

Impact and Performance of NICRA Interventions taken up During Summer, Kharif & Rabi in NICRA Adopted Villages

Suprakash Ghosh, Surya Bhushan, Ravi Shanker, Hemant Kr. Chaurasia, Anjani Kumar and Amrendra Kumar

GVT-Krishi Vigyan Kendra, Godda, Jharkhand – 814 133, India

ICAR-ATARI (Zone-IV), Patna, Bihar

ghoshsuprakash3@gmail.com

The National Innovation on Climate Resilient Agriculture (NICRA) is an initiative by the Indian Council of Agricultural Research (ICAR) launched in 2011 to address the challenges posed by climate change to Indian agriculture. The program aims to enhance the resilience of Indian agriculture to climate variability and extreme weather events through strategic research, technology development, and capacity-building among farmers. Key focus areas include developing climate-resilient crop varieties, efficient water management techniques, conservation of soil health, and adoption of climate-resilient farming practices. NICRA also promotes resource conservation practices and provides farmers with advisories on climate risks, supporting their adaptation and ensuring food security in the face of climate challenges.

Methodology

For this study, the Godda district was purposefully selected, with two villages, Garhi and Gouripur, chosen for inclusion in the project. Under the NICRA Project, GVT-KVK, Godda adopted these villages and introduced three specific farming typologies: FST-1 (rainfed without animals), FST-2 (rainfed with animals), and FST-4 (irrigated with animals). These typologies were designed to build resilience against climate variability by enhancing crop and livestock practices. GVT-KVK, Godda, provided high-yielding crop varieties and improved animal breeds suited to the local agro-climatic conditions. The new crop varieties included paddy (Sahbhagi, Sabour Deep), pigeonpea (IPA-203), finger millet (A-404), horse gram (IK-1), elephant foot yam (Gajendra), mustard (PM-28), wheat (Sabour Nirjal), black gram (PU-31), brinjal (Swarna Pratibha), and tomato (Swarna Kanchan) were demonstrated. To boost livestock productivity, Napier grass and Urea Mineral Molasses Blocks (UMMB) were introduced as animal feed, along with PPR vaccinations for goats. Additionally, high-yielding livestock breeds such as Jharsuk pigs and Khaki Campbell ducks were provided to farmers. To ensure effective adoption of these practices, training programs and demonstrations were conducted, emphasizing sustainable practices and climate resilience. This initiative has ultimately proven to be a profitable venture, bringing economic benefits and enhancing the livelihoods of poor farmers in Garhi and Gouripur.

Results

A review of the data in Table highlights that NICRA farmers consistently achieved higher productivity and gross returns (GR) compared to non-NICRA farmers across all crop types and farming systems.

Table 1. Performance of different drought tolerant varieties at NICRA Adapted villages

FST type	NICRA Farmers						Non-NICRA Farmers				
	Crop / season (name)	Technology demonstrated	Area (ha)	Productivity (q/ha)	CoC (Rs/ha)	GR (Rs/ha)	Non-NICRA farmers practice	Area (ha)	Productivity (q/ha)	CoC (Rs/ha)	GR (Rs/ha)
FST1 (Rainfed without animal)	Paddy (Kharif)	Sahbhagi	6.0	32.0	34040	54400	Saurabh	70	27.6	36120	46920
	Pigeon Pea (Kharif)	IPA 203	2.0	9.0	30082	44100	Local	10.0	7.7	28330	37730
	Finger Millet (Kharif)	A404	2.0	11.7	29360	46800	NA	--	--	--	--
	Horse gram (Kharif)	IK1	2.0	6.4	18507	23040	Local	13.0	5.8	18055	20800
	Elephant foot yam (Kharif)	Gajendra	0.5	201.5	197170	403000	NA	--	--	--	--
FST2 (Rainfed with animal)	Paddy (Kharif)	Sahbhagi	8.6	32.3	34040	54910	Saurabh	70	27.9	36120	47430
	Pigeon Pea (Kharif)	IPA 203	2.0	9.2	30082	45080	Local	10.0	7.8	28330	38220
	Finger Millet (Kharif)	A404	3.0	11.9	29360	47600	NA	--	--	--	--
	Horse gram (Kharif)	IK1	2.0	6.5	18507	23400	Local	13.0	5.9	18055	21240
	Elephant foot yam (Kharif)	Gajendra	0.5	198.6	197170	397200	NA	--	--	--	--
FST4 (Irrigated with animal)	Paddy (Kharif)	Sabour Deep	5.0	33.8	34040	57460	MTU7029	28.0	27.9	36120	47600
	Pigeon Pea (Kharif)	IPA 203	1.5	9.4	30082	46060	Local	7.5	7.7	28330	37730
	Black gram (Kharif)	PU-31	2.0	9.7	22000	48500	Local	15.0	8.5	21517	42500
	Wheat (Rabi)	Sabour Nirjal	17	36.5	36670	73000	20	30.4	36610	60800	17
	Mustard (Rabi)	PM-28	4.0	10.8	23540	54000	Local	16.0	9.0	22225	45000
	Tomato (Rabi)	Swarna Kanchan	1.0	230	66525	322000	Pvt. Company	2.5	182	63945	254800
	Brinjal (Rabi)	Swarna Pratibha	1.0	260	68595	338000	Local	2.0	190	63175	247000

For instance, under FST-1, NICRA farmers using *Sahbhagi* paddy achieved 32 q/ha with a GR of ₹54,400/ha, while non-NICRA farmers using *Saurabh* reached 27.6 q/ha with a GR of ₹46,920/ha.

In pigeon pea and horse gram, NICRA farmers outperformed non-NICRA farmers in both yield and GR. Exclusive crops for NICRA farmers, such as finger millet (*A404*) and elephant foot yam (*Gajendra*), also demonstrated high productivity, with GRs reaching ₹46,800/ha and ₹403,000/ha, respectively. Under FST-4, NICRA farmers growing *Sabour Deep* paddy, wheat, and mustard also showed higher yields and GRs than their non-NICRA counterparts. In high-value crops, NICRA farmers achieved substantial yields and returns, with 230 q/ha in tomato and 260 q/ha in brinjal, compared to non-NICRA farmers' 182 q/ha and 190 q/ha, respectively. In Table 2, under FST2 (Rainfed with animals), NICRA farmers feeding cows a mineral mixture achieve 1155 liters of milk annually with a GR of ₹46,200 per animal, compared to non-NICRA farmers' 966 liters and ₹38,640. For goats, NICRA farmers using PPR vaccination yield 7.2 kg per animal with only 2% mortality and a GR of ₹4320, while non-NICRA farmers have 6.5 kg production, 35% mortality, and a GR of ₹3900. In FST4 (Irrigated with animals), NICRA farmers raising Khaki Campbell ducks produce 212 eggs per duck and a GR of ₹1272, compared to 120 eggs and ₹720 for non-NICRA farmers with Indian Runner ducks. NICRA farmers with Jharsuk pigs reach 80 kg and ₹14,400 GR, while non-NICRA pigs yield 45 kg and ₹8100. NICRA farmers feeding cows Napier grass produce 1190 liters annually and a GR of ₹47,600, outperforming non-NICRA cows at 950 liters and ₹38,000.

Table 2. Performance of livestock demonstration in NICRA adopted villages

FST type	NICRA Farmers						Non-NICRA Farmers					
	Animal	No	Technology demonstrated	Production / year	CoC (Rs / animal)	GR (Rs / animal)	Animal	No	Technology demonstrated	Production / year	CoC (Rs / animal)	GR (Rs / animal)
FST2 (Rainfed with animal)	Cow	15	Mineral Mixture	1155 litre	15330	46200	Cow	10	Paddy straw + seasonal grass	966 litre	15080	38640
	Goat	30	PPR Vaccination	7.2 Kg (2% mortality)	30	4320	Goat	20	No Vaccination	6.5 Kg (35% mortality)	1300	3900
FST4 (Irrigated with animal)	Duck	100	Khaki Campbell	212 eggs	780	1272	Duck	05	Indian runner	120 eggs	590	720
	Pig	30	Jharsuk	80 kg	5125	14400	Pig	02	Non descriptive	45 kg	4825	8100
	Cow	05	Napier grass	1190 litre	15500	47600	Cow	1	Paddy straw + seasonal grass	950 litre	15080	38000

Conclusion

Across all FST types, NICRA farmers consistently achieved higher yields and returns than non-NICRA farmers due to the introduction of improved crop varieties and climate-resilient technologies. The productivity gains were particularly more in irrigated systems with animal

integration, where crops such as wheat, mustard, tomato, and brinjal showed substantial economic benefits. The adoption of NICRA practices has evidently enhanced farm resilience, profitability, crop productivity and livestock management.

Reference

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Demonstration of Leaf Curl Virus-Resistant Chilli Variety 'Arka Meghna' in Sirohi District, Rajasthan

Mahendra Singh, S. K. Khinchi, R. P. S. Jetawat and P. P. Rohilla

Krishi Vigyan Kendra Sirohi (Agriculture university, Jodhpur), ICAR-ATARI, Jodhpur

Chilli, *Capsicum annum* L. is one of the major vegetable spices grown all over the world except in colder regions. It is also known as red pepper or hot pepper. A demonstration was conducted on chilli variety 'Arka Meghna' during *rabi*, 2023-24 and studies on its resistance to leaf curl virus and high yield potential. Ten farmers of Sirohi of Rajasthan participated, cultivating the variety on 1 ha area, yielding 800 kg/ha, significantly outperforming local farmers. 'Arka Meghna' thrived in adverse climate conditions, requiring minimal care and management, ensuring high net returns. This demonstration aimed to evaluate leaf curl virus resistance, assess yield and climate tolerance and enhance farmers' income. Results revealed exceptional performance, combining high yields with virus resistance, reduced production costs and increased incomes. Recommendations include large-scale adoption, capacity building and expansion to additional villages.

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Women Empowerment Through Climate Resilient Micro Integrated Farming System: A Case Study

M. Mokidul Islam, Moloy S. Baruah, M. Sarma and B. Mukhim

Krishi Vigyan Kendra, Ri-Bhoi, ICAR Research Complex for North Eastern Hill Region, Umiam, Meghalaya - 793 104, India

Ri-Bhoi district in Meghalaya, India, covers an area of 2,448 sq. km and has a population of 258,840, with 88.89% being Schedule Tribe. The district is bordered by Kamrup district to
