वार्षिक प्रतिवेदन
Annual Report
2023

भाकृअनुप-कृषि तकनीकी अनुप्रयोग अनुसंधान संस्थान कोलकाता
ICAR- Agricultural Technology Application Research Institute
भूमि विहार काम्प्लेक्स, ब्लाक-जी.बी., सेक्टर-3, साल्ट लेक, कोलकाता - 700097
Bhumi Vihar Complex, Block- GB, Sector- III, Salt Lake, Kolkata- 700097, WB

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Preface

In the realm of scientific inquiry, each esteemed research institute publishes an annual progress report, a testament to the year's endeavors and triumphs. Echoing this tradition, the ICAR-Agricultural Technology Application Research Institute (ICAR-ATARI) Kolkata unveils its Annual Report for 2023, a narrative of achievement and dedication. This document chronicles the achievements of 59 Krishi Vigyan Kendras (KVKs) spread across the Union Territory of Andaman & Nicobar Islands, and the states of Odisha and West Bengal. These KVKs flourish under the stewardship of State Agricultural Universities, Central Universities, State Veterinary Universities, Deemed-to-be Universities, Indian Council of Agricultural Research Institutes, State Departments, and Non-Government Organizations.

The report paints a vivid picture of the technical guidance offered at the ICAR-ATARI level, the vigilant supervision undertaken, and the unwavering technological support provided by the Directorates of Extension Education of SAUs. It also highlights the proficiency of the host organizations in fostering robust infrastructure, recruiting skilled staff, and cultivating an environment conducive to the KVKs' mission of advancing the agricultural landscape for the farming community in this region.

In crafting the Annual Report 2023 of ICAR-ATARI Kolkata, we traverse through the myriad facets of KVK functioning. Detailed accounts of mandated activities—training, on-farm testing, frontline demonstrations, capacity building, soil testing, seed and planting material production, fish fingerlings and livestock production—are meticulously chronicled. This comprehensive overview illuminates the breadth of KVK activities and their far-reaching impact on farmers even in remote corners.

The launch of several flagship programs by the Government of India, alongside various Central Sector Schemes by different ministries, underscores the KVKs' commitment. Under the aegis of ICAR-ATARI Kolkata, these initiatives address a spectrum of farming practices, non-farming enterprises, climate change scenarios, entrepreneurship development, the *Swachh Bharat* Mission, and Scheduled Caste and Tribal development. These efforts are elegantly presented in this Annual Report, enriched with precise information and vivid photographs that capture the essence of their impact. The new initiatives, such as the Millet *Mela* and *Viksit Bharat Sankalp Yatra*, find their place in this narrative. The report also documents the contributions of the Directorates of Extension Education of SAUs in overseeing KVK operations, ensuring technological support, nurturing human resources, and enhancing the performance of ATICs. Events like *Mahila Kisan Divas*, *Swachhta Hi Seva* 2023, and the Celebration of Vigilance Week, held at ICAR-ATARI Kolkata and the KVKs, are depicted with special emphasis on digitization. The Annual Report 2023 offers a glimpse into the KVK Portal, KRISHI Portal, National Farmers Portal, and the regular data uploads on various platforms, painting a portrait of a dynamic and interconnected agricultural community.

This publication, a mosaic of agricultural development initiatives and newly approved research projects, executed during the period under report, thanks to the support and cooperation extended by all involved. I would like to extend my gratitude for the guidance provided by the Division of Agricultural Extension, Indian Council of Agricultural Research, New Delhi, and offer heartfelt thanks for the cooperation from all Host Organizations, the entire KVK fraternity of this zone, and the dedicated staff of ICAR-ATARI Kolkata.

Director

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कार्यकारी सारांश

क्षेत्रीय परियोजना निदेशालय को आईसीएआर-कृषि प्रौद्योगिकी अनुप्रयोग अनुसंधान संस्थान (अटारी) में अपग्रेड करने के साथ ही, गतिविधियों में विविधता लाना इस संस्थान का सार बन गया है। छोटे, मध्यम और भूमिहीन किसानों की खेती से जुड़ी समस्याओं को दूर करने और बेरोजगार युवाओं की जरूरतों को पूरा करने के लिए एक सतत प्रयास के रूप में, आंतरिक और राष्ट्रीय संगठनों के प्रभावी सहयोग से सभी हितधारकों को जरूरत के हिसाब से और समय पर परखे गए समाधान प्रदान करने के लिए एक व्यवस्थित दृष्टिकोण अपनाया गया है। इस प्रक्रिया में, आईसीएआर-अटारी, कोलकाता और इस क्षेत्र के 59 केवीके की कार्यात्मक गतिशीलता को काफी हद तक चार्ज/संशोधित किया गया है ताकि एक मजबूत प्रणाली का निर्माण किया जा सके।

अनुसंधान के क्षेत्र में, केवीके के लिए अनुकूली अनुसंधान का मार्गदर्शन करने के अलावा, आईसीएआर-अटारी, कोलकाता समस्या समाधान अनुसंधान में शामिल रहा है, ताकि बेहतर कृषि, परेशानी मुक्त पशुधन और मत्स्य पालन क्षेत्र, उचित संचार प्रौद्योगिकी अपनाने और प्रसार प्रक्रिया, फसल प्रणाली को खेती प्रणाली मोड में बदलने और अन्य उपयोगी तरीकों के व्यापक क्षेत्र के साथ सामने आ सके। संचयी अनुसंधान आउटपुट मौजूदा कृषि और संबद्ध प्रथाओं के भविष्य को आकार देने में एक लंबा रास्ता तय कर सकता है।

वैज्ञानिक विचारों का नियमित आदान-प्रदान और सफल व्यवहार में लागू की गई विशिष्ट अवधारणा से परिचित होने से अक्सर मौजूदा खेती और उससे जुड़ी गतिविधियों में वांछनीय बदलाव आते हैं। ओडिशा और पश्चिम बंगाल के चुनिंदा जिलों में चावल-गेहूं/चावल आधारित फसल प्रणाली से लेकर दलहन आधारित फसल प्रणाली के क्षेत्रों में सीएसआईएसए, सीआईएमएमवाईटी इंडिया और विश्व बैंक के साथ स्थापित सहयोग से दलहन उत्पादकता में मौजूदा अंतर का पता लगाने और एक निश्चित समय सीमा के भीतर इसे कई गुना बढ़ाने के लिए उपयुक्त नीतिगत निर्णय सुझाने की उम्मीद है। इसी तरह विश्व बैंक और पश्चिम बंगाल सरकार के जल उपयोगकर्ता संघ के साथ काम करने से पूरे राज्य में जल उत्पादकता बढ़ेगी और उसके बाद उचित फसल ज्यामिति होगी।

विभिन्न मंत्रालयों और आईसीएआर द्वारा शुरू किए गए प्रमुख कार्यक्रमों का मुख्य उद्देश्य मधुमक्खी पालन आधारित सामाजिक-आर्थिक स्थिति को वांछित दिशा में बदलना है, जिसमें स्वरोजगार के लिए प्रेरणा देना, नियमित कृषि को विपणन योग्य बनाना, स्टार्ट-अप के लिए उपयुक्त उद्यमों की पहचान करना और अन्य आवश्यक क्षेत्र शामिल हैं। ऐसे कार्यक्रमों की सफलता काफी हद तक लक्षित ग्राहकों के लिए जमीनी स्तर पर वास्तविक कार्यान्वयन पर निर्भर करती है। आईसीएआर-अटारी, कोलकाता ने कार्यान्वित परियोजनाओं से सर्वोत्तम संभव आउटपुट और परिणाम लाने के लिए पहचाने गए केवीके के माध्यम से इन सभी कार्यक्रमों को पूरा करने में बहुत व्यवस्थित काम किया है। जलवायु लचीली कृषि पर राष्ट्रीय नवाचार में, इस क्षेत्र के 17 केवीके ने इस संस्थान के मार्गदर्शन और पर्यवेक्षण के तहत कार्य योजना के व्यवस्थित डिजाइन के माध्यम से बड़ी संख्या में किसानों को सूखा, अनियमित वर्षा, नमी की कमी, गर्मी और शीत लहर, बाढ़, चक्रवाती तूफान आदि जैसी जलवायु कमजोरियों से निपटने के लिए सशक्त बनाया है। इस परियोजना में प्रत्यक्ष रूप से शामिल किसानों को प्राप्त लाभ के आकलन से पता चलता है कि 32880 किसानों में से 16 प्रतिशत किसान विभिन्न संस्थागत हस्तक्षेपों जैसे बीज बैंक, चारा बैंक, एडब्ल्यूएस आदि के माध्यम से लाभान्वित हुए, इसके बाद 15 प्रतिशत क्षमता निर्माण कार्यक्रमों के माध्यम से, 12 प्रतिशत फसल उत्पादन के माध्यम से और लगभग समान प्रतिशत प्राकृतिक संसाधन प्रबंधन और पशुधन और मत्स्य पालन मॉड्यूल के माध्यम से लाभान्वित हुए। एनआरएम के विभिन्न मापदंड इन-सीटू नमी संरक्षण, जल संचयन और पुनर्चक्रण, संरक्षित जुताई, कृत्रिम भूजल पुनर्भरण, जीवन रक्षक सिंचाई और अन्य प्रदर्शनों में सहायक रहे हैं। सहभागी, अंजलि, नवीन, अभिषेक जैसी सूखा सहिष्णु चावल की किस्मों, गोसाबा 5, कैरी धान 5, उषार धान 5, जरावा और गीतांजलि जैसी लवण सहिष्णु किस्मों की शुरूआत ने किसानों को तीव्र जलवायु तनाव की स्थिति के दौरान नियमित उपज प्राप्त करने में काफी मदद की। निक्रा गांवों में कस्टम हायरिंग सेंटर की स्थापना से किसान पावर टिलर, रीपर, रेज्ड बेड प्लांटर, जीरो-टिल ड्रिल और अन्य जैसे उन्नत कृषि उपकरणों और औजारों का उपयोग करने में सक्षम हो गए हैं। गांवों में गठित वीसीआरएमसी और सीएचसी ने %25 निधि समर्थन के साथ स्थायी निधि को बनाए रखने के लिए 13 लाख रुपये से अधिक कमाने का मार्ग प्रशस्त किया। विभिन्न विकास कार्यक्रमों और वन विभाग, सुंदरबन विकास बोर्ड और अन्य जैसे संगठनों के साथ प्रभावी अभिसरण के कारण निक्रा परियोजना की सफलता को बढ़ाया जा सका।

तिलहन और दलहन फसलों पर क्लस्टर फ्रंटलाइन प्रदर्शन ने बीज प्रतिस्थापन दर को बढ़ाने, उत्पादन और उत्पादकता बढ़ाने, मौजूदा प्रबंधन/खेती प्रथाओं को बदलने और किसानों को बेहतर तकनीकों से परिचित कराने में महत्वपूर्ण योगदान दिया है। संबद्ध भागीदारों द्वारा नियमित निगरानी ने इस क्षेत्र में -32 %57 की सीमा में समग्र तिलहन उत्पादकता बढ़ाने में मदद की। इस विशेष कार्यक्रम के तहत, मूंगफली, नाइजर, तिल, सूरजमुखी, रेपसीड और सरसों को शामिल करते हुए 1227.0 हेक्टेयर क्षेत्र को बेहतर प्रदर्शन के तहत लाया गया। पेश की गई नई किस्में मूंगफली की कदरी लेपाक्षी (K1812), तिल की सुप्रवा, सरसों की PM31-, PM28 और अन्य थीं।

दलहनों पर विशेष सीएफएलडी में, 900.0 हेक्टेयर क्षेत्र को अरहर की एल.जी. आर.52-, हरी चने की विराट, पीयू31-, पीयू10-, वी.बी.एन.9-, उड़द की वी.बी.एन.10- आदि उन्नत किस्मों के साथ विशेष प्रदर्शन के अंतर्गत लाया जा सका। प्रदर्शित की गई उन्नत पद्धतियों में जैव उर्वरकों, राइजोबियम, टी. विरिडी, मृदा सुधारक आदि के साथ बीज उपचार, सूक्ष्म पोषक तत्वों, जिंक और बोरान का पत्तियों पर छिड़काव, एकीकृत पोषक तत्व प्रबंधन और अन्य शामिल थे। उन्नत पद्धतियों के विवेकपूर्ण अनुप्रयोग ने पूरे क्षेत्र में फसल की उपज में 17 से %41 की वृद्धि की। फसलों की वृद्धि और उसके पर्यवेक्षण की प्रभावी निगरानी के लिए सभी पहचाने गए प्रदर्शित भूखंडों को जियो-टैग किया गया और कृषि मैपर मोबाइल ऐप पर अपलोड किया गया।

किसानों को गुणवत्तापूर्ण दलहन बीज उपलब्ध कराने के उद्देश्य से इस क्षेत्र के 10 बीज हब निर्धारित लक्ष्य के अनुसार चिन्हित दलहन फसलों के गुणवत्तापूर्ण बीज तैयार कर रहे हैं। किसानों को बीज उपलब्ध कराने के अलावा, इस क्षेत्र के कृषि विज्ञान केंद्रों के प्रदर्शन कार्यक्रमों में भी ऐसे बीजों का उपयोग किया जाता है। दलहन फसलों के प्रमुख बीज उत्पादक मसूर, लथीरस, मूंग और उड़द

हैं। आईसीएआर-आईआईपीआर, कानपुर आईसीएआर-अटारी कोलकाता के सहयोग से इस परियोजना की प्रत्यक्ष देखरेख और निगरानी कर रहा है।

फार्मर फर्स्ट आईसीएआर का एक अनूठा कार्यक्रम है जो किसानों और किसानों के खेत में वैज्ञानिकों के बीच इंटरफेस को बेहतर बनाता है। यह कार्यक्रम उत्पादन और उत्पादकता से परे देखता है और अधिकांश किसानों द्वारा सामना की जाने वाली जटिल, विविध और जोखिम-ग्रस्त वास्तविकताओं को प्राथमिकता देता है। यह कार्यक्रम मुख्य रूप से किसान के खेत के नवाचारों, संसाधनों, विज्ञान और प्रौद्योगिकी से संबंधित है। कार्यान्वयन करने वाले चार संस्थान/एसएयू कृषि और संबद्ध क्षेत्रों के मॉड्यूल-आधारित विकास में शामिल हैं, जिसमें जल और आजीविका सुरक्षा, स्थिरता के साथ चावल आधारित उत्पादन प्रणाली और अन्य शामिल हैं। कृषक समुदाय की आवश्यकता के आधार पर, निष्पादित हस्तक्षेप अनुशंसित मॉडलों से बहुत अधिक लाभ प्राप्त कर सकते हैं।

कृषि विज्ञान केंद्रों के माध्यम से पिछड़े वर्गों की सामाजिक-आर्थिक स्थिति में सुधार लाने का प्रयास इस क्षेत्र के सभी आदिवासी बहुल जिलों में काफी फायदेमंद साबित हुआ। अनुसूचित जातियों के लिए आदिवासी उपयोजना और विकास कार्य योजना में कृषि गतिविधियों, बागवानी, पशुपालन, मत्स्य पालन, किचन गार्डनिंग और आदिवासी समाज के विकास के लिए जिम्मेदार अन्य क्षेत्रों पर जोर दिया गया। इन परियोजनाओं के माध्यम से कौशल और ज्ञान में विकास के अलावा आदिवासियों की सुविधा के लिए परिसंपत्ति निर्माण भी संभव हुआ। कुल मिलाकर 12212 आदिवासी किसानों को टीएसपी के तहत और 54614 किसानों को डीएपीएससी के तहत उन्नत कृषि और संबद्ध पद्धतियों के अभ्यास के लिए प्रशिक्षित किया गया।

युवाओं के सशक्तिकरण के लिए उन्हें स्वरोजगार के लिए अनुकूल वातावरण प्रदान करके समाज की मुख्य धारा में शामिल करने पर अधिक ध्यान देने की आवश्यकता है। बड़ी संख्या में ग्रामीण युवाओं को आर्य, मधुमक्खी पालन और कौशल विकास योजनाओं के अंतर्गत लाया गया है, ताकि उन्हें या तो व्यावसायिक उद्यमों से जोड़ा जा सके या उन्हें स्वयं के रोजगार सृजन के अवसर पैदा करने में सक्षम बनाया जा सके। इस क्षेत्र के 9 जिलों के 798 ग्रामीण युवाओं को उद्यमशीलता प्रशिक्षण प्रदान करने के बाद, 445 युवाओं ने मशरूम, मत्स्य पालन, लाह, बागवानी, वर्मीकम्पोस्ट, प्रसंस्करण, मुर्गी पालन, बकरी पालन और मधुमक्खी पालन में उद्यमशील इकाइयां स्थापित कीं। ऐसे व्यावसायिक उद्यमों के सफल संचालन से उन्हें पिछले वर्ष की तुलना में %195-105 अधिक आय प्राप्त करने में सक्षम बनाया गया है। इसके अतिरिक्त, लगभग सभी उद्यमों में विभिन्न स्तरों पर जनशक्ति का सृजन भी किया गया है।

किसानों और ग्रामीण युवाओं के लिए लाभदायक उद्यम के रूप में मधुमक्खी पालन के अत्यधिक महत्व को देखते हुए, इस क्षेत्र के 15 चयनित जिलों में एनबीबी की एक केंद्रीय परियोजना लागू की गई है। इस परियोजना का मुख्य उद्देश्य मधुमक्खी पालन/शहद उत्पादन, मूल्य संवर्धन और विपणन में कृषि उद्यमियों और कृषि स्टार्टअप को बढ़ावा देना है ताकि आजीविका समर्थन के रूप में पर्याप्त आय उत्पन्न की जा सके। केवीके ने 26 गंभीर रूप से मूल्यांकित प्रशिक्षण कार्यक्रमों के माध्यम से 640 किसानों और युवाओं को प्रशिक्षित किया।

भारतीय कृषि कौशल परिषद और डीएएफडब्ल्यू के सहयोग से, इस क्षेत्र के केवीके द्वारा 200 घंटे या उससे अधिक का विशेष कौशल विकास प्रशिक्षण कार्यक्रम आयोजित किया गया, जिसका उद्देश्य उद्यमशील कृषि गतिविधियों, बागवानी, डेयरी फार्मिंग और अन्य सहित विभिन्न रोजगारोन्मुखी अवसरों में किसानों की क्षमता का विकास करना था। इस प्रक्रिया में ओडिशा और पश्चिम बंगाल के 13 केवीके 260 किसानों और ग्रामीण युवाओं को निर्धारित नौकरी भूमिकाओं के अनुसार प्रशिक्षित कर सके।

किसानों और वैज्ञानिकों के बीच किसानों के खेतों पर प्रभावी संपर्क स्थापित करने के लिए एमजीएमजी के नाम से संशोधित आयाम में प्रयोगशाला से भूमि कार्यक्रम चलाया गया। इस क्षेत्र में 17 आईसीएआर संस्थानों, क्षेत्रीय केंद्रों और राज्य कृषि विश्वविद्यालयों के वैज्ञानिकों ने इस क्षेत्र के 337 गांवों में फैले 38200 से अधिक किसानों से बातचीत की। पूरे कार्यक्रम की निगरानी और समन्वय आईसीएआर-अटारी कोलकाता द्वारा किया गया।

प्राकृतिक खेती को बढ़ावा देने के लिए भारत सरकार के प्रयासों को आईसीएआर-अटारी कोलकाता की प्रत्यक्ष देखरेख में इस क्षेत्र के कृषि विज्ञान केंद्रों द्वारा पर्याप्त समर्थन दिया गया है। देश भर में 425 कृषि विज्ञान केंद्रों के नेटवर्क सिस्टम के एक हिस्से के रूप में, इस क्षेत्र के 34 कृषि विज्ञान केंद्र प्राकृतिक खेती को बढ़ावा देने के लिए इस परियोजना को आगे बढ़ा रहे हैं। किसानों को जागरूक करने के लिए कार्यशालाओं के बाद बड़े पैमाने पर जागरूकता कार्यक्रम आयोजित किए गए, जिसमें प्राकृतिक खेती के पूर्ण कार्यान्वयन के लिए पर्चे, पोस्टर, साहित्य और अन्य विस्तार सामग्री वितरित की गई।

कृषि के क्षेत्र में एआई अनुप्रयोग के सर्वोत्तम रूप के रूप में कृषि मशीनीकरण इस क्षेत्र में 17 केवीके, आईसीएआर संस्थानों और राज्य कृषि विश्वविद्यालयों के माध्यम से ड्रोन प्रौद्योगिकी प्रदर्शन के कार्यान्वयन के साथ संभव हो गया है। इस अत्याधुनिक तकनीक ने कृषि-रसायनों, पोषक तत्वों, कीटनाशकों और खरपतवारनाशकों को सटीकता और श्रम की बचत तंत्र के साथ प्रभावी ढंग से लागू किया है। अब तक इस क्षेत्र के 6807 किसानों की भागीदारी के साथ 1101 हेक्टेयर क्षेत्र को ड्रोन प्रदर्शन कार्यक्रम के तहत लाया जा सका है।

इस संस्थान की विविध गतिविधियों को नाबार्ड जैसे वित्तीय संगठनों द्वारा पश्चिम बंगाल में मॉडल एकीकृत खेती पर एक परियोजना के लिए निधि सहायता प्रदान करने के रूप में विधिवत मान्यता दी गई थी। इस परियोजना का परिणाम पश्चिम बंगाल के 6 कृषि-जलवायु क्षेत्रों में मॉडल एकीकृत खेती के लिए क्षेत्र विकास योजनाओं का निर्माण और क्षेत्र-विशिष्ट सॉफ्टवेयर टेम्पलेट का विकास है।

पश्चिम बंगाल के पूरबा मेदिनीपुर जिले में आईसीएआर-अटारी कोलकाता द्वारा बाह्य वित्त पोषित परियोजना के रूप में खाद्यान्न, चारा और ईंधन के प्रति इकाई उत्पादन में वृद्धि, मृदा अपरदन को रोकना और मृदा की उर्वरता बढ़ाने के लिए मृदा नमी पर विचार किया गया। नाबार्ड की वित्तीय सहायता से 6.0 हेक्टेयर क्षेत्र में कृषि वानिकी मॉडल विकसित किए गए। इस परियोजना ने पारिस्थितिकी और पर्यावरण लाभ प्रदान करने के साथ-साथ ग्रामीण लोगों के लिए रोजगार के अवसर भी पैदा किए।

पोषण सुरक्षा सामाजिक विकास का एक महत्वपूर्ण क्षेत्र बन गया है, ताकि यह सुनिश्चित किया जा सके कि स्वास्थ्य सूचकांक विशेष रूप से ग्रामीण महिलाओं के बीच ठीक से बनाए रखा जाए। इस क्षेत्र में, 14 केवीके पोषण-संवेदनशील कृषि संसाधनों और नवाचारों पर प्रमुख परियोजना से जुड़े हुए हैं। की गई गतिविधियों में पोषण-स्मार्ट गांवों का विकास, पोषण उद्यान की स्थापना, जैव-फोर्टिफाइड किस्मों की खेती, मूल्य संवर्धन, खाद्य-फोर्टिफिकेशन आदि शामिल

थे। सभी 59 केवीके ने 905 प्रशिक्षण कार्यक्रमों और 1014 पोषण संबंधी विस्तार गतिविधियों के माध्यम से इस अवधारणा को लागू किया।

मौसम आधारित कृषि-सलाहों के महत्व से किसानों को परिचित कराने के साथ-साथ उन्हें जलवायु/मौसम संबंधी विचलनों और कृषि उत्पाद पर इसके प्रभाव को समझने में मदद करने के साथ-साथ ऐसी स्थिति को कम करने के लिए उचित रणनीति तैयार करने के लिए, इस क्षेत्र के 17 केवीके द्वारा जिला कृषि-मौसम इकाई ग्रामीण कृषि मौसम सेवा का प्रभावी ढंग से उपयोग किया गया है। फसल उत्पाद, रोग संक्रमण, पशुपालन और अन्य संबंधित क्षेत्रों पर समय पर सलाह के माध्यम से किसानों को लाभ पहुंचाया गया। ऐसी इकाइयों ने किसानों के बीच इसके प्रसार के लिए क्षेत्रीय भाषाओं में चेतावनी के बुलेटिन भी तैयार किए। किसानों को पूरे वर्ष अद्यतन जानकारी प्राप्त करने के लिए मेघदूत और दामिनी नामक दो विशिष्ट ऐप भी विकसित किए गए।

एफपीओ का गठन और संवर्धन मौजूदा सीबीबीओ और एनसीडीसी के सहयोग से आईसीएआर की एक सुविचारित परियोजना है। देश भर में बनने वाले 10,000 एफपीओ को सहायता प्रदान करने में, आईसीएआर-अटारी, कोलकाता केवीके और आईसीएआर संस्थान के माध्यम से चार (4) ऐसे एफपीओ बनाने में शामिल है। अब तक की गतिविधियों ने छोटे धारकों के लिए एक स्थायी आय-उन्मुख खेती और व्यवसाय मंच के विकास की सुविधा प्रदान की है। एफपीओ ने विभिन्न कृषि इनपुट और कृषि मशीनरी तक पहुंच के माध्यम से सामुदायिक खेती को विकसित करने में भी मदद की है।

प्रमुख कार्यक्रमों, बाह्य वित्तपोषित अनुसंधान परियोजनाओं और अन्य संबंधित गतिविधियों के कार्यान्वयन के अलावा, आईसीएआर-अटारी, कोलकाता ने नियमित आधार पर 59 केवीके की अनिवार्य गतिविधियों की निगरानी, मार्गदर्शन और मूल्यांकन करने पर पर्याप्त रूप से ध्यान केंद्रित किया है। किए गए प्रयास के परिणामस्वरूप प्रमुख विषयगत क्षेत्रों के तहत 325 प्रौद्योगिकियों का आकलन करने के लिए 3828 स्थानों में 574 ऑन-फैम परीक्षण किए गए हैं। इसी तरह, तिलहन, दलहन और अन्य फसलों के लिए एफएलडी कार्यक्रम के तहत 1391.25 हेक्टेयर क्षेत्र लाया जा सका। 10337 किसानों के खेत में प्रदर्शन किया गया। बेहतर किस्मों के प्रदर्शन और कार्यान्वयन की व्यवस्थित योजना के साथ-साथ निजी और उचित प्रबंधन प्रथाओं ने तिलहन में %45, दलहन में %57 और अन्य फसलों में %45 तक उपज बढ़ाने में सहायक रहे। इस तरह के प्रदर्शन पशुधन, मत्स्य पालन, कृषि उपकरणों और अन्य उद्यमों में भी किए गए।

किसानों, युवाओं और विस्तार कार्यकर्ताओं को उचित कौशल और ज्ञान प्रदान करना एक और क्षेत्र था जहाँ केवीके ने पूरे वर्ष आयोजित प्रशिक्षण कार्यक्रम के संदर्भ में उत्कृष्टता हासिल की। इस क्षेत्र की कृषि की बेहतरी के लिए 167954 ग्राहकों के ज्ञान और कौशल में सुधार किया जा सका/उन्हें अग्रणी तकनीकों से अवगत कराया जा सका। किसानों को गुणवत्तापूर्ण बीज और रोपण सामग्री उपलब्ध कराना अन्य क्षेत्र थे जो केवीके की विशिष्ट उपलब्धि को उजागर करते हैं। रिपोर्ट की गई अवधि के दौरान, 61.18 लाख रोपण सामग्री के उत्पादन के अलावा अनाज, दलहन, तिलहन, सब्जियों और अन्य के 15196 क्विंटल से अधिक बीज का उत्पादन किया गया।

केवीके किसानों के लाभ के लिए जैव उत्पादों, पशुधन और मत्स्य पालन सामग्री और अन्य जैविक निर्माण के उत्पादन में भी शामिल थे। केवीके द्वारा मिट्टी, पानी और पौधों के नमूनों का विश्लेषण भी किया गया ताकि मिट्टी परीक्षण मूल्य के अनुसार रसायनों का विवेकपूर्ण उपयोग सुनिश्चित किया जा सके। केवीके ने 4997 किसानों को मृदा स्वास्थ्य कार्ड प्रदान करने के लिए 53785 खोज नमूनों का परीक्षण किया।

केवीके को हमेशा विभिन्न उत्पादक गतिविधियों, विशेष रूप से विभिन्न कार्यक्रमों के सहयोगात्मक निष्पादन से अतिरिक्त राजस्व उत्पन्न करने के लिए प्रोत्साहित किया जाता है। वर्ष 2023 में, केवीके 478.78 लाख रुपये का राजस्व उत्पन्न करेंगे, जिसके बाद रिवॉल्विंग फंड को बढ़ाकर 1109.77 लाख रुपये किया जाएगा।

उन्नत/विकसित प्रौद्योगिकियों की उपलब्धता सुनिश्चित करना उन DEE की प्रमुख जिम्मेदारी है, जिनके अधिकार क्षेत्र में KVK हैं। इन विशेषणों को पूरा करने में, DEE ने KVK स्तर पर इसके मूल्यांकन के लिए विभिन्न प्रौद्योगिकियां प्रदान कीं। इसके अलावा, निदेशालय नियमित रूप से KVK और किसानों के खेतों का दौरा करते हैं ताकि खोज प्रौद्योगिकियों के कार्यान्वयन को देखा जा सके और संशोधन की आवश्यकता को समझा जा सके, यदि कोई हो। वे नियमित रूप से KVK कर्मियों के लिए HRD कार्यक्रम भी आयोजित करते हैं। किसानों को एक ही छत के नीचे प्रौद्योगिकी इनपुट और सूचना सहायता प्राप्त करने की सुविधा के लिए, इस क्षेत्र के चयनित ICAR संस्थान और SAU में ATIC की स्थापना की गई। 2023 में, 6305 किसानों ने तकनीकी जानकारी प्राप्त की, 2193 उपलब्ध प्रौद्योगिकी सेवाएँ और 10,000 से अधिक किसानों ने ATIC से गुणवत्तापूर्ण इनपुट एकत्र किए।

सामाजिक और व्यावसायिक जीवन में विशेष दिवस/सप्ताह मनाने का अपना महत्व है। इस महत्व को बनाए रखने के लिए, आईसीएआर-अटारी कोलकाता और इसके अंतर्गत आने वाले केवीके ने "स्वच्छता पखवाड़ा", "गणतंत्र दिवस", "विश्व बौद्धिक संपदा अधिकार दिवस", "अंतर्राष्ट्रीय योग दिवस", "अंतर्राष्ट्रीय महिला दिवस", संस्थान का स्थापना दिवस, फिट इंडिया फिटनेस सप्ताह, सतर्कता जागरूकता सप्ताह, महिला किसान दिवस और अन्य कई उत्सव मनाए/मनाया है।

भारत सरकार ने केवीके, आईसीएआर संस्थान और अन्य संगठनों की गतिविधियों/उपलब्धियों को उजागर करने के लिए विभिन्न ऑनलाइन पोर्टल/डिजिटल प्लेटफॉर्म बनाए हैं। कृषि, केवीके नॉलेज नेटवर्क, किसान सारथी, कृषि मैपर मोबाइल ऐप और अन्य महत्वपूर्ण सोशल प्लेटफॉर्म जैसे पोर्टलों पर आईसीएआर-अटारी कोलकाता में गहनता से विचार किया गया। ईआरपी, जीईएम, ई-ऑफिस, ई-परिचय, ई-एचआरएमएस, एआरएमएस, स्पैरो, पीएफएमएस के रूप में स्वचालन को इस कार्यालय में पूरी तरह से लागू किया गया है ताकि कागज रहित लेनदेन सुनिश्चित किया जा सके और साथ ही केवीकेएस और मेजबान संगठन को निधि का सहज हस्तांतरण सुनिश्चित किया जा सके।

आईसीएआर-अटारी कोलकाता की विविध गतिविधियाँ न केवल इस क्षेत्र के किसानों की मदद करती हैं, बल्कि आरएडब्ल्यूई कार्यक्रम के माध्यम से कृषि छात्रों, एआरएस परिवीक्षा प्रशिक्षण के माध्यम से कृषि पेशेवरों, इनपुट डीलरों (डीएईएसआई), भारत सरकार की विशेष पहल जैसे बाजरा मेला, विकसित भारत संकल्प यात्रा और अन्य के माध्यम से भी मदद करती हैं। आईसीएआर अटारी कोलकाता में सभी श्रेणियों के कर्मचारियों का समर्पण इस लक्ष्य को पूरा करने के साथ-साथ हितधारकों के उदार कार्य में प्रेरक शक्ति थी।

Executive Summary

With the upgradation of Zonal Project Directorate to ICAR-Agricultural Technology Application Research Institute (ATARI), diversification of activities has been the essence of this Institute. As a continuous bid to address the farming related problems of small, medium andlandless farmers followed by the fulfilment of the unemployed youth, a systematic approach has been adopted to provide need based and time-tested solutions to all the stakeholders with the effective collaboration of Internal and National Organizations. In the process, the functional dynamics of both ICAR-ATARI, Kolkata and 59 KVKs of this zone have been substantially charged/modified to usher into a formidable system to reckon with.

In the front of research pursuit, apart from guiding the adaptive research for the KVKs, ICAR-ATARI, Kolkata has been involved in problem solving research the to come up with broader arena ofimproved agriculture, hassle-free livestock and fishery sector, appropriate communication technology adoption and dissemination process, change of cropping system to farming system mode and other useful wayout. The cumulativeresearch output may go a long way in shaping the future of existing agricultural and allied practices.

Regular exchange of scientific ideas and exposure to distinctive concept put in successful practice often lead to desirable change in the existing farming and associated activities. Collaboration established with CSISA, CIMMYT India and World Bank in the areas of rice-wheat/rice-based cropping system to pulse-based cropping system in selected districts of Odisha and West Bengal is expected to find out existing gap in pulse productivity and suggest suitable policy decision to augment it many foldwithin a given timeframe. In the identical way working with Water Users Association of World Bank and West Bengal Government will enhance the water productivity across the state followed by appropriate crop geometry.

Flagship programmes launched by different Ministries and ICAR are mainly aimed at changing the apiculture-basedsocio-economic condition to a desired direction with infusion of motivation toself-employment, conversion of regular agriculture into marketable one, identification of suitable enterprises for start-ups and other needed areas. The successof such programmes greatly depend upon the actual implementation at the grassroot level for the intended clientele. ICAR - ATARI, Kolkata has been very much methodical in carrying out all these programmes through the identified KVKs to bring out best possible output and outcome from the implemented projects. In National innovation on Climate Resilient Agriculture, 17 KVKs of this zone have empowered a large number of farmers to cope up with climatic vulnerabilities like drought, erratic rainfall, moisture stress, heat and cold wave, flood, cyclonic storm etc. through systematic design of action plan under the guidance and supervision of this Institute. An assessment of benefit accrued to the farmers directly involved in this project indicates that out of 32880 farmers, 16 percent were benefitted through various institutional interventions like seed bank, fodder bank, AWS etc. followed by 15 percent through capacity building programmes, 12 percent through crop production and almost equal percentage through Natural Resource Management and livestock and fishery modules. Various parameters of NRM have been instrumental in in-situ moisture conservation, water harvesting and recycling, conservation tillage, artificial ground water recharge, life saving irrigation and other demonstrations. The introduction of drought tolerant rice varieties like Sahabhagi, Anjali, Naveen, Abhishek, salt tolerant varieties like Gosaba 5, CARI Dhan 5, Ushar Dhan 5, Jarava and Gitanjali etc. immensely helped the farmers to get regular yield during the acute climatic stress conditions. The establishment of Custom Hiring Centres in the NICRA villages enable the farmers to utilise improved farm tools and implements like power tiller, reaper, raised bed planter, zero-till drill and others. The VCRMC constituted in the villages and the CHC paved the way to earn more than rupees

13 lakh to maintain the sustainable fund with 25 % fund support. The success of NICRA project could be scaled up due to effective convergence with various development programme and organizations like Forest Department, Sundarban Development Board and others.

Cluster Frontline Demonstration on Oilseed and Pulse crops have contributed substantially to enhance the seed replacement rate, augmentproduction and productivity, replace the existing management/ Cultivation practices and expose the farmers towards improved technologies. The regular monitoring by the associated partners helped in increasing overall oilseed productivity in the range of 32-57% in this Zone. Under this special programme, an area of 1227.0 ha was brought under improved demonstration covering groundnut, niger, sesame, sunflower, rapeseed and mustard. The newer varieties introduced were Kadri Lepakshi (K1812) of groundnut, Suprava of sesame, PM-31, PM28 of mustard and others.

In special CFLD on pulses, an area of 900.0 ha could be brought under special demonstration with improved varieties like LGR-52 of pigeon pea, virat of green gram, PU-31, PU-10, VBN- 9, VBN-10 of Black gram etc. Improved package of practices demonstrated were seed treatment with biofertilizers, rhizobium, T. Virideae, soil ameliorants etc. foliar application of micronutrients, zinc and boron, Integrated nutrient management and others. The judicious application of improve package of practices enhanced the crop yield to the extent of 17 to 41% across the zone. All the identified demonstrated plots were geo-tagged and uploaded in Krishi Mapper mobile app to effectively monitor the growth of the crops and its supervision.

In view of making available quality pulse seeds to the farmers, 10 seed hubs of this zone are producing quality seeds of identified pulse crops as per assigned targets. Apart from making it available to the farmers, such seeds are also used in demonstration programmes of the KVKs of this zone. The major seed producing pulse crops are lentil, lathyrus, green gram, and black gram. ICAR-IIPR, Kanpur is directly supervising and monitoring this project in collaboration with ICAR-ATARI Kolkata.

Farmer FIRST is a unique programme of ICAR that improves the interface between farmers and scientist at the farmers' field. The programme looks beyond production and productivity and prioritises the complex, diverse and risk-prone realities faced by the majority of farmers. The programme mainly deals with innovations, resources, science and technology of the farmer's farm. The implementing four institutions/ SAU are involved on module-based development of agriculture and allied sectors including water and livelihood security,rice-based production system with sustainability and others. Based on the need of the farming community, the executed interventions could fetch much hair return from the recommended models.

The endeavour to improve the socio-economic condition of the backward classes through KVKs proved quite beneficial in all the tribal dominated districts in this zone. The tribal sub-plan and Development Action Plan for scheduled caste emphasized on agricultural activities, horticulture, animal husbandry, fishery, kitchen gardening and other areas responsible for the development of tribal society. Through these projects, apart from development in skill and knowledge, asset creation was also possible for the convenience of the tribals. Altogether 12212 tribal farmers were trained under TSP and 54614 farmers under DAPSC for practicing improved agricultural and allied practices.

Empowerment of youth calls for greater attention to involve them in the main stream of society through creating enabling environment conductive for self -employment. A large number of rural youth have been brought under the schemes of ARYA, bee keeping and development of skill to associate them either with commercial enterprises or to make them able to create their own employment generation opportunity. After providing entrepreneurial training to 798 rural youth of 9 districts of this zone, 445 number of youth could establish entrepreneurial units in mushroom, fishery, lac, horticulture, vermicompost, processing, poultry, goatary and apiary. The successful run of such commercial ventures has enable them to earn 105-195% more

than the income of previous year. In addition, manpower has also been created in almost all the enterprises to a varied degree.

Considering the enormous importance of beekeeping as a profitable enterprise for farmers and rural youth, a centrally founded project of NBB has been implemented in 15 selected districts of this zone. The project primarily aimed at promoting agri- entrepreneurs and agri-startups in beekeeping/ honey production, value addition and marketing to generate adequate income as a part of livelihood support. The KVKs trained 640 farmers and youth through 26 critically evaluated training programmes.

In collaboration with Agriculture Skill Council of India and DAFW, exclusive skill development training programme of 200 hours or more was conducted by the KVKs of this zone as a part of capacity development of farmers in various job oriented opportunities including entrepreneurial agricultural activities, gardening, dairy farming and others. In the process 13 KVKs of Odisha and West Bengal could train 260 farmers and rural youth as per schedule job roles.

Lab to land programme in a modified dimension was carried out in the name of MGMG to have effective interface between farmers and scientists at farmers' field. In this zone, scientists of 17 ICAR institutes, regional centres and SAUs interacted with more than 38200 farmers scattered in 337 villages of this zone.The entire programme was monitored and coordinated by ICAR-ATARI Kolkata.

The thrust of Government of India to go natural farming has been adequately supported by the KVKs of this zone under the direct supervision of ICAR-ATARI Kolkata. As a part of network system comprising of 425 KVKs across the country, 34 KVKs of this zone are carrying out this project to out scale natural farming. Large scale awareness programme followed by workshop to sensitize farmers were organized with distribution of leaflets, posters, literature and other extension materials on natural farming for its filled implementation.

Farm Mechanization as the best form of AI application in the field of agriculture has become possible with the implementation of drone technology demonstration in this Zone through 17 KVKs, ICAR institutes and SAUs. This cutting edge technology has effectively applied agro-chemicals, nutrients, pesticides and weedicides with precision and labour saving mechanism. So far 1101 ha could be brought under drone demonstration programme with the participation of 6807 farmers of this Zone.

The diversified activities of this institute was duly recognised by the financial organizations like NABARD in the form of providing fund support for a project on Model Integrated Farming in West Bengal. The fall out of the project has been formulation of area development schemes and development of area specific software template for Model Integrated Farming across 6 agro-climatic regions of West Bengal.

Enhancement of per unit production of food, fodder and fuel followed by arresting soil erosion and considering soil moisture to increase soil fertility was taken up in the form of an externally funded project by ICAR-ATARI Kolkata in Purba Medinipur district of West Bengal. With the financial support of NABARD to agroforestry models were developed in an area of 6.0 ha. The project also generated employment opportunities for rural people along with providing ecological and environment benefit.

Nutritional security has become an important area of societal development to ensure that the health indexes are properly maintained particularly among the rural women. In this Zone, 14 KVKs are associated with the flagship project on nutri-sensitive agricultural resources and innovations. The activities carried out were development of nutri-smart villages, establishment of nutrition garden, cultivation of bio-fortified varieties, value addition, food-fortification etc. All the 59 KVKs also implemented this concept through 905 numbers of training programme and 1014 nutrition related extension activities.

In view of acquainting the farmers with the importance of weather based agro-advisories as well as helping them understand the effect of climatic/ weather aberrations and its impact on agricultural

product as well as to formulate appropriate strategy to mitigate such situation, Gramin Krishi Mausam Sewa the District Agro-Met Unit has been effectively utilised by 17 KVKs of this zone. The farmers were benefitted through timely advisories on crop product, disease infestation, livestock rearing and other related areas. Such units also prepared bulletins of warning in regional languages for its circulation among the farmers. Two specific app namely *Meghdoot* and *Damini* were also developed for the farmers to have updated information throughout the year.

Formation and promotion of FPOs is a well thought out project of ICAR in collaboration with existing CBBOs and NCDC. In extending support to 10,000 FPOs to be formed across the country, ICAR-ATARI, Kolkata is involved informing in forming four (4) such FPOs through KVK and ICAR Institute. The activities have so far facilitated the development of a sustainable income-oriented farming and business platform for the small holders. The FPOs have also helped developing community farming through the access to various agricultural inputs and farm machinery.

Apart from implementing flagship programmes, externally funded research projects and other related activities, ICAR-ATARI, Kolkata has adequately focussed to monitor, guide and evaluate the mandated activities of 59 KVKs on a regular basis. The endeavour put forth has resulted into conduct of 574 on-fam trials in 3828 location to assess 325 technologies under major thematic areas. Similarly, 1391.25ha of area could be brought under FLD programme of oilseed, pulse and other crops. The demonstration was carried out in the field of 10337 farmers. The systematic plan of demonstration and implementation of improved varieties as well as private as well as appropriate management practices were instrumental in enhancing yield to the extent of 45% in oilseed, 57% in pulse and 45% in other crops. Such demonstration was also conducted in livestock, fishery, farm implements and other enterprises.

Providing appropriate skill and knowledge farmers, youth and extension functionaries to was another area where the KVKs excelled in terms of training programme organized throughout the year. The knowledge & skill of 167954 clientele could be improved/exposed to frontier technologies for the betterment of agriculture of this zone. Making quality seed and planting material available to farmers were other areas that highlight the specific achievement of KVKs. During the reported period, more than 15196q of seeds of cereal, pulse, oilseed, vegetables and other were produced in addition to production of 61.18 lakh planting materials.

The KVK were also involved in production of bioproducts, livestock and fishery materials and others organic formulation for the benefit of the farmers. Analysis of soil, water and plant sample were also done by the KVKs to ensure judicious application of chemical against the soil test value. The KVK tested 53785 number of search samples to provide soil health card to 4997 farmers.

The KVKs are always encourage to generate additional revenue out of various productive activities, particularly the collaborative execution of various program. In the year 2023, the KVKs generator revenue worth Rs.478.78 lakh followed by enhancement of revolving fund up to 1109.77 lakh.

Ensuring availability of improved /developed technologies is the prime responsibility of the DEEs having KVKs under their jurisdiction. In fulfilling the adjectives, the DEEs provided various technologies for its assessment at KVK level. Moreover, the directorates regularly visit the KVK and farmers field to witness the implementation of search technologies and to understand the requirement of modification, if any. They also regularly conduct HRD program for the KVK personal. In facilitating the farmers to get technology input and information support under one roof, ATIC was established to selected ICAR Institute and SAUs of this zone. In 2023, 6305 farmers obtained technological information, 2193 available technology servicesand more than 10,000 farmers collected quality inputs from ATIC.

Celebration of special day/week has its own implication in social and professional life. In upholding the significance, ICAR-ATARI Kolkata and KVKs under it have observed/ celebrate "Swachhata Pakwada", "Republic Day", "World

Intellectual Property Right Day", "International Yoga Day", "International Women's Day", Foundation Day of the Institute, Fit India fitness week, Vigilance Awareness Week, Mahila Kisan Divas and others.

Government of India has created various online portal/ digital platform to highlight activities/ achievement of KVKs, ICAR Institute and other organisations. The portals like KRISHI, KVK knowledge network, Kisan Sarathi, Krishi Mapper mobile app and others important social platform which were critically looked into at ICAR-ATARI Kolkata. The automation in the form of ERP, GeM, e-Office, e-Parichay, e-HRMS, ARMS, Sparrow, PFMS has been fully implemented in this office to ensure paperless transaction as well as smooth less transfer of fund to KVKS and host organisation.

The diversified activities of ICAR-ATARI Kolkata not only help the farmers of this zone but also to the agriculture students through RAWE program, agricultural professionals through ARS probation's training, input dealers (DAESI), special initiative of Government of India like Millet Mela, Viksit Bharat Sankalp Yatra and others. The dedication of all categories of staff at ICAR ATARI Kolkata was the driving force in accomplishing the set as well as stakeholders' benevolent assignment.

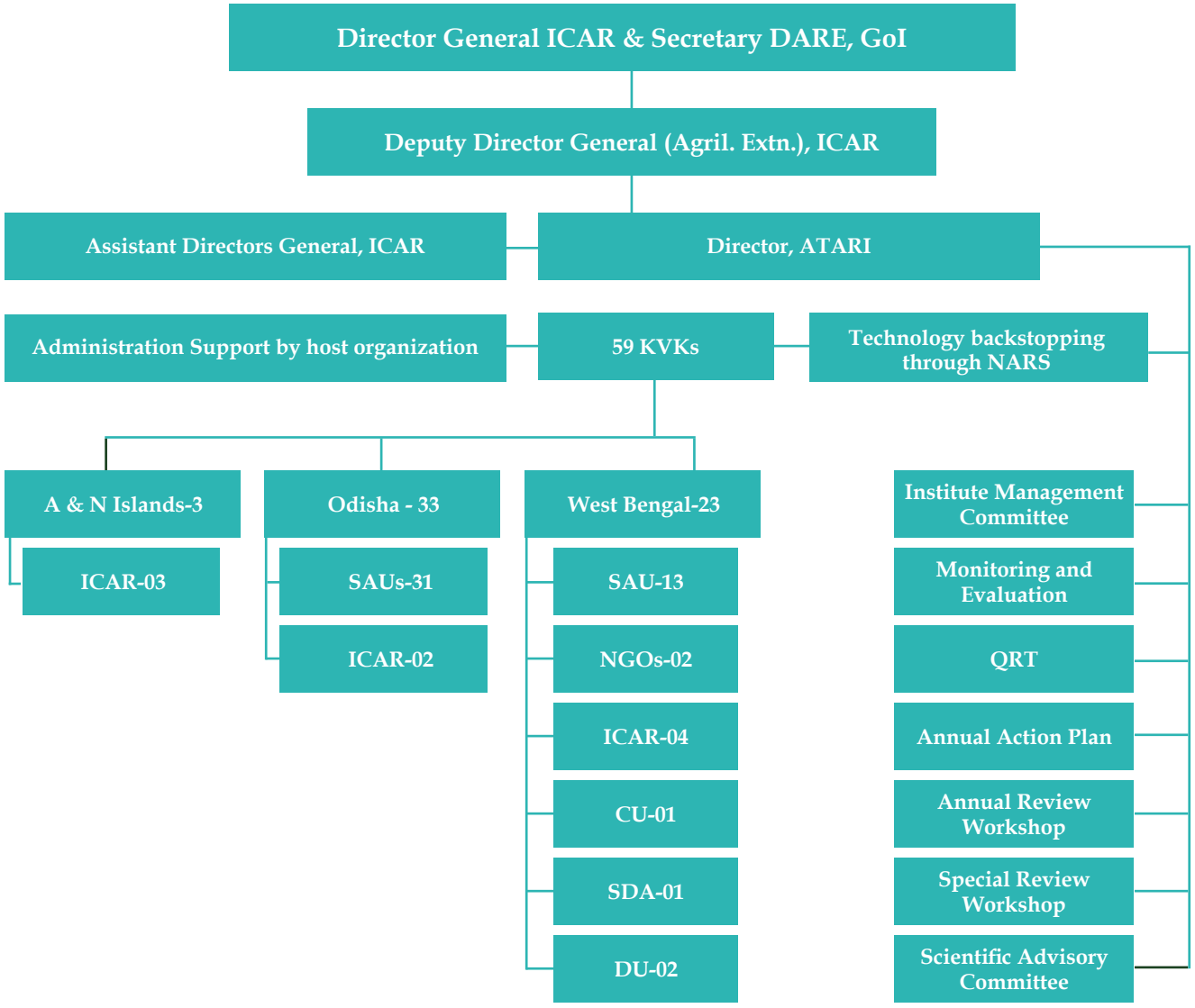
1.0 Introduction

For strengthening the KVK system across the country, Indian Council of Agricultural Research has approved 11 Agricultural Technology Application Research Institute to look after and guide the activities of 731 KVKs functioning in almost all the rural districts of the country, in the larger rural districts one additional KVK has also been established by ICAR. ICAR-ATARI, Kolkata has been entrusted with the monitoring of 59 KVKs spread across West Bengal, Odisha and Andaman & Nicobar Islands.

1.1 Profile :

ICAR-Agricultural Technology Application Research Institute Kolkata is functioning as an integral part of Division of Agricultural Extension, New Delhi headed by the Deputy Director General (AE). All the SMDs in ICAR including Division of Agricultural Extension come under the office of Secretary (DARE) and Director General (ICAR). The organizational structure of ICAR-ATARI, Kolkata is depicted through a concise chart as below.

1.2 Organizational Structure :



1.3 Budget Provision:

Provision of need based fund to the KVKs of this zone is of utmost importance in running the KVKs. It is always ensured that KVKs receive fund in time throughout the year for the mandated activities and to meet up other requirements. Accordingly, assessment of budget requirement, placing demand for fund and releasing fund are carried out by this Institute on a regular basis. The process helped 59 KVKs and 4 Directorates of Extension Education of the SAUs of this zone to receive a sum of Rs 10394.22 lakh during 2023 from ICAR-ATARI, Kolkata. Head-wise details are depicted in Table below:

Table: Budget in respect of ICAR-Agricultural Technology Application Research Institute & KVKs under Zone- V during 2023-24

(Rs. in lakh)

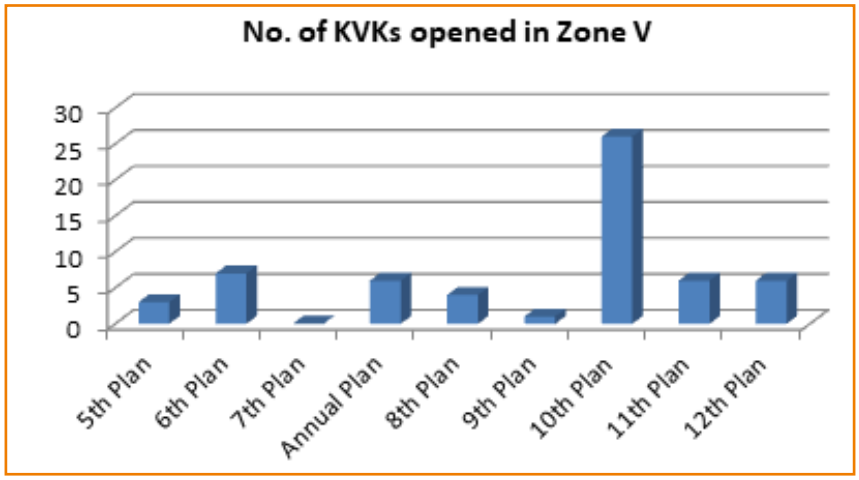
ZPD/KVK	Recurring							Non-Recurring					Revol. Fund	Grand Total
	P & A	T.A.	H.R.D	Cont.	TSP Cont.	SCSP Cont.	Total	Equip. & furn	Works	Lib.	Vehicle	Total		
ICAR-ATARI, Kolkata	308.62	16.91	0.00	59.64	0.00	0.00	385.17	1.79	0.00	0.00	0.00	1.79	0.00	386.96
State Agricultural University														
OUAT, Bhubaneswar (31)	3381.34	49.00	13.80	323.25	99.00	334.00	4200.39	44.47	209.23	3.10	36.00	292.80	0.00	4493.19
UBKV, Coochbehar, West Bengal (5)	1123.70	10.00	4.00	57.50	0.00	87.00	1282.20	15.70	48.68	0.50	0.00	64.88	0.00	1347.08
BCKV, Nadia, West Bengal (5)	808.88	6.95	2.40	65.50	0.00	109.79	993.52	9.30	93.94	0.50	0.00	103.74	0.00	1097.26
WBUA&FS, Kolkata (3)	513.99	6.50	3.40	38.50	0.00	48.00	610.39	11.52	29.33	0.30	0.00	41.15	0.00	651.54
ICAR														
ICAR-CIARI, A&N Islands (3)	262.49	4.00	0.70	53.00	11.00	0.00	331.19	3.88	0.00	0.30	0.00	4.18	0.00	335.37
ICAR-CRRI, Cuttack, Orissa (1)	111.00	1.10	0.00	11.20	0.00	16.00	139.30	1.50	33.06	0.10	0.00	34.66	0.00	173.96
ICAR-CIFA, Bhubaneswar, Orissa (1)	184.50	2.00	0.30	9.50	0.00	18.00	214.30	2.50	0.00	0.10	0.00	2.60	0.00	216.90
CRIJAF, West Bengal (2)	283.00	3.00	0.60	18.00	0.00	33.21	337.81	4.80	6.00	0.20	0.00	11.00	0.00	348.81
ICAR-CISH, Lucknow (1)	54.00	1.00	0.00	24.30	0.00	12.00	91.30	2.40	0.00	0.10	0.00	2.50	0.00	93.80
ICAR-NDRI, Karnal (1)	54.50	1.00	0.30	7.50	0.00	12.00	75.30	1.50	0.00	0.10	0.00	1.60	0.00	76.90
Central Univerisity, Visva Bharati, West Bengal (1)	136.32	2.00	0.30	9.50	0.00	17.00	165.12	2.00	0.00	0.10	0.00	2.10	0.00	167.22
Deemed Univerisity, RKMVERI, West Bengal (2)	403.85	3.20	0.60	19.40	0.00	34.00	461.05	5.20	17.69	0.20	0.00	23.09	0.00	484.14
State Govt. Undertaking														
WBCADC, Kolkata (1)	32.85	1.00	0.30	7.50	0.00	15.00	56.65	1.50	0.00	0.10	0.00	1.60	0.00	58.25
NGO														
West Bengal (2)	395.93	2.50	0.60	18.50	0.00	34.00	451.53	5.60	5.51	0.20	0.00	11.31	0.00	462.84
GRAND TOTAL	**8054.97**	**110.16**	**27.30**	**722.79**	**110.00**	**770.00**	**9795.22**	**113.66**	**443.44**	**5.90**	**36.00**	**599.00**	**0.00**	**10394.22**

2.0 Krishi Vigyan Kendras

In consonance with the generation of newer agriculture and allied technologies, the farming community needs regular access to such development for the betterment of their economic and social condition. To facilitate the process of making technologies available at the doorstep of the farmers, Indian Council of Agricultural Research established Krishi Vigyan Kendras (KVKs) for the rural districts of the country since 1974. Alongside, capacity development of farmers, rural youths and extension functionaries was also vested on KVK to take technology diffusion process in a holistic manner. To cater to the technology and information needs of the farmers, KVK is working as the link between National Agricultural Research System (NARS) and Transfer of Technology System (TOT) through effective convergence with state and other organs. Apart from the set mandate activities, the KVKs are also involved in a number of flagship programmes of state/central government to achieve the desired objectives.

2.1 Genesis of KVK:

The KVKs' journey started in the form of polytechnic for providing vocational training. Later on objectives of other programmes like Lab to Land, National Demonstration etc. were merged into an institutional shape in the form of KVK. The first KVK was established in 1974 at Puducherry under Tamil Nadu Agricultural University followed by the second KVK in West Midnapore district of West Bengal of this zone. During the same plan period another two KVKs were also established, one at South 24 Pgs of West Bengal (Nimpith) and Khordha, Odisha. During VI Five Year Plan, 7 KVKs were established of which six in Odisha and one in West Bengal followed by 6 KVKs during Annual Plan of 1991-92. The process of establishment of KVKs continued in each Five Year Plan and another 4 KVKs were established during VIII Five Year Plan. In IX Five Year plan, this zone was approved only one KVK but 26 KVKs were established during X Five Year plan. In the next two Five Year plan period, 6 KVK each were established in this zone. However, in XII Five Year plan, 5 additional KVKs were established in 5 large districts of West Bengal namely, Malda, Murshidabad, Nadia, North 24 Pgs and South 24 Pgs.



2.2 Mandate:

Many a times, the mandate of KVK has been changed as per the need of stakeholders for better application of policy initiatives in agricultural development. The present mandate of KVK is Technology Assessment and Demonstration for its wider Application and to enhance Capacity Development (TADA-CD). For accomplishment of the existing mandate the following activities are entrusted with the functioning of KVKs.

- Conduct on-farm trials to identify the location specificity of agricultural technologies under various farming systems.

- Organize frontline demonstrations to establish production potential of various crops and enterprises on the farmers' fields.
- Organize need based training for farmers to update their knowledge and skills on modern agricultural technologies and provide training to extension personnel to orient them in the frontier areas of technology development.
- Create awareness about improved agricultural technologies among various clientele groups through appropriate extension programmes.
- Produce quality seeds, planting materials, livestock breeds, animal products, bio-products etc. as per the demand and supply the same to different clienteles.
- Work as knowledge and resource centre of agricultural technologies to support the initiatives of public, private and voluntary sectors for improving the agricultural economy of the district.

2.3 State-Wise distribution of KVK

As per readjustment of states under each ATARI after the creation of three new ATARIs, the KVKs of Odisha, West Bengal and Andaman & Nicobar Islands have been brought under the jurisdiction of ICAR-ATARI, Kolkata (Zone V). Altogether 59 KVKs are in operation in this zone with stipulated mandate and mandated activities.

The State/ Union Territory-wise distribution of KVKs under ICAR-ATARI, Kolkata indicates that in Odisha 33 KVKs are working in all 30 districts, 23 KVKs are functioning in West Bengal and 3 KVKs are in operation in A&N Islands. The details of state-wise and host organization-wise distribution of KVKs are given as follws:

Table: State wise status of Krishi Vigyan Kendras

Name of the State	No. of Districts	No. of KVKs under						TOTAL
		SAU	ICAR	DU	CU	NGO	SDA	
A&N Islands	3	-	3	-	-	-	-	3
Odisha	30	31	2	-	-	-	-	33
West Bengal	22	13	4	2	1	2	1	23
Total	**55**	**44**	**9**	**2**	**1**	**2**	**1**	**59**

ICAR – Indian Council of Agricultural Research, SAU – State Agricultural University, CU- Central University, NGO – Non-Governmental Organization, SDA- State Department of Agriculture

Table: Host organization wise status of Krishi Vigyan Kendras

Sl. No.	State/UT	Host Institution	Total
1.	A & N Islands (3)	Central Island Agricultural Research Institute (ICAR), Port Blair	3
2.	Odisha (33)	Orissa University of Agriculture & Technology, Bhubaneswar	31
		ICAR-National Rice Research Institute, Cuttack	1
		ICAR-Central Institute of Fresh Water Aquaculture, Bhubaneswar	1
3.	West Bengal (23)	Bidhan Chandra KrishiViswavidyalaya, Nadia	5
		Uttar BangaKrishiViswavidyalaya, Coochbehar	5
		West Bengal University of Animal & Fishery Sciences, Kolkata	3
		VisvaBharati, Bolpur, Santiniketan (CU)	1
		Central Research Institute of Jute and Allied Fibres (ICAR), Barrackpore	2
		W.B. Comprehensive Area Development Corporation (SDA), Kolkata	1
		Kalyan, Purulia (NGO)	1

Sl. No.	State/UT	Host Institution	Total
		Rama Krishna Ashram, South 24 Parganas (NGO)	1
		Ram Krishna Mission Vivekananda University, Belur Math	2
		ICAR-ERS NDRI Kalyani, Nadia	1
		ICAR-CISH Regional Station, Malda	1
Total			**59**

2.4 Manpower:

Achievement of KVKs in both mandated and associated activities greatly depends on deployed manpower. All the host organizations having KVK in this zone are constantly pursued to fill up the vacant posts on priority. In non-ICAR run KVKs, there has been recruitment but the ICAR-run KVKs are still suffering due to skeleton staff strength. The summary of staff position is given below.

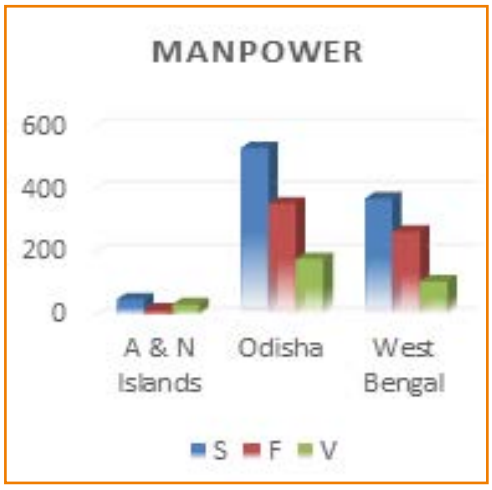
Table: State-wise Staff position at KVKs under ICAR-ATARI, Kolkata

Scientific and Technical

Name of the State	Sr. Scientist and Head			Subject Matter Specialist/T-6			Farm Manager/T-4			Program Assistant (computer)/T-4			Program Assistant (lab technician)/ T-4		
	S	F	V	S	F	V	S	F	V	S	F	V	S	F	V
A & N Islands	3	3	0	18	5	13	3	1	2	3	0	3	3	0	3
Odisha	33	29	4	198	123	75	33	24	9	33	31	2	33	18	15
West Bengal	23	20	3	138	94	44	23	17	6	23	19	4	23	14	9
Total	**59**	**52**	**7**	**354**	**222**	**132**	**59**	**42**	**17**	**59**	**50**	**9**	**59**	**32**	**27**

Administrative staff

Name of the State	Assistant			Stenographer grade III			Driver/T-1			Skilled Support Staff			Total		
	S	F	V	S	F	V	S	F	V	S	F	V	S	F	V
A & N Islands	3	0	3	3	1	2	6	4	2	6	2	4	48	16	32
Odisha	33	0	33	33	26	7	66	64	2	66	37	29	528	352	176
West Bengal	23	17	6	23	13	10	46	36	10	46	33	13	368	263	105
Total	**59**	**17**	**42**	**59**	**40**	**19**	**118**	**104**	**14**	**118**	**72**	**46**	**944**	**631**	**313**



S - Sanctioned; F - Filled; V- Vacant.

2.5 Infrastructure facilities:

ICAR-ATARI Kolkata ensured that the KVKs should be showcased as resource, technology and knowledge hub in the districts, so creation of all round infrastructural facility is a *sine qua non*. Apart from keeping administrative building and training hostel in sound shape, KVKs must maintain suitable demonstration units in fully functional mode which not only would increase its visibility and amplify farmers foot fall in the KVK butis instrumental in enhancing farmers perception and confidence upon the KVK and inculcating enthusein them to adopt the profitable technologies to thecause of enhancing their livelihood and income.

The matter of providing adequate infrastructureto the KVKs of this zone has been given priorityto help KVKs discharge their responsibilities ina better way. Barring a few KVKs, rest are having administrative building, farmers' hostel, staff quarter and demonstration unit. A few KVKs are also having other facilities. The summary of infrastructure facilities available with KVKs is given in following table.

Table: Status of Infrastructure facilities

Name of the State	Administrative Building (Y/N)	Staff Quarters (Y/N)	Farmer's Hostel (Y/N)	Demonstration Unit(Number/Names of the Demo Units) Along with source of funding (ICAR/ Others)				Demo Units Total	Soil and Water Testing Laboratory	Rain Water harvesting structure	Integrated Farming System	Minimal processing facility	e-Connectivity (ERNET)	Carp hatchery	Solar Panel	Technology Information Unit	Micronutient Facility	Tractor	Four Wheeler	Two Wheeler
				Number of DU(Funded By ICAR)	Name of the unit(s) (Funded By ICAR)	Number of DU (Funded by other organiations)	Name of the unit(s) (Funded by other organiations)													
A&N Islands	2	1	1	2	0	0	0	2	1	1	0	0	3	1	0	0	0	1	3	6
Odisha	33	20	33	116	3	52	0	168	29	1	15	4	8	11	0	3	3	33	33	31
West Bengal	23	15	22	54	0	72	0	126	14	26	12	9	5	8	2	6	5	23	23	39
Total	**58**	**36**	**56**	**172**	**3**	**124**	**0**	**296**	**44**	**28**	**27**	**13**	**16**	**20**	**2**	**9**	**8**	**57**	**59**	**76**

2.6 Thrust Area:

- Application of ICT towards agricultural development
- Creation and promotion of FPOs/ FPCs
- Enhancement of water use efficiency through micro-irrigation system
- Varietal substitution of field crops
- Economic improvement of farm women
- Drudgery reduction
- Value addition and minimization of post harvest loss crop diversification
- Promotion of IFS
- Improvement of livestock sector with feed and other management practices
- Soil health management
- Popularization of fodder production technology
- Management practices in fishery
- Application of RCT
- Farm mechanization with an emphasis on small tools
- Entrepreneurship development among rural youths
- Development of suitable strategy to combat climatic vulnerability towards crops and livestock production

3.0 About Agricultural Technology Application Research Institute (ATARI) Kolkata

ICAR-Agricultural Technology Application Research Institutes came into existence during July 2015 as upgradation of Zonal Project Directorates. All such eight (8) Zonal Project Directorates were renamed as ATARI with the inclusion of research component in its functioning. With the increase in the number of KVKs across the country, it was felt necessary to create additional ATARIs to bring parity in the monitoring and evaluation process. Accordingly, three additional ATARIs were created and the jurisdiction of all eleven ATARIs was re-adjusted keeping more or less equal number of KVKs under them. In the same process, ICAR-ATARI, Kolkata started monitoring and evaluating the activities of 59 KVKs functioning in A&N Islands, Odisha and West Bengal.

The current network of 731 KVKs spread across the country is centrally governed by Division of Agricultural Extension under Indian Council of Agricultural Research, headed by Deputy Director General. The guidelines of administrative, financial and overall functioning of KVK are provided by Division of Agricultural Extension. The ATARIs send regular report to Division of Agricultural Extension in all areas of KVK functioning.

Besides looking after KVK activities and providing need-based support, ICAR-ATARI, Kolkata is also implementing a number of flagship programme of DAC&FW, ICAR, IMD, I&B, Ministry of Tribal Affairs, Deptt. of Forestry and others through selected KVKs of this zone. A number of private organizations have also been allowed to work with KVKs in the areas of fuel efficiency, water management, farm mechanization etc. Collaboration with CYMMIT through CSISA project has also been established in this zone.

The capacity development for the manpower of KVKs has been taken up by this ATARI on a regular basis either through organizing specialized training programme at this institute or in collaboration with other ICAR institutes for improving the knowledge and skill level of the KVK personnel. The scientific, administrative and other staff of this institute are also encouraged to undergo specialized programme organized by national/ international institutes.

ICT application in monitoring of KVK activities has been ensured followed by financial transaction through Public Financial Management System. All the KVKs have been brought under this system for effortless transaction of fund at the shortest possible time.

3.1 Mandate:

The mandates of Agricultural Technology Application Research Institute are as follows:-

1. Coordination and monitoring technology application and Frontline Extension Education Programs.
2. Strengthening Agricultural Extension Research and Knowledge Management

The Agricultural Technology Application Research Institute, Kolkata takes up the following functions to achieve the above mandates.

- Formulate, implement, monitor, guide and evaluate the programmes and activities of KVKs.
- Coordinate the work relating to KVKs and ATICs implemented through various agencies such as SAUs, ICAR institutes, voluntary agencies and development departments.
- Coordinate with State/Central Government organizations, financial institutions and other organizations for successful implementation of programmes.
- Partnering with Directorates of Extension Education of SAUs in assured technological backstopping to KVKs and appropriate overseeing of KVK activities.
- Strengthening the Directorates of Extension Education of SAUs with financial support.
- Serve as feedback mechanism from the projects to research and extension systems.

- Implementing projects of ICAR like NICRA, FFP and others.
- Maintain close liaison with ICAR headquarter particularly with Division of Agricultural Extension for preparing reports, write ups and other important documents.

3.2 Staff Position of ATARI:

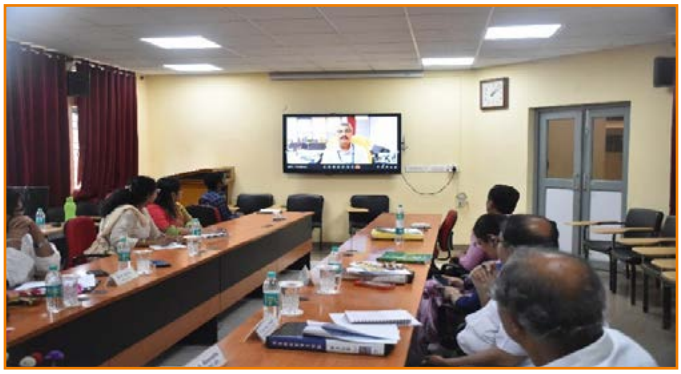
ICAR-ATARI Kolkata is having total sanctioned staff strength of 18, out of which 09 were filled up on 31.12.2023.

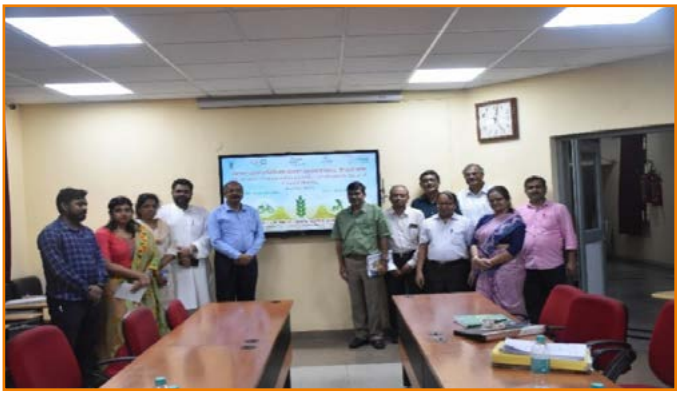
Table: Staff strength of ATARI, Kolkata

Category	Sanctioned	Filled
Director (RMP)	1	1
Scientific	6	4
Technical	1	1
Administrative	8	2
Skilled Supporting Staff (Gr. II)	2	1
Total	**18**	**9**

3.3 Institute Management Committee-cum-Institute Research Council (IMC-cum-IRC):

The nineteenth IMC-cum-IRC Meeting was conducted on 13.10.2023 at ATARI Kolkata under the chairmanship of Dr. Pradip Dey, Director, ICAR-ATARI Kolkata. Sh. R. Pradhan, Member Secretary, IMC formally welcome all the dignitaries and then, the chairman shared salient achievements of ATARI Kolkata during the period. The members discussed each agenda item in details and approved those items following all necessary codal formalities. For the first time, the IMC-cum-IRC discussed the Institute projects in detail and recommended for the approval after suitable suggested modifications.





3.4 Ongoing Research Projects of ICAR-ATARI Kolkata during 2023

The Research Advisory Committee for all the 11 ATARIs approved some research projects to be undertaken by the scientists of ATARIs. Some of the approved projects were in network mode across the whole country involving all the ATARIs, while others were inter-institutional in nature. The details are given below.

Table: Details of ongoing research projects at ICAR-ATARI Kolkata

Sl. No.	Title of the project	Lead Centre/ Institute	Name PI and Co-PI/ CCPI from ICAR-ATARI Kolkata
1.	Impact of technological interventions of KVKs on socio-economic empowerment and sustainable livelihood security of tribal farmers	ICAR-ATARI Guwahati	PI: Dr. G. Kadirvel Co-PI: Dr. K.S. Das
2.	Network project on Aspirational Districts programme	ICAR-ATARI Kolkata	PI: Dr. S.K. Roy Co-PI: Dr. K.S. Das
3.	Measuring impact of climate resilient technologies in different agro-climatic zones in India: A study in NICRA project areas	ICAR-ATARI Hyderabad	PI: Dr. G. Pratibha Co-PI: Dr. S.K. Mondal
4.	Impact of ARYA on promotion of agri-preneurship and alternative livelihoods	ICAR-ATARI Bengaluru	PI: Dr. M. J. ChandreGowda Co-PIs: Dr. P.P. Pal,

Sl. No.	Title of the project	Lead Centre/ Institute	Name PI and Co-PI/ CCPI from ICAR-ATARI Kolkata
5.	Impact assessment of selected interventions by KVK under Doubling Farmers' Income for enhancing farmers' income	ICAR-ATARI Jodhpur	PI: Dr. P. P. Rohilla Co-PI: Dr. A. Haldar
6.	Assessing dietary diversity, consumption pattern and nutritional security in Nutri-SMART Villages- A step towards vocal for local	ICAR-ATARI Jabalpur	PI: Dr. S. R. K. Singh Co-PI: Dr. S.K. Mondal
7.	A study on capacity development programs of the KVKs for augmenting livestock production and farmers' income in eastern India	Inter-Institutional Project	PI: Dr. A. Haldar Co-PIs: Dr. P.P. Pal, Dr. S.K. Mondal, Dr. K.S. Das
8.	Assessing appropriate delivery pathways of agriculture and allied technology dissemination in eastern India	Inter-Institutional Project	PI: Dr. P.P. Pal Co-PIs: Dr. S.K. Roy, Dr. A. Haldar, Dr. S.K. Mondal, Dr. F.H. Rahman, Dr. K.S. Das

3.5 Research Achievements:

A Study on Capacity Development Programs of the KVKs for Augmenting Livestock Production and Farmers' Income in Eastern India

Principal Investigator: Dr.Avijit Haldar

Co-Investigators: Dr. Shyamal Kumar Mondal, Dr. Kalyan Sundar Das, Dr. Partha Pratim Pal, Dr.Rupak Goswami, Dr. Tapas Kumr Dutta, Dr.Subashis Roy

The project entitled, 'A Study on Capacity Development Programs of the KVKs for Augmenting Livestock Production and Farmers' Income in Eastern India' was started in April 2021 and completed in December 2023. Capacity development is the key for agricultural extension activity and a major mandate of Krishi Vigyan Kendra. In India, the farm households access lesser information on livestock technology as compared to accessing information on modern technology for crop farming. No database is available on Capacity Development Programmes (CDPs) in livestock sector in KVK network system. The questions of what and how CDPs were appropriate to a given socio-economic milieu under certain agro-climatic region. Thus, the project has already figured out the relevance of various CDPs of the KVKs in terms of livestock production and farmers' income and made available reliable database for decision-making process for particular agro-climatic region in Eastern India as reported in previous year.

In the success of CDPs, the farmers' opinion/ thinking/ view is important. The ways in which the farmers put their thinkings/ visions into practice are indicative of their mental models of farming. Farmers' mental models of farming are influenced by prior values and knowledge, and are unique to each farmer. A mental model is essentially an individual's internal representation of how a system in the external world works. A mental model for a particular domain includes related values and beliefs. It includes conceptions of knowledge and skills, and how to use them. Mental models create perspectives and serve as a guide for information, learning experiences, decision-making and problem solving. By understanding the ways that individual farmers perceive their world, trainers/ educators can help the trainees/ stakeholders to think and act in ways that enable them to overcome many barriers to success. Considering the farmers' opinions and concerns about how the system of impact creation should be drawn, how it works and how one component affects another, Fuzzy Logic Cognitive Mapping (FCM) may be applied to develop a dynamic system modeling which may be called as a mental model of the stakeholders. The FCM elicitation usually takes stakeholders' opinions into account, thus helping us to understand a system comprehensively, often in a workshop environment. In such events, all the stakeholders discuss, develop, and modify complex systems by adding or removing elements, deciding on the directionality and strength among the element pairs and creating a shared understanding of the system altogether.

Eastern Regional Station (ERS) of National Dairy Research Institute (NDRI) located in Kalyani, West Bengal offers many training programmes on dairy farming to the farmers and it is expected that they are translated into increased milk production as well as farm income following a causal pathway. A training's intervention and its impacts on the stakeholders are all connected via invisible cause-effect relations and form an invisible system. Hence, a pilot study was undertaken to explore the nature of mental models of dairy farming and their role in dairy farming practice and to identify the pathways of ongoing CDPs for achieving higher farm production and farmers' income as perceived by a sample of dairy farmers in Nadia district of West Bengal. We arranged a workshop on 23.05.2023 at ERS of NDRI, Kalyani, West Bengal with the support of KVK under NDRI involving 62 dairy farmers who participated in training on dairy farming earlier. We explained the concept of FCM to the dairy farmers (n= 62) and asked the participants to draw a (cognitive) map of how previous training on dairy farming influenced their farm (milk) production and income as well. For individual map elicitation, each participant was asked to draw separately cognitive map/ pathways, involving causally linked system elements. Further, each participant was asked to assign a weight between -1 (extremely high negative causal relation) to +1 (extremely high positive causal relation) in a pair of linked elements. Thereafter, group map elicitation was done through Focus Group Discussion (FGD) by dividing all 62 participants randomly into two groups having 31 participants in each group. Two groups drew two maps with different elements and assigned a weight in a pair of linked elements between -1 to +1. After getting all individual and group maps and the weights of element pairs, the common elements (when present in at least two maps) were collected. The values of element pairs present in more than one map were averaged. Finally, all these maps were amalgamated together to form a common cognitive map for all the participants.

Objective

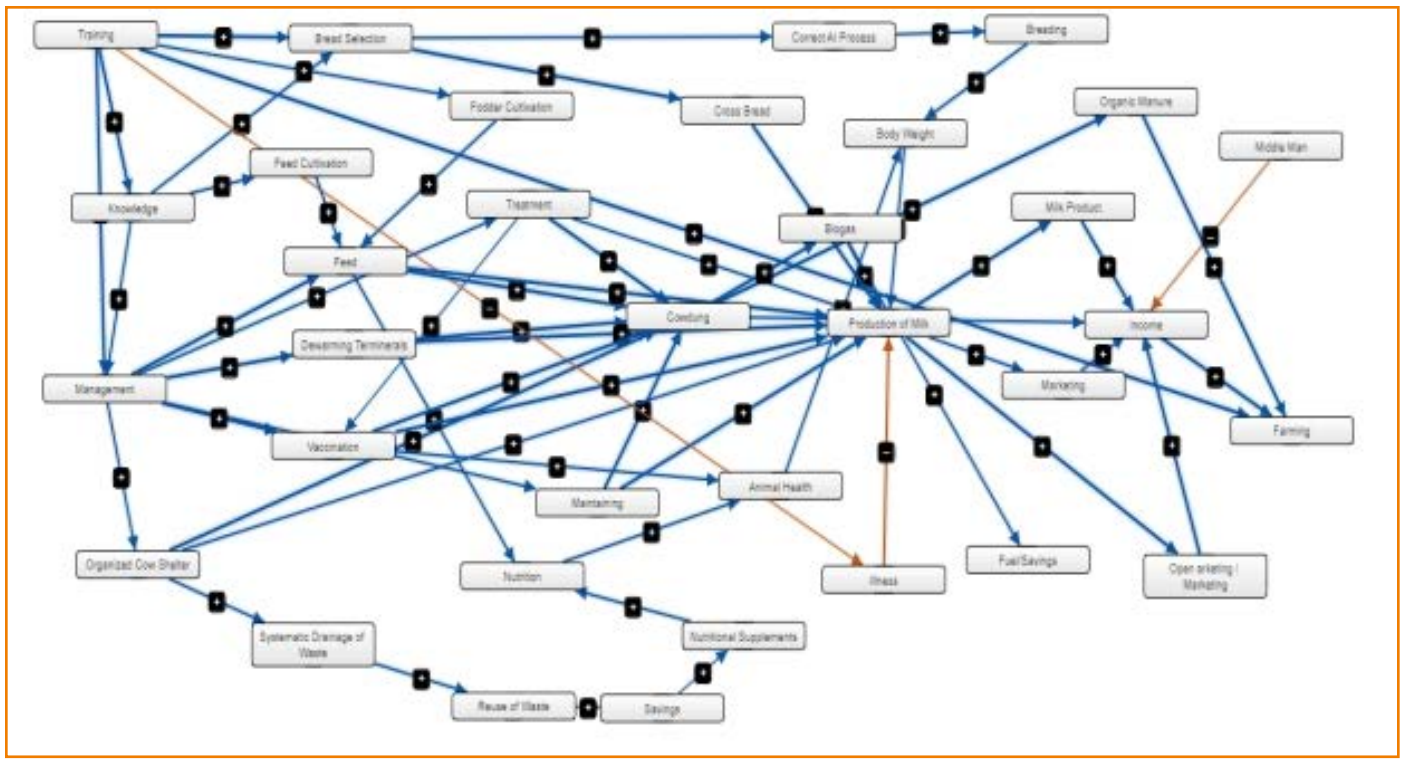
To map the pathways of ongoing CDPs for achieving higher farm production and farmers' income

Achievements

- Though this study is qualitative in nature, the specific mental model held by individual farmer in the study represents the unique mental model underlying each farmer's practice, his/ her own mental model of farming practices, and the interaction between the two elements. The individual mental model/ cognitive map may not be represented those held by other farmers; the study clearly illustrates that farmers may have different mental models of operating dairy farm in similar geographic region. However, group mental model/ cognitive map clearly indicates some commonness of understanding, knowledge, and experiences gathered through trainings for functioning dairy farm successfully.
- The participants' shared cognitive map of group elicitation illustrates the centralities and types of the system elements with the nodes, ties, signs, and strengths of the causal relationships among the elements. The highest indegree centrality (number of arrows coming towards it) is the factor/ element 'Milk Production' followed by

'Cow Dung' and 'Income' meaning that they are influenced by many other factors in the system. While 'Training' is the driving factor/ element, the highest outdegree centrality (number of arrows going out from it) is 'Management' meaning that it influences many other factors in the system. Farmers identify 'Feeds and Feeding', 'Vaccination', 'Shelter Management', 'Knowledge' and 'Treatment' as important outdegree factors/ elements for achieving higher farm production and farmers' income.

- The results of mental model/ cognitive mapping play a predominant role in learning, problem-solving, and decision making of the dairy farmers and also provide empirical support for trainers/ educators in both extension and field research settings.
- The present cognitive map puts forward scope for scenario analysis, where we can explore different realistic and potential scenarios and interventions to see how training's effect can be optimized by the KVKs and local stakeholders of animal husbandry to improve the income generation of the trainees/ farmers and their livelihoods.



Participants' shared amalgamated cognitive map of group elicitation shows the relationships between factors/ elements, through which the impact of training transitions to higher farm income. The blue ties with '+' sign denote positive relations among two factors/ elements, while the orange ties with '–'sign denote negative relations. The thickness of lines represents tie strength.

Table: Centralities of selected system elements in the beneficiaries (farmers') shared cognitive map of group elicitation

Component	Indegree	Outdegree	Centrality	Type
Breed Selection	1.6	1.7	3.3	Ordinary
Breeding	0.7	0.7	1.4	Ordinary
Income	**3.8**	0.9	**4.7**	Ordinary
Nutritional Supplements	0.3	0.7	1	Ordinary
Fodder Cultivation	0.8	0.8	1.6	Ordinary

Component	Indegree	Outdegree	Centrality	Type
Shelter Management	0.75	**2.5**	**3.25**	Ordinary
Marketing	0.8	0.8	1.6	Ordinary
Milk Production	**8.3**	2.7	**11**	Ordinary
Cow Dung	**6**	2.5	**8.5**	Ordinary
Waste Management	0.7	0.7	1.4	Ordinary
Training	0	**5**	**5**	**Driver**
Knowledge	1	**2.1**	**3.1**	Ordinary
Feeds and Feeding	2.35	**2.6**	**4.95**	Ordinary
Animal Health Care	1.3	0.6	1.9	Ordinary
Body Weight	1.3	0.6	1.9	Ordinary
Farm Management	1.6	**5.05**	**6.65**	Ordinary
Vaccination	1.2	**2.6**	**3.8**	Ordinary
Treatment	0.7	**2.1**	**2.8**	Ordinary

4.0 Achievements of Mandated Activities

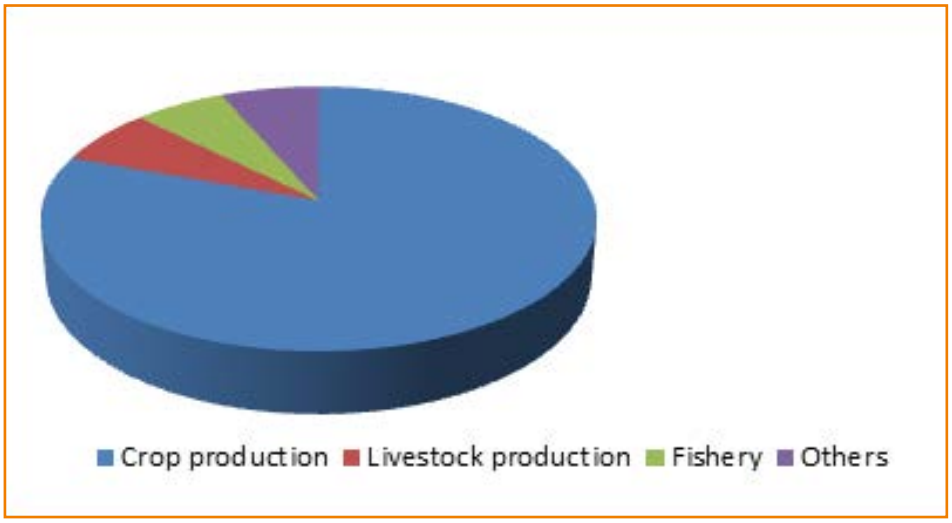
4.1 Technology Assessment:

4.1.1 On-farm Trials:

In the year 2023, all 59 KVKs under ICAR-ATARI Kolkata, spread over Andaman & Nicobar Islands, Odisha and West Bengal, conducted trials for technology assessment, demonstration and application in agriculture and allied fields. Under this most important mandated activity, i.e., technology assessment, the claimed superiority of location specific agricultural technologies was assessed through conducting on-farm trials by all the KVKs of this Zone, covering various crops, livestock and fishery related technologies extending their practical utility for increasing the income and betterment of livelihood of the farmers and other stakeholders.

4.1.2 Major Area-wise Trials Conducted:

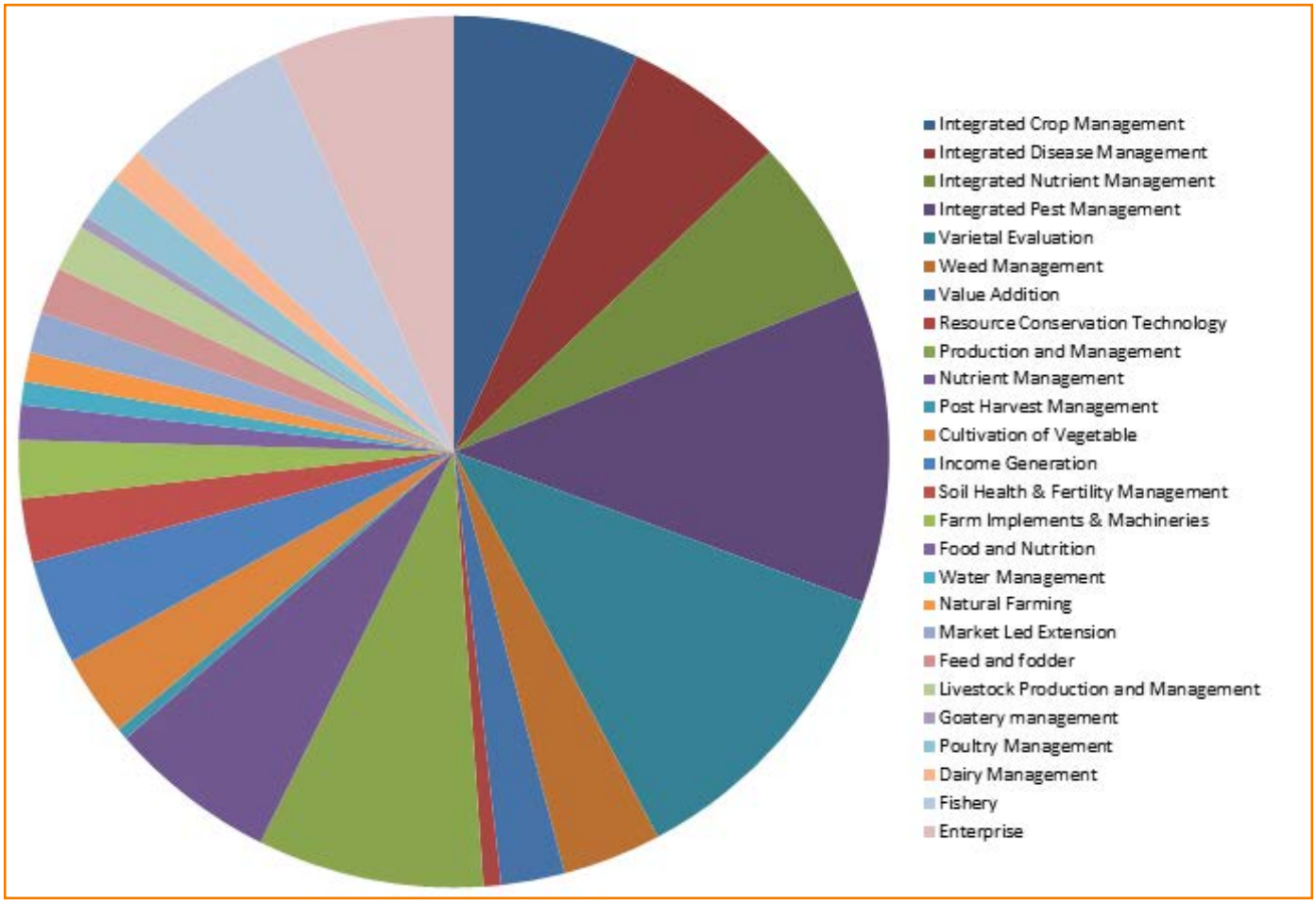
During 2023, the KVKs conducted on-farm trials with an objective to assess the technologies developed by different R & D institutions in agriculture and allied sectors. Specifically prioritized area of assessing the technologies by KVKs sometimes indicated assessment of the technologies through either KVKs or the research institutions. The assessed technologies included those in the areas of crop production including integrated crop management, crop improvement through varietal trials, insect-pest and disease management, nutrient management; livestock production including feed and fodder management, livestock production and health management; fish production; and others including income generating agri-enterprises and other areas. The on-farm trials taken up in crop, livestock and fishery sectors have been presented below.



4.1.3 Thematic Area-wise Trials Conducted:

Approximately 26 various thematic areas were identified for assessment of technologies and presented in following table. Improved technologies related to crop production, livestock production, fish production and value addition etc. have been assessed to provide technological solution to the farming community pertaining to various aspects of agriculture and allied areas. During the year 2023, the KVKs conducted 474 on-farm trials in 3828 locations to assess a total of 325 technologies. Among various thematic areas, technologies were tested through varietal evaluation in 54 on-farm trials involving 417 farmers, followed by integrated pest management (54 on-farm trials), production and management (39 on-farm trials), integrated crop management (32 on-farm trials), nutrient management (29 on-farm trials), integrated nutrient management and integrated disease management (28 on-farm trials each) and others. In livestock sector, the highest number (8 trials each) of on-farm trials was carried out in the

area of poultry management, livestock production management and feed and fodder followed by dairy management (6) involving a total of 1182 farmers. In fishery, 29 on-farm trials were conducted during this year involving composite fish culture and fish production and management benefitting 472 farmers. The distribution of on-farm trials based on thematic areas has been presented below.



4.1.4 State-wise Trials Conducted:

In the year 2023, an analysis of on-farm trials conducted by various states showed that KVKs of Andaman and Nicobar Islands carried out a total of 5 on-farm trials distributed in 35 locations, the corresponding values for the states Odisha were 269 and 2162, and for West Bengal were 200 and 1631, respectively. A total of 43 on-farm trials were conducted by KVKs of Odisha in varietal evaluation, while the KVKs of West Bengal carried out 11 on-farm trials on this thematic area. The other important areas for the KVKs of Odisha were integrated pest management (25 on-farm trials), integrated disease management (21 on-farm trials), integrated crop management and integrated nutrient management and enterprise (19 on-farm trials each) and income generation (18 on-farm trials) etc. In West Bengal, integrated pest management was the most important thematic area (29 on-farm trials) followed by nutrient management (24 on-farm trials), production and management and fishery (18 on-farm trials each), integrated crop management and enterprise (12 on-farm trials each) etc. In the area of livestock production, KVKs of West Bengal took up 19 on-farm trials followed by KVKs of Odisha (13 on-farm trials). The feedback on the performance of the technologies had also been brought to the notice of research and extension wing for their necessary rectification (if any)/ effective dissemination in the entire zone. Some of the on-farm trials conducted by the KVKs are detailed below with table, photographs and relevant information.

Table: State-wise details of on-farm trials conducted by the KVKs

Thematic Area	A & N Islands		Odisha		West Bengal		Total	
	No. of Locations	No. of OFT	No. of Locations	No. of OFT	No. of Locations	No. of OFT	No. of Locations	No. of OFT
Integrated Crop Management (ICM)	7	1	196	19	84	12	287	32
Integrated Disease Management (IDM)			163	21	70	7	233	28
Integrated Nutrient Management (INM)			135	19	82	9	217	28
Integrated Pest Management (IPM)			198	25	213	29	411	54
Varietal Evaluation (VE)			327	43	90	11	417	54
Weed Management (WM)			94	13	32	4	126	17
Value Addition (VA)			66	10	7	1	73	11
Resource Conservation Technology (RCT)					19	3	19	3
Production and Management (P&M)	7	1	144	20	136	18	287	39
Nutrient Management (NM)			41	5	179	24	220	29
Post Harvest Management					9	2	9	2
Cultivation of Vegetable			35	5	62	9	97	14
Income Generation			170	18			170	18
Soil Health & Fertility Management			39	5	40	6	79	11
Farm Implements & Machineries (FIM)			59	8	20	2	79	10
Food and Nutrition (F&N)	14	2	13	1	26	3	53	6
Water Management(WM)	7	1	7	1	18	2	32	4
Natural Farming(NF)			14	2	21	3	35	5
Market Led Extension			88	6	10	1	98	7
Others			37	5	34	5	71	10
Total	**35**	**5**	**1826**	**226**	**1152**	**151**	**3013**	**382**
Fishery			88	11	185	18	273	29
Total			**88**	**11**	**185**	**18**	**273**	**29**
Feed and fodder			22	3	88	5	110	8
Livestock Production and Management			28	4	32	4	60	8
Goatery management					25	2	25	2
Poultry Management			24	3	40	5	64	8
Dairy Management			14	3	22	3	36	6
Total			**88**	**13**	**207**	**19**	**295**	**32**
Enterprise			160	19	87	12	247	31
Total			**160**	**19**	**87**	**12**	**247**	**31**
Grand Total	**35**	**5**	**2162**	**269**	**1631**	**200**	**3828**	**474**

4.1.5 Details of selected OFTs

ANDAMAN & NICOBAR ISLANDS

KVK South Andaman

Thematic area: *Varietal evaluation*

Assessment of performance of medium duration rice cultivars in coastal agro-ecosystem

In order to get rid of the problem of lower rice yield and less scope of the second crop due to cultivating long duration traditional rice varieties, KVK South Andaman conducted a multi-locational field trial at 7 different locations of the district by involving Farmers' practice: FP (Jaya variety) and three medium duration rice cultivars, e.g., Technology option-I: TO-I (CARI Dhan-3), Technology option-II: TO-II (CARI Dhan-6) and Technology option-III: TO-III (CARI Dhan-7). In the trial, the production performance and economics of production were assessed. The results revealed that Technology option-III (TO-III), i.e., CARI Dhan-7 was significantly superior than other cultivars and it was recommended to the farmers for medium duration rice production. The highest yield recorded in TO-III was 47.9 q/ha with the highest B:C ratio of 2.09. Farmers were also very much interested in cultivation of this CARI Dhan-7 rice variety.

Technology assessed:

FP: Jaya variety of rice

TO-I: CARI Dhan-3

TO-II: CARI Dhan-6

TO-III: CARI Dhan-7

Source of Technology: ICAR-CIARI, Port Blair

Table: Performance assessment of medium duration rice cultivars

Technology option	No. of trials	Yield component			Disease/ insect pest incidence (%) Bacterial Leaf Blight	Yield (q/ha)	Cost of cultivation (Rs./ha)	Gross return (Rs/ha)	Net return (Rs./ha)	BC ratio
		No. of effective tillers/ hill	No. of spikelet per panicle	Test wt. (100 grain wt.)						
FP	7	250	72.8	21.6	35	37.8	106100	122000	15900	1.65
TO-I		275	81.6	23.5	10	43.8	120860	143400	22540	1.91
TO-II		309	100.3	22.4	10	45.6	124775	149250	24475	1.99
TO-III		337	119.6	24.8	3	47.9	129755	156700	26945	2.09
S.Em		18	4.3	1.4	0	2.34				
CD (p=0.05)		40	9.4	3		5.09				

ODISHA

KVK Bargarh

Thematic area: *Integrated Disease Management*

Assessment of chemical methods of controlling seedling blight disease of Finger millet

Poor yield of Finger millet due to seedling blight disease has been identified as a major problem of the district. To solve this problem, KVK Bargarh carried out a field trial at 7 different locations of the district testing different chemical methods of controlling the seedling blight disease. In the trial, the FP was sowing seeds with application of FYM@0.5t/ha only, and other technologies were TO-I: Soil application with Elemental sulphur @ 80 kg/ha just prior to sowing; TO-II: Soil application with Bleaching powder @ 30 kg/ha just 10 days prior to sowing + application of microbial consortium @ 2.5 kg/ha (mixed with seed) and TO-III: Seed treatment with combined bio agents (*Ps. fluorescence* + *Trichoderma viridae* @ 6gm/kg of seeds, Spraying of Vitavax 75% WP @ 5gm/L of water & Application of lime during last ploughing @ 250 kg/Ac. It was evident from the trial that the disease index was the lowest in TO-III (4.9) along with the highest yield of 13.64 q/ha and B:C ratio of 1.37. It can be recommended that TO-III (Seed treatment with combined bio agents (*Ps. fluorescence* + *Trichoderma viridae* @ 6gm/kg of seeds, Spraying of Vitavax 75% WP @ 5gm/L of water & Application of lime during last ploughing @ 250 kg/Ac) was the best option to control seedling blight disease in Finger millet during Kharif season. Farmers actively

participated in both crop management and timely sowing. More survival of seedlings also attracted other farmers.

Technology assessed:

FP: Sowing seeds with application of FYM@0.5t/ha only

TO-I: Soil application with Elemental sulphur @ 80 kg/ha just prior to sowing

TO-II: Soil application with Bleaching powder @ 30 kg/ha just 10 days prior to sowing + application of microbial consortium @ 2.5 kg/ha (mixed with seed)

TO-III: Seed treatment with combined bio agents (*Ps. fluorescence* + *Trichoderma viridae* @ 6gm/kg of seeds, Spraying of Vitavax 75% WP @ 5gm/L of water & Application of lime during last ploughing @ 250 kg/Ac

Source of technology: ICAR-IIMR, 2019; TNAU, 2014

Table: Efficacy of various methods of controlling Seedling blight disease in Finger millet

Technology option	No. of trials	Yield component		Yield dry chilli (q/ha)	Cost of cultivation (Rs./ha)	Gross return (Rs/ha)	Net return (Rs./ha)	BC ratio
		Disease index	Mortality% of seedlings at 15DAS					
FP	7	3.7	13.3	10.50	43100	52500	9400	1.21
TO-I		2.45	9.7	11.36	46600	56800	10200	1.21
TO-II		1.67	6.9	12.8	49800	64000	14200	1.28
TO-III		1.24	4.9	13.64	48600	67000	18400	1.37

KVK Boudh

Thematic area: *Integrated Pest Management*

Assessment of eco-friendly management of pod borer complex in Pigeon pea

Growing pigeon pea in medium irrigated land is norm of Boudh district. Low yield in Pigeon pea due to heavy damage of the crop during poding stage by pod borer infestation was a major problem for the farmers of Boudh district. To alleviate the pod borer disease, a field level trial was taken up by KVK Boudh at 7 different locations of the district involving eco-friendly management methods of controlling this disease. The results revealed that TO-II (Application of Azadirachtin 0.15% @ 1.5 L/ha + Emamectin Benzoate 5 SG @ 200 g/ha at 50% flowering and second 15-20 days after 1st spraying) was the best option for control of this disease with the lowest disease incidence (8%) and the highest yield (14.2 q/ha) with the highest B:C ratio of 3.9. Farmers appreciated the performance of this technology.

Technology Assessed:

FP: No use of control measures

TO-I: Application of Azadirachtin 0.15% @ 1.5 L/ ha

TO-II: Application of Azadirachtin 0.15% @ 1.5 L/ ha + Emamectin Benzoate 5 SG @ 200 g/ha at 50% flowering and second 15-20 days after 1st spraying

Source of technology: ICAR-NRRI, Cuttack

Table: Performance of eco-friendly management measures of pod borer complex in Pigeon pea

Technology option	No. of trials	Yield component			Disease/ insect pest incidence (%)	Yield (q/ ha)	% Change in Yield	Cost of cultivation (Rs./ha)	Gross return (Rs/ha)	Net return (Rs./ ha)	BC ratio
		No of infested pod/ plant	Disease incidence %	Test wt. (100 grain wt.)							
FP	7	132	23	71	36	8.7	-	25000	69600	44600	2.7
TO-I		19	4	73	11	12.6	30.95	27500	100800	73300	3.6
TO-II		11	2	75	8	14.2	38.73	29000	113600	84600	3.9

KVK Cuttack

Thematic area: *Varietal evaluation*

Assessment of the performance of bio-fortified cauliflower variety

Generally bio-fortified crops are more nutrient dense than conventional varieties. Under irrigated medium land situation of Cuttack district, cultivation of cauliflower is a common practice during *rabi* season. But the yield and market price of conventional varieties are less than the bio-fortified cultivars. Keeping this in view, KVK Cuttack undertook a multi-locational field trial at 10 different locations of the district for assessing the yield and nutritional quality of two bio-fortified varieties of cauliflower. It was observed that the Valentina variety was superior than others in terms of yield (400 q/ha) with the highest B:C ratio of 2.96. Farmers accepted Valentina cauliflower for its taste and colour.

Technology assessed:

FP: Farmers Practice-Kirmaya, Barkha

TO-I: -Valentina

TO-II: Carotena

Source of technology: ICAR-IARI, 2012

Table: Performance of bio-fortified cauliflower variety

Technology option	No. of trials	Yield and quality component			Disease/ infested plants (%)	Yield (q/ha)	Cost of cultivation (Rs./ha)	Gross return (Rs/ha)	Net return (Rs./ha)	BC ratio
		Curd weight / plant (g)	Shelf life (days)	Organol eptic test						
FP	10	800	4	Good	30	300	125000	250000	125000	2.0
TO-I		800	7	Best	2	400	135000	400000	265000	2.96
TO-II		650	7	Best	9	325	135000	325000	195000	2.5




KVK Ganjam-II

Thematic area: *Integrated crop management*

Assessment of foliar application of bio-stimulants on growth and flowering of African marigold

Low productivity and poor quality flowers of marigold was identified as a problem of farmers of Ganjam district. To address this issue, a field trial was conducted by KVK Ganjam-II for studying the effect of foliar application of bio-stimulants on growth and flowering of African marigold. The results revealed that by spraying of humic acid @ 0.2 % at 30, 45, 60 days after transplanting, the 1st flower came 22 days earlier and yield increased by 24.56%. The highest yield of 140.42 q/ha was recorded in TO-II with the B:C ratio of 3.01. It was concluded that non-application of growth promoter in marigold led to low flower productivity. Spraying of growth regulator with proper dose at 30, 45, 60 days after planting was necessary to enhance the flower quality and yield.

Technology assessed:

FP: No application of growth regulator

TO-I: Spray of Seaweed extract @ 1% at 30, 45, 60 DAT

TO-II: Spray of humic acid @ 0.2 % at 30, 45, 60 DAT

Source of technology: ICAR-DFR, 2016; TNAU, 2017

Table: Effect of foliar application of bio-stimulants on growth and flowering of African marigold

Technology option	No. of trials	Flower Yield (q/ha)	% increase	Time taken to 1st flower(days)	Gross cost	Gross return	Net return	BC ratio
FP	7	112.74	-	62.24	186900	450840	263940	2.41
TO-I		133.57	18.47	48.45	193579.70	534280	340700.30	2.76
TO-II		140.42	24.56	40.37	195582.20	589764	394181.80	3.01


KVK Kandhamal

Thematic area: *Weed management*

Evaluation of performance of different weed management measures in maize

Maize growers of Kandhamal district often face the problem of the low yield in maize due to heavy weed infestation. After identifying the problem, KVK Kandhamal took up a field trial at 7 different locations of the district by involving various measures of weed management. It was evident from the trial that Pre-emergence application of Atrazine @ 1.5 kg ai/ha followed by Tembotrione @ 120 g/ha as post-emergence at 25 DAS (TO-II) gave the best results in terms of yield (45.3 q/ha) and B:C ratio of 2.3. Farmers were happy due to higher yield and return and showed their interest for adoption of the technology.

Technology assessed:

FP: Hand weeding at 30 -35 DAS

TO-I: Pre-emergence application of Atrazine 50% wp@ 1.5 kg ai/ha

TO-II: Pre-emergence application of Atrazine @ 1.5 kg ai/ha followed by Tembotrione @ 120 g/ha as post-emergence at 25 DAS

Source of Technology: AICRP on Maize, OUAT, 2021

Table:Performance of different weed management measures in maize

Technology option	No. of trials	Yield component		Yield (q/ha)	Cost of cultivation (Rs./ha)	Gross return (Rs/ha)	Net return (Rs./ha)	BC ratio
		Plant height (cm)	Cob length (cm)					
FP	7	196.2	19.3	36.8	26400	60720	34320	1.3
TO-I		216.4	21.5	43.6	22500	71940	49440	2.2
TO-II		223.8	23.1	45.3	22800	74745	51945	2.3

KVK Kendrapara

Thematic area: *Crop production technology*

Assessment of different water chestnut varieties under water-logged condition

No income from land due to water logging condition was identified as a major problem of the farmers of Kendrapara district. Farmers usually went for deep water rice cultivation which was not at all profitable for them. Keeping this view, KVK Kendrapara carried out a field trial at 7 different locations of the district introducing two prominent water chestnut varieties suitable for the water logging condition. The results of the trial showed that TO-II gave the moderate yield of 122 fruits/ sq.m. with the highest B:C ratio of 2.94. It was recommended that water chestnut was a suitable crop to be grown under swampy water logged problematic area. Revenue can be generated form water logged fallow land with little effort and management. It did not only keep environment clean but incorporated biomass to the soil. Water chestnut crop was found suitable for the Kendrapara district, once after planting the crop got established within a week under field condition.

Yield wise Balasore Green was found superior over Balasore Red variety whereas Balasore Red has good market demand due to its appealing colour.

Technology assessed:

FP: Cultivation of deep water rice

TO-I: Cultivation of water chestnut var. Balasore Red

TO-II: Cultivation of water chestnut var. Balasore Green

Source of technology: IIWM, 2016

Table: Performance of different water chestnut varieties under water-logged condition

Technology option	No. of trials	Yield component			Av. numbers of fruits per Sq. m	Yield (q/ha)	Cost of cultivation (Rs. /ha)	Gross return (Rs/ ha)	Net return (Rs./ha)	BC ratio
		No. of days to get established after planting	Plant height during flowering (cm)	Days to 1st flowering						
FP	7	21	153	99	38	42.3	55600	84600	29000	1.52
TO-I		6	178	87	138	152	89000	250800	161800	2.82
TO-II		6	195	79	142	159	89000	262350	173350	2.94

KVK Keonjhar

Thematic area: *Livestock production management*

Assessment of low-cost concentrate mixture on crossbred heifers for early onset of oestrus

Improper nutrition of crossbred dairy heifers leading to onset of late puberty was a major problem of livestock farmers of Keonjhar district. In order to address this problem, a multi-locational field trial was undertaken by KVK Keonjhar at 7 different locations of the district by modifying the nutritional aspect of the animal management. It was found that the feeding the heifers with straw and concentrate mixture-2 (TO-II) had better performance with respect to onset of oestrus (5 months earlier) and recorded a B:C ratio of 2.22. The farmers were encouraged with the results and demanded the formulation of the concentrate mixture-2.

Technology assessed:

FP: Feeding straw + 5-6 kg wheat bran (100%)

TO-I: Feeding of Straw + Concentrate mixture -1 (CP=13.5%) @ 60:40

TO-II: Feeding of Straw + Concentrate mixture- 2 (CP=14.4%) @ 60:40

Source of technology:ICAR-IGFRI-2017

Table: Effect oflow-cost concentrate mixture on crossbred heifers for early onset of oestrus

Technology option	No. of trials	Yield component			Cost of cultivation (Rs./ha)	Gross return (Rs/ha)	Net return (Rs./ha)	BC ratio
		Body weight at puberty (kg)	Age at first heat (months)	Conception rate (%)				
FP	7	255.02 ± 22.97	23 ± 3.17	15.0	6886.22	18386.22	11500	1.67
TO-I		267.90 ± 24.18	20 ± 2.10	42.0	9114.58	26614.58	17500	1.92
TO-II		272.10 ± 23.21	18 ± 1.8	48.6	9639.63	31039.63	21400	2.22




KVK Koraput

Thematic area: *Integrated disease management*

Assessment of the effect of organic and inorganic measures for controlling rhizome rot in ginger

Due to continuous cultivation of ginger in same piece of land without any adoption of crop rotation practices, incidence of rhizome rot is recorded to be very high (85-90 %) in Koraput district. Non-availability of resistant/ tolerant variety to mitigate rhizome rot incidence was also a major production constraint in high value spice crop, i.e., ginger. Low yield of ginger due to high incidence of rhizome rot has been addressed by KVK Koraput through conducting a field trial at 7 different locations of the district involving various organic and inorganic control measures. Results of the trial revealed that TO-II (Rhizome treatment with Metalaxyl + Mancozeb @ 0.2% and Streptocyclin @ 0.1% along with soil drenching at 45 DAP and 90 DAP) gave the highest yield of 215.9 q/ha, lowest disease incidence of 8.2% and the highest B:C ratio of 3.98. Farmers participated actively during the trial and due to effectiveness of the TO-II, they were interested to adopt the same.

Technology assessed:

FP: Rhizome treatment with Metalaxyl + Mancozeb @ 3 g/ l of water

TO-I: Rhizome treatment with *T. viride*@10 ml/l and *Pseudomonas fluorescens* @10 ml/l along with soil drenching at 45 DAP and 90 DAP

TO-II: Rhizome treatment with Metalaxyl + Mancozeb @ 0.2% and Streptocyclin @ 0.1% along with soil drenching at 45 DAP and 90 DAP

Source of technology: ICAR-IISR, Calicut

Table: Effect of organic and inorganic measures for controlling rhizome rot in ginger

Technology option	No. of trials	Yield component		Disease/ insect pest incidence (%)	Yield (q/ha)	Cost of cultivation (Rs./ha)	Gross return (Rs/ha)	Net return (Rs./ ha)	BC ratio
		Plant height (cm)	No. of tillers/plant						
FP	7	63.8	16.1	14.1	196.6	430000	1596800	1165800	3.7
TO-I		70.5	22.2	8.6	213.6	432800	1708800	1276000	3.94
TO-II		72.2	25.3	8.2	215.9	433100	1727200	1294100	3.98

KVK Mayurbhanj-II

Thematic area: *Varietal evaluation*

Assessment of different high yielding finger millet varieties with nutrient management

Low yield due to use of traditional varieties and poor nutrient management has been a major concern for the finger millet growers of Mayurbhanj district. To solve this problem, KVK Mayurbhanj-II carried out a field level trial at 7 different locations of the district. It was found from the trial that TO-II, i.e., Ragi var. OUAT Kalinga Finger millet-601 (Shreeratna) with

application of NPK (80:30:30) performed better in comparison to local and Arjun variety under similar nutrient regimen with the highest yield of 19.4 q/ha and the highest B:C ratio of 1.88. Farmers were happy with the performance of the new varieties.

Technology assessed:

FP: Cultivation of local variety with no nutritional management

TO-I: Ragi var. Arjun with application of NPK (80:30:30) kg/ha

TO-II: Ragi var. OUAT Kalinga Finger millet-601 (Shreeratna) with application of NPK (80:30:30) kg/ha

Source of technology: OUAT, 2011; OUAT, 2023

Table:Performance ofdifferent high yielding finger millet varieties with nutrient management

Technology option	No. of trials	No of tillers/hill	No of Fingers/ ear head	Test weight (gm)	yield (q /ha)	Net return (Rs/ha)	BC ratio
FP	7	3.1	6.1	2.66	9.0	22716	1.41
TO-I		4.8	9.4	3.21	16.7	43765	1.74
TO-II		5.7	11.1	3.61	19.4	48783	1.88
CD 5%		0.21	1.3	0.84	6.1	6752	-




KVK Puri

Thematic area: *Fishery management*

Assessment of growth promoters for maximizing Amur carp / common carp fry yield in nursery tanks during winter

Less growth rate and poor survival of the fires of Amur carp/ Common carp leading to lower fry yield has been a major problem of pond based farming system of Puri district. KVK Puri attempted to address this issue by taking up a multi-locational field trial at 8 different locations of the district. It was evident from the trial that the combination of TO-I and TO-II, i.e., Use of Manganous sulphate and Cobaltous chloride each at a dose of 0.01mg per spawn per day (Incorporated with powdered feed) alnogwith use of commercially available yeast powder (*Saccharomyces cerevisiae*) at a dose of 0.5% of total powdered feed to be served daily resulted into the highest yield of fry (33.70 lakhs/ha) with the highest B:C ratio of 2.83.

Technology assessed:

FP: Use of only powdered feed (Rice bran: GNOC ::1:1)

TO-I: Use of Manganous sulphate and Cobaltous chloride each at a dose of 0.01mg per spawn per day (incorporated with powdered feed)

TO-II: Use of commercially available yeast powder (*Saccharomyces cerevisiae*) at a dose of 0.5% of total powdered feed to be served daily

TO-III: TO-I+TO-II(Combination of both essential trace minerals and yeast as feed probiotics)

Source of technology: ICAR-CIFA, 2013; TNAU, 2019

Table: Efficacy of growth promoters for maximizing Amur carp / common carp fry yield in nursery tanks during winter

Technology option	No. of trials	Yield (Lakhs/ ha)	% change in Yield	Yield components			Cost of cultivation (Rs/ha)	Gross Return (Rs/ha)	Net Return (Rs./ha)	BC Ratio
				Survival Rate (%)	% change in survival	DOC to attend avg. fry size (25mm)				
FP	8	25.20	-	33.00	-	18	212000	504000	292000	2.38
TO-I		32.50	28.97	42.40	28.48	14	235000	650000	415000	2.77
TO-II		27.80	10.32	36.00	9.1	16	215500	556000	340500	2.58
TO-III		33.70	33.73	44.10	33.64	13	238500	674000	435500	2.83

KVK Sundargarh-I

Thematic area: *Agricultural marketing*

Assessment the performances of FPOs with various levels of task and commodity to enhance the net return

Marketing of the agricultural produce at a suitable price is a problem of not only Sundargarh district but also of the state as well as country. This problem is attributed to unorganized nature of farmers that fetches low price due to distress sale of farm produce. For solving this problem, KVK Sundargarh-I thought of group marketing approach by farmers instead of marketing involving middleman. The FPOs were studied based on their involvement in marketing and other related activities (multi-task) and single or multi-commodity involvement. It was found that TO-III was the best among the technology options for enhancing profitability of the farmers.

Technology assessed:

FP: Farmers marketing their produce individually through intermediaries

TO-I: FPO dealing with a single commodity with a single task i.e., Vegetable/ Pulse/ or any other commodity –Marketing

TO-II: FPO dealing with multi-commodity with single task i.e., Pulses, Vegetable, Enterprises-Marketing

TO-III: FPO dealing with multi-commodity with multi-task i.e., Pulses, Crops Vegetable, Enterprises-sorting, grading, packing, value addition, branding, labelling and marketing

Source of technology: OUAT, 2019

Table: Performance of FPOs with various levels of task and commodity to enhance the net return

Results	*1 (%)	*2 (%)	*3 (%)	*4 (%)	*5 (%)	*6 (%)
FP : Farmers marketing their produce individually through intermediaries	23.33	33.33	36.67	26.67	20.00	10.00
TO-I: FPO dealing with a single commodity with a single task i.e., Vegetable/ Pulse/ or any other commodity –Marketing	60.00	50.00	43.33	40.00	40.00	43.33
TO-II: FPO dealing with multi-commodity with single task i.e., Pulses, Vegetable, Enterprises-Marketing.	66.67	60.00	53.33	46.67	50.00	53.33
TO-III: FPO dealing with multi-commodity with multi-task i.e., Pulses, Crops Vegetable, Enterprises- sorting, grading, packing, value addition, branding, leveling and marketing	93.33	83.33	66.67	63.33	93.33	90.00

*Observation Parameters: 1. A farmer to become a member 2. Contribution for share capital, 3. Better business planning, 4. Access to technology, 5. Access to inputs in time, 6. Better marketing facility

WEST BENGAL

KVK Burdwan

Thematic area: *Weed management*

Assessment of different improved weed management of jute under medium upland situation of PurbaBardhaman

Sub-optimal productivity and low profitability of jute due to weed infestation was identified as a major problem of jut growers of PurbaBardhaman district. In order to address this issue, KVK Burdwan conducted a field trial at 5 different locations of the district involving various improved weed management techniques. Results indicated that application of Propaquizafop (10% EC) @ 1.5 – 2.0 ml/lt after 15 days + One hand weeding (TO-II) was the most effective method in controlling weeds in jute (weed density:14.3 no/m2) while application of Fenoxaprop-p-ethyl (9% EC) @ 1.5 – 2.0 ml/lt after 15 days + One hand weeding (TO-I) was the second best option (weed density:18.7 no/m2) and was at par with two hand weedings at 25 and 45 DAS (FP) (weed density:17.2 no/m2). Productivities in TO-II was 34.3 q/ha while in TO-I and F, yield was recorded as 31.5 q/ha and 32.1 q/ha, respectively. However, benefit cost ratio in FP (B:C= 1.68) was lower than that in both technology options (TO-I=1.85 and TO-II=2.01). Therefore, farmers should follow the practice of applying Propaquizafop (10% EC) @ 1.5 – 2.0 ml/lt after 15 days + One hand weeding for augmented productivity of jute.

Technology assessed:

FP: Two hand weedings at 25 and 45 DAS

TO-I: Application of Fenoxaprop-p-ethyl (9% EC) @ 1.5 – 2.0 ml/lt after 15 days + One hand weeding

TO-II: Application of Propaquizafop (10% EC) @ 1.5 – 2.0 ml/lt after 15 days + One hand weeding

Source of technology: ICAR-CRIJAF, Barrackpore

Table: Performance ofdifferent improved weed management of jute under medium upland situation of PurbaBardhaman

Technology option	No. of trials	Yield component		Yield (q/ha)	Cost of cultivation (Rs./ha)	Gross return (Rs/ha)	Net return (Rs./ha)	BC ratio
		Weed density	Plant height (cm)					
FP	5	17.2	331	32.1	91600	154080	62480	1.68
TO-I		18.7	330	31.5	81600	151200	69600	1.85
TO-II		14.3	346	34.3	81800	164640	82840	2.01
LSD at 5%		2.41	3.78	1.06				

KVK Kalimpong

Thematic area: *Resource conservation technology*

Assessment of different types of mulches on tomato (*Lycopersicon esculentum*) production in Hill agro-climatic conditions

Traditional system of cultivation without using of mulching materials resulted into low yield of tomato in Hilly region of Kalimpong. For attempting to enhance the tomato production by using different types of mulching, KVK Kalimpong took up a field level trial at 7 different locations of the district. It was found from the trial that the use of black polythene mulch yielded the highest (63.52 q/ha) with the highest B:C ratio of 4.2. Among the different mulching materials, the tomato cultivation with black polythene mulch was recommended from the results of this trial. Farmers participated actively through phone calls, personal contacts, field days, etc. Farmers participated in this programme were highly interested in using the most effective type of mulching.

Technology assessed:

FP: Cultivation of tomato without mulching

TO-I: Cultivation of tomato using leaf mulch

Tech option II: Cultivation of tomato using black polythene mulch

Tech option III: Cultivation of tomato using straw mulch

Source of technology: Institute of Agricultural Science, University of Calcutta

Table: Performance of different types of mulches on tomato (*Lycopersicon esculentum)* production in Hill agro-climatic conditions

Technology option	No of trials	Yield Components			Yield q/ha)	Gross return (Rs/ha)	Gross cost (Rs/ha)	Net Return (Rs/ha)	BC ratio
		Average wt of fruits (g)	No of fruits/plant	Fruits wt/ plant(g)					
FP	7	28.86	38	0.98	27.19	271867	114010	114010	2.3
TO-I		19.40	100.77	2.16	55.83	670024	159784	510240	4.1
TO-II		21.57	120.28	2.42	63.52	762300	181144	581156	4.2
TO- III		18.23	99.42	2.10	55.54	555488	194784	360704	2.8
CD		NS	27.755	0.276	6.819				
SE(m)			9.877	0.080	2.283				
SE(d)			13.696	0.112	3.229				

KVK Howrah

Thematic area: *Integrated disease management*

Assessment of Integrated Disease Management (IDM) practices against Soft rot or Black leg (*Pectobacteriumatrosepticum)* of potato in medium land situation of Howrah district

Potato is a major crop of Howrah district. But it is observed very often that the loss of crop is attributed to the incidence of Soft rot or Black leg (*Pectobacteriumatrosepticum)*. This infestation is countered by the farmers through injudicious application of pesticides to control Potato Soft Rot, *Pectobacteriumatrosepticum*. This situation creates a great problem of yield loss and environmental concern. In an attempt to address this issue, KVK Howrah conducted a multi-locational field trial at 7 different locations involving various integrated disease management measures for controlling this. The results revealed that TO -II, i.e., Application of Streptocycline @1g + Copper oxychloride @4g/ liter of water at 10 days interval gave the highest yield of 256.75 q/ha, the lowest disease incidence of 8.90% and the highest B:C ratio of 2.33. Farmers participated in collaborative mode and they are very satisfied with this trial.

Technology assessed:

FP: Application of either Carbendazim or Thiophenate methyl in indiscriminate manner.

TO-I: Soil treatment with bleaching powder 10kg/ ha. and seed treatment with Streptocycline 1g/10l. wate r before sowing the seeds.

TO-II: Streptocycline @1g + Copper oxychloride @4g/ liter of waterat 10 days interval**.**

TO-III: Metalaxyl+ Mancozeb @3g/ liter of waterat 10 days interval**.**

Source of technology: CGIAR

Table: Efficacy of Integrated Disease Management (IDM) practices against Soft rot or Black leg (*Pectobacteriumatrosepticum)* of potato

Technology option	No. of trials	Disease Incidence (%)	No. of plant affected (m^2)	Yield (q/ha)	Cost of cultivation (Rs/ha)	Gross return (Rs/ha)	Net return (Rs/ha)	BC ratio
FP	7	22.65	5.26	170.52	190100	290500	100400	1.53
TO-I		09.10	2.35	245.57	172544	336578	164034	1.95
TO-II		08.90	1.80	256.75	163112	380645	217533	2.33
TO-III		09.50	2.68	241.74	180722	330361	149639	1.83
SEm±		1.202	0.756	4.359				
CD (P=0.05)		1.572	1.589	2.751				

KVK Malda II

Thematic area: Fishery management

Assessment of performance of different bottom dweller fish species in seasonal ponds

In Malda district, the ponds are seasonal in nature with poor water retention capacity. Fish farming is practiced with low inputs in these seasonal ponds, which gives poor economic returns. Low productivity and poor economic returns in seasonal ponds has been identified as a problem of the district. To address this problem, KVK Malda-II carried out a field trial at 5 different locations of the district. It was evident from the trial that the species *H. fossilis* could be a potential candidate for bottom dwellers with high economic return (TO-II) with the highest yield of 5.74 q/ha and the highest B:C ratio of 3.03. Therefore, replacing *L. bata* with *H. fossilis*should be explored in seasonal ponds of Malda district. Active participation of farmers in every stage of culture practice was encouraging. *H. fossilis*can be reared under high stocking density as being an airbreathing fish. They found to grow better in rejuvinated ponds where mud content is always high as compared to non-air breathing fishes. Marketable size of fish is achieved within a span of 120 to 160 days. It is recommended to culture *H. fossilis* in seasonal ponds and it was also found to be economical than *L. bata* as it fetched very high market price.

Technology assessed:

FP: Mrigal (1000 Nos/ ha)-100 %

TO-I: *L. bata* (3000 Nos/ ha)- 100 %

TO-II: *H. fossilis*(10000 Nos/ ha)- 100 %

Source of technology: ICAR-CIFA, Bhubaneswar

Table: Performance of different bottom dweller fish species in seasonal ponds

Technology option	No. of trials	Yield component			Disease incidence (%)	Yield (q/ha)	Cost of cultivation (Rs./ha)	Gross return (Rs/ha)	Net return (Rs./ha)	BC ratio
		Initial weight (gm)	Final weight (gm)	Percent survival (%)						
FP	5	23	265	90	Nil	2.39	16000	23850	7850	1.49
TO-I		18	145	90	Nil	3.92	25000	46980	21980	1.88
TO-II		12	82	70	Nil	5.74	75830	229600	153770	3.03

KVK Nadia II

Thematic area: ***Varietal evaluation***

Evaluation of new Coriander varieties for high seed spices production in agro-ecological condition of Nadia district

Low yield in local cultivars and more disease infestation (Stem gall) in local Coriander varieties were identified as a problem of Nadia district. In order to solve this, a field level trial was undertaken by KVK Nadia-II at 4 different locations with introduction of two improved and Stem gall resistant varieties of Coriander. The results of the trial showed that the TO-II, i.e., Acr-2 variety of Coriander recorded the highest yield of 12 q/ha. with the highest B:C ratio of 1.76. The farmers participated with good

response and were interested in more cultivation of this variety which was superior to others.

Technology assessed:

FP: Local variety of Coriander

TO-I: Coriander variety Acr-1

TO-II: Coriander variety Acr-2

Source of technology: ICAR-NRC on Seed Spices, Ajmer, Rajasthan

Table: Performanceof new Coriander varieties for high seed spices production

Technology option	No. of trials	Yield component			Yield (q/ha)	Cost of cultivation (Rs./ha)	Gross return (Rs/ha)	Net return (Rs./ha)	BC ratio
		Plant height (cm)	No. of effective branches/plant	No. of umbel/ plants					
FP	4	56.2cm	8.5	6.26	9.2	38000	47840	12840	1.30
TO-I		113.9cm	6.3	18.40	11.2	40750	67200	26450	1.64
TO-II		86.3cm	8.2	24.52	12.0	40750	72000	31250	1.76

KVK North 24 Parganas II

Thematic area: *Poultry management*

Assessment of egg quality and economics of different duck breeds under backyard production system

Inferior production characteristics of the indigenous pati ducks mostly reared by the farmers have been a major concern under backyard system of duck rearing in North 24 Parganas district. Therefore, KVK North 24 Parganas-II took up a field trial at 8 different locations involving the improved breeds for assessing the egg quality as well as economics of the farming. As per the result, rearing of White Pekin (TO-III) duck under backyard system was more remunerative compared to indigenous pati duck (FP), Khaki Campbell (TO-I) and Indian Runner (TO-II). In terms of egg quality, Khaki Campbell was found with highest Haugh index indicating thicker albumen followed by Indian Runner. However, under economic standpoint White Pekin duck was most profitable under backyard farming system with a B:C ratio of 3.50.

Technology assessed:

FP: Rearing of indigenous pati/ local duck

TO-I: Rearing of Khaki Campbell duck breed

TO-II: Rearing of Indian Runner duck breed

TO-III: Rearing of White Pekin duck breed

Source of technology: ICAR-CARI, Izatnagar

Table: Egg quality and economics of different duck breeds under backyard production system

Technology option	No. of trials	Yield component												Cost of input(Rs./unit)	Gross return (Rs/unit)	Net return(Rs./unit)	BC ratio
		Age at 1st egg of the flock	Egg up to 30 wks of age (no)	Egg up to 40 weeks of age (no)	Egg up to 50 wks of age (no)	Egg wt 30 wk (g)	Egg wt 40 wk	Egg wt 50 wk	Shape index	Albumen index	Yolk index	Haugh Index	Avg. Duck wt at 50 wks				
FP	2	192.4	7.67	17.45	32.55	40.62	49.83	50.34	72.6	0.163	0.451	97.18	1.34	243.5	662.4	418.9	2.72
TO-I	2	152.6	23	43.91	62.43	62.34	64.22	71.64	74.5	0.171	0.433	98.48	1.55	327.4	964.44	637.04	2.95
TO-II	2	143.4	32	78.77	89.88	61.66	64.52	67.22	74.82	0.776	0.429	98.2	1.64	375.6	1211.04	835.44	3.22
TO-III	2	173.4	19	34.08	65.38	56.17	67.3	69.28	75.45	0.723	0.42	97.42	3.28	430.6	1507.04	1076.44	3.50

KVK Jhargram

Thematic area: *Varietal evaluation*

Assessment of performance of different Tuberose (*Polianthes tuberose* L) varieties in the red and lateritic zone of Jhargram

Growing tuberose is gaining much popularity in Jhargram district during monsoon season in recent years. Market demand is also increasing day by day. But due to cultivation of local variety, the yield of the flower is low. This has been identified as a problem of the district. In order to address this issue, KVK Jhargram has taken up a field trial at 10 different locations of the district for evaluating the performance of different varieties of tuberose. The results indicated that cultivation of the variety 'Bidhan Ujjwal' (TO-III) yielded the highest (4.31 lakh spikes/ha) with the highest B:C ratio of 1.22.

Technology assessed:

FP: Cultivation of local variety.

TO-I: Cultivation of the variety 'Prajwal'

TO-II: Cultivation of the variety 'BidhanSnigdha'

TO-III: Cultivation of the variety 'Bidhan Ujjwal'

Source of technology: BCKV, West Bengal

Table:Performance of different Tuberose (*Polianthes tuberose* L) varieties in the red and lateritic zone

Technology option	No. of trials	Yield component		Yield (Spike Yield) (lakh/ha)	Cost of cultivation (Rs./ha)	Gross return (Rs/ ha)	Net return (Rs./ha)	BC ratio
		Spike Length (cm)	No. of floret/ spike					
FP	10	54.06	25.61	3.06	229000	460000	231000	1.00
TO-I		108.97	38.35	4.12	287000	612000	325000	1.13
TO-II		61.21	29.84	3.98	287000	607000	320000	1.11
TO-III		64.69	34.77	4.31	287000	638000	351000	1.22

KVK South 24 Parganas I (Nimpith)

Thematic area: *Integrated nutrient management*

Assessment of effect of nutrient management on the productivity and fruit quality of Litchi in South 24 Parganas district of West Bengal

Litchi is an important commercial fruit crop of South 24 Parganas, which also belongs to Agri-Export Zone. Litchi is grown extensively in the blocks of Baruipur, Joynagar-I, Magrahat I & II etc. However, farmers are facing the problem of fruit cracking and low productivity of litchi, which may be due to poor fertilizer management and nutrient deficiency. In order to solve this problem, KVK South 24 Parganas-I (Nimpith) conducted a field trial at 7 different locations through various nutrient management strategies. It was evident from the trial that both TO-I and TO-II performed better over FP

with respect to fruit cracking, yield and net income. It has been observed that the TO-II was a bit better than TO-I with the B:C ratio of 5.53. Farmers were involved through participatory approach.

Technology assessed:

FP: No basal or foliar application of fertilizer/ nutrient

TO-I: RDF (Soil application of Urea @ 1.3 kg; SSP @ 1.25 kg; MOP @ 1 kg per plant per year) + Multi-micronutrient @ 1.5 g/liter of water at 21 days interval (3 times) + $CaNO_3$ @ 3g/liter of water at 15 days interval (2 times at pin head stage & marble stage)

TO-II: RDF (Soil application of $CaNO_3$ @ 4 kg/plant; SSP @ 1.25 kg/plant; MOP @ 1 kg/plant per year) + Multi-micronutrient @ 1.5g/liter of water at 21 days interval (3 times)

Source of technology: AICRP on Fruits, BCKV

Table: Effect of nutrient management on the productivity and fruit quality of Litchi

Treatment	No. of trials	Fruit Size		Fruit weight (g)	Seed weight (g)	TSS (%)	Yield (q/ha)	Fruit Cracking (%)	Net Income (Rs)	BC ratio
		Length (cm)	Diameter (cm)							
FP	7	3.13	2.5	14.7	3	19.35	66.15	69.2	189250	10.46
TO-I		3.82	3.03	17.1	3.2	19.1	85.55	61.5	281000	5.01
TO-II		4.24	3.14	18.85	3.6	20.35	94.25	57.1	317000	5.53
CD (0.05)		0.202	0.122	1.167	0.454	0.881	0.924	1.874		

4.2 Technology Demonstration:

4.2.1 Frontline Demonstrations:

The Frontline demonstration (FLD) is the concept of demonstration popularized by Indian Council of Agricultural Research under the Technology Mission. The demonstrations are made on the latest technologies and varieties less than 10 years old with direct supervision of NARS scientist in the farmers' field. This programme is popular among the farmers as there is no other programme of oilseeds, pulses and other crops within the reach of the farmers which update the knowledge and technique of the cultivation. The KVKs of Zone V took up FLD programme not only in oilseeds and pulses but also in the area of cereals, vegetables, cash crop and other crop, so that farmers are updated with latest varieties and technologies under important field crops.

During 2023, the KVKs of Zone-V, conducted Frontline Demonstration programme on oilseeds in153.03 ha covering 1938 farmers. The area under demonstration in pulse was 83.42 ha which covered 882 farmers. The coverage in crops like paddy, wheat, maize, brinjal, cauliflower, onion etc. was 1154.80 ha which involved 7517 farmers. As a whole the KVKs of Zone V covered 1391.25ha under demonstration in 2023 and benefitted 10337 farmers.

The state-wise analysis of Frontline Demonstrations showed that Odisha covered 32.44 ha in oilseeds, 28.4 ha in pulses and 297.79 ha in cereals, vegetables and other crops in 2023. Total coverage of demonstration was 358.63 ha in the state which benefitted 2526 farmers. In the state of West Bengal, an area of 120.59 ha in oilseeds55.02 ha in pulses and 856.96 ha in cereals, vegetable etc. were covered in 2023. Total coverage in West Bengal was 1032.57 ha under demonstration which benefitted 7803 farmers of the zone.

Table: State-wise details of Frontline Demonstration on Oilseeds, Pulses and Other Crops

State	Oilseeds		Pulses		Other crops		Total	
	No. of Farmer	Area (ha)	No. of Farmer	Area (ha)	No. of Farmer	Area (ha)	No. of Farmer	Area (ha)
A & N Islands	0	0	0	0	8	0.05	8	0.05
Odisha	221	32.44	212	28.4	2093	297.79	2526	358.63

State	Oilseeds		Pulses		Other crops		Total	
	No. of Farmer	Area (ha)	No. of Farmer	Area (ha)	No. of Farmer	Area (ha)	No. of Farmer	Area (ha)
West Bengal	1717	120.59	670	55.02	5416	856.96	7803	1032.57
Total	**1938**	**153.03**	**882**	**83.42**	**7517**	**1154.80**	**10337**	**1391.25**

4.2.2 Oilseeds:

In the year 2023, total 153.03 ha area was covered under FLD on Oilseeds. Out of the total coverage, Oilseed was demonstrated 32.44 ha in Odisha and 120.59 ha in West Bengal. The farmers covered in West Bengal were 1717 and in Odisha it was 221. The demonstrated yield of groundnut was 26.25 q/ha in West Bengal with an increase in yield of 22.59%. In Odisha, the demonstration yield was 20.35q/ha which is 18.84% higher than traditional variety. In mustard coverage were 60.46 ha in West Bengal and 6.5 ha in Odisha. The demonstrated yield was 13.80 q/ha in West Bengal while it was 8.03 q/ha in Odisha. The increase in yield was 23.77% in West Bengal and 44.54% in Odisha. Oilseeds crops like sesame, sunflower were also demonstrated by the KVKs of Odisha and West Bengal. The yield improvement in West Bengal, with demonstrations was 31.78% in sesame, 20.44% in sunflower whereas in Odisha 33.21% increase in sesame, 17.97% in Sunflower was found.

Table: Frontline Demonstration on Oilseeds

Sl. No.	Crop	State	No. of KVKs	No. of Farmer	Area (ha)	Yield (q/ha)		% Increase
						Demo	Check	
1	Groundnut	Odisha	11	130	18.94	20.35	17.11	18.84
		West Bengal	15	640	40.63	26.25	21.92	22.59
		Total	**26**	**770**	**59.57**	23.30	19.52	20.72
2	Mustard	Odisha	3	48	6.5	8.03	5.83	44.54
		West Bengal	18	992	60.46	13.80	11.15	23.77
		Total	**21**	**1040**	**66.96**	**10.92**	**8.49**	**34.16**
3	Sesame	Odisha	3	30	5	6.00	4.60	33.21
		West Bengal	4	70	18	10.96	8.53	31.78
		Total	**7**	**100**	**23**	**8.48**	**6.57**	**32.49**
4	Sunflower	Odisha	1	13	2	20.74	17.58	17.97
		West Bengal	1	15	1.5	9.78	8.12	20.44
		Total	**2**	**28**	**3.5**	**15.26**	**12.85**	**19.21**
Grand Total			**56**	**1938**	**153.03**			




4.2.3 Pulses:

In pulses, demonstration was conducted in 83.42 ha covering 882 farmers. The major pulses demonstrated was Green Gram (33.9ha) and Lentil (29.2 ha). In Green Gram increase in yield (1.53 q/ha) was 30.14% in Odisha and 31.08% (2.43 q/ha) in West Bengal. Lentil was demonstrated in West Bengal in 29.2 ha and average demonstrated yield was recorded 11.91q/ha which was higher by 20.97 % of check yield. Pigeon pea, Cow pea and Garden pea were also demonstrated in 5-6 ha under this programme. The yield performance and coverage of frontline demonstration were depicted as follows:-

Table: Frontline demonstration on pulses

Sl. No.	Crop	State	No. of KVKs	No. of Farmer	Area (ha)	Yield (q/ha)		% Increase
						Demo	Check	
1	Black Gram	Odisha	4	45	8	6.56	5.40	22.70
		West Bengal	1	5	1	9.35	5.95	57.14
		Total	**5**	**50**	**9**	**7.95**	**5.67**	**39.92**
2	Green Gram	Odisha	10	112	13.9	6.74	5.21	30.14
		West Bengal	7	184	20	10.53	8.10	31.08
		Total	**17**	**296**	**33.9**	**8.64**	**6.65**	**30.61**
3	Lentil	West Bengal	10	444	29.2	11.91	9.92	20.97
		Total	**10**	**444**	**29.2**	**11.91**	**9.92**	**20.97**
5	Pigeon pea	Odisha	2	10	2	16.40	12.20	34.43
		Total	**2**	**10**	**2**	**16.40**	**12.20**	**34.43**
6	Cowpea	Odisha	1	10	1	156.40	119.50	30.88
		Total	**1**	**10**	**1**	**156.40**	**119.50**	**30.88**
7	Lathyrus	West Bengal	3	37	4.82	9.19	7.86	16.67
		Total	**3**	**37**	**4.82**	**9.19**	**7.86**	**16.67**
8	Garden pea	Odisha	2	35	3.5	116.90	82.10	42.39
		Total	**2**	**35**	**3.5**	**116.90**	**82.10**	**42.39**
Grand Total			**40**	**882**	**83.42**			

4.2.4 Other Crops:

Various field crops important for the respective districts of the KVK were taken up for the purpose of frontline demonstration, rice being the most important crop in the region grown preference for demonstration. The latest varieties and technologies on rice were demonstrated in 499.49 ha covering 2313 farmers. Average yield increase was 16.91% in Odisha and 20.59% in West Bengal. Wheat and maize are not a major crop in these states but to popularize these crops was demonstrated in 25 ha and 42.39 ha in West Bengal and 41.6 ha in Odisha which showed average increase in yield of 21.95% and 28.88% in West Bengal and 19.02% in Odisha.

In the vegetable crops, brinjal, cauliflower, onion, tomato, potato, cabbage, broccoli, chilli, cucumber, point gourd, elephant foot yam, bitter gourd were demonstrated through frontline demonstration programme. Improvement in yield was demonstrated 15.30 to 25.88% in brinjal, 24.53 to 26.46% in cauliflower, 23.32 to 27.03% in onion, 22.25 to 30.42% in tomato, 22.18 to 31.87% in cabbage, 27.38 to 31.90% in cucumberin the state of West Bengal and Odisha.

The spices like turmeric was demonstrated in both the states of West Bengal and Odisha showing improvement of yield of 25.30 to 25.74% over the existing practices.

Fruit crops like mango and banana were demonstrated during 2023. Yield increment with new technologies was 13.16% in West Bengal and 26.64% in Odisha. Banana in Odisha showed 13.23% increase in yield and in West Bengal 23.84%.

Table: Demonstration on crops other than oilseeds and pulses

Sl. No.	Crop	State	No. of KVKs	No. of Farmer	Area (ha)	Yield (q/ha)		% Increase
						Demonstration	Check	
1	Rice	Odisha	27	296	47.4	46.47	40.13	16.91
		West Bengal	21	2017	452.09	45.41	37.88	20.59
		Total	**48**	**2313**	**499.49**			
2	Wheat	West Bengal	3	141	25	36.90	30.38	21.95
		Total	**3**	**141**	**25**			
3	Finger Millet	Odisha	9	131	22.7	13.48	11.03	24.76
		West Bengal	6	78	9.04	14.24	9.80	39.64
		Total	**15**	**209**	**31.74**			
4	Okra	Odisha	3	33	2.1	128.20	111.43	15.11
		West Bengal	4	62	4.93	577.98	410.78	33.35
		Total	**7**	**95**	**7.03**			
5	Bitter gourd	Odisha	12	126	11.88	150.49	121.75	26.80
		West Bengal	3	60	1.51	430.73	373.87	24.15
		Total	**15**	**186**	**13.39**			
6	Brinjal	Odisha	16	163	19	285.57	228.29	25.88
		West Bengal	6	142	7.08	385.31	332.77	15.30
		Total	**22**	**305**	**26.08**			
7	Broccoli	Odisha	1	10	1	243.00	162.00	50.00
		West Bengal	4	111	4.70	187.69	135.99	29.38
		Total	**5**	**121**	**5.70**			
8	Cabbage	Odisha	4	55	6.1	314.08	240.05	31.87
		West Bengal	3	32	11.84	307.47	255.43	22.18
		Total	**7**	**87**	**17.94**			
9	Capsicum	Odisha	1	13	0.40	212.14	169.83	24.91
		West Bengal	3	23	1.15	109.73	84.97	30.38
		Total	**4**	**36**	**1.55**			
10	Cauliflower	Odisha	5	71	9.50	209.78	169.84	24.53
		West Bengal	11	199	6.24	207.98	163.53	26.46
		Total	**16**	**270**	**15.74**			
11	Chilli	Odisha	13	133	16	119.83	97.06	24.61
		West Bengal	3	62	4.5	89.73	69.57	27.47
		Total	**16**	**195**	**20.5**			
12	Cucumber	Odisha	2	10	1.4	130.59	99.01	31.90
		West Bengal	3	75	8	278.60	230.75	27.38
		Total	**5**	**85**	**9.4**			

Sl. No.	Crop	State	No. of KVKs	No. of Farmer	Area (ha)	Yield (q/ha)		% Increase
						Demonstration	Check	
13	Onion	Odisha	5	53	4.4	169.06	134.24	27.03
		West Bengal	4	50	6	212.38	176.50	23.32
		Total	**9**	**103**	**10.4**			
14	Pointed gourd	Odisha	2	17	2.6	198.00	172.75	21.32
		West Bengal	3	89	9.75	156.99	135.80	20.12
		Total	**5**	**106**	**12.35**			
15	Colocasia	Odisha	1	13	1	133	108	23.15
		West Bengal	1	8	2	125.00	93.00	34.41
		Total	**2**	**21**	**3**			
16	Sweet Corn	Odisha	4	20	11	97.90	73.70	31.30
		West Bengal	1	4	1	276.60	214.30	29.07
		Total	**5**	**24**	**12**			
17	Tomato	Odisha	11	108	13.2	340.32	275.32	22.25
		West Bengal	8	154	7.91	434.83	351.45	30.42
		Total	**19**	**262**	**21.11**			
18	Elephant Foot Yam	West Bengal	6	103	8.28	499.43	371.59	35.54
		Total	**6**	**103**	**8.28**			
19	Potato	Odisha	1	10	2.00	184	145	26.90
		West Bengal	4	98	8.17	305.8	258.025	19.10
		Total	**5**	**108**	**10.17**			
20	Sweet Potato	Odisha	2	25	0.9	72.82	58.53	21.76
		West Bengal	1	7	0.25	207.65	143.00	45.21
		Total	**3**	**32**	**1.15**			
21	Marigold	Odisha	4	44	2.8	117.18	93.63	26.64
		West Bengal	2	34	0.66	123.50	104.00	20.83
		Total	**6**	**78**	**3.46**			
22	Banana	Odisha	5	56	3.8	353.50	310.90	13.23
		West Bengal	6	148	16.65	439.01	356.47	23.84
		Total	**11**	**204**	**20.45**			
23	Dragon fruit	West Bengal	4	67	2.16	124.15	93.885	28.70
		Total	**4**	**67**	**2.16**			
24	Guava	West Bengal	2	18	6	283.44	237.46	19.36
		Total	**2**	**18**	**6**			
25	Mango	Odisha	4	44	2.8	117.175	93.625	26.64
		West Bengal	4	77	25.3	194.65	173.91	13.16
		Total	**8**	**121**	**28.1**			
26	Watermelon	Odisha	4	32	2.88	265.00	224.78	20.72
		Total	**4**	**32**	**2.88**			

Sl. No.	Crop	State	No. of KVKs	No. of Farmer	Area (ha)	Yield (q/ha)		% Increase
						Demonstration	Check	
27	Papaya	Odisha	1	13	1	145.00	105.00	38.10
		West Bengal	1	14	0.46	413.00	371.00	11.32
		Total	**2**	**27**	**1.46**			
28	Ginger	Odisha	3	30	3	211.87	205.40	3.19
		West Bengal	1	10	1	111.00	90.80	22.25
		Total	**4**	**40**	**4**			
29	Turmeric	Odisha	4	40	2.43	142.18	115.43	25.30
		West Bengal	6	98	2.93	235.11	189.51	25.74
		Total	**10**	**138**	**5.35**			
30	Cotton	Odisha	5	53	7.4	17.60	13.66	37.51
		West Bengal	2	8	2	13.16	9.90	28.69
		Total	**7**	**61**	**9.4**			
31	Sugarcane	Odisha	2	33	2	64.9	56.30	15.38
		Total	**2**	**33**	**2**			
32	Jute	Odisha	3	38	7	26.10	24.23	6.94
		West Bengal	9	845	163	28.12	23.66	19.89
		Total	**12**	**883**	**170**			
33	Maize	Odisha	21	230	41.6	55.10	47.00	19.02
		West Bengal	9	244	42.39	129.67	95.96	28.88
		Total	**30**	**474**	**83.99**			
34	Others	A & N Islands	2	8	0.0515	168.33	120.33	45.97
		Odisha	14	193	48.5	1071.58	669.18	44.72
		West Bengal	13	338	14.98	227.47	172.18	40.24
		Total	**29**	**539**	**63.53**			
Grand Total			**348**	**7517**	**1154.80**			









4.2.5 Livestock:

Various aspects of livestock management like new breed introduction, livestock feed formulation with locally available materials, deworming, vaccinations, health management measures were demonstrated by the KVKs of Odisha and West Bengal. In Odisha, demonstrations were made on 1018 livestock benefitting 691 farmers. In the state of West Bengal, 923 farmers were involved to demonstrate latest technology of1148 animals/ livestock.

Table: Frontline Demonstration on Livestock

Sl. No.	Category	State	No. of KVKs	No. of Farmer	No. of units
1	Poultry	Odisha	26	473	535
		West Bengal	15	448	568
		Total	**41**	**921**	**1103**
2	Sheep and goat	Odisha	5	55	170
		West Bengal	6	126	196
		Total	**11**	**181**	**366**
3	Dairy	Odisha	3	30	30
		West Bengal	6	77	102
		Total	**9**	**107**	**132**
4	Duckery	Odisha	4	55	190
		West Bengal	4	140	150
		Total	**8**	**195**	**340**
5	Pigerry	West Bengal	3	30	30
		Total	**3**	**30**	**30**
6	Feed and Fodder	Odisha	1	10	10
		West Bengal	1	20	20
		Total	**1**	**20**	**20**
7	Others	Odisha	5	68	83
		West Bengal	4	92	92
		Total	**9**	**160**	**175**
Grand Total			**82**	**1614**	**2166**

4.2.6 Fishery:

In fishery, demonstration was conducted on 453 units developed on Common carps, Composite fish, Ornamental fishes etc benefiting 570 farmers in Odisha and West Bengal.

Table: Frontline Demonstration on Fishery

Sl. No.	Category	State	No. of KVKs	No. of Farmer	No. of units
1	Common carps	Odisha	5	150	78
		West Bengal	7	50	50
		Total	**12**	**200**	**128**
2	Composite fish	Odisha	6	91	76
		West Bengal	8	133	133
		Total	**14**	**224**	**209**
3	Ornamental fishes	West Bengal	1	10	10
		Total	**1**	**10**	**10**
4	Others	Odisha	6	110	86
		West Bengal	5	26	20
		Total	**11**	**136**	**106**
Grand Total			**38**	**570**	**453**

4.2.7 Enterprise:

Under different enterprise like apiary, vermicomposting, mushroom production, Nutritional Garden, value addition of fruits and vegetables were demonstrated among farmers and rural youth to exhibit the earning potential of the technologies. These demonstrations benefitted 1533 farmers and rural youths along with 1327 units in this zone.

Table: Frontline Demonstration on Enterprise

Sl. No.	Category	State	No. of KVKs	No. of Farmer	No. of units
1	Oyster mushroom	Odisha	11	138	339
		West Bengal	8	169	170
		Total	**19**	**307**	**509**
2	Paddy straw mushroom	Odisha	10	95	125
		Total	**10**	**95**	**125**

Sl. No.	Category	State	No. of KVKs	No. of Farmer	No. of units
3	Vermicompost	A & N Islands	1	2	2
		Odisha	6	62	52
		West Bengal	5	46	46
		Total	**12**	**110**	**100**
4	Apiculture	Odisha	2	13	13
		West Bengal	4	71	117
		Total	**6**	**84**	**130**
5	Nutritional Garden	Odisha	3	30	30
		West Bengal	1	12	12
		Total	**4**	**42**	**42**
6	Value Addition	Odisha	6	54	54
		West Bengal	2	30	2
		Total	**8**	**84**	**56**
7	Sericulture	Odisha	1	10	10
		Total	**1**	**10**	**10**
8	Agroforestry	West Bengal	1	6	2
		Total	**1**	**6**	**2**
9	Others	A & N Islands	1	2	2
		Odisha	16	190	142
		West Bengal	17	603	209
		Total	**34**	**795**	**353**
Grand Total			**95**	**1533**	**1327**

4.2.8 Implements:

The agricultural implements and tools available for farmers are not in use in many villages due to lack of awareness about the machineries. To create awareness about implements and machineries, 298 demonstrations were organized involving 661 farmers,in the states of West Bengal, Odisha and A & N Islands.

Table: Frontline Demonstration on Implements

Sl. No.	Category	State	No. of KVKs	No. of Farmer	No. of units/No
1	Implement	A & N Islands	1	8	1
		Odisha	16	199	79
		West Bengal	8	454	218
		Total	**25**	**661**	**298**


4.2.9 Women Empowerment:

KVKs under ICAR-ATARI Kolkata carried out 598 demonstrations on different aspects of women empowerment during the year 2023. The various aspects of women empowerment included the strengthening of SHGs, enhanced economic power in the family, eradication of malnutrition in girl children and so on.

Table: Frontline Demonstration on Women Empowerment

Sl. No.	Category	State	No. of KVK	No. of demonstrations
1	Farm Women	A & N Islands	2	12
		Odisha	8	105
		West Bengal	6	202
		Total	**16**	**319**
2	Adolescent Girl	A & N Islands	1	6
		West Bengal	3	49
		Total	**4**	**55**
3	Other women	A & N Islands	3	18
		Odisha	3	30
		West Bengal	6	176
		Total	**12**	**224**
Grand Total			**32**	**598**



4.3 Training:

This is a common fact that continuous updating of knowledge and skill of the farmers are required in the field of agriculture and allied sectors to maintain sustainability in agricultural development. Various organizations come forward with their proposal of training programme to update skills of their farmers/ rural youths. KVKs took the lead role to train the farmers at district level with their expertise on different fields of agriculture and allied vocations. The farmers approach to the KVKs to get trained in the area of crop production, horticulture, water management, off-season vegetable cultivation, soil health and fertility management, post-harvest technology, plant protection, livestock production and management, fishery and value addition etc.

4.3.1 Consolidated achievements

The KVKs under ICAR-ATARI Kolkata organized 5573 training courses for the benefit of 167954 farmers and farm women, rural youth and extension functionaries during 2023. Out of total beneficiaries, 104824 was male (62.41%) and 63130 (37.59%) was female. A good number (58547) of SC farmers were also trained in the programme which constituted 34.86% total trainees. While the number of ST trained was 25324 which was 15.08% of total beneficiaries. The details are given in the table below.

Table: Summary of training programme conducted during 2023 in Zone V

State	No. of Courses	No. of Participants											
		Farmer & Farm Women			Rural Youth			Extension Functionaries			Grand Total		
		M	F	T	M	F	T	M	F	T	M	F	T
A & N Island	54	697	717	1414	71	213	284	28	28	56	796	958	1754
Odisha	2283	24589	23550	48139	3525	2309	5834	2495	1499	3994	30609	27358	57967
West Bengal	3236	54432	25924	80356	6063	4565	10628	12924	4325	17249	73419	34814	108233
TOTAL	**5573**	**79718**	**50191**	**129909**	**9659**	**7087**	**16746**	**15447**	**5852**	**21299**	**104824**	**63130**	**167954**

State wise distribution of training programmes

i) Farmers and farm women

State-wise analysis of training for farmers and farmwomen showed that Union Territory of A&N Islands conducted 41 courses for 1414 participants. In Odisha, 1718 courses were conducted for 48139 beneficiaries while in West Bengal 2391 courses were taken up for training of 80356 beneficiaries.

Table: State-wise training programme conducted for farmers and farm women in Zone V

State	No. of Courses	No. of Participants											
		General			SC			ST			Grand Total		
		M	F	T	M	F	T	M	F	T	M	F	T
A & N Island	41	360	506	866	0	0	0	337	211	548	697	717	1414
Odisha	1718	14138	11294	25432	5256	6710	11966	5181	5500	10681	24589	23550	48139
West Bengal	2391	26743	9400	36143	22698	12702	35400	4991	3822	8813	54432	25924	80356
TOTAL	**4150**	**41241**	**21200**	**62441**	**27954**	**19412**	**47366**	**10509**	**9533**	**20042**	**79718**	**50191**	**129909**

ii) Rural youth

Skill and knowledge development through training of rural youth was one of the most important objectives of the KVKs to generate rural employment. Mushroom production, production of organic inputs, seed production, value addition, dairy farming, poultry farming, fish seed production, repair and maintenance of farm machines and bee keeping were the most preferred areas for rural youth training. The KVKs conducted those training

programme generally on on-campus mode. Farmers got trained in the latest technologies in those programmes.

During the year 2023, 737 courses were organized for 16746 rural youths through on and off-campus training. Out of the total participants, 9659 (57.68%) was male and 7087 (42.32%) was female. Participation of SC in these programmes was 5971 which constituted 35.66% of the total trainees, while participation from ST was 2732 (16.31%).

State-wise analysis of the rural youth trained showed that West Bengal trained maximum rural girls (4565) which constitute about 42.95% of total trainees. The percentage of the rural girls was 75.00% in the Union Territory of A&N Islands and 39.58% in the state of Odisha. A significant number of training programme was organized by the states for rural youths. Union territory of A & N Islands organized 11 courses for 284 beneficiaries. Odisha organized 338 courses for 5834 beneficiaries and West Bengal organized 388 courses for 10628 beneficiaries which makes a total of 737 courses for 16746 beneficiaries.

Table: State-wise training programme conducted for rural youth in Zone V

State	No. of Courses	No. of Participants											
		General			SC			ST			Grand Total		
		M	F	T	M	F	T	M	F	T	M	F	T
A & N Island	11	31	204	235	0	0	0	40	9	49	71	213	284
Odisha	338	1832	1288	3120	656	554	1210	1037	467	1504	3525	2309	5834
West Bengal	388	2768	1920	4688	2600	2161	4761	695	484	1179	6063	4565	10628
TOTAL	**737**	**4631**	**3412**	**8043**	**3256**	**2715**	**5971**	**1772**	**960**	**2732**	**9659**	**7087**	**16746**

iii) Extension functionaries

The extension functionaries in state level were interested in obtaining training from the Krishi Vigyan Kendras. Those extension functionaries were mainly VLWs, *Krishi PrayuktiSahayak* and other block level workers of the state government. State-wise analysis of the programmes showed that West Bengal organized maximum number of training programme of 457 courses involving 17249 extension functionaries while Odisha organized 227 courses for 3994 extension functionaries and A&N Islands organized 2 courses for 56 beneficiaries. Gender analysis of the trainees indicated that nearly 27.47% were female and 72.53% were male participants in 2023. The constitution of SC was 24.46% while ST was 11.97% of the extension functionaries trained in KVKs.

Table: State-wise training programme conducted for extension functionaries in Zone V

State	No. of Courses	No. of Participants											
		General			SC			ST			Grand Total		
		M	F	T	M	F	T	M	F	T	M	F	T
A & N Island	2	28	28	56	0	0	0	0	0	0	28	28	56
Odisha	227	1720	1033	2753	496	227	723	279	239	518	2495	1499	3994
West Bengal	457	8538	2192	10730	2718	1769	4487	1668	364	2032	12924	4325	17249
TOTAL	**686**	**10286**	**3253**	**13539**	**3214**	**1996**	**5210**	**1947**	**603**	**2550**	**15447**	**5852**	**21299**

4.3.1.1 On and Off Campus Training Programmes

The training programmes conducted by the KVKs of Zone V were in both on-campus and off-campus mode. Due to lack of accommodation facilities some of the trainings were organized in off-campus mode. Out of total training programmes (5573) conducted in all categories, around 57.45% was in off-campus mode and 42.55% in on-campus mode. While 100599 participants received training on off-campus mode (59.90%) and 67355 (40.10%) received training on on-campus mode.

Table: On- and Off-Campus training programme conducted for farmers, farm women rural youth and extension functionaries in Zone V

Farmers and Farm Women

Mode	No. of Courses	No. of Participants											
		Other			SC			ST			Grand Total		
		M	F	T	M	F	T	M	F	T	M	F	T
ON	1243	12234	5630	17864	9534	5754	15288	2783	2406	5189	24551	13790	38341
OFF	2907	29007	15570	44577	18420	13658	32078	7726	7127	14853	55167	36401	91568
Total	**4150**	**41241**	**21200**	**62441**	**27954**	**19412**	**47366**	**10509**	**9533**	**20042**	**79718**	**50191**	**129909**

Rural Youths

Mode	No. of Courses	No. of Participants											
		Other			SC			ST			Grand Total		
		M	F	T	M	F	T	M	F	T	M	F	T
ON	569	3260	2516	5776	2263	1870	4133	1322	602	1924	6845	4988	11833
OFF	168	1371	896	2267	993	845	1838	450	358	808	2814	2099	4913
Total	**737**	**4631**	**3412**	**8043**	**3256**	**2715**	**5971**	**1772**	**960**	**2732**	**9659**	**7087**	**16746**

Extension Functionaries

Mode	No. of Courses	No. of Participants											
		Other			SC			ST			Grand Total		
		M	F	T	M	F	T	M	F	T	M	F	T
ON	559	8891	2459	11350	2378	1343	3721	1665	445	2110	12934	4247	17181
OFF	127	1395	794	2189	836	653	1489	282	158	440	2513	1605	4118
Total	**686**	**10286**	**3253**	**13539**	**3214**	**1996**	**5210**	**1947**	**603**	**2550**	**15447**	**5852**	**21299**

4.3.1.2 Thematic area-wise training programme

4.3.1.2.1 Farmers and farm women

Further classification of training programme on thematic area basis showed that under crop production category, training on integrated crop management was conducted for 140 courses involving 4492 participants while in integrated nutrient management, 100 courses were organized for 2951 beneficiaries. In horticulture, important areas of training included off-season vegetable cultivation in which 62 trainings were organized for 1879 beneficiaries. In fruits cultivation, 159 trainings were organized for 4653 beneficiaries. Trainings were also organized on ornamental plants cultivation (34), plantation crops (22), tuber crops (25), spices (36), medicinal and aromatic plants (15). In soil health and fertility management, a large number (407) of training programmes were organized involving 13077 beneficiaries to address the issues of efficient fertilizer use and integrated nutrient management. In Livestock Production and Management, 388 courses were organized for 11644 beneficiaries; it included dairy management, poultry management, piggery management, livestock disease management etc. It showed the importance of those issues for the farmers in the districts. In Home Science, 340 courses were organized for 10822 beneficiaries which included courses like income generation by rural women, value addition of fruits and vegetables. In Agricultural Engineering, 130 courses were organized for 4024 beneficiaries. In plant protection, 527 courses were organized for 17066 beneficiaries in the areas of IPM, IDM and bio-control. Other important areas of training for the farmers were fishery, production of input, capacity building, agro-forestry to create alternative evenness of employment generation. In Fisheries, 287 courses were conducted involving 8873 farmers. In production of input, 208 courses were organized for 5671 farmers. In capacity building, 233 courses involving 7241 farmers and in agro-forestry, 68 courses for 1912 farmers were organized. Details of the training programmes for farmers and farm women are given in the Table below.

Table: Thematic area wise training programme for farmers and farm women

Area of training	No. of Courses	No. of Participants											
		General			SC			ST			Grand Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
Crop Production													
Weed Management	98	981	468	1449	560	266	826	429	237	666	1970	971	2941
Resource Conservation Technologies	48	530	144	674	512	150	662	142	81	223	1184	375	1559
Cropping Systems	63	678	214	892	629	225	854	138	124	262	1445	563	2008
Crop Diversification	72	858	290	1148	588	186	774	203	149	352	1649	625	2274
Integrated Farming	52	395	298	693	463	201	664	146	143	289	1004	642	1646
Micro irrigation/ irrigation	17	173	75	248	115	75	190	37	9	46	325	159	484
Seed production	98	1531	501	2032	738	199	937	164	95	259	2433	795	3228
Nursery management	31	350	138	488	310	168	478	130	87	217	790	393	1183
Integrated Crop Management	140	1637	596	2233	982	591	1573	443	243	686	3062	1430	4492
Soil & water conservation	43	755	180	935	149	89	238	46	28	74	950	297	1247
Integrated nutrient Management	100	988	467	1455	666	241	907	373	216	589	2027	924	2951
Production of organic inputs	57	654	234	888	858	290	1148	143	122	265	1655	646	2301
Others	66	829	301	1130	544	306	850	125	110	235	1498	717	2215
Total	**885**	**10359**	**3906**	**14265**	**7114**	**2987**	**10101**	**2519**	**1644**	**4163**	**19992**	**8537**	**28529**
Horticulture													
a) Vegetable Crops													
Production of low volume and high value crops	59	573	187	760	504	200	704	177	128	305	1254	515	1769
Off-season vegetables	62	521	234	755	448	415	863	151	110	261	1120	759	1879
Nursery raising	61	532	251	783	547	279	826	142	216	358	1221	746	1967
Exotic vegetables	22	202	128	330	226	104	330	41	50	91	469	282	751
Export potential vegetables	13	163	68	231	43	33	76	46	32	78	252	133	385
Grading and standardization	6	62	21	83	33	18	51	17	16	33	112	55	167
Protective cultivation	45	436	247	683	301	217	518	147	179	326	884	643	1527
Others	103	1056	467	1523	557	480	1037	294	293	587	1907	1240	3147
Total (a)	**369**	**3531**	**1557**	**5088**	**2659**	**1746**	**4405**	**1015**	**1024**	**2039**	**7219**	**4373**	**11592**
b) Fruits													
Training and Pruning	14	76	46	122	66	44	110	51	37	88	193	127	320
Layout and Management of Orchards	26	130	73	203	210	134	344	99	97	196	439	304	743
Cultivation of Fruit	32	286	164	450	266	175	441	73	62	135	625	401	1026

Area of training	No. of Courses	No. of Participants											
		General			SC			ST			Grand Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
Management of young plants/ orchards	15	110	68	178	105	45	150	72	17	89	287	130	417
Rejuvenation of old orchards	8	57	29	86	37	18	55	29	42	71	123	89	212
Export potential fruits	10	66	42	108	71	37	108	29	18	47	166	97	263
Micro irrigation systems of orchards	13	192	46	238	110	32	142	22	19	41	324	97	421
Plant propagation techniques	28	294	94	388	159	95	254	158	63	221	611	252	863
Others	13	117	57	174	86	50	136	58	20	78	261	127	388
Total (b)	**159**	**1328**	**619**	**1947**	**1110**	**630**	**1740**	**591**	**375**	**966**	**3029**	**1624**	**4653**
c) Ornamental Plants													
Nursery Management	7	71	31	102	61	49	110	5	1	6	137	81	218
Management of potted plants	3	28	14	42	4	2	6	10	14	24	42	30	72
Export potential of ornamental plants	2	2	4	6	16	9	25	11	8	19	29	21	50
Propagation techniques of Ornamental Plants	10	178	29	207	30	40	70	11	3	14	219	72	291
Others	12	140	37	177	69	49	118	16	39	55	225	125	350
Total (c)	**34**	**419**	**115**	**534**	**180**	**149**	**329**	**53**	**65**	**118**	**652**	**329**	**981**
d) Plantation crops													
Production and Management technology	12	113	49	162	83	48	131	62	37	99	258	134	392
Processing and value addition	4	34	20	54	13	2	15	6	6	12	53	28	81
Others	6	53	26	79	34	41	75	19	35	54	106	102	208
Total (d)	**22**	**200**	**95**	**295**	**130**	**91**	**221**	**87**	**78**	**165**	**417**	**264**	**681**
e) Tuber crops													
Production and Management technology	20	212	91	303	117	74	191	98	92	190	427	257	684
Processing and value addition	3	80	8	88	5	5	10	11	5	16	96	18	114
Others	2	11	8	19	18	17	35	1	0	1	30	25	55
Total (e)	**25**	**303**	**107**	**410**	**140**	**96**	**236**	**110**	**97**	**207**	**553**	**300**	**853**
f) Spices													
Production and Management technology	28	317	102	419	194	104	298	94	95	189	605	301	906
Processing and value addition	4	6	15	21	18	35	53	11	43	54	35	93	128
Others	4	16	25	41	33	38	71	31	14	45	80	77	157
Total (f)	**36**	**339**	**142**	**481**	**245**	**177**	**422**	**136**	**152**	**288**	**720**	**471**	**1191**
g) Medicinal and Aromatic Plants													
Nursery management	2	20	21	41	3	3	6	5	3	8	28	27	55

Area of training	No. of Courses	No. of Participants											
		General			SC			ST			Grand Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
Production and management technology	10	132	70	202	45	51	96	3	65	68	180	186	366
Post harvest technology and value addition	1	5	5	10	7	8	15	2	2	4	14	15	29
Others	2	10	2	12	14	8	22	11	5	16	35	15	50
Total (g)	**15**	**167**	**98**	**265**	**69**	**70**	**139**	**21**	**75**	**96**	**257**	**243**	**500**
Total(a-g)	**660**	**6287**	**2733**	**9020**	**4533**	**2959**	**7492**	**2013**	**1866**	**3879**	**12847**	**7604**	**20451**
Soil Health and Fertility Management													
Soil fertility management	77	1182	233	1415	557	207	764	295	108	403	2034	548	2582
Integrated water management	9	52	32	84	28	16	44	65	26	91	145	74	219
Integrated Nutrient Management	82	794	261	1055	428	197	625	384	205	589	1606	663	2269
Production and use of organic inputs	57	504	295	799	286	203	489	126	149	275	916	647	1563
Management of Problematic soils	20	274	82	356	110	50	160	66	44	110	450	176	626
Micro nutrient deficiency in crops	24	258	158	416	201	82	283	37	45	82	496	285	781
Nutrient Use Efficiency	20	204	72	276	177	138	315	58	35	93	439	245	684
Balance Use of fertilizer	33	304	92	396	273	175	448	91	70	161	668	337	1005
Soil & water testing	52	846	225	1071	303	249	552	274	168	442	1423	642	2065
others	33	397	40	437	343	108	451	267	128	395	1007	276	1283
Total	**407**	**4815**	**1490**	**6305**	**2706**	**1425**	**4131**	**1663**	**978**	**2641**	**9184**	**3893**	**13077**
Livestock Production and Management													
Dairy Management	50	410	310	720	264	288	552	39	157	196	713	755	1468
Poultry Management	80	370	467	837	571	765	1336	70	150	220	1011	1382	2393
Piggery Management	21	49	51	100	126	38	164	61	175	236	236	264	500
Rabbit Management	7	67	13	80	39	41	80	16	44	60	122	98	220
Animal Nutrition Management	24	212	63	275	157	152	309	40	38	78	409	253	662
Disease Management	78	682	295	977	758	474	1232	135	96	231	1575	865	2440
Feed & fodder technologies	56	304	300	604	411	363	774	69	214	283	784	877	1661
Production of quality animal products	28	138	138	276	166	148	314	44	60	104	348	346	694
Others	44	466	241	707	356	329	685	88	126	214	910	696	1606
Total	**388**	**2698**	**1878**	**4576**	**2848**	**2598**	**5446**	**562**	**1060**	**1622**	**6108**	**5536**	**11644**

Area of training	No. of Courses	No. of Participants											
		General			SC			ST			Grand Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
Home Science/Women empowerment													
Household food security by kitchen gardening and nutrition gardening	61	261	765	1026	143	701	844	53	216	269	457	1682	2139
Design and development of low/minimum cost diet	7	1	111	112	0	56	56	0	10	10	1	177	178
Designing and development for high nutrient efficiency diet	13	49	163	212	26	107	133	16	91	107	91	361	452
Minimization of nutrient loss in processing	5	19	60	79	7	40	47	3	16	19	29	116	145
Processing & cooking	17	226	91	317	91	108	199	2	59	61	319	258	577
Gender mainstreaming through SHGs	8	0	65	65	25	130	155	0	25	25	25	220	245
Storage loss minimization techniques	9	6	133	139	0	94	94	4	68	72	10	295	305
Value addition	83	405	1036	1441	146	698	844	63	330	393	614	2064	2678
Women empowerment	27	37	397	434	23	271	294	12	81	93	72	749	821
Location specific drudgery reduction technologies	19	6	246	252	2	116	118	1	160	161	9	522	531
Rural Crafts	6	0	83	83	0	69	69	0	21	21	0	173	173
Women and child care	20	10	338	348	5	298	303	5	80	85	20	716	736
Others	65	104	704	808	256	559	815	19	200	219	379	1463	1842
Total	**340**	**1124**	**4192**	**5316**	**724**	**3247**	**3971**	**178**	**1357**	**1535**	**2026**	**8796**	**10822**
Agril. Engineering													
Farm machinery & its maintenance	31	439	167	606	73	31	104	149	65	214	661	263	924
Installation and maintenance of micro irrigation systems	14	282	52	334	72	16	88	52	5	57	406	73	479
Use of Plastics in farming practices	8	149	45	194	55	26	81	3	1	4	207	72	279
Production of small tools and implements	19	79	120	199	113	188	301	5	6	11	197	314	511
Repair and maintenance of farm machinery and implements	10	141	125	266	29	6	35	0	0	0	170	131	301
Small scale processing and value addition	8	71	70	141	31	21	52	7	12	19	109	103	212

Area of training	No. of Courses	No. of Participants											
		General			SC			ST			Grand Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
Post Harvest Technology	10	147	46	193	29	26	55	7	41	48	183	113	296
Others	30	104	93	197	452	295	747	58	20	78	614	408	1022
Total	**130**	**1412**	**718**	**2130**	**854**	**609**	**1463**	**281**	**150**	**431**	**2547**	**1477**	**4024**
Plant Protection													
Integrated Pest Management	224	2950	855	3795	1642	583	2225	789	272	1061	5381	1710	7081
Integrated Disease Management	141	1633	499	2132	998	518	1516	542	206	748	3173	1223	4396
Bio-control of pests and diseases	43	430	186	626	482	185	667	96	67	163	1008	438	1456
Production of bio control agents and bio pesticides	26	292	156	448	187	29	216	49	34	83	528	219	747
Others	93	1085	365	1450	1142	557	1699	138	99	237	2365	1021	3386
Total	**527**	**6390**	**2061**	**8451**	**4451**	**1872**	**6323**	**1614**	**678**	**2292**	**12455**	**4611**	**17066**
Fisheries													
Integrated fish farming	42	453	129	582	353	208	561	85	56	141	891	393	1284
Carp breeding and hatchery management	17	148	67	215	199	80	279	24	22	46	371	169	540
Carp fry and fingerling rearing	32	349	209	558	207	185	392	35	17	52	591	411	1002
Composite fish culture	54	485	326	811	512	218	730	105	48	153	1102	592	1694
Hatchery management and culture of freshwater prawn	12	104	106	210	92	49	141	15	6	21	211	161	372
Breeding and culture of ornamental fishes	13	107	53	160	103	95	198	15	22	37	225	170	395
Portable plastic carp hatchery	14	77	28	105	193	130	323	42	27	69	312	185	497
Pen culture of fish and prawn	11	166	63	229	57	4	61	27	46	73	250	113	363
Shrimp farming	9	94	45	139	83	31	114	13	10	23	190	86	276
Edible oyster farming	7	40	27	67	60	56	116	12	5	17	112	88	200
Pearl culture	16	186	67	253	148	67	215	7	8	15	341	142	483
Fish processing and value addition	28	261	79	340	214	124	338	39	40	79	514	243	757
Others	32	239	96	335	433	132	565	56	54	110	728	282	1010
Total	**287**	**2709**	**1295**	**4004**	**2654**	**1379**	**4033**	**475**	**361**	**836**	**5838**	**3035**	**8873**
Production of Input at site													
Seed Production	53	680	162	842	206	80	286	141	60	201	1027	302	1329
Planting material production	7	70	41	111	65	13	78	25	6	31	160	60	220
Bio-agents production	4	40	10	50	48	2	50	25	5	30	113	17	130
Bio-pesticides production	11	50	59	109	45	103	148	25	28	53	120	190	310

Area of training	No. of Courses	No. of Participants											
		General			SC			ST			Grand Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
Bio-fertilizer production	7	76	10	86	54	10	64	30	10	40	160	30	190
Vermi-compost production	33	199	133	332	150	167	317	74	60	134	423	360	783
Organic manures production	4	44	1	45	48	2	50	20	0	20	112	3	115
Production of fry and fingerlings	6	25	37	62	15	19	34	12	17	29	52	73	125
Production of Bee-colonies and wax sheets	5	0	9	9	28	22	50	42	24	66	70	55	125
Small tools and implements	0	0	0	0	0	0	0	0	0	0	0	0	0
Production of livestock feed and fodder	7	66	2	68	55	51	106	21	7	28	142	60	202
Production of Fish feed	5	45	50	95	40	10	50	48	2	50	133	62	195
Mushroom production	56	420	558	978	108	298	406	86	202	288	614	1058	1672
Apiculture	9	17	93	110	58	50	108	18	14	32	93	157	250
Others	1	18	3	21	0	0	0	2	2	4	20	5	25
Total	**208**	**1750**	**1168**	**2918**	**920**	**827**	**1747**	**569**	**437**	**1006**	**3239**	**2432**	**5671**
Capacity Building and Group Dynamics													
Leadership development	23	328	119	447	137	61	198	44	57	101	509	237	746
Group dynamics	34	368	177	545	88	302	390	107	162	269	563	641	1204
Formation and Management of SHGs	36	205	394	599	48	200	248	89	156	245	342	750	1092
Mobilization of social capital	18	301	48	349	51	20	71	16	57	73	368	125	493
Entrepreneurial development of farmers/youths	41	469	122	591	208	191	399	66	174	240	743	487	1230
WTO and IPR issues	8	68	34	102	101	107	208	24	46	70	193	187	380
Others	73	997	364	1361	185	275	460	127	148	275	1309	787	2096
Total	**233**	**2736**	**1258**	**3994**	**818**	**1156**	**1974**	**473**	**800**	**1273**	**4027**	**3214**	**7241**
Agro forestry													
Production technologies	17	191	95	286	70	49	119	36	18	54	297	162	459
Nursery management	14	212	93	305	64	23	87	23	6	29	299	122	421
Integrated Farming Systems	20	174	130	304	64	85	149	44	90	134	282	305	587
Others	17	137	113	250	34	100	134	22	39	61	193	252	445
Total	**68**	**714**	**431**	**1145**	**232**	**257**	**489**	**125**	**153**	**278**	**1071**	**841**	**1912**
Others (Pl. specify)	**17**	**247**	**70**	**317**	**100**	**96**	**196**	**37**	**49**	**86**	**384**	**215**	**599**
Grand Total	**4150**	**41241**	**21200**	**62441**	**27954**	**19412**	**47366**	**10509**	**9533**	**20042**	**79718**	**50191**	**129909**

4.3.1.2.2 Rural Youths

In the year 2023, considering the employment generation of the rural youths in the rural areas, training programmes for rural youths were organized by the KVKs of this Zone. The KVKs of Zone V conducted 737 courses for 16746 beneficiaries for rural youths in A&N Islands, West Bengal and Odisha. Trainings were organized both in on- and off-campus mode. In mushroom production, 90 courses were organized for 1955 beneficiaries while in nursery management of horticultural crops, 60 courses were organized for 1299 youths. Other courses organized were for production of organic inputs (49), vermi-culture (41), value addition (38), beekeeping (36), planting material production (33), seed production (30) and others. The details are given in the following table.

Table: Thematic area wise training programme for rural youth

Area of training	No. of Courses	No. of Participants											
		General			SC			ST			Grand Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
Nursery Management of Horticulture crops	60	437	280	717	213	162	375	112	95	207	762	537	1299
Training and pruning of orchards	7	66	48	114	15	18	33	13	10	23	94	76	170
Protected cultivation of vegetable crops	20	122	75	197	77	15	92	58	60	118	257	150	407
Commercial fruit production	11	72	36	108	88	48	136	18	8	26	178	92	270
Integrated farming	27	208	107	315	140	77	217	136	35	171	484	219	703
Seed production	30	253	96	349	142	61	203	101	16	117	496	173	669
Production of organic inputs	49	319	198	517	171	152	323	84	62	146	574	412	986
Planting material production	33	206	182	388	121	120	241	46	21	67	373	323	696
Vermiculture	41	207	139	346	196	145	341	151	48	199	554	332	886
Mushroom Production	90	607	481	1088	243	363	606	102	159	261	952	1003	1955
Beekeeping	36	250	128	378	155	89	244	93	7	100	498	224	722
Sericulture	5	40	24	64	23	6	29	19	3	22	82	33	115
Repair and maintenance of farm machinery and implements	12	110	3	113	83	13	96	20	0	20	213	16	229
Value addition	38	77	217	294	35	126	161	48	43	91	160	386	546
Small scale processing	7	17	88	105	3	12	15	15	0	15	35	100	135
Post Harvest Technology	13	44	99	143	56	31	87	66	12	78	166	142	308
Tailoring and Stitching	9	73	71	144	31	30	61	23	6	29	127	107	234
Rural Crafts	13	48	39	87	32	211	243	11	45	56	91	295	386
Production of quality animal products	11	43	37	80	73	126	199	39	19	58	155	182	337
Dairying	14	113	117	230	7	5	12	28	50	78	148	172	320

Area of training	No. of Courses	No. of Participants											
		General			SC			ST			Grand Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
Sheep and goat rearing	19	212	112	324	197	132	329	32	19	51	441	263	704
Quail farming	5	13	17	30	70	45	115	18	0	18	101	62	163
Piggery	9	30	72	102	20	33	53	94	59	153	144	164	308
Rabbit farming	4	14	6	20	45	36	81	20	4	24	79	46	125
Poultry production	27	149	80	229	151	224	375	85	24	109	385	328	713
Ornamental fisheries	10	86	40	126	50	26	76	19	3	22	155	69	224
Composite fish culture	9	41	25	66	78	53	131	22	4	26	141	82	223
Freshwater prawn culture	5	58	25	83	23	9	32	34	1	35	115	35	150
Shrimp farming	8	65	41	106	60	30	90	30	16	46	155	87	242
Pearl culture	5	12	33	45	40	17	57	26	5	31	78	55	133
Cold water fisheries	7	17	45	62	62	33	95	21	6	27	100	84	184
Fish harvest and processing technology	12	96	48	144	72	24	96	28	1	29	196	73	269
Fry and fingerling rearing	21	119	119	238	109	40	149	14	11	25	242	170	412
Others	70	407	284	691	375	203	578	146	108	254	928	595	1523
TOTAL	**737**	**4631**	**3412**	**8043**	**3256**	**2715**	**5971**	**1772**	**960**	**2732**	**9659**	**7087**	**16746**

4.3.1.2.3 Extension Functionaries

Extension functionaries of state department of agriculture and veterinary and animal husbandry, and extension workers of other government departments approached KVKs for updating of their knowledge and skills. In the area, KVK played an important role in updating knowledge of the state departments. Sometimes, NGO people also approached for training of their staffs. In the year 2023, a total of 686 courses were organized for 21299 extension functionaries under Zone V. The areas of training were Productivity enhancement in field crops (109), Integrated Pest Management (71), integrated nutrient management (55), Production and use of organic inputs (34), Rejuvenation of old orchards (29), Capacity building for ICT application (29), Livestock feed and fodder production (24), Information and networking among farmers (23) and protected cultivation (21) etc. To extend the benefit to large number of extension workers, apart from line department staffs, teachers, NGO staffs, agricultural workers of the districts, were also included in the training programmes.

Table: Thematic area wise training programme for Extension functionaries

Area of training	No. of Courses	No. of Participants											
		General			SC			ST			Grand Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
Productivity enhancement in field crops	109	1768	466	2234	615	225	840	133	48	181	2516	739	3255
Integrated Pest Management	71	1388	209	1597	361	73	434	383	56	439	2132	338	2470
Integrated Nutrient management	55	659	292	951	123	232	355	380	62	442	1162	586	1748

Area of training	No. of Courses	No. of Participants											
		General			SC			ST			Grand Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
Rejuvenation of old orchards	29	295	161	456	183	125	308	56	16	72	534	302	836
Protected cultivation technology	21	308	79	387	124	55	179	25	8	33	457	142	599
Production and use of organic inputs	34	417	166	583	245	89	334	72	35	107	734	290	1024
Care and maintenance of farm machinery and implements	16	173	80	253	43	36	79	76	16	92	292	132	424
Gender mainstreaming through SHGs	14	94	82	176	61	520	581	26	31	57	181	633	814
Formation and Management of SHGs	15	192	63	255	69	33	102	36	36	72	297	132	429
Women and Child care	14	138	76	214	109	29	138	8	25	33	255	130	385
Low cost and nutrient efficient diet designing	16	180	98	278	100	33	133	36	9	45	316	140	456
Group Dynamics and farmers organization	17	220	90	310	84	11	95	18	7	25	322	108	430
Information networking among farmers	23	256	108	364	119	30	149	11	55	66	386	193	579
Capacity building for ICT application	29	379	140	519	116	54	170	78	14	92	573	208	781
Management in farm animals	17	174	105	279	136	52	188	41	7	48	351	164	515
Livestock feed and fodder production	24	181	152	333	112	49	161	145	37	182	438	238	676
Household food security	46	686	204	890	168	62	230	222	47	269	1076	313	1389
Other	136	2778	682	3460	446	288	734	201	94	295	3425	1064	4489
TOTAL	**686**	**10286**	**3253**	**13539**	**3214**	**1996**	**5210**	**1947**	**603**	**2550**	**15447**	**5852**	**21299**

4.3.2 Sponsored Training Programme

KVKs of this Zone trained farmers on various aspects of agriculture and allied sectors using their own resources as well as the resources received from the different organizations. A number of government and other non-government organizations were associated to conduct different kinds of trainings for different clienteles. Even different state governments, central government boarders, NABARD, ATMA were working in collaboration with the KVKs to reach the farmers at district level. In those programmes, experts were provided by the KVKs. In the year 2023, the KVKs conducted sponsored 635 training programmes for 23355 beneficiaries with the fund support from different organizations. Out of these, 19379 were male (82.98%) and 17.02% were female beneficiaries (3976). The composition of SC/ ST in those training programmes was 22.68%.

The major courses covered in these programmes were crop production and management (328)

for 12030 participants, livestock and fishery (102) for 4034 participants and Home science (83) for 2305 participants and others.

State-wise analysis showed that Union Territory of A&N Islands, organized 14 courses for 447 participants, while Odisha organized 143 courses for 3707 participants and West Bengal organized 478 courses for 19201 participants. It indicated that sponsoring organization preferred KVKs for getting their clientele trained for the benefit of their organization. The details are given in the Table below.

Table: Sponsored training programmes conducted by KVKs of Zone V

Area of training	No. of courses	No. of participants											
		General			SC			ST			Grand Total		
		M	F	T	M	F	T	M	F	T	Male	Female	Total
Crop production and management													
Increasing production and productivity of crops	42	1087	138	1225	199	55	254	133	31	164	1419	224	1643
Commercial production of vegetables	38	1023	112	1135	152	51	203	9	4	13	1184	167	1351
Production and value addition	10	346	49	395	147	12	159	0	0	0	493	61	554
Fruit Plants	17	617	19	636	101	1	102	9	0	9	727	20	747
Ornamental plants	16	538	72	610	218	53	271	28	1	29	784	126	910
Spices crops	21	636	47	683	256	130	386	0	0	0	892	177	1069
Soil health and fertility management	40	1006	190	1196	296	62	358	14	8	22	1316	260	1576
Production of Inputs at site	34	1014	20	1034	137	73	210	2	0	2	1153	93	1246
Methods of protective cultivation	6	184	11	195	39	2	41	0	0	0	223	13	236
Others (pl. specify)	104	2152	183	2335	202	62	264	58	41	99	2412	286	2698
Total	**328**	**8603**	**841**	**9444**	**1747**	**501**	**2248**	**253**	**85**	**338**	**10603**	**1427**	**12030**
Post harvest technology and value addition													
Processing and value addition	6	212	32	244	12	9	21	9	8	17	233	49	282
Others (pl. specify)	41	1383	58	1441	114	30	144	7	3	10	1504	91	1595
Total	**47**	**1595**	**90**	**1685**	**126**	**39**	**165**	**16**	**11**	**27**	**1737**	**140**	**1877**
Farm machinery													
Farm machinery, tools and implements	4	163	2	165	5	0	5	0	0	0	168	2	170
Others (pl. specify)	3	198	6	204	11	12	23	0	0	0	209	18	227
Total	**7**	**361**	**8**	**369**	**16**	**12**	**28**	**0**	**0**	**0**	**377**	**20**	**397**
Livestock and fisheries													
Livestock production and management	48	1166	143	1309	135	176	311	44	11	55	1345	330	1675
Animal Nutrition Management	5	78	51	129	14	14	28	2	10	12	94	75	169
Animal Disease Management	3	198	6	204	31	2	33	0	0	0	229	8	237
Fisheries Nutrition	4	49	100	149	47	22	69	0	0	0	96	122	218
Fisheries Management	10	345	26	371	96	141	237	20	9	29	461	176	637
Others (pl. specify)	32	406	153	559	355	112	467	57	15	72	818	280	1098
Total	**102**	**2242**	**479**	**2721**	**678**	**467**	**1145**	**123**	**45**	**168**	**3043**	**991**	**4034**

Area of training	No. of courses	No. of participants											
		General			SC			ST			Grand Total		
		M	F	T	M	F	T	M	F	T	Male	Female	Total
Home Science													
Household nutritional security	0	0	0	0	0	0	0	0	0	0	0	0	0
Economic empowerment of women	14	208	58	266	22	17	39	30	25	55	260	100	360
Drudgery reduction of women	2	9	3	12	12	10	22	3	3	6	24	16	40
Others (pl. specify)	67	1045	307	1352	46	458	504	14	35	49	1105	800	1905
Total	**83**	**1262**	**368**	**1630**	**80**	**485**	**565**	**47**	**63**	**110**	**1389**	**916**	**2305**
Agricultural Extension													
Capacity Building and Group Dynamics	19	490	9	499	64	34	98	1	0	1	555	43	598
Others (pl. specify)	49	1520	191	1711	149	248	397	6	0	6	1675	439	2114
Total	**68**	**2010**	**200**	**2210**	**213**	**282**	**495**	**7**	**0**	**7**	**2230**	**482**	**2712**
GRAND TOTAL	**635**	**16073**	**1986**	**18059**	**2860**	**1786**	**4646**	**446**	**204**	**650**	**19379**	**3976**	**23355**

4.3.3 Vocational Training Programme

The much-needed training programme at KVK level are the vocational training programmes as these programmes are directed to employment generation and much focus are given on rural based employment generation techniques like repair of maintenance of farm machines, commercial floriculture, commercial fruit production, value addition, tailoring & stitching, dairy farming, composite fish culture, rural craft. After obtaining training in these areas, rural youth/ farm women can take up self-employment in their field. Vocational training being a longer duration course, farmers are enriched by knowledge and skill both and they reach in a position to take up self-employment.

During the year 2023, 276 vocational training programmes were conducted by the KVKs of Zone V for benefit of 5317 beneficiaries. Among these West Bengal organized 130 courses for 3067 beneficiaries and Odisha conducted 128 courses for 1805 beneficiaries, while in A & N Islands, 18 courses were organised for 445 participants. Among the courses, mushroom cultivation was most sought by the beneficiaries. A total of 39 such courses were organized for 787 beneficiaries. While the course on integrated crop management gained favour among the rural youths and 696 rural youths were trained through 28 courses. Other courses that gained popularity were Production bio-agents and bio-pesticides (420 participants), Composite fish culture (305 participants), value addition (269 participants) and others. In these training programmes, a good number (2266) of SC/ST got trained which constitute 42.62% of the total beneficiaries.

Table: Vocational training conducted by KVKs of Zone V

Area of Training	No. of courses	No of Participants									Grand Total		
		General			SC			ST					
		M	F	T	M	F	T	M	F	T	M	F	T
Crop production and management													
Commercial floriculture	6	46	29	75	18	6	24	14	14	28	78	49	127
Commercial fruit production	6	22	14	36	21	9	30	10	2	12	53	25	78
Commercial vegetable production	14	59	36	95	19	17	36	30	11	41	108	64	172
Integrated crop management	28	240	76	316	247	85	332	31	17	48	518	178	696
Organic farming	8	27	24	51	13	13	26	5	13	18	45	50	95
Other	19	147	46	193	39	12	51	43	5	48	229	63	292
Total	**81**	**541**	**225**	**766**	**357**	**142**	**499**	**133**	**62**	**195**	**1031**	**429**	**1460**

Area of Training	No. of courses	No of Participants									Grand Total		
		General			SC			ST					
		M	F	T	M	F	T	M	F	T	M	F	T
Post harvest technology and value addition													
Value addition	24	0	187	187	0	64	64	0	18	18	0	269	269
Others (pl. specify)	9	20	25	45	7	5	12	2	6	8	29	36	65
Total	**33**	**20**	**212**	**232**	**7**	**69**	**76**	**2**	**24**	**26**	**29**	**305**	**334**
Livestock and fisheries													
Dairy farming	5	27	16	43	45	22	67	11	4	15	83	42	125
Composite fish culture	12	92	51	143	92	38	130	19	13	32	203	102	305
Sheep and goat rearing	8	53	33	86	103	28	131	15	9	24	171	70	241
Piggery	2	22	20	42	0	1	1	8	4	12	30	25	55
Poultry farming	12	65	130	195	11	31	42	14	16	30	90	177	267
Others (pl. specify)	13	80	50	130	57	78	135	32	8	40	169	136	305
Total	**52**	**339**	**300**	**639**	**308**	**198**	**506**	**99**	**54**	**153**	**746**	**552**	**1298**
Income generation activities													
Vermicomposting	18	123	46	169	39	17	56	8	6	14	170	69	239
Production of bioagents, biopesticides,	17	197	74	271	103	23	126	19	4	23	319	101	420
biofertilizers etc.	1	14	7	21	0	2	2	0	2	2	14	11	25
Repair and maintenance of farm machinery &imlements	2	42	0	42	12	0	12	6	0	6	60	0	60
Rural Crafts	9	6	34	40	6	135	141	3	0	3	15	169	184
Seed production	4	48	10	58	25	5	30	9	3	12	82	18	100
Sericulture	1	11	2	13	1	0	1	1	0	1	13	2	15
Mushroom cultivation	39	195	336	531	58	88	146	52	58	110	305	482	787
Nursery, grafting etc.	3	29	63	92	1	7	8	11	17	28	41	87	128
Tailoring, stitching, embroidery, dying etc.	3	14	25	39	2	3	5	7	6	13	23	34	57
Agril. Para-workers, para-vet training	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	8	40	38	78	14	27	41	7	5	12	61	70	131
Total	**105**	**719**	**635**	**1354**	**261**	**307**	**568**	**123**	**101**	**224**	**1103**	**1043**	**2146**
Agricultural Extension													
Capacity building and group dynamics	2	19	8	27	0	0	0	2	1	3	21	9	30
Others (pl. specify)	3	22	11	33	2	2	4	1	11	12	25	24	49
Total	**5**	**41**	**19**	**60**	**2**	**2**	**4**	**3**	**12**	**15**	**46**	**33**	**79**
Grand Total	**276**	**1660**	**1391**	**3051**	**935**	**718**	**1653**	**360**	**253**	**613**	**2955**	**2362**	**5317**







4.4 Extension Programmes:

The technologies assessed through different programmes of assessment and demonstration are taken to the doorstep of the farmers through the extension activities like field day, exhibition, group meetings, exposure visit, farmers club meeting and through organizing different celebration days in the KVK campus. In creating awareness of the latest technologies in crop production, livestock farming, horticultural production, fishery and other allied technologies, the KVKs of Zone-V organized 68592 numbers of activities involving 2229428 farmers and extension officials in the state of West Bengal, Odisha and A&N Islands. Among these beneficiaries 2192550 were farmers and 36878 were extension officials. Analysis of the gender-wise participation showed that 25.54% was women beneficiaries, which is almost 1/3 of the male beneficiaries. A number of extension officials (3444) paid visit to the KVKs and interacted with them regarding the latest technologies. Farmers in large number (106371) visited the KVKs and took knowledge about the latest technologies available in the KVK farm and nearby villages. Scientists of the KVK also regularly visited the farmers field. A total of 6850 visit were made by the scientists and during the course of visit 54396 farmers consulted with the scientists. KVKs conducted Kisan Goshties for creating awareness of the different technologies and 176 such Kishan Gosthies were organized for 5881 beneficiaries.

The KVKs also participated in 162 Kisan Melas and 293 numbers of exhibition which benefited 79319 and 49089 beneficiaries, respectively. Different technologies and successful cases were also exhibited through arranging film show for 23187 participants. Farmers seminar, workshop was also organized for creating awareness about different programmes and government schemes. In the year 2023, 237 seminars and 153 workshops were organized to cover 10001 and 5112 farmers, respectively. Advisory services were one of the most popular services sought by the farmers. In the year, 7434 such services were offered by the KVK staff for the interest of 878878 beneficiaries. Camps and clinics were also organized to show the farmers about the latest technologies through 82 soil health camps and 233 animal health camps, 571agri-mobile clinics were organized to benefit 3132, 45270 and 33210 beneficiaries, respectively. Farm Science Club, Importance days, Self-help group meeting and Mahila Mandals meetings were organized to make contact of large numbers of farmers, rural youth to the KVKs, 640 such meetings were organized for benefits of 35854 rural people. Involving farmers and rural people with the KVKs by observation of different programmes like celebration of important days, Mahila Kisan Divas, Swachhta Hi Suraksha, International Women's Day was the objective of the KVK to create awareness regarding the government programmes.

4.4.1 State-wise details of Extension Activities conducted

The state-wise analysis of the extension activities showed that the KVKs of A&N Islands conducted extension activities for the benefit of 29497 participants. Maximum number of participants (16408) benefitted from Soil test campaigns. Animal Health Camps were provided to 1180 participants and Farmers visit to KVK was done by 364 participants as well as celebration of important days by 152 participants.

Altogether 23 KVKs of West Bengal organized various extension activities for benefit of 1275288 farmers, farm women, rural youth and extension functionaries. Major extension activities included advisory services (667680), Kisan Mela (60690), animal health camps (42376), farmers visit to KVK (32945) etc.

The state of Odisha (33 KVKs) carried out different extension activities involving 924643 participants. The highest participation was in advisory services (583660), the next being farmers' visit to KVK (76506). Other important extension activities organized by KVKs of Odisha included scientists' visit to farmers' field (35890), Lectures delivered as resource persons (34175), Exhibition (30441) etc.

Table: Extension activities organised by KVKs of Zone-V

Nature of Extension Activity	No. of activities	Farmers				Extension Officials			Total		
		Male	Female	Total	SC/ ST (% of total)	Male	Female	Total	Male	Female	Total
Field Day	573	13688	6072	19760	48.98	402	242	644	14090	6314	20404
Kisan Mela	162	49107	30212	79319	34.66	708	297	1005	49815	30509	80324
Kisan Ghosthi	176	3497	2384	5881	15.60	183	116	299	3680	2500	6180
Exhibition	293	32024	17065	49089	31.51	907	528	1435	32931	17593	50524
Film Show	681	13492	8820	22312	30.43	613	262	875	14105	9082	23187
Method Demonstrations	1104	10760	5800	16560	39.21	509	255	764	11269	6055	17324
Farmers Seminar	237	7084	2917	10001	19.39	192	81	273	7276	2998	10274
Workshop	153	3781	1331	5112	22.05	387	147	534	4168	1478	5646
Group meetings	3309	12380	6524	18904	27.90	725	331	1056	13105	6855	19960
Lectures delivered as resource persons	1615	32200	16380	48580	39.20	2290	1184	3474	34490	17564	52054
Advisory Services	7434	660992	217886	878878	29.99	6688	3473	10161	667680	221359	889039
Scientific visit to farmers field	6850	38557	15839	54396	63.63	1276	730	2006	39833	16569	56402
Farmers visit to KVK	36731	67700	38671	106371	49.34	2525	919	3444	70225	39590	109815
Diagnostic visits	2466	20829	11013	31842	37.71	1409	829	2238	22238	11842	34080
Exposure visits	1130	8616	3203	11819	27.69	367	144	511	8983	3347	12330
Ex-trainees Sammelan	78	1869	894	2763	10.10	466	311	777	2335	1205	3540
Soil health Camp	82	2288	844	3132	12.84	179	53	232	2467	897	3364
Animal Health Camp	233	20273	24997	45270	16.49	213	106	319	20486	25103	45589
Agri mobile clinic	571	27954	5256	33210	4.05	1042	20	1062	28996	5276	34272
Soil test campaigns	100	8405	10819	19224	9.20	115	62	177	8520	10881	19401
Farm Science Club Conveners meet	99	2285	910	3195	10.33	65	31	96	2350	941	3291
Self Help Group Conveners meetings	138	2337	2959	5296	11.09	145	71	216	2482	3030	5512
MahilaMandals Conveners meetings	34	425	910	1335	7.90	25	67	92	450	977	1427
Celebration of important days (specify)	369	16245	9783	26028	51.49	507	254	761	16752	10037	26789
Sankalp Se Siddhi	38	1516	1427	2943	23.29	87	36	123	1603	1463	3066
Swatchta Hi Sewa	401	6927	3715	10642	29.53	709	215	924	7636	3930	11566
Mahila Kisan Divas	86	4657	7308	11965	28.78	375	162	537	5032	7470	12502
Any Other (Specify)	3449	565218	103505	668723	46.32	1704	1139	2843	566922	104644	671566
Total	**68592**	**1635106**	**557444**	**2192550**	**27.81**	**24813**	**12065**	**36878**	**1659919**	**569509**	**2229428**

Table: State-wise extension activities organised by KVKs of Zone-V

Nature of Extension Activity	A & N Islands			Odisha			West Bengal			Total		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
Field Day	105	106	211	7575	3824	11399	6410	2384	8794	14090	6314	20404
Kisan Mela	280	120	400	11180	8054	19234	38355	22335	60690	49815	30509	80324
Kisan Ghosthi	126	52	178	1829	1045	2874	1725	1403	3128	3680	2500	6180
Exhibition	52	118	170	19629	10812	30441	13250	6663	19913	32931	17593	50524
Film Show	150	273	423	7572	5649	13221	6383	3160	9543	14105	9082	23187
Method Demonstrations	76	14	90	6639	4047	10686	4554	1994	6548	11269	6055	17324
Farmers Seminar	90	64	154	1476	1171	2647	5710	1763	7473	7276	2998	10274
Workshop	96	58	154	1947	970	2917	2125	450	2575	4168	1478	5646
Group meetings	143	61	204	7958	4490	12448	5004	2304	7308	13105	6855	19960
Lectures delivered as resource persons	114	62	176	22103	12072	34175	12273	5430	17703	34490	17564	52054
Advisory Services	107	43	150	444132	139528	583660	223441	81788	305229	667680	221359	889039
Scientific visit to farmers field	217	139	356	24641	11249	35890	14975	5181	20156	39833	16569	56402
Farmers visit to KVK	261	103	364	45793	30713	76506	24171	8774	32945	70225	39590	109815
Diagnostic visits	131	88	219	15047	7663	22710	7060	4091	11151	22238	11842	34080
Exposure visits	63	6	69	2707	1309	4016	6213	2032	8245	8983	3347	12330
Ex-trainees Sammelan	0	0	0	654	513	1167	1681	692	2373	2335	1205	3540
Soil health Camp	0	0	0	1195	494	1689	1272	403	1675	2467	897	3364
Animal Health Camp	584	596	1180	1432	601	2033	18470	23906	42376	20486	25103	45589
Agri mobile clinic	0	0	0	644	252	896	28352	5024	33376	28996	5276	34272
Soil test campaigns	6563	9845	16408	1282	733	2015	675	303	978	8520	10881	19401
Farm Science Club Conveners meet	175	61	236	534	180	714	1641	700	2341	2350	941	3291
Self Help Group Conveners meetings	19	105	124	609	1960	2569	1854	965	2819	2482	3030	5512
MahilaMandals Conveners meetings	0	0	0	345	400	745	105	577	682	450	977	1427
Celebration of important days (specify)	99	53	152	9399	6178	15577	7254	3806	11060	16752	10037	26789
Sankalp Se Siddhi	175	113	288	598	560	1158	830	790	1620	1603	1463	3066
Swatchta Hi Sewa	164	77	241	4043	2855	6898	3429	998	4427	7636	3930	11566
Mahila Kisan Divas	3	35	38	4113	5945	10058	916	1490	2406	5032	7470	12502
Any Other (Specify)	3056	4456	7512	7219	9081	16300	556647	91107	647754	566922	104644	671566
Total	**12849**	**16648**	**29497**	**652295**	**272348**	**924643**	**994775**	**280513**	**1275288**	**1659919**	**569509**	**2229428**





4.4.2 Other Extension Activities

KVKs of Zone V also gave extensive coverage of their programme through social network and print media. A total of 13276Extension Literatures were developed while 711 news coverage in newspaper, 241 TV talks and 167 radio talks were provided to highlight the KVK programmes and on-going projects.

Table: Other extension activities organised by KVKs of Zone-V

Nature of Extension Activity	No. of activities
Newspaper coverage	711
Radio talks	167
TV talks	241
Popular articles	147
Extension Literature	13276
Other, if any	46
Total	**14588**

5.0 Production of Seed, Planting Materials and Bio-Products

5.1 Seed Production:

Seed production programme of Krishi Vigyan Kendra is a unique venture for supply of quality seed to the farmers at district level. There is no designated agency at village level to cater the need of quality seed of the farmers. Therefore, the farmers compelled to use their own seeds. On the other hand, seeds of the recently released varieties are also not available to the farmers. Seed production programme of the KVK enables the farmers to get recently released varieties of different crops, thus helps in spread of such varieties.

The state-wise analysis of seed production programme showed that A&N Islands produced 5.1 q seeds which benefited 49 farmers and earned Rs.12750/- in 2023. Odisha produced 4186.487q seeds, West Bengal produced 11004.64 q seeds in 2023. Total value of seeds was about Rs.59628573/- which benefitted more than 24023 farmers to get seeds of recent varieties.

Table: State-wise total Seed production by KVKs

Sl. No.	State	Village Seed			KVK seed			Total		
		Quantity of seed (q)	Value (Rs)	No. of farmers	Quantity of seed (q)	Value (Rs)	No. of farmers	Quantity of seed (q)	Value (Rs)	No. of farmers
1	A & N Islands	0	0	0	5.1	12750	49	**5.1**	**12750**	**49**
2	Odisha	156	555672	1	4030.487	6591419.2	1304	**4186.487**	**7147163.2**	**1305**
3	West Bengal	9174.27	44126835	16499	1830.37	8341825	6170	**11004.64**	**52468660**	**22669**
Total		**9330.27**	**44682507**	**16500**	**5865.957**	**14945994**	**7523**	15196.23	59628573	24023

Total production of seed in cereals was 12422.66 q, which benefitted 13075 farmers. After cereals, 1350.515 q pulse seed production was given importance and 499.6 q seed of black gram, 456.38 q lentil, 60.495 q green gram seeds were produced through village and KVK seed production programme. In oilseeds, 408.09 q of sesame, 437.94q of mustard, and 154.7q of groundnut seeds were produced.

Table: Crop-wise seed production in Zone-V

Crop	Name of the crop	Village Seed			KVK Seed			Total		
		Quantity of seed (q)	Value (Rs)	No. of farmers	Quantity of seed (q)	Value (Rs)	No. of farmers	Quantity of seed (q)	Value (Rs)	No. of farmers
Cereals	Paddy	7134.56	22260017	9095	5272.99	11078606.2	3630	**12407.55**	**33338623.2**	**12725**
	Wheat	0	0	0	5.1	25100	32	**5.1**	**25100**	**32**
	Maize	0	0	0	10.012	38478	318	**10.012**	**38478**	**318**
	Total	**7134.56**	**22260017**	**9095**	**5288.102**	**11142184**	**3980**	12422.66	33402201	13075
Oilseeds	Mustard	388.36	4028080	4090	49.58	454650	1336	**437.94**	**4482730**	**5426**
	Toria	0	0	0	9.4	98800	15	**9.4**	**98800**	**15**
	Linseed	0	0	0	0	0	0	**0**	**0**	**0**
	Niger	0	0	0	4.52	56380	34	**4.52**	**56380**	**34**
	Sesame	375.56	3881840	609	32.53	372913	243	**408.09**	**4254753**	**852**
	Groundnut	148.05	1276875	262	6.65	61350	38	**154.7**	**1338225**	**300**
	Soybean	0	0	0	0	0	0	**0**	**0**	**0**
	Rai	0	0	0	0	0	0	**0**	**0**	**0**

Crop	Name of the crop	Village Seed			KVK Seed			Total		
		Quantity of seed (q)	Value (Rs)	No. of farmers	Quantity of seed (q)	Value (Rs)	No. of farmers	Quantity of seed (q)	Value (Rs)	No. of farmers
	Sun Flower	5.45	441450	160	6.5	387900	101	**11.95**	**829350**	**261**
	Toria	0	0	0	5.5	47987	0	**5.5**	**47987**	**0**
	Total	**917.42**	**9628245**	**5121**	**114.68**	**1479980**	**1767**	**1032.1**	**11108225**	**6888**
Pulses	Redgram	11	99000	50	13.18	31320	16	**24.18**	**130320**	**66**
	Chickpea	300	3150000	401	2	13340	12	**302**	**3163340**	**413**
	Lentil	438.36	4423920	698	18.02	253130	352	**456.38**	**4677050**	**1050**
	Greengram	31.47	229845	190	29.025	200149	276	**60.495**	**429994**	**466**
	Blackgram	481.5	4815000	917	18.1	185684	219	**499.6**	**5000684**	**1136**
	Pea	0	0	0	4	40000	50	**4**	**40000**	**50**
	Cowpea	0	0	0	1.35	7800	6	**1.35**	**7800**	**6**
	Rajmash	0	0	0	2.51	33120	64	**2.51**	**33120**	**64**
	Total	**1262.33**	**12717765**	**2256**	**88.185**	**764543**	**995**	**1350.515**	**13482308**	**3251**
Commercial crops	Potato	12	55000	8	8.3	23300	73	**20.3**	**78300**	**81**
	Sugarcane	0	0	0	0	0	0	**0**	**0**	**0**
	Total	**12**	**55000**	**8**	**8.3**	**23300**	**73**	**20.3**	**78300**	**81**
Vegetables	Okra	0	0	0	0.3	15000	0	**0.3**	**15000**	**0**
	Tomato	0	0	0	2.3	2760	0	**2.3**	**2760**	**0**
	Palak	0	0	0	0	0	0	**0**	**0**	**0**
	Radish	0	0	0	0	0	0	**0**	**0**	**0**
	Onion	0	0	0	0.8	35000	30	**0.8**	**35000**	**30**
	chilli	0	0	0	0	0	0	**0**	**0**	**0**
	Brinjal	0	0	0	36.08	21885	94	**36.08**	**21885**	**94**
	Lobia	0.96	12480	10	14.58	17500	0	**15.54**	**29980**	**10**
	Total	**0.96**	**12480**	**10**	**54.06**	**92145**	**124**	**55.02**	**104625**	**134**
Spices	Coriander	0	0	0	0	0	0	**0**	**0**	**0**
	Ginger	0	0	0	4.5	19000	38	**4.5**	**19000**	**38**
	Methi	0	0	0	0	0	0	**0**	**0**	**0**
	Turmeric	0	0	0	201.9	633385	167	**201.9**	**633385**	**167**
	Fenugrick	0	0	0	1	11000	26	**1**	**11000**	**26**
	Total	**0**	**0**	**0**	**207.4**	**663385**	**231**	**207.4**	**663385**	**231**
Fodder crop seeds	Rice Bean	0	0	0	0.5	4000	10	**0.5**	**4000**	**10**
	Barseem	0	0	0	2	10686	29	**2**	**10686**	**29**
	Total	**0**	**0**	**0**	**2.5**	**14686**	**39**	**2.5**	**14686**	**39**
Fiber crops	Jute	0	0	0	12	48000	0	**12**	**48000**	**0**
	Sunhemp	0	0	0	33.4	540000	175	**33.4**	**540000**	**175**
	Total	**0**	**0**	**0**	**45.4**	**588000**	**175**	**45.4**	**588000**	**175**
Forest Species		**0**	**0**	**0**	**0.3**	**600**	**0**	**0.3**	**600**	**0**
Others	Dhaincha	0	0	0	3.38	18800	20	**3.38**	**18800**	**20**
	Broom Stick	0	0	0	0	0	0	**0**	**0**	**0**
	Elephant Footyam	3	9000	10	41	109800	25	**44**	**118800**	**35**
	Sisbania	0	0	0	12.65	48643	94	**12.65**	**48643**	**94**
	Total	**3**	**9000**	**10**	**57.03**	**177243**	**139**	**60.03**	**186243**	**149**
Grand Total		**9330.27**	**44682507**	**16500**	**5865.957**	**14946066**	**7523**	**15196.23**	**59628573**	**24023**

Table: State-wise seed production

Name of the crop	A & N Islands			Odisha			West Bengal			Zone Total		
	Quantity of seed (q)	Value (Rs)	No. of farmers	Quantity of seed (q)	Value (Rs)	No. of farmers	Quantity of seed (q)	Value (Rs)	No. of farmers	Quantity of seed (q)	Value (Rs)	No. of farmers
Cereals												
Paddy	5.1	12750	49	3965.95	6252993.2	736	8436.5	27072880	11940	**12407.55**	**33338623.2**	**12725**
Wheat	0	0	0	0	0	0	5.1	25100	32	**5.1**	**25100**	**32**
Maize	0	0	0	6.582	11418	135	3.43	27060	183	**10.012**	**38478**	**318**
Total	**5.1**	**12750**	**49**	**3972.532**	**6264411**	**871**	**8445.03**	**27125040**	**12155**	12422.66	33402201	13075
Oilseeds												
Mustard	0	0	0	0	0	0	437.94	4482730	5426	**437.94**	**4482730**	**5426**
Toria	0	0	0	8	96000	15	1.4	2800	0	**9.4**	**98800**	**15**
Linseed	0	0	0	0	0	0	0	0	0	**0**	**0**	**0**
Niger	0	0	0	4.52	56380	34	0	0	0	**4.52**	**56380**	**34**
Sesame	0	0	0	2.46	19213	106	405.63	4235540	746	**408.09**	**4254753**	**852**
Groundnut	0	0	0	0	0	0	154.7	1338225	300	**154.7**	**1338225**	**300**
Soybean	0	0	0	0	0	0	0	0	0	**0**	**0**	**0**
Rai	0	0	0	0	0	0	0	0	0	**0**	**0**	**0**
Sun Flower	0	0	0	0	0	0	11.95	829350	261	**11.95**	**829350**	**261**
Toria	0	0	0	5.5	47987	0	0	0	0	**5.5**	**47987**	**0**
Total	**0**	**0**	**0**	**20.48**	**219580**	**155**	**1011.62**	**10888645**	**6733**	1032.1	11108225	6888
Pulses												
Redgram	0	0	0	0	0	0	24.18	130320	66	**24.18**	**130320**	**66**
Chickpea	0	0	0	0	0	0	302	3163340	413	**302**	**3163340**	**413**
Lentil	0	0	0	0	0	0	456.38	4677050	1050	**456.38**	**4677050**	**1050**
Greengram	0	0	0	15.785	19189	31	44.71	410805	435	**60.495**	**429994**	**466**
Blackgram	0	0	0	6.04	19054	0	493.56	4981630	1136	**499.6**	**5000684**	**1136**
Pea	0	0	0	4	40000	50	0	0	0	**4**	**40000**	**50**
Cowpea	0	0	0	0	0	0	1.35	7800	6	**1.35**	**7800**	**6**
Rajmash	0	0	0	0	0	0	2.51	33120	64	**2.51**	**33120**	**64**
Total	**0**	**0**	**0**	**25.825**	**78243**	**81**	**1324.69**	**13404065**	**3170**	1350.515	13482308	3251
Commercial crops												
Potato	0	0	0	0	0	0	20.3	78300	81	**20.3**	**78300**	**81**
Sugarcane	0	0	0	0	0	0	0	0	0	**0**	**0**	**0**
Total	**0**	**0**	**0**	**0**	**0**	**0**	**20.3**	**78300**	**81**	20.3	78300	81
Vegetables												
Okra	0	0	0	0	0	0	0.3	15000	0	**0.3**	**15000**	**0**
Tomato	0	0	0	0	0	0	2.3	2760	0	**2.3**	**2760**	**0**
Palak	0	0	0	0	0	0	0	0	0	**0**	**0**	**0**
Radish	0	0	0	0	0	0	0	0	0	**0**	**0**	**0**
Onion	0	0	0	0	0	0	0.8	35000	30	**0.8**	**35000**	**30**
chilli	0	0	0	0	0	0	0	0	0	**0**	**0**	**0**
Brinjal	0	0	0	0	0	0	36.08	21885	94	**36.08**	**21885**	**94**
Lobia	0	0	0	0	0	0	15.54	29980	10	**15.54**	**29980**	**10**
Total	**0**	**0**	**0**	**0**	**0**	**0**	**55.02**	**104625**	**134**	55.02	104625	134
Spices												
Coriander	0	0	0	0	0	0	0	0	0	**0**	**0**	**0**
Ginger	0	0	0	4	16000	30	0.5	3000	8	**4.5**	**19000**	**38**
Methi	0	0	0	0	0	0	0	0	0	**0**	**0**	**0**
Turmeric	0	0	0	145.6	509600	45	56.3	123785	122	**201.9**	**633385**	**167**
Fenugrick	0	0	0	0	0	0	1	11000	26	**1**	**11000**	**26**
Total	**0**	**0**	**0**	**149.6**	**525600**	**75**	**57.8**	**137785**	**156**	207.4	663385	231

Name of the crop	A & N Islands			Odisha			West Bengal			Zone Total		
	Quantity of seed (q)	Value (Rs)	No. of farmers	Quantity of seed (q)	Value (Rs)	No. of farmers	Quantity of seed (q)	Value (Rs)	No. of farmers	Quantity of seed (q)	Value (Rs)	No. of farmers
Forest Species	**0**	**0**	**0**	**0**	**0**	**0**	**0.3**	**600**	**0**	**0.3**	**600**	**0**
Fodder crop seeds												
Rice Bean	0	0	0	0	0	0	0.5	4000	10	**0.5**	**4000**	**10**
Barseem	0	0	0	2	10686	29	0	0	0	**2**	**10686**	**29**
Total	**0**	**0**	**0**	**2**	**10686**	**29**	**0.5**	**4000**	**10**	**2.5**	**14686**	**39**
Fiber crops												
Jute	0	0	0	0	0	0	12	48000	0	**12**	**48000**	**0**
Sunhemp	0	0	0	3.4	0	0	30	540000	175	**33.4**	**540000**	**175**
Total	**0**	**0**	**0**	**3.4**	**0**	**0**	**42**	**588000**	**175**	**45.4**	**588000**	**175**
Others												
Dhaincha	0	0	0	0	0	0	3.38	18800	20	**3.38**	**18800**	**20**
Broom Stick	0	0	0	0	0	0	0	0	0	**0**	**0**	**0**
Elephant Footyam	0	0	0	0	0	0	44	118800	35	**44**	**118800**	**35**
Sisbania	0	0	0	12.65	48643	94	0	0	0	**12.65**	**48643**	**94**
Total	**0**	**0**	**0**	**12.65**	**48643**	**94**	**47.38**	**137600**	**55**	**60.03**	**186243**	**149**
Grand Total	**5.1**	**12750**	**49**	**4186.487**	**7147163**	**1305**	**11004.64**	**52468660**	**22669**	**15196.23**	**59628573**	**24023**

5.2 Planting Materials Production:

Number of fruits and vegetable crops are grown in the states of West Bengal, Odisha and A&N Islands. Very few nurseries are available in these states which supply quality planting materials to the farmers. To address this problem KVKs took up planting material production programme in the district level to provide direct access to the farmers to the planting materials. In the year 2023, KVKs of Zone V produced 61.18207 lakh planting materials of graft, gooties, sapling, seedlings and bulbs of fruits and vegetables and earned Rs.125.78458 lakh which benefitted 52845 farmers. Among the different crops mango, banana, guava, lime, papaya, watermelon, brinjal, tomato, cucumber, cauliflower, okra, onion, chilli, bitter gourd, broccoli, capsicum varieties were produced in these programme.

State-wise analysis showed that A&N Islands produced 31150 number of planting materials, Odisha produced 4138662 number of planting materials and West Bengal produced 1948215 number of planting materials in the year 2023.

Table: Planting materials production by KVKs

Category	Crop	Number	Value (Rs)	Distributed to No. of Farmers	Number	Value (Rs)	Distributed to No. of Farmers	Number	Value (Rs)	Distributed to No. of Farmers	Number	Value (Rs)	Distributed to No. of Farmers
		A & N Islands			Odisha			West Bengal			Total		
Vegetable Seedling	Cauliflower	0	0	0	354781	459764	5148	153126	231644	1085	507907	691408	6233
	Cabbage	0	0	0	171775	371031.5	3488	170801	290227	863	342576	661258.5	4351
	Tomato	6000	36000	185	409537	774042	6298	328642	317950	1134	744179	1127992	7617
	Brinjal	10700	45600	370	435511	786001	4819	304707	206353	928	750918	1037954	6117
	Chilli	4800	38400	166	813908	558388.5	5511	279317	236550	806	1098025	833338.5	6483
	Onion	0	0	0	1163477	379401	2486	117781	214400	427	1281258	593801	2913
	Others	150	6000	86	548202	891211	4769	215735	921890	767	764087	1819101	5622
	Total	**21650**	**126000**	**807**	**3897191**	**4219839**	**32519**	**1570109**	**2419014**	**6010**	**5488950**	**6764853**	**39336**
Fruits	Mango	0	0	0	1853	63276	416	13956	422470	266	15809	485746	682
	Guava	400	4000	35	2801	122010	1002	8568	254490	368	11769	380500	1405
	Lime	0	0	0	2166	19960	654	21206	375950	1206	23372	395910	1860
	Papaya	1200	8000	66	25003	435680	1792	21718	182860	200	47921	626540	2058
	Banana	850	24000	57	29377	237735	1275	29244	205060	93	59471	466795	1425
	Others	0	0	0	28162	539605	1367	39150	823660	885	67312	1363265	2252
	Total	**2450**	**36000**	**158**	**89362**	**1418266**	**6506**	**133842**	**2264490**	**3018**	**225654**	**3718756**	**9682**
Ornamental plants	Ornamental plants	1200	48000	83	49208	76071	350	65200	98350	830	115608	222421	1263
	Total	**1200**	**48000**	**83**	**49208**	**76071**	**350**	**65200**	**98350**	**830**	**115608**	**222421**	**1263**
Medicinal and Aromatic	Medicinal and Aromatic	0	0	0	22927	54950	210	10570	139200	174	33497	194150	384
	Total	**0**	**0**	**0**	**22927**	**54950**	**210**	**10570**	**139200**	**174**	**33497**	**194150**	**384**
Plantation	Plantation	5500	131000	62	5643	133755	67	10500	82376	105	21643	347131	234
	Total	**5500**	**131000**	**62**	**5643**	**133755**	**67**	**10500**	**82376**	**105**	**21643**	**347131**	**234**
Spices	Turmeric	0	0	0	102	16500	25	3564	298725	742	3666	315225	767
	Others	0	0	0	0	0	0	0	0	0	0	0	0
	Total	**0**	**0**	**0**	**102**	**16500**	**25**	**3564**	**298725**	**742**	**3666**	**315225**	**767**
Tuber	Elephant yams	0	0	0	1055	17680	80	8169	247305	92	9224	264985	172
	Total	**0**	**0**	**0**	**1055**	**17680**	**80**	**8169**	**247305**	**92**	**9224**	**264985**	**172**
Fodder crop saplings	Fodder crop saplings	0	0	0	6200	13100	162	72930	123400	58	79130	136500	220
	Total	**0**	**0**	**0**	**6200**	**13100**	**162**	**72930**	**123400**	**58**	**79130**	**136500**	**220**
Forest Species	Forest Species	0	0	0	9245	76910	216	30450	99600	179	39695	176510	395
	Total	**0**	**0**	**0**	**9245**	**76910**	**216**	**30450**	**99600**	**179**	**39695**	**176510**	**395**
Others, pl.specify	Others	350	87500	30	57729	274105	136	42881	76322	226	100960	437927	392
	Total	**350**	**87500**	**30**	**57729**	**274105**	**136**	**42881**	**76322**	**226**	**100960**	**437927**	**392**
Grand Total		**31150**	**428500**	**1140**	**4138662**	**6301176**	**40271**	**1948215**	**5848782**	**11434**	**6118027**	**12578458**	**52845**



5.3 Production of Bio-products:

A lot of demand of organic fertilizers at village level was observed particularly in vegetable cultivation. To meet up the need of the farmers and to promote organic cultivation for maintaining soil fertility of the soil KVKs encourages the use of bio product and promotes vermi-compost and bio-fertilizer in large scale. In the state of Odisha, 19832kg of bio fertilizers and 8044kg of bio-agent were produced which benefitted 1677 farmers and earned a value of Rs.560180/- in 2023. In West Bengal 209370kg of bio-agent and 38929kg of bio fertilizers were produced which benefitted 1551 farmers and earned Rs.276875/- in 2023.In A & N Islands 700kg of bio-agent and 300kg of bio fungicides were produced which benefitted 71 farmers and earned Rs.68000/- in 2023. The total production of bio products was 367113.5kg in 2023 under Zone-V which benefitted 7603 farmers and earned value of Rs.3490325/-.

Table: Production of bio-product by KVKs

Name of the product	A & N Islands			Odisha			West Bengal			Grand Total		
	Quantity (Kg.)	Value (Rs.)	Number of farmers	Quantity (Kg.)	Value (Rs.)	Number of farmers	Quantity (Kg.)	Value (Rs.)	Number of farmers	Quantity (Kg.)	Value (Rs.)	Number of farmers
Bio-fertilizers	0	0	0	19832	292380	1452	38929	702975	892	**58761**	**995355**	**2344**
Bio-pesticide	0	0	0	9060	110500	663	12015	231050	523	**21075**	**341550**	**1186**
Bio-fungicide	300	54000	38	8052	160000	109	4865	544450	1090	**13217**	**758450**	**1237**
Bio-agents	700	14000	33	8044	267800	225	209370	248600	659	**218114**	**530400**	**917**
Others, please specify.	800	40000	53	19263	418020	975	35883.5	406550	891	**55946.5**	**864570**	**1919**
Total	**1800**	**108000**	**124**	**64251**	**1248700**	**3424**	**301062.5**	**2133625**	**4055**	**367113.5**	**3490325**	**7603**


5.4 Livestock and Fishery:

The livestock strains, like chicks, eggs, piglets, fingerlings, spawns etc. were supplied to the farmers by KVKs through their livestock production programmes. In the year 2023, total production of Poultry was 3198 in the state of A&N Islands. It benefitted 58 farmers and earned Rs.12792/-. In the state of Odisha25688 Duals (layer + broiler) chicks, 19908 broiler chicks, 4200 ducks, 1027920 fingerlings

of major carps, Indian carp (78150), Spawn (8144) were produced which makes total production of 1181500 livestock and fish produced in the state of Odisha in 2023. It benefitted 3858 farmers and earned revenue of Rs.4439907/-. In the state of West Bengal Duck production was 794, Broiler production was 50173,Turkey production was 1611, Cow production was 18, Goat production was 225 and in fishproduction, 3548245 no. of Indian Carp was produced followed by 92440000Spawn. Total production of livestock and fish was 98378457 in 2023 in the state of West Bengal. It benefitted 2450 farmers and earned Rs.9853200/-. In the entire Zone -V, the total production of livestock and fish was 99563155 number in 2023 which benefitted 6366 farmers and earned Rs.14305899/-.

Table: Production of livestock and fishery by KVKs

Particulars of Live stock	Number	Value (Rs)	No. of Farmers	Number	Value (Rs)	No. of Farmers	Number	Value (Rs)	No. of Farmers	Number	Value (Rs)	No. of Farmers
	A & N Islands			Odisha			West Bengal			Total		
Dairy animals												
Cows	0	0	0	0	0	0	18	356950	2	18	356950	2
Buffaloes	0	0	0	0	0	0	0	0	0	0	0	0
Calves	0	0	0	1	2000	1	29	352000	3	30	354000	4
Others (Pl. specify)	0	0	0	0	0	0	1000	2000	2	1000	2000	2
Total	0	0	0	1	2000	1	1047	710950	7	1048	712950	8
Small ruminants												
Sheep	0	0	0	2	1000	2	55	86200	17	57	87200	19
Goat	0	0	0	0	0	0	225	530100	53	225	530100	53
Other, please specify	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	2	1000	2	280	616300	70	282	617300	72
Poultry												
Broilers	0	0	0	19908	647146	664	50173	525939	43	70081	1173085	707
Layers	0	0	0	1520	120350	60	437	54804	48	1957	175154	108
Duals (broiler and layer)	0	0	0	25688	1771845	1386	2328	453600	100	28016	2225445	1486
Japanese Quail	0	0	0	1700	55200	96	23	2300	5	1723	57500	101
Turkey	0	0	0	0	0	0	1611	220330	131	1611	220330	131
Emu	0	0	0	0	0	0	0	0	0	0	0	0
Ducks	0	0	0	4200	185950	53	794	105120	147	4994	291070	200
Others (Pl. specify)	3198	12792	58	4811	328780	158	37008	1762112	1003	45017	2103684	1219
Total	3198	12792	58	57827	3109271	2417	92374	3124205	1477	153399	6246268	3952
Piggery												
Piglet	0	0	0	0	0	0	91	348000	8	91	348000	8
Hog	0	0	0	0	0	0	0	0	0	0	0	0
Others (Pl. specify)	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	91	348000	8	91	348000	8
Fisheries												
Indian carp	0	0	0	78150	200000	185	3548245	1194410	329	3626395	1394410	514
Exotic carp	0	0	0	360	1800	9	1478450	253775	87	1478810	255575	96
Mixed carp	0	0	0	0	0	0	250000	750000	0	250000	750000	0
Fish fingerlings	0	0	0	1027920	587220	346	458560	1330700	295	1486480	1917920	641
Spawn	0	0	0	8144	348570	284	92440000	1009760	72	92448144	1358330	356
Others (Pl. specify)	0	0	0	9096	190046	614	109410	515100	105	118506	705146	719
Total	0	0	0	1123670	1327636	1438	98284665	5053745	888	99408335	6381381	2326
Grand Total	**3198**	**12792**	**58**	**1181500**	**4439907**	**3858**	**98378457**	**9853200**	**2450**	**99563155**	**14305899**	**6366**

6.0 Soil, Water and Plant Sample Analysis

In order to reduce the inefficient use of fertilizers and manage environmental and other health risks, scientists working in the KVKs under ICAR-ATARI Kolkata inspired farmers through a variety of awareness-raising and training initiatives. Aside from that, several water samples collected by farmers for quality analysis were examined by scientists in their KVK facilities.

A total of 53785 soil samples (33260 through mini soil testing kit/ labs and 20522 through soil testing laboratory) were tested from 1426 villages which benefitted total 62373 farmers in this Zone. A minimum amount was charged from farmers for testing each soil sample. Thus, KVKs of ICAR-ATARI Kolkata earned about Rs. 11.19 lakh during the period.

Table: **Soil and water analysis by the KVKs of Zone V**

State	Number of soil samples analyzed			No. of Farmers	No. of Villages	Amount realized (in Rs.)
	Through mini soil testing kit/labs	Through soil testing laboratory	Total			
A & N Islands	0	97	97	68	15	0
Odisha	3143	5789	8935	28456	482	22365
West Bengal	30117	14636	44753	33849	929	1097050
Total	**33260**	**20522**	**53785**	**62373**	**1426**	**1119415**

7.0 Soil Health Cards Distribution and Observance of World Soil Day

World Soil Day is held annually on 5 December as a means to focus attention on the importance of healthy soil and to advocate for the sustainable management of soil resources. This year's theme is "Soil and Water: A Source of Life". Our survival depends on the precious link between soil and water. Soil water, vital for nutrient absorption by plants, binds our ecosystems together. This symbiotic relationship is the foundation of our agricultural systems. But as a result of climate change and human activity, our soils are deteriorating, which is placing undue strain on our water supplies. By lowering water infiltration and availability for all forms of life, erosion upsets the natural balance.

Reduced erosion and pollution, increased water infiltration and storage, crop rotation, low tillage, and the addition of organic matter are examples of sustainable soil management techniques that improve soil health. These methods are essential in the fight against climate change because they enhance fertility, protect soil biodiversity, and aid in carbon sequestration.

The goal of World Soil Day (WSD) 2023 and its campaign is to increase public awareness of the role that soil and water play in creating resilient and sustainable agri-food systems. WSD is a special worldwide forum that encourages and inspires people all over the world to enhance soil health in addition to celebrating soils.

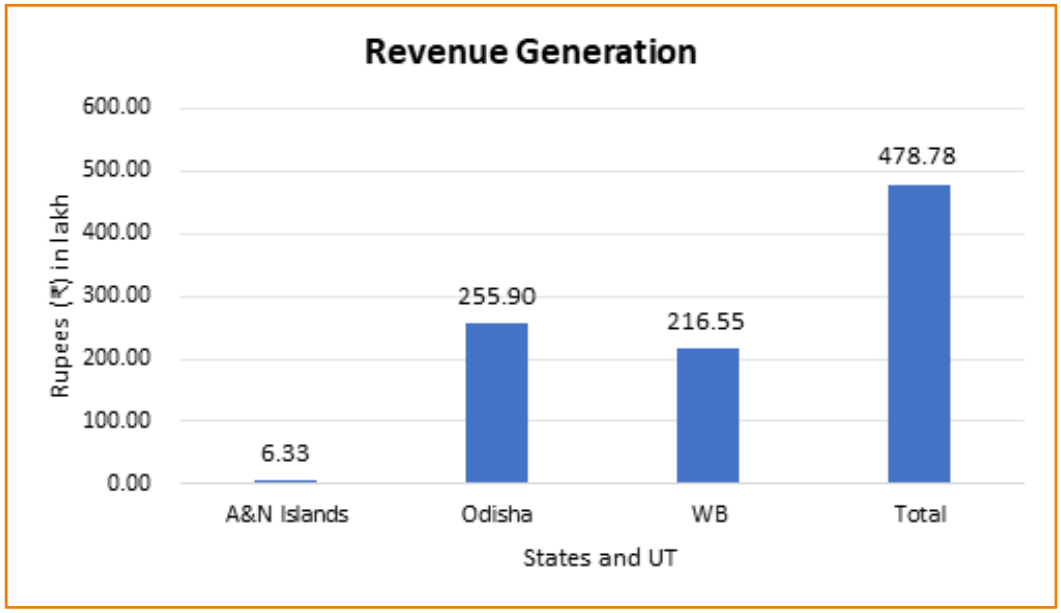
All the KVKs of Zone-V distributed the soil health cards among the farmers. A total of 3522 numbers of Soil Health Cards were distributed on World Soil Day, Dec 5, 2023 by the public representatives like MP/ MLAs and others in the respective KVKs. State wise distribution of soil health cards are presented in the following table.

Table: Soil Health Card prepared and distributed during the year

KVK	No of soil samples collected	No of samples analyzed	SHC issued	No of farmers benefitted
A & N Islands	95	91	91	91
Odisha	1714	1714	1714	2826
West Bengal	1587	1587	1717	2080
Total	**3396**	**3392**	**3522**	**4997**

8.0 Revenue Generation

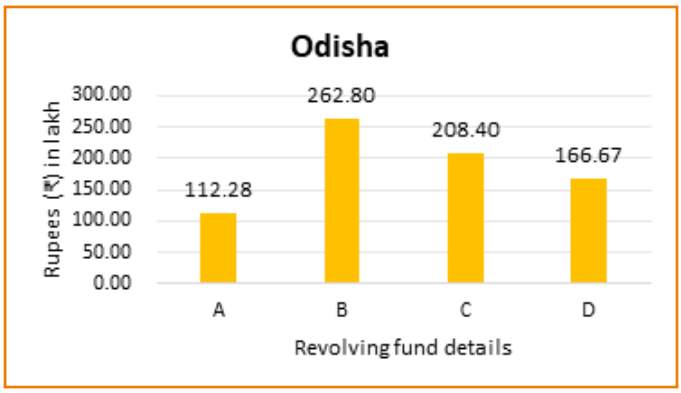
The KVK scientists under ICAR-ATARI Kolkata were actively involved in receiving funds from a large number of external sources through sanctioned projects *i.e.* organizing additional training programmes, research projects, building infrastructural facilities and so on which helped in supporting and strengthening of their KVKs. During the year 2023 KVKs of this zone managed to receive funds from the State Department of Agriculture, NABARD, ATMA, and many others. A total of 478.78 lakh Rs. revenue was generated by the KVKs of ICAR-ATARI Kolkata. Out of this A&N islands KVKs generated Rs. 6.33 lakh, Odisha KVKs of Rs. 255.90 lakh and the rest was generated by West Bengal KVKs.

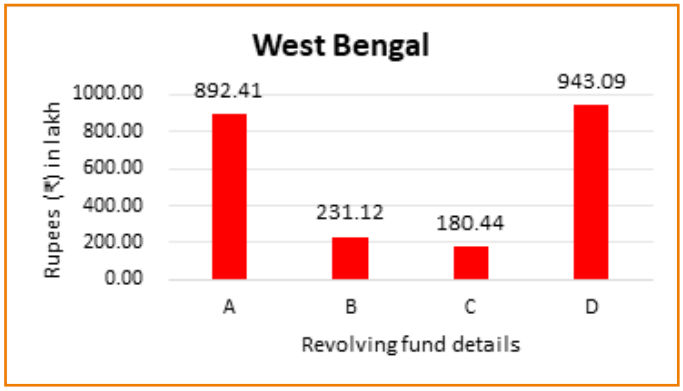


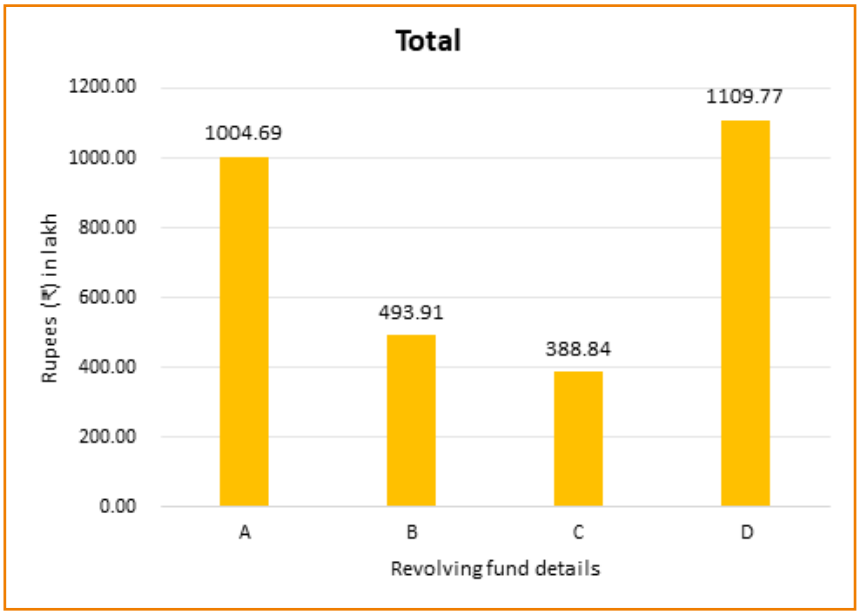
9.0 Revolving fund status

Krishi Vigyan Kendras (KVKs) play a pivotal role in enhancing agricultural productivity through their innovative approach with help of the revolving fund. This financial model begins with an initial grant provided to KVKs for various agricultural activities such as seed production, livestock breeding, and horticultural production, which are then sold to generate revenue. This revenue is not merely an end in itself but serves as a resource for the subsequent cycle of production. By reinvesting the earnings back into agricultural activities, KVKs ensure a continuous flow of funds. The primary objective of the revolving fund is to promote self-sufficiency and sustainability within these institutions. In 2023-24 it was seen that, at gross, the KVKs started the year with Rs. 1004.69 lakh. Then they have earned Rs. 493.91 lakh but spent 388.84 lakh. As a result, this year they have completed with Rs. 1109.77 lakh in hand. Out of this the major share is contributed by WB KVKs. In case of Odisha KVKs, they have increased 48% of their revolving fund as a whole from the previous financial year. Mayurbhanj-I and Puri KVK has earned the most. In WB, Coochbehar, Malda and Narendrapur KVK has generated higher revolving fund than others.

Where, A= Opening balance on 1st April, 2023; B= Income during the financial year; C= Expenditure during the financial year; D= Net balance in hand as on 31st March, 2024 [Kind + Cash].







10.0 Publication by KVKs

In order to highlight the results of research and other related activities, KVK scientists worked hard in 2023 to prepare and publish research papers, technical bulletins, newsletters, popular articles, leaflets/ pamphlets, DVDs/CDs, and other materials. These materials were made available to other KVKs, SAUs, ICAR institutes, line departments, ATMA, NABARD, other agencies, farmers, and other stakeholders. The KVK staff in this Zone produced a total of 9772 publications, which included 115 research papers, 58 symposium papers, 660 newsletters, 124 popular articles, 63 books, 38 book chapters, 6259 extension pamphlets/literature, 1728 bulletins, 519 technical reports, and 180 electronic publications. There were 395925 copies in circulation overall.Twenty publications that the Andaman and Nicobar Islands KVKs published were distributed to 1700 beneficiaries. Likewise, the KVKs in the states of Odisha and West Bengal produced 3022 and 6730 publications, in that order. During that time, there were 160268 and 233957 circulations in the corresponding state.

Item	A & N Islands			Odisha			West Bengal			Total		
	Number	No. circulated	No. of KVK	Number	No. circulated	No. of KVK	Number	No. circulated	No. of KVK	Number	No. circulated	No. of KVK
Research paper	3	0	2	51	335	18	61	0	12	**115**	**335**	**32**
Seminar/ conference/ symposia papers	4	300	2	21	285	9	33	1006	12	**58**	**1591**	**23**
Books	2	0	1	53	21258	12	8	730	5	**63**	**21988**	**18**
Bulletins	2	100	2	1604	14250	8	122	34800	6	**1728**	**49150**	**16**
News letter	2	200	1	543	18850	27	115	85400	8	**660**	**104450**	**36**
Popular Articles	1	500	1	73	19950	17	50	4190	10	**124**	**24640**	**28**
Book Chapter	0	0	0	17	7700	8	21	3555	10	**38**	**11255**	**18**
Extension Pamphlets/ literature	2	600	2	127	72460	22	6130	34578	18	**6259**	**107638**	**42**
Technical reports	4	0	1	435	1730	19	80	12230	15	**519**	**13960**	**35**
Electronic Publication (CD/DVD etc)	0	0	0	93	950	17	87	24412	13	**180**	**25362**	**30**
others	0	0	0	5	2500	1	23	33056	2	**28**	**35556**	**3**
	20	***1700***	***12***	***3022***	***160268***	***158***	***6730***	***233957***	***111***	***9772***	***395925***	***281***

11.0 Scientific Advisory Committee Meetings

Each year, the KVKs organize the Scientific Advisory Committee (SAC) Meeting to finalize the Action Plan for the upcoming year. The committee, in accordance with ICAR guidelines, is made up of representatives from the following organizations: ICAR-ATARI Kolkata, the Host Organization, other ICAR Institutes in the nearby areas, State Agricultural Universities, district development departments, media personnel, financial institutions, progressive farmers and farm women, and others. There was assurance that every member who had been nominated attended the meeting.Fifty-two SAC meetings were held in 2023 by the 59 KVKs of ICAR-ATARI Kolkata. 23 KVKs in the state of West Bengal conducted 19 SAC meetings, while thirty-three KVKs in the state of Odisha conducted thirty meetings. In contrast, three KVKs from the Andaman and Nicobar Islands held three meetings during that time. There were 1624 people in attendance during the meeting.

Sl. No.	State/UT	No. of SAC meeting	No. of participants
01.	A & N Islands	3	124
02.	Odisha	30	985
03.	West Bengal	19	515
Total		**52**	**1624**



12.0 Technology Backstopping by Directorates of Extension Education

Nodal Scientist: Dr. K. S. Das

The Directorates of Extension Education (DEEs) of concerned State Agricultural Universities (SAUs) under ICAR-ATARI Kolkata played important role to disseminate updated agricultural technologies available at various Research Institutes/ SAUs for farmers engaged in agriculture during the year 2023. At their respective KVKs, they conducted on-farm trials (OFTs), front line demonstrations (FLDs), training programmes, hands-on-trainings and other many related activities. All fifty nine KVKs of this zone have been distributed under the jurisdiction of four DEEs irrespective of any host organizations for transferring technologies in a better way. The Extension Directorate of Odisha University of Agriculture and Technology (OUAT), Bhubaneswar has been allotted with 33 KVKs; Bidhan Chandra Krishi Viswavidyalaya (BCKV), Mohanpur with 17 KVKs; Uttar Banga Krishi Viswavidyalaya (UBKV), Pundibari with 6 KVKs and West Bengal University

of Animal and Fishery Sciences (WBUAFS), Belgachhia with 3 KVKs.

All the Directorates conducted HRD programmes, meetings, workshops, exposure visits and interface meetings to fulfil the demands of their KVK personnel for enhancing working skills with KVK system during the year 2023. A total of 22 HRD programmes were conducted during the period under report for 973 KVK personnel involving 244 KVKs. The area of training programmes were- technologies on OFT proposals of food crops; scientific agri-horticultural animal husbandry/ aquacultural practices in augmenting income from small farming; planning, execution and reporting of KVK mandatory activities; policy reforms for administrative and financial management of KVKs; education-extension interface in agriculture, IPD and IDM in horticultural crops; convergence workshop of CSISA; spawn and mushroom production technology; advance technologies in apiculture; reinventing extension system for agricultural transformation; agri-journalist conclave, awareness camp, strengthening KVK activities and so on. Maximum programme (10) was conducted by WBUAFS, Kolkata followed by OUAT, Bhubaneswar (8 programmes), UBKV, Pundibari (3 programmes) and BCKV (1 programme).

The DEEs and/ or their officials visited their KVKs for 222 occasions to attend different programmes organized at their KVKs viz. SAC meetings, field days, technology week, inaugurating training programmes/ workshop, *'World Soil Day'* celebration, '*Swatchh Bharat*' programme, '*World Pulse Day'* celebration, DAESI inaugural programme, '*Rabi'* campaign, '*Kharif*' campaign, special visit of Vice-Chancellors, field visit of agroforestry project etc. However, the officials from DEE, OUAT visited their KVKs for 92 times, from BCKV for 37 times, from UBKV for 32 times and from WBUAFS for 61 times. A total of 148 KVKs (35 from BCKV, 24 from WBUAFS, 15 from UBKV and 74 from OUAT) involved in those programmes during the year 2023.

The frequent visits of OFT and FLD experimental fields of KVKs/ farmers' were made by DEE officials to oversee KVK field activities, to provide technical advices and to enrich knowledge and skill of KVK personnel. The total visits were recorded to be 247 times. The Directorate officials from BCKV, Mohanpur visited OFT fields for 6 occasions and FLD for 10 occasions to check the performance of different crop varieties under various cropping systems/ seed replacement rates, to assess various new technologies etc. Four separate visits were done by BCKV officials to monitor seed production at KVK farm and farmers' field. Similarly, UBKV officials visited OFT and FLD fields for 10 times each to see crop's performance under different nutrient applications, to check new technology adoption by farmers, to collect farmers' feedback and many others. The respective numbers of field visits by the officials of WBUAFS, Belgachia were noted to be 12 and 14 to know the disease and pest incidences of different field crops/animals/fishes, to note farmers' feedback and so on. In addition, 4 visits were also made to see the performance of low-cost mini fish hatchery for IMC and to check demonstration units funded by RKVY and NICRA. A large number of field visits i.e. 70 for OFTs and 92 for FLDs were conducted by the Dean, Extension Education and/ or other officials of OUAT, Bhubaneswar for overseeing KVK activities e.g. to

check data collection of different experiments and maintaining records, to maintain experimental fields with proper display boards, to discuss various issues with concerned Line Departments of the districts, to check the performance of various adopted technologies and many more. Not only that, OUAT officials visited a substantial number of times (15) to monitor different activities related to NICRA, ARYA etc.

In the year 2023, all four Extension Directorates evaluated a total of 114 technologies through their KVKs. Out of which, BCKV, Mohanpur evaluated 55 technologies involving 82 KVKs.Out of those technologies, different retting process on retting time, yield and quality of jute; optimizing sulphur application on growth, yield and oil content of sesame; performance of different foliar nutrients for controlling flower and early fruit drop in offseason 'dofla' mango; varietal evaluation of water melon in red and laterite zone of Jhargram; green manuring technology in Aman rice; production technology of millets; introduction of low cost poly walking tunnel for year round offseason vegetable cultivation; evaluation of INM practice through use of bio-fertilizer for kharif rice; use of plug tray for vegetable seedling production; effect of height of shed net boroj on growth, yield and quality of betel vine production etc. were important.

Fourteen technologies i.e. scientific management of Ghoongroo pig; preparation of value added products from small animals, poultry and fish production; seasonal fodder cultivation technology; ornamental fish rearing in pond system; application of regional-specific mineral mixture; brooding management of chicks; area specific integrated farming system model; restoring soil health and mass production of vermicompost; use of superior Black Bengal goat for increasing meat production were implemented by WBUAFS, Kolkata at 69 KVKs.

The UBKV, Pundibari implemented 19 technologies in 19 KVKs viz. suitable cultivation methods of *rabi* maize in North Bengal region of West Bengal; weed management in *rabi* onion; integrated plant nutrient supply systemin *Aman* rice; IPM modules against tomato insect pest; IPM in horticultural crops; effect of boron application in chili production; efficacy of different organic manures on growth performance in IMC; IDM and value addition of ginger; introduction of suitable variety of strawberry in hills; INM of Darjeeling Mandarin; effect of different heat sources for controlling piglet mortality and so on.

Similarly, OUAT, Bhubaneswar Directorate implemented 26 technologies involving 691 KVKs. Important technologies were disease management in rice; weed management in groundnut; micronutrient application in vegetables; low cost poly tunnel off-season seedling raising;trellis system of vegetables production; performance of drudgery reducing equipments; pest management of stored grains; economic mushroom cultivation; scientific pisciculture; soil test based fertilizer application; farm mechanization; *kharif* onion cultivation; introduction of poultry breed*Kadaknath*under backyard poultry farming; promotion of high value crop cultivation; promotion of millet cultivation; INM and IDM and IPM in horticultural crop production etc.

All the Extension Directorates under ICAR-ATARI Kolkata published and updated total 21 technology inventories. In addition, they published a large number of literatures e.g. newsletter, magazine, booklet, diary, bulletin etc. in English and local languages related to agriculture for the farmers. The Directorate of BCKV, Mohanpur published maximum (10) technology inventory during the period followed by WBUAFS (9 inventories), OUAT and UBKV one each.

Supply of updated technologies and technological products viz. seeds, planting materials, bio-products, livestock/ poultry breeds, mineral mixture for animals, fish spawn/ fingerlings, mushroom spawn etc. to the KVKs were also the part of activities of all the Extension Directorates of this Zone. A total of 211 KVKs received various technological products from their Directorates. Considering the individual Directorate, OUAT supplied their products to 155 KVKs, BCKV to 13 KVKs, WBUAFS to 32 KVKs and UBKV to 11 KVKs during the year 2023.

13.0 Agricultural Technology Information Centre (ATIC)

Nodal Scientist: Dr. K. S. Das

The Agricultural Technology Information Centre (ATIC) is being used by the Research Institutes/ State Agricultural Universities to provide solution to the location specific problems, to make available all updated technological information along with technology inputs and products on agriculture developed by the institutes, livestock and fishery sciences, and to help the farmers/ other stakeholders at one place. This centre has created better interaction between researcher and technology users, and serves as a '*single window*' delivery system for services and products resulting from research. The ATIC is usually established at the entrance of the institute. In this zone, ATICs are being operated in the Union Territory of Andaman and Nicobar Islands under ICAR-Central Island Agricultural Research Institute (ICAR-CIARI), Port Blair; in Odisha state under ICAR-Central Institute of Freshwater Aquaculture (CIFA), Bhubaneswar and Odisha University of Agriculture and Technology (OUAT), Bhubaneswar; and in West Bengal state under Bidhan Chandra Krishi Viswavidyalaya (BCKV), Mohanpur and Uttar Banga Krishi Viswavidyalaya (UBKV), Pundibari. It has the facility of reception counter, exhibition/ technology museum, touch screen kiosk, sales counter, farmers' feedback register, video conferencing facility, library, cafeteria etc.

A total of 14552 farmers from different corners of A & N Islands, Odisha and West Bengal visited ATICs during 2023 to get technology information (6305 persons), technology products (2139 persons), technology services (4314 persons) and other purposes (1794 persons). Maximum visit (6472) was recorded at the ATIC of BCKV followed by CIFA (4098), UBKV (3340), CIARI (469) and OUAT (173).

As per technology information was concerned, a total of 6464 farmers were benefitted from it. Maximum farmers (1973) were interested in getting information on pest management followed by disease management (1582), animal husbandry including fisheries (1261) and varieties/hybrids (641). The Kisan Call Centre was used by maximum 4141 farmers to get the information mainly on varieties/ hybrids (161), pest management (1536), disease management (1124), agro-techniques (250), soil and water conservation (98), post-harvest technology and value addition (49), and animal husbandry including fisheries (923) during the year 2023. Data on Kisan Call Centre depicted that UBKV alone handled about 95% farmers from their ATIC out of total farmers. Again, 25 farmers got benefit from from video showing and 45 farmers from writing letters to the concerned authorities of the ATICs. A number of need based training programmes were also organized in the ATICs for 2221farmers, technocrats and students. Among the trainee participants, maximum persons took training on varietal trials (454), followed by disease management (439), pest management (415), animal husbandry including fisheries (331), post-harvest technology including value addition (273), agri-techniques (165) and soil and water conservation (144). ICAR-CIARI, port Blair took lead in training provided (55% of total trainings) followed by BCKV (45%).



The literatures either in the form of book and technical bulletins on agriculture, livestock and fishery sciences were supplied to the farmers and other stakeholders from the ATICs. Mostly, it was given to the farmers free of cost and sometimes, they were charged nominal prices for getting the publications. During the year 2023, 523 books and 3460 technical bulletins were sold from different ATICs under ICAR-ATARI Kolkata which benefitted 7649 farmers for updating their knowledge. Around Rs. 40416/- revenue was generated from the sale of those publications.

The sales counter of different ATICs were stored with various technological products viz. seeds, planting materials, bio-products, arecanut, aromatic rice, honey, green coconuts, popcorn, turmeric etc. for sale. During the year 2023, 3925 q seeds, 51245 no. of planting materials, 2270 q bio-products, 644 q aromatic rice, 116 q arecanut, 27.25 kg honey, 20 pieces green coconut, 30 packet baby corn and 45 packet turmeric were supplied to the farmers through different ATICs. From the sale of those products, 17770 farmers were benefitted and Rs. 42.18 lakh revenue was generated during the year 2023.

For farmers, the ATICs were also facilitated to analyse soil and water samples, to diagnose plant diseases, to provide livestock vaccines/ treatment of animal diseases and to provide information on facility available with line departments about various campaigning programmes launched by state governments and so on. During the period under report, 639 soil/ water samples were analysed which benefitted 1753 farmers, and 151 plant samples were diagnosed for diseases which benefitted 2302 farmers. Maximum (435) soil samples were analysed from the ATIC by ICAR-CIFA followed by OUAT (168) and BCKV (36). Eighty plants were diagnosed with various diseases by OUAT followed by 22 plants by BCKV whereas CIFA diagnosed 49 fishes with various diseases from their respective ATICs.


14.0 Flagship Programmes

14.1 National Innovations in Climate Resilient Agriculture - Technology Demonstration Component (NICRA-TDC)

Nodal Scientist: Dr.S.K. Mondal

Due to dietary changes and global population growth, there is an increased need for food. In many regions of the world, crop yields are plateauing, the condition of the ocean is deteriorating, and natural resources like soils, water, and biodiversity are rapidly running out. It's getting harder for production to stay up with these advancements. An estimate from 2020 states that 8.9 percent of the world's population, or around 690 million people, are undernourished—a rise of about 60 million in just five years. The issue of guaranteeing food security will only worsen because, by 2050, the world will need to produce almost 70% more food in order to feed the projected 9 billion people.

The Indian Council of Agricultural Research launched - A Flagship Network Project 'National Initiative on Climate Resilient Agriculture' (NICRA) during XI Plan in February 2011, and during XII Plan it is referred as 'National Innovations in Climate Resilient Agriculture' (NICRA). Considering that the climate change is a continued challenge, the focus on this critical area needs to be continued with greater emphasis. Keeping this view, one scheme has been strengthened and efforts were made to build on the initiative taken during XII five year plan. Thus National Innovations in Climate Resilient Agriculture' (NICRA) has been continuing with these objectives 1. To enhance the resilience of Indian agriculture covering crops, livestock and fisheries to climatic variability and climate change through development and application of improved production and risk management technologies, 2. To demonstrate site specific technology packages on farmers' fields for adapting to current climate risks, 3. To enhance the capacity building of scientists and other stakeholders in climate resilient agricultural research and its application and 4.To draw policy guidelines for wider scale adoption of resilience-enhancing technologies and options

Technology Demonstration Component (TDC) of NICRA offers great opportunity to work with farmers and apply such technologies under field conditions to address current climate variability.This will accelerate the uptake of these robust technologies. In 121 climatically susceptible areas nationwide, village clusters are doing on-farm participatory demonstrations for climate resilience through KVKs and seven core research institutes of ICAR. The focus has been on documenting and enhancing our knowledge of how technologies function in various farming systems and agro-ecologies. This makes it easier to identify what, in various biophysical and socioeconomic circumstances, qualifies as climate resilience. Plans and methods for contingency crops at the village level were devised and executed by NICRA KVKs.

Climatic vulnerability of selected Seventeen KVK districts of Odisha (9), West Bengal (7) and union Territory of A & N Islands (1) assessed during implementation of NICRA programme brought forward definite requirement in terms of technological support, human resource development and overall empowerment of farming community to enable them to cope up with climate vulnerabilities like droughts, erratic rainfall, heat wave, flood, cyclonic storm. Plan of action, accordingly, was prepared for its implementation through executing technological interventions to initiate crop production, resource conservation, livestock and fish rearing, water harvesting *etc.* in the vulnerable villages of KVK districts.

The vulnerabilities of the respective KVK under different districts are mentioned here under:

A & N Islands

S. N.	Districts	Climate vulnerability
1	Port Blair	Cyclone

Odisha

S. N.	Districts	Climate vulnerability
1	Ganjam 1	Drought
2	Bolangir	Drought
3	Kalahandi	Drought

S. N.	Districts	Climate vulnerability
4	Kendrapara	Flood / Cyclone
5	Keojhar	Drought / Flood
6	Puri	Heavy rainfall with irregular distribution, flood
7	Jagatsinghpur	Flood/Cyclone
8	Bhadrak	Flood, eratic distribution of rain, thunderstorm in summer
9	Dhenkanal	Erratic, unseasonal rainfall with irregular distribution

West Bengal

S. N.	Districts	Climate vulnerability
1	Coochbehar	Heavy rainfall
2	Malda	Flood
3	South 24 Parganas	Cyclonic storm/heavy rainfall within short period
4	North 24 Parganas	Cyclone and Flood prone with soil salinity during Rabi-Summer
5	Purulia	Intermediate drought, Heat wave
6	Mursidabad II	Drought
7	Kalimpong	Cold and foggy

Components of National Innovations on Climate Resilient Agriculture Programme in various module benefitting 32880 farmers (NRM- 2369, Crop Production-4006, Livestock and Fisheries- 2294, Institutional Interventions- 5294, Capacity Building-4992 and Extension Activities- 13925).

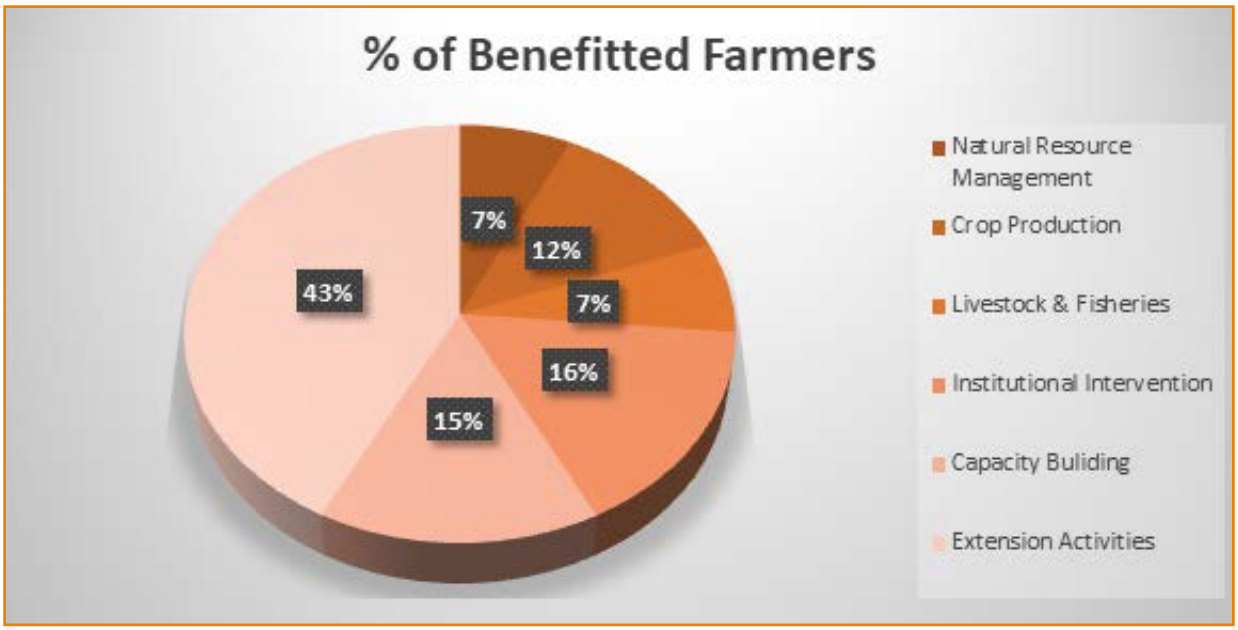
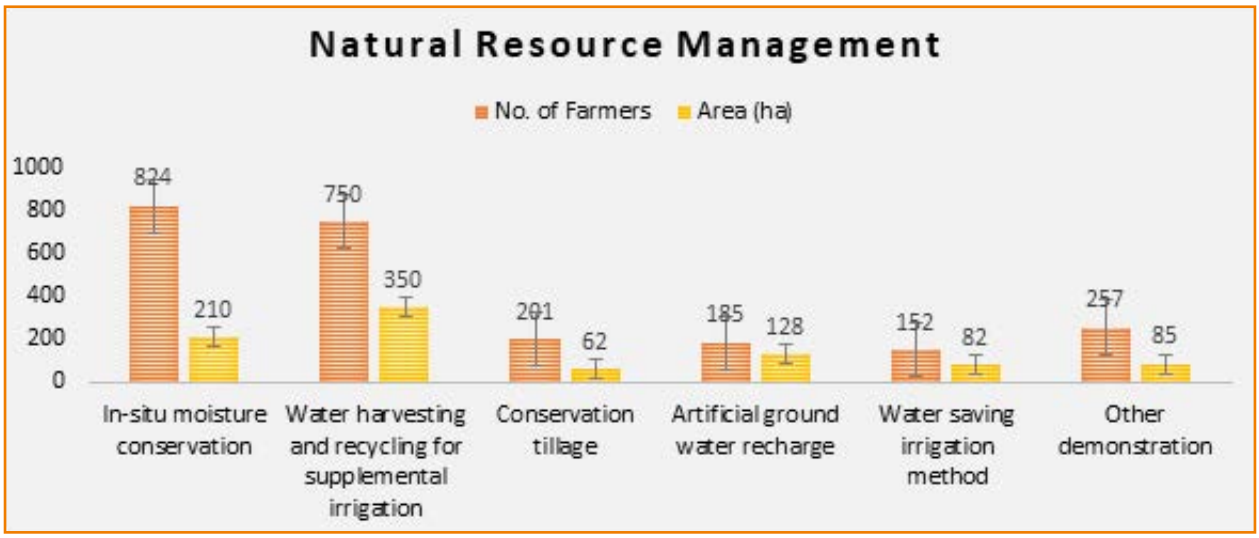


Fig: % of Benefitted Farmers under different component of NICRA-TDC

Natural Resource Management

Various demonstrations of in-situ moisture conservation strategies, such as summer plowing, green manuring, zero tillage, organic mulching, etc., have been conducted in seventeen NICRA-adopted communities, covering 210 hectares with 824 farmers. The implementation of the Broad Bed and Furrow intervention had a significant effect on the farmers of A&N Island. The ridge and furrow method is used to seed maize in order to increase water efficiency and avoid water logging. The ridge and furrow method is used to seed maize in order to increase water efficiency and avoid water logging. The various KVKs demonstrated water collection and recycling for supplemental irrigation in adopted villages by repairing ponds, wells, and canals, erecting bundsetc. With wheat,

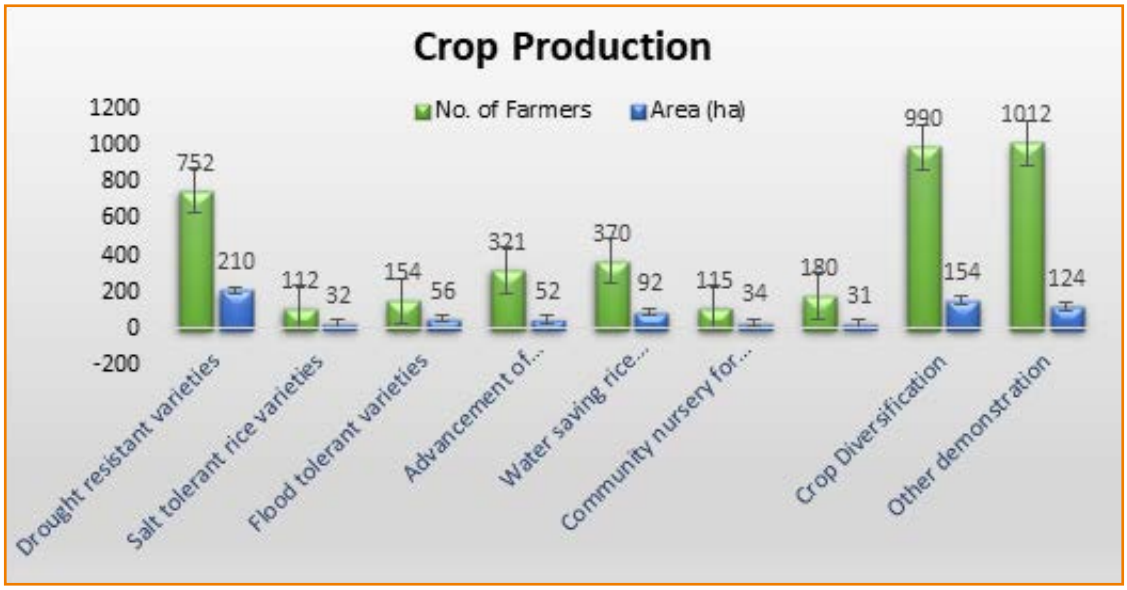
lentils, and chickpeas, more than 62 hectares of land farmed by 201 farmers effectively employed the conservation tillage strategy for resource conservation.In NICRA-adopted areas, 152 farmer farms spanning 82 hectares demonstrated the use of sprinkler irrigation, LEWA for rice, RBF for brinjal, and micro-lift irrigation for rice. 65 new rainwater collection structures and 51 restored ones have been constructed, with a combined storage capacity of 1.02 million cu m and the potential for protected irrigation of 512 hectares. Cropping intensity was increased by up to 250% using this approach. Artificial ground water recharge techniques include field bundling, water management, and SRI by subsoiler in rice demonstrated in farmer's fields. This module provided 917 hectares of land worth of benefits to 2369 different farmers in total. Number of farmers and area covered of different intervention under this module are as follow:



Crop Production

Under the Crop Production module, a range of area-specific measures were implemented, such as showcasing drought, salt, and flood tolerant/ resistant varieties; pushing forward the planting dates of Rabi crops to prevent terminal heat stress; utilizing water-saving paddy cultivation techniques such as SRI, aerobic, and direct seedling; setting up community nurseries to delay the monsoon; introducing new crops/crop diversification; and providing custodial care. Drought-tolerant rice cultivars like Sahbhagi, Anjali, Naveen, and Abhishek; brinjal (*VNR-218*), tomato (*Utkal kumara, laxmi*), cotton (*Shalimar*), chilli (*VNR-315*), maize (*CO-4*) were tested in 752 farmer fields over 210 hectares. A total of 32 hawere used to test 112 farmer's fields with the following salt-tolerant rice cultivars: Gosaba 5, CARI Dhan-5, Usar Dhan-5, Jarava, Geetanjali, SR-26B, and Amalmona. During rabi season, crops such as rice, wheat, lentils, mustard, potatoes, and others were sown 12 days ahead of time to avoid terminal heat stress. These demonstrations took place in adopted villages

and comprised 321 farms cover52 hectares of land owned by farmers. A 34 hectare area was covered for spaced-out community nurseries of rice, brinjal, cauliflower, and tomato, with the aim of benefiting 115 farmers. In Odisha, ridge and furrow farming is very common. Cabbage, cauliflower, brinjal, tomatoes, chilies, cowpeas, and bottle gourds are grown on an area about 245 hectares. The yearly revenue on average is quite high. Using hybrid maize allows for crop diversification. Different intercropping methods were shown in areas where intercropping is a crucial adaptation technique for environments with fluctuating rainfall. Site-specific intercropping intervention was demonstrated in almost all adopted villages. Benefits were given to 4006 farmers in total, covering 785 hectares of land. Number of farmers and area covered of different intervention under this module are as follow:



Livestock and Fisheries

Numerous interventions focused on the needs of livestock were implemented, such as improving breeds, managing feed and fodder balance through mineral mixtures, producing silage and feed blocks, azolla feeding, improving shelters to lessen livestock heat stress, and managing fish ponds and tanks in times of excess and scarcity of water.These treatments were received by 1412 livestock owners with 4121 animals registered in the immunization campaign. Animals in rainfed areas need on a steady supply of dry or green feed to survive. Numerous states experienced delayed onset and insufficient precipitation conditions. There has been a decline in the area planted with pulses and millets, which are essential for providing fodder in rainfed areas. Improved output of silage and rice-bean fodder was seen in farmer farms. Community

lands employ 175 farmers for various forms of fodder production, were on show in a number of adopted villages. The initiative's primary feedstuffs were hybrid napier, sudanchari, oats, and berseem. Of all four demonstration legumes, Sudan grass had the highest benefit return (B: C: 5.59). The following vaccination clinics were held in the adopted communities: deworming, PPR for goats, FMD for cattle, Ranikhet for poultry, and BQ vaccine. Up to 90% less deaths and up to 40% more milk produced by cattle on average have been reported when the immunization camps were organized. An exhibit featured backyard poultry from rural areas (Kuroiler and Nicobari ducks), along with cow feed made of mineral mixture, azolla, vanraja, kadaknath, and Khaki Campbell ducks. An enhanced ornamental bird was introduced with the help of this intervention, which also produced incredibly optimistic effects. Low death rates and less heat stress were seen in the upgraded chicken shed. Better shelter with standard space allowed poultry and dairy animals to perform better. Improved shelter was shown to be effective to lessen heat stress for increased survivorship of backyard poultry and dairy animals. A total of 2294 number of farmers are benefitted from this module.

Institutional Intervention

Institutional interventions include the creation of commodity groups, a seed bank, a fodder bank, custom hiring for timely operations, communal selling, irrigation, community nursery rearing, and awareness-raising in almost all NICRA communities. A total 4850 numbers of numbers are benefitted from this intervention. A large number of agricultural tools are available at Custom Hiring Center, such as a power tiller, reaper, water pump, raised bed planter, sprayer, zero-till drill, and weeder, among others. A feature of a Mini Automatic Weather Station (AWS) allows farmers to get weather forecasts.

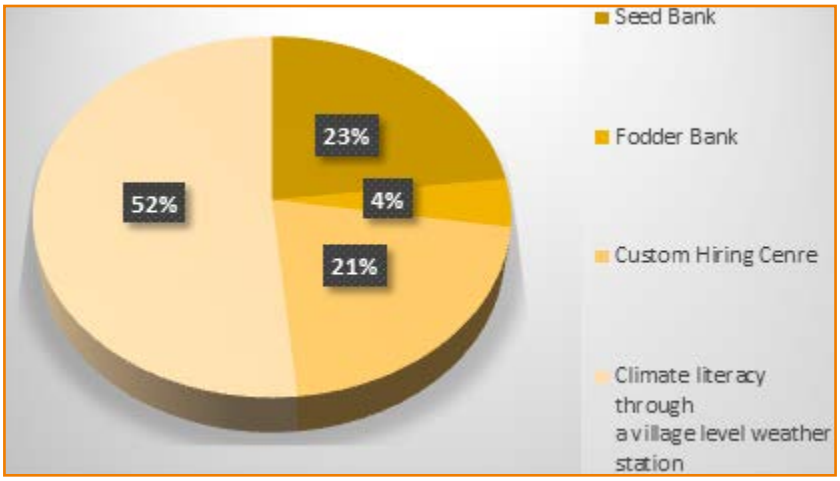


Fig: % of Benefitted farmers from Institutional Intervention

Village Climate Risk Management Committee (VCRMC)

After extensive discussions with the villagers regarding the tactics to be implemented under this initiative and how to mitigate the climatic vulnerabilities of the villages, the Village Climate Risk Management Committee (VCRMC) was established. The President of VCRMC and the Head of the relevant KVK jointly opened a bank account in their name, marking the start of VCRMC's operations. In addition to overseeing the special renting of different farm tools and implements, VCRMC also made critical decisions regarding the technological interventions to be carried out at the village in consultation with the KVK. Farm equipment such as a power tiller, thresher, reaper, water pump, zero-till drill, raised bed planter, sprayer, and weeder are available at Custom Hiring Center.

Custom hiring of farm implementsand machinery at NICRA adopted villages

Apart from consulting the KVK to make important decisions regarding the technological interventions to be implemented in the village, the VCRMC also managed the custom hiring of different farm tools and implements, which has become very popular with the farmers and has brought in a substantial amount of money. Agricultural activities need to be timely in order to deal with climate fluctuations, particularly when sowing and collaborating across cultural boundaries. Access to equipment for planting on raised beds, broad bed furrows, and ridge-furrow is essential for the widespread adoption of resilient methods for maintaining in situ soil moisture and draining excess water in heavy soils. This committee also uses the money received from hiring fees and payments placed into a bank account opened in VCRMC's name. The remaining revenues are used to maintain and repair the tools, with 25% going toward a sustainability fund. The most popular farm equipment that CHCs stock includes disc harrows, bucket lavelers, reapers, thresers, cultivators, rotavators, pumpsets, zero-till

drills, Happy Seeders, BBF planters, drum seeders, multicrop planters, power weeders, mechanical weeders, chaff cutters, conoweeders, duster, sprayers, lavelers, FIRB planters, sub-soilers, zero-till frti-seed, disc harrows, bucket lavelers, reapers, thresers, scrubbers, and other equipment.

Table: Revenue generated through Custom Hiring Centres and VCRMC in KVKs 2023-24

Sl. No.	Name of KVK	Revenue Generated (Rs.)	
		From Custom Hiring Centres	Total Under VCRMC
1	Bhadrak	5000	15000
2	Bolangir	11200	11200
3	Dhenkanal	7500	7500
4	Ganjam I	4300	0
5	Jagatsinghpur	15131	30782
6	Kalahandi	13500	13500
7	Kendrapara	30000	30000
8	Keonjhar	5920	5920
9	Puri	7100	2100
10	Coochbehar	75992	98302
11	Darjeeling	0	2340
12	Malda	4500	65000
13	Murshidabad	49000	66780
14	Purulia	23720	75520
15	North 24 Parganas	41000	106000
16	South 24 Parganas	112337	403634
17	Port Blair	0	21
Total		**406200**	**931499**

Capacity building

Crop management, natural resource management, nutrient management, integrated crop management, crop diversification, resource conservation technology, pest and disease management, livestock and fishery management, nursery raising, employment generation, nutrient garden, repair and maintenance of farm machinery and implements, integrated farming system, fodder and feed management, lac cultivation drudgery reduction with farm implements for women, and nutrient garden are the thematic areas covered among 4992 (2777 farmers and 2215 farm women) number of farmers covering 278 no. of different courses under these thematic areas.

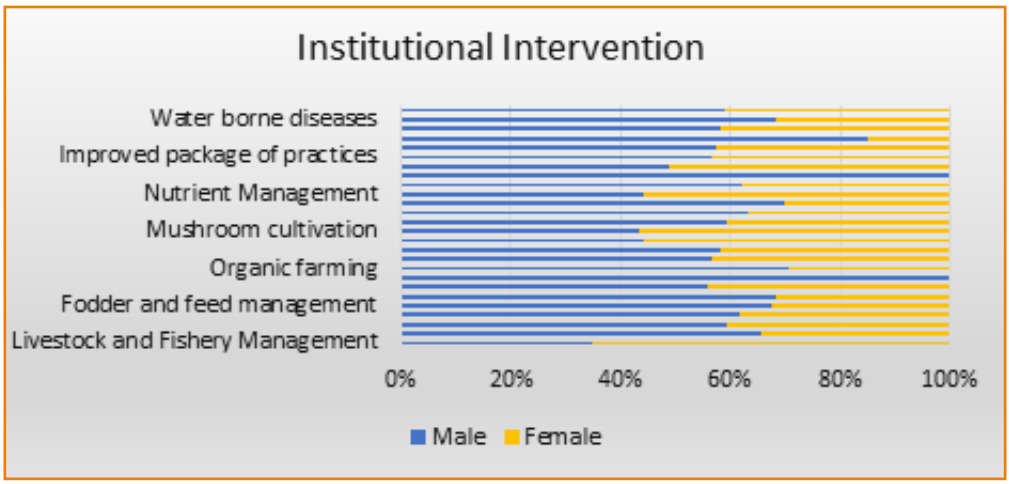


Fig: Beneficiaries under Capacity Building Programme

Extension activities

479 Extension Activities covering a range of topics were provided to 13925 working farmers (8536 men and 5389 women) during the reporting period. Method demonstrations, agro advisory services, resource conservation technologies, awareness animal health camps, diagnostic visits, school student visits, group discussions, World Earth Day, technology week, and kishan mela were some of the extension activities that were carried out. World Soil Day was marked on December 5, 2023, in the appropriate KVK, and 710 soil health certificates were distributed to farmers in NICRA villages.

Name of the activity	Number of Programmes	No. of beneficiaries		
		Male	Female	Total
Method demonstrations	42	540	329	869
Group meetings	25	520	290	810
Field day	21	444	320	764
Exposure visits	32	570	233	803
Awareness Campaigns	32	512	402	914
ICT based extension services	17	480	256	736
Diagnostic visit	27	505	291	796
Field Visit	55	510	280	790
World Environment Day Celebration	14	460	310	770
Live Webcasting	14	394	330	724
Strengthening SHGs	15	0	410	410

Name of the activity	Number of Programmes	No. of beneficiaries		
		Male	Female	Total
Strengthening kisan clubs	10	149	110	259
Other Training Courses	47	810	325	1135
KMAS Services	8	161	85	246
Popular extension literature	31	435	342	777
Animal Health Camp	58	952	285	1237
NICRA Workshop	1	57	38	95
Scientist visit to field	22	385	301	686
Kisan Mela	8	652	452	1104
Total	**479**	**8536**	**5389**	**13925**

Convergence by NICRA with ongoing development programmes

NICRA KVKs engaged in numerous interventions in Convergence mode with developmental agencies that operate in the villages that NICRA has adopted throughout the year. Scaling up of effective initiatives in the community was made possible by funding from various development programs.

In 2023-24, the NICRA implemented KVK with ongoing development programs or schemes through a significant number of convergence programs. ICAR Institutes, the Forest Department, the Irrigation Department, the Sunderban Development Board, the MGNREGA, the SCSP, and several state departments are the prominent development schemes. Through these scheme, a significant sum has been earned during the year.

14.2 Cluster Frontline Demonstrations

14.2.1 Oilseeds

Nodal Scientist: Dr. P.P. Pal

Cluster Frontline Demonstration on Oilseeds under NFSM are carried out to showcase the relative advantage of improved technologies as well as managemnent practices in the farmer's field to replace the existing technologies/management practices for a better yield and financial return by the farmers. The project is being implemented since 2015-16. Initially Bihar, Jharkhand and West Bengal were under this zone. In the year 2017-18 Bihar and Jharkhand shifted under ATARI Patna whereas Odisha joined ATARI Kolkata. Since then, CFLD Oilseeds project is implemented in the KVKs of West Bengal and Odisha under this zone. Usually, the demonstrations are conducted in three seasons, Kharif, Rabi and Summer based on the availability of funds.

In continuation of CFLD Oilseeds programme of the year 2022-23, the reports of Rabi and summer seasons were not recorded in the Annual Report of the year 2022. Therefore, the details of the performance of CFLD Oilseeds during Rabi season of the year 2021-22 are reported in Annual Report of 2023. The demonstrations were conducted on Groundnut, Rapeseed & Mustard and Sunflower in the selected districts through respective KVKs of West Bengal and Odisha.

Table: State and crop wise performance of CFLD Oilseeds during Rabi 2022-23

Sl. No.	State	Crop	Target of FLD Approved		Achievements of CFLD		Yield(q/ha)		Increase%	Difference in yield (q/ha)
			No. of Demo	Area(ha)	No. of Demo	Area(ha)	Demo	Local		
1	West Bengal	Groundnut	150	60	266	60	24.10	18.0	33.88	6.1
		Rapeseed & Mustard	875	350	648	130	13.9	10.0	39.0	3.9
2	Odisha	Groundnut	575	230	378	150	20.40	15.0	36.0	5.4
		Rapeseed & Mustard	400	160	350	140	6.9	5.0	38.0	1.9
		Sunflower	575	230	478	210	15.35	11.0	39.5	4.35
	Total		**2575**	**1030**	**2120**	**690**				

In rabi season total 690 ha area was covered under CFLD Oilseeds in West Bengal and Odisha. Altogether 998 demonstrations were conducted on rapeseed & mustard covering an area of 130 ha in West Bengal and 140 ha in Odisha. The yield increase percentage of rapeseed & mustard is observed 39% in West Bengal and 38% in Odisha. In case of groundnut a total 644 demonstrations were conducted covering an area of 60 ha in West Bengal and 150 ha in Odisha. The yield increase percentage of groundnut is observed 33.88% and 36%, respectively, in West Bengal and Odisha. 478 CFLDs were conducted on sunflower in an area of 210 ha in Odisha. The yield increase percentage of sunflower is observed 39.5%.

Table: State and crop wise performance of CFLD Oilseeds during Summer 2023

Sl. No.	State	Crop	Target of FLD Approved		Achievements of CFLD		Yield(q/ha)		Increase%	Difference in yield (q/ha)
			No. of Demo	Area(ha)	No. of Demo	Area(ha)	Demo	Local		
1	West Bengal	Groundnut	375	150	100	40	22.16	16.11	37.55	6.05
		Sesame	750	300	300	120	12.74	8.45	50.76	4.29
		Sunflower	120	300	175	70	12.0	8.0	50.0	4.0
2	Odisha	Groundnut	100	40	100	40	17.33	12.71	36.34	4.62
		Sesame	175	70	100	40	7.25	4.8	51.04	2.45
		Sunflower	125	50	50	20	15.6	10.8	44.44	4.8
	Total		**1825**	**730**	**825**	**330**				

In summer season total 330 ha area was covered under CFLD Oilseeds in West Bengal and Odisha. Altogether 200 demonstrations were conducted on groundnut covering an area of 40 ha in West Bengal and 40 ha in Odisha. The yield increase percentage of groundnut is observed 37.55% in West Bengal and 36.34% in Odisha. In case of sesame a total 400 demonstrations were conducted covering an area of 120 ha in West Bengal and 40 ha in Odisha. The yield increase percentage of groundnut is observed 50.76% and 51.04%, respectively, in West Bengal and Odisha. 225 CFLDs were conducted on sunflower in an area of 70 ha in West Bengal and 20 ha Odisha. The yield increase percentage of sunflower is observed 44.44%.

Table: State and crop wise performance of CFLD Oilseeds during Kharif 2023

Sl. No.	State	Crop	Target of FLD Approved		Achievements of CFLD		Yield(q/ha)		Increase%	Difference in yield (q/ha)
			Area (ha)	No. of Demo	Area(ha)	No. of Demo	Demo	Local		
1	West Bengal	Groundnut	56	140	76	254	24.13	17.19	40.34	6.94
		Sesame	160	400	130	537	9.24	7.14	29.41	2.10
2	Odisha	Groundnut	50	125	40	125	18.65	14.22	31.15	4.43
		Sesame	340	850	320	970	6.16	4.27	44.26	1.89
		Niger	40	100	40	100	4.73	3.0	57.66	1.73
	Total		**646**	**1615**	**606**	**1986**				

In Kharif season, a total 1986 no of demonstrations were conducted by the KVKs of West Bengal in 206 ha and 400 ha of Odisha. Out of 1986 demonstrations, more no of demonstrations were on Sesame (1507) followed by groundnut (379) and Niger (100). The maximum yield increase percentage in West

Bengal is observed in groundnut i.e., 40.34%. The yield increase percentage of groundnut in Odisha is 31.15%. The yield increase percentage of sesame in West Bengal and Odisha is 29.41% and 44.26%, respectively. In niger the yield increase percentage is 57.66% in Odisha during CLFD Oilseeds Kharif programme of the year 2022.



Success Story on CFLD Oilseeds

Name of KVK	Uttar Dinajpur KVK
Crop and Variety	Groundnut, Dharani (TCGS-1043)
Name of farmer & Address	Keshab Barman, S/o Ramchandra Barman Tunikhari, Chopra, Uttar Dinajpur Mob: 8653052949 
Background information about farmer field	Before Groundnut crop grown, previously the field was rice crop. After harvest of rice the Groundnut crop sown in the field.
Details of technology demonstrated	**Integrated Crop Management:** Improved variety Dharani + Seed treatment through Trichoderma Viredi +spray of 20 % boron @ 1.5 gm/ L at 25 and 60 DAS and Two times Earthing-up at 35 & 60 DAS
Institutional Involvement	All Input supply, Timely technology provided through training and phone service as when required, field monitoring and inspection, visit of field several ties for successful crop growth and crop stand
Success Point	1. New crop introduced at fellow land for second crop. 2. Integrated Crop Management where seed treatment with TV and application of boron as spray for crop growth. 3. Two times Earthing-up at 35 & 60 DAS
Farmer Feedback	He is very happy for crop yield. He is cultivating first time of groundnut and he agreed two times earthing-up in timely gave higher yield than others. Boron application during before and during flowering as spray gave more yields.
Outcome Yield (q/ha)	
- Demonstration	30.60
- Potential yield of variety/technology	39.32
- District average (Previous year)	22.84
- State average (Previous year)	23.33

Table: Performance of technology vis-à-vis Local check (Increase in productivity and returns)

Specific Technology	Yield (q/ha)	Gross cost (Rs/ha)	Gross income (Rs/ha)	Net income (Rs/ha)	B:C ratio
Farmer practices	21.32	50500/-	106600/-	56100/-	2.11
Demonstration	30.60	55800/-	153000/-	97200/-	2.74
% Increase	**43.53**	**10.50**	**43.53**	**73.26**	**29.86**




14.2.2 Pulses

Nodal Scientist: Dr.P.P. Pal

Cluster frontline demonstrations (CFLDs) are being conducted on the farmers' fields at different location in a given farming system to showcase the performance of various advanced production technologies. KVKs located in the states of Odisha and West Bengal and Union Territory of A&N Islandsdemonstrate improved, newly released varieties with appropriate management practices to exploit the production potential of pulse crops at different locations.

The CFLDs on greengramwere takenup for demonstration during summer 2023 as per the set target. Altogether 490 ha were allotted for summer greengram out of which 80 ha could be finally brought under demonstration programme in Odisha and West Bengal. Improved varieties like IPM 205-7 (*Virat*) and IPM 410-3 (*Shikha*) of greengram were demonstrated. Advanced technologies like seed treatment, line sowing, integrated nutrient management, micronutrients like B&Zn application, use of herbicide, integrated pest management were demonstrated in farmers' field. Performance analysis of CFLD results into 33.59 per cent increase in average yield increase in Odisha and 17.34 per cent in West Bengal.

Table: Cluster Frontline Demonstration on summer greengram during 2023

Name of crop	State	Target of FLD approved		Achievements of FLD		Yield (q/ha)		Increase %	Difference in yield (q/ha)
		No.of Demo.	Area (ha)	No.of Demo.	Area (ha)	Demo	Check		
Greengram	Odisha	375	150	75	30	7.04	5.27	33.59	1.77
	West Bengal	850	340	125	50	9.34	7.96	17.34	1.38
Total		**1225**	**490**	**200**	**80**				

During *kharif* 2023, CFLD on pigeon pea was taken up in an area of 430 ha in Odisha and CFLD on blackgram was conducted in an area of 470 ha in West Bengal. The pigeonpea varieties demonstrated were LRG-52 and WRGE 93. The average yield of pigeonpea in CFLD plot was 11.67q/ha whereas in check plot it was 8.25 q/ha, an increase of more than 42 per cent. In West Bengal, increase in average yield of blackgram was 34 per cent. The average yield of blackgram in demonstrated plot was 9.96 q/ha. The blackgram varieties taken up for demonstration were Indra Urd Pratham, PU-31, P U-10, PU 10-23, IPU-13-1, VBN-11, IPU-02-43, VBN-9 and PU-9. The details are given in the following table.

Table: Cluster Frontline Demonstration on *Kharif* Pulses during 2023

Name of crop	State	Target of FLD approved		Achievements of FLD		Yield (q/ha)		Increase %	Difference in yield (q/ha)
		No.of Demo.	Area (ha)	No.of Demo.	Area (ha)	Demo	Check		
Pigeonpea	Odisha	1070	428	1078	430	11.67	8.25	41.53	3.42
Blackgram	West Bengal	1200	480	1175	470	9.96	7.44	33.87	2.52
Total		**2270**	**908**	**2253**	**900**				

14.2.2.1 Krishi MApper Mobile App for CFLD Pulses

As per the communication received from Ministry of Agriculture & Farmers Welfare, all demonstration/ CFLD are to be brought under Krishi Mapper. Krishi MApper is a geo-spatial mobile and mobile application for geo-tagging of land area and collection of baseline land based scheme data to ensure right benefits reach the right beneficiaries. It is evidence based monitoring. Krishi MApper platform helps the users to view the consolidated and comprehensive information pertaining to farmers' agricultural activities across scheme.

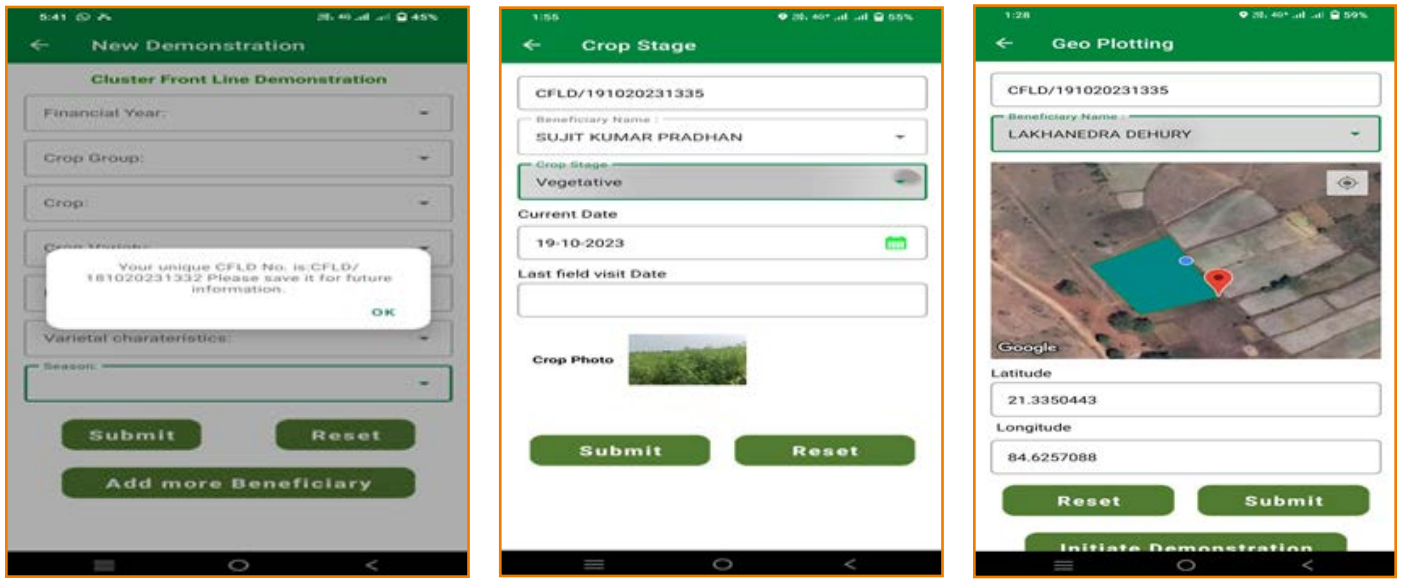
KrishiMApper

Accordingly, KVKs under the jurisdiction of ICAR-ATARI,Kolkata uploaded the information of demonstration/CFLD in Krishi MApper . The details of Krishi Mapper registration by the KVKs are given below:

Table: Status of Krishi MApper Mobile App for CFLD Pulses (*Kharif* 2023)

Programme	Season	Crop	CFLD ID no. created	No. of beneficiaries registered	No. of KVK completed the mapping
CFLD Pulses	Kharif 2023	Pigeonpea	10	93	6 (Odisha)
		Blackgram	46	431	7(W. Bengal)
Total			**56**	**524**	

Photographs of Krishi MApper Mobile App



Success Story on CFLD Pulses

Name of KVK	R. A. KrishiVigyan Kendra, Nimpith
Crop and variety	Greengram, *Virat* (IPM 205-7)
Name of farmer & address	Mr. Tapas Kanji, Vill+ PO-Kishorimohanpur, Block-Kultali, Dist.-South 24 Parganas Pin- 743383 West Bengal 
Background information about farmer's field	Substantial low yield from greengram cultivation was a matter of concern for Mr. Tapas Kanji who was involved in pulse cultivation for last 3 to 4 years. His visit to KVK Nimpith and field of KVK adopted farmers followed by frequent interaction made him understand the potentiality of improved greengram cultivation practices. Consequently,he approached the KVK to be the part of CFLD programme on Greengram. After attending training on improved cultivation of greengram conducted by the KVK,he was selected as one of the beneficiaries for conducting CFLD on greengram.
Details of technology demonstrated	• Line sowing with variety IPM 205-7 • Seed inoculation with *Rhizobium,* PSB & KSB @ 1.5 kg/ ha each • Foliar spray of micro nutrient (B, Mo & Zn) @ • 2g/l of water at flowering stage
Institutional Involvement	Mr. Tapas Kanji was trained by theKVK regarding benefits of improved seed, line sowing, seed inoculation with bio fertilizer and importance of micro nutrient spray. Several field diagnostic visits were done by KVK scientists to solve the problems related to diseases and pest.
Success point	Line sowing (45 cm X 20 cm) makes intercultural operation handy to control weed both manually and mechanically. In addition, tillage operation during weeding also helps in root development and better plant growth. In line sowing plots, more number of pods/plant was recorded. Insect pest infestation was also less in demo plots.

Farmer's feedback	The variety *Virat*produced20.37 % moreyield due to proper crop stand and pod bearing ability. It wasalso tolerant to YMV.Disease and pest infestation were also less. Proper cultural practices helped in better performance of the crop to yield more. The seeds werebold and lash green in colour, as a result it fetched better market price than the local choitimoong. Thus, the net return (Rs.26312/-) as well as benefit-cost ratio was more.
Outcome Yield (q/ha)	
- Demonstration	9.75 q/ha
- Potential yield of variety	10-12 q/ha
- District average	7.19 q/ha
- State average	7.55q/ha

Table: Performance of technology vis-à-vis Local check (Increase in productivity and returns)

UsedPractice	Yield (q/ha)	Gross cost (Rs/ha)	Gross income (Rs/ha)	Net income (Rs/ha)	BC ratio
Farmer's local practices	8.10	33198	51030	17832	1.54
Demonstration with improved package	9.75	37063	63375	26312	1.71
% Increase in yield	**20.37**	-	-	-	-

14.3 Seed Hub Programme for Pulses

Nodal Scientist: Dr.P.P. Pal

Quality seed production is one of the most critical components for ensuring quality seed supply of pulses at the doorstep of farmers. Provision of quality seeds is an important step in enhancing the yield and production of pulses. Replacing old varieties from seed chain and farmers' fields remains a major concern among research managers, extension workers and other stakeholders. Realizing importance of quality seed in enhancing productivity of pulses, Department of Agriculture, Cooperation & Farmers Welfare (DAC&FW), Government of India (GoI), approved a special project "Creation of seed hubs for increasing indigenous production of pulses in India". The main objective of this project was to ensure supply of quality seed and maintain sustainability with profitability for the farmers by developing suitable infrastructure for seed quality enhancement, safe storage and seeds development. ICAR-ATARI, Kolkata has been given responsibility to coordinate and monitor quality seed production of *Kharif*, *Rabi* and Summer pulses through 10 Seed Hub Centres of this Zone. Among the 10 Seed Hub centers, 7 Seed Hubs are in Odisha (Bargarh, Bhadrak, Cuttack, Deogarh, Kalahandi, Keonjhar and Mayurbhanj I) and 3 in West Bengal (South

24 Parganas, Narendrapur, CISH Malda and Uttar Dinajpur). The seed hub project was allotted to these seed hubs during 2017-18 and a one-time grant of Rs. 50 Lakh was sanctioned in the first year for creating infrastructure such as seed processing plant and storage facility. In addition to this, Rs. 100 Lakh was allocated to the seed hub as a revolving fund to meet expenses for production, procurement and processing of seeds. During 2023, Seed Hub centres produced more than 1963.0quintal seed of greengram, lathyrus, blackgram and lentil of less than 10 years old.These centres actively involved in procurement, production, grading, labelling and marketing of seed of farmers. The activities facilitated speeding-up of dissemination and adoption of pulses production technologies. Farmers started to generate additional income through the sale of seeds. It has also been made mandatory to provide such quality seeds to other KVKs of this Zone for their activities like OFT, demonstration and CFLD programme.

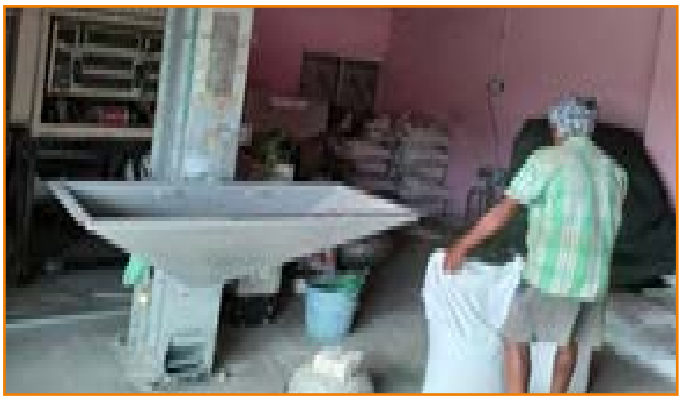
Table: Quality Seed Production Report during *Rabi* 2022-23

Name of KVK	*Crops*	*Variety*	*Year of release*	*Production (q)*				*Remarks*
				Target (q)	*Area (ha.)*	*Production (q)*	*Category (FS/CS)*	
West Bengal								
1. CISH Malda	Lentil	L-4717		135	**20**	186	FS	
	Lentil	IPL-220		115 .0	**15**	98	FS	
Sub-total				**250**	**35**	**284**		
2. South 24 Pgns (Additional)	Lentil	IPL-220	2018	200	25	224	FS & CS	
		L-4717	2017					
	Khesari (Lathyrus)	Bidhan Khesari-1	2019	100	13	110	FS & CS	
	Greengram	*Shikha*	2016	700	60	736	FS & CS	
		Virat	2016					
Sub-total				**1000**	**98**	**1070**		
3.Uttar Dinajpur	Lentil	IPL-220	2018	1	0.13	0.8	FS	
		L-4717	2017	1	0.13	0.7	FS	
		KLS-122	2017	1	0.13	0.7	FS & CS	
		IPL-220	2018	15	2	7.4	CS	
		L-4717	2017	15	2	6.8	CS	
		KLS-122 *(Shekhar 5)*	2017	15	2	7.5	FS	
Sub-total				**48**	**6.39**	**23.9**		
Total				**1298**	**139.39**	**1377.9**		

Name of KVK	Crops	Variety	Year of release	Production (q)				Remarks
				Target (q)	Area (ha.)	Production (q)	Category (FS/CS)	
Odisha								
4.NRRI Cuttack	Blackgram	PU-1(KPU 07-08)	2013	1000	12	67		
5.Mayurbhanj I	Greengram	*Virat*	2016	50	50	7.2		
6.Bhadrak	Greengram	*Virat*	2016	300	60	437.8		
7.Baragarh	Greengram	*Virat*	2016	28	7	20		
8. Deogarh	Greengram	*Virat*	2016	50	10	18.5		
9.Kalahandi				0	0			
10.Keonjhar				0	0			
Total				**1428**	**139**	**550.5**		
Total (*Rabi*)				**2726**	**278.39**	**1928.4**		

Table: Quality Seed Production Report during Summer 2022-23

KVK	Crops	Variety	Year of release	Production (q)				Remarks
				Target (q)	Area (ha.)	Production (q)	Category (FS/CS)	
CISH Malda	Greengram	IPM 410-3 (*Shikha*)	2016	150	20	14.27	**FS**	Target could not be achieved due to unfavourable weather
		Varsha	2018			20.51	**FS**	
Total (Summer)				**150**	**20**	**34.78**		
Grand total (*Rabi* & Summer)				**2876**	**298.39**	**1963.18**		



14.4 Farmer FIRST Programme

Nodal Scientist: Dr. K.S. Das

The Indian Council of Agricultural Research (ICAR) started Farmer FIRST Programme (FFP) during the year 2015-16 to improve the interface between farmers and scientists in order to prioritise smallholder agriculture and the complex, diverse, and risk-prone realities that faced the majority of farmers. It was considered beyond the production and productivity. The main focus was given on farmer's Farm, Innovations, Resources, Science and Technology (FIRST). Resource management, climate

resilient agriculture, supply chains, value chains, market, storage, innovation systems, information systems etc. werealso given attention. The Farmer FIRST as a concept of ICAR was developed as farmer in a centric role for research problem identification, prioritization and conduct of experiments and its management in his farm conditions. Based on the current farmingsituations and problems, technologies were integrated, reviewed and implemented by the scientists to solve the problems of farmers.

After zone reorganisation during 2017 to 2018, four FFP centres i.e. ICAR-CIFA, Bhubaneswar; ICAR-NRRI, Cuttack; ICAR-IIWM, Bhubaneswar and OUAT, Bhubaneswar started working under ATARI Kolkata. All the centres implemented various technologies through different modules and conducted various extension programmes in their new and old adopted villages. During the year 2023, 3150 farm families were involved in 969 demonstrations under crop, horticulture, livestock/ fisheries, IFS, enterprise and NRM modules. Throughout the year a total of 103 programmes on various extension activities were conducted which benefitted 3221 farmers. Two zonal review workshops in hybrid mode were organised by ICAR-ATARI Kolkata for four FFP institutes to review the physical/financial progress (2023-24) of the projects and to finalize the action plan (2024-25). Two monitoring field visits involving PIs/Co-PIs/SRFs/FAs of 4 FFP centres were conducted for checking the progress of different activities being conducted at the adopted villages, for getting farmers' feedback and for cross learning.

During the period of report, one initiative was taken to publish a book entitled *'Recent advances in farmer FIRST programme: Reflection from ICAR-ATARI Kolkata'* from this officewhich reflected the outcome of physical and financial achievements of four concerned centres. Based on the cases of successful farmers, one coffee table bookentitled '*Pioneer farmers: Agri-sustainability through farmer FIRST approach*' was also published by ATARI Kolkata which was released by the Union Agriculture Minister during celebration of Foundation Day of ICAR on 16.07.2023 at New Delhi. One chapter on FFP achievements during 2022-23 for this zone was compiled and submitted to the SMD (AE) to prepare Annual Progress Report of Farmer FIRST Programme 2022-23 which was published by the Division and released in FFP National Workshop held at Palampur, Himachal Pradesh on 28-30 Nov., 2023. Not only that, another book chapter on the achievements of four FFP centres during last 7 years was prepared and submitted from this zone to DKMA, ICAR, New Delhi to publish it in the name of *'From Vision to Impact: Farmer FIRST Programme Achievements in Seven Years'*. ICAR-ATARI Kolkata also organized one exposure visit for the FFP farmers of CIFA, Bhubaneswar to RAKVK, Nimpith, West Bengal to interact with fellow farmers of the KVK and to exchange of ideas on new agricultural technologies. The details of the projects and their fund allocations during 2023-24 are given in the following table.

Sl. No.	*Name of the project (Institute/University)*	*Name of the PI/ Nodal Scientist of the project*	*Fund allocated during 2023-24 (Rs. in lakh)*	*Fund utilized during 2023-24 (Rs. in lakh)*
1.	Increasing productivity and sustaining the rice-based production system through Farmer FIRST approach (*ICAR- National Rice Research Institute, Cuttack*)	Dr. B. Mondal, Pr. Scientist	17.27	17.09
2.	Promoting improved agriculture and allied sector technologies in Khordha district through farmer FIRST approach (*ICAR-Central Institute Freshwater Aquaculture, Bhubaneswar*)	Dr. H. K. De, Pr. Scientist	15.30	15.28
3.	Enhancing water and livelihoods security and improving water productivity in tribal dominated paddy fallow rainfed agro-ecosystem of Odisha (*ICAR-Indian Institute of Water Management, Bhubaneswar*)	Dr. S. K. Mishra, Pr. Scientist	19.90	19.90

Sl. No.	Name of the project (Institute/University)	Name of the PI/ Nodal Scientist of the project	Fund allocated during 2023-24 (Rs. in lakh)	Fund utilized during 2023-24 (Rs. in lakh)
4.	Enhancing farm productivity & profitability with 'Farmer FIRST' focus inKhordha district of Odisha (OUAT, Bhubaneswar)	Prof. B. S. Rath (03 .03.2024) and Prof. B. K. Mahapatra (04 .03.2024), Head, Agronomy	17.38	15.78
5.	*ICAR-Agricultural Technology Application Research Institute (ATARI) Kolkata* as Nodal Institute	Dr. K. S. Das, Pr. Scientist	7.30	7.30
	Total		**77.15**	**75.35**

Salient achievements of projects

The institute-wise salient achievements of FFP during the year 2023-24 have been presented below.

14.4.1 ICAR-CIFA, Bhubaneswar

ICAR-CIFA, Bhubaneswar worked in six villages e.g.Aloi, Barijanga and Purohitpurof Balianta block and Bramhanakhandi, Taraboi and Turintiraof Balipatna block, Khordha district, Odisha. A total of around 400 farmers including farm women were benefitted. Priority was given to small and marginal farmers including SC, ST and women farmers. Under component offarmers-scientists interface, total 4 programmes, 60 field visits and one field day were organised which covered around 1000 beneficiaries. Similarly, under component of technology assemblage, various interventions were implementedthrough different modules in the farmers' field under the close supervision of team of scientists from CIFA.

I. Fishery-based module:

Scientific fish farming was carried out covering pond area of around 15 acres benefiting 110 farmers. That practice gave an average yield of 3.75 t/ha with net return of Rs. 227750/- per ha and B:C ratio of 2.5 against 3.0 t/ha with net return of Rs. 208000/- per ha and B:C ratio of 1.86 in case of existing traditional fish farming.

II. Horticulture-based module:

Various interventions viz.introduction of nutrigardeningusing kits procured from IIHR Bangalore, introduction of improved varieties of cauliflower, French beans, bitter gourd etc. were undertaken. Demonstration of nutrigardening was done for 100 beneficiaries covering 1.5 acres area. Improved thermo-insensitive late variety cauliflower, *Fujiyama,* was demonstrated in an area of 2 acres involving 35 farmers. That variety gave an average yield of 20 t/ha with net return of Rs. 208660/- per ha and B:C ratio of 2.28 against 18.0 t/ha with net return of Rs. 165674/- per ha and B:C ratio of 1.72 usingearlier local variety.

Similarly, two new varieties French beans e.g.*Arka arjuna* and *Arkasharath* were introduced in 2.5 acres of land involving 35 farmers. Those two varieties performed better and gave an average yield of 12 t/ha with net return of Rs. 276112/- per ha and B:C ratio of 3.29 against 10.0 t/ha with net return of Rs. 217070/- per ha and B:C ratio of 2.61 while used the varieties- *Arkakomal* and *Arkasuvidha*.

Forbitter gourd cultivation, an improved variety, *Rushaan*, was introduced in 6.5 acres of land involving 55 farmers, which gave an average yield of 9 t/ha with net return of Rs. 240444/- per ha and B:C ratio of 1.46 against 6.5 t/ha with net return of Rs. 138860/- per ha and B:C ratio of 1.15 while used the variety *US 1315 Nunhems*.

III. Livestock-based module:

Backyard poultry was carried out by introducing 2000 nos. *Vanaraja* and *RIR* day old chicks which involved 82 farmers.

IV. IFS-based module:

Six fish-based IFS were established involving 6 beneficiaries and 15 acres area. The economic feasibility of different interventions is given in the following table.

Crop/technology/ methodology	*Yield (t/ha)*		*Net return (Rs./ha)*		*B:C ratio*	
	Farmers' practice	*Recommended practice*	*Farmers' practice*	*Recommened practice*	*Farmers' practice*	*Recommended practice*
Scientific fish farming	3.0	3.75	208000	227750	1.86	2.5
Introduction of cauliflower var. *Fujiyama*	18	20	165674	208660	1.72	2.28
Introduction of bush type of French bean var. *Arka Arjuna* and *Arka Sharath*	10	12	217070	276112	2.61	3.29
Introduction of bitter gourd	6.5	9	138860	240444	1.15	1.46

ICAR-CIFA, Bhubaneswar inaugurated *'Aqua Chaupal'* under the theme of Aquaculture Field School (AFS) at Sarakana village, Balianta block on 28.07.2023 which was inaugurated by Padmashree awardee Sh. BatakrushnaSahoo. *'Aqua chaupal'* is a place where fish farmers can sit together and discuss fishery related issues to improve decision making ability and develop interpersonal skills among one another. The chaupalwas located close to the fish farm and in the midst of village to attract potential fish farmers to gather and discuss about the issues faced by them in scientific fish farming practices. The team scientists from CIFA constantly guided the fish farmers through regular interactions.

A performance excellence award 2022-23 was awarded to ICAR-CIFA on 30thNovember, 2023 in the National Review Workshop on FFP held at CSKHPKV, Palampur during 28-30th November, 2023 for outstanding performance in Farmer FIRST Project in Zone V.

With the help of ATARI Kolkata, CIFA organized an exposure visit for 6 farmers to RAKVK, Nimpth, West Bengal from 26 to 29thFebruary, 2024. The purpose of this visit was to facilitate cross-learning among farmers. The RAKVK is known as one of the best and award-winning KVKs in India, showcasing various units viz. apiculture, vermi-compost, ornamental fish, IMC, horticulture and many more. During the visit, farmers had the opportunity to learn from the expertise of RAKVK's scientists who provided valuable insights into different units.

14.4.2 ICAR-IIWM, Bhubaneswar

ICAR-IIWM, Bhubaneswar implemented in three newly adopted tribal dominated contiguous villages viz.*Haridamada*, *Jamujhari* and *Barapita* of Khordha district, Odisha having 408 households with a total population of 2119, in addition to three villages of old cluster, namely, *Khuntapingu*, *Mallarpada* and *Jamuda* of Keonjhar district, Odisha during 2023-24. A brief demography of the newly adopted village cluster is given below. The demography (population) of new cluster is given below in table.

Village	*Total household*	*Caste-wise population*			
		SC (Freq, %)	*ST (Freq, %)*	*Others (Freq, %)*	*Total (Freq, %)*
Haridamada	140	0 (0.00)	345 (51.72)	332 (49.78)	677 (100.0)
Jamujhari	189	27 (2.36)	305 (26.66)	812 (70.98)	1,144 (100.0)
Barapita	79	10 (3.35)	288 (96.64)	0 (0.0)	298 (100.0)
Cluster total	**408**	**37 (1.75)**	**938 (44.27)**	**1144 (53.99)**	**2,119 (100.0)**

(Figures in the parentheses indicate percentages)

I. Crop based module:

During summer season 2023, two high yielding rice varieties i.e. '*CR Dhan-310*' (a high protein variety with 10.3% grain protein content) and '*Naveen*' were introduced in Haridamada village with variety '*Mamata*' as local check by providing 30 kg and 84 kg quality paddy seeds, respectively covering an area of 8.0 acres benefiting 16 farmers. The crop cutting experiment (CCE) data revealed fresh grain yield of 6.96 t/h (38.10% yield advantage) of the demonstrated variety '*CR Dhan 310*' and 6.07 t/h of '*Naveen*' (20.44% yield advantage) as against the local check '*Mamata*' with 5.04 t/h. Similarly, during summer season 2024, eight high yielding rice varieties i.e.'*CR Dhan 209*', '*CR Dhan 310*', '*CR Dhan 312*', '*CR Dhan 313*', '*CR Dhan 314*', '*CR Dhan 317*', '*CR Dhan 324*' and '*Khitish*' were introduced in Haridamada and Barapita villages in Khordha cluster by providing 6.0 qt. quality seeds covering an area of 40.0 acres benefiting 60 farmers, the crops of which were in reproductive stages. Pesticidal spray with the broad-spectrum insecticide 'Chlorantraniliprole 18.5 SC' was demonstrated using a 16 lt capacity agricultural drone in 20.0 acres summer rice area in both the villages.

During *kharif* season 2024, four high yielding and climate resilient rice varieties i.e. '*SwarnaSub 1*' (8.0 qt seeds) and '*Mrunalini*' (2.0 qt seeds) in shallow lowland areas; and '*Binadhan 11*' (3.0 qt seeds) and '*MTU 1001*' (2.0 qt seeds)in medium upland areas were demonstrated in all six adopted villages of Khordha and Keonjhar cluster by providing 15.0 qt quality seeds, respectively covering an area of about 125.0 acres benefiting 123 farmers. All seeds were treated with *Trichoderma viridae* by providing 15 kg of the bio-agent. In addition, other crop management practices like green manuring with dhanicha (in 10 acres by 73 farmers), weeding by cono- and finger-weeder and herbicide application (pre-emergence herbicides: Pretilaclor, Pyrazosulfuron ethyl & Londax Power; post-emergence herbicide: Nominee Gold, Almix, Sunrice & Penoxulum), recommended dose of fertilizers and need-based application of pesticides were adopted by the participating farmers. Performance of those four demonstrated varieties were assessed with respect to grain yield (kg/ha), grain productivity (kg/ha/day), gross return, net return, B:C ratio, physical water productivity (kg/m3) and grain yield advantage (change %age over local check). It was found that highest grain productivity of 40.66 kg/ha/day was found in '*Binadhan 11*', highest B:C ratio of 2.13 and grain yield advantage of 24.37% in '*MTU 1001*' against local check '*Lalat*', and highest net return of Rs. 65945/- per ha as well as highest physical water productivity of 0.67 kg/m^3 (kg/1000 lt water) in case of '*Mrunalini*'. All the introduced varieties performed better than their local checks. In order to promote millet in rainfed upland areas, finger millet (variety '*Arjun*') was introduced during *kharif* 2023 in 8.0 acre involving 33 farmers in both the clusters by providing 50kg quality seeds.The performance of climate resilient rice varieties during *kharif* 2023 (N=30) are given in the following table.

Table: Performance of different crop varieties

Varieties (Duration)	*Grain yield (kg/ ha)*	*Grain productivity (kg/ha/day)*	*Gross return (Rs./ha)*	*Net return (Rs./ha)*	*B:C ratio*	*Physical water productivity (kg/m3)*	*Grain yield advantage (%)*
Swarna Sub 1 (145 days)	5525	38.10	120611	63411	2.11	0.65	13.92
Mrunalini (145 days)	5664	39.06	123645	65945	2.14	0.67	16.78
Swarna (Check) (145 days)	4850	33.45	105876	47676	1.82	0.57	Local check
Binadhan 11 (120 days)	4879	40.66	106509	53609	2.01	0.64	14.00
MTU 1001 (135 days)	5323	39.43	116201	61551	2.13	0.63	24.37
Lalat (Check) (130 days)	4280	32.92	93432	38232	1.69	0.52	Local check

II. Horticulture based module:

Demonstrations on high yielding and hybrid vegetable cultivation were conducted during winter season 2023 with eight different kinds of vegetables like cauliflower, cabbage, capsicum, tomato, okra, onion, beans, and pointed guard by providing seeds and seedlings covering an area of 10.0 acres with the participation of 30 farmers in Khordha cluster; 'backyard nutri-gardening' during rainy season 2023 for ensuring family nutrition by providing 325 seed kits to 310 farmwomen; raising quality seedlings in 150 protrays along with coco peat; backyard plantation of fruit crops by 150 farmers/ farmwomen with 235 grafted saplings of mango (var. *GulabKhas*, *Bombay Green*, *Mallika*, *Daseri*, *Amrapalli*, *Himsagar*and *Baiganpalli*) and guava (var. *BNR Bihi*). Results of demonstrations on nutri-garden with a sample of 30 households revealed that out of average total vegetable production of 5527 kg/household, 1917 kg was consumed at home while surplus quantity of 3610 kg was sold locally generating an additional annual family income of Rs. 1.19 lakh per family. Brinjal was preferred most by the farmwomen with an average production of 3740 kg/household (67.7 % of total vegetable production by weight) followed by cucumber (8.1%) and okra (7.4%).

III. NRM based module:

Demonstration on polythene mulching was done in both clusters in 5.0 acre vegetable area involving 20 farmers for water conservation, weed control and increasing water use efficiency and overall crop productivity. In addition, two ICAR-IIWM developed technologies, namely, (i) three 'dugout sunken ponds' and (ii) eighteen cemented 'optimum dyke heights structure' were constructed in rice fields benefitting over fifteen farmers of Haridamada village for conserving rainwater and increasing water productivity in three locations covering about 15 acres area. Farmers in groups were provided with six diesel pump sets (3.2 HP-3 nos., 5 HP-3 nos.) with irrigation pipes, three paddy threshers-cum-winnowers, two power weeders, ten cono-weeders and twelve numbers of battery operated power sprayers for community level weed and pest management.

IV. Livestock based module:

For undertaking demonstrations on scientific backyard poultry production, 2639 nos. one-day old chicks of four strains, namely, *Vanaraja*, *Vejaguda*, *RIR* and *Kaveri*; 60 nos. feeders, 60 nos. drinker, 500kg pre-starter chick feed, various vaccines, food supplements like vitamins, minerals, growth promoters, immunity booster, glucose, medicines and electric bulbs with reflector etc. were provided as critical inputs to 70 farmers in three adopted villages i.e.Haridamada, Jamujhari and Barapita of Khordha. For enhancing milk production as well as promoting good health of livestock animals like cattle and goats, 200 kg of mineral mixtures were provided to over hundred animal growers in the newly adopted cluster.

V. Enterprise based module:

Demonstrations on paddy straw and oyster mushroom cultivation, and vermi-composting were conducted in three adopted villages of Khordha cluster benefiting 125, 125 and 76 farmers and farmwomen, respectively. As critical inputs, 500 spawn bottles each of paddy straw and oyster mushroom, polythene sheets and two vermi-compost beds along with required quantity of earthworms were provided. The adopted farmerSri KalandiCharanBehera of Haridamada produced 450 kg of vermi-compost from two beds in five months, of which he used 150 kg in his farm while he sold 300 kg surplus @ Rs. 25/- per kg earning Rs. 7500/-.

HRD/ training programmes for farmers:

A total of ten farmers' trainings programmes were organized during 2023-24 covering various aspects of field and horticultural crops, poultry, mushroom, vermicompost and use of drone in agriculture benefiting 746 farmers, farmwomen and rural youths in six adopted villages of both the clusters. The details of training programmes are given in the following table.

Table: Different training programme for farmers

Sl. No.	*Title of the Training Programme*	*Date*	*No. of trainees*
1	*'Seed treatment, nursery management and green manuring in kharif paddy'* for Haridamada and Jamujhari farmers	12.06.2023	59
2	*'Seed treatment, nursery management and green manuring in kharif paddy'* for Barapita farmers	13.06.2023	59
3	*'Generating employment opportunities and enhancing farm income through horticultural enterprises'* for three newly adopted of Khordha	12 to 14.07.2023	76
4	*'Integrated crop and water management in kharif paddy and rainy season vegetables'* for Khuntapingu and Mallarpada farmers, Keonjhar	17.08.2023	57
5	*'Integrated crop and water management in kharif paddy and rainy season vegetables'* at Jamuda farmers, Keonjhar	18.08.2023	51
6	*'Integrated weed management in rice, finger millet and rainy season vegetables'* in Khordha cluster	29.09.2023	49
7	*'Oyster mushroom farming for additional family income and nutritional security'* in Khordha cluster	28.12.2023	102
8	*'Trichoderma viridae for rice seed treatment'* in rice in Khordha cluster	15.01.2024	59
9	*'Scientific backyard poultry farming'* with improved breeds for livelihood and nutritional security' in Khordha cluster	21.2.2024	50
10	*'Use of drone technology in agriculture'* in Khordha cluster	7 and 9 to 10.03. 2024	184
	Total		***746***



Farmer-scientists interface:

In addition to regular field visits, monitoring and technological backstopping by the project scientists and staff, over thirty special events like rice and millet field days along with CCEs and feedback sharing activity on demonstrations, *pre-kharif* and *pre-rabi* planning meeting, parthenium awareness week, van mahotsav, swachhta awareness-cum-cleanliness drive, world environment day-cum-plantation drive etc. were conducted in the adopted clusters.




Awards and recognitions:

- Adopted farmwoman Smt. Mina Mahanta of Khuntapingu, Keonjhar was felicitated with the *'Excellent Farmer Award'* by Sri Arjun MundaJi, Hon'ble Union Minster of Agriculture & Farmers Welfare, Govt. of India on 3rd February, 2024 during the *'Regional Agricultural Fair for Eastern Region'* organized at Torpa, Khunti, Jharkhand during 3-5 Feb., 2024 in the presence of Secretary (DARE) & DG (ICAR).
- Smt. Mina Mahanta of Khuntapingu, Keonjhar has also been selected as the *'IARI Innovative*

Farmer 2024' to be felicitated during the 'PusaKrishiVigyanMela 2024' (*scheduled in February, 2024, but was postponed*).

- Sri KalandiCharanaBehera of Haridamada, Khordha received *'Progressive Farmer Award'* from DDG (NRM), ICAR during the 36th Foundation Day of ICAR-IIWM on 11th May, 2023 in the presence of the Principal Secretary (Ag & FE), Govt. of Odisha and VC (OUAT), Bhubaneswar.
- Sri Narayan Behera and Sri AtilaNayk of Haridamada village were felicitated with *'Water Saver Award'* by DDG (NRM), ICAR during the *'World Water Day 2024'* celebration by ICAR-IIWM on 22nd March, 2024.
- Seven adopted farmers (04) and farmwomen (03), namely, Sri Narayan Behera, Sri Prafulla Dalai, Sri BankanidhiNayak, Sri ChabanDehuri, Smt. NiraNayak, Smt. Mani Hisa and Smt. SaraswatiBirua from Haridamada, Jamujhari and Barapita adopted villages of Khordha were felicitated by ICAR-IIWM during the *'10th World Soil Day'* celebration on 5th December, 2023.

14.4.3 ICAR-NRRI, Cuttack

ICAR-NRRI, Cuttack implemented the project in four villages viz. Purushottampur, Ganapur, Gopinathpur, Malihata of Salipurblock of Cuttack district and involved 672 farmers including farm women under different modules and 361 farmers including farm women under capacity building and different extension activities.

I. Crop-based module:

The institute demonstrated four most promising rice varieties namely,*'CR Dhan 1009 (Sub-1)', 'Swarna Sub-1', 'Varshadhan'* and *'Sarala'* with complete package of practices during *kharif* 2023 covering over 107 acre area in four adopted villages. As critical inputs, 10-15 kg seed mini kits along with partial fertilizers and need-based pesticides were provided to each of the 152 farmers. Demonstrated and distributed *Trichoderma viridae* as a bio-fungicide for seed and soil treatment, and also demonstrated of battery-operated sprayer where 20 farmers were benefitted through the project.

II. Horticulture-based module:

Cultivation of vegetables i.e.cucumber (*Rain special*), bitter gourd (*Rushan*), ridge gourd (*NZ/1001*), cauliflower (*White Pearl*and*NS60N*), cabbage (*Bio samrat*), chilli (*HP 7715*and*HP 5424*), brinjal (*1419 Long*) and capsicum (*Rajdhani*) were demonstrated for 194 farmers/farmwomen. Tissue culture papaya cultivation was also demonstrated and seedlings (*Red lady*) were distributed among two farmers. Six net house structures for raising and protecting nursery and saplings were demonstrated to the farmers during the period under report.

III. Livestock-based module:

For enhancing milk production and improving health and productivity of dairy cattle and for popularizing goat farming, demonstrations on feeding of mineral mixture were done in the adopted villages and 400 kg mineral mixture (Agrimin Forte®)was distributed as critical input among 180 dairy farmers.

IV. Enterprise-based module:

The method of paddy straw mushroom cultivation was demonstrated among 94 farmers/farmwomen @ 10-15 beds each along with providing polythene sheet of 105 kg. The method for converting organic waste into nutrient rich vermincompost to enhance soil fertility and to reduce the dependency of chemical fertilizers was also demonstrated to 30 farmers.

Wet grinder and badi dropper for 4 women groups were demonstrated to produce value added product (badi) for enhancing their income through badiproduction.Under capacity building and extension activities, training programmeswere conducted on '*Feeding and Medication in Animals and Birds*' for 88 farmers and *'Integrated disease and pest management in rice'*for 67 farmers. The *'National Millet Expo 2023'* was conducted for 38 farmers. Exposure visit of farmers was conducted for 10 farmers. Not only that, skill training-cum-demonstration programme on vermicomposting for 37 farmers and field visit and interaction meet by team ICAR-ATARI, Kolkata were also organized where 112 farmers got benefit from it.

On the occasion of celebration of *'International Women's Day 2024'*, five women farmers of FFP were awarded with *'Innovative Farmers Award'* for different agricultural activities at ICAR-NRRI, Cuttack during the period under report.

14.4.4 OUAT, Bhubaneswar

During the year 2023-24, OUAT, Bhubaneswar conducted various activities in 4 old adopted villages i.e.Govindapur, Gopalpur, Brahmapura and Brahmapurapatna,Govindapur GP, Beguniablock, Khordha, Odisha and 2 new adopted villages i.e. Lokipur andBrahmapura II under the same block. A total of 470 households were involved from the adopted villages.

I. Crop-based module:

Before FFP intervention, the farmers were following broadcasting and low yielding local varieties like *Nalidhusura,Chinamali*etc. were used. After FFP intervention towards DFI**,** demonstrations of line sowing and HYVs like *Kalachampa* and *Mrunalini* with improved package of practices were done in 75 ha area involving 120 farmers. The yield advantages are given in the table below.

Table: Performance of crop varieties

Crop variety	*Area (ha)*	*Yield (q/ha)*	*Percentage growth over farmers' practice*	*Net return (Rs.)*
Kalachampa (150 days)	40	23	13	13278/-
Mrunalini (145 days)	35	21	11	9278/-

II. Horticulture-based module:

The production of hybrid pumpkin var. *'Kalas Rana'* andhybrid cucumber cv. *'Rajmata'* were intensified through demonstrations in 7 ha area involving 50 households. Through that, the seed rate/ha was reduced by 500g/ha and off-season cultivation of hybrid pumpkin with improved package of practices enhanced the profitability of farmers. On the other

hand, cultivation of hybrid papaya var. *'Red Lady 782'* was introduced among farmers which covered 2 ha area and 10 households in adopted villages. The scientific cultivation practices of marigold var. *'BM 2'* were also introduced which was grown in pro-tray culture under poly-house through root cuttings. For the first time 4000 sq m area was covered involving 5 households. The economics of production has been given in the table below. The papaya cultivation along with pointed gourd production in trellis system gave good profit to the farmers during off-season.

Table: Performance of crop varieties

Crop variety	*Area (ha)*	*Yield (q/ha)*	*Percentage growth over farmers' practice*	*Net return (Rs.)*
Pumpkin hybrid *'Kalas Rana'*	5.0	210	117	123486/-
Cucumber- Annapurna hybrid *'Rajmata'*	2.0	186	66	186429/-
Papaya hybrid *'Red Lady 782'*	2.0	292	235	207960/-
Marigold, rooted cuttings *'BM 2'*	0.25	60	Newly introduced	100000/-
Papaya + pointed gourd in trellis	2.0	392	97	470400/-

Through convergence with Odisha State Govt. Departments, improved package of practices of the following horticultural crops were demonstrated to the farmers by the scientists of OUAT under FFP during 2023-24 which gave substantial income to the farmers.

Table: Different crop varietal performance

Crop variety	*Area (ha)*	*Households (No.)*	*Yield (q/ha)*	*Net return (Rs./ha)*
Brinjal	5	50	625	402000/-
Bitter gourd	2	10	415	795500/-

III. Livestock-based module:

Scientific management of crossbred dairy cows, enhancing the performance of goat trough scientific package of practices and improving production and productivity of backyard poultry were demonstrated in 50 cows, 257 goats and 1000 birds involving 50, 50 and 100 households, respectively.

Dairy component: The dairy animals were facilitated with vaccination for diseases like HS, BQ and FMD and also advised for routine deworming and supplementation of mineral mixture/vitamins through feed. Deworming medicines and vitamins were also distributed among livestock farmers. Training regarding scientific dairy farming, oestrous synchronization, nutritional management and adopting hygienic measures for improvised animal health care were given. Fifty repeat breeder cows with single birth were identified for therapeutic intervention and timely AI to promote crossbreeding for enhancing milk production. It was observed that after FFP intervention, milk production of animals increased from 2 lit/day to 5 lit/day and farmers income increased from Rs. 1910/- per month to Rs. 3290/- per month.

Goatery component: Before intervention, the kid mortality rate was about 20%. After introducing superior *Ganjam*breed buck into the breeding programme, the mortality rate came down to 3.95%. The birth weight of kids was increased from 1.53kg to 1.85 kg in 2023-24 whereas weaning weight of kids at 90 days was increased from 3.03 kg to 3.77 kg during the period. Improvement in slaughter weight was noted by 40% (5-7 kg/ animal) which led to increase the net income of farmer from Rs. 3250/- to Rs. 5950/-.

Backyard poultry: The beneficiaries were provided with 21 days old chicks rather than day old chicks in convergence with Odisha State Govt. Animal Husbandry Department. The chicks were vaccinated and supplemented with vitamins and feeds for proper growth under backyard rearing. The project intervention enhanced the profit from Rs. 50400/- to Rs. 89600/- to the farmers and provided employment to the unemployed youth and women of the adopted villages through establishing 3 poultry hatchery units.Initiativeswas also taken for capacity building training of one lead farmer for rearing day-old chicksup-to 21 days which were distributed to other FFP poultry beneficiaries. It decreased mortality rate to only 5%. Finally, those interventions were encouraged by the farmers in adopting backyard poultry rearing. A total of 1000 synthetic coloured poultry breeds were distributed among 100 farmers which fetched net income of Rs. 220/- from each bird.

IV. Enterprise-based module:

Low cost-mushroom spawn productionby using paddy seeds, value addition and preservation of paddy straw and oyster mushrooms were demonstrated among 50 households and out of them, 14 progressive farmers started their production during 2023-24. Operations like boiling of paddy, drying, filling in the bottles, plugging with non-absorbent cotton, autoclaving and inoculation of bottles were also demonstrated. Similarly, badi making machine with drier was demonstrated among 15 households for production of badi. On the other hand, vermicomposting was demonstrated for 30 households to reduce the purchase cost of fertilizers. Demonstration of vermicomposting gave extra income of Rs. 9600/- annually to the farmers. About 75 vermin-bags were distributed among 50 Households in convergence with State Govt. departments. The capacity building of landless farmers for different enterprises were organized by the centre which substantially increased income from agricultural activities. The details of enterprises, interventions and income generation have been presented in the following table.

Table: Performance of various enterprises

Name of the enterprise	*Nature of intervention*	*Net income (Rs.)*
Mushroom spawn production unit (8 progressive farmers)	1497 paddy straw spawn bottles (118contaminated, 1374 sold @ 18-20/ bottle)	Rs. 19300/- (gross income= Rs. 28300/- and cost of production= Rs. 9000/-)
Spawn production using Paddy seeds (6 progressive farmers)	1293 paddy straw spawn bottles (72 contaminated, 1221 sold @ 18-20/ bottle) within 3 months	Rs. 17978/- (gross income= Rs. 21978/- and cost of production= Rs. 4000/-)
Using low-cost of technology for mushroom spawn production i.e. PP bags and paddy seeds instead of glass bottles and wheat reduced the cost of production of spawn bottles by Rs. 3/- per bag. The spawn quantity was increased by 15% using PP bags.		
Flour mill	Grinding of spices and condiments	Rs.22000/-to Rs. 25000/- per year
Dal mill	Splitting of green gram, black gram, urad dal etc.	Rs.35000/- to Rs. 50000/- per year

14.5 Development Action Plan for Scheduled Tribes erstwhile Tribal Sub-Plan or Scheduled Tribe Component

Nodal Scientists: Dr. K.S. Das and Dr. S.K. Mondal

The Tribal Sub Plan (TSP) was implemented in India for the first time during Fifth Five Year Plan (1974-1979) and the sphere of the plan was gradually increased with the passage of time. The purpose of TSP was to minimize the gap between the livelihood of tribal people and other general communities both in physical and financial terms through addressing the issues relating to education, health services, housing, income generating opportunities, and protection against exploitation and oppression. Ministry of Tribal Affairs, GoI identified tribal dominated (>50% tribal population) districts in India for providing better quality of life to tribal community. After merger of Plan and Non-Plan, the TSP was renamed as Scheduled Tribe Component (STC) by Ministry of Finance in the year 2021-22 and the monitoring of STC plan was given to Ministry of Tribal Affairs. In the year 2022-23, STC was renames as development action plan for scheduled

tribes (DAPST). Ministry of Tribal Affairs is the nodal Ministry for the overall policy, planning and coordination of programs for the development of the Scheduled Tribes.

Under ICAR-ATARI Kolkata, such 10 tribal dominated districts i.e. one district (Nicobar) from Andaman & Nicobar Islands and nine (Gajapati, Kandhamal, Mayurbhanj-I and II, Malkangiri, Nabarangapur, Raygada, Sundargarh-I and II) from Odisha state were identified under this scheme in the year 2023. A sum of Rs. 220.00 lakh fund was allotted to above ten KVKs for conducting various activities e.g. agricultural farming, horticulture, animal husbandry, dairy development, fish production, kitchen gardening, vocational training and many others for tribal people. Out of total fund, Rs. 14.98 lakh was allocated for Andaman & Nicobar Islands KVK and rest Rs. 205.02 lakh was allocated for Odisha state KVKs. The achievements of physical output and outcome under DAPST by the KVKs of ATARI Kolkata during 2023 have been presented in the following table.

Table: Various activities undertaken in tribal districts

Activity	*Unit*	*During the year 2023*	
		Achievements	*No. of benefitted farmers*
Trainings (Capacity building/skill development etc.)	No.	502	12212
On-farm trials (OFTs)	No.	79	616
Front line demonstrations (FLDs)	No.	1871	1871
Awareness camps, exposure visits etc.	No.	440	19071
Input distribution			
Seeds	Quintals	1020.56	4539
Planting materials	No.	757839	33169
Mushroom spawns, bio-fertilizers etc.	Packets	16901	983
Honey bee colonies	No.	45	121
Livestock strain and fish fingerlings	No.	29266	1581
Assets	No.	4576	2809
Infrastructure/civil works/ponds etc.	No.	6	30
Setting up plant nursery/seed farm/hatchery	No.	8	40
Fertilizer (NPK)/secondary fertilizers/micronutrients	Tonnes	8.68	836
FYM/vermicompost	Tonnes	8.74	539
Plant protection chemicals	Kg	260	840
Animal feeds and fodders	Tonnes	6.98	939
Animal medicines	Doses	2218	270
Services/facilitation			
Animal health camps	No.	45	1046
Artificial insemination / vaccination	No.	26	506
Testing samples of soil, plant, water, feed, fodder and livestock disease diagnosis	No.	3410	9004
Promotion of agri-entrepreneurship	No.	153	622
Natural farming (trainings, demonstrations andawareness programmes)	No.	321	4848
Distribution of literature	No.	17510	21284
Total			**117776**

As per achievements of physical output was concerned, a substantial number (4576) of assets e.g. sprayer, ridge maker, pump set, weeder, store bins, drip irrigation set, poultry feeder/ drinker etc. were created for the benefit of 2809 tribal farmers during the period. The KVKs of tribal districts conducted 79 OFTs and 1871 FLDs for overall agricultural development in the districts.

More than 12212 farmers were trained and 19071 farmers took participation in various awareness camps, exposure visits etc. conducted by the KVKs. The KVKs produced 1020 tonnes seed, 7.58 lakh planting materials and 29266 livestock strains and fingerlings which benefitted 4539, 33169 and 1581 tribal farmers, respectively.The KVKs also provided services/facilities in the form of animal health camp, AI/vaccination, testing of soil/plant/water/ feed/fodders and livestock disease diagnosis, and promotion of agri-preneurship and natural farming which benefitted more than 16000 tribal farmers. A total of 21284 farmers got benefit from receiving various literatures related to agricultural farmingduring the period.

14.6 Development Action Plan for Scheduled Castes (DAPSC) or Scheduled Caste Sub-Plan (SCSP) Programme

Nodal Officer: Dr. S.K. Mondal

The Indian Council of Agricultural Research and Ministry of Social Justice& Empowerment, GoI are

jointly running an important Central Sector Scheme, i.e., DAPSC or SCSP. After series of brainstorming and recommendations, it was decided that the Schemes/Projects should address the problem related to farming and value addition faced by the SC farmers. The Schemes/Projects should include activities to develop agriculture and allied sectors viz. irrigation, animal husbandry, dairy development, food processing, vocational training, etc. that provide a source of livelihood to the SC population. This scheme was conceived with specific objectives of:

- Ensuring that the share of resources spent for the benefit of the SCs is at least in proportion to their share in population of the country;
- Substantial reduction in poverty and unemployment, and creation of income generating opportunities among the SCs;
- Creation of productive assets in favour of the SCs;
- Human resource development of the SCs through specifically providing adequate educational and health services;
- Provision of physical and financial security against all types of exploitation and oppression;
- Ensuring mainstreaming most vulnerable community groups in major flagship programmes; and
- Enhancing/creating institutional capacity at national/state/district and local levels for ensuring a voice and social inclusion of the most vulnerable community groups.

During the year 2023, under ICAR-ATARI Kolkata a total of 47 KVKs (24 from Odisha and 23 from West Bengal) were involved in this programme. OFTs (276), FLDs (4653), Training (54614 farmers) and extension activities (165328 farmers) were conducted under this programme. Considerable quantity of seeds (6552 q), planting materials (12.23 lakhs), fish fingerlings (21.23lakhs) and other inputs were distributed among 1.40 lakh farmers. A total of 86900 farmers were benefitted from the activities like animal health camps, vaccination and soil sample analysis. Around 1.00 lakh farmers were given the extension literature and about 5430 man-months of employment were generated. Total budget during 2023-24 was Rs. 990.00 lakhs. The details of the activities are given in the Table below:

Table: Different activities carried out by KVKs of Zone-V under SCSP during 2023

Activity	*Unit*	*During the year 2023*	
		Achievements	*No. of benefitted farmers*
Trainings (Capacity building/skill development etc.)	No.	2168	54614
On-farm trials (OFTs)	No.	276	2174
Front line demonstrations (FLDs)	No.	4653	4653
Awareness camps, exposure visits etc.	No.	4327	165328
Input distribution			
Seeds	Quintals	6021.84	22726
Planting materials	No.	1223507	70447
Mushroom spawns, bio-fertilizers etc.	Packets	52614	2211
Honey bee colonies	No.	284	1159
Livestock strain and fish fingerlings	No.	2226858	21922
Assets	No.	1768	1202
Infrastructure/civil works/ponds etc.	No.	84	408
Setting up plant nursery/seed farm/hatchery	No.	83	298
Fertilizer (NPK)/secondary fertilizers/micronutrients	Tonnes	33.2	4558
FYM/vermicompost	Tonnes	121	3347
Plant protection chemicals	Kg	2109.6	3565

Activity	Unit	During the year 2023	
		Achievements	No. of benefitted farmers
Animal feeds and fodders	Tonnes	34	1232
Animal medicines	Doses	9787	2459
Services/facilitation			
Animal health camps	No.	975	32210
Artificial insemination / vaccination	No.	6078	3019
Testing samples of soil, plant, water, feed, fodder and livestock disease diagnosis	No.	37342	47900
Promotion of agri-entrepreneurship	No.	201	1202
Promotion of IFS, IOFS, Natural Farming, Nutrigarden, kitchen garden, orchards etc.	No.	1364	6107
Distribution of literature	No.	81768	96394
Employment generation for livelihood	Man-months	5430	3821
Total			**552956**






14.7 Attracting and Retaining Youth in Agriculture (ARYA)

Nodal Scientist: Dr. P.P. Pal

Agriculture, with its allied sectors, is the largest source of livelihoods in India. According to FAO (2022), about 70 percent of Indian rural households still depend primarily on agriculture for their livelihood. In this context, it is to be mentioned that India has already been considered as a country of youth, with over 50% of its population under 25 years old and over 65% under 35. This 'youth bulge' phenomenon will last until 2025. India will likely have one of the world's youngest populations until 2030. In every sector of this developing country the active participation of the youth is a prerequisite for the overall development of the country. Youth involvement is strongly realized for agricultural reform also so that it can keep pace with changing global economy. Youth in rural India have been witnessing a paradoxical situation of unemployment on one hand and untapped potential

for transforming agriculture to agribusiness on the other. Channelizing the youth workforce of the country into agriculture sector requires strong strategies for attracting and retaining youth in agro-based rural enterprises. Since large numbers of unemployed rural youth are migrating to cities in search of work, agriculture-based entrepreneurship development can be a viable approach to minimize the outward migration. Creating and sustaining livelihood opportunities in rural areas is fundamental to retain the youth in agriculture. Scientifically managed and business-oriented farms can provide household wellbeing, food security and livelihoods for many millions of people. Realizing the importance, the Indian Council of Agricultural Research (ICAR) implemented the "Attracting and Retaining Youth in Agriculture (ARYA)" project since 2015-16. The ARYA project is an initiative of the Indian Council of Agricultural Research (ICAR), to encourage rural youth sustaining their livelihood in agriculture-based income-generating activities.

In this zone, during 2023-24 altogether nine KVKs namely, Nimpith, Hooghly, Uttar Dinajpur and Purulia from West Bengal and Nayagarh, Sambalpur, Ganjam-1, Puri, and Cuttack from Odisha were involved in carrying out this programme. The location of ARYA implementing KVKs isdepicted in Figure1. The achievements of the project have been assessed against different parameters like increased number of participants, average seasonal/ yearly income, additional manpower creation and support of various organizations towards entrepreneurship development. The total number of training conducted this year, youth involved and entrepreneurial units established and running successfully are presented in Table1. It can be observed that among all the KVKs, highest number of units was developed in Ganjam-I (82) followed by Nayagarh (80), Sambalpur (65), Purulia (57),Puri (51), Hooghly (49), Uttar Dinajpur (28), Nimpith (19), and Cuttack (14). Regardless of KVKs, out of nine (09) enterprises, highest number of youth were involved in horticulture nursery enterprise (201) followed by mushroom enterprise (199).

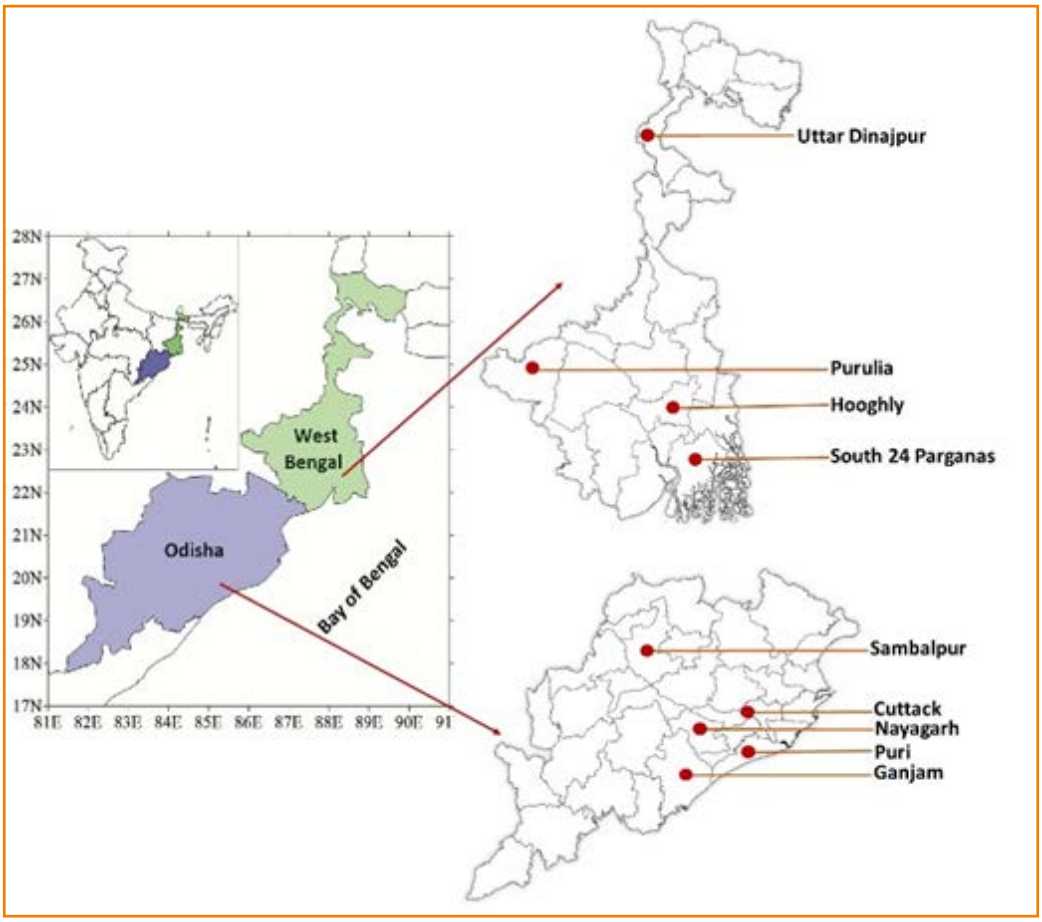
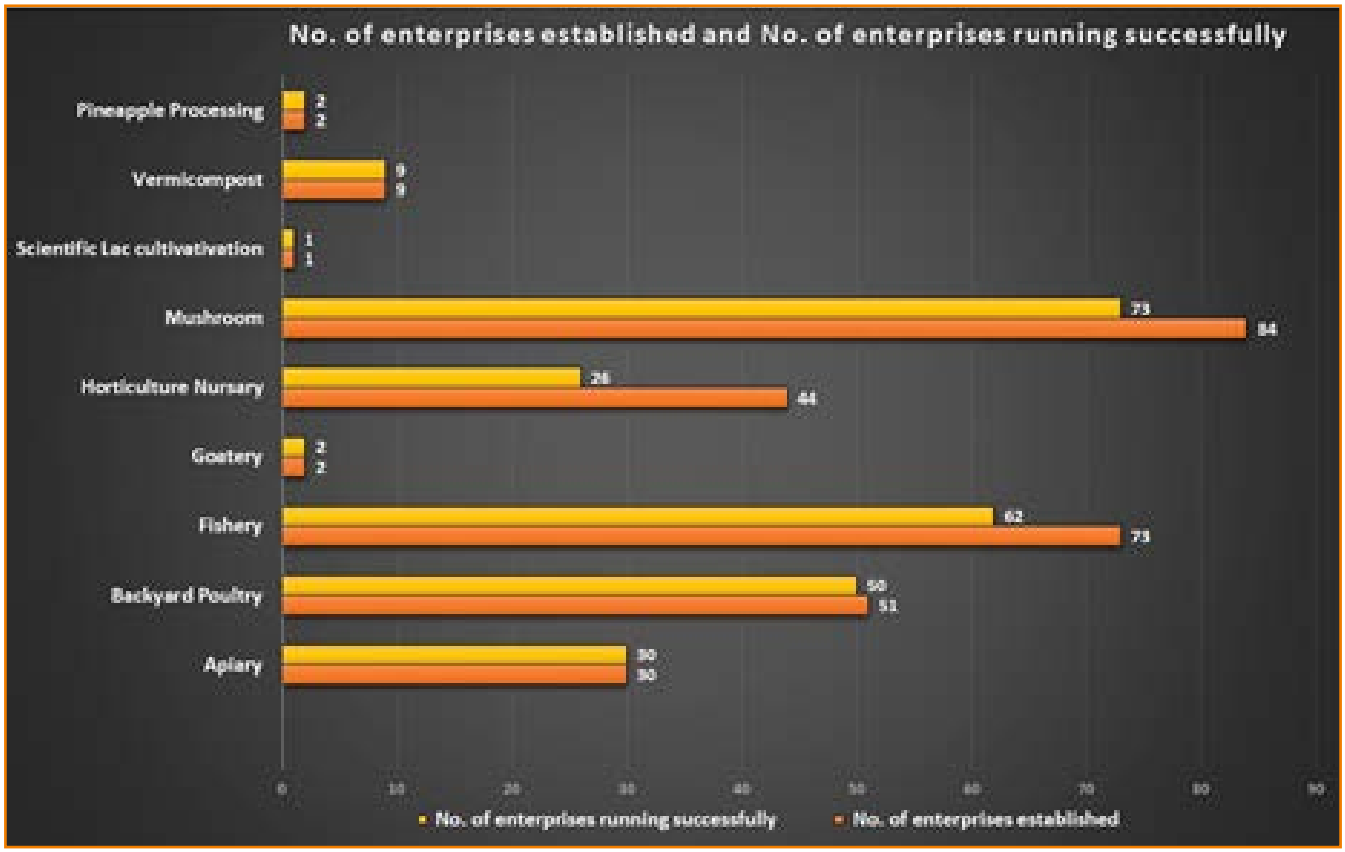


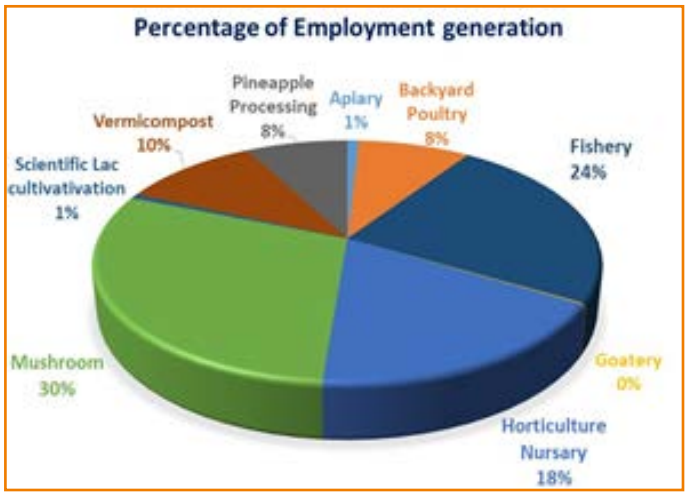
Table1. Training and horizontal spread of ARYA activities

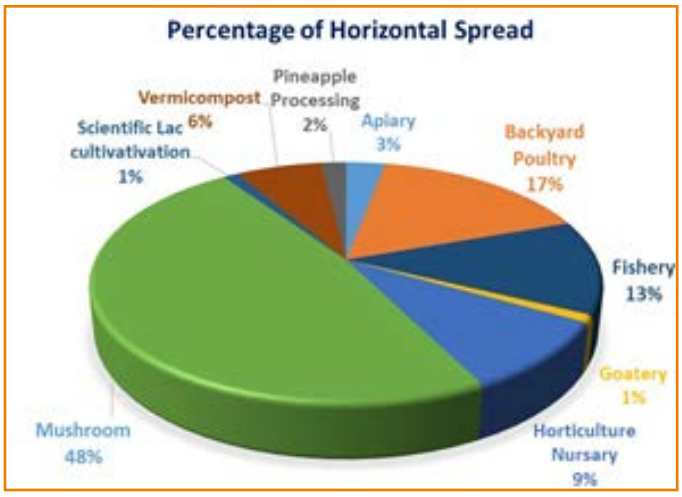
Name of the Enterprise	No. of Training in 2023	No. of youth trained in 2023	No. of entrepreneurial unit established and running successfully in 2023
A. Nimpith KVK			
Fish Hatchery	1	13	5
Horticulture nursery	1	10	5
Mushroom	1	16	4
Poultry	1	10	5
B. Purulia KVK			
Lac cultivation	2	13	13
Vermicompost	2	15	10
Horticulture nursery	2	15	14
Goatery	2	21	20
C. Uttar Dinajpur KVK			
Mushroom	2	41	6
Vermicompost	1	17	10
Fish Hatchery	1	22	8
Horticulture nursery	2	48	2
Pineapple Processing	2	8	2
D. Hooghly KVK			
Horticulture nursery	1	18	15
Poultry	1	19	12
Mushroom	1	14	12
Vermicompost	1	19	10
E. Cuttack KVK			
Mushroom	1	3	3
Poultry	1	4	4
Goatery	1	2	2
Horticulture nursery	1	15	5
F. Nayagarh KVK			
Poultry	1	20	20
Mushroom	1	20	20
Fish Hatchery	1	20	20
Horticulture nursery	1	20	20
G. Sambalpur KVK			
Poultry	1	25	25
Mushroom	1	20	20
Horticulture nursery	2	20	20
H. Ganjam-I KVK			
Fish Hatchery	1	55	12
Poultry	3	70	27
Mushroom	4	70	27
Horticulture nursery	2	55	16
I. Puri KVK			
Mushroom	1	15	15
Poultry	1	15	12
Apiary	1	15	14
Fish Hatchery	1	15	10

The performance of ARYA project in respect of total number of enterprises developed as well as enterprises running successfully is presented graphically in Figure 2. It is observed that out of nine (09) enterprises, highest and lowest number of enterprises was developed in Mushroom (84) and Lac cultivation (1), respectively (Figure 2).

The contribution of ARYA project in terms of employment generation and horizontal spread is indicated in Figure 3. It can be observed that the magnitude of employment generation was highest in Mushroom (30%) followed by Fishery (24%), Horticulture nursery (18%), Vermicompost (10%), Poultry (8%), Pineapple processing (8%), Apiary (1%) and Scientific lac cultivation (1%). The picture is slightly different in the case of horizontal spread of enterprises where maximum spread took place in Mushroom (48%) followed by Poultry (17%), Fishery (13%), Horticulture nursery (9%), Vermicompost (6%), Apiary (3%), Pineapple processing (2%), Scientific lac cultivation (1%) and Goatery (1%).







The benefits of ARYA project on the income parameter of rural youth can easily be understood against the change in their annual income. Figure 4 clearly depicts the difference in annual income from all the enterprises within last one year. Hence, it can very well be concluded that the project has created a positive impact in income generation, employment generation and overall livelihood security.

A brand value always ensures the products quality and fetches a good market. The products and by-products of ARYA enterprises were of no exception. The youth involved in processing of products and its value addition were adequately paid by the market after obtaining *fssai* certificates of value added products of mushroom and pineapple. Local branding of other products also could fetch additional income owing to its hygienic quality and involvement of KVKs during the process of value addition. A no. of SHGs is finding their ways to earn from selling of such products also. The following are the products/by-products of various enterprises:

Action photographs of different enterprises under ARYA project

Mushroom cultivation

Horticulture nursery

Scientific lac cultivation

Poultry

Fishery

Vermicompost

Pineapple processing

14.8 *Mera Gaon Mera Gaurav* Programme

Nodal Scientist: Dr. P.P. Pal

Numerous agricultural revolutions have occurred over the course of history, each of which has gradually improved our capacity to produce food. Nevertheless, additional efforts are still required in order to achieve self-sufficiency and improve the quality of life for Indian farmers. To varied degrees, the farming community accepts and implements the technology that is generated and popularized by research institutes, agricultural universities, private companies, and other organizations. During 2015–2016, the Prime Minister of India made the announcement of the Mera Gaon Mera Gaurav (MGMG) Program. The program's objective was to strengthen the connection between scientific discoveries and their practical implementation, notably in the area of agricultural production. The purpose of this program is to make it easier for scientists and farmers to communicate directly with one another in order to speed up the process of transferring knowledge and technology from the laboratory to the field. Through the adoption of

villages, this initiative makes it possible to provide farmers with the important knowledge, expertise, and direction they require on a constant basis. With the aid of a number of other ICAR institutes, regional research stations, and SAUs, ICAR-ATARI Kolkata is in charge of supervising and carrying out this project in A&N Islands, Odisha, and West Bengal.

Table: Achievements of *Mera Gaon Mera Gaurav* Programme during 2023

State	Groups/ Teams	Scientists involved	Villages covered	Field activities	Messages / advisory sent	Farmers benefited
A&N Islands	9	34	28	53	45	2031
Odisha	41	147	178	430	334	19772
West Bengal	36	122	131	314	322	16416
Total	86	303	337	797	701	38219

14.9 Celebration of Swachhta Pakhwada 2023 (*Swachhta Hi Suraksha*)

Nodal Scientist: Dr. S.K. Mondal

During 2023, various Swachhta activities were conducted by ICAR-ATARI Kolkata as well as its constituent KVKs. For various Swachhta Action Plan (SAP) activities a total of Rs. 20.00 lakh was sanctioned and utilized in the Zone. ICAR-ATARI Kolkata received SwachhtaPakhwada Rank/ Award 3 for the year 2023 from ICAR for recognition of its outstanding contribution towards the maintenance of cleanliness at its premises, at the premises of its KVKs and surroundings for the better and healthy life. The details of the Swachhta activities taken up by ATARI Kolkata and the KVKs of Zone-V have been given below:

Table: Celebration of SwachhtaPakhwada during 16 to 31 December, 2023 (*Swachhta Hi Suraksha*)

Date	Activities	No. of KVKs Involved	No. of Participants (Farmers/ Staff/ Other Participants)	No. of VIPs attended the program
16.12.2023	Display of banner at prominent places, taking Swachhata pledge, Stock taking & briefing of the activities to be organized during the Pakhwada, plantation of trees.	59	614	21
17.12.2023	Basic maintenance: Stock taking on digitization of office records/ e-office implementation. Cleanliness drive including cleaning of offices, corridors and premises. Review of progress on weeding out old records, disposing of old and obsolete furniture's, junk materials and white washing/painting.	32	236	12
18.12.2023	Sanitation and SWM Cleanliness and sanitation drive in the adopted villages and/or other schemes by ICAR Institutes/KVKs involving village community. Reviewing the progress made under ongoing Swachhtaactivities including implementation of Swachhta Action Plan (SAP) & providing at the spot solutions.	35	334	14
19.12.2023	Sanitation and SWM Cleanliness and sanitation drive within campuses and surroundings including residential colonies, common market places. Stock taking of biodegradable and non-biodegradable waste disposal status and providing on the spot solutions.	29	319	11

Date	Activities	No. of KVKs Involved	No. of Participants (Farmers/ Staff/ Other Participants)	No. of VIPs attended the program
20.12.2023	Stock taking of waste management & other activities including utilization of organic wastes/ generation of wealth from waste, polythene free status, composting of kitchen and home waste materials. Promoting clean & green technologies and organic farming practices in kitchen gardens of residential colonies and at least one nearby village and proving on the spot technology solutions.	18	63	4
21.12.2023	Campaign on cleaning of sewerage & water lines, awareness on recycling of waste water, water harvesting for agriculture/ horticulture application/ kitchen gardens in residential colonies/ 1-2 nearby villages.	7	44	7
22.12.2023	Organizing Workshops, exhibitions, technology demonstrations on agricultural technologies for conversion of waste to wealth, safe disposal of all kinds of wastes. Debate on Swachhata at the DARE/ICAR establishments, Seminars, awareness camps, rallies, street plays and expert talks	32	511	10
23.12.2023	Celebration of Special Day - Kisan Diwas (Farmer's Day) - 23 December inviting farmers. Experience sharing on Swachhata initiatives by farmers and civil society officials. Felicitating farmers/ civil society officials for exemplary initiatives on Swachhata.	22	653	14
24.12.2023	Swachhta Awareness at local level (organizing Sanitation Campaigns involving and with the help of the farmers, farm women and village youth in new villages not adopted under any scheme by Institutes/ establishments.	13	167	15
25.12.2023	Cleaning of public places, community market places and/or nearby tourist/selected spots.	8	38	5
26.12.2023	Fostering healthy competition: Organizing Webinar, VC meetings, competition and rewarding best offices/ residential areas/ campuses on cleanliness. Quiz, assay & drawing competitions for school children, village youth.	15	62	7
27.12.2023	Awareness on waste management & other activities including utilization of organic wastes/ generation of wealth from waste, polythene free status. Curb the use of Single Use plastic (SUP) and discourage the use of plastic in the office. Composting of kitchen and home waste materials, promoting clean & green technologies and organic farming practices in new area.	20	237	9
28.12.2023	Campaign on cleaning of sewerage & water lines, awareness on recycling of waste water, water harvesting for agriculture/ horticulture application/ kitchen gardens in residential colonies. Outside campuses/ nearby villages with the involvement of local/ village communities.	22	235	7

Date	Activities	No. of KVKs Involved	No. of Participants (Farmers/ Staff/ Other Participants)	No. of VIPs attended the program
29.12.2023	Visits of community waste disposal sites/ compost pits, cleaning and creating awareness on treatment & safe disposal of bio-degradable/ non-bio-degradable wastes by involving civil/ farming community.	28	109	13
30.12.2023	Involvement of VIP/ VVIPs (Union Ministers, MPS and other dignitaries) in the Swachhta activities, Involvement of print and electronic media may be ensured so that adequate publicity is given to the SwachhtaPakhwada.	8	43	6
31.12.2023	Organization of press conference for highlighting the activities of Swachh Bharat Pakhwada by involving all stake holders including farmers/ VIPs/ press and electronic media.	51	598	8







14.10 Scientific Beekeeping Training: National Bee Board (NBB) Sponsored Central Sector Scheme

Nodal Scientist: Dr. A. Haldar

The importance of bee keeping is enormous. Beekeeping is a profitable enterprise for farmers and rural populations. Beekeeping provides products like honey, bee wax, propolis, pollen, royal jelly, bee venom etc. which have commercial value. Without bees, agriculture is almost impossible. Bees are indispensable for pollination and the service of pollinating flowers is required for sustainable agricultural farming. There is a famous quote from Albert Einstein "If the bee disappeared off the surface of the globe, then man would only have four years left to live" and this may be quite true for an absolutely huge amount of food, because of the existence of bees. About 60-70% agricultural/ horticultural crops depend upon honeybees for cross pollination.The growing market potential for honey and its products has resulted emerging of bee keeping as an economically viable and socially acceptable agro-based enterprise, particularly for socioeconomic development of landless, small and marginal farmers as well as unemployed rural youth. Thus, beekeeping has come up as an important agricultural activity which shows the way of self-

employment and entrepreneurship among the rural youth as well as subsidiary income for the practicing farmers.

With the aim of overall development of beekeepingto increase the productivity of crops through pollination and increase the honey production for increasing the income of the beekeepers/ farmers, the National Bee Board (NBB) has sanctioned Rs. 921.15 lakh/- to the ICAR in the month of January 2021 for organizing 600trainings (500 physical and 100 online trainings) on Scientific Beekeepingby 100 KVKs across the country.Scientific Beekeepingtraining can help people learn the skills and knowledge needed to start a beekeeping business, and to promote beekeeping as an important industry and can help support crops through pollination.

Accordingly, ICAR-ATARI Kolkata received Rs. 64,48,050.00 during 2020- 21 financial year and again Rs. 64,48,050.00 during 2021- 22 financial year from the Council for organizing training on Scientific Beekeepingby selected 15 KVKs of Andaman and Nicobar Islands (Port Blair), Odisha (Cuttack, Dhenkanal, Gajapati, Kalahandi, Keonjhar, Jharsuguda, Puri, Sundargarh-I) and West Bengal (Cooch Behar, Dekshin Dinajpur), Murshidabad-II-Sargachi, Nadia-I-Gayespur, South 24 Parganas-Nimpith, Birbhum) in this Zone V. ICAR-ATARI Kolkata released Rs. 64,48,050.00 during 2020- 21 financial year and again Rs. 64,48,050.00 during 2021- 22 financial year to 15 KVKs. Till March 31, 2024, a total of Rs. 1,28,41,543.00 (99.58% of fund) was utilized and only Rs. 54,557.00remained unutilized.

Objectives

- To train the farmers, rural youth, women for engagement in beekeeping and production of higher quantity and good quality of honey and other high value beehive products, viz.; bee wax, bee pollen, propolis, royal jelly, comb honey, bee venom, etc. in regards to income generation and livelihood support.
- To maximize, economic, ecological and social benefits by diversification through beekeeping.
- To promote agri- entrepreneurs and agri- startup in beekeeping/ honey production through either individual or group approach (SHGs/ FPCs/ FPOs)

Achievements

- Rs. 41,02,293.00 was utilized out of revalidated Rs. 41,56,850.00 by 8 KVKs in Zone V and only Rs. 54,557.00remained unutilized during FY 2023-24.
- A total of 26 trainings on Scientific Beekeepingwere conducted by 7 KVKs of Odisha (Dhenkanal, Gajapati, Kalahandi, Keonjhar, Jharsuguda, Puri, Sundargarh-I) and one KVK of Nadia-I-Gayespur, West Bengal with the participation of 640 trainees in this Zone V.
- The most significant achievements of the training included effective skill development on Scientific Beekeeping, enthusiasm and interest creation among the rural youth, especially women. About 258 trainees have started either individual or group beekeeping entrepreneurship as a new venture.

14.11 CSISA-ICAR Collaboration Project Phase-IV

Nodal Scientist: Dr. P.P. Pal

To discuss the insights of rabi season of 2022-23 and kharif 2023, generate common messages for communication, collect feedback on the progress during rabi 2023-24 and planning activities for kharif 2024, "Convergence Platform (CP) Odisha Meeting and Land Diagnostic Survey (LDS) under CSISA" was organized by the Directorate of Extension Education, OUAT and ATARI, Kolkata in OUAT, Bhubaneswar on 22.02.2024. It was facilitated by CSISA and DSR-Odisha Projects. The meeting was attended by Dr. P.J. Mishra, DEE-OUAT welcomed the Chief Guest Prof. P.K. Roul, Vice Chancellor, OUAT, BBSR, Dr. R.K. Malik , Country coordinator, CSISA-CIMMYT India, Dr. K.S. Das, Principal Scientist , ICAR-ATARI Kolkata and other dignitaries and participants like Project partners and different stakeholders (57 including 06 females), 8-OUAT-KVKs, 4-West Bengal KVKs, Scientist-NRRI, Officers of DOA, CDAOs, IMAGE, DMS, Bayer Crop Science, Reliance Foundation, Carbon Core, Industry (machine Manufactures & Business Heads/Dealers), NGOs (I-Concept Initiatives-Puri, AJKA-Bargarh, Loksebak-Kalahandi, Unnayan-Mayurbhanj, Dinnabandhu Trust-West Bengal) and progressive farmers and Service Providers, and DSR-Odisha/CSISA project team comprising Dr. Ashok Kumar, Dr. Bidhan K. Mohapatra, Dr. Iftikar Wasim and Dr. N.C Banik participated.

Key insights/recommendations identified/ discussed for interventions

1. Preparation of DSR-based future to intensify rice-fallows in Odisha.
2. Mechanized DSR is identified as one of the most effective alternative rice establishment methods in Odisha. Moreover, there's a considerable scope for scaling it through custom service provision as there is need for a number of quality multi-crop planters and favorable policies/schemes.
3. Two potential challenges including uniform emergence and weedy/voluntary rice are being handed using new innovations being generated through project implementation experiences.
4. The recommendation of a cropping and production system for Odisha involves mechanized DSR combined with dominant varieties of 140+ days during the kharif season, followed by mechanized seeding of pulses (green gram) and oilseeds (groundnut and mustard) with validated varieties during the rabi season. Millets and pigeon pea are also suggested for inclusion in the cropping system in suitable landscapes.
5. The availability of quality seed of validated/ recommended varieties poses a significant concern, emphasizing the need to integrate these varieties into the seed production system or supply chain or disseminate information about their sources.

6. To scale the DSR-technology, there is a need to organize a training of Agro Service Centre (ASC) owners by the Directorate of Extension Education, OUAT.
7. Present Convergence Platform should also explore and initiate collaboration with MukhyamantriMakka Mission (MMM) to alleviate pressure on rice especially in plateau regions and upland ecologies.
8. Considering profitability as a crucial triggering factor in any crop adoption, a cost-benefit analysis of rabi crops is suggested to recommend crops for sustainable adoption.
9. It is recommended to explore the convergence between CSISA/DSR-Odisha and the FAO-funded and GoO-supported projects in Ganjam and Kalahandi.
10. Training of enumerators for the Landscape Diagnostic Survey of pulses (LDS-pulses) in

Odisha should be conductedpromptly for 9 KVKs (Bargarh,Puri,Dhenkanal,Cuttack,Mayur bhanj-II,Birbhum,Murshidabad,Nadia,North 24 PGS)

11. Experience of community-based organizations identified that the availability of herbicides at affordable prices is crucial for the sustainable adoption of DSR.
12. It is emphasized that the project should continue until the technology gains the trust of farmers.

14.12 Natural Farming: Taking to the farmers through KVKs

Nodal Scientist: Dr. A. Haldar

The Green Revolution has made the country self-sufficient in food grain production. The farmers have adopted using of high yielding varieties of hybrid seeds to get higher yields, chemical fertilizers to nourish the soil and pesticides to combat crop damage. These hybrid seeds, unfortunately, lack resistance against pests and diseases. Furthermore, the over use of chemical fertilizers and pesticides have brought adverse effects on soil health including soil micro-organisms, rendering the land infertile impacting human health and ecology. Inordertodealwiththe challengesofsoilhealth, water foot print, chemical use in agricultural practices, Agricultural Extension Division of ICAR, New Delhi has implemented a flagship project "Out scaling of Natural Farming through Krishi Vigyan Kendras" in 425 KVK network system in India in2022-23 with the support of Department of Agriculture & Farmers Welfare, Govt.of India, aiming to a ware, promote and adapt the natural farming practices in Indian agricultural system.

ICAR-Agricultural Technology Application Research Institute Kolkata has successfully implemented this project in 17 districts of Odisha, 13 districts of West Bengal and 1 district of Andaman and Nicobar Islands involving 34 KVKs under Zone 5 in Eastern India since 2022. While the widespread adoption of chemical-intensive agriculture has brought about a range of adverse consequences for the farming and the farmers, economic dynamics within the farming communities, ecosystems, and society at large, transitioning towards natural farming practices has come into play a great role in mitigating the negative impacts of chemical-based agriculture and promoting healthier food systems and resilient agricultural landscapes. This projectisbasically revisiting the Indian age-old practices in the way of seeing the farming practices asap artofnature.

Aims of the Project

- Topreservenaturalfloraandfauna
- To Restore Soil Health And Fertility And Soil'biological life
- To Maintain Diversity In Crop Production
- To utilize land and natural resources (light, air, water) efficiently
- To promote natural beneficial insects, animals and micro bes in soil for nutrientrecycling and biological control of pests and diseases
- To promote local breeds for lives tock integration
- To use of natural/local resource-based inputs
- To reduce in put cost of agricultural production

Objectives

I. To spread Awareness Programme

II. To conduct Field Demonstration

III. ToorganizeTrainingProgramme

Achievements

- The capacity building programme on Natural Farmin go fK VK personnel of Odisha (17KVKs), West Bengal (16KVKs) and Andaman & Nicobar Islands (1 KVK) was organized by ICAR-ATARI, Kolkata on February 15-16, 2023 at West Bengal University of Animal and Fishery Sciences (WBUAFS), Kolkata. The Heads of a ll34 KVK salong with Nodal SMS soft heres pective KVK attended the workshop. Prof. T.K. Mondal, the then Vice-Chancellor, WBUAFS, Kolkata urged the scientists for strategicim plement ation of natural farming components to build agreenand glorious nation. Dr. P.Dey, Director, ICAR-ATARI addressed the importance of soil health management, gender participation, decreasing cost of production, and in creasing production to dovetai l3 Fofagro-eco systemi.e; Farm-Farmer-

Farming. Further, Action Plan meeting on Natural farming for FY 2023-24 was organized by ICAR-ATARI Kolkata on 9th and 17th November 2023. Total 34 KVKs from West Bengal, Odisha and Andaman & Nicobar Islands participated in this workshop. Dr. Avijit Haldar, Nodal Scientis to ft his project, presented a brief over view on how to develop action planasperallocatedfund for FY2023-24. an online review meeting about activities undertaken in FY 2023-24 and video making on Natural farming was conducted on 21st December 2023.

- ICAR-ATARI Kolkata has utilized 99.99% fund (utilization of Rs.2,60,23,476.00 out of Rs. 2,60,24,110.00) during 2023-24.
- Activities covering awareness programme, training and demonstration conducted under Natural project in 2023 are shown in the following Table.

Table: Different activities under Natural farming

Awareness Programme	No. of Participants	Training Programme	No. of Beneficiaries	No. of Demonstration conducted
272	59,186	136	5970	579

- Awareness programmes include exhibition camps, meeting, kisan mela with main focus on natural farming, field day, mobile table auformass campaign, awareness, workshop for extension function ariesas well as distribution of leaflets, literatures, posters and other extension materials on different facts of natural farming for making the farmers aware about the natural farming. The natural farming project has created huge awareness at the grassroots level for natural farming practices and its benefits through organizing 272 awareness programmes involving 59, 186 farmers, farm women and rural youth during 2023.Total and state-wiseawareness programme conducted in this zone is presented in the following table.

Table: Sate wise awareness programmes

State	No of awareness Programmes	Number of Participants
A&N	3	908
Odisha	122	31719
WB	147	26559
Total	272	59186

- Training programmes covered preparation of different bio-formulations of natural farming (jeevamrit, beejamrit, ghana jeevamrit) and their applications, preparation of neemmastra, agnistra, dashpani ark, brhamastra for pest and disease management, Package and practices for rabi crop cultivation following natural farming technology etc. Each training programme had two days duration. A total of 136 training programmes were conducted during 2023 in this zone to build the capacity of 5, 970 farmer son the practices associated with natural farming. Total and state-wise training programmes conducted in this zone is presented in the following table.

Table: State wise training programmes

State	No of training Programmes	Number of Participants
A&N	1	20
Odisha	62	2543
WB	73	3407
Total	136	5970

- Demonstration programmes include preparation and application of jeevamrit and ghanaj eevamrit in soil, seed treatment with beejamrit and foliar application of neemastra, brahmastra, agniastra and sourbutter milk for insectpest and disease management. Various vegetables, paddy, maize, tea etc were selected for demonstration. Intercropping/ mixed cropping was also followed in demonstration field. Straw mulching is followed to conserve soil moisture. Ridge and furrow irrigation method is followed to maintain whapasa. The farmers have witnessed positive outputs of natural farming, while it has been demonstrated on different cropsatthef armer's field through 579 demonstration programmes covering 60.79 ha area in this zone during 2023.Total and state-wise demonstration programmes conducted in this zone is presented in the following table.

Table: State wise demonstration conducted

State	No. of Demonstration Plots	Area of Demo. Plots(ha)
A&N	6	0.15
Odisha	285	41.8
WB	288	18.84
Total	579	60.79

14.13 Agri-Drone

Nodal Scientist: Dr.S.K. Mondal

During the year 2022, DA&FW launched a Central Sector Scheme entitled "Sub Mission on Agricultural Mechanization for implementation of its component No. 1 under Drone Technology Demonstration". Agri Drone Project is being Implemented in 17 Centres KVKs, Institutes and SAUs) under ICAR-ATARI Kolkata. An agricultural drone is an unmanned aerial vehicle used in agriculture operations, mostly in yield optimization and in monitoring crop growth and crop production. Agricultural drones provide information on crop growth stages, crop health, and soil variations. Agri drones are a cutting-edge technology that can also be effectively used to spray pesticides, thereby reducing chemical usage and costs, evaluating the health of crops, and real-time monitoring of weed, disease, and insect infestations over a wide area to enable their timely management practices.

Table: List of Agri Drone Project Implementing Centres (PICs) under ICAR-ATARI Kolkata

State	Name of the KVK	Name of Institute/SAU	Name of SAU
West Bengal	South 24 Parganas South 24 Parganas (Addl.) Murshidabad Birbhum Coochbehar	ICAR-CIFRI Barrackpore ICAR-CRIJAF Barrackpore	BCKV Mohanpur
Odisha	Deogarh Mayurbhanj I Nayagarh	ICAR-IIWM Bhubaneswar ICAR-CIFA Bhubaneswar ICAR-NRRI Cuttack ICAR-CIWA Bhubaneswar	OUAT Bhubaneswar
A&N Island		ICAR-CIARI Port Blair	

Table: Details of Drone Demonstration during 2023

No. of Kisan Drones Sanctioned	No. of Kisan Drones Purchased	No. of persons trained as Drone Pilot	Target Area for Drone Demonstration (ha)	Area Covered under Drone Demonstration (ha)	No. of Drone Demonstration organized	No. of farmers participated
26	27	14	6500	1101	349	6807

Agri-Drone technology is used for a variety of agricultural tasks, such as the application of agrochemicals, nutrients, and pesticides and weedicides. Several advantages were shown by these Kisan Drone Demonstrations, including lower labour costs, time and water savings, and an effective spraying method.


Demonstration of drone basedtechnology for aquaculture at Moyna Aqua Expo 2024 by ICAR-CIFRI, Barrackpore

15.0 Training and Capacity Building

Nodal Scientist: Dr. S.K. Mondal

The Training Need Assessment (TNA) and preparation of Annual Training Plan (ATP) for all categories of employees of the Institute were initiated in the year 2015-16. In continuation, ICAR-ATARI, Kolkata has performed TNA and prepared ATP for the year 2023. For a continuous Human Resource Development (HRD) in the institute, such plans became instrumental and category-wise trainings have also been planned and implemented. The completed trainings have not been uploaded in ERP system by individual employees. During the year 2023, out of 9 employees of the institute none opted for training through Training Information Management System (TIMS) and no fund was allocated for HRD during the year.



15.1 Capacity Building of Farmers through Training Programmes on Profitable Dairy Farming

Under the capacity building of farmers, a special programme on profitable dairy farming was undertaken by KVKs of West Bengal and Odisha during the period from April 2023 to December 2023. The programme mainly focused on various aspects like Skill Development Training on Profitable Cattle Farming, Scientific Management of Dairy Farming, Dairy and Poultry based Integrated Farming for sustainable livelihood, Production of Value Added Milk Product, Commercial Dairy Management, Multipurpose Artificial Insemination Technician in Rural India (MAITRI), Livestock Disease Management and others. A total of 125 rural youth were trained under this programme.

Table: Capacity building on profitable dairy farming

Name of the State	No. of courses	No. of Participants								
		SC		ST		General		Total		Grand Total
		M	F	M	F	M	F	M	F	
West Bengal	4	43	20	3	2	5	2	51	24	75
Odisha	3	2	2	8	2	22	14	32	18	50
Grand Total	**7**	**45**	**22**	**11**	**4**	**27**	**16**	**83**	**42**	**125**



15.2 Capacity Building Programme on Group Dynamics

The capacity building of farmers also included a special programme on Group dynamics of farmers This programme was undertaken by KVKs of the Zone during the period under report. The programme mainly focused on various aspects like Skill Development Training, Leadership development, Group dynamics, Formation & Management of SHGs, Mobilization of social capital, Entrepreneurial development of farmers/ youths, Youths WTO and IPR issues and others. A total of 7241 farmers/ rural youth were trained under this programme.

Table: Capacity building programme on group dynamics

Name of the State/ UT	No. of courses	No. of Participants								
		SC		ST		General		Total		Grand Total
		M	F	M	F	M	F	M	F	
West Bengal	195	393	649	109	277	1519	568	2021	1494	**3515**
Odisha	214	425	507	364	523	1203	690	1992	1720	**3712**
A & N Islands	1	0	0	0	0	14	0	14	0	**14**
Grand Total	**410**	**818**	**1156**	**473**	**800**	**2736**	**1258**	**4027**	**3214**	**7241**



15.3 HRD programme by ATARI Kolkata

ICAR-ATARI, Kolkata conducted 45 HRD programme during the year for updating knowledge and skill of the KVK staff. The details are given in the following table.

Table: Workshop-cum-training programme and meetings organised by ICAR-ATARI, Kolkata

Sl. No.	*Name of the programme(s)*	*No. of scientist(s)/ staff attended*
1	Scientific advisory committee (SAC)meeting of KVKs	6
2	Online and offline review meetings/ workshops of various schemes/projects of ICAR-ATARI Kolkata	10
3	Selection committee meeting as Chairman/Member for selecting SRF/YP-I/Project Assistants of FFP/ ARYA/NEMA/NABARD funded projects at ICAR-ATARI Kolkata	10
4	Online and offline meeting of Director and other staff ATARI Kolkata with DG, DDG (AE), ADGs, Pr. Scientists and other administrative staff of the Council on financial, administrative and other various issues	8
5	Online meeting with PIs/CO-PIs/SSHs of KVKs of different network projects	6
6	Review meeting with PIs/CO-PIs of different Institute projects	4
7	Meeting with Director, ICAR-ATARI Kolkata on various issues	12
8	Attended DDG's Online meeting on 'Mann Ki Baat' organized by SMD (Agri Ext), ICAR, New Delhi	6
9	Organized Annual Zonal Workshop 2023 of KVKs of Zone V at Kalimpong organized by ATARI Kolkata	10
10	Attended a workshop on Fuzzy Logic Cognitive Mapping of the farmers on Dairy Farming organized by ERS, NDRI, Kalyani	2
11	Attended Online PM Kisan Samman Nidhi Program organized by PMO	10

Sl. No.	Name of the programme(s)	No. of scientist(s)/ staff attended
12	Attended meetings as an Expert Committee Member organized by various other institutes/ KVKs for promotion of personnel/ award of degree/ IRC / selection of manpower in KVKs etc.	5
13	Online and offline meeting with DDG/ADGs/Pr. Scientists/Under Secretaries of AE (Ext.), ICAR, New Delhi and Director/ Pr. Scientists/ AAO/AFAO/others on fund utilization, progress of schemes/projects and other administrative issues	10
14	Other meetings on various issues	10
15	Online and offline scientific advisory committee (SAC)meeting of KVKs	6
16	Online and offline zonal review meetings/workshops of various schemes/projects of ICAR-ATARI Kolkata	10
17	Meetings as an Expert of Committee Member organized by various other institutes/KVKs for promotion of personnel/award of degree/IRC/selection of manpower etc.	5
18	Online and offline meeting with DDG/ADGs/Pr. Scientists/Under Secretaries of AE (Ext.), ICAR, New Delhi and Director/ Pr. Scientists/ AAO/AFAO/others on fund utilization, progress of schemes/projects and other administrative issues	10
19	Online meeting with PIs/CO-PIs/SSHs of KVKs of different network projects	6
20	Review meeting with PIs/CO-PIs of different institute projects	4
21	Meeting with Director, ICAR-ATARI Kolkata on various issues	12
22	Online and offline meeting of Director and other staff ATARI Kolkata with DG, DDG (AE), ADGs, Pr. Scientists and other administrative staff of the Council on financial, administrative and other various issues	8
23	Online meeting on ARMS-APAR-SPARROW organized by with ADG (ICT) on 06.07.2023	
24	Online meeting on Global Agri Connect: An ASCI and NSFI Initiative on 31.07.2023	3
25	Interaction meeting with Hob'ble Vice-Chancellor and Dean of Extension education, OUAT, Bhubaneswar organized by ICAR-ATARI Kolkata	16
26	Online meeting on *'Soil moisture measurement by DAMUs'* organized by IMD, Pune	4
27	Meeting on CSISA chaired by Hon'ble Secretary, DARE & DG, ICAR and other issues at HQ	1
28	Executive Council meeting of ISCA and discussion on RAWE programme with LPU at Jalandhar	1
29	Meeting on asset transfer from Seva Bharati to Jhargram KVK and TSP programme for farmers at BCKV, Mohanpur	1
30	'*Kisan Samman Diwas*' and '*Farmer-Scientist Interaction*' programme attended by the Hon'ble AM at KVK Keonjhar	2
31	'*27th Sundarban Kristi Mela O LokoSanskritiUtsab*' at Kultali, Narayantala, Basanti, Dist. 24 Pgs(s), West Bengal	1
32	'*Viksit Bharat Sankalp Yatra*'programme at KVK Ashoknagar, North 24 Parganas	2
33	MFOI panel discussion and SMD programme	1
34	NICRA National Workshop, Meri Maati-DeshSamriddhi initiative, deliberation in SCSI International Conference and QH Meeting	1
35	National review workshop of FFP held at CSK HPKV, Palampur	1
36	Online meeting with DDG (AE), ADGs (AE) and Director, ATARIs on new network project	5
37	RAC meeting at Bangalore	2
38	Online meeting on RAWE programme organized by ATARI Kolkata	6
39	Virtual review meeting on activities, video making, developing action plan etc. for natural farming project	4
40	International conference on *'Sustainable innovation in food safety, health & nutrition'* at Viswa Bangla Convention Centre, New Town, Kolkata	1
41	Virtual training for Asia-Pacific on participatory video in agri-food systems and digital environments organized by FAO	1
42	Online and offline meeting of IRC/IMC/PME and others at institute level	10
43	HRD Programme on *'Contemporary Issues and Recommendations from Network Research in food crops for facilitating OFT proposals'* at BCKV, Nadia	2
44	Meeting on soil related aspect in KVK and ISSS Convention at Bhopal and Global Micronutrient Summit at ICAR HQ, New Delhi	1
45	Other meetings on various issues	10

16.0 Ongoing Programmes

16.1 Formation and Promotion of FPOs

Nodal Scientist: Dr. A. Haldar

Agriculture is the primary sector of the economy and primary source of livelihood for about 58 per cent of India's population. India has over 92 million small holdings or nearly 21% of the world's small holdings of 450 million, the second largest after China. The small and marginal holdings taken together (0.00-2.00 ha) constitute 86.21% in 2015-16 while their share in the operated area stand 47.34% in 2015-16 census.The size of operational holdings in India is continuously declining with every successivegeneration. The situation has raised serious question on the survivability of these smallholders.The smallholding farmis associated with limited marketable surplusand lower access to inputs, like seeds, fertilizers,credit, information, and extension services. Smalland marginal farmers also have poor accessto public goods, such as public irrigation andgovernment subsidies. Poor transportation andcommunication networks restrict farmers fromaccessing remunerative markets and result inopportunities for rent seeking by local traders.Lack of adequate local markets and costliertransport for small quantities force farmers to sellto local traders at low prices. Withoutlarge volumes, small farmers face low bargainingpower in input procurement and in output sale.To minimize the gap between the farmers and consumers, Government of India aimed at new institutional options which can provide the farmers, a level playing field to compete in the modern agro-food networks.Collectivization of producers, especially small and marginal farmers, into producer organizations is emerging as one of the most effective pathways to address many challenges of agriculture and most importantly, improved access to investments, technology and inputs and markets. Hence, the National Cooperative Development Corporation (NCDC) has implemented a flagship project "Formation and Promotion of 10,000 Farmer Producer Organisations"under the Central Sector Scheme. The basic purpose envisioned for the FPOs is to collectivize small farmers for backward linkage for inputs like seeds, fertilizers, credit, insurance, knowledge and extension services; and forward linkages such as collective marketing, processing, and market-led agriculture production.

Agricultural Extension Division of ICAR, New Delhi has implemented this flagship project through ATARIs and KVKs/ ICAR Institutes as Cluster Based Business Organisations (CBBOs) in India since2021-22 with the support of NCDC. These CBBOs are professional organisations that are engaged to function at the Block level for formation and nurturing of FPOs. CBBOs have a critical role in the entire process right from cluster identification, baseline study, community mobilisation, registration of FPO as cooperative, training and capacity building of FPO and farmers, business planning for FPO, regular interface with other institutions including research, dissemination of information to farmers, incubation and handholding, reporting and data collection, FPO rating, assisting FPO in financial management and accounting. CBBOs are supposed to train FPOs in subject matters covering topics ranging from organisational management/ behaviour, crop husbandry, value addition, processing, marketing, trading, export, supply chain, grading, branding, packaging, accounting, auditing, compliance requirements, incubation, Information and Communications Technology (ICT) and Management Information System (MIS) as may be relevant for promotion of FPOs including case studies in best practices, if any.

Aims of the Project

- Tocatalyse transformation of agriculture sector, where small and marginal holdings less than 2 hectares constitute over 80% of farmers' population and distressingly have ownership of a minor share of land
- Toachieve inclusive and sustainable transformation through the creation of a holistic and supportive ecosystem for the formation of FPOs and their nurturing, handholding and capacity building over a five-year period from their inception

- Tofacilitate the development of vibrant and sustainable income-oriented farming that would lead to the overall socio-economic development and wellbeing of agrarian communities

Objectives

I. To facilitate the development of a sustainable income-oriented farming and business platform for the smallholder farmers

II. Toassure the farmers' income by enhancing productivity and reducing costs of cultivation, up scaling trade and bulk selling of the produce or its further processing into downstream products, enabling access to technology, integration with value chains, increasing market access and bargaining power

Achievements

- The project facilitated the development of a sustainable income-oriented farming and business platform for the smallholder farmers through the formation of four FPOs at BalasoreSadar and Remuna of Balasore district and Komna and Boden of Nuapada district of Odisha under the guidance of two CBBOs, namely ICAR-National Rice Research Institute, Cuttack and KVK, Nuapad, respectively.
- The Competent Authority of NCDC and thereafter Agricultural Extension Division of ICAR, New Delhi has sanctioned and released an amount of Rs. 11,00,000.00 to ICAR-ATARI and Rs. 6,00,000.00 to KVK, Nuapada during the financial year 2023-24 for for functioning of FPOs at BalasoreSadar and Remuna of Balasore district and Komna and Boden of Nuapada district of Odisha, respectively.
- A total of 2,049 are the shareholders in these 4 FPOs. FPOs have helped the small and marginal farmers in individual as well as community farming through the access to various inputs such as quality seeds, fertilizer, pesticides, organic manure, farm machinery etc. The farmers have started collective marketing of various commodities. FPOs have started value addition, processing, packaging and marketing.

Table: Status of FPOs under ICAR- ATARI, Kolkata during 2023

Name of CBBO	Name of FPO	Block & District	Registration Number & Date of Registration	No. of Shareholders (Male and Female)	No. of Training Organized	Commodity wise Business Achieved (Sale in ton & Net Profit)	Paid up capital (in lakh)	Equity collected (in lakh)
ICAR-NRRI, Cuttack	PurbaBaleswar 4S4R FPO	Remuna, Balasore	Registration Number: 1418/ BLSDT.24.09.2021 Dated 24.09.21	Total: 712 (Male: 396 & Female: 316)	6	Vegetables Paddy seeds	7.24	15.0
	Upakula Baleswar 4S4RFPO	Balasore Sadar, Balasore	Registration Number: 1419/ BLS Dated 26.07.22	Total: 455 (Male: 300& Female:155)	7	Vegetables Paddy seeds	1.90	15.0
KVK, Nuapada, OUAT	Sidheswar FPO	Komna, Nuapada	Registration Number: 43/NPD Dated 02.06.22	Total: 401 (Male: 338 & Female: 63)	3	Millets Oilseeds NTFP	11.65	1.04
	Sibashakti FPO	Boden, Nuapada	Registration Number: 44/NPD Dated 02.06.22	Total: 481 (Male: 351& Female:130)	4	Millets Oilseeds NTFP	14.15	1.22

- In Balasore district, PurbaBaleswar 4S4R FPO sold vegetable and paddy seeds and earned Rs.12.60 lakhs in 2023 and installed Puffed Rice Machine, Stick Manufacturing Machine and Mulberry juice machine. UpakulaBaleswar 4S4RFPO established a seed processing unit, a pre-cleaner, grader, and gravity separator and earned Rs. 5.15 lakhs in vegetables and paddy seed business in 2023 and also developed a paneer factory at the cost of Rs. 8.50 lakhs and sold 5 quintal paneer in 2023.

► In Nuapada district, Sidheswar FPO and Sibashakti FPO installed mini dal mill for dal processing and started processing and packaging and of pulses, oilseeds, millets and NTFP. Sibashakti FPO earned Rs. 1.75 lakhs from mushroom selling in 2023. Both the FPOs completed the process for fertilizer, seed and pesticide license. The farmers members express that it's really a good platform for availability of critical inputs at right time and marketing of agriculture produces at right price at their door step.

16.2 Skill Development Training Programmes

Nodal Scientist: Dr. S.K. Mondal

16.2.1 ASCI Skill Development Training Programme (duration of 200 hrs or more)

In collaboration with DAFW and ASCI, long duration skill development training courses were provided to mainly rural youth and practising farmers of younger age for inculcating the skill development in the field of entrepreneurial agricultural activities like Small mushroom grower, Garden keeper, Small dairy farmer, Honey bee farmer etc. In this front, the KVKs of this Zone carried out a total of 13 training during 2023 covering 260 farmers and rural youth. A total of Rs. 30.10 lakhs was spent by the KVKs out of allocated fund of Rs. 41.74 lakhs. The details of the training are given in the Table below.

Table: Skill development training programme (200 hrs or more) conducted in Zone V

State	No. of training conducted	No. of participants									Fund utilized for the training (Rs.)
		SC/ST			Other			Total			
		M	F	T	M	F	T	M	F	T	
A & N Islands	0	0	0	0	0	0	0	0	0	0	0
Odisha	7	37	17	54	55	31	86	92	48	140	1670475
West Bengal	6	19	21	40	60	20	80	79	41	120	1339450
Total	**13**	**56**	**38**	**94**	**115**	**51**	**166**	**171**	**89**	**260**	**3009925**





16.2.2 Skill Development Training programme (Other than ASCI)

The KVKs of this Zone also took up different skill development training programmes (of less than 200 hours duration) as a part of capacity development of farmers in various job-oriented aspects of agriculture and allied sectors during the period under report. Thirty six training programmes were undertaken by KVKs of this Zone covering 863 participants with a budget expenditure of Rs. 17.51 lakhs. The details of skill development trainings are given in the Table below.

Table: Skill development training programme (less than 200 hrs) conducted in Zone V

State	No. of training conducted	Duration (in hrs.)	No. of participants			Fund utilized for the training (Rs.)
			Total			
			M	F	T	
A & N Islands	1	120	18	20	38	124000
Odisha	30	1436	389	391	780	1417250
West Bengal	5	228	32	13	45	210000
Total	**36**	**1784**	**439**	**424**	**863**	**1751250**



16.3 National Farmers' Portal (*m-Kisan* Portal)

Nodal Scientist: Dr. K.S. Das

In the era of information technology, farmers from every corner of the country are being interested to receive latest information and knowledge on various agricultural activities through mobiles, internet, touch screen kiosks, agri-clinics, mass media, common service centres, kisan call centres etc. All Government Organizations e.g. Krishi Vigyan Kendras, Meteorological Department, State Agriculture Universities, ICAR Institutes, Department of Animal Husbandry, Dairying and Fisheries and others are providing information/ services/ advisories to the farmers engaged in agriculture by sending SMSs in their language through National Farmers' Portal/ *mKisan* Portal platform (*www.mkisan.gov.in*).Since its inception on 16.07.2013, about 327 crore messages or more than 1044 crore SMSs on crops, seeds, pesticides, farmers' insurance, farm machineries, storage, fertilizers, market price of agricultural produce, package of practices, various extension activities, weather forecasts, disease incidences and so on have been sent to more than 8.93 crore farm families. All the KVKs under ICAR-ATARI Kolkata were providing various information to the farmers of their concerned district through SMSs. During the year 2023, KVKs of Andaman and Nicobar Islands, Odisha and West Bengal sent 64, 1997 and 4688 messages, respectively which benefitted more than 1.85 crore agricultural farmers. The state wise distribution of messages and number of beneficiaries has been given in the following table.

Table: Details of different categories of messages sent by the KVKs and number of benefitted farmers during the year 2023

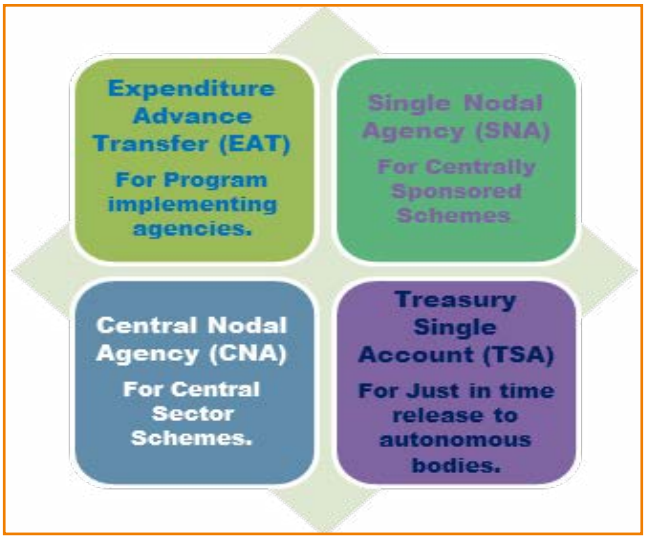
Messages on	*A & N Islands*		*Odisha*		*West Bengal*		*Total*	
	No. of messages sent (Text+ Voice+ Video)	*No. of farmer benefitted*	*No. of messages sent (Text +Voice +Video)*	*No. of farmer benefitted*	*No. of messages sent (Text+ Voice+ Video)*	*No. of farmer benefitted*	*No. of messages sent (Text +Voice +Video)*	*No. of farmer benefitted*
Crops	20	223	1228	4176445	366	394220	1614	**4570888**
Livestock	10	115	174	1157632	107	88705	291	**1246452**
Fishery	10	102	89	1038593	60	75045	159	**1113740**
Weather	10	142	206	1424757	3889	6232394	4105	**7657293**
Marketing	2	23	32	696148	89	62147	123	**758318**
Awareness	10	140	147	1688070	70	61534	227	**1749744**
Other enterprises	2	27	121	1202662	107	233675	230	**1436364**
Total	**64**	**772**	**1997**	**11384307**	**4688**	**7147720**	**6749**	**18532799**

16.4 Implementation of Public Financial management System (PFMS)

The Public Financial Management System (PFMS) is a web-based financial management application developed and implemented by the Controller General of Accounts (CGA), Department of Expenditure, Ministry of Finance, Government of India.

PFMS is a Centralized Transaction System & Platform, providing end to end financial management services to all stakeholders.

Real Time Monitoring of Releases and Various Fund Flow Mechanisms



All the funds under Pay & Allowances heads are booked in PFMS under non-scheme (1270) and the fund under the Grant-in-aid "General" and "capital" are booked under scheme (0092). The both fund under two different schemes are regulated through PFMS with Digital Signatures by two authorized signatories of this Institute. During the financial year 2023-24 an amount of Rs.24,54,37,000 was released through scheme 0092 and Rs.80,95,97,000 was released through scheme 1270

16.5 Gramin Krishi Mausam Sewa (GKMS) through District AgroMet Unit (DAMU)

Nodal Scientist: Dr.S.K. Mondal

India Meteorological Department (IMD) established District AgroMet Unit (DAMU) in 530 districts, in addition to already operating 130 AgroMet Field Units (AMFUs) under Gramin Krishi Mausam Sewa (GKMS) scheme. DAMUs receive weather forecast from IMD to prepare and disseminate sub-district level agromet advisory bulletins. ICAR maintains Agromet observatories as well as Automated Weather Stations (AWS) and record Agromet observations at its Institutions, National Research Centres, Project Directorates, Krishi Vigyan Kendras (KVK) etc. to generate agrometeorological information for use in studies of crops, pests and diseases, soil, agro-forestry, livestock, horticulture, agricultural physics, soil science etc. Such data help ICAR Institutes to study crop-weather relationship, relationship between crop-weather and pest/disease and develop region/

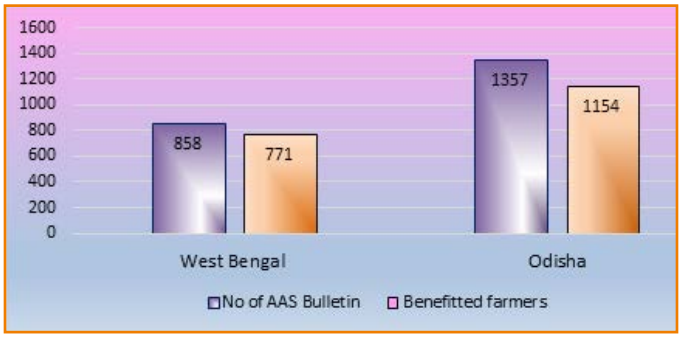
location specific agromet predictive models. A budget of Rs.3.49 crore is sanctioned for this Zone during the year 2023-24. Seventeen DAMUs under ATARI Zone V are providing weather forecast bulletins to the farmers since inception of the project. Weather forecast bulletins/special bulletins are generated regularly in English and local languages and communicated to the farmers well in advance. Agromet Advisory Bulletins are prepared twice a week (every Tuesday and Friday) and circulated among all the farmers of the district. Several modes of dissemination of advisories are used like email, messages, whatsapp group, social media, through input dealers, block level extension functionaries, through village-based clusters etc. The KVKs are enhancing outreach and dissemination of agromet advisories using new and effective means of communication i.e. emails, whatsapp, KVK facebook page and SMS (in m-Kisan portal) are being used to deliver agromet advisory bulletins to registered members of different farmers clubs, FPOs, line departments and ultimately to reach the farmers. With the help of RMC/MCs, DAMUs are also using social media and whatsapp groups consisting of AMFUs (Nodal Officer, Technical Officer), DAMUs (Nodal officer, SMS-Agromet) and concerned officials viz. DAOs etc. for quick dissemination of weather forecast, nowcasts, alerts & warnings, and agromet content to farmers at village level. They are utilizing this channel effectively for sending information on very high impact weather events like thunderstorm & lightening to farmers to reduce the casualties and other losses. During extreme weather conditions over Odisha, West Bengal and neighbourhood, these DAMUs prepare special bulletins of warnings in regional languages and circulate to the farmers well in advance, such as to complete harvesting of crops, strengthen the *macha* of vegetables and betel vine, to stay at home along with safety of cattle and livestock in this period, fishermen are advised not to move into the sea. This helps the farmers to a great extent in minimizing the loss and crop damage during these extreme weather conditions. KVKs are also taking initiative in popularizing of *'Meghdoot'* and *'Damini'* mobile apps for outreach of agromet advisories and to help individuals keep updated about thunderstorm/ lightening likely to strike in their locations.

To acquaint the farmers with the importance of weather based agro advisories, help them understand the effect of climatic/weather aberrations and its impact on agricultural production and strategies to mitigate the situations, DAMUs organize several Farmers Awareness Programme (FAP) and trainings to cover all the blocks and farmers and farmwomen of the district. Total no. of FAPs conducted during the year by DAMU KVKs along with total no. of farmers who benefitted are mentioned below:

KVK	No. of Programmes	No. of farmers benefitted
17	58	1925

Total no. of AAS prepared and circulated to the farmers during the year by DAMUs along with total no. of beneficiaries are mentioned below:

KVKs	Number of AAS Bulletin	Beneficiaries
17	2215	60952



16.6 Nutri-sensitive Agricultural Resources and Innovations (NARI)

Nodal Scientist: Dr. S.K. Mondal

The concept on nutri-sensitive agriculture was being nurtured by the Council since the year 2018-19. Initially, ICAR-ATARI Kolkata identified 6 KVKs (4 from Odisha and 2 from West Bengal) for undertaking the activities related to nutri-garden, biofortified crop etc. under this concept. Lateron, a project on Nutri-SMART village has been approved by RAC during 2021-22. Therefore, the conceptual framework was same but the no. of KVKs increased to 14 for taking up OFT, FLD, training and extension activities on various aspects of the nutri-sensitive agriculture in this Zone. The details of the activities conducted during 2023 have been tabulated below.

Table: State wise details of nutri-sensitive agricultural activities during 2023

State	No. of KVKs	Nutri-SMART Villages	Number of beneficiaries						
			Nutrition Garden	Bio-fortified varieties	Value addition	Food fortification	Training programme on nutrition	Extension activities for nutrition	Total
A&N Islands	3	2	7	0	2	1	244	161	415
Odisha	33	10	62	14	26	20	335	555	1012
West Bengal	23	2	41	39	14	10	326	298	728
Total	**59**	**14**	**110**	**53**	**42**	**31**	**905**	**1014**	**2155**



Table: Nutri-sensitive agricultural activities undertaken during 2023 by KVKs of Zone-V

State/ UT	No. of KVKs involved	No. of OFT on specified aspects	No. of FLD on specified aspects	No. of capacity development programme on specified aspects	No. of Extension activities on specified aspects	No. of farmers/ farm women/ girls benefitted		
						M	F	T
A & N Islands	2	1	4	1	4	21	394	415
Odisha	10	6	138	21	37	128	884	1012
West Bengal	2	4	59	18	11	123	605	728
Total	**14**	**11**	**201**	**40**	**52**	**272**	**1883**	**2155**



16.7 Institute (ICAR-ATARI Kolkata) website

Nodal Scientist: Dr. K.S. Das

The website of ICAR-ATARI Kolkata was regularly updated with latest information on its KVKs, host organizations, personnel of ATARI Kolkata, events of ATARI Kolkata and KVKs, publications, proceedings of meetings/ review workshops, awards, news items, KVK websites and many more. The website can be accessed through logging in *www.atarikolkata.org*.

16.8 Model Integrated Farming in West Bengal: An Externally NABARD Funded Project

Nodal Scientist: Dr. A. Haldar

Farming is facing changing demands. There is a continuous decline in per capita availability of land in the country, practically there is no scope for horizontal expansion of land for agriculture. Expansion is only possible by integrating farming components to ensure reasonable returns to farm families.Integrated farming (IF) has been advocated for harmonious use of inputs through integration of various available resources to make the agriculture productive, profitable and sustainable. In the process of technology transfer by the Krishi Vigyan Kendra (KVK) of West Bengal, a shift from the traditional model of farming to systemic and client-oriented IF has been developed at the farmers' field in six agro-climatic zones of West Bengal, which are (i) northern hill zone, (ii) terai and teestazone, (iii) old alluvial zone, (iv) new alluvial zone, (v) red and laterite zone and (vi) costal saline zone. Yet, adoption of IF remains low. Besides, there is neither a complete information on different models of IF, nor data on possible combination of different components with recycle mechanism for the reduction of cost of production within IF, economics of various IFs, infrastructure and support services availability, growth potential of sectoral activities, forward and backward linkages and marketing of produces across six agro-climatic regions of West Bengal. Hence, NABARD Kolkata approved a project entitled, 'Formulation of Area Development Schemes and Development of Area-Specific Software Template for Model Integrated Farming across Six Agro-Climatic Regions of West Bengal' (sanction No. NB.WBRO/736/FSDD-FSPF/ICAR-ATARI/2021-22 dated 19.08.2021) with a grant of Rs. 9.0 lakhs.

Objectives

(i) To explore technically feasible, economically viable, area-specific existing models of IF across six agro-climatic regions of West Bengal for preparing Area Development Schemes on IF.

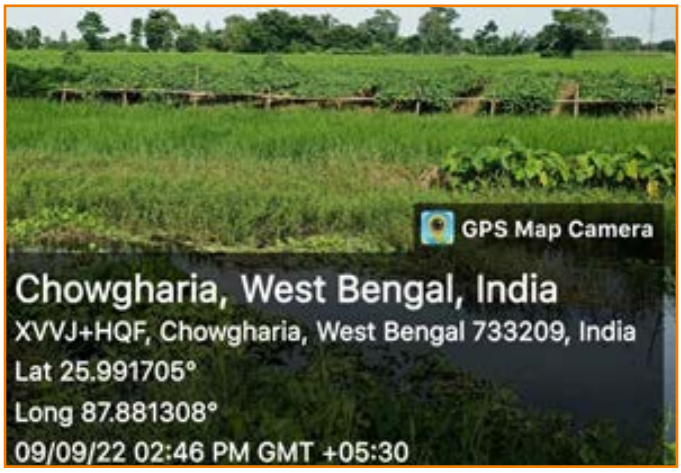
(ii) To develop Software Template for Model Integrated Farming (MIF)with unit cost, economics and financing plan across six agro-climatic regions of West Bengal.

Achievements

- NABARD funded externally project entitled, 'Formulation of Area Development Schemes and Development of Area-Specific Software Template for Model Integrated Farming across Six Agro-Climatic Zones of West Bengal' was completed successfully on 30.06.2023.
- Multi-stage sampling was followed to select integrated farming (IF) adopted farmers (n~60) as respondents from six broad agro-climatic zones (ACZs) of West Bengal considering 10 IF adopted farmers from each ACZ for data collection.
- An integrated SWOT– AHP (Analytic Hierarchy Process) analysis revealed "Sustainable

livelihood security" was the most key driving factor followed by "promotion of organic farming", "better risk management", "incorporation of high-value crops", "increased farm production and productivity" and "enhancement in income".

- A smart, dynamic digital form with 20 dependent variables and 211 independent variables for data entry, scoring of each independent variable was developed for ranking of 60 existing IFs. The selected IFs were categorized into four types based on the component-wise net income and thus found the maximum number of IFs were horticulture-based (35.0%) followed by livestock-based (25.0%), fishery-based (21.7%) and agriculture-based (18.3%).
- A software template/ website for Model IF with 7 different modules including area development bankable scheme was developed based on available information on generated database across six ACZs of West Bengal.



16.9 *KRISHI* Portal

Nodal Scientist: Dr. K. S. Das

The Knowledge based resources information systems hub for innovations in agriculture (KRISHI) Portal, one kind of data inventory repository, was developed by ICAR-IASRI, New Delhi to bring its knowledge resources to all stakeholders e.g. farmers, researchers and planners etc. at one place. This portal has a centralized data repository system of ICAR consisting of technology, publications, data generated through experiments/ surveys/ observational studies, geo-spatial data, learning resources etc. The portal can be accessed at *http://krishi.icar.gov.in*. During the year 2023, all the documents including books, annual reports, newsletters, technical bulletins etc. published by this institute were uploaded in *KRISHI* Portal for wide circulation among readers.

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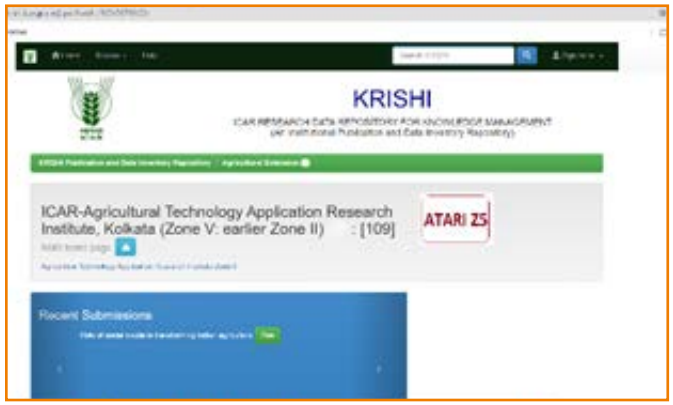
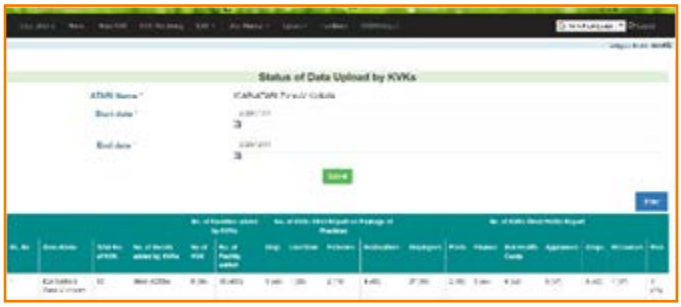


16.10 Krishi Vigyan Kendra Knowledge Network or *KVK* Portal

Nodal Scientist: Dr. K. S. Das

The Krishi Vigyan Kendra (KVK), also known as *'One Stop Shop'* in the district, serves as knowledge and resource centre of agricultural technologies and is linking the NARS with extension system and famers. During the year 2016-17, Government of India launched '*KVK Portal or KVK Knowledge Network*' to upload various activities relating to agriculture and allied sectors at district level which was conducted by the KVKs spread over this country to access information related to KVKs by the farmers and other stake holders from one place at the National Level, to review and monitor the functioning of KVKs against the mandates and objectives, and to provide the information and advisory to the farmers. The portal is accessed through logging in- *http://kvk.icar.gov.in*.It has been developed in such a way that it can be monitored with ease from Ministry Level to Farmers' doorstep depending upon its necessity. With the passage of time, the portal has been enriched with various kinds of features e.g. facilities available with the KVKs, KVK profile, package of practices for production of crops/ horticulture/ livestock/ fisheries, past, ongoing and future events, monthly report, report on DBT, news items, various national programmes, mobile apps, and so on. It has created deep impression in the minds of farmers related to Agriculture, Horticulture, Animal Husbandry and Dairying, Fishery etc. in retrieving various information.



All 59 KVKs (3 from Andaman & Nicobar Islands, 33 from Odisha and 23 from West Bengal) have already been registered with ATARI Kolkata and the information is being uploaded in their

respective portal on regular basis for the benefit of farmers, researchers and planners at different level. ICAR-ATARI Kolkata continuously sensitized 59 KVKsthrough online meetings (hybrid mode), mails, WhatsApp messages to uploadlatest information relating to the KVKs and solved various issues related to *KVK Portal* uploading with the help of portal developing team at ICAR-IASRI, New Delhi. During the year 2023, KVKs of this zone added 9640 events. Six KVKs added 18 different facilities available at their KVKs. Twelve KVKs uploaded package of practices on crop, livestock, fisheries and horticulture. A total of 52 KVKs updated their profile report related to employee, post, finance, SHC etc. in KVK portal.

16.11 Promotion of Agroforestry: An Externally NABARD Funded Project

Nodal Scientist: Dr. A. Haldar

Agroforestry is the concept of modern cropping system for effective utilization of available space, both horizontally and vertically to enhance productivity and risk coverage against unstable weather conditions. While monocropping neither provides gainful employment opportunities nor generates sufficient income to meet the family expenses, agroforestry systems have significant potential in employment generation, household nutritional security from vegetables and fruits and economic development with a hope of insurance or pension resource of a farm family out of the forest plants besides the scope of processing and value addition. Agroforestry is an excellent sustainable model to improve natural ecosystem with biodiversity conservation of the area through inclusion of diversified crops in different tiers leading to augmentation of atmospheric carbon sequestration and mitigation of climate change effects as well. Perhaps, agroforestry is the only viable option to achieve the forest and tree cover to 33 percent of total geographical area of country. However, unfortunately, we have still a shortage of agroforestry and thus there is an urgent need for large-scale afforestation activities in the non-forest areas particularly in cultivable fallows, degraded, barren and wasteland and backyards to provide the resources to small and marginal farmers for meeting livelihood and food security along with the economic growth in the region. Hence, NABARD Kolkata funded a project entitled, 'Agroforestry and Value Chain Management for Doubling Farmers' Income in New Alluvial Region of West Bengal' (sanction no. NB.WBRO/2807/FSDD-FSPF/ ICAR-ATARI/ 2020-21 dated 29.03.2021) with a grant of Rs. 19.40 lakhs. The project was implemented through the KVK network in floodplain coastal Purba Medinipur district of West Bengal at six villages in Panskura block of Purba Medinipur district targeting the involvement of 300 farm families (50 families each from one village) during a period of 3 years from 2021 - 22 to 2023 - 24.

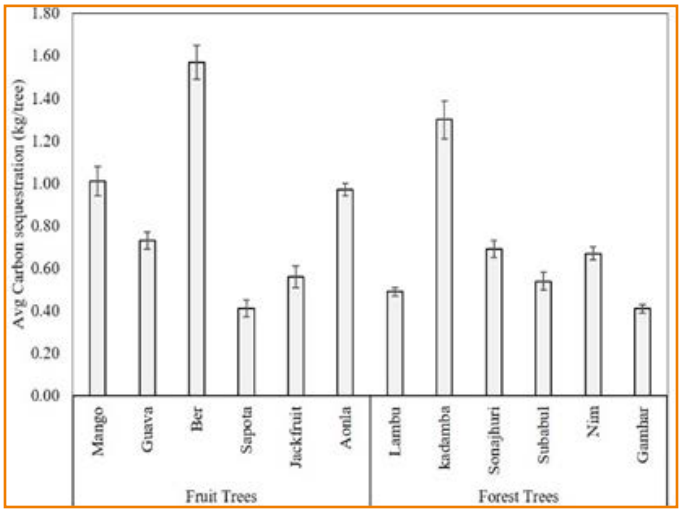
Objectives

1. To utilize the available farm resources properly.
2. To maximize per unit production of food, fodder and fuel.
3. To check soil erosion, conserve soil moisture and increase the soil fertility.
4. To generate employment opportunities for rural people.
5. To manage land efficiently so that the system can contribute in doubling farmers' income.

Achievements

- The projectwas implemented since July 2021 through the KVK network in floodplain coastal Purba Medinipur district of West Bengal at six villages, namely Dabuapukur, Rupchak, Sundarnagar, Saraswata, Atberia and Harijhamain Panskura block of Purba Medinipur district with the participation of 300 farm families during a period of 3 years from 2021 - 22 to 2023 - 24. About 31.35% farm women were involved in this project. A total of 30 trainings were organized at the villages.
- Two agroforestry models (Fruit plants + Forest plants +Vegetables or Spices in interspace) were developed in an area of 6 ha area. A total of 105 farmers utilized homestead barren lands and/ or homestead backyard land covering 2.1 ha area for developing homestead agro-forestry.

- An immediate income generation was made ranging from Rs. 4800.00 to Rs. 5050.00 by the farm families from one katha (approx.) interspace land by cultivating seasonal vegetables or spices in newly developed agroforestry models for the first time in the adopted villages.
- Generation of 110 man-days in a year from a single agroforestry unit.
- Ecological and environmental benefits like richness of biodiversity in the area; increased fruit set of nearby crops due to improvement of pollinators as informed by the farmers. Carbon sequestration potential(kg/year) by the growing plants was recorded.



16.12 Kisan Sarathi

Nodal Scientist: Dr. A. Haldar

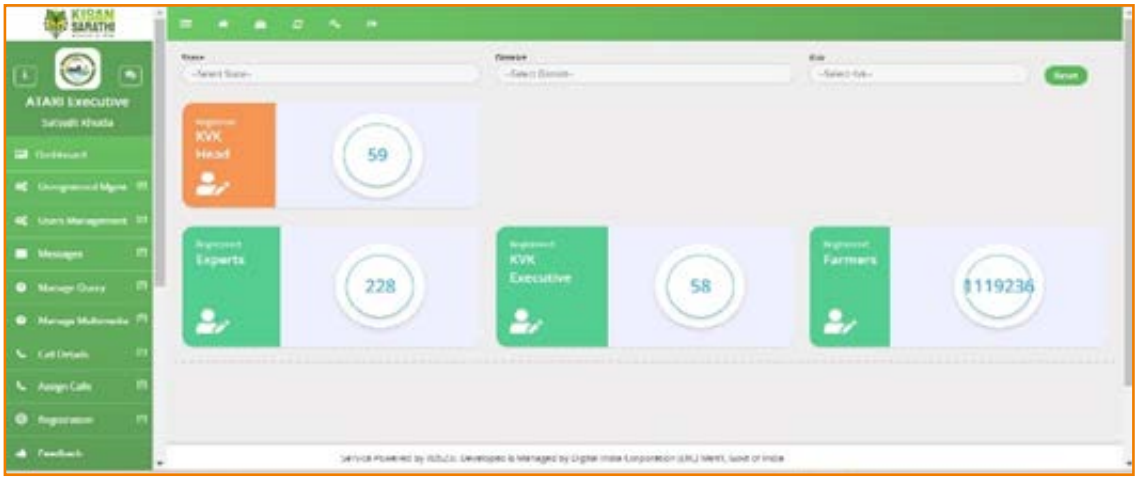
'Kisan Sarathi'- System of Agri-information Resources Auto-transmission and Technology Hub Interface, ICAR,powered by: Interactive Information Dissemination System (IIDS), Digital India Corporation (DIC), Ministry of Electronics and Information Technology (MeitY), Govt. of India. 'Kisan Sarathi' is an Information Communication and Technology (ICT) based interface online platform for supporting agriculture at a local niche with a national perspective. This digital platform was launched jointly by Shri. Narendra Singh Tomar, Minister for Agriculture and Farmers Welfare with Shri Ashwini Vaishnaw, Minister for Electronics and Information Technology, through video conference on 16th July 2021 on 93rd Foundation Day celebration of Indian Council of Agriculture Research (ICAR) to facilitate farmers to get 'right information at right time' in their desired language.

With the 'Kisan Sarathi' digital platform, the farmers can interact and avail personalised advisories on agriculture and allied areas directly from the respective scientists of Krishi Vigyan Kendra (KVKs). 'Kisan Sarathi' initiative is highly valuable not only in addressing the location specific information needs of the farmers but also in Agricultural Extension, Education and Research activities of ICAR. Using this digital platform, the farmers can get information about crop, livestock, fisheries etc and their productions, among other things that help them in improving the quantity and quality of their produces. With the help of 'Kisan Sarathi' platform, the farmers are able to get information about good crop practices, good livestock management practices and many other farming practices. Moreover, the

farmers can learn new farming techniques and/ or technologies using the 'Kisan Sarathi' platform,

Under 'Kisan Sarathi' platform, a total of 11,19,236 farmers of this Zone V have already been registered from different districts of Andaman & Nicobar Islands, Odisha and West Bengal. Fifty-nine KVKs with 228 experts of KVKs under ICAR-ATARI Kolkata have been registered. A total of 71,898 calls/ queries have been made in 2023. This initiative of 'Kisan Sarathi' definitely empowers farmers with technological interventions to reach farmers in remote areas.

Sl. No.	State	Registered Farmers	Max. (KVK)	Min. (KVK)
1	**A & N Islands**	2,889	1204 (Port Blair)	775 (Nicobar)
2	**Odisha**	4,03,362	28,396 (Angul)	2116 (Nabarangapur)
3	**West Bengal**	7,12,985	1,05,835 (Nadia Addi.)	1,451 (Kalimpong)
	Total	**11,19,236**		

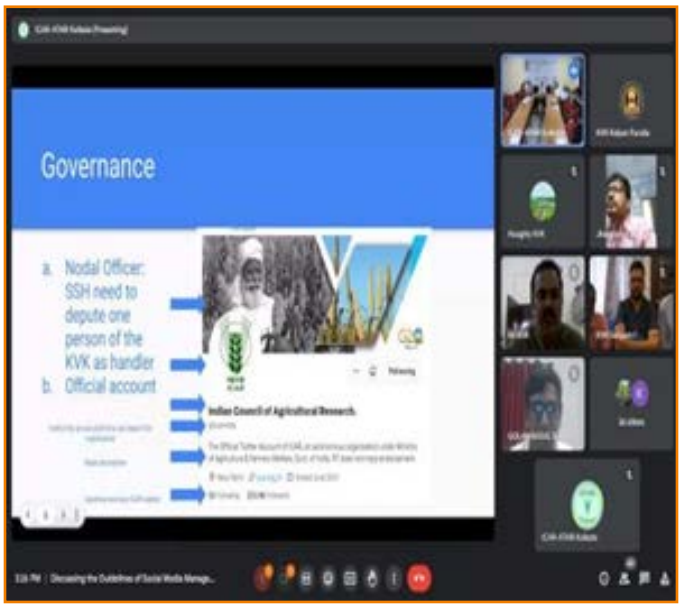


16.13 Social Media Coverage

Nodal officer: Dr. K. S. Das

In an era of digital connectivity, shaping the way of human interaction, social media platforms have permeated all sectors, including agriculture. Facebook, Twitter, and WhatsApp have become virtual tools of farmers engaged in agriculture to share their knowledge, experiences and insights. Throughout the year, ICAR-ATARI Kolkata's X (formerly Twitter) account (@AtariKolkata) has been an invaluable tool for sharing ongoing research, breakthroughs, outreach programs and institute's events with the broader community. Regular updates were provided on various Government schemes/projects, seminars, workshops, meetings etc. being implemented/organized by the KVKs and by this office. Information like crops/livestock/ fishery management practices, their production and productivity through adopting innovative technologies; advancements in sustainable farming practices; secondary agriculture etc. were shared through the platform. The tweets were not only kept the followers informed but also fostered engagement and collaboration with Government Officials, other ICAR Institutes, State Govt. Departments, NGOs and enthusiastic Farmers nationwide. The activities like *Swacchata* programme and *Vikshit Bharat Sankalp Yatra* in this zone were continuously updated. In the year 2023-24, sensitization workshops involving all the KVK officials were organized to discuss various protocols issued by Government, its security measures for maintaining the social media accounts, proper usage of hashtags and tags for wider reach of tweets and review the progress from time to time. Currently, all 59 KVKs of this zone are having one official X account for sharing their activities in their respective districts. By leveraging this platform, this office have significantly enhanced the outreach programmes related to agricultural extension which was recognized and appreciated widely. In last one year ICAR-ATARI Kolkata has posted 171 tweets

as original posts as well as reposts from KVKs and ICAR's tweets. The tweets were garnered over 400 retweets and 800 likes, reflecting widespread interest and support from the agricultural community. The profile is currently having 99 followers. In the coming days, ICAR-ATARI Kolkata is looking forward to extend the tweets to short duration audio-visual formats. Also, target has been made to increase the frequency of tweeting with maximum number of KVKs in the country.



17.0 Other Programmes

17.1 Celebration of 'Republic Day 2023'

The *'Republic Day 2023'* was celebrated at ICAR-ATARI Kolkata on 26th January, 2023. All staff members of ICAR-ATARI Kolkata assembled in front of the institute to commemorate the spirit of independent India.The Director, Dr.P. Dey highlighted the importance of the day and urged everybody to work at their full ability to strengthen this office as well as our nation.

17.2 Celebration of 'World Intellectual Property Day 2023'

ICAR-ATARI Kolkata organized *'World Intellectual Property Day 2023'* on 26.04.2023 under the Chairmanship of Dr. P. Dey, Director of the Institute on the theme *'Women and IP: Accelerating Innovations and Creativity'*. The Scientists from ICAR-NBSS & LUP, Kolkata Centre, and scientists and all the staff of ICAR-ATARI Kolkata were present in the occasion. Dr. B. N. Ghosh, Pr. Scientist, NBSS & LUP, Kolkata Centre emphasized on the theme of the event highlighting the ICAR initiative in celebrating the Day in a big way. He underlined more and more women participation in research and their contribution towards patents, trademarks, copyrights etc. Later, the Director, ATARI Kolkata made a presentation on *'Management of IP Portfolio: Know your rights'* and he highlighted different types of intellectual properties and ways to protect IPs in ICAR research ecosystem. Patentability and patent application process were discussed in details. He also stressed upon the multidisciplinary team work in filing and obtaining the patent. Thereafter, a Q & A session was held on various aspects of intellectual properties in which scientists and other staff of NBSS & LUP, Kolkata and ATARI Kolkata were actively participated.

17.3 Celebration of 'World Environment Day 2023'

The *'World Environment Day 2023'*was celebrated at ICAR-ATARI Kolkata on 5th June, 2023. In this context, all staff members of ICAR-ATARI Kolkata assembled in the Conference hall of the institute to take a*'Pledge for LiFE-The Lifestyle for Environment'*.Dr. P. Dey, Director of this institutebriefed the importance of the dayand stressed on the planting of trees to make environment pollution free for coming days.

17.4 Celebration of 'International Yoga Day 2023'

'International Yoga Day 2023' was conducted at ICAR-ATARI Kolkata on 21st June, 2023. All the staff of ATARI Kolkata practiced different yoga Asanas (*Taadasan, Ardha Chakrasana, Vrikshasan, Uthanasan* etc.) and Pranayams (*Kapalbhati, Anulom Vilom, Bhramari)* with full enthusiasm. The advantages of practicing yoga in our daily life were also discussed in the occasion.

17.5 Celebration of 'International Women Day 2023'

The *'International Women's Day 2023'* was celebrated at ICAR-ATARI Kolkata on 08.03.2023 to recognize the role of women in different spheres, their challenges and achievements. The theme of this year was *'DigitALL: Innovation and technology for gender equality'*. Mrs. T. Banerjee, Pr. Scientist from ICAR-NBSS&LUP Kolkata Centre was the Chief Guest in the programme. On the eve of the day, Dr. P. Dey felicitated with a token of gift to all the female staff members of this office and encouraged them for their future endeavours.

17.6 Celebration of Foundation Day of ICAR-ATARI Kolkata

ICAR-ATARI Kolkata celebrated its Foundation Day on 09.08.2023. The programme started with ICAR song and watering of sacred plant followed by Vedic chanting; a discussion on Extension Approaches for *'Amrit Kaal'* was also organised on the occasion. The Chief Guest of the programme Swami Atmapriyananda Maharaj Ji, Pro-Chancellor, RKMVERI, Belur Math encouraged all to work as a team for bringing synergy between ATARI-University-KVKs to carry out extension, teaching and research activities simultaneously. He emphasized that in this century skill is important along with a degree. He said that agriculture is not limited to any one subject. There are many innovative farmers who excel despite not having degrees in agriculture-related fields. He emphasised the concept of translational research in order to deliver more pertinent, useful innovation that directly address the *'One Health'* concept, the interdependent soil-plant-animal-human health.

Dr. Pradip Dey, Director, ATARI Kolkata told that ATARI Kolkata was helping to harness the demographic dividend through ARYA, climatic resilience through NICRA, soil health through SHC, cereal system sustainability through CSISA, protein security through CFLD Pulses, yellow revolution through CFLD Oilseeds and precision farming through Agri-Drone. ICAR-ATARI Kolkata through its KVKs was marching towards the nature friendly agriculture through natural farming, building capacity in the aspirational districts through KKA,

facilitating farm innovation through FFP, SKDT under ASCI, farmer-scientist interaction through MGMG, reaching the unreached and serving the unserved through STC/TSP and SCSP schemes, he added. Dr. G. Kar, Director, ICAR-CRIJAF Barrackpore and Guest of Honour discussed about the challenges of reducing quality of food, water and land resource as well as manpower. He highlighted the organized systematic planning starting from seed production to value addition and bio fortification of jute and allied fibres. Dr. Shakyawar, Director, ICAR-NINFET, Tollygunge and Guest of Honour highlighted the route of technology dissemination and activities related to farmer-oriented technology. He focused on the use of fibre bags considering the global concern of single use plastic bags. Products of FPCs/FPOs supported by KVKs, publication and Institute video documentary were released during the occasion. Representatives of FPCs/FPOs were felicitated during the occasion.The programme was coordinated by Dr. P.P. Pal, Pr. Scientist and in the end, vote of thanks was proposed by Dr. A. Haldar, Pr. Scientist, ICAR-ATARI Kolkata.

17.7 Celebration of 'Independence Day 2023'

The '*Independence Day 2023*' was celebrated at ICAR-ATARI Kolkata on 15th August, 2023. 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. Pradip Dey narrated the importance of the day and requested to work sincerely for the development of Nation. On the occasion, staff of this Institute took pledge and at the end, plantation was done in the office premises.

17.8 Celebration of Fit India Movement-Fitness Week

Towards achieving the mission of the Movement to bring about behavioural changes in order to gain wholesome health and move towards a more physically active lifestyle, ICAR-ATARI Kolkata celebrated Fit India Movement-fitness week on 29.08.2023 at its campus. The programme commenced on 21.08.2023 with oath taken by all Officials as enshrined in Fit India Pledge and culminated on National Sports Day on 29.08.2023. During the week, a march past was organized in the office premises holding the fit India banner. Different sports like goal scoring, under arm cricket, wicket hitting and basketball were played on this day. Active participation and cordial cooperation of all the Staff has not only made the event a grand success but also triggered / reflected the sportsman sprit throughout the event. This has again proved, *'Coming together is a beginning, staying together is progress, and working together is success'*. The programme ended with prize distribution ceremony to the winner teams.

17.9 Inauguration of 'Hindi Pakhwada 2023' and celebration of 'Hindi Diwas'

ICAR-ATARI Kolkata celebrated *'Hindi Diwas'* on 14th September, 2023 along with opening ceremony of *'Hindi Pakhwada 2023'*. In the occasion, the importance of using Hindi as official language was lauded by the dignitaries. It was also emphasized that how Hindi language can be more effectively used in our day-to-day official works. Prof. D. P. Mishra, Director of NITTTR Kolkata, the Chief Guest of the function, addressed the gathering and told that Hindi language had much more creativity than other languages. He urged that the Institute must further its attempts to implement Hindi language at a large scale. He also envisioned about establishing *'Bhasha Setu'* for exchanging the flow of thoughts. Dr. P. Dey, Director of the Institute, took the pledge for spreading Hindi language as Rajbhasa alongwith all the staff. He narrated the use of Hindi language in office files was easier than using English. Moreover, it has much similarity with Bengali language which is the local language of the region where ICAR-ATARI is situated. Earlier Dr. S. K. Mondal, Pr. Scientist extended welcome to dignitaries and all the staff of the Institute. He highlighted the different activities of ATARI Kolkata in implementing Hindi language in official works. The occasion was ended with formal vote of thanks.

17.10 Observation of 'Vigilance Awareness 2023' Week

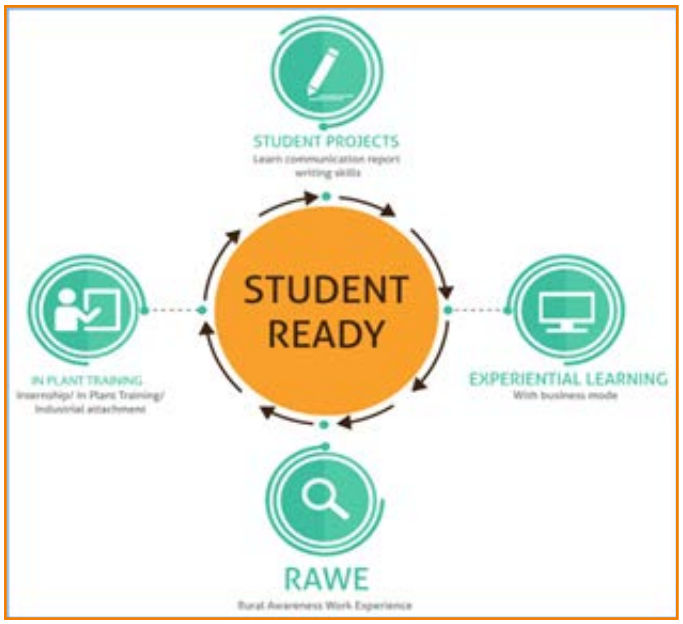
The '*Vigilance Awareness Week* 2023' is being celebrated every year and coincides with the birthday of Sardar Vallabhbhai Patel, known to be a man of high integrity. The week was observed by the KVKs of this zone including ATARI Kolkata from 30.10.2023 to 05.11.2023, with the theme 'भ्रष्टाचार का विरोध करें; राष्ट्र के प्रति समर्पित रहें' or '*Say no to corruption; commit to the Nation*'. A total of 496 employees and 2714 farmers undertook integrity pledge on 31.10.2023 at 11.0 AM at different KVKs and ATARI Kolkata. A number of various programmes like panel discussion, lecture, workshop, awareness seminars, debate, quiz competition, drawingcompetition, poster competition etc. were also conducted involving employees, farmers, school boys 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 to 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 avoice message in local language were also used to sensitize the people on vigilance awareness.

17.11 BSF Personnel Training

The KVK scientists of ATARI Kolkata educated BSF personnel available in their respective districts on various technologies relating to agriculture and allied sectors e.g. horticultural production, grafting techniques, honey production, hi-tech agriculture, livestock rearing, fish rearing and many others. Very good liaison between army personnel and local civilians were established by the KVKs. During 2023, two KVKs from West Bengal state trained 213 BSF personnel.

17.12 Rural Agricultural Work Experience (RAWE)Programme

The Rural Agricultural Work Experience (RAWE) program is a hands-on program that provides agricultural students with practical experience in farming and village life. As a part of the program, students work with farm families to identify problems and use extension tools to transfer the latest agricultural technologies. The program includes an orientation period to help students prepare for thechallenges and problems they may encounter in farmers' fields and to develop theircompetence and confidence in solving agricultural problems. In this Zone, RAWE students



from different agricultural institutes/universities took training from 24 KVKs of West Bengal and Odisha. Altogether 16 KVKs of West Bengal and 8 KVKs of Odisha imparted the training to those RAWE students. The number of trained students was 755, out of which 671 students were from West Bengal and 84 students were from Odisha. In this training programme, the participating students stayed for 1453 days for carrying out different training module scheduled by KVKs.Apart from training, they were exposed to different activities of KVK like nursery management, seed production and certification, mass multiplicationof *Trichoderma / Pseudomonas*, biofertilizer culture and its transfer and multiplication, soil collection and soil nutrient analysis, soil health card generation, vermicompost preparation, natural farming, use of agri-drone in crop field, dairy management, backyard and broiler poultry farming, catfish and ornamental fish breeding and culture, carp fish culture and other different farm activities. Farmers-students interaction was also organised and awareness programmes, farmer field visit, entrepreneur meet *etc*. were also conducted.

Table: State wise RAWE programmes

Sl. No.	State	No. of student trained	No. of days stayed
1	Odisha	84	315
2	West Bengal	671	1138
Total		**755**	**1453**

17.13 ARS Probationers' Training

As a part of special orientation programme, 15 ARS probationers were exposed to rural setting and farming practices of the farmers for a period of 15 days during last one year. The programme took place in four KVKs of this zone to make them familiar about agriculture farming situation under rural conditions at district level.

17.14 Agricultural Knowledge in Rural School

Being an agrarian country, proper agricultural knowledge, skills, attitude and dedication of farmers play very important role in India for successful and sustainable farming. However, in the present scenario, farmers are well aware of latest technologies in the fields of agriculture, but, the current generation of children and youths are not willing agriculture as their dignified profession. In this light, it is very essential to educate the children at young stage about the importance and benefits of agricultural farming. The scientists from 18 KVKs under ICAR-ATARI Kolkata tried to motivate such young buds to inculcate the basic knowledge of agriculture through delivering lectures, presentations, showing audio visuals, distributing leaflets/ pamphlets, group discussion, organizing quizzes etc. Twenty schools from Odisha and 21 schools from West Bengal were approached for the purpose. During the year 2023, a total of 43 programmes were conducted in different districts of this zone.

Sl. No.	State/ UT	No. of School	No. of Visit	No. of KVK
1	A & N Islands	0	0	0
2	Odisha	20	22	10
3	West Bengal	21	21	8
Total		**41**	**43**	**18**

17.15 Observation of Mahila Kisan Diwas

Considering International Day of Rural Women (IDRW) as an UN observance, Government of India (GoI) declared 15th October as 'Mahila Kisan Diwas' for recognizing the critical role and contribution of rural women, for enhancing agricultural and rural development, for improving food security and eradicating rural poverty. The diffenent activities of this programme are Nutritional Security through kitchen gardening, discussion on Swachhata activities, Natural farming and Millet cultivation, role of women in agriculture and its empowering aspects. During the year 2023, total 17 no. of VIPs attend this programme with 153 different villages.

Table: State wise observation of Mahila Kisan Diwas

Sl. No.	State/UT	Number of KVKs organised programme	No. of villages Involved	No. of VIPs	No. of Participants
1	A & N Islands	2	5	0	99
2	Odisha	27	77	10	1439
3	West Bengal	16	71	7	1321
Total		**45**	**153**	**17**	**2859**



18.0 New Initiatives

18.1 Viksit Bharat Sankalp Yatra (VBSY)

The '*Viksit Bharat Sankalp Yatra*' was flagged off by Prime Minister of India on 15.11.2023 from Khunti, Jharkhand with multiple information, education and communication (IEC) vans launched simultaneously from various locations across the country. The objective was to raise awareness through outreach activities and achieve saturation of various welfare schemes launched by the Government of India. The Yatra aimed to cover over 2.60 lakh Gram Panchayats and 4000 + Urban Local Bodies across the country by 25.01.2024. The KVKs were given responsibility for creating awareness programme on natural farming and soil testing under VBSY for farmers in different GPs in this zone. The Yatra started from 15.11.2023 to 26.11.2023 in selected tribal KVKs. Then, all the non-tribal KVKs conducted the Yatra up-to 25.01.2024 as per schedule of van in different GPs of this zone.

A) VBSY for tribal KVKs and *'Janjatiya Gaurav Diwas 2023'* celebration

Nodal Scientist: Dr. K. S. Das

'*Janjatiya Gaurav Diwas*' is a name given on 15.11.2021 by the Union Cabinet of the Government of India, in its meeting held on 10.11.2021, to remember the contribution of tribal freedom fighters, as part of the year-long celebration of the 75th Anniversary of Indian Independence. The selected tribal KVKs of this Zone celebrated '*Janjatiya Gaurav Diwas 2023*' at their district w.e.f. 15.11.2023 to 26.11.2023 to Honor the Birth Anniversary of the revered tribal freedom fighter, Bhagwan Birsa Munda so that coming generations could know about the sacrifices for the country. Prime Minister of India flagged off the celebration of '*Janjatiya Gaurav Diwas 2023*' at Birsa College, Khunti, Jharkhand, on 15th November, 2023. This occasion also witnessed the release of the 15th installment of the Pradhan Mantri Kisan Samman Nidhi (PM-KISAN) scheme, reflecting the

government's commitment to support farmers and promote inclusive agricultural development.

In this zone, total 13 tribal dominated KVKs i.e. 9 from Odisha (Kalahandi, Kandhamal, Keonjhar, Koraput, Malkangiri, Mayurbhanj-I and II, Sundargarh-I and II) and 4 from West Bengal (Bankura, Paschim Medinipur, Jhargram and Jalpaiguri) were selected to celebrate *'Janjatiya Gaurav Diwas 2023'*. On that occasion, 13 KVKs of this zone organized 65 CB trainings, 171 awareness campaigns and documented 22 success stories which benefitted 7891, 11204 and 43 tribal farmers, respectively during the period. ICAR-ATARI Kolkata compiled daily and weekly report of *'Satat Krishi'* under VBSY ofselected tribal districts and submitted to ATARI Guwahati for further compilation and onward transmission to the Council. Total 364 lectures were delivered to 57907 participants from 13 districts covering 331 GP of this zone.

B) VBSY for non-tribal KVKs

Nodal Scientist: Dr. P. P. Pal and Dr. K. S. Das

Under ICAR-ATARI Kolkata, remaining 27 KVKs took part in VBSY programmes in their respective jurisdiction. This office compiled *'Satat Krishi'* daily reports for 27 non-tribal KVKs. Total 1773 lectures were delivered to 431687 participants from 27 districts covering 2342 GP of this zone. Total 63671 persons from 284 KVKs attended PM's live telecast in this zone. Farmers of 7 KVKs interacted with PM and 3563 dignitaries were present. The reports of other Zones (6/7/8/10/11) including compiled report of 5 ATARIs received from ATARI Jodhpur were finally compiled and submitted to the Council on daily and weekly basis with cumulative data during 25.11.2023 to 25.01.2024. Not only that, this office also compiled the reports of those selected non-tribal KVKs across the Zones where PM was interacted with farmers and submitted the final compiled report of 11 ATARIs to the Council on weekly basis from 09.12.2023 to 23.01.2024 and then, time to time. Compiled reports (KVKs, where Union Ministers visited) of 11 ATARIs were also submitted to the Council.

18.2 Millet Mission Programme

Nodal Scientist: Dr. K. S. Das

During the year 2023, ICAR took initiatives for conducting a country scale extension programme on the eve of International Year of Millets (IYoM)-2023 in the form of 'Recipe Contest' among the rural women in millet potential areas which was identified by ATARIs in the country. It was conducted at the KVK following multi-stakeholder approach. ICAR-ATARI Kolkata identified total 18 KVKs- 12 KVKs from Odisha and 6 KVKs from West Bengal as per millet growing area in the district. The selected KVKs from Odisha were- Bolangir, Gajapati, Ganjam-I and Ganjam-II, Kandhamal, Kalahandi, Koraput,

Malkangiri, Nuapada, Rayagada, Sundargarh-I and Sundargarh-II and from West Bengal were Bankura, Coochbehar, Darjeeling, Murshidabad, Murshidabad(Addl.) and Purulia.

This office processes the procurement of different varieties millet seeds for the KVKs of this Zone through SMD (AE), ICAR. The schedule for millet programmes/activities was prepared by the KVKs which were organized during the year 2023 and the consolidated report of this zone was submitted to the Council. Each KVK prepared three *'Millet Recipe Contests'* during the period following sampling plan and other standard norms of competition as per guidelines of the Council. A total of 33 *'Millet Recipe Contests'* were conducted by the KVKs of this zone involving 793 participants. Not only that, as desired, innovative and traditional millet recipes from the concerned districts of Odisha and West Bengal were collected from the KVKs and submitted to NITI Aayog for documentation.

19.0 Selected Success Stories

19.1 KVK South Andaman

Value addition of millet fetched remunerative price to SHG members

The food processing industry can play a vital role in alleviating poverty, empowering women and sustainable development in India. Food processing can enhance farmers' income as well as help in preventing post-harvest losses to a very large extent. Keeping this in mind, each year KVK, South Andaman organizes different training programmes on value addition and processing for rural women, SHG's and others.

PARASH SHG, located at Humfrigunj, Port Blair, South Anadaman created an example of getting higher profit from the secondary agriculture involving millets. This SHG sent all its members for training at KVK South Andaman on value addition of millets. As part of celebration of International Year of Millets, KVK, South Andaman conducted a training programme on Value addition in Millets in the month of March, 2023 at KVK. Millets have high nutritional value and can be used to develop a variety of value-added products. SHG group named "Parash" consisting of 10 members attended the training programme. All the group members showed keen interest and enthusiasm in learning

about the health benefits of consuming millets as well as how different millets can be incorporated and replaced in various recipes. Training included demonstration on preparation of ragi laddu, multi millet laddu, ragi murruku, multi millet flour etc. After attending the training programme the SHG group members realized the tremendous entrepreneurship opportunities for processing and value addition of millets which can be successfully pursued by them. The group decided to take this as an opportunity to start processing of millets.

In view of the immense interest of the group KVK provided technical guidance and support including topics like Processing Techniques, Value Addition, Packaging, Marketing, Labelling, Calculation of Product Price, etc. Initially the SHG group started by preparing ragi laddu and after seeing the response from nearby market they underwent another training from KVK for value addition in fruits and seafood. With continuous perseverance and hard work PARASH SHG started preparing Bajra laddu, Fish pickle, Suji Laddu, Coconut laddu, Papaya Jam, Prawn chutney and Idly chutney. At present the group is supplying their products to many shops in Port Blair. To motivate such SHG's Dept. of agriculture has provided them with an outlet stall at Mitranchal, Sippighat. They are also selling their products during Mela's and exhibitions arranged at local level. With great zeal and enthusiasm PARASH SHG has already produced around 178 kgs of different items and sold successfully during last 5 months with a total income of Rs 141840.

19.2 KVK Angul

Round the year mushroom production increased farmer's income

Smt. Kalyani Sahoo of Kumurisingha village, Angul district of Odisha (Mob.: 8328891137) is a small farmwoman having 2.5 ha of land. Due to her keen interest in mushroom cultivation, she contacted KVK Angul and got the training and subsequent technical guidance for round the year production of mushroom. Cultivation of Paddy straw mushroom var. *V. volvacea* in bed method 2x2 ft size in temperature range between 25-38°C was practised by Smt. Sahoo. These mushrooms are egg shaped and fleshy with excellent taste. There was pin head appearance at 7-8 days and its shelf life was 12-24 hours at 25-30°C and 4-5 days at 4°C.

She achieved 16-20% increase in production in controlled atmospheric condition in case of paddy straw mushroom with additional income of Rs. 15000 than traditional practice. She was also involved in Oyster mushroom cultivation and received 36% increase in production (2.4 kg/bag) in case of Oyster mushroom and obtained an additional income of Rs. 11000 (From 400 Bags) with cultivation of this mushroom.

Farmers preferred the better taste and prolific fruiting. After improving the cultivation techniques, they are cultivated as widely and cheaply as other common vegetables, which was thus beneficial to the general public. In view of the pleasing favour, high protein level and medicinal values; mushrooms clearly represented one of the district's greatest untapped resources of nutritious and palatable food for our current generation and for future generations to come. It is marketed as fresh, dry or as mushroom powder which creates a small entrepreneurship scope for SHGs in the district.

Through the year-round mushroom production, recycling of organic wastes was possible which had a great impact on the environment. Around 30-40% paddy straw was used for mushroom cultivation and the spent mushroom substrate (SMS) could be used as an excellent organic input for vermicomposting. These wastes are also converted into valuable resources through proper management, with their utilization leading to reduced environmental

pollution and further economic growth. In 3 blocks of Angul district 415 farm women in 45 villages adopted this variety of mushroom due to its high production.

19.3 KVK Bargarh

Cultivation of sesamum brought additional income to the farmer

Shri Prahalad Bhue is a farmer of Vill/PO/GP Hatisara, Block-Bhatli, Dist. Bargarh, Odisha (Mob.: 9937198653) who is practicing rice cultivation in his two acre land during Kharif and vegetables during rabi season leaving another one acre fallow in every kharif season. The drying and very less grains per panicle during every kharif season made him frustrated due to cessation of rain by end of September forcing him to leave the land fallow. Grazing of domestic animals is also a great problem in his area in semi- or less-cropped area during kharif. As a result, he was unable to get sufficient crop from his entire land. One day during a farmers-training and interaction programme at his village where KVK scientists made him aware about sesamum crop that germinates under low soil moisture and can be successfully cultivated during kharif under drought condition. It is the most preferable crop that resists animals, monkeys and birds due to offensive odour. After that he decided and took up sesamum in 0.3 ha. land during kharif 2022-23. He was supplied with sesamum seed var. Smarak from KVK. He followed line sowing behind plough 30 cm x 10 cm, seed treatment with Vitavax Power @ 2.5 gm/kg seed, application of STBF, application of Phospho-Gypsum @ 2.5 q/ha. alongwith spraying of Indoxacarb 14.5 SC @ 1ml/lit. of water and spraying of Carbendazim 12 % plus Mancozeb 63 % @ 3 gm / lit of water. He has also kept clean the plot himself after weeding twice manually.

He reaped a very good crop that he had never seen before and harvested 153kg of seed from 0.3 ha land. He sold 100 kg of seeds to other farmers @Rs. 80/kg, earns a marginable profit as well as used the sticks for fuel purpose. He is happy with the additional income from barren land. He is now able to pay his daughter's tution fee in time.

This is the only profitable crop that can be grown under all odds and particularly during kharif. Being a short duration (75 days) variety, it helped him to plan a sure crop in unbounded uplands of his village for improving economy. The barren land is effectively used for sesamun cultivation as it requires less water and care. It is also resistant to pest and diseases. So, there is a less chance of environmental pollution due to less use of chemicals. Looking at the success of Sri Bhue 36 farmers of nearby villages followed him and decided to go for sesamum in fallow land.

19.4 KVK Cuttack

Hi-tech horticultural interventions made farming profitable round the year

Shri Santosh Nayak, an educated and innovative farmer of Vill-Pathapur, PO-Pathapur, Block-Dampada, Dist-Cuttack, Pin-754007, State-Odisha (Mob.: 9776726030/ 7008235996) having a land area of 12.5 acres. He has 12.5 acres of farmland. He was constantly losing money due to various disease and pest problems in rice and vegetables. He was interested in crop diversity to reduce crop loss due to insect infestations. He approached KVK specialists to seek advice on how to get profit from his land.

He contacted a KVK specialist to ask about plant protection methods for his crops during the covid epidemic. He received the necessary advice and solution for a successful crop stand during the epidemic. After that, he keeps in touch with KVK experts and has been present for all training sessions pertaining to his crop. He began the agricultural diversification process by relocating 1.5 acres of beans, 0.5 acres of high-value broccoli, 2 acres of guava fruit production, and 0.5 acres of marigold cultivation. KVK has supplied the technical know-how of better nursery raising, drip and fertilization systems, mulching, and selection of guava and tomato plantlets for successful crop stand in the field. In addition, KVK supplied a drip system, plant protection agents, and soluble fertilizers for the ARYA project.

He got increased the sustainable income from various components round the year. The cost of production has been drastically reduced due to water and fertilizer consumption drastically reduced. His yield increased 20-25% due to improved production technology. Disease and pest infestation reduced 23% after taking plant protection measures suggested by KVK.

His success influenced neighbouring farmers so much that many other farmers get interested and adopted fruit cultivation along with Flower and high value vegetables to get higher remuneration. He became the role model for adopting mulching and drip fertigation systems in Guava farming. ICAR-NRRI, Cuttack has awarded him the best farmer title during the NRRI Foundation Day celebration.

About 122 farmers are following the hi-tech horticulture practice after seeing its benefits and revenue. Approximately 50 farmers from neighbouring blocks are in constant touch to get planting materials and plant protection techniques and other good agricultural practices. Department of Horticulture and other NGOs in the district promoted the protected cultivation technology. Farmers Producer Group is gaining momentum in the Banki area to adopt these hi-tech horticultural techniques.

19.5 KVK Gajapati

Improved crop production practices gave higher profit to farmer

Shri Dayanidhi Karjee of Vill- Dihudisahi, GP-Mangarajpur, Block- R.Udayagiri, Dist- Gajapati, PIN-761016 (Mob.: 9439525724) is a small farmer having 0.8

ha of land. He was frustrated with the lower income from his farming due to abrupt weather aberrations and incidence of diseases and pests in the rice and other conventional crops. With the intervention by KVK Gajapati, he started improved crop production practices for making his farming profitable. He was involved in cultivation of Pigeon pea var. LRG-52 @ 15 kg/ha,with seed treatment with Rhizobium sp. @ 25g/kg, Pre-emergence application of Pendimethalin 30%EC @ 1.5ml/l within 24 hrs. of sowing followed by post-emergence application of Imazethapyr 10% SL @1ml/l at 21-25 DAS for controlling weed flora. Use of Yellow Sticky Trap @ 10 pcs/ha for controlling pest population, foliar spray of water soluble NPK (19:19:19) @ 2g/l at 30 DAS for better growth and spraying of Carbendazim 12% + Mancozeb 63% WP @ 2g/l for controlling Fusarium wilt were also followed alongwith application of Emamectin Benzoate 5% SG @ 0.4 g/l to control pod bore and spraying of Boron (20% B) @ 1g/l at flowering for better fruit setting. He also practised cultivation of cowpea bean in trellis system with seed treatment with Rhizobium and cultivation of early cauliflower and cabbage and application of micronutrient. The farmer used to get annual income of Rs. 46500 but by interventions like improved agricultural practices etc., he is getting annual income of Rs 59750 and the yield increased by 28.49%.

Shri Dayanidhi Karjee has now become a rich farmer and an example for the local farmers. He has been identified as a very progressive and receptive farmer who can mobilize the beneficiaries for systematic and scientific cultivation by his own interest. He has cultivated Raikia beans, cowpea and off-season cauliflower and cabbage round the year in his field. Farmers from nearby twenty villages of R. Udayagiri block visited the field of Shri Dayanidhi Karjee to see the year round cultivation of vegetables and pigeon pea and showed their interest to learn the technique of cultivation of bean in trellis system and seed treatment of pigeon pea with Rhizobium.

19.6 KVK Jajpur

Hi-tech vegetable cultivation increased farm income

Shri Sisira Kumar Rout of Village- Bahabalapur Block-Rasulpur, Dist- Jajpur is a progressive farmer having 3.0 ha of land area. He practiced the improved vegetable production techniques under the technical guidance of KVK Jajpur. He used polythene mulching in the farm land for off-season cultivation of cabbage and cauliflower and other high value vegetable crops like broccoli etc. Through such interventions, he earned Rs. 300000 per year. Now he is maintaining a good social life. The farmer has developed interest to know about different modern technologies available for increasing production of different vegetables. Seeing the success of Shri Rout, the farmers from nearby villages are also showing interest for adopting the modern cultivation practices to increase their farm income.

19.7 KVK Jharsuguda

Livestock based integrated farming system enhanced profitability

Shri Mitrabhanu Patel is a farmers residing at Gudigaon, G.P- Keldamal, Block- Kolabira, Dist.- Jharsuguda (Mob.: 9556899125). He has 16.0 acres of land, out of which he developed integrated farming system in 5 acres having components of Agriculture (Paddy, Sesame, Greengram and Maize), Horticulture (Mango, Ginger,Tomato, Brinjal,Chilli), Livestock (Dairy, Goatery) and Fishery (Bio-floc) and rest land are used for paddy production.

From all the components under IFS, his annual income is Rs.718000 and net income is Rs. 420000. His income has enhanced due to adoption of improved technologies demonstrated by KVK and capacity building programmes imparted by KVK scientists. Establishment of different components of the IFS is being made successfully by the help of line departments and technical guidance of KVK scientists. By developing IFS model, he is engaging two manpowers daily for management of the different enterprises and during crop production he has been engaging a total of 270-280 man-days per annum. Farmers of his village and nearby villages can enhance their knowledge and skill by visiting his field and till now spread of the technologies to different farmers has happened to 5-6 villages.

19.8 KVK Kalahandi

Off-season vegetable cultivation helped to earn more from the farm land

Shri GourangaSahu of Village-Indramal, Block-Narla, Dist-Kalahandi (Mob.: 9692643595) is a progressive and highly enthusiastic farmer having 5 ha of land. He was interested in off-season vegetable cultivation for catching the remunerative market and came into the tough of KVK Kalahandi. Shri Sahuwas 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 & 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. 4.5-5.0 lakhs annually from vegetable cultivation.

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 GourangaSahu'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.

Witnessing the profit gained from the crops (specific-vegetable) other educated youth also 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. His farm land is 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.

19.9 KVK Kendrapara

Introduction of Amur carp for profitable pisciculture

Shri Prasanta Kumar Das of Vill. Ghigidia, Dist. Kendrapara (Mob.: 8917607167) is a 54 years old farmer with matriculation. He is having 6 Ac land area. The different farming components are rice (3 acres), pisciculture (2 acres), vegetables (1 acre) and two numbers of cows. The pisciculture tanks were prepared by proper liming and fertilization before stocking of yearlings. Yearlings of Catla, Rohu and Amur carp was stocked at a ratio of 3:4:3 and @ 5000 nos/Ha. Mrigal was completely replaced by Amur carp having higher growth rate. Floating fish feed was applied @ 2-1% of body weight twice daily. pH and alkalinity of pond water was tested in each month and accordingly liming and fertilizer application was done. The average weight of Amur carp was 1.1 kg during final harvest with a total production of 39.5q/ha fish.

Increase in production of 8.5 q/ha over control was found. The net profit was Rs. 182000 per year from pisciculture and Rs. 94000 from other components. He could generate around 140 man-days of employment per year in his farm. Technical guidance from KVK such as scientific pond management practice and complete replacement of Mrigal with Amur carp, intercropping with Java Punti enriched his knowledge. He is the key trainer in pisciculture for other nearby farmers.

19.10 KVK Koraput

Practice of natural farming enriched nutri-garden nutritionally

Shri Khaga Hantal is a farmer residing at Village Gunthaput, Block Nandapur and Dist. Koraput (Mob.: 8917574235). Shri Hantal is a vegetable grower, who used to grow different high value vegetable crops viz. off-season (cauliflower, onion, chilli, bean, tomato, cabbage, field pea, coriander and high value spice crops like ginger and garlic). He also used to grow millets by employing different landraces of millets (ragi and little millet). As Koraput district is endowed with natural flora and fauna, that's why Shri Hantal used to grow high value vegetable crops organically by using cow dung. Afterwards KVK intervened in the form of practicing him to get involved in the preparation of different natural farming components viz. jeevamruta, bijamruta, neemastra and handikhata for encouraging the cultivation practices through natural farming. KVK provided different capacity building training programme as well as demonstration by the extension concept of learning by doing. He came to KVK, Koraput for more information on organic farming and natural farming. KVK, Koraput trained him for outscalling of natural farming by using jeevamruta, bijamruta, mulching and preparation of handikhata and provided the planting material of tomato, bean, cauliflower, cabbage and marigold seedling. He had grown the vegetables (cauliflower, cabbage, beans, tomato) with application of jeevamruta, bijamruta, handikhata and mulching. Marigold was grown as trap crop in vegetables. He was able to earn Rs. 350090 per year through such farming.

He had got less production in first year but got quality produce as compared to non-demo plot. The produce being from natural farming practices, he got appreciable consumer preference and good market price. After realization of outstanding outcome in the form of quality produce, other farmers were motivated to grow their produce with natural farming practices, with an ultimate motive to rejuvenate soil fertility and better land utility. He used to grow the vegetable crops by not using chemicals and by involvement of cowdung and natural farming practices which is eco-friendly so farmers from nearby villages were also interested for adopting the technologies.

19.11 KVK Mayurbhanj I

Handicraft making from Sabai grass brought prosperity to farming family

Smt. Usha Rani Naik is farm woman residing in Village Guhaldihi, Block Betnoti, District Mayurbhanj (Mob.: 8895068125). She is a very enthusiastic young woman who has an inherent entrepreneurship developing quality. She came in contact with KVK Mayurbhanj-I and got the idea of different value added products that can be formed from Sabai grass (*Eulaliopsis binata*). Sabai grass is characterized by long leaves which are used for making ropes, pulp for paper production, and many other arts and crafts. In India, Sabai grass is abundantly found in the forest fringes of the Chhotanagpur Plateau in West Bengal and Odisha. Smt. Naik is earning profit of Rs. 35 lakh annually with turnover of around 60 lakhs. She has now become a source of inspiration among the tribal community and is working as a resource person for the promotion of value added products from Sabai grass. Initially, the business was started by her by taking 15 members. Now she has formed

Guhaldihi Sabai Producers Group having 150 women members.

19.12 KVK Sonepur

Integration in farming led to prosperity and sustainability

Smt. Suprava Dani is a progressive farmer of Village Laturpet, Block Biramaharajpur, DistSubarnapur (Mob.: 7751075590). She is an enthusiastic lady, aged about 45 years is having 3.5 acres of total land and was cultivating mainly paddy in only 2 acres of land. In addition, she had a small dairy unit with 5 cows in the backyard to get some additional income throughout the year. But, due to meager profit, she prompted her to explore the possibility of earning more from other livelihood vocations. Her visit to KVK, Sonepur and scientific knowledge and skill acquired about the improved dairy farming and mushroom cultivation motivated her to give these vocations a try. She had set up a mushroom production unit and spawn production unit in the adjoining area of her residence. She regularly sell mushroom as well as spawn in the near-by villages of Biramaharajpur block with remunerative prices. Recently she has started value added products like mushroom pickle, soup powder, namkeen, cookies, dry mushroom powder, sauce, badi, arisapitha etc from oyster mushroom.

During her visit to KVK Sonepur, she participated in a 5 days vocational/skill training programme on "Scientific Mushroom cultivation and Spawn Production" at KVK. From the training she acquire scientific knowledge and skill about the improved mushroom production technology like selection of good quality spawn, straw management, bed preparation, diseases and their management in beds, spawn preparation, preparation of different value added product from oyster mushroom, which motivated her to start her journey in this direction. From mushroom and spawn unitshe earned a net income of Rs. 2.24 lakh from 2800 quality paddy straw mushroom beds and 2.0 lakh from 50000 spawn bottle In addition from the dairy farming with 23 nos of cross bred cows, she earned an annual net income of Rs. 2.75 lakh. In total, she earned an annual net income of Rs. 6.99 lakhs.

The training and time to time interaction with KVK scientist and visits helped her a lot to acquire knowledge and skill on various aspects of mushroom cultivation, production of good quality mother spawn as well as commercial spawn, preparation of different value added products from oyster mushroom etc. Smt. Dani has established a mushroom unit after acquiring the scientific knowledge and skill from the KVK like maintenance of diseased free mushroom beds. She is also able to establish a spawn production unit by acquiring the prescribed knowledge and skill from the KVK like media preparation, mother spawn and commercial spawn production etc. She has started preparing different value added products from mushroom. She is serving as a resource person on "scientific mushroom cultivation" for SBI-RSETI and Horticulture department and source of motivation for other farm women. Now in her farm she is giving employment to 10 persons of nearby villages round the year. The initiative taken by Suprava Dani has proved that rural women can take gainful employment and income through "Scientific mushroom cultivation techniques".




19.13 KVK Sundargarh I

Pond based integrated farming system enhanced profitability

Shri Hirod Patel, of Village-Ratanpur, Block-Tangarpali, Dist-Sundargarh, Odisha (Mob.: 7750930801), is progressive farmer having a land area of 10.5 ha. He started his own IFS system after attending a training at KVK during the year 2018-19 on quality seed and vegetable production. He had about 4.2 ha of his own paddy field. At first he started from a small area of banana cultivation and gradually transformed his land and cultivation practices. At present the different technical components of his enterprises is as follows: Rice- 2ha., Banana-2 ha., Mango- 0.4 ha, Vegetable cultivation-1.2 ha., Fishery-0.6 ha, dairy-4 nos. duckery-10 nos.

Before taking-up the enterprise, he was earning Rs. 50,000 per annum from Paddy &Arhar, however after practicing the enterprise he is earning Rs. 1200000 per annum. His enterprise has developed as one of the successful IFS model in the district which employs about 9 labourers on a daily basis with innovative and modern components. He himself is a skilled worker trained through KVK for managing the crops and marketing. His enterprise has complete infrastructure for storing and marketing along with different farm mechanization like tractor, power tiller, weeder, sprayers and all other small implements.

He prefered and successfully used organic inputs for fertilizers and bio-pesticides in his unit and has modelled it into a successful organic unit. He has developed his own crop residue system generating compost and other bio-growth promoters from the farmyard waste of all his units. His enterprise currently supports about 10 farmers, has developed his enterprise single handed which has created an example among other farmers. Inspired by his endeavour, about 13 farmers namely from Kutra, Bisra and Rajgangpur blocks under the OMBADC vegetable cluster programme who had visited the units during their Exposure visit, have replicated the exact system (model) of integrated farming in their own units. Sri Hirod continues to inspire many other farmers for which he has been suitably rewarded through Block, District and State level Farmer Awards.






19.14 KVK Murshidabad II

Entrepreneurial venture on beekeeping helped sustain the profitability

Smt. Ila Roy Biswas of Vill. Khidirpur, Block Hariharpara, Dist Murshidabad, West Bengal (Mob.: 7431016127) is an enthusiastic farm woman having entrepreneurial quality. She was associated with KhidirpurAlor Disha FPC with an annual profit of Rs. 303580 through marketing of honey. Beekeeping is an age-old practice of the district like Murshidabad, West Bengal. A number of beekeepers are associated with this profession; however, a significant improvement of their livelihood is not visible for last few decades. Although, the district Murshidabad is known to be a resource generating zone for beekeeping, lack of scientific knowledge and proper guidance pushed the beekeeping community towards the back of the development. Previously, there was lack of provision of in-hand savings for the farm women and also was least aware as a community about beneficial aspects of beekeeping as well as bee products. Precious leisure time of the women literally was of no use in actual development basis. Moreover, group sense and we feeling was so feeble that a dissonance among them was prevalent. In this context, an awareness programme was conducted by the Dhaanya Ganga Krishi Vigyan Kendra, Murshidabad Additional, Ramakrishna Mission Ashrama, Sargachi, Murshidabad for the farm women, rural youths and beekeeping aspirants with a view of developing some basic knowledge regarding the two-edged beneficial aspects of honey bee both in term of crop development and the positive impacts of bee products. Extrinsic motivation was provided about having some monetary flow in their hand for better livelihood through an excellent use of the leisure time to extract maximum benefits in every possible dimensions. A strong sense of adherence among the village women created which led them towards intrinsic motivation of doing beekeeping practices as a group.

At the initial stage of the enterprise, the beekeeping women faced some difficulties to conduct the beekeeping practices, such as lack of alternative honey bee flora in the local areas, huge input cost involvement during dearth period, problems of supervising bee boxes during migration, absence of any government outlet or super market, lack of knowledge for establishment of value chain system, unavailability of processing plant in the district, poor investment capacity of women involved in beekeeping, forced to sale raw honey due to non-existence of processing plant, lack of knowledge about royal jelly, bee venom, bee wax and other by products and lack of support and knowledge for branding, packaging and preparing other products from honey etc. The group of 30 women started the beekeeping practice with 60 numbers of bee boxes in 2020, and currently they have increased their number of boxes up to 200 including *Apis cerena* and *Apis mellifera*. During the last year, the production of honey per annum was 5768 kg and the net profit per annum was Rs. 303580 only. Marketing is one of the majors constrains for beekeeping activities of this group. The major portion of honey is being sold to middlemen, and the remaining amount was sold to the local town market. At the initial stage, the beekeeping group was received a fund of Rs. 300000 from NABARD.

19.15 KVK Uttar Dinajpur

Oyster mushroom cultivation strengthened the economic condition of SHG

Smt. ShushilaTudu of Village- Gulamigachh, PO- Ghorugach, Uttar Dinajpur (Mob.: 8116666073) is an entrepreneur in true sense and a member of Sardi- Sabon SHG. Since last 3 years Smt. Tudu is engrossed in this enterprise. By running two small units continuously, she is able to give uninterrupted supply in market. Mushroom Production unit was constructed under asset creation in Tribal Sub-Plan Project of KVK Uttar Dinajpur. From tea garden labourer to an entrepreneur, Smt. Tudu is earning net profit of Rs.7000-9000 per month by selling mushroom. This year in the month of January she has been nominated for Mahindra Samrridhi Awards 2017-18 and has been selected National nominee under youth category on March 6th, 2018, she has been awarded by honourable Union Agri. Minister, Shri Radha Mohan Singh ji at New Delhi and remunerated with 2.16 Lakhs. This was a pride moment for Smt. ShushilaTudu, her family members, whole locality as well as pride moment for Uttar Dinajpur KVK. She is now stepping towards better livelihood.

Smt. ShushilaTudu is source of inspiration for so many other farmers not only in Chopra block but in whole district. People know her and after getting National award from Mahindra Samridhi she has been interviewed by many TV channels and local newspaper. Now, she is role model for many other farm women especially among tribal farm families. Farmers from distant places visit KVK for different training purpose and many of them who were interested in mushroom cultivation always showed keen interest in visiting her mushroom unit in Gulamigachh village. Shushila's family gained a prestigious position in the village. Her husband always helped her in her work, morally supported her and encouraged her in difficult times. She has been acting as catalyst for mushroom cultivation promotion program of KVK.

During training on mushroom cultivation, farmers and farm women were instructed and made cautious about proper use of chemical and its impact on environment if it is injudiciously used. As per instructions, Smt. Tudu is also making judicial use of chemical when and where it is required and above all she is not dumping the spent here and there, but making quality vermicompost along with her fellow SHG members in a vermicompost production unit provided by KVK under Tribal Sub-Plan in her village. Smt. Tudu is contacted by many farmers of nearby villages for her expertise in the field of mushroom cultivation and so far 18 individual farmers of 5 nearby villages started this venture after learning from her.

19.16 KVK Malda

Use of Mango special boosted the fruit quality and profitability of mango orchard

Sk Habib of Village- Rukundipur, Block- Ratua-I, District- Malda, West Bengal (Mob: 9647208193) is a marginal farmer having a land of 4 bigha. He is a marginal farmer with middle level of education follows a diverse pattern of crop cultivation throughout the year, growing Mango, litchi, rice,

jute, maize, black gram, aman rice, tomatoes, wheat, mustard, lentils, bhindi (okra), brinjal (eggplant), turmeric, ginger. In mango, he is using Mango special for last 3 years for inflorescence development, fruit setting and fruit quality of mango. Before application of Mango special - 4 times (twice before flowering & twice after flowering) in his mango orchard, his annual income was around Rs 2.0 lakhs. After Mango special application his income boosted to approximately Rs 3.0 lakhs. He is selling his good quality mangoes and processed products in the local market and fetching higher price.

The social impact of Mango special application is very significant for the life of Sk Habib. It helps him with the knowledge for proper micronutrient management for good quality mango production, and it becomes a higher income generating activity. He is now a source of inspiration for other farmers of the locality who are learning scientific practices for improving their livelihood. More than 70 farmers have adopted this technology and farmers of other districts are also going to start it.




19.17 KVK South 24 Parganas II

Production of High value vegetables gave financial security to farmer

Shri Samir Halder of Village- Moutala, Baruipur, South 24 Parganas (Mob.: 8001325142) is a small farmer having a land holding of 2.3 ha. He was very much interested in improved cultivation practices of high value vegetables and came in contact with KVK Narendrapur (South 24 Parganas-II). He was trained by KVK and the experts continuously monitored his farming. He cultivated high value vegetables, seasonal vegetables, cereals before the KVK intervention and got a profit of Rs. 95750. But after he adopted the scientific farming, he cultivated Paddy, Chilli, Tomato, Cabbage, Coloured Cabbage Cauliflower, Coloured Cauliflower, French Bean, Broccoli, Knolkhol, capsicum etc. and generated a net income of Rs. 194600.

He generated employment and better livelihood options for the poor from the sale of newly introduced crop as like coloured cauliflower, coloured cabbage, cherry tomato along with high-value vegetables and other crops in the concerned locales.He produced Purple cauliflower, orange cauliflower, red cabbage and others as like high value vegetables, winter vegetables along with other seasonal crops and encouraging people to start up their production with highly nutritious profitable newly introduced crops in their cropping system with proper guidelines of Sasya Shyamala KVK and environment-safely approaches by using hi-tech technology.Nearby progressive farmers and rural youths have been motivated and converted their cropping pattern by using these newly evolved crops by applying scientific approaches which create a landmark.




20.0 Publications

Research articles

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Haldar A, Pal P, Ghosh S, Pan S. 2023. 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* **57**(9): 1251-1257 [doi: 10.18805/IJAR.B-4894].

Rana R K, M J C G, Singh R K, Monga S, Kaur T, Sheoran P, Dubey S, Meena M, Pal P P, Kumar A, Bordoloi R, Bhaskaran A, Singh S R K, Shirur M, Burman R R, Singh R, Sigh R, Singh A K, Kesava, Gautam, U S. 2024. Strengthening the agricultural entrepreneurship: Insights on transformative influence. *The Indian Journal of Agricultural Sciences***94**(3-1): 72-80.

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Book edited

Das K S, Mondal S K, Begam A, Roy S K and Dey P. 2023. Pioneer farmers: Agri-sustainability through Farmer FIRST approach. Published by the Director, ICAR-ATARI Kolkata, pp:1-70.

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Haldar A, Mudi N, Sau S, Sarkar T, Choudhury A K, Hassan M, Das A, Samanta P, Sahaji S and Dey P. 2024. Agroforestry for the floodplain villages of Purba Medinipur district in West Bengal.Published by the Director, ICAR-ATARI Kolkata.

Haldar A, Mandal S N, Das U, Roy K, Das A, Samanta P, Sahaji S and Dey P. 2024.Integrated Farming Systems in West Bengal: A Step towards Sustainable Rural Livelihoods.Published by the Director, ICAR-ATARI Kolkata.

Mondal S K, Bhattacharya R, Nandi S, Rahman F H, Das K Sand Dey P. 2024. Fostering climate resilient technologies for sustainability in eastern region.Published by the Director, ICAR-ATARI Kolkata, pp:1-70.

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Technical bulletins

Mondal S K, Das K S, Pal P P, Haldar A and Dey P. 2023. ICAR-ATARI Kolkata Annual Report 2022. Published by Director, ATARI Kolkata, pp: 1-163.

Newsletters

Das KS, Mondal SK, Roy SK, Pal PP, Haldar A and Rahman FH. 2023. ATARI Kolkata News. Published by the Director, ICAR-ATARI Kolkata, Vol 6, No. 2, pp:1-12.

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Important news items

- *'Review Workshop-cum-Monitoring Field Visit of Farmer FIRST Programme (FFP)'*
- *'Golden Jubilee Celebration of KVKs'*
- *'Interactive Workshop-cum-Capacity Development Programme on Attracting and Retaining Youth in Agriculture (ARYA)'*
- *'Secretary, DARE & DG, ICAR visited North Bengal on the occasion of celebration of Golden Jubilee Year of KVKs and International Year of Millet 2023'*
- *'Secretary (DARE) & Director General (ICAR) visited an entrepreneurial mushroom unit of a young engineer guided by Cooch Behar KVK'*
- *'High level FPOs-FPCs-Farmers' Meet Chaired by the Hon'ble Secretary, DARE & DG, ICAR'*
- *'Interactive meeting on Extension approaches towards Natural Fibres in West Bengal organised'*
- *'World Intellectual Property Day 2023'*
- *'Hon'ble Secretary DARE and DG, ICAR inaugurated Natural Farming Demonstration Unit at Kalyan KVK'*
- *'Annual Zonal Workshop 2023 of KVKs under ICAR-ATARI Kolkata organized at UBKV-KVK Kalimpong, West Bengal'*

- » *'ICAR-ATARI Kolkata organized NICRA Field visit at Paiyong Busty, Kalimpong'*
- » *'Workshop on Convergence* Platform of CSISA organized jointly by ICAR-ATARI Kolkata and OUAT Bhubaneswar'
- » *'Project Completion-cum-Convergence Workshop on Integrated Farming System'*
- » **'***Millet Mela organized at Howrah KVK for creating awareness***'** held at Howrah KVK on 25.7.2023 for ICAR (www.icar.org.in), KVK Portal (www.kvk.icar.gov.in) and ICAR-ATARI Kolkata (www.atarikolkata.org) website.
- » **'***Orchids poised to boost farm income and create aesthetically pleasing environment in West Bengal'* held at Hooghly KVK on 03.08.2023 forKVK Portal (www.kvk.icar.gov.in) and ICAR-ATARI Kolkata (www.atarikolkata.org) website.
- » **'***ICAR-ATARI Kolkata Celebrates its Foundation Day'* held at ATARI Kolkata on 09.08.2023 forKVK Portal (www.kvk.icar.gov.in) and ICAR-ATARI Kolkata (www.atarikolkata.org) website.
- » *'Workshop onreinventing extension system for agricultural transformation organized'* held at OUAT, Bhubaneswar on 25.08.2023 **for**KVK Portal (www.kvk.icar.gov.in) and ICAR-ATARI Kolkata (www.atarikolkata.org) website
- » **'***Fit India movement-fitness week celebrated at ICAR-ATARI Kolkata'* held at ATARI Kolkata on 29.08.2023 **for**ICAR (www.icar.org.in), KVK Portal (www.kvk.icar.gov.in) and ICAR-ATARI Kolkata (www.atarikolkata.org) website.
- » *'Interactive meeting for implementation of promotion of climate resilient model IFS incoastal Sundarbans'* held at KVK N 24 Parganas (Ashokenagar) on 29.08.2023 **for**KVK Portal (www.kvk.icar.gov.in) and ICAR-ATARI Kolkata (www.atarikolkata.org) website.
- » *'Awareness campaign to combat malnutrition organized'* held at KVK Birbhum on 02.09.2023 **for**ICAR (www.icar.org.in), KVK Portal (www.kvk.icar.gov.in) and ICAR-ATARI Kolkata (www.atarikolkata.org) website.
- » *'Virtual meeting on the guidelines for social media management'* held at ATARI Kolkata on 04.09.2023 **for**ICAR (www.icar.org.in), KVK Portal (www.kvk.icar.gov.in) and ICAR-ATARI Kolkata (www.atarikolkata.org) website.
- » *'Zonal Review Workshop of FFP under ICAR-ATARIKolkata'* held on 31.10.2023 at ATARI Kolkata for ICAR (www.icar.org.in), KVK Portal (www.kvk.icar.gov.in) and ICAR-ATARI Kolkata (www.atarikolkata.org) website.
- » **'***Dr. Himanshu Pathak, Secretary (DARE) and Director General (ICAR) inaugurated the administrative building and other facilities of ICAR-KVK, Malda'* held at ICAR-CISH, Malda on 25.11.2023 for ICAR (www.icar.org.in).

21.0 Awards and Recognitions

1. Achieved second Best Poster Presentation Award for the paperon *'Low-cost nutritional weaning food for malnourished children'* by Sharma A, Haldar A, Sarkar S, Pal PK, Dey P. 2023. In: International Conference on *'Sustainable Innovation in Food Safety, Health and Nutrition'*organized by the Faculty of Dairy Technology, WBUAFS, Kolkata, West Bengal on 22nd to 23rd December, 2023 at Biswa Bangla Convention Centre, New Town, Kolkata.
2. Dr. S. K. Mondal, Pr. Scientist of this office was awarded Certificate of Excellence in Reviewing for Asian Journal of Extension, Economics and Sociology; and International Journal of Environment and Climate Change

22.0 Distinguished Visitors

Date	Name of the person	Purpose of visit
17.04.2023	Dr. P. K. Singh, Agriculture Commissioner, GoI	Interactive meeting with Agriculture commissioner, GoI on 'Extension approaches towards use of natural fibres in West Bengal'
	Dr. N. Kumar, Director, Directorate of Jute Development, GoI	
	Dr. S. Gupta, IAS, Joint Secretary, GoWB	
	Shri J. Das, JD, Directorate of Jute Development, GoI	
	Dr. R. Mondal, Jt. Director, ARAH, GoWB	
	Dr. Y. Tamang, Director, DAR&AH, GoWB	
05.05.2023	Dr. A. K. Patra, Emeritus Scientist and Former Director, ICAR-IISS, Bhopal	Interactive meeting on soil health programme
09.05.2023	Dr. P. Venkatesan, Pr. Scientist, ICAR-NAARM, Hyderabad	Interactive meeting-cum-focussed group discussion
30.06.2023	Dr. J. K. Ray, IAS, Secretary, PSC, Arunachal Pradesh	NABARD funded project on integrated farming
	Dr. P. Sengupta, Director, Agriculture, GoWB and Ex-Officio Secretary	
	Mr. S. Priyadarshi, AM, NABARD, Kolkata	
02.08.2023	Dr. P. K. Roul, Vice-Chancellor, OUAT, Odisha	Meeting with Host Organization of Odisha KVKs
07.08.2023	Dr. A. K. Singh, Former Director, ICAR-ATARI Kolkata and Former Vice-Chancellor, BAU, Sabour, Bihar	Interaction meeting with Former Director, ATARI Kolkata and Vice-Chancellor, BAU, Sabour
11.09.2023	Dr. Manas Adhikari, Vice Chancellor, BCKV	Interactive meeting on'Agri-Extension Approach to Amrit Kaal through Swamiji's Darshan' on the occasion of the 130th Anniversary of Swami Vivekananda's
20.09.2023	Prof. A. K. Dhar, Director, Aquaculture Pathology Laboratory, University of Arizona, Tucson, Arizona, USA	Inaugurated Webinar on Aquaculture
29.09.2023	Dr. P. Das, Former DDG (AE), ICAR, New Delhi	Seminar on 'Paradigm shift in extension to appropriately support sustainable agricultural development'
16.10.2023	Dr. R.R. Burman, ADG (AE), ICAR New Delhi	Interaction meeting with ADG (AE), ICAR, New Delhi and scientist of ATARI Kolkata




23.0 Personnel

Staff position of ICAR-ATARI Kolkata as on 31.12.2023 has been presented in the table below:

Sl. No.	Name	Designation
1	Dr. P. Dey	Director
2	Dr. P.P. Pal	Principal Scientist
3	Dr. A. Haldar	Principal Scientist
4	Dr. S.K. Mondal	Principal Scientist
5	Dr. K.S. Das	Principal Scientist
6	Shri A.D. Banik	Assistant
7	Shri D. Debnath	Driver (T-2)
8	Shri S. Saha	UDC
9	Smt. A. Roy	SSS
10	Ms. J. Basak	SRF, CFLD-Pulse
11	Ms. R. Bhattacharya	SRF, NICRA
12	Shri S. Ghosh	SRF, NEMA
13	Ms. B. Ghosh	SRF, CFLD-Oilseed
14	Ms. S. Das	SRF, ARYA
15	Ms. Ankita Begam	SRF, FFP
16	Shri S. Khutia	DEO, CFLD-Pulse - NFSM
17	Shri S. Nandi	Project Assistant, GKMS

Sl. No.	Name	Designation
18	Shri S. Paul	DEO, CSISA
19	Shri A. Dewanji	YP-II, MIS-FMS
20	Mr. Salim Sahaji	YP-I, Natural Farming
21	Mr. Purbendu Samanta	YP-I, Natural Farming

Joining/Relieving/Promotion/Demise

Joining

Dr. P. Dey, Pr. Scientist and Project Coordinator, AICRP on STCR joined as Director of this Institute on 06.02.2023 (morning).

Relieving

1. Dr. S. K. Roy, Pr. Scientist has been relieved from this Institute on 14.03.2023 (Evening) to join his new assignment as Director, ICAR-ATARI, Pune.

2. Dr. F. H. Rahman, Pr. Scientist has been relieved from this Institute on 22.06.2023 (Evening) to join his new assignment as Head, NBSS&LUP, Kolkata Centre.
3. Sh. Somnath Mukherjee, AF&AO of this institute has been relieved from this Institute on 25.07.2023 (AN) to join his new assignment at ICAR-IISR, Indore.
4. Sh. R. C. Pradhan, AAO of this institute has been relieved from this Institute on 25.10.2023 (AN) to join his new assignment at ICAR-ATARI Umium, Shillong, Meghalaya.

Visit of Hon'ble Secretary, DARE & DG, ICAR

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हर कदम, हर डगर
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