

ATARI Kolkata **NEWS**



Volume: 6 Number: 2
July to December, 2022

A Biannual Newsletter of ICAR-Agricultural Technology Application Research Institute Kolkata
(An ISO 9001: 2015 Certified Institute)

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From the Director's Desk

'The history of agriculture is the history of humans breeding seeds and animals to produce traits we want in our crops and livestock'- Michael Specter

Being an agro-economy, Indian agriculture is highly dependent on the cycles of production, distribution and consumption. Productivity is another problem of such agro-economical situation when it is compared with other advanced countries. Despite so many disadvantages of the agricultural sector in our country, this sector plays crucial role in generating substantial employment opportunities to the rural agricultural and non-agricultural labourers, in supplying food items to the huge population, in supporting industrial sector and international trade through import/export activities, in strengthening GDP of the country and many more. The agricultural scientific fraternity of our country is continuously engaged for enhancing production and productivity in crop, horticulture, livestock, fishery, agri-engineering and other related sectors to combat various challenges. As a result, a number of technologies have been/are being generated which have the potential of increasing farm and non-farm income. The successful technologies are being continuously taken into the farmers' field through different convergence modules. In addition, during the period from July to December, 2022, Extension Division of the Council, ICAR-ATARI Kolkata and all its 59 KVKs implemented various Central and State sponsored schemes, organized and conducted large numbers of workshops, seminars, skill training programmes, awareness programmes, exposure visits, monitoring visits for the benefits of the farmers of this Zone. Besides, scientists of this institute published research papers, technical articles, technical bulletins, books, book chapters, reports, abstracts etc. I must appreciate the sincere efforts and dedications of ICAR, ATARI Kolkata and KVK personnel for working day and night for the farming community of Andaman and Nicobar Islands, Odisha and West Bengal. I congratulate the scientists who are actively involved with this newsletter for its timely publication. Feedback and suggestions are always welcome for further improvements.

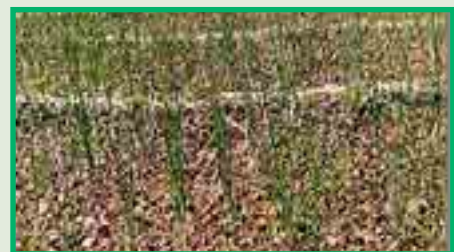


S. K. Roy
(S. K. Roy)

Technologies applied successfully

Increase of farmers' income through crop diversification

Sundargarh district of Odisha has 52% uplands and out of which, 75% of the land is covered with traditional paddy cultivation during *kharif*. There was a vast scope of crop diversification which was literally untouched. The scientists of Sundargarh-II KVK explored the feasibility and scope of *kharif* onion



cultivation in that region. Onion is a highly remunerative crop for Sundargarh farmers being cultivated in around 1472 ha. But, the cultivation practice of onion was only confined to *rabi* season. Since last few years, it has been observed that due to insufficient supply of onion there was price hiking during off season. That's why, Sundargarh-II KVK introduced *kharif* onion var. *Agri Found Dark Red* and *L-883* under OFT programme. Then, it was demonstrated in the farmers' field and many farmers adopted this cultivation. Mr. Natha Charan Behera, Village- Ranto, Block-Lathikata, District- Sundargarh, Odisha is one among those successful onion cultivators. He was trained with the package and practices of cultivating of *kharif* onion. The seedling was grown in raised bed equipped with poly tunnel to protect them from rainfall and to provide a conducive environment to grow. Transplanting was done in the last week of August in broad bed furrow method. All the cultivation practices like nutrient management, integrated pest management and integrated disease management schedule were recommended in time to protect disease/ pest attack. The onion was harvested in the month of December. The average yield was about 173 qtl/ha. The net profit



was recorded to be Rs. 171000/- per ha. This has created enthusiasm among farmers and they have given positive thought towards adoption of *kharif* onion in the district. This technology saves the farmers from panic selling at under-rated price. After adoption they could feel the difference in price and marketing of onion in a positive note. This off-season cultivation spreads more than 100 ha area in his village and surrounding



villages. The essence of introducing crop diversification in upland is proved to be successful and it has opened up the path of cultivating non paddy crops in uplands to augment income and prosperity.

Source: Sundargarh II KVK, Odisha

Non-sacrifice breeding and seed production technology of stinging catfish- *H. fossilis*

West Bengal is recognized for Indian carp culture. Next to carps, catfishes are considered to be potential cultivable species. Among these, *C. batrachus* and *H. fossilis* are preferred medium-sized catfish for pond culture. In *C. batrachus*, seed production is a problem due to its male availability. On the other hand, *H. fossilis*, popularly called '*Singhi*' in India, has high demand for its taste and therapeutic value. '*Singhi*' fishes fetch high market price than carp and *C. batrachus* in India. They can be stocked at high densities i.e. 5-10 times higher than the carp stocking densities because of their hardy and air-breathing nature. The stinging catfish (*H. fossilis*), belongs to the family *Heteropneustidae*, is a commercially important fish species in India. This is primarily a fish of ponds, ditches, beels, swamps and marshes and even sometimes, it is found in muddy rivers. The air-breathing apparatus of stinging catfish enables it to exist in almost any kind of water. However, constant supply of good quality fingerlings is vital for the culture of any fish species including *H. fossilis*. Although, major sources of fry and

fingerlings for aquaculture were mainly the capture fishery due to the limited capacity of the then existing hatchery facilities in the past, nonetheless, induced breeding techniques are being continually improved. Subsequently, at present, hatchery produced fry and fingerlings become the major sources of seed for the aquaculture industry in the country. While the production of fish seed from hatchery sources has increased dramatically, the quality has not improved owing to poor hatchery management practices resulting from negative selection, inbreeding depression, indiscriminate interspecific hybridization etc. To solve those problems, S 24 Parganas (Addl.), West Bengal under RKMVERI, Belur has developed non-sacrifice breeding and seed production technology of stinging catfish- *H. fossilis* which has been discussed here.

Brood stock management

Maintenance of healthy brood fish is a prerequisite for successful seed production in captivity (Fig.1). *H. fossilis* attains maturity in the first year. Brood fish of 70-80 g (male) and 100-120 g (female) weight, commonly preferred for breeding, are raised in soil-based cement tanks at 2.0/m². This reduces difficulties in collecting brood fish from the earthen ponds and facilitates easy maintenance of water quality through water exchange when it is required to improve maturity. The suitable water



Fig. 1

Fig. 2



Fig. 3

quality parameters are- dissolved oxygen (D.O.): 5.2-5.7 ppm; carbon-di-oxide (CO₂): 4.6-5.8 ppm; pH: 7.3-8.5 and temperature: 27-30°C. Often, hatchery owners can collect brood fish from ponds and can maintain them in nylon hapa nets fixed in the ponds. Even farmers can purchase brood fish during monsoon months and can keep them in big silver containers for breeding, a condition that invites breeding failure in many cases. Farmers previously fed brood fish with ground low-cost fish or fishmeal mixed with groundnut oil cake or rice bran. However, better breeding performance can be obtained by feeding a compound pelleted feed made from a mixture of fishmeal, groundnut oil cake, soybean meal and rice bran with vitamins and minerals, containing 33% protein, at 2% of body weight daily.

Sexual dimorphism

Externally sexes can be distinguished only during breeding season, when secondary sexual characteristics become prominent. The best morphological character indicative of a ripe *H. fossilis* brood female is bulging vent and a well round abdomen, the fullness of which extends posteriorly to the pelvic fins. The males look lean with pale vent and a papilla like structure with a pointed tip. In a mature female, the genital papilla remains in the form of a raised prominent structure, round and blunt with a slit like opening in the middle (Fig.2).

Induced breeding

Brood stock injection and breeding induced- Commercially available dehydrated carp pituitary gland extracts



Fig. 4

Fig. 5

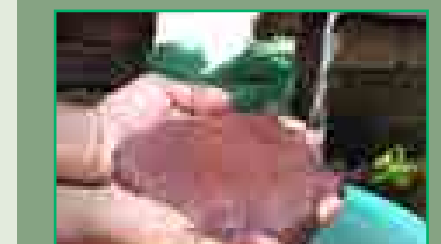


Fig. 6

and synthetic hormone spawn-pro can be used. The body weight (g) of each brooder is to be weighed on an electronic balance to estimate the required amount of inducing agents. The brooders are to be injected 0.3 ml/kg body weight of females and 0.1 ml/kg body weight of males. Five females and ten males of *H. fossilis* are to be used. The hormone is to be administered by intra-muscular injection on muscles beneath the dorsal fin slightly above the lateral line (Fig. 3). After injection, the brooders are to be released in breeding hapa inside the breeding tanks.

Breeding and egg transfer for incubation

All the brooders are to be ovulated after a period of 10-15 hrs after injection. The brooders are then to be transferred from the holding tanks after the completion of ovulation easily through the breeding hapa (Fig.4). Whereas, the fertilized eggs are to be kept in same tank to avoid damage and fungal/bacterial contamination during the egg collection. Each cemented tank can accommodate approximately 10000 eggs. Afterwards, a continuous flow of water is to be maintained for aeration (Fig.5). For large-scale incubation, an improvised model has been developed by the SSKVK wherein hatching occurs within 16-22 hrs at 27-30°C under this tropical climatic condition. After hatching, continuous flow of water is to be maintained in newly hatched larvae containing tank to make them free of eggshells and damage eggs. Hatchlings are transferred to circular/rectangular fiberglass or plastic containers for further rearing.

Larval rearing

Three days old hatchlings of *H. fossilis* can be raised without feeding until the yolk absorption. After this, the post-larvae are to be fed on Tubifex worm in paste form at 10% body weight twice per day (Fig.6 and 7). Successful rearing of post-larvae up to the stage suitable for stocking in nursery ponds remains as the major challenge for the expansion of culture practice of *H. fossilis* at commercial level. Hence suitable feed is the basic requirement for the growth and survival of fish larvae. The transition from one type of food to another can be a challenge for larviculture. The period of transition often referred to as a period of weaning may be between two types of live feed or from a live feed to an inert formulated diet.

Fry to fingerling production

Fingerling production can be carried out with the aim to get a higher price and production if stocked for grow-out. The release of fry directly into ponds results in lower recovery related to natural mortality or predation. It is recommended to rear fry in small cement tanks of 10-20 m² for better survival and easy management (Fig.8). Hence, tanks are to be provided with date leaves, for shade or shelters are to be provided at the tank bottom for fry. The shelters serve as hiding places for a large number of fry, which makes it easier to feed them near or around the shelter. Differential growth may be found at this stage. Hence, it is necessary to grade at regular intervals to reduce the competition for feed among small fry and big fry, which also enhances survival. Formation of filamentous algae occurs in the fingerling tank because of the shallow water depth and high nutrient leaching from uneaten feed and



Fig. 7

Fig. 8



Fig. 9

excreta of fish. Therefore, it is essential to remove filamentous algae at regular intervals for better growth and survival of fry. Fry usually attains the weight of 1 g in 50-55 days. Fries are to be segregated and to be stocked again at 50-100/m² for further rearing, until they reached 4-5 g in another 70-80 days (Fig.9). In spite of this, many farmers release fry to small nursery ponds because of lack of a proper rearing system. Some seed growers also divide paddy fields into small plots to rear fry along with paddy rice for enhanced production, and some released in bio-floc system.

Salient features

- Brood fish of 80-120 g are to be stocked at 2-3/m² and to be fed with 33% protein pellet feed at 2% body weight twice a day.
- Females @ 0.3 ml/kg BW and males @ 0.1 ml/kg BW are to be injected with synthetic hormone (spawn-pro/gonadoprim/WOVA-FH) to induce breeding.
- Maintain water quality through aeration and water replenishment during larval rearing to reduce stress in larvae and to enhance growth and survival.
- Larvae can be reared at 1000-1500/m² for 15-20 days in indoor conditions for better growth and survival. Stocking at higher density leads to sudden mortality and reduced growth.
- Tubifex paste should be provided during the initial phase of larval feeding and then, gradually weaned to live tubifex and finally, compound feed. This husbandry practice stimulates fry to accept feed immediately after release into nursery tanks during fingerling production which ultimately increases growth and survival.
- Segregation of bigger fry and removal of filamentous algae at periodic intervals results in better growth and survival.

Source: South 24 Pgs. (Narendrapur) KVK, WB

Spices cultivation through horticulture-based integrated farming enhanced farmers' income

Shri Anand Kumar Chetri, 46 years old farmer, is hailing from Sangsey village of Algarah-II block of Kalimpong district. He has developed a horticulture-based integrated farm at his farm covering 2.4 ha (18 bigha) of hilly terrain land. More than 80% of the total population of Sangsey village depends on farming for their livelihoods. Shri Chetri was born in a farmers' family. In the year of 1991, when he passed 10th, he left the school and joined with his parents in farming. In 2015, he came to know about the integrated farming from Kalimpong KVK. Soil

erosion, crop damage due to frequent and heavy precipitation, water scarcity during summer, sometimes hailstorm during winter, remoteness and less accessibility of market are very common constraints in hill farming. He adopted sustainable agricultural practices by following rotational cropping system in growing a sequence of different crops covering cereal, pulse and vegetables in different seasons. In horticulture-based integrated farm, Shri Chetri focussed on cultivation of spices like large cardamom, dalle chilli and grew 40 golden apple fruit plants.



Horticulture-based integrated farm

Considering the increasing demand of persimmon, a yellow to orange coloured sweet exotic fruit resembling with tomato, he started planting persimmon fruit tree at his farm. He also reared 4 crossbred cows, 22 goats and 11 local poultry birds along with a stock of 40 broiler birds for every production cycle.

Shri A. K. Chetri was not aware of the term 'integrated farming', but he knew how to use waste of one component as input to another component and how to maximize production and minimize the cost of cultivation as well as environmental pollution. The waste residues from agriculture produces were used as feed resources for livestock and livestock excreta was utilized in preparing vermicompost which was applied in agriculture field for crop production. Post-harvest wastes of cereal, pulse, spices, vegetables and fruit plants including leaves of forest trees costing Rs. 14500/- were used as feed resources for livestock while the cost of cow dung, goat and poultry droppings was Rs. 22000/- that was used for preparing vermicompost and subsequent use in agriculture field. A total of Rs. 36500/- was circulating as bio-economics in the whole integrated system of this farm.



Resource recycling system at the farm

In horticulture-based integrated farm, Shri. A. K. Chetri recorded the highest net income from spices (Rs. 408500/-) followed by goater (Rs. 212000/-), poultry (Rs. 61976/-) and fruit plant (Rs. 40000/-). The highest annual net income sharing comes from horticultural crops (56.47%) followed by livestock sector (36.19%) and the rest (7.34%) was secured from cereal, pulse, broom grass and vermicompost. The income analysis revealed that from a small farm piece of 2.4 ha area, the annual gross income of Rs. 1213800/- could be realized from an investment of Rs. 357124/- with a generation of 900 days of man-days of employment costing Rs. 252000/- as labour wage including his own labour. At present, Sh. Chetri is able to satisfy nutritional demands of his five-membered family with cereal, pulse, vegetables, fruits, milk, meat and egg from his farm grown agriculture and livestock produce. Though the food item available from Anand's farm was not sufficient for his daily need, he was satisfied with the quality he got from the system. Shri Anand Chetri wanted to continue with the diversification of integrated farming and share his experience and knowledge of integrated farming with the neighbouring farmers for agricultural development in the area. He is a proud farmer who is highly satisfied with his farming occupation. The story of Shri Chetri clearly indicates that developing horticulture-based integrated farm can technically be feasible and economically viable with the net return of Rs. 366100/- from a 1.0 ha land with a resource use efficiency of Rs. 3.40 per rupee invested.

Source: Kalimpong KVK, WB

Important activities of KVKs (July to December, 2022)

Sl. No.	Activity	Achievement
1	Number of on- farm trials conducted (Number of technologies)	797 (108)
2	Frontline demonstrations conducted (Number)	17711
3	Farmers trained (Number)	42269
4	Extension personnel trained (Number)	3605

Sl. No.	Activity	Achievement
5	Participants in extension activities (in lakh)	1.35
6	Production of seed (in quintals)	1325.80
7	Planting materials produced (in lakh)	18.13
8	Livestock strains and fingerlings produced (in lakh)	23.94
9	Soil, water, plant and manures samples tested (Number)	7380
10	Mobile agro-advisory provided to farmers (in lakh)	31.18

News from KVKs

National campaign on 'Poshan Abhiyan and Tree Plantation' conducted

One national campaign on 'Poshan Abhiyan and Tree Plantation' was conducted at the KVK campuses under ICAR-ATARI Kolkata on 17th September, 2022. The focus of



the Abhiyaan was to lay emphasis on nutritional status of adolescent girls, pregnant women, lactating mothers and children from 0-6 year's age. The use of latest technologies, convergence and community involvement with a targeted approach were the parts of the programme to address the malnutrition problems. A total of 5815 farmers, farm women and others have participated in such programmes wherein 11132 saplings and 3846 vegetable seed packets were distributed in the states of West Bengal, Odisha and Andaman & Nicobar Islands in collaboration with IFFCO. The program also emphasized on awareness



about nutri-garden and bio-fortified varieties. To hasten the awareness process several public representative was also invited. Two MPs, one MLA and 171 other guests participated in the programme. The detail report has been given below.

Name of State/UT	No. of KVKs organized the fair	No. of farmers participated	Saplings planted/ distributed (No.)	Vegetable Seed Packets distributed (No.)	No. of public representatives participated		
					Central Ministers/ MPs	State Ministers/ MLAs	Others
A & N Islands	3	140	522	15	0	0	5
Odisha	33	3022	5140	2137	1	2	130
West Bengal	23	2653	5470	1694	0	0	36
Total	59	5815	11132	3846	1	2	171

Monitoring field visit on Homestead Agroforestry conducted

One monitoring field visit of NABARD funded project on 'Agroforestry and Value Chain Management for Doubling Farmers' Income in New Alluvial Region of West Bengal' was conducted on 19th September, 2022 by Dr. A. Haldar, PI of the project along with Dr. N. Mudi, SSH, Purba Medinipur KVK and other Co-PIs of the project to monitor the progress of work. The farmers have successfully implemented two kinds of three-tier systems Fruit-based Agroforestry models. Seeds of pre-



rabi vegetables like radish, spinach, brinjal etc. were given to 150 beneficiaries who

have grown vegetables in the interspaces successfully. Seedlings of winter vegetables like cabbage, cauliflower, broccoli, knol-khol and pakchoi were supplied along with seeds of spinach to



150 beneficiaries. Total 350 fruit and 200 forest plants were distributed among 100 beneficiaries for gap filling during the period under report. Each farmer was supplied with 10 kg DAP, 10 kg mustard cake, 10 kg vermicompost, 200 g SAAF (fungicide), 250 ml miraculan (PGR), 100 ml aminose (Bio-stimulant) and 250 ml neem oil (10000 ppm). Total seven training programmes were conducted involving 300 farmers.

Central Agriculture Minister of State, GoI visited Jalpaiguri KVK

Shri K. Chowdhury, Hon'ble Union Minister of State, Ministry of Ag. & FW, GoI visited the Jalpaiguri KVK, Ramshai under WBUAFS, Kolkata on 22nd September, 2022. He was welcome by Shri J. Roy, Hon'ble Member of Parliament, Jalpaiguri Constituency. The officials from WBUAFS, Scientists from West Bengal and Sikkim, FPO/ FPC members, NGO members, KVK staff, progressive farmers including women and many others were also present.



Dr. B. Das, SSH, Jalpaiguri KVK welcomed all the dignitaries and briefed the KVK activities before the august gathering. The Hon'ble Minister directly interacted with farmers, farm women, FPO/FPC members, NGO members and others at the KVK Conference Hall. He highlighted the Govt. Flagship programmes viz.



PMFBY, PMKSY, natural farming, area specific crop model, nutri-farming, IFS model, Prime Minister's Kisan Sanman and so on. The Hon'ble Minister and MP visited the exhibition stall of FPOs/FPCs, SHGs, progressive farmers and entrepreneurs at the KVK premises. The Minister interacted with



the scientists of KVK and appreciated KVK activities. He also distributed seed kits to the women farmer at the end of the interaction programme at KVK campus. The Hon'ble Minister and MP also visited demonstration units of KVKs including adopted villages, fields of DFI farmers' of Satvendi village, tea garden of small tea growers, tea estate and tea factory and interacted with the farmers there.

Monitoring field visits of ARYA project conducted

Dr. (Ms.) S. Das, SRF, ARYA project, ICAR-ATARI Kolkata along with SSH, SMS (Horticulture) and YP-I of Hooghly KVK visited Village-Arenga,



Taherpur, Kantul and Monipur, District- Hooghly, West Bengal on 27th September, 2022 to monitor the activities of ARYA project under Hooghly KVK. All the four enterprises viz. nursery raising of vegetables, backyard poultry, mushroom cultivation and vermicompost production were running successfully. The women SHG was formed and value addition of mushrooms, capsicum and tomato was under process.

Dr. (Ms.) S. Das, SRF, ARYA project also visited Village-Biswanathpur, Bheda, Samshepur, Sahapur, Jagatpur and Pathapur, District Cuttack, Odisha on 27th November, 2022 to monitor ARYA activities. The SSH and YP-I of Cuttack



KVK accompanied the visit. All four enterprises were running successfully. The performance of mushroom enterprise was quite satisfactory. The value added products of mushroom e.g. mushroom pickle, cookies, powder, bori etc. were fetching good market price. Supply of Vanaraja chicks and Black



Bengal bucks by Cuttack KVK to the ARYA beneficiaries helped to flourish the poultry and goater enterprise in the district. Introduction of drip irrigation and fertigation technology by the KVK had improved the protected cultivation of vegetables enterprise by reducing weed infestation, amount of fertilizers



and pesticides and ultimately the cost of cultivation. To overcome the inundation problem during flood every year, flood tolerant vegetables and seasonal flowers were grown.

Monitoring field visits of Natural Farming project conducted

Mr. P. Samanta, YP-I of Natural Farming project visited the field of South 24 Parganas (Nimpith) KVK, West Bengal on 13th October, 2022 to monitor the demonstration



units and plots of natural farming. Their demonstration plots were very systematically developed with all



components of natural farming. The fields of Malda KVK on 2nd December, 2022 and Cooch Behar KVK on 7-8th December, 2022 were also visited which were found to be in the planning stages.

Hon'ble Secretary, DARE and DG, ICAR visited Bankura KVK

The Hon'ble Secretary, DARE and Director General, ICAR, New Delhi, Dr. H. Pathak visited Bankura KVK and inaugurated NIRD cold room on the occasion of one day workshop on FPCs/FPOs activities of the district on 16th December, 2022. The workshop was inaugurated by Minister-In-Charge, Sri P. Mazumdar, Panchayat and Rural Development, Govt. of WB and Hon'ble Secretary, DARE and DG, ICAR, Dr. H. Pathak. Smt. R. Aiyar,

DM, Bankura; Dr. F. H. Rahman, Pr. Scientist; senior officials of Govt. of WB, around 150 FPCs; FPOs; farmers



groups, SHGs, staff of Bankura KVK and many others were present. Dr. F. H. Rahman, Pr. Scientist, ICAR-ATARI Kolkata, while welcoming the guests, highlighted the need of FPCs/FPOs to attain sustainable livelihood and security at their end. Dr. (Mrs.) M. Dey Gupta, SSH, WBCADC KVK Bankura briefed about the initiatives/activities

taken to promote FPCs of the district. Sri P. Mazumdar appreciated the efforts to conduct such workshop for FPCs/FPOs of the district. He mentioned that FPCs are the future of farming community. He also emphasized the need of technology backstopping to



attain sustainability in farming and schemes like 'Matir Sristi prokolpo' and 'Krisak Bima Yojana' which played a vital role in development of farming



community of the district. Dr. H. Pathak, in his address, urged to perceive the fullest potential of the FPCs/FPOs and to organize more technical skill-oriented trainings. He suggested to converge with the line departments of the district, intra- and inter-state exposure visit of FPCs to expedite the control over their business. He appreciated the concept of 'Mrittika' branding of FPCs/FPOs products by Bankura KVK.

Events

'Independence Day 2022' celebrated

The 'Independence Day 2022' was celebrated at this institute on 15th August, 2022. All staff members of ATARI Kolkata assembled in front of the institute to celebrate the day with utmost fervour, zest and a spirit of patriotism for marking the innumerable sacrifices of the freedom fighters of our



country. The Director, Dr. S. K. Roy pointed out the role of freedom fighters and discussed the importance of the day. Dr. Roy requested everybody to work



for the development of the organization and ultimately, for the Nation.

'Vigilance Awareness Week 2022' observed

The 'Vigilance Awareness Week 2022' was observed from 31st October to 6th November, 2022 at ICAR-ATARI Kolkata



including KVKs of this Zone. The main theme was focussed on 'Corruption free India for a developed Nation'. About 576 staff and 1818 farmers under ATARI Kolkata have undertaken integrity pledge on 31st October at 11 AM for upholding the highest



standards of ethical conduct, honesty and integrity. A number of various programs like panel discussion, lecture, workshop, awareness seminars, debate, quiz competition, drawing competition, poster competition etc. were conducted involving employees, farmers, school boy and girls



throughout the week for sensitizing the people to generate awareness in the public at large about the ill effects of corruption and fight against corruption and enhance transparency and accountability in their functioning. Besides, banner and poster on vigilance awareness week were displayed. Social networking sites like Facebook, Twitter, YouTube, WhatsApp and a voice message in local language, were also used to sensitize the people on vigilance awareness.

Swachhta Hi Suraksha 2022 organized

ICAR-ATARI Kolkata along with all its 59 KVKs organized a 'Swachhta Pakhwara' during 16th to 31st December, 2022 for creating mass awareness about cleanliness and sanitation. During the event, a total of 3046 farmers/ farm women could be mobilized by KVKs. At ICAR-ATARI Kolkata, all the staff participated in swachhta activities too.



Meetings/workshops/training programmes organized/conducted

Management Development Programme (MDP) conducted

The third phase of Management Development Programme (MDP) for newly recruited Senior Scientist and Heads (SSH) of KVKs of this Zone was conducted from 14.07.2022 to 18.07.2022 at ICAR-ATARI Kolkata. Dr. S. Sarkar from U. Dinajpur KVK, West Bengal; Dr. S. Srichandran from Sambalpur KVK, Odisha and Dr. L. Pradhan from Sundargarh-I KVK, Odisha attended



the programme. During five days programme, they were acquainted with the various activities of ICAR-ATARI Kolkata and special trainings were imparted by the staff of this institute to improve their administrative and financial management skills for smooth running of KVKs.

Awareness program on agroforestry organized

An awareness program on establishment of homestead agroforestry under Agroforestry (SMAF) Project of DAC



& FW, GoI was organized at Jajpur KVK, Odisha on 6th August, 2022. Dr. H. K. Sahoo, JDE, OUAT chaired the



program. Dr. A. Halder, Nodal Scientist; Dr. S. C. Mohapatra, OIC, AICRP on Agroforestry; Dr. S. Mahapatra; SSH, Jajpur KVK; CDAO, Jajpur; DFO, Cuttack; ADH, Jajpur; PD Watershed, Jajpur; SMSs and staff of Jajpur KVK and more than 40 farmers attended this program. The planting materials of fruits/forest plants were provided to the farmers.

Institute Management Committee (IMC) Meetings organised

The Sixteenth and Seventeenth Institute Management Committee (IMC) Meetings were conducted on 21st September, 2022 and 23rd November, 2022, respectively at ICAR-ATARI Kolkata under the chairmanship of Dr. S. K. Roy, Director, ICAR-ATARI Kolkata. Dr. F. H. Rahman, Pr. Scientist-cum-Member Secretary, IMC formally welcome all the dignitaries and then, the chairman shared salient achievements of ICAR-ATARI Kolkata during the period. Dr. S. K. Roy apprised the



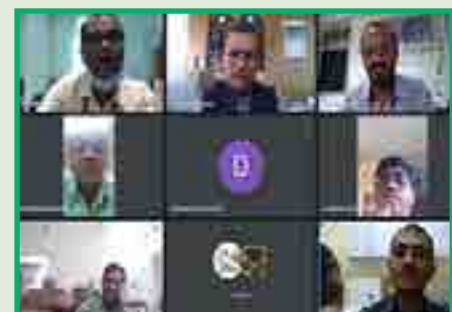
members regarding the expenditure on essential capital items as per ICAR order from ADG (PIM), ICAR. The members discussed each agenda item in details and approved those items following all necessary codal formalities.

Workshop for developing action plan on 'Natural Farming' organized

One virtual workshop for developing action plan on 'Out scaling of Natural Farming through KVKs' of ICAR-ATARI Kolkata was organized on 9th November, 2022. A total of 34 KVKs from West Bengal, Odisha and A & N Islands participated in the workshop. Dr. S. K. Roy, Director of this institute briefed about the advantages of natural farming and benefits accrued by the farmers through the interventions of different components of natural farming. Dr. F. H. Rahman, Nodal Officer of the project presented a brief overview and fund allocation of the project. Dr. N. K. Bharat, Prof. of UHF, Solan and expert of natural farming

described the process of preparation of various components, their application, methodology and outcome of natural farming. All the KVKs presented their recent activities in the workshop.

Another capacity building and action plan development programme on 'Out-scaling of natural farming for West Bengal KVKs' was organized by this institute in collaboration with Sasya Shyamala KVK, RKMVERI, Narendrapur on 29th November, 2022 at Narendrapur to discuss the implementation of the project. The workshop was attended



by SSHs and SMSs of 16 KVKs of West Bengal. Dr. F. H. Rahman, Nodal Officer, Natural Farming, while welcoming all the dignitaries and participants, briefed about the objectives and principles of the natural farming and elaborately described how to conduct different activities of the project. Swami Shivapurnanandaji Maharaj, Administrative Head, IRDM, RKMVERI proposed to make innovative models and strategies for agricultural sustainability through natural farming to reduce the cost of cultivation and to help in arresting growing needs for fertilizer and to



reduce subsidy burden. Dr. A. K. Singh, Ex-Vice Chancellor BAU, Sabour suggested to make current efforts to increase farmers' income and food production which should happen within the framework of sustainable

management of natural resources to avoid further depletion of water tables, biodiversity and habitat for wild species and land and soil degradation. Dr. S. K. Roy, Director, ICAR-ATARI Kolkata proposed for public environmental awareness and participation to bring about a change in attitude and finally restricting further damage to the



environment. Dr. N. J. Maitra, DDREF, WBUAFS mentioned about the agro-ecology based diversified farming system and suggested that KVK should



identify the farmers and other local stakeholders towards agriculture driven environmental issues. One newsletter of ICAR-ATARI Kolkata and one leaflet of SS KVK on Natural Farming were released during the programme.

Review workshop-cum-training programme on ARYA organized

One review workshop-cum-training programme on Attracting and Retaining Youth in Agriculture (ARYA) on 20.12.2022 to review the achievements of the Project run by 9 KVKs of Zone V. The workshop was attended by more than 50 participants including the Senior Scientist and Heads, Nodal Subject Matter Specialists, selected successful entrepreneurs and all the technical as well as scientific staff of ICAR-ATARI, Kolkata. Dr. R. K. Samanta, Former V.C., BCKV, Nadia chaired the session



and suggested to implement the ARYA project in the remaining KVKs of the country. He advised to popularize the cases of successful entrepreneurs through ICT, publication and other means. He also suggested to diversify the enterprises based on the need of the districts. He underlined the need to expose the non-ARYA KVKs of this zone to provide necessary guidelines for youth empowerment. Dr. S. K. Roy, Director, ICAR-ATARI Kolkata while welcoming the dignitaries emphasized to expand the running enterprises under

ARYA project among more number of youths. He urged the KVKs and host organizations to utilize the fund allocated to the ARYA implementing



KVKs properly. Dr. P. P. Pal, Pr. Scientist and Nodal Officer, ARYA briefed about the achievements of ARYA project and elaborately described how to scale up the project among non-beneficiaries. ARYA implementing KVKs presented in detail about the achievements of the project and future plan of action to make it a youth-friendly platform towards entrepreneurship development. Successful entrepreneurs shared their experiences with the help of videography and acknowledged the support and guidance received through this project to change their livelihood. They committed to expand the benefit among other youths to infuse the sense of self-employment. The matter of women empowerment achieved through this project was specially appreciated by the House. On this occasion, an e-Publication was also released on Achievements@75 by the KVKs of Odisha, West Bengal and Andaman & Nicobar Islands as a part of celebration of 'Azadi ka Amrit Mahotsav'.

Meetings/workshops/symposia etc. attended by scientists/ staff

Sl. No.	Name of the programme(s)	No. of scientist(s)/ staff attended
1	Online meeting on discussion and finalization of DFI success stories organized by Division of Agricultural Extension, ICAR, New Delhi	4
2	Review meeting on budget utilization under various projects of ICAR, New Delhi	10
3	Online meeting with DDG and Director, ATARIs on 'Review of budget utilization of different schemes' organized by Division of Agricultural Extension, ICAR, New Delhi	7
4	Online programme of 94 th Foundation Day of ICAR held at New Delhi organized by the Council	14
5	Scientific Advisory Committee (SAC) meeting of KVKs through virtual/physical mode	6
6	Online/offline review meeting with PIs/CO-PIs/SSHs of KVKs of different National Network projects	6
7	Online/offline review/PMC meeting with PIs/CO-PIs of Institute/NABARD Funded projects	8

Sl. No.	Name of the programme(s)	No. of scientist(s)/ staff attended
8	Selection Committee meeting as Chairman/Member for selecting SRF/YP-I/DEO of different projects at ICAR-ATARI Kolkata	10
9	Review workshop of ARYA	30
10	Online meeting for preparing documents on achievements under STC/TSP w.r.t. ICAR-ATARI Kolkata	3
11	Meeting as Chairman/Committee Member for scrutinizing applications for different posts of KVKs held at ATARI Kolkata	6
12	Meeting with newly recruited KVK scientists under MDP programme at ATARI Kolkata	11
13	Online interaction meeting of OIC-Data Management for <i>KRISHI Portal</i> organized by Dr. R. Prasad, Director, ICAR-IASRI, New Delhi and In-Charge, <i>KRISHI Portal</i>	2
14	Meeting on 'Awareness programme for soil testing labs under soil health card scheme' organized by ICAR-ATARI Kolkata in collaboration with National Accreditation Board for Testing and Calibration Laboratories (NABL) at ICAR-ATARI Kolkata	25
15	Online meeting on 'Special campaign 2.0 for disposal of pending matters from 02.10.2022 to 31.10.2022' under the Chairmanship of Hon'ble DG, ICAR and Secretary, DARE organized by ICT, New Delhi	12
16	Online programme on 'Agri-start up conclave and PM Kisan Sammelan' inaugurated by the Hon'ble Prime Minister of India organized by Ministry of Ag. & FW, New Delhi at ICAR-IARI, New Delhi	10
17	Online interaction meeting of Hon'ble DG, ICAR and Secretary, DARE with Scientists of ICAR on 'Revitalizing ICAR activities, aspirations and actions' organized by ICT, New Delhi	10
18	Online meeting of DDGs, ICAR on 'Activities and Aspirations of ICAR' under the Chairmanship of Hon'ble DG, ICAR, New Delhi organized by ICT, New Delhi	6
19	Online meeting with WBSCTVESD organized by ATARI Kolkata	4
20	Meeting of Extension Council as ICAR Nominee for U.B.K.V., Coochbehar	1
21	Online/offline review meeting on NICRA/ DAMU project	5
22	Meeting on tribal village development of Bankura district	2
23	Meeting of Regional Advisory Group of NABARD, Kolkata organized at NABARD, Kolkata	2
24	Online meeting on 'Kisan Sarathi' of Zone V organized by ICAR-ATARI Kolkata	3
25	'Livestock Conference-2022' at Park Hotel, Kolkata organized by Confederation of Indian Industry, Eastern Region, Kolkata	1
26	Meetings of District Level Committee for ARYA project	2
27	Online meeting to present the achievements of National Agricultural Science Funded (NASF) completed project on Black Bengal goats organized by NASF, ICAR, New Delhi	1
28	Meeting with Director, ICAR-ATARI Kolkata, scientists and other staff members of ATARI Kolkata on various issues	12
29	Online review meeting on ASCI SKDT programme organized by the Council	1
30	Workshop as an expert for OFT finalization on animal science for the KVKs of Zone IV organized by ICAR-ATARI Patna	1
31	Online/offline review meeting on implementation of Agri-Drone project	6
32	National workshop on Natural Farming at Kurukshetra, Haryana	3
33	Other meetings on various issues	10

Distinguished visitor

- Dr. R. K. Samanta, Former Vice Chancellor, BCKV, Mohanpur, West Bengal and Former Chairman, QRT, ICAR-ATARI Kolkata

Publications

Research articles

Bommayasamy N, Singh L B, Nanda B K and Rahman F H. 2021. Effect of split application of nitrogen on productivity, profitability and nitrogen use efficiency of drought tolerant rice. *Indian Journal of Extension Education*, Vol 57, No.3.

Haldar A, Kumar D, Behera M, Ghosh S, Joshi S K, Das U, Kumar A and Roy S K. 2022. Climate resilient technologies for augmenting livestock production and enhancing farmer's income under smallholder farming system. *Indian Journal of Animal Health*, 61(2): 41- 54.

Haldar A, Pal P, Ghosh S and Pan S. 2022. Body weight prediction using recursive partitioning and regression trees (RPART) model in Indian Black Bengal goat breed: A machine learning approach. *Indian Journal of Animal Research* [DOI: 10.18805/IJAR.B-4894].

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Laishram M, Mandal S N, Haldar A, Das S, Bera S, Samanta R. 2022. Biometric identification of Black Bengal goat: Unique iris pattern matching system vs. deep learning approach. *Animal Bioscience*, Nov. 14 [DOI: 10.5713/ab.22.0157. PMID: 36397702].

Mahato S, Mandal S and Rahman F H. 2022. Study on Economic benefit by following agromet advisory services received from district agromet unit in the lateritic belt of Birbhum. *International Journal of Agricultural Science*, pp: 102-

107. (<http://iaras.org/iaras/journals/ijas.7>).

Malakar H, Timsina G, Dutta J, Borgohain A, Deka D, Babu A, Paul R K, Yeasin M, Rahman F H, Panja S and Karak T. 2022. Sick or rich: Assessing the selected soil properties and fertility status across the tea growing region of Dooars, West Bengal, India. *Frontiers in Plant Science*, 13: 1-22 (DOI: 10.3389/fpls.2022.1017145).

Mondal S K, Das K S, Roy S K and Rajkhowa C. 2022. Carcass characteristics and proximate composition of Mithun (*Bos frontalis*) carcass. *Journal of Veterinary and Animal Sciences*, 53(2): 292-296 [DOI: <https://doi.org/10.51966/jvas.2022.53.2.292-296>].

Mondal S K, Saikia P and Das K S. 2022. Incidence of splay leg in purebred and crossbred Landrace piglets. Accepted for publication in *Journal of Livestock Science*.

Pathak P K, Roy U, Bhattacharya R and Rahman F H. 2022. Assessment of efficacy of pheromone trap to control fruit and shoot borer (*Leucinodes orbonalis* Guenee) in brinjal at Murshidabad district of West Bengal. *Indian Agriculturist* (Accepted).

Pathak P K, Roy U, Ghosh D K, Bhattacharya R and Rahman F H. 2022. Performance of different turmeric cultivars under old mango orchard at Murshidabad district of West Bengal. *Environment and Ecology*, 40 (4C): 2661-2663.

Technical bulletins

Das K S, Mondal S K, Roy S K, Pal P P, Haldar A and Rahman F H. 2022. ATARI Kolkata News. Published by the Director, ICAR-ATARI Kolkata, 6(1): 1- 12.

Ghorai D, Sarkar S, Rahman M A S, Behera M S, Rahman F H and Kar G. 2022. Compendium on Advanced farming technology for doubling farmers income. Vol 1. Published by the Director, ICAR-CRIJAF Barrackpore, pp:1-45.

Roy S K, Mondal S K, Pal P P, Das K S, Rahman F H and Haldar A. 2022. ICAR-ATARI Kolkata Annual Report 2021. Published by the Director, ATARI Kolkata, pp: 1-172.

Technical article

Begam A, Dutta S, Das K S and Pramanik M. 2022. Agriculture operations using drone technology. *Just Agriculture*, November 2022, pp: 17-19.

Begam A, Dutta S, Das K S and Mondal S K. 2022. Climate smart agronomical practices for increasing agricultural production. *Indian Farming*, 72(4):26-29.

Abstracts presented in national/international seminars, conferences etc.

Dey Gupta M, Mondal S K, Das K S and Roy S K. 2022. Effect of modifications of existing goat houses on kid mortality of Bankura district of West Bengal. Abstract accepted in National Conference on 'Futuristic approach to viable animal production vis-à-vis climate and calamity challenges' organized by Indian Society of Animal Production Management and Department of Livestock Production and Management, College of Veterinary Science and Animal Husbandry, OUAT, Bhubaneswar to be held on 18th to 20th January, 2023.

George Z, Mondal S K and Das K S. 2022. Evaluation of supplementation

of minerals and vitamins for enhancing growth of Teressa goats. Abstract accepted in National Conference on 'Futuristic approach to viable animal production vis-à-vis climate and calamity challenges' organized by Indian Society of Animal Production Management and Department of Livestock Production and Management, College of Veterinary Science and Animal Husbandry, OUAT, Bhubaneswar to be held on 18th to 20th January, 2023.

Malik H N, Bhattacharya R and Rahman F H. 2022. Comparative study of different moisture stress tolerant rice varieties in western undulating zone of Odisha. Paper presented in the International Conference on 'Re-imagining on rainfed agro-ecosystem: challenges and opportunities' held on 22nd to 24th December, 2022 at ICAR-CRIDA, Hyderabad.

Rahman F H, Bhattacharya R, Malik H N, and Roy S K. 2022. Micronutrient management on pigeon pea [*Cajanus cajan* (L.) Cv. PRG 176] in Kalahandi district of Odisha. Paper presented in the

International Conference on 'Re-imagining on rainfed agro-ecosystem: challenges and opportunities' held on 22nd to 24th December, 2022 at ICAR-CRIDA, Hyderabad.

Book edited

Pal P P, Das S and Ghosh S. 2022. Achievements @75 by the KVKs of Odisha, West Bengal and Andaman & Nicobar Islands [e-book]. Published by the Director, ICAR-Agricultural Technology Application Research Institute, Kolkata, India, pp: 1-180.

Book chapters/ contribution made in compendium

Mondal S K, Das K S and Singh S S. 2022. Smallholder pig value chains development and livelihood security. Book chapter In: Kumar A, Kumar P, Singh S S, Trisasongko B H and Rani M. 2022. Agriculture, Livestock Production and Aquaculture: Advances for Smallholder Farming Systems Volume 1. Published by Springer Nature, pp: 183-204 [DOI : 10.1007/978-3-030-93258-9].

Majumder D, Saha S, Mukherjee B, Das S, Rahman F H and

Hossain A. 2022. Application of biochar for improving the crops yield and quality of crops under changing climatic scenarios. In: Deadline is approaching for Biochar amendments to improve agricultural systems: from crop production to climate change and plant stressors mitigation. Published by Springer, Switzerland. 2022. (Accepted)

Rahman F H and Bhattacharya R. 2022. Climate resilient agriculture for sustainable production of agriculture and allied sectors in Eastern India. In: Advanced extension & communication strategies for sustainable livelihood through Animal Husbandry and allied farming system. Published by NIPA Genx Electronic Resources & Solutions Pvt. Ltd., New Delhi, pp: 288-303.

News items

- 'Action Plan Workshop of outscaling of natural farming through KVKs' on 09.11.2022 for ICAR website.
- 'Capacity building programme on natural farming' on 29.11.2022 for ICAR website.

Personalia

Joining

Mr. Purbendu Samanta and Mr. Salim Sahaji joined this institute as YP-I under Natural Farming Project on 30.09.2022 and 07.11.2022, respectively.

Superannuation

Mrs. Sulekha Pal, Principal Private Secretary to the Director, ICAR-ATARI Kolkata has been superannuated from her service on 31.08.2022.

Recognition

Dr. K. S. Das, Pr. Scientist of this institute, has been awarded with one of the Editorial Board Members of *Asian Journal of Dairy and Food Research* (Formerly: *Journal of Dairying, Foods and Home Sciences*) published by Agricultural Research Communication Centre, Karnal, Haryana for his outstanding contribution to the journal during the year 2022.

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

ATARI Kolkata News

A Bi-annual Newsletter of ICAR-Agricultural Technology Application Research Institute
(An ISO 9001: 2015 Certified Institute)

An Institution of Indian Council of Agricultural Research (ICAR)

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Published by

Director, ICAR-ATARI Kolkata

Compiled and Edited by

Das K S, Mondal S K, Begam A, Haldar A, Rahman F H, Pal P P and Roy S K

Designed by

Mondal S K and Das K S