Infrastructure for Climate Resilient Growth in India (ICRG)

NATIONAL INSTITUTE OF RURAL DEVELOPMENT

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MGNREGA and Climate Resilience

- Since 2005; MGNREGA has invested £53,024 m and generated 23,440 m person days

- Studies show that MGNREGA has helped cope with climate change, but
  - it does not effectively target the poor and the marginalized, and
  - does not address the underlying causes of vulnerability – '***disturbance – damage – recovery – damage'***

- **KEY QUESTIONS that remain UNANSWERED are**

  - What kind of structures, for whom, and where?
  - How to design structures that are resilient to the impacts of climate change?

ICRG Overview

- Technical Assistance programme to MoRD, and 103 blocks in three state – Chhattisgarh, Odisha and Bihar
- Contributes to GoI and State Government's focus on durability of assets under MGNREGS by climate proofing works
- Emphasis on NRM works and those on individual land
- Specifically ICRG does the following:
  - Building capacity of different tiers of government line departments at state level to plan, converge, implement and monitor development programmes addressing climate change
  - By working with them to realise improved resilience through climate proofing of MGNREGA works
  - Fostering and demonstrating convergence as prioritised by State Government and GoI for reducing climate change vulnerabilities

Project Coverage

STATE	DISTRICTS	BLOCKS	TOTAL NUMBER OF GRAM PANCHAYATS IN ICRG BLOCKS	TOTAL NUMBER OF GRAM PANCHAYATS UNDER MISSION ANTYODAYA IN ICRG BLOCKS	MISSION WATER CONSERVATION AND ICRG BLOCKS
Bihar	8	35	522	334	1 district with 4 common blocks
Odisha	5	35	724	481	4 districts with 29 common blocks
Chhattisgarh	9	33	2703	120	6 districts with 20 common blocks
TOTAL	**22**	**103**	**3949**	**935**	**53 of 103 ICRG blocks**

STATE	CRWs SELECTED IN 2017-18	
	TOTAL GRAM PANCHAYATS SELECTED	MISSION ANTYODAYA GRAM PANCHAYATS IN SELECTION
Bihar	60	25
Odisha	89	13
Chhattisgarh	70	20
TOTAL	**219**	**58**

Opportunities to leverage MGNREGA for Enhancing Climate Resilience of Rural Communities

- Impacts of climate change not factored in the choice of assets

- Poor quality of assets
  - Low resilience of infrastructure to flooding and droughts.
  - Low productive benefits of infrastructure .
  - Low evidence base for shaping policy

ICRG Approach: Climate Proofing of MGNREGA Assets

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- **Climate compatible planning of MGNREGA assets** – *Identifying assets that have the greatest potential to reduce climate vulnerability and enhance resilience*

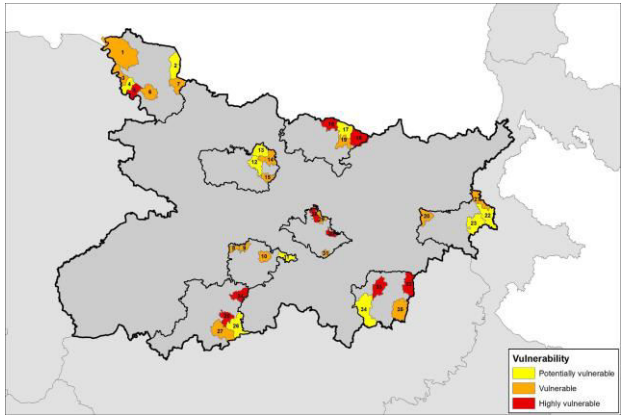
- Climate proofing of selected assets
  - Climate resilient engineering design
  - Integrated natural resource management approach
  - Convergence with other development programs, agriculture, horticulture, forestry, fisheries

Vulnerability Assessment

- "**WHAT**" issues are highly vulnerable to climate change and extreme weather events; "**WHERE**" and for "**Whom**" across the ICRG blocks.
- Vulnerabilities related to climate-sensitive issues (bio-physical parameters)
  - Groundwater availability
  - Net irrigated area
  - Forest cover
- Vulnerabilities related to limiting adaptive capacities (socio-economic parameters)
  - % households with monthly income < Rs 5000
  - % landless households deriving major part of their income from manual casual labour
  - % women-headed households
  - % disabled
  - % primitive tribal group households
- Blocks are ranked relative to values for the parameter as High (H), Medium (M) and Low (L)

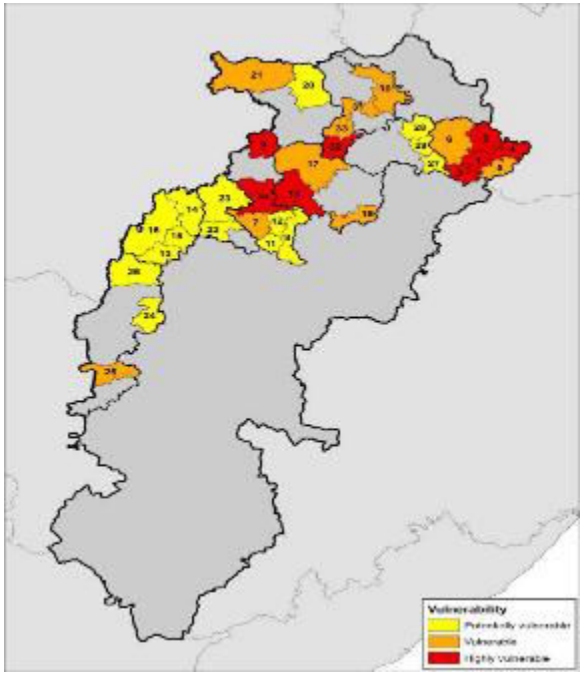
Vulnerability assessment

Bihar: Map of block-level aggregate vulnerability



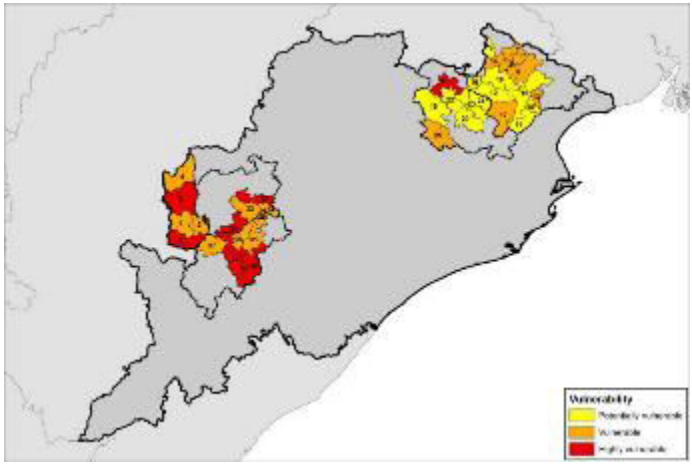
Blocks with high vulnerability: Bhitaha (paschim champaran); Ladania, Laukahi (Madhubani); Muhra, Tankuppa (Gaya); Chhorahi, Dandari (Begusarai); Dhuraiya, Phullidomar (Banka);

CG: Map of block-level aggregate vulnerability



Blocks with high vulnerability:Bilaspur (Kota, Marwahi); Jashpur (Kansabel, Kunkuri, Manora, Pharsabaha); Korba (Pali); Surajpur (Premnagar)

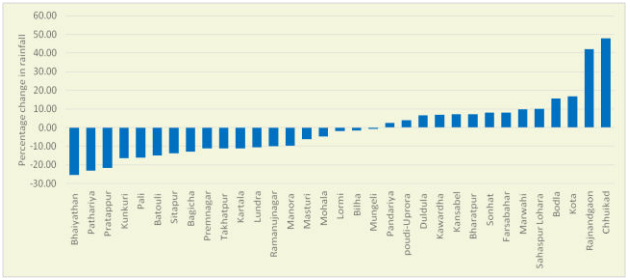
Odisha: Map of block-level aggregate vulnerability

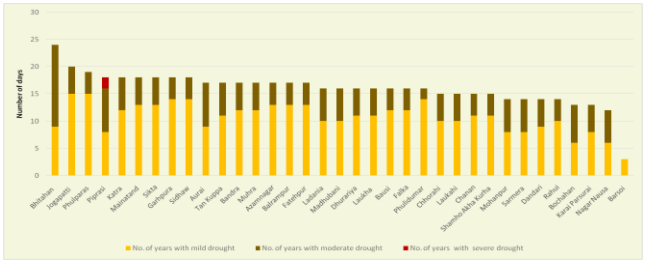


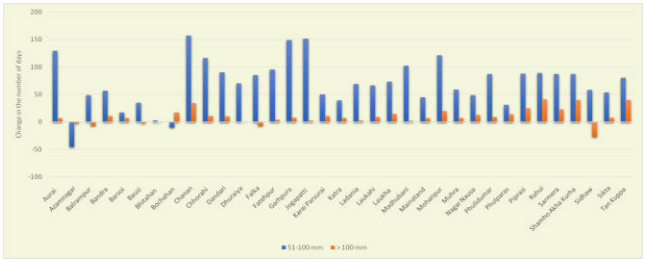
Blocks with high vulnerability:Bolangir (Deogaon, Titlagarh); Kalahandi (Bhawanipatna, Lanjigarh); Kendujhar (Jhumpura); Nuapada (Komana, Sinapali)

CLIMATE Modeling Study at the Block Level

- Climate change projections at block level based on maximum and minimum temperature, monsoon seasonal rainfall, monthly rainfall and droughts for 2020 to 2050
- 103 blocks ranked and prioritized to **identify the "Hotspots" of current climate variability and future climate change**







Planning of Climate Resilient MGNREGA Works

- Block Level Adaptation Packages based of permissible works under MGNREGA identified
- Participatory Labor Budget Preparation and selection of 'dimate resilient works' (CRW) - (i) resource mapping and problem (ii) social mapping improved targeting (iii) selection of CRWs on cluster approach

Map identity no.	Block	District	Aggregate vulnerability	High vulnerability (Poverty)	High vulnerability (Marginalisation)	Low adaptive capacity (Poverty)	Low adaptive capacity (Marginalisation)	Exposure – Drought	Exposure – Flood	Priority works – Drought (Works are listed by Sr. no._Work category code_Name of work)	Priority works – Flood (Works are listed by Sr. no._Work category code_Name of work)
1	Kunkuri	Jashpur	M		• Net irrigated area • Groundw ater availability • Forest cover		• Women-headed households	H	H	**Net irrigated area:** 19_WC_Countour bunds 21_WC_Earthen bunding 32_IC_Rehabilitation of minors, sub minors 33_IC_Community well for irrigation 31_IC_Lining of canals 6_WC_Farm pond 36_WH_Strengthening of embankment **Groundwater availability:** 1_DW_Recharge pits 19_WC_Countour bunds 3_WC_Artificial recharge of well through sand filter 25_WC_Staggered trench 17_WC_Box trenches 20_WC_Diversion drain **Forest cover:** 41_DP_Grass land development and silvipasture 39_DP_Eco restoration of forest 40_DP_Forest protection 44_DP_Road/canal side plantation 38_DP_Afforestation 43_DP_Plantation in Government premises 45_DP_Plantation	**Net irrigated area:** 90_FP_Construction of intermediate and link drains 97_FP_Drainage in water logged areas 96_FP_Diversion weir 91_FP_Construction of storm water drains 95_FP_Diversion channel 93_FP_Deepening and repair of flood channels **Groundwater availability:** 89_FP_Chaur renovation 92_FP_Cross bond **Forest cover:** 44_DP_Road/canal side plantation 38_DP_Afforestation 43_DP_Plantation in Government premises 45_DP_Plantation 87_FP_Bio drainage 96_FP_Diversion weir

Case Study: Khandabandh Village, Jashipur Block in Mayurbhanj District of Odisha

Sensitivity (Biophysical)
Net Irrigated Area
Groundwater availability
Forest cover

Adaptive Capacity (Poverty)
Households monthly income <Rs. 5000
Houseless rural

Adaptive Capacity (Marginalization)
Women headed households

Exposure (Drought)
High (16/30)

Exposure (Flood)
Medium -32 (50-100mm)
9 (>100m)

Priority Works (Drought)

Net irrigated area:
- Contour bunds
- Earthen bunding
- Rehabilitation of minors, sub minors

Groundwater Availability:
- Recharge pits
- Contour bunds
- Artificial recharge of well through sand filter

Forest Cover:
- Afforestation
- Plantation in Government premises
- Plantation

Indicators used for prioritization: Efficacy, Urgency, Durability, Acceptance, Knowledge/Skills, Time, and Co-benefits

Case Study… continued

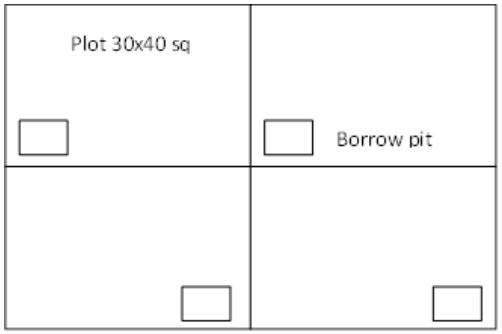
Climate Resilient Infrastructure

- Land development
- 3 farm ponds on individual land belonging to Scheduled Tribe
- 2 Irrigation well
- Compost pits for 31 households
- Legume cultivation on the bunds

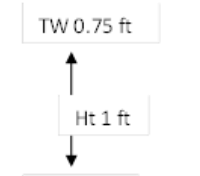
Convergence:

- Drought tolerant paddy varieties and legumes for bund plantation from Agriculture Department
- Promoting linkages with banks and financial support for agricultural equipment through Orissa Livelihood Mission

Climate Resilient Design

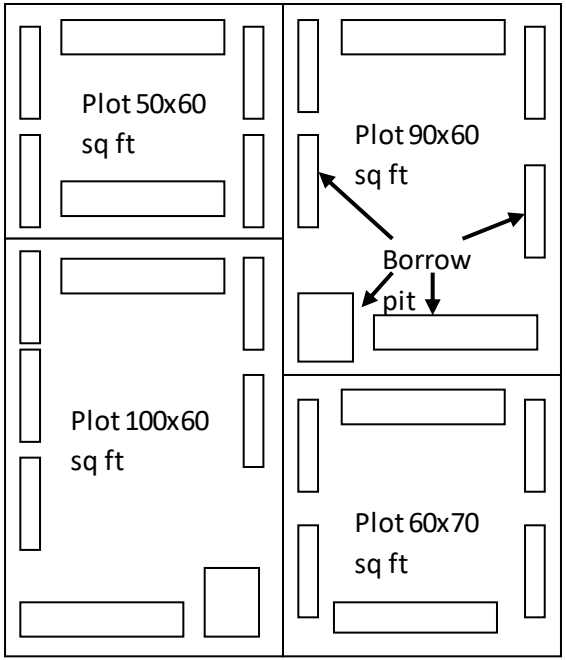


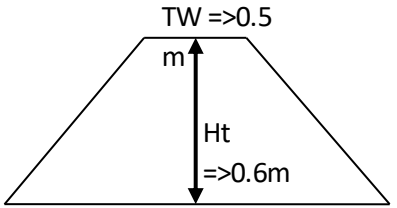
Lavout of plots with size and borrow pits



x-section of bund

Original design: 30x40 model





BW
=>1.7 m
X-section of
bund

ICRG Design: Variable plot sizes as per farmer's wisdom and revenue boundary along with burrow pits at different places & sizes as per slope of the plot and requirement of soil to construct bunds.

Costs and Estimated Benefit

- **Initial Cost –** INR 8.76 lakh
- **Additional Cost**

Components	Units	Total Cost (in INR)	Funding Source
Land Development	11 ha	1.75 lakh	MGNREGS
Farm Pond	3	0.53 lakh	MGNREGS
Dug Well	2	0.33 lakh	MGNREGS
Compost Pit	31	0.33 lakh	MGNREGS
Legumes and fruit trees	20 kg and 500 trees	70,000	Agriculture Department
Agricultural equipment loan		0.44 lakh	OLM
Total		**3.12 lakh**	

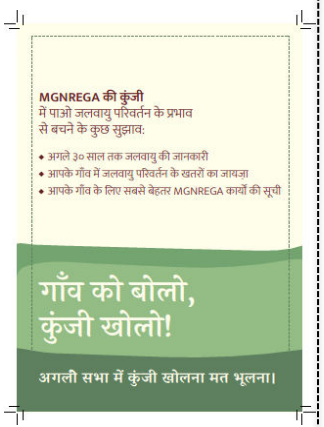
Estimated Benefits

- 18 ha of fallow land will be brought under cultivation; 31 households' direct beneficiaries
- Farm ponds to harvest 29 lakh liters of water for Kharif and Rabi crops
- Assured water for 5 ha of land for vegetable cultivation
- Soil and water conservation
- Improved soil health through organic manure
- Mitigation co-benefits through plantation and soil work

Communication Material on Climate Change

- ‘Climate Kunji’ developed to be used to communicate on possible impacts of climate stress

Paper Tool



Card Game

Animation

https://drive.google.com/a/please-see.com/file/d/1SEO-hoAg6Ct8EtvjUtrh_4EN1iiUeZNS/view?usp=drivesdk

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For more information

http://ipetechnologies.com/icrg

THANK YOU

A joint initiative of :

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Government of India