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General Note



Article is recommended to print as color version in recycled paper. *Save Plants, Save Climate.*







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Technology Demonstration and Capacity Building on Climate Resilient Agriculture: NICRA Experiences

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National Innovations on Climate Resilient Agriculture

Convergence and Continuum

40 institutes of ICAR, 121 KVKs
several SAUs

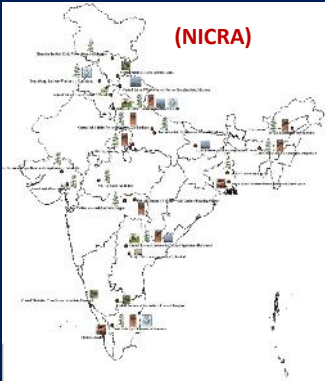
State-of-Art Infrastructure

To enhance the resilience of Indian agriculture (NRM, crops, livestock & fisheries) to climatic variability and climate change through strategic research on adaptation and mitigation

Technology demonstration in 121 districts of 27 States

Capacity Building

- Training of Trainers
- Demonstration of Suitable Agriculture Practices



(NICRA)

Development & dissemination of block level Agromet advisory services

Raipur

RHC, Raipur IVD provides weather forecast to Dist. Climatologist.
 IISKV Dist. of Agrometeorology
 KVK Mahasamund (SRF and advisory committee)
 Preparation of block-level agromet advisories twice a week.

Kovilpatti

Agromet advisory services are provided through KVK Mahasamund (SRF and advisory committee).
 Preparation of block-level agromet advisories twice a week.

Jammu

Agromet advisory services are provided through KVK Mahasamund (SRF and advisory committee).
 Preparation of block-level agromet advisories twice a week.

Work flowcharts developed for block level agromet advisory services

Pilot testing of customized agro met advisories at block level through SAU-KVK interface based on real time feed back- AICRPAM centres and KVKs

Participatory Demonstration of suitable technologies on farmers fields for coping with climate variability

**121 implementation sites by KVKs
7 Core Research Institutes**

Climate Vulnerabilities addressed

- Drought (53)
- Drought & Heat wave (13)
- Drought & Flood (6)
- Drought & Salinity (3)
- Heat wave & High temperature stress (3)
- Heat wave & Cold wave (1)
- Frost / Cold wave / Cold stress (7)
- Cold wave & Hail storm (4)
- Water stress & Cold stress (7)
- Scanty / Erratic rainfall (2)
- Flood / Cyclone / High rainfall (22)

Modules & Interventions

CLIMATE RESILIENT AGRICULTURE

- Soil Health and Carbon Sequestration**: Reliwater Harvesting and Recycling, In situ Moisture Conservation
- Integrated Farming Systems**: Resilient Cropping Systems, Crops and Outlets
- Natural Resource Management**: Crop Production Systems
- Livestock and Fisheries**: Enabling Support Systems
- Feed and Fodder**: Feed and Fodder, Stress Tolerant Breeds
- Extension and Training**: Extension and Training, Village Climate Risk Management Committee

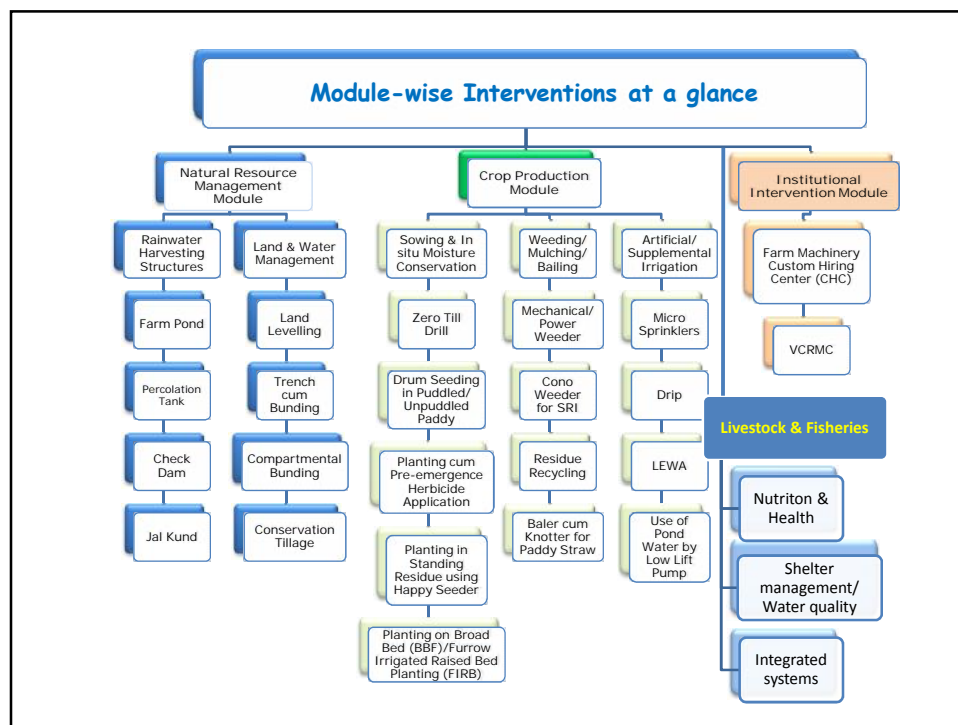
District level contingency plans

Central Research Institute for Dryland Agriculture (CRIDA)
 http://www.crida.in

Technology Demonstrations Across the Country for enhancing resilience to climate variability : Reach


151 sites across the country

Zone (State)	No. of KVKs
Zone I (Haryana, HP, J&K, Punjab)	13
Zone II (A&N Islands, Bihar, Jharkand, West Bangal)	17
Zone III (Arunachal Pradesh, Assam, Manipur, Meghalaya, Nagaland, Sikkim, Tripura)	23
Zone IV (UP, Uttarkhand)	15
Zone V (AP, Maharashtra, Telangana)	15
Zone VI (Rajasthan, Gujarat)	10
Zone VII (Chhattisgarh, MP, Orissa)	17
Zone VIII (Tamilnadu, Karnataka, Kerala)	11
Co-operating centres of AICRP on Dryland Agriculture	23
Technology Transfer Divisions of partner Institutes (CRIDA, IARI, IIHR, NDRI, CMFRI, CIAE & ICAR-RC-NEH)	7




TDC

Village Climate Risk Management Committee



- Comprises of **12-20 members**, represent the community
- Elected President, Secretary and Treasurer
- Manages the **custom hiring centre** for farm machinery
- Under takes repair, maintenance of equipment
- Mobilizes fellow farmers for capacity building programs
- Collectively decide the **implementation of interventions** & pass appropriate resolutions
- **Operates bank account**, deposits include hiring charges and farmers share towards critical inputs like seed, breeds & other inputs



Name of the VCRMC	Village name	No. of members	Bank details	
			A/C no.	Amount
VCRMC, Gumla	Gunia	12	4935101100 06239	44000

TDC

Small Farm Mechanization through Custom Hiring Centers

- Facilitates timely sowing operations in narrow windows of moisture availability
- Precision planting, good germination and better crop stand
- Access to small & marginal farmers of costly machinery
- Crop residue recycling
- Water saving, in situ moisture conservation
- Increase in crop productivity
- Labor saving
- Multiple operations e.g. planter & rotavator



Most Popular Implements in CHCs

- Zero till drill
- Drum seeder
- Rotavator
- Happy seeder
- Ridge & furrow planter
- Multi crop planter
- Multi crop thresher
- Power tiller

Coping with delayed onset of monsoon

Staggered Community nursery technique

- To avoid transplanting of over-aged seedlings (medium to long duration varieties in lowlands)
- Nursery sowings on 15th June, 28th June and 12th July
- Technique adopted by the State Dept. of Agriculture, Bihar in 2013 (Rs 16500 /acre nursery)



TDC

Village level seed production in short duration soybean varieties and flood tolerant paddy variety



ATMA teams visit



District Agriculture officials visit



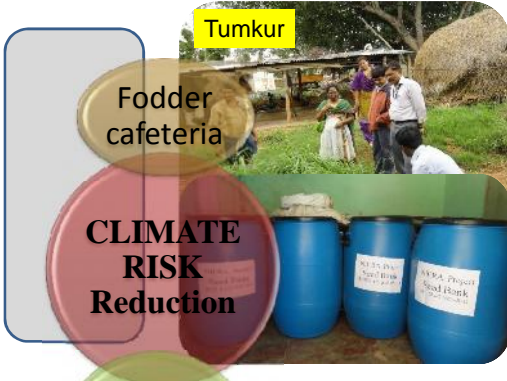
Farmers visit to seed production fields



GAR-13 Lodging resistant paddy variety

Fodder Bank & Seed Bank


Managed by : Bhalot NICRA Management Samiti
 Budget : Annual turn over Rs. 1.80 Lakh
 Period of Fodder Bank : March to June (4 months)
 No. of Farmers benefited : 142
 No. of Animals : 380



Tumkur




Fodder cafeteria

CLIMATE RISK Reduction



Kutch

TDC		Animal Health Camp (AHC)			Zone II
Technology demonstrated	No. of farmers	Unit	Measurable indicators of output* (q/ha)		
			Demo	Local	
Vaccination camp against FMD Cattle & PPR against goat	679	735	Mortality rate (70-80%) reduced	Mortality rate (40-50%) reduced	
Vaccination HS,BQ	2800	1330	100 % Mortality reduced, Increase Milk yield Av. from 1.4 -1.8 lit/day/cow	2.2% Mortality reduced, Av. Milk yield 1.4 lit/day/cow	
Vaccination for PPR in goat and Ranikhet in Poultry.	469	550	Occurrence of disease not recorded in vaccinated group.	Sporadic out break	
Animal health camp (HS+BQ)	300	365	10 % mortality	65 %mortality	
Deworming (Febendazole) & Mineral mixture	50	255	12% mortality	100% Mortality	
Animal Treatment Camp Butox, Prajana,Sulpha Dimadin Oxytetra cycle	330	260 nos	Reduced occurrence of diseases 92%	Occurrence of diseases 35%	
Proper De-worming	1124	500	5	7	
Vaccination raksha triovac	146	120	25	35	
Total	5898	3855			

TDC

Community participation



Village Climate Risk Management, Custom hiring centres, Capacity building of stakeholders, Cross learning visits

In-situ Rain Water Harvesting Structures



Demonstrated on
67 ha involving 229 farmers
Value of convergence Rs 800000



Umarani village, Nandurbar



Convergence with
MGNREGA

Demonstration of Tolerant Paddy Varieties in Flood Prone Areas

- Flood tolerant paddy varieties demonstrated in Assam, AP, Orissa, Bihar, West Bengal, Gujarat
 - Identified performing varieties in low, medium and high inundation areas
 - Submergence tolerance from 7-10 days
 - Increased yield due to reduced extent of lodging
 - Prevented loss in grain and straw yield

Tolerant paddy cultivars	Yield (q/ha)		% increase in yield	B: C ratio
	Demo	Local		
Swarna Sub-1	41.25	33.75	18.9	2.09
MTU-1061	45.28	28.1	23.1	1.84
MTU-1140	55.1	31.8	73.2	2.01



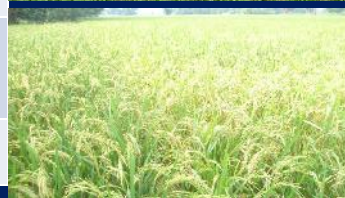
Saran

Direct Seeded Rice for delayed planting

Yield (q/ha)		% increase	Economics of demonstration (Rs./ha)				Economics of Local (Rs./ha)			
Demo	Local		Gross Cost	Gross Return	Net Return	BCR	Gross Cost	Gross Return	Net Return	BCR
35	30	16.67	24238	47000	23510	2.00	30527	41000	11363	1.34

What we could get through NICRA intervention

- Saving in 25 liters of HSD in transplanting
- Saving in 5 hours in tractor operation
- Saving in 35 Man days in uprooting and transplanting of seedlings
- Pump set hours reduced by 3 /ha



TDC

Soil test based SSNM




747 Soil health cards saturated coverage in Rasoolpur Jatan village, Muzaffarnagar



Sea level rise and salinity intrusion to estuaries found to influence the livelihood of estuarine fishermen

Demonstration technology packages for culturing salinity tolerant species in vulnerable districts identified


Species identified

- Milkfish
- Pompano
- Seabass
- Snappers
- Pearlspot

Fish cum paddy culture in Pokkali fields

Small-scale cages




Pen farming of Milkfishes

CMFRI

ADAPTATION &

TDC Training of farmers and cross-learning visits

Thematic Area	Courses	Total
Crop diversification	17	1063
Resilient crop production	249	9562
Farm implements	53	1981
Livestock management	139	5269
NRM	118	4349
STFR	91	3438
RCTs	55	2225
TOTAL	722	27887



TDC Extension Activities

Zone VI

Thematic area	Activities	Male	Female	Total
Method Demonstration	57	738	176	914
Exposure visits	09	241	36	277
Field Day & Kisan Mela	19	961	180	1141
Group discussion	81	1449	217	1666
Awareness	46	403	252	655
Agro-Advisory	125	1028	300	1328
Diagnostic visit to field	37	224	75	299
Animal Health camps	05	201	70	271
Total	379	5245	1306	6551



Capacity building Activities



Training on Agromet advisory services in collaboration with AICRPDA, Biswanath Chariali (Sonitpur)



Animal Health Camp organized at Kyrdem Village (Ri-Bhoi)



Exposure Visit West Tripura (Cachar)



Diagnostic visit (Mokokchung)



Villupuram-Visit to KVK Salem

Training Programme on SRI at Uchol, Andro



Training on value addition (Dimapur)



Silage making at Ramanad

Convergence with ongoing Schemes

KVK / District	Organizations	Interventions
Nalgonda, Kutch Ahmednagar, Amravati, Baramati, Gumla, Kodarma, Chatra, Lunglei, Phek, Senapati, Chittrakoot, Kushinagar, Dantewada, Belgaum, Villupuram	MGNREGA, IWDP, NHM Andhra Pradesh Micro Irrigation Project, GGRC Agriculture Department	Drip, farm ponds, <i>in situ</i> soil & water conservation practices, check dam, farm bundling, jalkund, land levelling
Kodarma, Mokokchung	State Departments of Agriculture	Improved seed of pigeonpea and SRI cultivation
Malda, Dibrugarh, East Sikkim, Mokokchung, Ri-bhoi, West Garo Hills, Cachar, Gorakhpur, Kota, Belgaum, Kolar	State Departments of Agriculture, Animal Husbandry and Fisheries	Animal health camp, preventive vaccination, deworming, improved breeds, fingerlings, fish ponds, mineral mixtures
Muzzafarnagar, Gorakhpur, Nalgonda	District Agriculture department	Seed of green manuring crops and vegetables
Bhagapat, Tumkur	State Agriculture Department, IFFCO, Forest department	Vermicompost, tree seedlings
East Sikkim, Lunglei	ATMA	Training programs, exposure visits

Dissemination involving State line departments at the district level



RKVY member



State Agricultural officers visit



Dryland Agriculture Mission members, Maharashtra



Steering committee members, Tumkur

TDC

Focused Training to Improve Quality of Interventions

- Focused training courses for addressing specific issues
 - Management of rice in flood-prone areas – CRRRI, Cuttack,
 - Management of Direct Seeded Rice – CRURRS, Hazaribag,
 - Operation of machinery in CHCs
 - Establishing climate friendly potential of different interventions
 - Addressing institutional issues



Capacity Development Program for NICRA KVK Scientists at ICAR-CRIDA



19-31 January, 2015; 161 participants from 93 NICRA KVKs



30th April 2015, CRIDA, Hyderabad

Orientation Workshop for 21 new NICRA KVKs

TDC

Video documentation of resilient technologies (30 KVKs)



Brainstorming Workshop conducted on *Climate Resilient Villages (CRVs)*



- Aligning interventions with principles for climate resilience
- Prioritization & trade-offs
- **Measurement & indicators of resilience**
- Support systems, Convergence

Zone	KVK	Zone	KVK
I	Faridkot	V	Amravati
II	Gumla	VI	Valsad
III	West Garo Hills	VII	Datia
IV	Gonda	VIII	Namakkal

Best NICRA KVK Award

Climate Change Portal

