Annual Report 2023-24

National Innovations in Climate Resilient Agriculture

KRISHI VIGYAN KENDRA KENDRAPARA, JAJANGA





Odisha University of Agriculture & Technology

National Innovations in Climate Resilient Agriculture Technology Demonstration Component

Annual Report 2023-24

Name of KVK: KVK, Kendrapara

Nature of Climatic Vulnerability: Flood, cyclone, heat wave, thunder and hail storm.

Name of Adopted Villages: Gajapitha

Brief description of the villages: NICRA adopted village Gajapitha is situated besides river Baghuni, a subsidiary of Chitroptala river which is a branch river of Mahanadi. Flood, Cyclone and heat wave are the regular phenomenon of this village. It belongs to Marshaghai block of Kendrapara district. Agriculture and its allied sectors are the main livelihood option of this village. Major crops of this village are rice, jute and vegetables. Good numbers of livestock population are their major resource (Cow, Buffalo, Sheep, Goat and Poultry). Initially there were only four numbers of farm ponds in this village and the numbers increased after NICRA project intervention. Farm women were being trained on mushroom cultivation, apiary, horticultural QPM production, off season flower cultivation, fodder and seed bank production, vermi-compost preparation, vermiwash and vermin production.

Name of PI/Co-PI/Associated Scientist/SRF:

- Dr. Aurovinda Das (Senior Scientist & Head, PI, NICRA, KVK, Kendrapara)
- Dr. Prabhanjan Mishra (Scientist Horticulture, Co-PI, NICRA, KVK, Kendrapara)

Sri Matruprasad Mohanty (SRF, NICRA, KVK, Kendrapara)

I. Module I: NRM

Technology demonstrated	No. of	Area	Yield	Economics of demonstration (Rs/h		a)
	farmers	(ha)	(q/ha)	Gross Cost	Net Return	BCR
Green manuring (dhaincha) in rice	20	8	14 t/ha	8,500	2500	-
			biomass	(additional cost)	(additional NR)	
Brown manuring in rice						
Summer Ploughing in rice	10	4	-	7,500	5600	-
					(additional NR)	
Azolla in Paddy						

Table. Performances of demonstration of in-situ moisture conservation technologies

Technology demonstrated	No. of	Area	Yield	Economics of demonstration (Rs/ha)		a)
	farmers	(ha)	(q/ha)	Gross Cost	Net Return	BCR
Zero Tillage in wheat / Maize/						
Others crops						
Repair of bund						
Horticultural production on pond	10	0.4	-	12,000	Result awaited	-
dykes						
Organic mulching in vegetables	10	1	-	1,50,200	1,90,500	2.26
Mulching						
Any intervention not covered in						
above						
Total	50	13.4				



Demonstration of green manuring (Dhaincha) in Rice

Table. Performances of water harvesting and recycling for supplemental irrigation

Technology demonstrated	No. of farmers	Area (ha)/Unit	Output (q/ha)	Economics of demonstration (Rs/ha)		
				Gross Cost	Net Return	BCR
Renovation of pond for fish production						
and irrigation						
Renovation of canal						
5% Model						
Bora bandh						
Renovation of Well for irrigation						
Bund making leveling in paddy field						
New water harvesting structure						
Raising of land embankment						
Ground water recharge	45	6 no.	-	29,900	Crops not harvested yet	-
Desiltation of defunct water harvesting structures						

Technology demonstrated	No. of farmers	Area (ha)/Unit	Output (q/ha)	Econo	Economics of demonstration (Rs/ha)	
				Gross Cost	Net Return	BCR
Renovation of irrigation channel						
Newly Check dam						
Renovation of common pond						
Any intervention not covered in above						
River bank plantation of Cashewnut	All villagers	5 ha		28,970	Continuing	
Total	>45					

Enclosed 2/3 photos

Table. Performance of artificial ground water recharge technologies demonstrated

Technology demonstrated	No. of farmers	Area (ha)	Output (q/ha)	Economics of demonstrati (Rs./ha)		tration
				Gross Cost	Net Return	BCR
Field bunding for rice	10	01	45.6	54,400	41,360	1.76
Water management through bunding of rice						
Ground water recharge through SRI by sub-soiler						
Any intervention not covered in above						
Total	10	01				



Field bunding for rice

Technology demonstrated	No. of farmers	Area (ha)	Output (q/ha)	Economics of demonstrati (Rs./ha)		stration
				Gross Cost	Net Return	BCR
Irrigation system (micro Irrigation system)						
Application of bio fertilizer in rice/crops	10	0.4	245	1,45,520	1,84,500	2.26
Vermi-compost from biodegradable wastes						
Production of crops on farm bund						
RBF in crops						
LEWA in crops						
Sprinkler irrigation in crops						
Any intervention not covered in above						
Total	10	0.4				

Table. Performance of different water saving irrigation methods

Mention the variety and Enclosed 2/3 photos

Table. Performance of other demonstrations

Technology demonstrated	No. of farmers	Area (ha)	Output (q/ha)	Economics of demonstration (Rs./ha)		
				Gross Cost	Net Return	BCR
Demo 1						
Demo 2						
Demo 3						
Others if any						
Total						

Enclosed 2/3 photos

Table: KVK wise rainwater harvesting structures developed

RWH structures	No.	Storage	No. of	Protective	Increase in
		(cu.m)	Tarmers	potential (ha)	intensity (%)
Desilting Pond					
New Pond created					
Pond Renovation					
Canal					
Checkdam					
5% model					
Pyne					
Well					
Inlet Channel					
Desiliting drainage channel					
Bora bandh (Temporary check dam)					
Repaired well					

RWH structures	No.	Storage capacity (cu.m)	No. of farmers	Protective irrigation potential (ha)	Increase in cropping intensity (%)
Jalkund					
Small ditches for jute retting					
Landshaping and rain water harvesting					
structure					
Others if any					
Total					

Enclosed 2/3 photos

II. Module II: Crop Production

Table. Performance of different drought tolerant varieties

Technology demonstrated	No. of	Area	Yield(q/ha)		%	Economic	Economics of demonstratio	
Crops with varieties	farmers	(ha)			increase		(Rs./ha)	
			Demo	Local		Gross	Net	BCR
						Cost	Return	
Drought tolerant rice variety	10	10	42.3	34.7	21.9	55,170	33,660	1.61
Bina 11								
Total	10	10						



Demonstration on drought tolerant rice variety Bina-11

Table.	Performance	of differen	t salt tolerant	paddy	varieties

Technology demonstrated (Crops with varieties)	No. of farmers	Area (ha)	Yield (q/ha)		% increase	Economics of demonstration (Rs./ha)		
			Demo	Local		Gross Cost	Net Return	BCR
Crop I								
Crop 2								
Crop 3								
More if any								
Total								

Enclosed 2/3 photos

Technology demonstrated	No. of farmers	Area (ha)	Yield(q/ha)		% increase	Economics (Economics of demonstration (Rs./ha)		
(Crops with varieties)			Demo	Local		Gross Cost	Net Return	BCR	
Flood tolerant rice variety Swarna sub1	10	10	45.6	38.6	18.13	58,400	37,360	1.63	
Flood tolerant rice variety CR1009 sub1	10	10	46.7	41.4	12.8	58,400	39,670	1.67	
Total	20	20							

Table. Performance of different flood tolerant varieties

Mention the variety and Enclosed 2/3 photos





Demonstration on flood tolerant rice variety CR1009 sub1

Demonstration on flood tolerant rice variety Swarna

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sub1
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Technology demonstrated	No. of farmers	Area (ha)	Yield (q/ha)		% increase	Economic	Economics of demonstrati (Rs./ha)	
			Demo	Local	a	Gross Cost	Net Return	BCR
Crop I								
Crop 2								
Crop 3								
More if any								
Total								

Table. Performance of advancement of planting dates in different crops

Mention the variety and Enclosed 2/3 photos

Table. Performances of water saving technologies

Technology demonstrated	No. of	Area	Yield (q/ha)		%	Economic	Economics of demonstration		
	farmers	(ha)			increase	(Rs./ha)			
			Demo Local			Gross	Net	BCR	
						Cost	Return		
Water saving technology									
through SRI									
Aerobic Rice									

Technology demonstrated	No. of farmers	Area (ha)	Yield (q/ha)		% increase	Economic	Economics of demonstr (Rs./ha)	
			Demo	Local		Gross Cost	Net Return	BCR
Direct seeded brown manured rice								
DSR								
Sowing of rice / wheat / Maize with ZTD machine								
Others if any								
Total								

Mention the variety and Enclosed 2/3 photos

Performance of Community nurseries

Technology demonstrated	No. of farmers	Area (ha)	Yield (q/ha)		% increase	Economics of demonstra (Rs./ha)		ration
			Demo	Local		Gross Cost	Net Return	BCR
Crop I								
Crop 2								
Crop 3								
More if any								
Total								

Mention the variety and Enclosed 2/3 photos

Table. Performance of different location specific intercropping systems

Technology	No. of	Area (ha)	Yield (q/ha)		% increase	Economi	Economics of demonstratio		
		(114)	Demo	Local	increase	Gross Cost	Net Return	BCR	
ICM in Rice-blackgram paira cropping system	20	8	62 (REY)	42	61.9	70,100	53,900	1.77	
Crop 3 + Crop 4									
More if any									
Total	20	8							



Demonstration on ICM in rice- blackgram paira cropping

Technology demonstrated	No. of farmers	Area (ha)	Yield (q/ha)		% increase	Economics of demonstration (Rs./ha)		ation
			Demo	Local		Gross Net Cost Return		BCR
Round the year marigold cultivation	10	0.8	133	-	100	1,30,000	2,69,000	3.1
Heat tolerant tomato cultivation	10	2	340	-	100	1,75,800	3,34,200	2.9
Bitter gourd in trellis and grow bag	10	0.4	120	92	30.43	1,19,000	1,80,000	2.51
More if any								
Total	30	3.2						

Table. Performance of different crop diversification in NICRA villages



Demonstration on heat tolerant tomato cultivation



Demonstration on round the year marigold cultivation



Demonstration on vegetable cultivation in grow bag and trellis system

Table.	Performance	of other	demonstration	under cron	production	module
1	I CITOT III MILEC	or other	action action	anaci crop	production	mount

Technology	No. of	Area	Yield	(q/ha)	%	Economic	s of demonst	ration	
demonstrated	farmers	(ha)			increase		(Rs./ha)		
			Demo	Local		Gross	Net	BCR	
						Cost	Return		
Short duration green gram variety Virat in post flood situation	20	10	5.8	5.1	13.7	25,300	15,300	1.6	
Application of vermi- compost in tomato	10	2	280	237	18	2,85,100	2,74,900	1.96	
IPM in green gram	10	2	5.6	4.8	16.6	24,800	14,400	1.58	
IPM in tomato	20	2	295	255	15.6	2, 80,950	3,09,050	2.1	
Oyster mushroom production using jute stick	10	-	2 kg/ bed	1.5 kg/ bed	33.33	46	84	2.82	
Total	70	16		•	•	•	•		



Demonstration on application of vermi compost in tomato



Short duration greengram cultivation in post flood situation



Demonstration on IPM in tomato

III. Module III : Livestocks and Fisheries

Table. Performance of different fodder demonstration in community lands

Technology	No. of	Unit/ Area	Out	put	%	Economic	Economics of demonstration		
demonstrated	farmers	(ha)	(q/	ha)	increase		(Rs/ha)		
			Demo	Local		Gross	Net	BCR	
						Cost	Return		
Hybrid napier CO4	10	0.4	200	-	100	78000	32000	1.41	
Fodder 2									
Total	10	0.4							



Fodder bank

Table. Performance of improved fodder

Technology	No. of	Unit/ Area	Yield (q/ha)		%	Economics of demonstrat		ration
demonstrated	farmers	(ha)			increase	increase (Rs./ha)		
			Demo	Local		Gross	Net	BCR
						Cost	Return	
Fodder 1								
Fodder 2								
Total								

Mention the variety and Enclosed 2/3 photos

Table. Performance of various vaccination camps organized

Technology demonstrated	No. of farmers	Unit/ No/	Measurable indicators of		% increase	E demon	conomics of stration (Re	s /ha)
ucinonstrateu	iai inci ș	Area	output	* (q/ha)	mercase	ucinon	ucinonstrution (1387	
		(ha)	Demo	Local	1	Gross	Net	BCR
						Cost	Return	
Vaccination camp against								
FMD Cattle & PPR								
against goat								
Vaccination for PPR in								
goat and Ranikhet in								
Poultry.								
Deworming								
Mineral mixture								
Proper De-worming								
Vaccination camp against								
other diseases								
Others if any								
Total								

Enclosed 2/3 photo

Table. Performance of composite and cat fish in the renovated ponds

Technology demonstrated	No. of farmers	Unit/ No. / Area	Measurable%indicators ofincreaseoutput* (q/ha)increase		% increase	Ec demons	onomics of tration (Rs.	/ha)
		(ha)	Demo	Local		Gross Cost	Net Return	BCR
Stocking of java punti fingerlings in post flood situation	05	0.8	37.86	31.24	21.19	1,98,320	2,56,000	2.29
Stocking of IMC yearling in post flood situation to minimize culture duration	05	0.8	39.74	31.83	24.85	2,11,947	2,64,933	2.24
More if any								
Total	10	1.6						



Post flood stocking of IMC yearlings to minimize culture duration

Technology demonstrated	No. of farmers	Unit/ No. / Area	Measu indicators (q/h	rable of output [*] na)	% increase	Economics (Economics of demonstration (Rs./bird)	
		(ha)	Demo	Local		Gross Cost	Net Return	BCR
Rearing of stress tolerant poultry breed rainbow roaster	10	200	2.3 kg in 5 months	1.8 kg in 5 months	27.77	157	303	2.92
Rearing of stress tolerant duck breed Khaki Campbell	10	200	2.1 kg in 5 months	1.7 kg in 5 month	23.52	135	243	2.80
Total	20	400						

Table. Performance of livestock demonstration in NICRA adopted villages



Demonstration on rearing of stress tolerant poultry breed Rainbow roaster

Demonstration on rearing of stress tolerant duck breed Khaki Campbell

Technology demonstrated	No. of farmers	Unit/ No. / Area (ha)	Measu indicators (q/l	rable of output na)	% increase	Economics of demonstration (Rs./ha)			
			Demo	Local		Gross	Gross	Net	BCR
						Cost	Return	Return	
Lowcost Portable poultry house	05	05 no.	Continuing						
Shelter 2									
Others if any									
Total	05	05							

Table. Performance of improved shelters for poultry and dairy animals



IV. Module IV: Institutional Intervention

Table. Details of the various institutional interventions

Interventions	ventions No. of Details of activity					
	KVKs	Name of crops / Commodity groups / Implements	Quantity(q) / Number / Rent / Charges	Technology used in seed / fodder bank & function of groups	farmers	No. /Area (ha)
Seed bank						
Fodder bank	01	Hybrid napier CO4	80q	Production of hybrid napier variety Co 4 and Co 5	10	01
Commodity groups						

Interventions	No. of		Details of activity		No. of	Unit/
	KVKs	Name of crops / Commodity groups / Implements	Quantity(q) / Number / Rent / Charges	Technology used in seed / fodder bank & function of groups	farmers	No. /Area (ha)
Custom hiring centre	01	Power tiller, Reaper, knapsack sprayer, Disel pumpset, Power sprayer , Chain saw, Leveller, Weighing machine	Power tiller: Rs. 400/hr Reaper: Rs. 500/hr knapsack Sprayer: Rs. 10/hr Pumpset : Rs. 100/hr Power sprayer (1 no.) Chain saw (1 no.) Leveller (1 no.) Weighing machine (1 no.)	-	55	25
Collective marketing						
Climate literacy through a village level weather station	01	Rain gauge (new)	Rain gauge 1 no.	-	55	-
More if any Total					120	26

V. Village Climate Risk Management Committee (VCRMC)

A VCRMC has been formed by taking members from the village who are actively participating in the decision-making process of NICRA activities in the village. The VCRMC meeting is being conducted monthly for smooth facilitation of NICRA on going activities in the NICRA village. In every meeting the members are discussed about the last month activities along with coming month activities to be taken up in the villages. Apart from that the members are actively participating in the management of seed bank, fodder bank, community plantation, Community nursery, CHC etc. The members also facilitate the selection of appropriate beneficiaries and site for implementation of the proposed program.



VI. Custom Hiring Centres:



Table. Revenue generated through Custom hiring Centres (CHCs) and VCRMC in KVKs

Name of KVK	Revenue generated (Rs.)				
	From CHC during the year Total fund under VCRMC as on 31.03.20				
KVK, Kendrapara	25,500	25,500			
Total	25,500	25,500			

VII. Capacity Building

Thematic area	Topic of the training	No. of	No. of beneficiaries			
		Courses	Male	Female	Total	
Natural Resource Management	Vermi compost production	01	12	18	30	
Crop Management	Increasing cropping intensity by paira cropping	01	27	03	30	
Nutrient Management						
Integrated Crop Management						
Crop Diversification	Cultivation of heat tolerant tomato	01	28	02	30	
Resource conservation Technology						
Pest and disease management	Integrated disease and pest management in green gram	01	15	15	30	
Nursery raising						
Employment Generation						
Nutrition garden						
Repair & Maintenance of farm machinery & Implement						
Integrated Farming System						
Livestock and Fishery Management	Fish pond management in post flood situation	01	18	12	30	
Fodder and feed management						
Lac cultivation						

Thematic area	Topic of the training	No. of	No. of beneficiaries		
		Courses	Male	Female	Total
Farm implements and machineries					
Value addition					
Employment generation	Off season paddy straw mushroom production	01	13	17	30
Others if any					



Training programs conducted on different climate resilient activities

VIII. Extension Activities

Name of the activity	Number of		No.	of beneficiaries
	Programmes	Male	Female	Total
Agro advisory Services				
Awareness				
Diagnostic visit	08	28	12	40
Exposure visits	01	25	15	40
Field Day				
Group Discussion	03	31	14	45
Method demonstrations	04	14	07	21
KMAS Services				
Farmers day				
SHG				
Campaign				
Popular extension literature	01	130	70	200
Animal Health Camp				
World earth day				
Krishak Chaupal				
Kishan Gosthi	02	12	03	15
Woman health and nutrition	01	05	25	30
Technology week				
NICRA Workshop at	01	02		02
ATARI, Kolkata	01	02	-	02
Scientist visit to field	85	220	80	300
Others (Farmers' Fair)	01	110	70	180
Total	107	567	296	873



IX. Soil Health Card Prepared and Distributed

Table- SHC card distribution at NICRA adopted villages

KVK	Year	No of soil samples collected	No. of samples analysed	SHC issued	No of Farmers involved
-	-	-	-	-	-
Employe	J 1/2 DI	h o fo guo u b g			

Enclosed 2/3 Photographs

X. Convergence with Other Ongoing Development Programmes

Table: Convergence of Ongoing Development Programmes/Schemes in NICRA implementing KVKs <td

KVK	Development Scheme /Programme	Nature of work	Amount (Rs.)
-	-	-	-

Enclosed 2/3 Photographs

XI. Dignitaries visited NICRA Villages during 2023-24

Name of KVK	Name of VIPs/Experts	Date of visit
KVK, Kendrapara	Sri Manoranjan Roul, DPD, ATMA, Kendrapara	23.02.2024
KVK, Kendrapara	Sri Mrutyunjay Pattanaik, ADVO, Marshaghai	23.02.2024
KVK, Kendrapara	Dr. Sagarika Pattnaik, Scientist, ORSAC	23.02.2024
KVK, Kendrapara	Sri Dijabar Sethi, ADAO, Garadpur	23.02.2024
KVK, Kendrapara	Dr. Sriram Ratan Pradhan, AHO, Garadpur	23.02.2024
KVK, Kendrapara	Sri Ashok Samal, Assistant Director, Soil conservation, Kendrapara	23.02.2024



XII. Success stories of NICRA Village Farmers with photographs <u>Rice- Blackgram Paira cropping: Converting rice- fallow to rice- pulse system</u>

Nigam Ranjan Lenka, A 35 years old young farmer of NICRA adopted village Gajapitha having 2 hectares of cultivable land, used to cultivate only rice during kharif season and the land remains fallow during rabi season as no irrigation and low residual soil moisture conditions offered little opportunity for a second crop.

As a climate resilient technology KVK, Kendrapara has transformed the rice- fallow into rice- pulse cropping system through paira cropping under NICRA project. Conventionally grown late rice variety 'MTU 7029' was substituted with shorter duration 'Bina 11'. Rice could be harvested earlier leaving adequate residual soil moisture which was utilized successfully for growing a blackgram as paira crop. It was sown in standing rice crop about 10 days before the harvest. Sri Lenka was successful in utilizing the fallow for crop intensification.

Annual net income increased from Rs.24, 500/ha to Rs.46,140/ha and could utilize rice fallow for successful cropping.



XIII. Newspaper coverage



Farmer' Fair cum Exhibition, 23.02.2024, The Sambad



Farmer' Fair cum Exhibition, 23.02.2024, The Samaj

XIV. Publication (Booklet)



Booklet on cultivation of Millet crops in coastal climate

Name of KVK	FINAL RE				Expenditure	Closing Balance
	Contingencies	TA	NRC	Total		31.03.2022
KVK, Kendrapara	9,00,000	45,000	94,000	10,39,000	10,39,000	0

XV. Expenditure Statement of NICRA-TDC Budget during 2021-22

XVI. Awards/Recognition etc. (with photos)

- 1. Sri Sarbeswar Parida (Progressive vegetable farmer)
- 2. Sri Rabindra lenka (Progressive Fish farmer)
- 3. Sri Alok Das (Progressive farmer in goatery sector)
- 4. Sri Chinmaya Mohanty (Progressive farmer in IFS)



XVII. Any other activities (not covered above) (with photos)