SUMMARY OF INTERVENTIONS TAKEN UP UNDER NICRA PROJECT DURING THE YEAR 2023-24.

National Innovations on Climate Resilient Agriculture

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Technology Demonstration Component of NICRA

Summary of interventions taken up in NICRA villages in 2023-24
(Annual Report of TDC)

Village: Indramal, Khairbhadi **KVK and District:**Bhawanipatna, Kalahandi **State:**Odisha

Information about the NICRA villages and the focus of activities in these villages

Details of Villages	Village 1 (Indramal)	Village 2 (Kharibhadi)
Name	Indramal	Khairbhadi
Year adopted in NICRA	2021-22	2021-22
*Demonstrations were taken up	Yes	Yes
*Scaling up of promising technologies	Yes	Yes

***Taking up of interventions or Scaling up or hand holding

Summary of Interventions taken up during 2023-24

#Villages	FST1 (Rainfed systems without animal)	FST2 (Rainfed with animals)	FST3 (Irrigated without animal)	FST4 (Irrigated with animal)
	No. of farmers involved in demonstrations	No. of farmers involved in demonstrations	No. of farmers involved in demonstrations	No. of farmers involved in demonstrations
Village 1	15	60	70	14
Village 2	14	42	85	09
Total	**29**	**102**	**155**	**23**

Natural resource management interventions taken up in farming system typologies during the year 2023-24 (in all the villages)

Resilient practice	No. of Demonstrations	Farmers covered	Area covered (ha)
Poly Mulching	5	20	1.5 ha
Renovation of Farm Pond	1	25	9.3ha (Area to be irrigated)

Add rows if necessary

Crop Production interventions taken up in farming system typologies during the year 2023-24(in all the villages)

Resilient practice	No. of Demonstrations	Farmers covered	Area covered (ha)
Demonstration of Climate smart Rice variety "CR DHAN 801"	2	10	2.5 ha

Demonstration on Perennial fodder crop "Super Napier"	2	20	2 ha
Demonstration on Ragi variety-Arjun	2	20	5 ha
Integrated nutrient management in cotton ($ZnSo_4$ + Borax)	2	20	5 ha
Demonstration on Heat tolerant tomato variety-Arka Apeksha & Arka Vishesh	3	15	2 ha
Demonstration on Dragonfruit	2	20	1 ha

Add rows if necessary

Livestock and fisheries interventions taken up in farming system typologies during the year 2023-24(in all the villages)

Resilient practice	No. of Demonstrations	Farmers covered	No. of animals covered	Area covered (ha)
Backyard rearing of poultry bird	1	30	210	-
Low cost goatery shed	5	5	12	-

Add rows if necessary

By products produced and recycled in farming system typologies during the year 2023-24 (in all the villages)

By product produced	Quantity (q/ha)	Selling price (Rs/q)	Recycling of by product	Amount mobilised (Rs)

Institutional interventions (Custom Hiring Centre) taken up during the year 2023-24

Custom hiring centre	Implements	Amount mobilised (Rs)	Farmers covered	Area covered (ha)
1	Paddy Reaper	13500/-	32	8.2

Add rows if necessary

Institutional interventions (Seed bank) taken up during the year 2023-24

Seed systems	Seed produced (tons)	Farmers covered	Area covered (ha)	Quantity of seed retained for next season	Amount mobilised (Rs)

Add rows if necessary

Institutional interventions (Fodder bank) taken up during the year 2023-24

Fodder systems	Fodder produced (tons)	Farmers covered	Area covered (ha)	Quantity of fodder retained for next year	Amount mobilised (Rs)

Add rows if necessary

Capacity Building programmes (HRD) taken up for KVK Staff during the year 2023-24

Theme	No. of training programmes	Number of beneficiaries		
		Male	Female	Total

Add rows if necessary

Capacity Building programmes (HRD) taken up for farmers during the year 2023-24

Thematic area	No of Courses	No of beneficiaries								
		SC		ST		Other		Total		
Farmers and farmwomen training	10	M	F	M	F	M	F	M	F	T
Use of green manuring for better fertility status and crop yield	1	3	5	4	3	9	6	16	14	30
High density planting system in cotton	1	5	3	1	-	14	8	19	11	30
In-situ moisture conservation in vegetable	1	3	-	4	3	15	5	22	8	30
Trenching and bunding method in mango plantation	1	6	4	2	1	10	7	18	12	30
Nursery raising techniques for vegetable	1	8	1	2	6	5	8	15	15	30
Practice of bio-pesticides for management of sucking pest in cotton	1	2	-	5	-	14	9	21	9	30
Disease management in stress tolerant crops	1	3	5	4	2	10	6	17	13	30

Use of small scale entrepreneurship in oyster mushroom production	1	7	4	3	6	4	11	9	21	30
Round the year mushroom cultivation technique in drought prone area	1	2	6	2	1	3	15	7	23	30
Use of farm machinery for conservation of soil moisture	1	2	1	4	1	18	2	26	4	30

Add rows if necessary

Other extension activities being taken up during the year 2023-24

Name of the Programme	**No of activities**	**No of beneficiaries**								
		SC		**ST**		**Other**		**Total**		
		M	F	M	F	M	F	M	F	T
Exposure visit to Hi-tech Horticulture, Nabarangpur	1	9	-	7	-	14	-	30	-	30
Field Day programme on CR Dhan 801	1	8	4	5	7	15	11	28	22	50
Field day Programme on Super Napier	1	9	6	6	4	17	8	32	18	50
Field day programme on Grafted vegetables	1	10	5	4	8	9	14	23	27	50

Add rows if necessary

Summary of Upscaling of technologies taken up during the year 2023-24 (For the continuing KVKs)

Village name	**Technology scaling up/out**	**No. of farmers reached**	**Convergence with the programme**	**Approx. amount mobilised**
Indramal & Khairbhadi	Construction of low-cost goat shed	5	Dept. of Veterinary	50000
Khairbhadi	Renovation of Farm Pond	25	Dept. of Agril-engineering	50000
Indramal	Community Nursery	15	Dept. of Horticulture	40000
Khairbhadi	Backyard rearing of poultry birds	30	Dept. of Veterinary	14000

Add rows if necessary

Extreme events, high intensity rains and dry spells observed during 2023-24so far

Nature of event	**Date**	**Impact on crop yield**

Add rows if necessary

Distinguished visitors during the year 2023-24

Name of visitors	Date	Remarks

Add rows if necessary

Significant achievements during the year 2023-24with good photographs (with JPEG Photographs)

Description	No. of farmers covered	Impact
Demonstration of Climate smart Rice variety "CR DHAN 801" 	10	The paddy var CR DHAN 801 recorded a yield of around 48.2q/ha, where the other traditional varieties have yielded about 39q/ha.
Demonstration on Perennial fodder crop "Super Napier" 	20	Super Napier has boosted livestock productivity by providing high-nutrition fodder, ensuring resilience against climate variations and sustaining fodder availability. Farmers adopting Super Napier have enjoyed increased income due to enhanced milk production and reduced reliance on purchased fodder.
Demonstration on Heat tolerant tomato variety-Arka Apeksha & Arka Vishesh 	15	These varieties have demonstrated resilience to high temperatures, ensuring consistent tomato yields even during summer season. The heat tolerance of these varieties has allowed for extended growing seasons, enabling farmers to cultivate tomatoes in warmer climates and during hotter months. So, farmers got higher return, especially during summer when the market price of tomato is high.
Renovation of Farm Pond 	25	Renovated farm ponds have enhanced water storage capacity, ensuring year-round water availability for irrigation up to an area of 9.3 ha.

Add rows if necessary

Publications from the project

Description	Nature of publication	Citation
Performance of Climate Smart Rice (var. CR DHAN 801): A Case Study from Western Undulating Zone of Odisha, India	Original Research Paper	Meher S., Panda A., Mishra P., Majhi T., Mondal S.K., and Phonlosa A., **Performance of Climate Smart Rice (var. CR DHAN 801): A Case Study from Western Undulating Zone of Odisha, India**, 2024, Vol-14 (Issue-4), *International Journal of Environment and Climate Change*, DOI: https://doi.org/10.9734/ijecc/2024/v14i44098

Provide detailed information of interventions demonstrated in NICRA villages in the following format

a) NRM interventions

NRM Activity	Technology demonstrated	Season	Area (ha)	Productivity (q/ha)	Cost of cultivation (Rs/ha)	Gross returns (Rs/ha)
NICRA Farmers	Polymulching to conserve soil moisturte	Rabi, 2023	1.5	-	-	-
Non-NICRA Farmers						
Specificity of technology	Polymulching, a technique using plastic film or mulch on soil, is crucial for farming in dry areas. It saves water, helps crops grow better, fights weeds, keeps soil temperatures steady, prevents erosion, and boosts yields. Though it costs at first, it pays off with water savings and better harvests. Eco-friendly options for disposal make it sustainable. In short, Polymulching is pivotal for sustainable farming, vital for farmers in dry regions, securing better lives and food for communities.					
Farmers perception about technology	Farmers initially had doubts about Polymulching's effectiveness and cost under the NICRA Project. However, as they experienced its benefits firsthand, their perception likely improved. They would appreciate the water savings, better yields, and healthier soil. The simple and compatible nature of the technique with traditional farming would have also contributed to their positive view. Overall, farmers likely see Polymulching as a valuable solution for tackling water scarcity and boosting agricultural productivity in their village.					

NRM Activity	Technology demonstrated	Season	Area (ha)	Productivity (q/ha)	Cost of cultivation (Rs/ha)	Gross returns (Rs/ha)
NICRA Farmers	Renovation of farm pond to make water available for off-season farming	Rabi, 2023	9.1 ha total area to be irrigator	-	-	-
Specificity of technology	Renovating farm ponds for off-season farming irrigation under the NICRA Project is a proactive approach to managing natural resources. It involves increasing water storage capacity to ensure reliable irrigation during dry periods and improving water quality by addressing sediment and contamination issues.					

	Upgrading pond infrastructure enhances efficiency, while efforts to preserve habitats and engage the community ensure sustainability. This strategic approach aims to boost water availability and agricultural resilience, aligning with the project's goals.
Farmers perception about technology	Farmers are likely to welcome the renovation of farm ponds for off-season farming irrigation under the NICRA Project this year. Initially, there might have been some curiosity about its effectiveness. However, as they see the benefits firsthand, such as improved water availability and quality for their crops, their perception is likely to become positive. They would appreciate the reliability of irrigation during off-seasons, easing their workload and reducing reliance on unpredictable water sources. Overall, farmers would likely see this initiative as a valuable investment in their productivity and resilience, benefiting their livelihoods and sustainable farming practices in the long run.

b) Crop interventions

Crop/perennial	Technology demonstrated	Season	Crop stage affected	Area (ha)	Productivity (q/ha)	Cost of cultivation (Rs/ha)	Gross returns (Rs/ha)
NICRA Farmers	Demonstration on Climate-smart Rice var-CR DHAN 801	Kharif		2	51.2q/ha	57471/-	111970/-
Non-NICRA Farmers	Followed the cultivation of traditional rice var.	Kharif			39q/ha	55215/-	78000/-
Specificity of technology	Under the NICRA Project, cultivating the climate-smart rice variety CR Dhan 801 in drought conditions involves using a rice type that's bred to handle drought. This approach includes methods like saving water during irrigation, keeping soil moist, using precise farming techniques, and managing pests effectively. Farmers are trained to adopt these practices. Overall, the goal is to use water efficiently and make rice more resilient to drought.						
Farmers perception about technology	Farmers like the technology showcased in the NICRA Project, especially the drought-resistant rice variety CR Dhan 801. They're happy that it can survive with less water and still produce good yields. The methods to save water and control pests are also helpful to them. They find the training useful for learning these new techniques. Overall, farmers see this technology as a good way to make rice farming more resilient and sustainable in a changing climate.						

Crop/perennial	Technology demonstrated	Season	Crop stage affected	Area (ha)	Productivity (q/ha)	Cost of cultivation (Rs/ha)	Gross returns (Rs/ha)
NICRA Farmers	Demonstration on Ragi Var-Arjun	Kharif		2.1	8.5q/ha	11538/-	26000/-
Non-NICRA Farmers	Followed the cultivation of traditional	Kharif			5.8q/ha	11214/-	17500/-

	ragi var.						
Specificity of technology	The NICRA Project's demonstration of growing Ragi variety Arjun in drought conditions has been effective. It maintains good yields despite less water. Farmers like it because it handles drought well. Using methods to save water and manage pests has also helped. Overall, this technology improves Ragi farming in dry areas.						
Farmers perception about technology	Farmers appreciate the technology introduced by the NICRA Project, particularly for cultivating the drought-resistant Ragi variety Arjun. They value its ability to thrive despite water scarcity, maintaining satisfactory yields. The water-saving techniques and pest management methods associated with it are considered practical by farmers. Overall, farmers perceive this technology as a favorable approach to enhance the resilience and sustainability of Ragi farming amidst climate variations.						

Crop/perennial	**Technology demonstrated**	**Season**	**Crop stage affected**	**Area (ha)**	**Productivity (q/ha)**	**Cost of cultivation (Rs/ha)**	**Gross returns (Rs/ha)**
NICRA Farmers	Demonstration on INM in cotton (Zinc + Boron)	Kharif		3	8.5q/ha	27902/-	52870/-
Non-NICRA Farmers	Followed the traditional practices.	Kharif			4.9q/ha	26400/-	34300/-
Specificity of technology	The INM demonstration in cotton, focusing on Zinc and Boron supplementation under the NICRA Project, has been successful. By carefully managing these nutrients, the cotton plants' deficiencies are effectively addressed. This targeted application, whether through soil or foliar spray, ensures they're available when needed, improving plant health and productivity. Positive results include better yields and possibly improved fiber quality, along with increased resilience to stresses like drought or nutrient imbalances. It's economically viable, making it a practical choice for cotton farmers and enhancing sustainability and profitability in cotton farming across different conditions.						
Farmers perception about technology	Farmers are pleased with the INM demonstration in cotton using Zinc and Boron under the NICRA Project. Initially, they were not able to understand the concept, but later on found it helpful for improving crop health and productivity by addressing nutrient deficiencies. This technology has led to higher yields and possibly better fiber quality, which farmers appreciate. They also recognize its ability to help cotton plants withstand environmental stresses like drought. Moreover, farmers consider it financially viable, making it a practical choice for cotton farming.						

Crop/perennial	**Technology demonstrated**	**Season**	**Crop stage affected**	**Area (ha)**	**Productivity (t/ha)**	**Cost of cultivation (Rs/ha)**	**Gross returns (Rs/ha)**
NICRA Farmers	Demonstration on perennial fodder-Super Napier	Kharif		4.6	105t/ha	165250/-	31500/-
Non-NICRA	Do not						

Farmers	cultivate fodder crops.						
Specificity of technology	The NICRA Project's demonstration focused on cultivating specific varieties of super napier grass suited for diverse climates. Adaptations to local conditions ensured successful growth, with best practices in planting, spacing, and material selection optimizing yields. Management guidelines addressed irrigation, fertilization, and pest control, alongside intercropping to enhance soil health. Efficient harvesting and utilization techniques maintained fodder quality and livestock nutrition. Farmer training sessions equipped participants with skills for technology adoption, aiming to enhance resilience and livelihoods in targeted regions.						
Farmers perception about technology	Farmers generally had a positive perception of the "Cultivation of perennial fodder super napier" technology under the NICRA Project. They liked that super napier grass could withstand tough weather, like droughts, ensuring a steady supply of fodder for their animals. They found it easy to adopt since it fit well with their existing farming methods, and the project's training sessions helped a lot. Farmers also appreciated the grass's nutrition, which improved their livestock's health and productivity. While they faced some challenges, like initial costs and ongoing management, they still saw the technology as valuable for coping with climate change and making their lives better.						

Crop/perennial	**Technology demonstrated**	**Season**	**Crop stage affected**	**Area (ha)**	**Productivity (q/ha)**	**Cost of cultivation (Rs/ha)**	**Gross returns (Rs/ha)**
NICRA Farmers	Demonstration on Heat tolerant Tomato (ARKA Apeksha & ARKA Vishesh)	Rabi		4.6	240q/ha	105000/-	3.74lakh/-
Non-NICRA Farmers	Followed the cultivation of traditional tomato var.	Rabi			173q/ha	100260/-	269591/-
Specificity of technology	The specificity of this technology lies in its focus on cultivating heat-tolerant tomato varieties, such as ARKA Apeksha and ARKA Vishesh, to address the challenges posed by high temperatures in tomato cultivation. By leveraging these specific varieties and implementing supportive practices, the technology aims to enhance the resilience, productivity, and sustainability of tomato farming in hot climates.						
Farmers perception about technology	Initially, farmers felt intrigued by the idea of heat-tolerant tomato varieties like ARKA Apeksha and ARKA Vishesh, especially if they've struggled with traditional varieties in hot conditions. There could be hope that these new varieties will withstand high temperatures and still yield well, potentially addressing losses due to heat stress. However, some farmers have doubts about the performance of these unfamiliar varieties compared to traditional ones. They were seeking more information about the characteristics and management practices associated with ARKA Apeksha and ARKA Vishesh to effectively adopt them. Overall, farmers saw these heat-tolerant varieties as a positive step towards enhancing farming resilience and sustainability in hot climates, with optimism about their potential to mitigate climate change impacts on agriculture. These perceptions may evolve over						

	time as farmers gain experience and support from the NICRA Project.

Crop/perennial	Technology demonstrated	Season	Crop stage affected	Area (ha)	Productivity (q/ha)	Cost of cultivation (Rs/ha)	Gross returns (Rs/ha)
NICRA Farmers	Demonstration on Dragon Fruit	Rabi		2	Waiting	-	-
Non-NICRA Farmers							
Specificity of technology	The NICRA Project's demonstration on dragon fruit cultivation this year is designed to introduce farmers to a potentially profitable new crop. It encompasses various key aspects: Farmers undergo thorough training in cultivation techniques covering planting, irrigation, pruning, and pest management. The project supplies high-quality planting materials to ensure the establishment of robust orchards.						
Farmers perception about technology	Farmers' perceptions of the demonstration on dragon fruit cultivation under the NICRA Project this year are largely positive. As dragon fruit is a new crop for them, they view it as an exciting opportunity to diversify their income streams and potentially earn better returns.						

c) Livestock intervention

Animals	Technology demonstrated	Production /year	Selling price (Rs/unit)	Cost of production (Rs/ Animal)	Gross returns (Rs/ha)	By products quantity (q)	Unit price of by product (Rs)	Gross returns from byproducts (Rs/ha)
NICRA Farmers	Backyard Rearing of Poultry Birds	3kg	500	170	330			
Non-NICRA Farmers								
Specificity of technology	Under the NICRA project, KVK Kalahandi has showcased backyard rearing of poultry birds, specifically emphasizing "Colour Birds," likely referring to breeds known for their vibrant plumage. This approach signifies a small-scale, decentralized method of poultry farming, well-suited for rural households. Notably, the initiative integrates climate-resilient practices, likely involving breed selection tailored to local conditions and sustainable management techniques. Besides enhancing climate resilience, this initiative holds promise for community empowerment, offering income generation and nutritional security. KVK's role includes providing tailored training on bird management, from feeding to marketing, thereby fostering local capacity building and livelihood improvement.							

Farmers perception about technology	Farmers had a positive view of backyard rearing of poultry birds (Colour birds) under the NICRA Project. They liked the convenience and accessibility of raising birds at home, which provided protein and extra income. This low-resource technology was easy to implement and added aesthetic value to their backyard. Fresh eggs and meat improved family nutrition and food security. Despite challenges like disease and feed availability, farmers saw backyard poultry rearing as a valuable and sustainable practice for small-scale farming communities.

Animals	**Technology demonstrated**	**Production /year**	**Selling price (Rs/unit)**	**Cost of production (Rs/ Animal)**	**Gross returns (Rs/ha)**	**By products quantity (q)**	**Unit price of by product (Rs)**	**Gross returns from by products (Rs/ha)**
NICRA Farmers	Construction of low-cost goat shed	-	750/kg	7800/-	17300/-	-	-	-
Non-NICRA Farmers								
Specificity of technology	The NICRA Project's demonstration on low-cost goat sheds emphasizes sustainability, climate adaptation, and cost efficiency. Using locally available materials like bamboo, wood, and timber reduces construction costs and promotes sustainability. The sheds are designed to ensure goats' comfort and well-being in various weather conditions.							
Farmers perception about technology	Farmers see these shelters as a practical solution that enhances the welfare of their livestock, offering them protection from weather extremes and predators. They appreciate the use of locally available materials like bamboo, wood, and timber, which reduces costs and promotes sustainability.							

Photographs:


DEMONSTRATION ON


DEMONSTRATION ON
LOW COST GOATERY SHADE
Under NICRA-TDC Project
YEAR - 2023-24


FIELD DAY


FIELD DAY


EXPOSURE VISIT
Under NICRA-TDC Project
YEAR - 2023-24