



Newsletter



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Introduction

The demand for food is rising due to changes in diet and an increasing worldwide population. Crop yields are leveling off in many parts of the world, ocean health is declining, and natural resources, such as soils, water, and biodiversity, are severely depleted. Production is finding it difficult to keep up with these developments. Almost 690 million people, or 8.9 percent of the world's population, are undernourished, according to a 2020 estimate, an increase of nearly 60 million in only five years. Given that the globe would need to produce roughly 70% more food by 2050 in order to feed an expected 9 billion people, the problem of ensuring food security will only get worse.

The NICRA Technology Demonstration Component (TDC) is an excellent chance to collaborate with farmers in order to meet the current climate variability and food security with corresponding responses. The NICRA program is responsible for creating new technology, such as drought- or flood-tolerant crops, to meet the demands of a changing climate, as well as distributing current technologies to small and marginal farmers.

Plans and methods for contingency crops at the village level were devised and executed by NICRA KVKs. The NICRA Technology Demonstration Component (TDC) is an excellent chance to collaborate with farmers in order to handle current climatic variability with corresponding responses. The climate vulnerability of seventeen districts in West Bengal,

Odisha, and the A and N Islands has been identified at the district level. These districts have been coordinated regionally by ICAR-Agricultural Technology Application Research Institutes (ATARIs), and they have specific needs in terms of technological support, human resource development, and overall farming community empowerment to enable them to deal with climate vulnerabilities such as heat waves, droughts, cyclonic storms, and unpredictable rainfall. In the context of climatic variability, it is critical to strengthen the adaptive capability and resilience of farming communities in order to effectively manage these catastrophic events.

In the vulnerable villages of the KVK districts, a plan of action was created in accordance with this, and it was intended to be implemented through the use of technological interventions to start crop production, resource conservation, livestock and fish rearing, water gathering, etc. The NICRA-KVKs' interventions in NICRA-adopted villages have not only given farmers the tools they need to adapt to climate vulnerability, but have also given them the ability to maintain their way of life. In the adopted villages, short-duration crops, salt, flood, drought, disease-pest tolerance crops, and crop diversity are introduced. The establishment of VCRM and NICRA-accredited custom hiring centers in each of the designated villages enhanced the project's grassroots level monitoring, which was then followed by the start of farm mechanization based on the viability of small and marginal holdings.

Demonstration of Kisan Drone in NICRA Village for foliar application of nutrient in 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 Poirra 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.



Innovative approach of spraying agricultural field in Kaikhali village of South 24 Parganas

Sri Shankar Naskar is a young and energetic well educated rural youth from Kaikhali village of Kultali block in South 24 Parganas district, who has witnessed the vagary of climate change in and around his village since his childhood. He has witnessed of crop losses due to cyclones, floods and dry spells that are very common in Sundarbans. However, to Sri. Naskar, the main challenge in the event of any climatic vagary has been the timely application of any remedial measures, especially during land preparation, plant protection measures and harvesting. To save time, Sri. Naskar uses the farm machineries from the custom hiring centre. He ploughs his land timely with the help of assured irrigation in his land shaping plot. He uses the mechanical paddy thresher to quickly transport his produce from the field to his storehouse.

This year Sri. Naskar adopted another innovative approach by spraying his greengram field with the help of Kisan Drone and motivated all the villagers to adopt the same. It is a new experience for Sri. Naskar and the other villagers. All the

villagers doubted on the effectiveness of the drone in spraying the fields uniformly. But after the practical demonstration on his green gram field, everyone became ready to spray on their field also. Green gram is the second most important crop in the district after paddy. It is cultivated as Rabi-Summer pulse crop after harvesting paddy. However, least care is taken in this crop regarding pest management as most of the farmers and labourers migrate to cities after harvesting the preceding crop. So it is difficult to find labours to spray the crop in case of pest infestation. In this situation the use of Kisan Drone for foliar application of Neem Oil (Azadirachtin) has twin advantage of saving time and labour in addition to increasing crop productivity. 400 ml Azadirachtin

(10000ppm) was sprayed with 10 L water over one acre area in 8 minutes. To cover the same area with manual spraying would have required 5-6hr for an agricultural labour. In one day it was possible to spray 30 acre of green gram plots with the help of one Kisan Drone. In climate resilient farming, "Time" is the most important factor, be it in decision making or in any farm operation. 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.



(Dr. C. K. Mondal, Dr. P. K. Garain and Mr. A. Saha
Ramakrishna Ashrama Krishi Vigyan Kendra,
Nimpith, S 24 Parganas,
West Bengal)

Scientific mushroom production an income generation source for women in Coochbehar

Cooch Behar District experiences high rainfall (average 3000 mm) so, most of the time weather here remains humid which is congenial for growing mushroom. In order to tap potentiality of this climatic vulnerability Coochbehar KVK encouraged to farmers and farmer women for cultivation of Mushroom.

Smt. Krishna Sarkar, aged 26 years and holding master degree in arts is one of the important Mushroom trainees of Coochbehar KVK. After getting training, she started one small unit at chat Singimari, with 800 cylinders in her own plot of land in the year 2022-23. She was very much interested in this cultivation of milky mushroom with the support from NICRA Project of Coochbehar KVK. She started scientific way of milky mushroom cultivation after getting proper training and support from Coochbehar KVK under NICRA Project. The harvested milky mushroom was

being supplied to various parts of Bhutan and Assam. Her unit is a model for farmers, farmwomen and members of Self Help Groups who have been interested for producing milky mushroom and generate employment.

Smt. Sarkar is a house wife and working on her own farm, but now she is a successful milky mushroom grower and through her skill and knowledge she has attained a better position which is really appreciable. Presently, she is earning Rs. 24,000 to 27,000 per month of which a net profit of Rs. 10,000 to 12,000.

She has set her name as successful women mushroom grower in her area and popularized various types of mushroom (oyster and milky) in her village as well as various parts of Coochbehar, Assam and Bhutan as a source of nutrients in daily diets of the people.

Mushroom cultivation does not have any

adverse impact on environment. As per suggestions of KVK, Mrs. Sarkar is using chemicals of standard grade and using them judiciously. She is also converting mushroom spent into compost for its further use in agricultural field and quality crop production.

She is selling fresh product in local market as well as in nearby markets of Assam and Bhutan. It is getting popular day by day which motivated her for large scale cultivation. Apart from fresh mushroom sale, she also sundries the mushroom and packs them for longer time storage. This drying technology has been adopted by many more youths of the village who took the training from Coochbehar KVK.

(Dr. Bikash Roy, Dr. Samima Sultana and Dr. Bablu Ganguly

Coochbehar Krishi Vigyan Kendra, West Bengal)



Backyard poultry farming as a livelihood support enterprise under climate change at Bhadrak

Backyard poultry has tremendous potential and is ideal to augment the income and nutrition of small and marginal farmers. Besides income generation, backyard poultry has the potential to minimize the stress on farm families in the event of crop failure under adverse climatic condition. Demonstrations on backyard poultry using a dual purpose multi-coloured indigenous chicken breed (*Rainbow rooster*) were conducted during 2022-23 involving 6 SHGs. During the demonstration, the farmers were trained in feeding management and vaccination schedule. Twenty one days old vaccinated chicks were provided under NICRA programme of KVK Bhadrak (10 birds/

beneficiary) with an average initial weight of 256.8 gm/bird. The growth performance

of *Rainbow rooster* was very impressive with an average body weight of 2.45 kg/



bird within 6 months and with average egg production of 180 numbers of egg/bird/year.

On an average a farm family could earn supplementary net earnings of Rs. 3570 due to backyard poultry. This small support

could help the farm family immensely to improve their livelihood.

Technology	Total body weight in 6 month (10 bird)	Total no of egg Production (10 bird/year)	Cost of cultivation (Rs)/ (10 bird)	Net income (Rs)/ (10 bird)
Demo	24.5 kg	1800	2800	3570
FP	4 kg	750	820	580

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

Performance of Swarna Shreya cultivation in NICRA adopted village of drought prone district of Dhenkanal

A demonstration on “Stress tolerant rice variety *Swarna Shreya*” was conducted in Kharif 2022-23 at Arachua Village, GP-Mathatentulia, District-Dhenkanal, Odisha under NICRA TDC Project. In Arachua



village climate vulnerabilities like delayed onset and quick withdrawal of monsoon, unseasonal rainfall, early and mid-season drought are the major problems. Rice is the major crop in this village and most of the farmers go for rice cultivation in both *kharif* and *rabi* seasons. Farmers in



the village normally grow long duration local rice varieties (130-140 days), which regularly experience moisture stress and are prone to more disease and pest problem during various growth stages of the crop.



Due to water stress in the vegetative as well as reproductive stage, the yield of the rice gets drastically reduced for which farmers face problems and get low income. After intervention of NICRA TDC Project by KVK Dhenkanal under climate resilient crop management systems, stress tolerant rice variety, *Swarna Shreya*, having the characteristics of 120-125 days duration, semi dwarf (105-110 cm), capacity to withstand drought and tolerance to many diseases and insects, was provided to the farmers.

Technology demonstrated	Yield(q/ha)		% increase	Economics of demonstration (Rs./ha)		
	Demo	Local		Cost	Net Return	B:C Ratio
Stress tolerant Rice- <i>Swarna Shreya</i>	40	30	33%	30000	40000	2.33

(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)

Poly mulching in Brinjal to cope up with weed infestation at Ganjam district

Brinjal is a major vegetable crop of Ganjam district cultivated in 8000 hectare area. Weed is a major menace in brinjal crop which is labour intensive and increases cost of production. To cope up with the problem a demonstration programme on Poly-mulching in brinjal crop has been conducted in NICRA cluster villages- Lepa, Chikili, Nada and Chopara in 0.6 ha area involving 10 famers during *Rabi* 2022-23. Raised beds are made with 03 ft. width and 06 inch height. A distance of 1.5 ft was maintained between two beds. Mulch Polythene of 50 micron thickness and one metre width was used. Basal fertilizer and FYM were applied to top of bed and incorporated by light harrowing.

Mulch Polythene was spread over the raised bed and holes were made with a cylindrical tin container of 10 cm diameter. On the raised bed, paired row planting was done where one ft distance was given between the two rows on a bed and 1.5 ft distance was given within the rows. Planting of seedling was done in the holes. The poly-mulch can



be used for four seasons and other vegetables can also be grown. By poly-mulching the weed population decreased by 84% and labour for weeding and hoeing decreased by 60%. The yield in poly-mulch field was 264.2q/ha which was 15.6 % higher than open condition with no poly-mulch (228.4q/ha). There was an incremental net profit of Rs. 25800 per ha by adopting poly-mulching in brinjal.

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

Promoting Mushroom Cultivation to enhance income generation in Port Blair

Mushroom cultivation in Andaman & Nicobar Islands is almost negligible, although an increase in demand has been observed during the past few years. The climate of Andaman Islands is very much suitable for cultivation of Oyster mushroom almost throughout the year. In order to raise the family income of small, marginal and landless farmers and farmwomen mushroom cultivation was considered to be

an alternative source of income generating activity through SHG members. KVK South Andaman introduced the FLD on oyster mushroom cultivation to 2 SHGs from NICRA villages namely Gopal Nagar, Badmash Pahad. In these villages, Jaya SHG and Asha SHG were selected after seeing keen interest of the members in mushroom cultivation. Necessary technical assistance, guidance along with inputs were provided

to the farm women. Both the SHGs are adopting the technology; though it is in initial stages, their determination is high to take mushroom cultivation as an enterprise and enhance their family income.

*(Dr. Y Ramkrishna and Mr. J. Chakraborty)
Port Blair Krishi Vigyan Kendra,
A&N Islands)*



SRI method of rice cultivation shows superiority in rainfed banded medium lands of Purulia

As a part of the conservation technology, KVK Purulia introduced SRI method of rice cultivation during kharif season. For effective implementation of this technology, it organised village level training for the farmer while screening various video related to package of practice of SRI method and

arised interest among them. Finally KVK selected four numbers of farmers who were very much interested for the new method of rice cultivation in their 0.52 ha. of land. KVK scientists regularly visited and guided them from seed sowing to harvesting in every stage of crop growth. From the beginning the

farmers of the NICRA village and farmers from adjoining villages have seen the difference and superiority in SRI practice over their normal cultivation procedure. After harvesting it has been observed that in case of traditional method of rice transplanting the farmers were getting maximum 30 – 32 q/ha, while in case

of SRI method they got 50- 56 q/ha. It is also seen that in case of SRI method the labour cost of weeding, fertilizer and pesticide application is low compared to traditional method of rice cultivation. Now this SRI method creates very positive vibe among the farmers of the NICRA village and they are very much interested to apply SRI method in the forth coming season.



Milky mushroom cultivation for income generation of rural women at NICRA adopted village of Purulia

As a part of the income generation activity in hot humid condition, Milky mushroom cultivation was introduced at our NICRA adopted village Haramjanga. At first, KVK Purulia organised a two days hands-on



training on mushroom cultivation where the KVK scientists demonstrated them briefly about the mushroom cultivation. Then two Self Help Groups were selected who were very much enthusiastic about the mushroom cultivation which is also a good source of essential amino acid, protein and medicinal



value. KVK gave the inputs like spawn of milky mushroom. The members of the SHG had carefully done all the things which were instructed by KVK scientists. After that when the mushroom grew then the villagers of the NICRA village and adjoining villages were surprised to see the mushroom which is very good in size and it looks very attractive. And the members of the SHG groups were very much happy. They sell it at Rs. 200/kg in the Purulia town market and earn very good

amount of money. They also realise that the demand of the milky mushroom is very high and the cultivation of mushroom required very less time and labour. They easily do it after completing all household activities. For that reason, they continue it and they are now producing paddy straw mushroom and oyster mushroom also. They now believe that they can extend it in commercial basis and can train others in the village.



Finger Millet - a true alternative for the highly eroded and degraded uplands of Purulia facing severe moisture stress during different crop growth stages

As Govt. of India declared this year (2023) as the 'International Year of Millet', KVK Purulia introduced finger millet at NICRA adopted village Haramjanga. Breeder seed of finger millet variety 'Indravathi' was collected from WBSSC. Then KVK selected a field near



about one ha for demonstration and seed production purpose. KVK Scientists demonstrated them full package of practice like how to prepare seed bed for seedling raising, transplanting, inter-culture operations and how to control insect pest attack till harvesting. It has been observed



that with minimum attention and external input farmers got about 14 q/ha production from a highly degraded and eroded upland with severe moisture stress. KVK collected and stored all the seed for the area expansion in the next kharif season for the highly degraded uplands of NICRA project area as the farmers of NICRA adopted village were also very much interested to cultivate the finger millet next year in their field.

(Dr. Manas Bhattacharjya,
Dr. Sanjib Bhattacharya and Dr. Biman Maity
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Scientific nursery management of Boro rice to avoid cold injury and minimize use of irrigation water at Murshidabad

Boro paddy is widely cultivated in certain pockets of Murshidabad district of West Bengal and the adopted village under NICRA project is not an exception. It is mainly cultivated in the medium to low land having irrigation facility in the adopted village. Cold injury and high-water usage are the predominant hindrance in management of Boro Paddy seed bed along with slow growth



which causes prolonged time duration in this stage. Considering these problems, the demonstration has been designed where the following two technology has been assessed.

1) Seed bed preparation of *Boro* paddy

under Poly tunnel condition.

2) Use of ash and vermicompost to increase water holding capacity in *Boro* paddy seed bed.

The demonstration has been performed among 5 nos of farmers of the adopted village. All the demonstrated lands were having irrigation facility. In this demonstration, vermicompost and ash has



been mixed with the soil to increase water holding capacity. The poly tunnel structure has been prepared with split bamboo and transparent polythene of 45 GSM has been used. After the demonstration, it has been found that the seed bed time has been



reduced considerably by 20% which may be due to increased temperature under poly tunnel condition. Another significant observation is the reduction in water usage by 40% which is a good indication of water conservation in *Boro* paddy cultivation. It is also noted that sign of chlorosis has been found in the control plot whereas no such sign has been found in the demonstration plot. This may be due to cold injury of seedlings in open condition.

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

Augmentation of milk production in dairy animals in Kalahandi

Sri Dileswar Sha 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 2015, he decided to start dairy farm as an enterprise to provide economic stability and sustainable livelihood for his family.

Sri Sha started a dairy farm having 10 numbers of cows. The dairy animals were fed with balanced ration supplemented with proper vitamins and minerals. A recommended DCP and TDN was strictly followed and balanced feeding schedule was formulated for optimum feed intake for better production and improved reproductive performance of dairy animal. Proper deworming and vaccination schedule was followed for prevention of diseases and infection. Fodder crops were cultivated (Hybrid Napier and Maize) over

1 acre of land in the vicinity of the dairy farm by the assistance of KVK Kalahandi. High yielding Bajra-Napier Hybrids (IGFRI-7) were recommended to plant with a spacing of 60 X 60 cm in fertile part of the land and maize was recommended for moderately fertile land. Proper dose and timely fertilizer application to the fodder and technical know-how on cutting management to ensure green fodder throughout the year were given.

On an average he obtained 0.75-1 q green fodder every day to feed his ten high yielding animals. In 2017, convinced by the benefits of growing high yielding fodder crops and reduction in his expenditure on dry fodder, he expanded the area under these improved fodder crops to 1.5 acres. With this he is now able to harvest on an average 1.5-2 q green fodder daily. He started to expand his dairy with another 15

high yielding cows and gradually increased herd size.

He was awarded as best Agri-entrepreneurs from Kalahandi district by Honourable Vice Chancellor, OUAT, Bhubaneswar and felicitated by Dr. Damadar Rout Honourable Agriculture Minister, Govt. of Odisha

The Scientist from KVK, Kalahandi trained him to take proper care and management of his dairy farm. A recommended DCP and TDN was strictly followed and balanced feeding schedule was formulated by scientist from KVK for optimum feed intake for better production and improved reproductive performance of dairy animal. Fodder crops were cultivated (Hybrid Napier and Maize) over 1 acre of land in the vicinity of the dairy farm by the assistance of KVK, Kalahandi.

Impact factor	Before Adoption	After Adoption
Farmer Practice	Only five non-descriptive cattle were reared without any scientific care and management. No fodder crops were cultivated	Twenty Red Sindhi cows were reared in his dairy farm. Proper care and management was taken into practice. Hybrid Napier and maize grasses were cultivated in vicinity of his dairy farm.
Yield of Product	15 lit/day from non- descriptive cattle	Total milk production from his dairy farm is around 155 litres daily.
Fixed Cost	60,000/-	2,78,000/-
Recurring Cost	44,500/- per Year	3,64,000/- per Year
Gross Income	1,00,600/- per Year	10,15,000/- per Year
Net Profit	56,100/- per Year	6,51,000/- per Year
B:C Ratio	1.26	1.78
Marketing	Local retail market	Supplied to OMFED
Dissemination of knowledge in the locality	No fodder cultivation were adopted	The farmers residing at neighbouring areas of Muskuti village adopted to fodder cultivation and scientific care and management of dairy cattle
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. Swraj Mehar
Kalahandi Krishi Vigyan Kendra, Odisha
Dr. P. J. Mishra and Dr. A. Phonglosa, OUAT, Odisha)

Different initiatives to combat with climatic vulnerability in the drought prone village of Keonjhar district

ICAR-CRIDA, Hyderabad sanctioned NICRA Project to KVK Keonjhar during the financial year 2021-22. Under this programme, Denua village of Patna Block was selected as NICRA village taking into consideration the climatic vulnerability due to its uneven and erratic rainfall pattern which is faced by the prevalent farming situation of the district. During these two years, various demonstrations have been conducted keeping the needs of the farmers and farming situation. Demonstration

on drought tolerant rice variety *Sahabhagidhan*; demonstration on grafted brinjal (Var:VNR-212); demonstration of *in-situ* moisture conservation technology like mulching and stacking in tomato to mitigate the water scarcity; renovation of Farm pond for water harvesting and recycling for supplemental irrigation and low cost night shelter for poultry has been demonstrated to improve backyard poultry farming and to safeguard the birds from predatory attacks and adverse climatic

conditions during night time which was widely accepted by the farmers. Under this programme, demonstration on Improved backyard poultry breed Kadaknath and improved duck breed White Pekin has been carried out for livelihood support to the SHGs. For easy accessibility of the farm implements and machineries to the farmers of the village, a custom hiring centre has been established under this programme.

Different activities under NICRA-TDC are as follows:

• Demonstration on drought resistant Rice Variety Sahabhagidhan



• Demonstration on Grafted Brinjal (VNR-212)



• Demonstration on Improved local backyard poultry breed (Kadaknath)



• Demonstration on Improved local duckling breed (White Pekin)



• Demonstration on Low cost Night Shelter of Poultry



(Dr. S. K. Sahoo, Dr. Deepak Hembram and Dr. Sipra Mohapatra
Keonjhar Krishi Vigyan Kendra, Odisha
Dr. P. J. Mishra and Dr. A. Phonglosa, OUAT, Odisha)

Improved goat shelter: Combating climate change in Kendrapara

Innovative goat housing system introduced by KVK Kendrapara during 2022 has visible impact in village Gajapitha of Kendrapara district. Being flood prone village, farmers face numerous issues in rainy season in traditional goat sheds adopted by them. Particularly shed floor become unhygienic with excreta during this season. Regular flood aggravates their problem further leading to occurrence of various diseases. Under conventional goat houses goats find it difficult to take shelter when flood occurs. Also feeding the goats is a major constraint during the rainy season.

Looking at these issues, KVK Kendrapara introduced low cost improved goat shelter in 2022 to address the problem. 10 goat farmers were selected for demonstration

of this technology. This type of goat shelter was constructed with raised bamboo structure and cemented wall. The goat shelter included a pallet underneath as a floor. The cost of construction of one such goat house was Rs. 17000. Goats usually prefer to stay on an elevated place above the ground level. The height of above constructed goat house was 3 ft from ground level. Ventilation provision was ensured by



keeping the shelter one side open to let the air flow in. There was a provision of lock system to ensure safety during night. As the goat excreta falls directly to the ground it is easy to maintain the sanitation which has also reduced occurrence of diseases. They remain healthy which enhances their meat and milk production by 15-20% as compared to farming under conventional sheds. It is also interesting to note that the

fertility rate increased whereas the goat mortality rate reduced under improved housing system.

Looking at the success of this technology

other farmers of the village and nearby villages are encouraged to adopt it. Around 20 farmers have adopted this improved goat housing system till now.

(Dr. S. N. Mishra, Dr. N. Mohapatra and Mr. Matruprasad Mohanty Kendrapara Krishi Vigyan Kendra, Odisha Dr. P. J. Mishra and Dr. A. Phonglosa, OUAT, Odisha)

Creating revenue through the cultivation of mushroom in the NICRA village of Jagatsinghpur

A chhutadaspur village in Erasama block is known for wide spread paddy cultivation with farmers having medium land holdings. Maa Brundabati SHG having members 12 were doing paddy cultivation only. With less holding, paddy and few vegetables were being grown and their husbands used to go for marketing the products in local market. During one training programme under NICRA in their village, they got awareness on Mushroom cultivation as a profitable enterprise.

Technology of mushroom cultivation

- Use of old and dilapidated shed of the existing house.
- Sterilization of the unit by spraying Formalin @ 150 ml/ 5 lit
- Cutting of paddy straw of desired length of 1.5 ft.
- Soaking of paddy straw in Water and Bleaching Powder to reduce the acidity of straw
- Stacking of straw to drain out excess water

and Pasteurization of straw.

- Layering of paddy straw and mounting over wooden ballahs with bricks.
- Spraying of Nuvan @ 2ml/lit to prevent flies from egg laying before covering with polythene
- Regular maintenance of moisture in beds & Regular plucking before full bloom
- Value addition through preparation of Pickles and Dried mushroom in case of Surplus.
- Imparting training, followed by demonstration of technology
- Capacity building of farm woman for skill & knowledge up gradation at KVK.
- Special training at CTMRT, OUAT, Bhubaneswar.
- Enrollment at Distance Education programme of Directorate of Extension Education, OUAT.
- Exposure visit to mushroom growing units.

- Literatures published by KVK in local language.

Salient achievements:

- Reduction of disease and contamination due to sterilization of unit and straw
- Growing of both Paddy straw mushroom in Kharif and Dhingri strain during Rabi season.
- Adequate and timely provision of Mushroom Spawn from KVK and Paddy straw in the village.
- Marketing of produce at farmers production point and market driven production
- Value addition of Mushroom through Pickles, dried mushroom, Chutney etc.

With investment of Rs 1,00,000/- per annum, they got a profit of Rs 2,60,000/-. They purchased 25 cent of land to increase their volume of business and constructed one separate study room for their children.

Seasons	No. of Beds	Yield / Bed	Price / Kg (Rs.)	Cost of production (Rs.)	Gross Return (Rs)	Net profit (Rs.)
Kharif (Paddy Straw)	1000	1 kg	200	70,000	2,00,000	1,30,000
Rabi (Dhingri)	1000	2 kg	80	30,000	1,60,000	1,30,000
Total	2000	3000 kg/ yr	-	1,00,000	3,60,000	2,60,000

Mushroom unit has been adopted by 22 farm women of the block as income generation activity. Master trainer for other farm women of the area plans to raise own polyhouse for Paddy straw mushroom in Rabi season.



(Dr. B. Pattanaik, Dr. Pradipta Majhi and Mr. Prabhu Jagatsinghpur Krishi Vigyan Kendra, Odisha Dr. P. J. Mishra and Dr. A. Phonglosa, OUAT, Odisha)

Creation of Jalkunds to improve livelihood of marginal farmers of Paiyong village, Kalimpong

Jalkunds are small water harvesting structures that act as a supplementary source of irrigation water throughout the year. These structures are primarily meant for rainwater harvesting. They can be very helpful in improving irrigation facilities throughout the year most prominently during the dry spells particularly for very small and marginal farmers. As the farmers of NICRA adopted village, Paiyong are extensively engaged on vegetable cultivation, jalkund is indeed crucial for such a village as it supports their agriculture



activities and helps to address water scarcity challenge. Jalkund structure of 18 ft × 10 ft × 5 ft with water holding capacity of more than 18000 litres was constructed at NICRA adopted village Paiyong with the initiative of NICRA project under the aegis of Krishi Vigyan Kendra, Kalimpong. It was constructed to cope up with the changing climate and the errant rainfall, which lead to loss of livelihood for farmers. At least 10 number of farmers' households are benefitted from this jalkund structure. The construction of jalkund in

Paiyong was a boost for farmers as they have acknowledged the practical solution for water scarcity specially during the dry season and now have decided even to take up the initiative of constructing jalkund for rain water harvesting on their own.

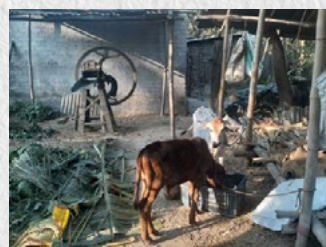
*(Dr. MW Moktan, Dr. Pranab Barman and Dr. Novin Chamling
Kalimpong Krishi Vigyan Kendra, West Bengal)*

Exposure visit-cum-interaction with NICRA beneficiaries at Malda

A visit-cum-meeting with the farmers were arranged at the five NICRA adopted villages of flood prone Malda district on 02.12.2022. Miss Ria

Bhattacharya, Senior Research Fellow under NICRA-TDC Project and Mr. Purbendu Samanta, Young Professional-I came to Malda Krishi Vigyan Kendra from

ATARI, Kolkata. They have visited the demonstration units at NICRA villages and have also seen field typology condition during *rabi* season, 2022.



A survey was conducted by them with semi-structured questionnaires to the farmers about impact of NICRA project in adopted villages with majority of the

response in binary forms only in terms of production and productivity of crops, natural resources management and socio-economic upliftment before and after

the NICRA Project. The farmers have responded well during the collection of data.



During the data collection the farmers pointed out their major constraints that they are facing tremendous flood situation for about one and half to two months due to occasional rain and flood water from the river Ganges which is very near to their villages during rainy season. To overcome

their major constraints, they were advised with some climate resilient technologies and contingency crop planning just after the flood superseded. The farmers have reported that they have already adopted some of the resilient technologies such as flood resistant crops variety, multi-tier horticulture, short duration varieties of crop just after flood, low-cost mushroom cultivation, low cost goatery unit, fodder production etc. and also contingency crop planning as per the timing of the flood.

After completion of field visit, a meeting and discussion with VCRMC members and farmers were organized where the members detailed their mode of activities and

implementation of different climate resilient activities in the village. The VCRMC members and the farmers expressed their thankfulness for their visit and giving valuable suggestions regarding climate resilient practices and also enormous support they are getting from ICAR-ATARI Kolkata through NICRA project running under the supervision of Malda Krishi Vigyan Kendra, Ratua, UBKV, West Bengal.

*(Dr. Rakesh Roy, Dr. Victor Sarkar
and Dr. Sachin Sarkar
Malda Krishi Vigyan Kendra, West Bengal)*

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



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