upland portion to enhance productivity.

In the light of recent evidence of climate change risks, these agro-climatic vulnerabilities of Bihar will only get aggravated. The aim of ICRG programme is to build capacity of technical and administrative functionaries of MGNREGA so as to build more climate resilient assets under schedule A & B works of MGNREGA. For this purpose, the ICRG team along with its local partners conducted sensitisation trainings of MGNREGA staff in the eight ICRG districts in the state.

2 PREPARATION PRIOR TO TRAININGS

In order to prepare for the trainings for the technical functionaries of MGNREGA, the state team studied, reviewed & analysed the existing knowledge and training resources (training manuals, data reports) available for training of the technical staff. The team also studied data on climate change within Bihar state and developed trends of weather change patterns.
and appropriate works for the ICRG districts. The team carried out consultations with MGNREGA commissioner and rural development department personnel responsible for technical trainings of the MGNREGA technical functionaries amongst others. Based on this, it developed a manual for carrying out technical trainings on developing Natural Resources Management (NRM) works under MGNREGA as climate resilient assets. These trainings were carried out in April-June 2017.

The earlier set of trainings for MGNREGA administrative staff was carried out in Jan-Feb 2017 and the ICRG team received enriching feedback from the participants and incorporated the feedback in the trainings it carried out for the technical staff in Apr-June 2017. Following points were incorporated:

i. Trainings for planning and implementation were organised for the PRI members and SHG leaders where the climate resilient work (CRW) sites have been finalised. The training material prepared by the ICRG team was tailored to participants' expertise and awareness level on climate change in this case.

ii. The ICRG team prepared training and reference materials for the technical staff which included more local techniques, resources and solutions which will be more accessible to them. These were used in the field demonstrations, for e.g. a native variety of lemongrass and mint cultivation in Madhubani to be used in the area around MGNREGA pond; and elevation determination of pond by rope in absence of technical instruments in PaschimChamparan.

iii. The ICRG team provided a copy of technical training manual at the block level and to District Rural Development Authority (DRDA) for future reference.

2.1 Objectives of Technical Training

The technical functionaries of MGNREGA (EE, AE, JE, PTAs) are well versed with the planning and implementation processes of the scheme as a wage employment programme with creation of some assets. But in the context to climate resilient infrastructure under MGNREGA, the technical functionaries at all levels need to be sensitized and capacitated. There is a need to understand the concept of climate resilient works, adaptation packages and how MGNREGA will be able to address the climate change through planning and execution and also how the assets created under MGNREGS would be more durable and climate resilient. More specifically the training aimed at:

i. Planning specifically selection, technical designs and estimate preparation and modifications required for CRWs.

ii. Execution process of CRWs

iii. Promoting knowledge and awareness on climate change, climate vulnerability and its linkage to MGNREGS

iv. Synergy among different programme/schemes to make the MGNREGS works durable and sustainable.

---

1 Under ICRG programme the district level training of administrative personnel was organized in 8 districts in Jan-Feb 2017. In the administrative training 383 participants participated which included 306 MGNREGA administrative staffs, 29 Line departments’ representatives and 48 MGNREGA technical staff.

2 More details on pg.6
2.2 Learning Outcomes Expected

At the end of the training, the participants will be able to learn the following concepts:

i. Understand ICRG objectives and key climate change related terminologies and concepts and situate their local climatic patterns in this context

ii. Understand the linkage of CRWs to MGNREGA and more specifically how the permissible works under MGNREGA are related to climate change.

iii. Understand and learn the technical aspect of CRWs which will include basic technical aspect of Watershed approach & treatment; surface run-off, technical survey for site selection; design modification and addition; estimate modification, use of technical instruments and steps for execution of CRWs

iv. Learn the step by step planning and execution process of building CRWs, basic criteria for selection of sites which includes thorough consideration of the needs and issues of vulnerable populations - women, STs, PVTGs, SCs and physically challenged

v. Understand the importance of post work - asset management process, to integrate alternate livelihoods options and ensure that the CRWs are maintained and utilized efficiently.

PERIOD OF TRAINING: April-June 2017

DISTRICTS: Banka, Begusarai, Katihar, Madhubani, Nalanda, Muzaffarpur, PaschimChamparan, Gaya.

2.3 Profile of the Trainers

<table>
<thead>
<tr>
<th>ICRG Team- Bihar</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Subhendra Sanyal</strong></td>
</tr>
<tr>
<td>Institutional Expert</td>
</tr>
<tr>
<td><strong>Dr. Krishan Murari</strong></td>
</tr>
<tr>
<td>NRM Expert</td>
</tr>
<tr>
<td><strong>Arvind Kumar</strong></td>
</tr>
<tr>
<td>Climate Resilient Expert</td>
</tr>
<tr>
<td><strong>Himanshu Shekhar</strong></td>
</tr>
<tr>
<td>Research Associate</td>
</tr>
</tbody>
</table>

2.4 Profile of the Trainees

The ICRG team sensitised 124 persons, out of which 85 were MGNREGA technical personnel, 36 were MGNREGA administrative personnel (28 Programme Officers and 8 Panchayat Rozgar Sahayaks) and the remaining were line departments personnel (District Programme Manager-Jeevika, Block Programme Manager Jeevika). There was one representative from DRDA, i.e. Project Economist in Katihar.

The participant’s profile can be seen below:
Furthermore, out of the total 124 participants, 3 were women trainees (2.4%). The women trainees comprised Programme Officers (2 nos.) and Block Programme Manager (1 no.) from Jeevika.

3 SESSIONS, METHODOLOGY, RESPONSE AND PROCEEDINGS

Opening Session:

The ICRG team conducted an introductory session through a presentation to take the participants through the objectives of the ICRG programme, technical support it will provide to develop CRWs and the scope of implementation within Bihar and about its presence in Odisha and Chhattisgarh. In Bihar, 35 blocks from eight districts have been selected for ICRG. The session also briefed the trainees about the support required from the MGNREGA personnel official in execution of CRWs in the blocks and the districts.

The rest of the training was conducted in two sessions:

3.1 Session I

In this session, trainees were taken through the broad concept of climate change and importance of this issue in the present times. The trainees were made familiar with the various terminologies used in the context of climate change. They were explained the basic differences between weather and climate and what events can be attributed to climate change and what may not. The session was conducted through a participatory method and the participants shared their current level of understanding on these issues. The trainers conducted a visualisation activity for the participants where they could assume themselves in any four roles, for e.g. farmer, scientist, educationist, teacher, MGNREGA worker etc. and then share their perspective and experience of climate change.

The next part of the session focused on group learning where the trainees shared examples and experiences from their work geographies, for e.g. Balrampur block of Katihar district which earlier had very less incidences of cyclones, now has frequent occurrences of cyclone, locally known as KaalBaishakhi; while Barsoi and Azamnagar has shifting pattern of rainfall by 15 days. Almost all districts reported an increase in heat stress due to increase in temperature and irregular rainfall. The ICRG trainers utilised the information shared by the participants to brief them about suitable INRM works and approach to be considered planning and implementation. This included – usefulness of INRM works on environmental, social and economic front; contribution to food and income security and the need for beneficiaries’ consent while planning for works. A detail of convergence possibilities was
explored with information about various line departments’ schemes which can be used (refer Annexure 1 for the photos of the session).

This session concluded with a group activity where the trainees discussed - “What is the best NRM work you have been part of and what were the technical considerations that made the work successful?” (refer Annexure 2 and Annexure 6 for detailed responses of each district). The main aim of this exercise was to identify the current level of technical knowledge and local information used by MGNREGA staff.

### 3.2 Session II

The second session was a technical session and trained the participants on site selection, implementation of works and important considerations while constructing CRWs and for carrying out impact assessment of work. The discussions were centred on the following topics:

i. **Use of revenue map and topo-sheet for planning of works:** The work must be identified on revenue map as it gives physical location of the site and the surrounding areas. Additionally, a topo-sheet is a very important tool for works planning according to geographical parameters, catchment area, contour etc. Both of these tools were explained to the participants through diagrams. It emerged from the discussions that while most of the participants had knowledge about revenue maps, however very few knew about toposheet. The participants were informed that each district/block needs toposheet for work planning and could be fetched from Survey of India office.

ii. **Use of survey tools:** The participants were explained the use of instruments such as level, pipe, dumpy level, theodolite and A-frame. The technical personnel often did not make use of these instruments mainly due to two reasons, first, many of them did not know how to use them and second, the instruments may not be available in many blocks or at the time and place when they are needed. Further, the ICRG team also took the participants through information on construction materials, soil types, sand, bricks etc. for different works. It was suggested to personally inspect the grade and quality of materials to be used.

iii. **Measurement book and estimation as per SoRs and design:** This topic focused on the measurement books (MBs) and estimation according to the Schedule of Rates (SoRs) and the design. While the knowledge of current rate is important, the trainees suggested that rates should be applied according to the physical conditions of the blocks, for e.g. Gaya and Banka district are hard and rocky but the SoRs is same for Bihar.

iv. **Design and making of Climate Resilient Structure:** The final topic of discussion was designing of climate resilient MGNREGA structures, for which information about local climate, soil, water-runoff, geo-hydrology of the area and an understanding of the community needs is very important. The community should be involved in identifying works that also help them diversify their livelihoods is important. The technical personnel have to determine the catchment area, rainfall and water holding capacity prior to planning of works. The trainers took the participants through some practice mathematical calculations for determining surface-runoff, water demand and size of
pond calculation.

The next part of the session focused on specific structures preferred and constructed in ICRG regions and a model for making them CRWs were discussed. The various structures and the main discussions were:

i. **Farm Pond**: Farm ponds are priority works in Nalanda, Begusarai, Katihar and Muzaffarpur where there are frequent floods. The design of dugout farm pond should have inlet-outlet provisions, and silt trap in the pond to make them sustainable and which were at present being ignored. As part of class exercise, the trainees were asked to identify appropriate place for construction of ponds in their blocks in area of different land slopes (refer Annexure 3).

ii. **Ahar-pyne**: These traditional irrigational structures are priority works in Muzaffarpur, PaschimChamparan and Gaya and need cleaning and maintenance of slope. Other considerations for ahar-pyne include connection of pynes wherever possible to maintain flow of water, construction of small masonry check dam/gunny bag filled with sand check dam and a catchment area treatment of the ahar structure.

iii. **Plantation**: The plantation work is most preferred and successful in Muzaffarpur and PaschimChamparan. The participants were briefed about selection of plant variety according to area suitability and demand of the community, for e.g. mango and litchi in Muzaffarpur and jackfruit trees in Madhubani. The trainers explained the participants about timber tree plantation, ornamental tree plantation according to basic specifications of pit size, plant to plant distance, lay-out and need of protection.

iv. **Earthen dams**: These are most preferred in Nalanda, Banka and Gaya for irrigation purpose. The trainers were asked to consider core wall, upstream slope, downstream slope and integration of other activities such as plantation to make it durable.

v. **Check dams**: They are preferred works in drought prone districts such as Nalanda, Gaya and Banka. As they are more material-intensive work, they require sound technical design. The trainees were asked to consider proper foundation excavation, apron construction, headwall, wing-wall and controlling of silt deposition in structure.

The session ended with a group exercise where the trainees were asked questions from their respective blocks: calculations of the dimension of the pond based on rainfall and crop water requirement and calculation of surface runoff of water? (refer Annexure 4 for photos of the session)

**Orientation of PRIs**: A half-day orientation programme was organised next day for the panchayat leaders, PRI and SHG members, ward members, and community and block level MGNREGA functionaries in eight blocks. The main objectives were to orient PRI members on Climate Change and Objectives of ICRG programme, sensitise PRI/SHG members on the critical role they play in planning of CRWs, Labor budget preparation and identification of work and explain them the INRM approach to work.

Total 265 participants took part in these orientation trainings, of which 72 were women participants. (refer Annexure 5 for Media Coverage of PRI orientation)
Field Visits for Identification of Demonstration Sites and Process Note for Identification of CRW Sites:
The team visited 150 works in 75 panchayats for identification of CRW works for 2017-18.

The method adopted by team in selection/identification of CRW site was:

**Climate Resilience Work Identification Process**

I. Site selection: How to select Demonstration site at Panchayat level

A. Basic details of Block and panchayat
   a. Population density: Census;
   b. Women/OVG participation percentage: MIS data;
   c. NRM work percentage: MIS data;
   d. Major NRM types of work in the area: MIS;
   e. Major problems on NRM works in the area: Action plan document, VA report, NICRA document, NIC district profile, MIS analysis, validating with people.

Outcome: To identify the area/panchayat need to NRM work
B. Crop, soil and water status of panchayat
   a. Cropping systems: Bihar agriculture profile, validating with the people;
   b. Productivity of crop: Bihar agriculture profile, validating with the people;
   c. Soil types: Bihar agriculture profile, CGWR department report;
   d. Hydrology condition of area: CGWR department report;
   e. Water bodies in area: Water resource department report, some validation with PO;
   f. Any water diversion in area: Discussion with local authorities.

Outcome: Based on the analysis of the secondary data, validating with field functionaries and approved work list the site has been identified.

Outcome: To help which types of structure needed in area

C. Situation analysis
   a. Length of structure: with help of Technical staffs and PRS;
   b. Community need assessment: Discussion with community on demand;
   c. Catchment area of structure: for the demand purpose;
   d. Water flow of the area: runoff, lines of water flow, water bodies/ basins;
   e. Maximum benefit for community: by design, twinkling in shape and size, by adding some more work;
   f. Livelihood model in structure: analyzing existing and new options;
   g. Possibility of convergence: proclivity of the community and matching with the schemes of other department;
   h. How many OVG near structure: land distribution pattern around the structure.

Outcome: To find out the sustainability of structure

D. Finalised the CRW
   a. Work listed in Labour budget 2017-18: matching with work list;
   b. Time line of work completion: discussion with the functionaries and community
   c. Estimate, drawing and designed: hand holding
support to PO and JE

d. Periodic follow-up: field visit, discussion,

e. Correlation of Project log frame: data collection

Outcome: To create climate resilience work in area

4 TRAINING ASSESSMENT

The following section is based on participants’ feedback forms and collective reflections of the trainers and the trainees:

The participants were required to fill up the training feedback sheet and give their response on 14 different questions. A total of 115 feedback forms were received from participants.

The main outcomes as per the feedback were:

a. Training content and handouts: 49.57% of respondents reported training content and handouts (manual) to be good, whereas 26% reported training content to be very good.

b. Training methodology: 45.22% of participants reported training methodology which was participatory to be good, whereas 36.53% rated it to be very good and effective.

c. Did Objective of training was met: 71% of respondents felt that the objective of training...
of technical staffs was met.

d. Overall duration of training: 64% of respondents felt that the duration of the training was just right whereas, 29% felt it was either too long or short.

![Duration of the Training Graph]

e. Topics which they found most useful: Respondents reported the topics of Climate change and technical designing of Climate resilient work to be most useful and interesting.

f. Use of training in their work: Respondents mainly reported use of technical information in planning, site selection and technical designing.

![Training Objective was met Graph]

g. Main suggestions and comments from participants: The main suggestions from participants about the training were-

- Training should be held for three days and should be on regular basis as it is very useful and rejuvenating;
- Technical training should be accompanied and be held with field demonstration;
- Training should also be held for Panchayat level workers and leaders;
- Guidelines and model estimate of CRW should be provided to participants for more usefulness.
5 LEARNING OUTCOMES ACHIEVED

The following section summarises main learning outcomes achieved as mentioned in the beginning of the report and is based on collective reflections of the trainers and the trainees:

a. Identify work according to technical suitability: The topics covered in the training included the different approaches to planning, work selection and implementation according to technical suitability. The participants were now in a better position to identify works according to technical suitability as they can bring together their prior knowledge with the technical knowledge imparted by ICRG team.

b. Design climate resilient work, estimation (water catchment area, surface runoff): The ICRG team experts shared design, important consideration to be followed while implementing a work. The participants shared their prior experiences and identified gaps which they were earlier missing. The participants were also involved and cross checked by group/individual exercises. Majority of trainees could understand the basic calculation methods of surface runoff, catchment area etc.

c. Identify integration and livelihood options in surrounding areas: The team oriented the trainees on priority structures in their regions through a CRW and ICRG lens which has the potential to be a package of several convergence and livelihood measures. The trainees shared that they will be able to apply the same in their field work.

d. Understand key climate change related terminologies and concepts and situate their local climatic patterns in this context: Through first session of the training the participants were briefed about climate change knowledge and their experiences were shared. The participants of Katihar district reported local climate resilient and livelihood practices of mulberry plantation. Other examples of linkage of ponds, plantation around pond examples were shared by participants

6 PRE AND POST TRAINING ANALYSIS

The training impact on participants was assessed in Madhubani district by Pre-Post assessment form. The participants were required to answer 15 multiple choice questions in 30 minutes on topics covered by training. The questions included Climate change basic information and engineering and technical questions. It was observed that overall knowledge by training has increased to 73% after the training from 42% marks before the training.

One Junior Engineer from Madhubani opined about the assessment that “Hum logkosabhi engineering terminology yaadaarahi hai, par upyognahi hone k Karanbhuljarahehai. Fir se apne knowledge aur dimagkaupyog hone se hum kaafikhushai.”

We heard many such views in our training in each district.
7 | RECOMMENDATIONS FOR THE ICRG TEAM

The participants suggested various recommendations for the Bihar ICRG team which must be included in next trainings. These recommendations were:

- The classroom training should be held with field demonstration training especially for technical staff. Also, all panchayat level workers could be involved for larger knowledge dissemination;
- The technical training could be given more time and audio-visual tools could be used for better understanding;
- All participants should be given training IEC, if possible soft copies of materials;
- The technical personnel need to be trained in the field for use of technical instruments like dumpy level for better understanding;
- Related subjects and topics such as agriculture, vermin-composting, NADEP etc could also be included in the training.

8 | ACTION POINTS FOR THE BIHAR STATE ICRG TEAM

Based on the recommendations of the technical trainees, the Bihar ICRG state team has taken following actions for future trainings within the state:

a) **Technical demonstration of CRW:** Based on the feedback of trainees, Bihar team will guide technical staffs in field for use of instruments and technical inputs to be used. The team has started in this subject by involving technical staffs in providing technical outputs during field visits to nearly 70 panchayats provided availability of technical instruments.

b) **Local PRI level trainings planned:** Based on demand by trainees, 8 blocks PRI orientation has been completed. The remaining panchayat orientation is planned and will also be done soon.

c) **Local technical solutions and expertise:** The team will help technical staffs in find local solutions of technical problems in designing in absence of proper instruments in most places.

d) **Reading materials and audio-video tools:** As suggested by participants the team will be using more audio-visual tools in the upcoming training for better understanding of topics. In this training, the IEC materials were given to each block.