



Newsletter



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Introduction

Climate-resilient agriculture (CRA) is a strategy that aims to increase farm income and productivity over the long run while utilizing the natural resources that are already available through systems of crop and livestock production. A crucial component needed for agriculture to flourish in a sustainable and revolutionary way is making sure that financial decisions are supported by solid data regarding current and potential climate hazards. A key idea in climate risk management is climatic resilience. Resilience in this context refers to an agricultural system's capacity to foresee, prepare for, adapt to, absorb, and recover from the effects of severe weather and climatic changes.

Ensuring the transparent and inclusive engagement of various actors and stakeholders in decision-making and management processes, together with the implementation of both short- and long-term strategies for climate mitigation and adaptation, can all contribute to increased resilience. Certain hydro-meteorological risks, such as temperature and precipitation variations that lead to long-term temperature shifts, altered rainfall patterns, and agricultural droughts, have a gradual beginning. Conversely, some, like floods and tropical storms, happen far more quickly. Both demand a high level of risk readiness based on the evaluation of climate risk.

In 2011, the Ministry of Agriculture and Farmers' Welfare in India, along with the Indian Council of Agricultural Research (ICAR), launched the National Innovations on Climate Resilient Agriculture - Technology Demonstration Component (NICRA-TDC) program. In order to address these issues and promote

climate-resilient agricultural practices, the NICRA-TDC initiative was created. It focuses on creating and advancing management techniques and technological advancements that can improve Indian agriculture's ability to respond to climatic variability and change. Numerous programs are implemented under the NICRA-TDC program to showcase and encourage climate-resilient agriculture techniques across different agro-ecological zones.

Climate vulnerability of 17 KVK districts in West Bengal, Odisha, and the Union Territory of the A & N Islands, was selected through regional coordination by the ICAR-Agricultural Technology Application Research Institute Kolkata. Enhancing farming communities' resilience and adaptive capacity is essential in light of climatic unpredictability and to deal with these extreme events. The NICRA community was selected on the basis of agriculture's vulnerability to weather variations. Using available resources and secondary meteorological data, the multidisciplinary KVK team looked at the constraints brought about by climate fluctuation. The team looked at the limitations related to climate variability based on secondary meteorological data, resource availability, farming practices, and agricultural yields during the last few years.

Therefore, the NICRA-KVK interventions carried out in NICRA villages through the intervention like Natural Resource Management, Crop Production, Livestock, Institutional Intervention, Capacity Building and Extension Activities have not only enabled the farmers to cope up with climatic vulnerability but also played a key role in farmers' adaptive capacity along with sustainable agricultural production.

Drill seeded direct seeded Rice under flood affected situation for resource conservation and profitability at Bhadrak

Occurrence of flood is a regular phenomenon in *kharif* rice in NICRA village Fatepur. There is minimal chance of safeguarding the crop from adverse effect of water submergence. Looking at this prioritized issue, a demonstration on drill seeded direct seeded rice using climate resilient varieties under flood affected situation was conducted during 2022-23 involving 40 farmers. Demonstration comprised of

flood tolerant variety, CR 1009 sub-1 and Swarna sub-1 dry seeding using seed drill, post-emergence application of herbicide Bispribac Sodium 10 sc at 250 ml/ha, disease and pest management measures. Farmers usually practise direct seeded rice with broadcast sowing using normal rice variety such as *Swarna*. Unfortunate flood situation occurred during August at tillering stage of the crop. Farmer practice of using normal variety with broadcast

sowing registered a setback due to flood and the crops were damaged partially; whereas demonstration plot registered encouraging results. Number of hills/m², average no of tillers/hill and grain yield were significantly higher under demonstration over the farmers practice. Farmers have given positive feedback and hopeful for area expansion using this technology in subsequent years.

Technology	No. of hills/m ²	Avg No. of effective tillers/hill	Grain yield(q/ha)	Cost of cultivation(Rs./ha)	Net income (Rs./ha)	BC Ratio
FP	12	8	10.3	25,300	-6,245	0.75
Demo	22	23	38.5	44,700	26,525	1.59



Rice fallow management technology: A successful case of contingent crop planning in flood affected NICRA village of Bhadrak district

Fatepur is a KVK adopted village under NICRA, situated at Dhamnagar block of Bhadrak district. The village is frequently affected by flood resulting in complete damage of main crop rice in *kharif*. During August 2022, 80% of rice crop damaged by unfortunate flood. To meet up this damage, a contingent crop plan has been

made for rice fallow management. Under the rice fallow management plan, a cluster demonstration on pulses (blackgram) has been conducted in 40 ha area involving 100 farmers and farm women. For the demonstration programme, local variety of blackgram has been used. The seeds have been treated with rhizobium

culture and broadcasted in residual soil moisture. By this practice farmers got an average yield of 6.28q/ha. With an average investment of Rs. 10,160/- farmers got an average net return of Rs. 33,800/- which have been proved as a successful climate resilient intervention under NICRA.

Technology demonstrated	No of farmers	Area (ha)	Yield(q/ha)		% increase	Other parameters		Economics of demonstration (Rs./ha)		
			Demo	Local		Demo (No of pod/plant)	Local (No of pod/plant)	Gross Cost	Net Return	BCR
Cultivation of black gram for rice fallow management utilizing residual soil moisture	100	40	6.28	4.9	28.1	23	19	10,160	33,800	3.3

(Dr. A. Das, Dr. J. Maharana & Ms. Bhanumati Dinda
Bhadrak Krishi Vigyan Kendra, Odisha
Dr. P. J. Mishra and Dr. A. Phonglosa, OUAT, Odisha)



Climate Smart technologies to cope up with climatic vulnerability in rain-fed medium land situations at Ganjam

Dry spell and terminal moisture stress is considered to be major abiotic stress in rain-fed area of Ganjam district. To reduce the adverse impact of climate change in medium land condition it is pertinent to mobilise farmers to adopt climate smart natural resources management technologies and to cultivate newly developed stress tolerant rice varieties. Krishi Vigyan Kendra, Ganjam-I carried out a demonstration programme in rain-fed medium land and the climate smart technologies used were raising of farm bund of a height of 10 inch, green manuring with sesbania at 35 DAT, transplanting one week in advance by raising nursery near water bodies and using drought tolerant medium duration (120-125 days) rice variety (*Swarna Shreya*). The demonstration was conducted in NICRA cluster villages- Lepa, Chikili, Nada and Chopara in 10 ha area involving

30 farmers during *kharif* 2022. *Swarna Shreya* is a medium duration (120-125 days) rice variety, tolerant to moisture stress for 12-14 days. Traditionally farmers were growing *Lalat* (120-125 days) without any climate smart technology with average productivity of 33 q/ha. The variety was also prone to disease and pest and could not withstand terminal moisture stress. Nursery raising was done during 3rd week of June and transplanting was done during 3rd week of July. All the package of practices of rice were followed and harvested during 4th week of October. A dry spell of 11 days



(21.09.2022 to 01.10.2022) occurred at milking stage of crop. The *Lalat* variety was affected to a great extent by chaffy grains. However, a significantly higher production of 17.5% (35.6 q/ha) was achieved by growing *Swarna Shreya* as compared to traditional rice var. *Lalat* (30.3 q/ha). The net profit in *Swarna Shreya* var. was Rs.35200/ha with B:C ratio of 1.98 as compared to net profit of Rs. 27600/ha and B:C ratio of 1.84 in *Lalat* var. of rice. It also facilitated for early greengram sowing with better soil moisture availability. Farmers were satisfied with the new climate smart technologies for drought prone rain-fed medium land situations.

(Dr. S K Satapathy and Dr. P K Panda
Ganjam I Krishi Vigyan Kendra, Odisha
Drs. P.J. Mishra and A. Phonglosa, OUAT,
Odisha)

Creation of better livelihood through capacity building of farmers and farmwomen on backyard poultry farming at Dhenkanal

Ademonstration on “Backyard poultry farming” was conducted in the year 2022-23 at Arachua Village, GP-Mathatentulia, District-Dhenkanal, Odisha under NICRA-TDC Project. In Arachua village climatic constraints like drought, cyclone, heat wave etc. are the major problems leading to crop failure, for which farmers face a lot of problems at the time of cropping season. Most of the people of the village depend upon farming like rice, vegetables cultivation and livestock production. After intervention



of NICRA-TDC Project undertaken by KVK Dhenkanal at Arachua village,



training and demonstration on backyard poultry farming were conducted

involving farmers and farmwomen of the village. Poultry breeds such as *Aseel*, *Vanaraja*, *Kadaknath* with low-cost poultry shelter were provided to

the farmers for additional income and livelihood support throughout the year to enhance their standard of living. By adopting this technology, farmers got

additional income of Rs. 30000/- per year as compared to the local non-descript variety.

Technology demonstrated	No. of farmers / units	Unit/ No. / Area (ha)	Av. Body weight at 6 months		% increase	Economics of demonstration (Rs./ bird)		
			Demo	Local		Cost	Net Return	B:C Ratio
Poultry (Aseel)	20	1000 birds (20 units @ 50 birds per unit)	1.20kg/bird	0.80kg/bird	50	164	436	3.66

(Dr. Bimalendu Mohanty, Dr. Dibya S Kar and Ms. Soumyasree Swain
Dhenkanal Krishi Vigyan Kendra, Odisha
Dr. P. J. Mishra and Dr. A. Phonglosa, OUAT, Odisha)

Ensuring livelihood security by Community based Sequential Paddy-cum-Fish Farming in Puri District

Puri district is mostly affected by climatic hazards like untimely heavy rainfall, cyclone, super-cyclone, flood, flash flood etc. More than 70% of the geographical area of NICRA adopted Jatipur village are low-lying and become water-logged during monsoon season. In these areas, water stands 3 to 4 feet level above the crop fields and this hinders greatly to take up rice cultivation during *kharif* season. During this *kharif* season of 6-8 months, farmers sit idle and compel some of them to go on exodus in regular basis to different cities of the country to earn their livelihood as daily labourers in brick kilns, construction sites, agricultural farms, hotels, spinning mills etc. Therefore, KVK Puri took some interventions looking into the issues.

Out of total geographical area of 77 ha of village, a compact patch of paddy field of 17 acres area with ownership of 17 nos. of small and marginal farmers was identified



to take up "Scientific sequential paddy-cum-fish farming" during fallow period of *kharif* 2022. During the month of May-2022, the peripheral embankment of the 17 acres land was made strengthened by doing mechanical earthwork up to a height above maximum flood level that came during last 10 years. There, two nos. of 'Farm ponds' of total WSA 0.3 acres were present within the selected patch. The farm ponds were made dewatered, exposed for sun-drying, filled up with water, fertilized and stocked initially with 4000 nos. of *Jayanti rohu* stunted fingerlings. To start with backyard income generating activities the interested farm families were supplied with 400 nos. of *Khaki Campbell* ducks, 1000 nos. of *Kadaknath* chicks and 1000 nos. of White Pekin ducks. During July and August, 2022 the two farm ponds were phase-wise stocked with 10000 nos. of *GI catla*, 8000 nos. of *Jayanti rohu* and 10000 nos. of *Amur* carp fry.

By the end of August 2022, the 17 acres patch was impounded with sufficient rain water and the water depth became 3 – 5 feet level (due to undulated bottom). 800 kg lime was applied into the water after checking water quality parameters. Then water was manured with raw cow dung according to the requirement. Around 150 kg grass carp juveniles were stocked to control luxuriant growth of emergent weeds (*Nymphaea*).

Over the newly strengthened peripheral embankment, fruit crops like 800 nos. of Andhra Patakapura Banana were planted at a stretch of 925 metres within which other crops like sweet corn *var. Madhuri*, *colocassia*, okra, cowpea, radish, marigold and cucumber were intercropped.

During the month of December 2022, the beneficiaries of this 17 acres land transplanted the *Bina 11* variety of rice for summer paddy cultivation after dewatering






and harvesting of fishes. The land was mucky and ready for transplanting. The luxuriant vegetative growth of paddy plants was envisaged due to adequate supply of nutrients from the organic matter that gradually accumulated in the soil during the previous fish crop. Without much application of manures, fertilizers and taking negligible measures for pest attack they could be able to harvest a bumper paddy crop by first week of May 2023.




With this technological intervention, the yield from summer paddy was increased up to 22-24% over previous years with productivity of 43.6 and 46.2 q/ha for *Swarna sub-1* and *CR-1009 sub-1* with additional net incomes of Rs. 8,300/- and Rs.10,600/- per ha. respectively. During the “No income period” of *kharif* season farmers could be able to produce 35.7 q fish of worth Rs.3,60,000/- with net income of Rs.1,65,000/- and 360 q of vegetables of worth Rs.4,21,000/- with net income

of Rs.2,30,000/- approximately. With the success of the project, the model is now popularly called as “Jatipur model”.

(Dr. S. Mohanty, Dr. Dipsika Paramjita and
Mr. Pranaya Pradhan
Puri Krishi Vigyan Kendra, Odisha
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Different climate smart activities for improving agricultural production in NICRA village of Coochbehar to Combat with change Senario

Technologies demonstrated	Description	Impact	
Submergence-tolerant variety of rice (<i>Swarna Sub-1</i>)	Demonstration conducted on Khagribari, Singimari, Pachunir Par and Chhat Singimari village. Total numbers of farmers are 45.	In low lying areas submergence tolerant variety of rice showed better results than traditionally used varieties	
Short duration variety of rice (<i>GB-1</i>)	Demonstration conducted on Khagribari and Singimari, Pachunir Par village. Total numbers of farmers are 20.	Cultivation of short duration variety of rice in Jute fallow field resulted in early sowing of next crop.	
Zero tillage in Maize (<i>DKC 9217</i>)	Demonstration conducted on Khagribari, Singimari, Chhat Singimari village. Total numbers of farmers are 35.	Innovative measures, such as the demonstration of zero-tillage maize production in paddy fallows during the <i>Rabi</i> season, were acknowledged as improving the cropping pattern. The advantages of zero tillage include reduction in the crop duration and thereby early cropping can be obtained to get significant yields, reduction in the cost of inputs for land preparation, residual moisture can be effectively utilized and number of irrigations can be reduced and dry matter and organic matter get added to the soil. Farmers prefer this technology due to farm labour shortage; avoid delay in planting and to reduce the cost of production.	

Technologies demonstrated	Description	Impact	
Zero tillage in Wheat (DBW-187)	Demonstration conducted on Singimari village. Total numbers of farmers are 10.	In the context of progressive climate change, response consistency becomes an increasingly important evaluation criterion when assessing the suitability of a technology for smallholders with a low risk-bearing capacity. Sustainably enhancing wheat productivity in Coochbehar is vital for ensuring future food security. Zero-tillage (ZT) wheat has previously shown significant yield benefits in field trials.	
Poly-Mulching in vegetables	Demonstration conducted on Khagribari village. Total numbers of farmers are 12.	The use of poly mulch has assumed a significant part in the increases in production of brinjal, tomato, winter cucumber, okra among different vegetables. Farmers will make use of this innovative technique that helps them conserve moisture, avoid weeds and improve soil health tremendously while producing more.	
Straw-Mulching in vegetables	Demonstration conducted on Khagribari, Singimari village. Total numbers of farmers are 20.	Mulching could potentially serve the purpose by reducing soil evaporation, conserving moisture, controlling soil temperature, reducing weed growth, and improving microbial activities. Additionally, mulches could provide economical, aesthetic, and environmental advantages to agriculture. Mulches are a cheap source to reduce weed populations and to conserve the soil moisture contents to a substantial level.	

(Dr. Bikash Roy, Dr. Samima Sultana and Dr. Bablu Ganguly
Coochbehar Krishi Vigyan Kendra, West Bengal)

Mulching: An effective climate smart technology for okra production in Murshidabad

The district Murshidabad is endowed with wide bio-diversity. Thus, the district is popularly known as 'crop cafeteria' or 'crop museum'. Apart from jute, paddy, pulse and oilseeds; diversified types of vegetables also predominate in the district. Okra, one of the major vegetables produced, is cultivated during pre-kharif



and kharif season in the district and the village adopted under NICRA project as well. However, it has been noticed that the productivity is not upto the desired level and cost of cultivation is also higher due to heavy weed infestation, irregular rainfall with short dry spell and low soil moisture holding capacity along with high

atmospheric and soil temperature requiring irrigation that too lifting ground water. Keeping the above in view, Dhaanyaganga Krishi Vigyan Kendra conducted demonstration using plastic mulch in okra cultivation.

The black plastic mulch of 25 micron was



used in demonstrated plots at Sujapur, Beldanga-1 block, Murshidabad. The perforation in mulch was made as per spacing requirement that is 50 x 30 cm. It has been observed that seed germination and plant growth was higher in demonstration plots as compared to no-mulch plots. About 18-20% higher yield over the control, i.e., non-mulched plot was recorded in mulched plot specifically

due to more number of fruits per plant and number of pickings. This can be explained by better microclimate, i.e., ambient low soil temperature and optimum moisture content under poly-mulch because of better surface energy balance in mulched plot and better nutrient uptake by the crop due to nearly 50% less weed infestation as indicated by weed biomass weight in mulched plot. Lower cost of cultivation in

mulched plots even after additional cost involvement for mulch material was due to reduction in total number of irrigation by 4 no. and less labour requirements for weeding operation.

(Dr. Sujan Biswas, Mr. Uday Narayan Das
and Dr. Manas Mondal
Dhaanyaganga Krishi Vigyan Kendra,
Sargachhi, West Bengal)

Improved Millets variety –A boon for the drought prone areas of Purulia district

About 30-35 years back, before the invasion of dwarf, short duration, drought tolerant HYVs gradually replacing tall, photosensitive, long duration, poor yielder, traditional rice varieties; the crop suffered badly due to intermittent drought phases. At that time, majority of farm families, mostly marginal and small, were over-burdened with debt as they normally exhausted their food grain's stocks in the month of September before the harvest of *kharif* rice. As a result, they were familiar to consume short duration drought tolerant upland crops like millets namely pearl millet, barnyard millet, finger millet *etc.* to save their families from complete starvation. Therefore, farmers of this drought prone tract of Purulia are well aware about the cultivation and consumption of those nutri-cereals as an age-old practice and capable of producing these crops in the vast available uplands not fit for other annuals particularly rice. Therefore, with re-introduction and popularisation of millets in our drought prone vast available land resource, we can replace our weakness as our strength while our threats as an opportunity with increasing demand among economically strong and health-conscious masses.



In this backdrop, we have initiated activities like demonstration and seed production of improved varieties of certain millets, particularly finger millet and barnyard millet, since 2018 when our government declared it as a "National Year of Millet". From those days we are gradually



taken initiatives like organising training programmes, field days, farmers days and seed production involving practicing farmers. We have initiated seed production of finger millet variety '*Indravathi*' from



breeder seed collected from WBSSC with complete technological backup. It has been observed that with minimum attention and external input we got about 14 q/ha production from a highly degraded and



eroded upland with severe moisture stress.

This year also along with all our regular programmes we have organised 'Recipe contest among rural women on millet-based food product', after a series of group meetings involving women SHGs of our NICRA village -Haramjanga of G.P.-Bhangra of Purulia to celebrate "International Year of Millet-2023". The village women are actively participated there and made several types of food items from finger millet and barnyard millet like *Payas*, *Paratha*, *Pitha*, *Laddu*, *Khichuri*, *Barfi*, *Halua* etc. which were

very much tasty and very good for our health also. The village people along with some renowned persons from different parts of Purulia tasted the food products and after evaluating the products some of the participants were greeted with trophies and certificates for their extra-ordinary performance in the recipe contest. It was not only an eye opener for grassroot level extension workers like us but also for the villagers as they found that, they are capable of preparing such exclusive nutritious high value food products from those crops which have been neglected for the last two to three decades and was in the verge of

extinction from their crop calendar.

In this programme about 150 participants from different adjoining villages participated and we have selected 15 of them, three from each category as the prize winners that have created huge enthusiasm particularly among farm women of these drought prone area.

(Dr. Manas Bhattacharjya,
Dr. Sanjib Bhattacharya and Dr. Biman Maity
Purulia Krishi Vigyan Kendra,
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Mulching, INM and IDM augmented vegetable cultivation in Kalahandi

Sri Gouranga Sahu was a marginal farmer having low economic background and managed his family with lot difficulties. He was completely dependent upon agriculture for his daily expenses. In 2020, he decided to start vegetable farming in addition to cultivation of paddy as an enterprise to provide economic stability and sustainable livelihood for his family.

Sri Gouranga Sahu started vegetable farming in the year 2021 in 40 decimals of land area. Initially the cultivation method was found to be traditional with low yield rate. He started cultivating Tomato and Brinjal using the local varieties. This young farmer is very enthusiastic to practice innovative agricultural practices and cultivates the produce considering consumers demand and prevailing markets price which helps him to incur



profit from his agricultural practices. Learning the techniques from various capacity building programmes of KVK Kalahandi and adopting those practices at right time grant him a positive result in the field in terms of production and income. He was added as a beneficiary in the intervention practices of Mulching in vegetable, which was taken up to conserve the soil moisture under NICRA project. Another intervention which helped him was the practice of IPM and IDM in vegetables taken up under NICRA Project for the year 2022-23. He has also received the quality planting materials of different vegetables distributed by KVK. He also got knowledge on use of hi-tech horticulture, drip system of irrigation (per drop more crop), use of water-soluble

nutrients, off-season vegetable cultivation and production of high value low volume exotic crops etc., which was promoted by KVK through various extension programmes. Now he is profitably cultivating vegetables on 1.5 acres of land area, which encompasses the production of Tomato, Chilli, Okra, Bottle gourd, Cauliflower, Cabbage, Bitter gourd etc.

Sri Sahu was included as a beneficiary in the Mulching intervention under the NICRA project. This practice helped him conserve soil moisture, reducing water usage and enhancing crop yields. The strategies of IPM and IDM significantly reduced pest and disease pressure, resulting in healthier crops and higher yields. He expanded his farming calendar by engaging in off-season vegetable cultivation. This allowed him to take advantage of market opportunities and



generate income year-round. Now he is able to earn an average of Rs. 4.5-5 lakhs annually from vegetable cultivation.

Witnessing the profit gained from the crops (specific-vegetable) other educated youth also are trying to follow his footsteps. The village is known in the district for vegetable cultivation. To promote vegetable farming, farmers are supported with low cost shade net, quality planting material by district horticulture department.

The Scientist from KVK, Kalahandi trained him to take proper care and management of vegetable farm. A recommended cropping scheme was strictly followed. Krishi Vigyan Kendra has played a multifaceted role in Sri Sahu's agricultural journey, ranging from knowledge transfer and technical guidance to providing critical support through the implementation of specific interventions and the distribution of quality planting materials. Through its comprehensive

approach, KVK has empowered Gouranga to transition from traditional farming methods with low yields to a profitable agricultural enterprise that embraces innovation, sustainability, and market demands.

His farm land has been visited by farmers of in and out of the district and been renowned as technical expert in his village in terms of vegetable farming.

Impactfactor	Before Adoption	After Adoption
Farmer Practice	Only tomato and Brinjal were grown without any scientific care and management. No hybrid varieties were cultivated	Vegetable component includes Tomato, Brinjal, Chilli, Okra, Bottlegourd, Cauliflower, Cabbage, Bittergourd, Cucumber etc. Proper care and management was taken into practice. Hybrids and grafted cultivars are used.
Yield of Product	Tomato Production is around 10.5 q from 0.2 acre of land.	Tomato production from 0.5 acre of land is around 41 q.
	Brinjal Production is around 11.6 q from 0.2 acre of land.	Brinjal production from 0.5 acre of land is around 43 q.
	-	Total vegetable production from his farm is around 185 q annually.
Gross Income	1,13,040/-perYear	4,45,000/-perYear
Net Profit	74,520/-perYear	3,52,500/-perYear
Dissemination of knowledge in the locality	A few farmers have adopted vegetable cultivation but with the local varieties and no proper care and management.	The farmers residing at vicinity to Indramal village adopted to cultivation of vegetables using hybrid cultivars and taken scientific care and management.
Knowledge gain based on 1-5 scale*	1	5
Feeling of economic security based on 1-5 scale*	1	4
Ability to understand and solve problems based on 1- 5 scale*	1	5
Self image in community based on 1-5 scale*	1	4
Self confidence based on 1-5 scale*	1	5

*1-5 Scale Indicates 1= lowest and 5= highest

(Dr. A Panda, Dr. Tulsi Majhi and Mr. Swaraj Meher
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Dr. P. J. Mishra and Dr. A. Phonglosa, OUAT, Odisha)

LiFE Campaign and Celebration of World Environment Day in NICRA village of Sundarbans

A demonstration on application of Kisan Drone was organized for spraying nano-DAP on Lathyrus in the NICRA village on 29 December, 2022. Lathyrus is an important pulse crop in Sundarbans mostly grown as paira crop in the short winter season. However,



least care is taken in this crop regarding nutrient management as most of the farmers migrate to cities after harvesting the preceding paddy crop. In this situation the use of drone for foliar application of nutrients has twin advantage of saving time and labour in addition to increasing



crop productivity. Though the impact of foliar application of DAP on pulse crop is well established, however, its adoption and popularization always remain poor due to added cost and timely unavailability of labourers for manual spraying. The use of nano-fertilizer formulation helped

to reduce the cost of the fertilizer. Only 800 ml nano-DAP is required for foliar spray over an acre of Lathyrus crop. The spraying of the chemical (pesticide or fertilizer) with a Kisan Drone took only 6-8 min for covering an acre in comparison to 5-6 hrs required by a labourer for spraying the same, manually. In climate resilient farming, "Time" is the most important factor, be it in decision making or in any farm operation. To combat a particular situation (weather vagaries, pest infestation, etc.), sometimes it is required to take the action within a small period of time. Hence, the application of Kisan Drone can play an important role in reducing the time required for any farm operation like spraying of an important



agro-chemical, monitoring the crop health, etc.

(Dr. C. K. Mondal, Dr. P. K. Garain and Mr. Abhijit Saha
Ramakrishna Ashrama Krishi Vigyan Kendra, Nimpith, West Bengal)

Annual Zonal Workshop of NICRA-TDC organized by ICAR-ATARI Kolkata held at Sargachi Murshidabad

ICAR-Agricultural Technology Application Research Institute, Kolkata organized the Annual Zonal Workshop on National Innovations on Climate Resilient Agriculture (NICRA)-TDC Project for Krishi Vigyan Kendras of Odisha (9 KVKs), West Bengal (7 KVKs) and A & N Islands (1 KVK) under Zone V during May 2-4, 2023 at R. K. Mission Ashrama-Dhaanyaganga Krishi Vigyan Kendra Sargachi, Berhampur, West Bengal. The objective of the workshop was to review the progress of activities of the project in 2022-23 and finalization of the action plan for 2023-24.

Swami Vishwamayananda Ji Maharaj, Secretary, RKMA, Sargachi has enlightened the house with his views on integration of science and spirituality in the field of agriculture where nature plays the pivotal role.

Dr. H K Senapati, Chairman, NICRA Zonal



Monitoring Committee has expressed his overwhelmingness being present in this workshop within the ambience of Ramakrishna Mission where Banga and Kalinga have gathered to discuss activities and the road map regarding NICRA-TDC Project. He stressed upon the judicious use of natural resources towards sustainability.

Dr. Pradip Dey, Director, ICAR-ATARI Kolkata has stated that conservation agriculture has a huge importance in the scenario of climate changes and advocated to link production system to market intelligence for better profitability.

Dr. M Prabhakar, PI, NICRA, ICAR-CRIDA Hyderabad has made the house concerned about the precedented gradual increase of global temperature and its related consequences. He has exhorted his views towards the NICRA-KVKs of Zone V

for an intensive care towards nurturing the interventions against climatic vulnerability and upscaling the related technologies.

Mr. A Nayek, DDA (Admn) Murshidabad has opined for optimum use of natural resources and the advantages of Murshidabad being the crop cafeteria of the state.

Mr. Nazrul Islam, Sabhapati, Beldanga-I Panchayat Samiti has expressed his gratitude to ICAR for sanctioning NICRA Project to Murshidabad district and also promised to stand by in every possible way.

Earlier, Dr. F H Rahman, Principal Scientist-cum-Nodal Officer of the project appreciated the role of all 17 KVKs in disseminating the climate resilient technologies in respect of different modules viz. NRM, Crop Production, Livestock and Fisheries and Institutional Intervention





among the farmers of 35 villages so far in combating the climate adversities upon agriculture and allied sectors.

One Technical Bulletin on *Climate Smart Adaptive Strategies in Agriculture and Allied Sectors* and 'Niramoy' an anti-stress supplements for livestock were released.

All the KVKs have presented their progress of activities of the project conducted during last year which were critically reviewed by the experts and panelists and action plan for 2023-24 of each KVK was finalized.

Zonal Monitoring Committee comprising Prof H. K. Senapati, Dr. Pradip Dey, Dr.

K. Das, Dr M. Prabhkar, Dr. P. K. Pal, DEE UBKV, Dr. F. H. Rahman and other scientists/ experts visit was also conducted on May 03, 2023 in the NICRA village Sujapur adopted by the KVK for monitoring and reviewing the ongoing demonstrations of climate resilient technologies of various modules. The Committee discussed with the VCRMC members, farmers and farm women of the village on the various issues on climate vulnerabilities and their possible adaptive strategies.

Shri Adhir Ranjan Chowdhury, Hon'ble Member of the Parliament of Berhampur, Leader of Opposition in Lok Sabha

and Chairman of the Public Accounts Parliament Standing Committee was present in the valedictory session of the workshop. Sri Chowdhury elaborately explained the post-green revolution prosperities of agricultural sector and the loopholes those are still to be mended from the end of policy makers and emphasized to take the oath of taking utmost care of Mother Nature which will in turn take care of mankind. He highlighted the local issues of agriculture like arsenic contamination in soils, flooding, soil erosion etc. and appreciated the ICAR to launch the NICRA project for the district.

ICAR-ATARI Kolkata organized NICRA Field visit at Paiyong Busty, Kalimpong

ICAR-Agricultural Technology Application Research Institute, Kolkata organized field visit of National Innovations on Climate Resilient Agriculture (NICRA)-TDC Project at Paiyong Busty, Kalimpong on June 7, 2023.

Mr. Ruden Saga Lepcha, Member of Legislative Assembly, Kalimpong West Bengal urged upon the rain water harvesting for cultivation and domestic purposes. He emphasized to develop various enterprises like fingerling production, pig rearing, mandarin cultivation for improving livelihood security of farmers and farm women of the hill zone. He mentioned that there is need of exposure visit of the poor farmers of the village may be conducted to different KVKs preferably Cooch Behar KVK for encouraging farmers to scale up their farming intervention

Dr. H K Senapati, Chairman, NICRA Zonal Monitoring Committee overwhelms with the activities on *Jalkund*, mandarin rejuvenation, mushroom cultivation, trout



fish cultivation in the remote villages of Kalimpong. He stressed upon the judicious use of natural resources towards sustainability.

Dr. Pradip Dey, Director, ICAR-ATARI Kolkata has stated that conservation agriculture has a huge importance in the scenario of climate changes and advocated to link production system to market intelligence for better profitability. He also mentioned that meteorological data of the village should be taken up before making agricultural operation.

Dr. Krisnendu Das, DDG (NRM) Nominee of NICRA Zonal Monitoring Committee



mentioned about the precedented gradual increase of global temperature and its related consequences. He mentioned that NICRA-KVKs should take intensive care towards nurturing the interventions against climatic vulnerability and upscaling the related technologies.

Dr. F H Rahman, Principal Scientist-cum-Nodal Officer of the project appreciated the role of all Kalimpong KVK in disseminating the climate resilient technologies in respect of different modules viz. NRM, Crop Production, Livestock and Fisheries and Institutional Intervention among the farmers of the Paiyong Busty, Kalimpong in combating the climate adversities upon agriculture and allied sectors. Dr. Rahman suggested that multi-tier cropping may be introduced in NICRA village.

Prof. Prabhat Kumar Pal, DEE, UBKV, Prof. T.S. Ghimiray, Prof. S Ali, RRS (HZ), UBKV and Head of Kalimpong KVK, VCRMC members and around 50 farmers were present in the field visit.



Campaign under the Mission LiFE on Climate Resilient and Smart Agriculture during May 22-28, 2023 at different NICRA KVK districts

Different types of campaign, training, awareness and demonstration under these following thematic areas were conducted in the NICRA villages of the zone during May 22-28, 2023.

- Awareness programme for the agri input dealers on safe and judicious use of agro chemicals and promotion of organic farming.
- Creating awareness for rainwater harvesting and its efficient use. (Catch the Rain).
- Awareness programme on climate resilient livestock management practices among the farmers of the districts.
- Awareness programme on natural farming among the farmers.
- Awareness programme on millets for next generation climate smart agriculture.
- Procession on LiFE campaign and afforestation programme.
- Awareness programme on agri credit for timely farm operation to mitigate climate change among the SHG members.
- Training on livestock management in the perspective of climate change.
- Mass awareness and training on livestock management in the perspective of climate change.



A PDF version of the Newsletter is also available at: <http://www.atarikolkata.org/publications>



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