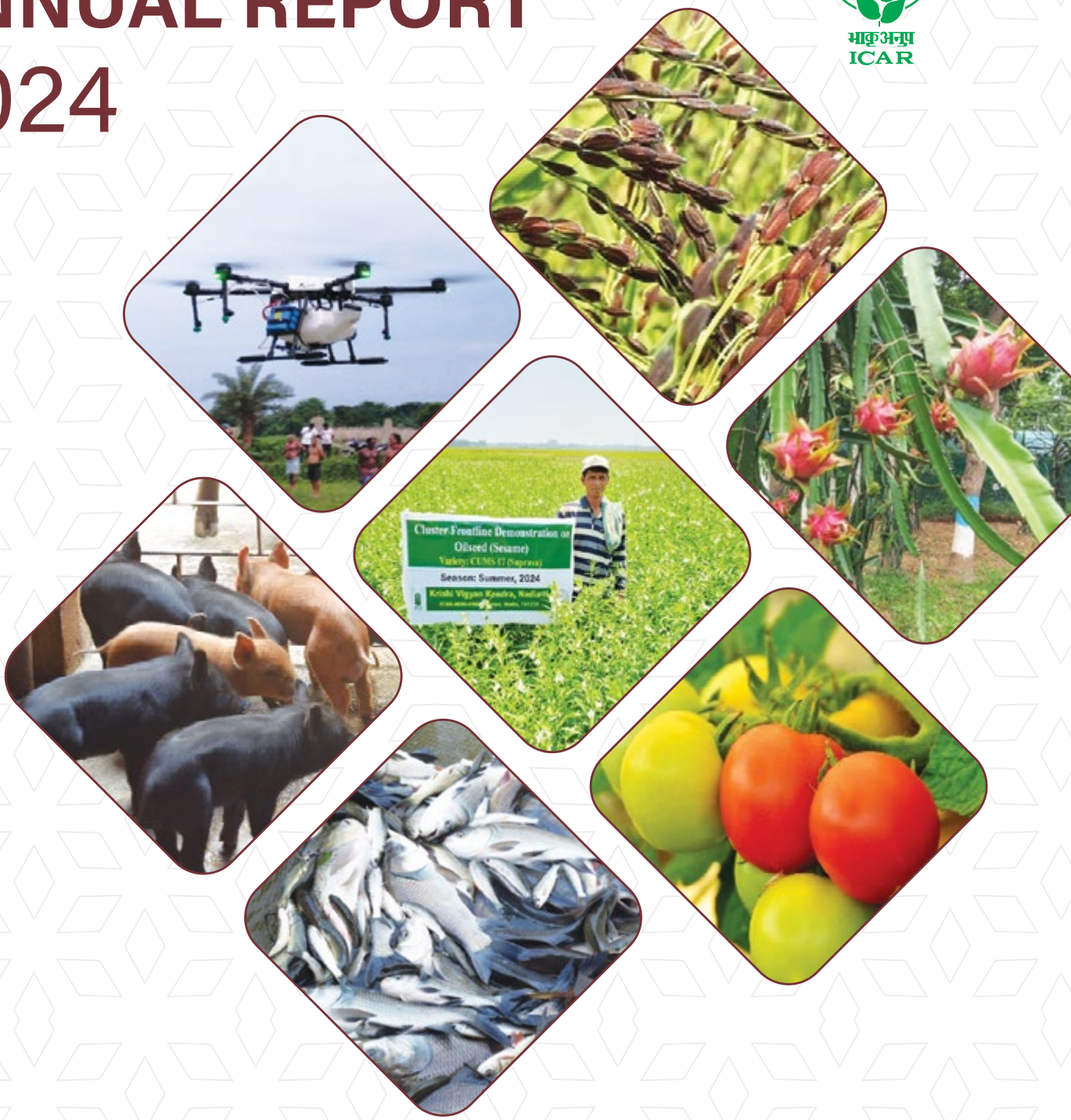
वार्षिक प्रतिवेदन
ANNUAL REPORT
2024

भाकृअनुप
ICAR



भाकृअनुप-कृषि प्रौद्योगिकी अनुप्रयोग अनुसंधान संस्थान कोलकाता
भूमि विहार परिसर, ब्लॉक - जीबी सेक्टर III, साल्ट लेक कोलकाता, पश्चिम बंगाल-700097

ICAR-AGRICULTURAL TECHNOLOGY APPLICATION RESEARCH INSTITUTE KOLKATA
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(An ISO 9001:2015 Certified Institute)

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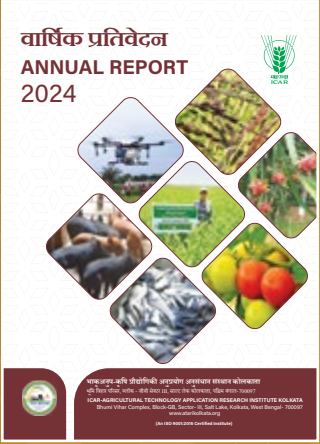

Citation

Mondal S K, Das K S, Haldar A and Dey P. 2025. Annual Report 2024, ICAR-ATARI Kolkata. Published by Dr. P. Dey, Director, ICAR-Agricultural Technology Application Research Institute Kolkata, Salt Lake, Kolkata – 700097 (West Bengal), pp: 1-190.

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Published by

Dr. Pradip Dey, Director, ICAR-ATARI Kolkata

ISBN: 978-81-977098-6-9

Printed at

Jagannath Reprographics Pvt. Ltd.
31, Akhil Mistry Lane, Kolkata-700009
Contact: +91 9038245205

Preface

The Annual Report is much more than a routine documentation—it is a mirror of institutional commitment, scientific progress, and the transformative journey undertaken across agro-ecological landscapes. The Annual Report 2024 of ICAR-ATARI Kolkata captures the consolidated achievements and evolving direction of 59 Krishi Vigyan Kendras (KVKs) functioning under its domain in the Union Territory of Andaman & Nicobar Islands and the states of Odisha and West Bengal. These KVKs, supported by State Agricultural Universities (SAUs), ICAR Institutes, Deemed Universities, NGOs, Central Universities, and State Departments, serve as the last-mile interface for farm innovation, resilience-building, and livelihood security.

Aligned with the national aspiration of Viksit Bharat@2047, which envisions a prosperous, inclusive and sustainable India, the performance of KVKs in this zone has been a critical lever for achieving grassroots impact. With farmers' engagement through training, demonstrations, advisory services, and input support, the zone's efforts are synchronised with the long-term vision of boosting productivity, enhancing input efficiency, improving agri-value chains, ensuring climate resilience, and fostering agri-entrepreneurship—particularly among youth and women. The year 2024 has reaffirmed our commitment to these goals through scientific rigour and systemic innovation.

A landmark achievement was scripted by Nadia KVK, which became India's first Net Zero certified KVK, achieving a net carbon footprint of (-)74.99 metric tonnes CO_2e, as certified by UK-based i-NoCarbon Limited. This milestone was made possible through the collaborative innovation of ICAR-ATARI Kolkata and the Inhana Organic Research Foundation (IORF), culminating in the development of the Agriculture Carbon Footprint Assessor (ACFA)—India's indigenous carbon accounting tool for diverse farming systems. The evolution from ACFA ver. 1.0 to ver. 2.0, and now to the TEC Tool, has equipped farmers and institutions with the ability to quantify and manage carbon emissions, ushering in a new era of climate-smart agriculture.

This Annual Report offers a comprehensive overview of the KVKs' mandated activities—covering on-farm trials, frontline demonstrations, training, soil and water testing, seed and planting material production, animal husbandry and fishery support and ICT-led extension initiatives. Special attention has been paid to achievements under flagship schemes of the Department of Agriculture & Farmers Welfare and ICAR, such as PM-KISAN, DAPSC/DAPST, Oilseed and Pulse

Model Villages and programs aligned with the Sustainable Development Goals (SDGs). In parallel, capacity building was given strategic thrust through workshops on PM-KUSUM, NABL-accredited soil health training and awareness campaigns under PPVFRA, which enhanced the quality of farmer advisories and policy literacy. Additionally, integrated nutrient management programmes sponsored by FAI and community outreach supported by ICRO strengthened our mission of inclusive, knowledge-driven agricultural development. The report also presents the progress of PFMS implementation, digital data management, and activities that foster institutional culture—ranging from the observance of International Women's Day, Hindi Pakhwada, World IP Day, and Swachhta Hi Seva, Safai Mitra Camp, to Vigilance Awareness Week and digitization of office records.

Publishing this report within the stipulated timeframe was possible only because of the seamless cooperation extended by all stakeholders. I gratefully acknowledge the guidance of ICAR Headquarters, New Delhi, the support of Host Organizations, the contributions of the Directors of Extension Education, and the tireless dedication of the KVK personnel and the entire ATARI team—scientific, technical, administrative and contractual. As we look ahead, this compilation not only celebrates past achievements but also sets the direction for a future where every farm is climate-smart, every farmer is an entrepreneur and every region contributes meaningfully to Viksit Bharat@2047.

Kolkata

(Pradip Dey)

10.07.2025

Contents

कार्यकारी सारांश

वर्ष 2015 में, क्षेत्रीय परियोजना निदेशालय को आईसीएआर-कृषि प्रौद्योगिकी अनुप्रयोग अनुसंधान संस्थान (अटारी) में अपग्रेड किया गया; तब से गतिविधियों का विविधीकरण इस संस्थान का सार रहा 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, अंतर्राष्ट्रीय और राष्ट्रीय संगठनों के प्रभावी सहयोग से सभी हितधारकों को जरूरत आधारित और समय-परीक्षणित 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।

जहाँ तक शोध का सवाल है, केवीके के लिए अनुकूली शोध का मार्गदर्शन करने के अलावा, आईसीएआर-अटारी कोलकाता 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 आने के लिए समस्या समाधान अनुसंधान में शामिल रहा है। इस संस्थान के वैज्ञानिकों द्वारा वर्ष 2024 के दौरान गैर-उत्पादक मवेशियों को मुख्यधारा में लाने, शेवॉन मूल्य श्रृंखला प्रबंधन और जलवायु लचीलापन को कवर करते हुए कुल तीन शोध परियोजनाएँ शुरू की गईं। संचयी शोध आउटपुट मौजूदा कृषि और संबद्ध प्रथाओं के भविष्य को आकार देने में एक लंबा रास्ता तय कर सकता है।

नई/उभरती कृषि प्रौद्योगिकियों के आगमन के साथ, वैज्ञानिक विचारों का नियमित आदान-प्रदान और सफल अभ्यास में विशिष्ट अवधारणा के संपर्क में आने से अक्सर मौजूदा खेती और संबंधित गतिविधियों में वांछनीय परिवर्तन होता है। ओडिशा और पश्चिम बंगाल के चयनित 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 ने कई प्रमुख कार्यक्रम शुरू किए हैं, जिनका मुख्य उद्देश्य मधुमक्खी पालन आधारित सामाजिक-आर्थिक स्थिति को स्वरोजगार के लिए प्रेरणा प्रदान करके वांछित दिशा में बदलना, नियमित कृषि को विपणन योग्य बनाना, स्टार्ट-अप के लिए उपयुक्त उद्यमों की पहचान करना और अन्य आवश्यक क्षेत्रों में सुधार करना है। 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 तरीके से काम किया है।

जलवायु लचीला कृषि में राष्ट्रीय नवाचारों में, इस क्षेत्र के 17 केवीके ने इस संस्थान के साथ-साथ आईसीएआर-सीआरआईडीए, हैदराबाद के मार्गदर्शन और पर्यवेक्षण में कार्य योजना के व्यवस्थित डिजाइन के माध्यम से सूखा, अनियमित वर्षा, नमी तनाव, गर्मी और शीत लहर, बाढ़, चक्रवाती तूफान आदि जैसी जलवायु कमजोरियों से निपटने के लिए बड़ी संख्या में किसानों को सशक्त बनाया है। इस परियोजना में सीधे तौर पर शामिल किसानों को हुए लाभ का आकलन बताता है कि 33934 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 पैरामीटर 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 सहनशील चावल की किस्मों, गोसाबा 5, कैरी धान 5, उषार धान 5, जरावा और गीतांजलि जैसी लवण सहनशील किस्मों की शुरूआत ने किसानों को तीव्र जलवायु तनाव की स्थिति के दौरान नियमित उपज प्राप्त करने में बहुत मदद की। निक्रा गांवों में कस्टम हायरिंग सेंटर की स्थापना से किसानों को पावर टिलर, रीपर, रेज्ड बेड प्लांटर, जीरो-टिल ड्रिल और अन्य जैसे उन्नत कृषि उपकरणों और औजारों का उपयोग करने में सक्षम बनाया गया है। गांवों में गठित वीसीआरएमसी और सीएचसी ने 25% निधि समर्थन के साथ स्थायी निधि को बनाए रखने के लिए 12.95 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 महत्वपूर्ण योगदान दिया है और बीज प्रतिस्थापन दर को बढ़ाने, उत्पादन और उत्पादकता में वृद्धि करने, मौजूदा प्रबंधन/खेती प्रथाओं को बदलने और किसानों को बेहतर प्रौद्योगिकियों से परिचित कराने में मदद की है। संबद्ध भागीदारों द्वारा नियमित निगरानी ने इस क्षेत्र में 29.03-43.36% 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 2361.0 हेक्टेयर क्षेत्र को बेहतर प्रदर्शन के तहत लाया गया था। पेश की गई नई किस्में मूंगफली की कादरी लेपाक्षी (K1812), तिल की सुप्रवा, सरसों की PM-31, PM28 और अन्य थीं। हाल ही में शुरू किए गए तिलहन मॉडल ग्राम कार्यक्रम में, तिल की सुप्रवा किस्म ने शानदार प्रदर्शन किया और 52.49% अधिक उपज दी। इस कार्यक्रम के अंतर्गत, सूरजमुखी की KBSH 78 किस्म ने भी तिल की तुलना में बेहतर प्रदर्शन किया तथा उपज में 63.43% की वृद्धि दर्ज की गई।

दलहन प्रदर्शन कार्यक्रम पर विशेष सीएफएलडी के अंतर्गत 200.0 हेक्टेयर क्षेत्र लाया जा सका, जिसमें एल-4717 (पूसा अगेती) और आईपीएल-220 जैसी उन्नत मसूर किस्मों का उपयोग किया गया, जिससे किसानों की तुलना में औसत उपज में 12 से 25.45 प्रतिशत की वृद्धि हुई। प्रदर्शित की गई उन्नत पद्धतियों में जैव-उर्वरकों, राइजोबियम, टी. विरिडे, मृदा सुधारक आदि के साथ बीज उपचार, सूक्ष्म पोषक तत्वों, जिंक और बोरॉन का पत्तियों पर छिड़काव, एकीकृत पोषक तत्व प्रबंधन और अन्य शामिल थे। 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।

हाल ही में शुरू किए गए दलहन मॉडल ग्राम कार्यक्रम के माध्यम से, इस क्षेत्र में दलहन उत्पादन में आत्मनिर्भरता प्राप्त करने के लिए 1040 हेक्टेयर क्षेत्र को विशेष प्रदर्शन के अंतर्गत लाया गया। वर्ष के दौरान कुल 2600 प्रदर्शन आयोजित किए गए और मुख्य ध्यान अरहर और उड़द (खरीफ), मसूर और उड़द (रबी) और उड़द (वसंत/ग्रीष्म) पर था।

किसानों को गुणवत्तापूर्ण दलहन बीज उपलब्ध कराने के लिए इस क्षेत्र के 10 बीज हब निर्धारित लक्ष्यों के अनुसार चिन्हित दलहन फसलों के गुणवत्तापूर्ण बीज तैयार कर रहे हैं। किसानों को बीज उपलब्ध कराने के अलावा, ऐसे बीजों का उपयोग इस क्षेत्र के केवीके के प्रदर्शन कार्यक्रमों में भी किया जाता है। दलहन फसलों में प्रमुख बीज उत्पादक मसूर, लथीरस, मूंग और उड़द हैं तथा कुल उत्पादन 468.54 क्विंटल रहा। आईसीएआर-आईआईपीआर, कानपुर आईसीएआर-अटारी कोलकाता के सहयोग से इस परियोजना की प्रत्यक्ष देखरेख और निगरानी कर रहा है।

आईसीएआर का एक अनूठा कार्यक्रम, फार्मर फर्स्ट कार्यक्रम, किसानों के खेत पर किसानों और 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 किसानों के खेत के नवाचारों, संसाधनों, विज्ञान और प्रौद्योगिकी से संबंधित है। कार्यान्वयन करने वाले चार संस्थान/एसएयू जल और आजीविका सुरक्षा, स्थिरता के साथ चावल आधारित उत्पादन प्रणाली और अन्य सहित कृषि और संबद्ध क्षेत्रों के मॉड्यूल-आधारित विकास में शामिल हैं। कृषक समुदाय की आवश्यकता के आधार पर, निष्पादित हस्तक्षेप अनुशंसित मॉडलों से बहुत अधिक लाभ प्राप्त कर सकते हैं। वर्ष के दौरान, इस क्षेत्र के फार्मर फर्स्ट कार्यक्रम के तहत एक नया केंद्र, डब्ल्यूबीयूएएफएस, कोलकाता लाया गया।

पिछड़े वर्गों की सामाजिक-आर्थिक स्थिति को बदलने के लिए केवीके के माध्यम से इस क्षेत्र के सभी आदिवासी बहुल जिलों में काफी फायदेमंद साबित हुआ। अनुसूचित जनजाति के लिए विकास कार्य योजना (10 केवीके) और अनुसूचित जाति के लिए विकास कार्य योजना (47 केवीके) ने कृषि गतिविधियों, बागवानी, पशुपालन, मत्स्य पालन, किचन गार्डनिंग और आदिवासी समाज के विकास के लिए जिम्मेदार अन्य क्षेत्रों पर जोर दिया। इन परियोजनाओं के माध्यम से कौशल और ज्ञान में विकास के अलावा, एससी/एसटी की सुविधा के लिए संपत्ति निर्माण भी संभव हुआ। कुल मिलाकर 114461 आदिवासी किसानों को डीएपीएसटी के तहत और 388065 किसानों को डीएपीएससी के तहत उन्नत कृषि और संबद्ध प्रथाओं का अभ्यास करने के लिए प्रशिक्षित किया गया।

युवाओं को स्वरोजगार के लिए अनुकूल वातावरण प्रदान करके उन्हें समाज की मुख्य धारा में शामिल करने के लिए उनके सशक्तिकरण पर अधिक ध्यान दिया गया है। बड़ी संख्या में ग्रामीण युवाओं को आर्य, मधुमक्खी पालन और कौशल विकास योजनाओं के तहत 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 1222 ग्रामीण युवाओं को उद्यमशीलता प्रशिक्षण प्रदान करने के बाद, 296 युवाओं ने मशरूम, मत्स्य पालन, लाह, बागवानी, वर्मी-कम्पोस्ट, 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 24-203% अधिक आय अर्जित करने में सक्षम बनाया गया है। इसके अलावा, लगभग सभी उद्यमों में अलग-अलग स्तर पर जनशक्ति भी तैयार की गई है।

किसानों और ग्रामीण युवाओं के लिए लाभदायक उद्यम के रूप में मधुमक्खी पालन के अत्यधिक महत्व को देखते हुए, इस क्षेत्र के चयनित जिले में एनबीबी की एक केंद्र द्वारा वित्तपोषित 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 एक हिस्से के रूप में पर्याप्त आय उत्पन्न की जा सके। केवीके ने 9 गंभीर रूप से मूल्यांकित प्रशिक्षण कार्यक्रमों के माध्यम से 225 किसानों और युवाओं को प्रशिक्षित किया।

कृषि कौशल परिषद और डीएएफडब्ल्यू ने आईसीएआर के साथ मिलकर 200 घंटे या उससे अधिक के विशेष कौशल विकास प्रशिक्षण कार्यक्रम आयोजित किए थे। इस कार्यक्रम का उद्देश्य इस क्षेत्र के केवीके द्वारा किसानों की क्षमता विकास के लिए उद्यमितापूर्ण कृषि गतिविधियों, बागवानी, डेयरी फार्मिंग और अन्य सहित विभिन्न रोजगारोन्मुखी अवसरों में क्षमता विकास करना था। इस प्रक्रिया में ओडिशा और पश्चिम बंगाल के 7 केवीके 155 किसानों और ग्रामीण युवाओं को निर्धारित नौकरी भूमिकाओं के अनुसार प्रशिक्षित कर सके।

प्रयोगशाला से भूमि कार्यक्रम का संशोधित आयाम एमजीएमजी किसानों के खेतों में किसानों और वैज्ञानिकों के बीच प्रभावी संपर्क को मजबूत करने के लिए चलाया गया। इस क्षेत्र में 17 आईसीएआर संस्थानों, क्षेत्रीय केंद्रों और राज्य कृषि विश्वविद्यालयों के वैज्ञानिकों ने इस क्षेत्र के 226 गांवों में फैले 20321 से अधिक किसानों से बातचीत की। पूरे कार्यक्रम की निगरानी और समन्वय आईसीएआर-अटारी कोलकाता द्वारा किया गया।

भारत सरकार द्वारा प्राकृतिक खेती पर जोर दिया गया और तदनुसार, इस क्षेत्र के केवीके ने आईसीएआर-अटारी कोलकाता की देखरेख में अपने-अपने जिलों में इसे लागू किया है। देश भर में 425 केवीके से युक्त नेटवर्क सिस्टम के एक हिस्से के रूप में, इस क्षेत्र के 34 केवीके प्राकृतिक खेती को आगे बढ़ाने के लिए इस परियोजना को अंजाम दे रहे हैं। किसानों को जागरूक करने के लिए कार्यशाला के बाद बड़े पैमाने पर जागरूकता कार्यक्रम आयोजित किए गए, जिसमें इसके पूर्ण कार्यान्वयन के लिए प्राकृतिक खेती पर पर्चे, पोस्टर, साहित्य और अन्य विस्तार सामग्री वितरित की गई। कुल 45 प्रशिक्षण कार्यक्रम आयोजित किए गए, जिनसे 1928 किसान लाभान्वित हुए।

कृषि के क्षेत्र में एआई का उपयोग 17 केवीके, आईसीएआर संस्थानों और राज्य कृषि विश्वविद्यालयों के माध्यम से इस क्षेत्र में ड्रोन प्रौद्योगिकी प्रदर्शन के कार्यान्वयन से संभव हो पाया 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 19248 किसानों की भागीदारी के साथ 3148 हेक्टेयर क्षेत्र को ड्रोन प्रदर्शन कार्यक्रम के अंतर्गत लाया जा सका है।

पोषण सुरक्षा के लिए उठाए गए कदमों के माध्यम से यह सुनिश्चित किया गया कि स्वास्थ्य सूचकांक विशेष रूप से ग्रामीण महिलाओं के बीच ठीक से बनाए रखा जाए। इस क्षेत्र में, 13 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 639 प्रशिक्षण कार्यक्रमों और 934 पोषण संबंधी विस्तार गतिविधियों के माध्यम से इस अवधारणा को लागू किया।

आईसीएआर ने मौजूदा सीबीबीओ और एनसीडीसी के सहयोग से एफपीओ के गठन और संवर्धन पर एक परियोजना शुरू की है। देश भर में बनने वाले 10000 एफपीओ को सहायता प्रदान करने के लिए, आईसीएआर-अटारी, कोलकाता केवीके और आईसीएआर संस्थान के माध्यम से 2382 किसान सदस्यों को शामिल करते हुए चार (4) ऐसे एफपीओ बनाने में शामिल है। अब तक की गतिविधियों ने छोटे किसानों 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 316 प्रौद्योगिकियों का आकलन करने के लिए 4123 स्थानों में 459 ऑन-फैम परीक्षण किए गए हैं। इसी तरह, तिलहन, दलहन और अन्य फसलों के लिए 2148.25 हेक्टेयर क्षेत्र को एफएलडी कार्यक्रम के तहत लाया जा सका। 12357 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 20-37%, दलहन में 12-62% और अन्य फसलों में 6-50% तक उपज बढ़ाने में सहायक रहे।

एक अन्य क्षेत्र जहां केवीके ने किसानों, युवाओं और विस्तार कार्यकर्ताओं को उचित कौशल और ज्ञान प्रदान करने में उत्कृष्टता हासिल की, वह था पूरे वर्ष आयोजित प्रशिक्षण कार्यक्रम। इस क्षेत्र की कृषि की बेहतरी के लिए 184592 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, 53.41 लाख रोपण सामग्री के उत्पादन के अलावा अनाज, दलहन, तिलहन, सब्जियों और अन्य के 13417 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 45185 किसानों को मृदा स्वास्थ्य कार्ड प्रदान करने के लिए 46136 मिट्टी के 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 2024 में, केवीके ने 559.01 लाख रुपये का राजस्व उत्पन्न किया, जिसके बाद रिवॉल्विंग फंड को बढ़ाकर 1051.92 लाख रुपये कर दिया गया।

अपने अधिकार क्षेत्र में केवीके रखने वाले डीईई की मुख्य जिम्मेदारी बेहतर/विकसित प्रौद्योगिकियों की उपलब्धता सुनिश्चित करना था। उद्देश्यों को पूरा करने में, डीईई ने केवीके स्तर पर इसके मूल्यांकन के लिए विभिन्न प्रौद्योगिकियां प्रदान कीं। इसके अलावा, निदेशालय नियमित रूप से केवीके और किसानों के खेतों का दौरा करते हैं ताकि ऐसी प्रौद्योगिकियों के कार्यान्वयन को देखा जा सके और संशोधन की आवश्यकता को समझा जा सके। वे नियमित रूप से केवीके कर्मियों के लिए एचआरडी कार्यक्रम भी आयोजित करते हैं। किसानों को एक ही छत के नीचे प्रौद्योगिकी इनपुट और सूचना सहायता प्राप्त करने की सुविधा प्रदान करने के लिए, इस क्षेत्र के चयनित आईसीएआर संस्थान और एसएयू में एटीआईसी की स्थापना की गई थी। 2024 में, 1207 किसानों ने तकनीकी जानकारी प्राप्त की, 618 उपलब्ध प्रौद्योगिकी सेवाएँ और 10253 से अधिक किसानों ने एटीआईसी से गुणवत्ता इनपुट संगृहीत 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', 'हिंदी पखवाड़ा', 'गणतंत्र दिवस', 'विश्व बौद्धिक संपदा अधिकार दिवस', 'अंतर्राष्ट्रीय योग दिवस', 'अंतर्राष्ट्रीय महिला दिवस', 'सतर्कता जागरूकता सप्ताह', 'महिला किसान दिवस' और अन्य कार्यक्रम मनाए/मनाया है।

राष्ट्रीय 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, 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।

पीएम-किसान से जुड़े कार्यक्रम के तहत, इस क्षेत्र के केवीके ने 17वीं और 18वीं किस्तों के जारी होने के दौरान 16316 किसानों और अन्य हितधारकों को युक्त किया। 100 दिवसीय कार्य योजना के तहत गतिविधियों के मोर्चे पर, कम से कम पांच दिनों की अवधि के कुल 289 प्रशिक्षण कार्यक्रम आयोजित किए गए, जिनसे 4739 कृषक महिलाएं और 4668 कृषक युवा लाभान्वित हुए। नवीन और नवीकरणीय ऊर्जा मंत्रालय की पीएम-कुसुम पहल के तहत, 112 किसानों की भागीदारी के साथ 4 कार्यशालाएँ आयोजित की गईं, जिनमें से कई ने सौर ऊर्जा प्रणाली अपनाने में रुचि व्यक्त की। पीपीवी और एफआरए कार्यक्रम के तहत, अंडमान और निकोबार द्वीप समूह, ओडिशा और पश्चिम बंगाल से विभिन्न फसलों को कवर करने वाली किसानों की किस्मों के पंजीकरण के लिए 120 से अधिक आवेदन प्रस्तुत किए गए।

आईसीएआर-अटारी कोलकाता की बहुआयामी गतिविधियों ने न केवल इस क्षेत्र के किसानों की मदद की, बल्कि आरएडब्ल्यूई कार्यक्रम के माध्यम से कृषि छात्रों, एआरएस परिवीक्षाधीन प्रशिक्षण के माध्यम से कृषि पेशेवरों, इनपुट डीलरों (डीएईएसआई), 100 दिवसीय कार्य योजना के तहत गतिविधियों, पीएम-किसान किस्तों के जारी होने जैसी भारत सरकार की विशेष पहलों से भी मदद मिली। आईसीएआर-अटारी कोलकाता में सभी श्रेणियों के कर्मचारियों का समर्पण निर्धारित कार्यों को पूरा करने के साथ-साथ हितधारकों की आवश्यकताओं को पूरा करने में प्रेरक शक्ति था।

Executive Summary

In the year 2015, the Zonal Project Directorate was upgraded to ICAR-Agricultural Technology Application Research Institute (ATARI); since then 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 International 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.

As far as the research front is concerned, apart from guiding the adaptive research for the KVKs, ICAR-ATARI Kolkata has been involved in problem solving research to come up with broader arena of improved 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. A total of three research projects were undertaken during the year 2024 by the scientists of this Institute covering the mainstreaming of non-productive cattle, chevon value chain management and climate resilience. The cumulative research output may go a long way in shaping the future of existing agricultural and allied practices.

With the advent of newer/ emerging agricultural technologies, 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 fold within 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.

Different Ministries and ICAR launched various flagship programmes which are mainly aimed at changing the apiculture-based socio-economic condition to a desired direction with infusion of motivation to self-employment, conversion of regular agriculture into marketable one, identification of suitable enterprises for start-ups and other needed areas. The success of such programmes greatly depends 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.

Under National Innovations in 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 as well as of ICAR-CRIDA, Hyderabad. An assessment of benefit accrued to the farmers directly involved in this project indicates that out of 33934 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 Rs. 12.95 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.

The Cluster Frontline Demonstration on Oilseed and Pulse crops has contributed substantially and helped to enhance the seed replacement rate, augment production 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 29.03-43.36% in this Zone. Under this special programme, an area of 2361.0 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 a newly launched Oilseed Model Village programme, the Suprava variety of sesame performed excellently and yielded 52.49% more. Under this programme, KBSH 78 variety of sunflower also performed better than the sesame and recorded a yield increase of 63.43%.

An area of 200.0 ha could be brought, under special CFLD on pulses demonstration programme with improved lentil varieties like L-4717 (Pusa Ageti) and IPL-220 resulted 12 to 25.45 per cent increase in average yield when compared to farmer's practice. Improved package of practices demonstrated were seed treatment with bio-fertilizers, *rhizobium, T. viridae*, soil ameliorants etc. foliar application of micronutrients, zinc and boron, integrated nutrient management and others. 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.

Through a newly launched Pulse Model Village programme, an area of 1040 ha was brought under special demonstration for achieving self-sufficiency in pulse production in this Zone. A total of 2600 demonstration were conducted during the year and the major focus was on pigeon pea and black gram (kharif), lentil and blackgram (rabi) and black gram (spring/summer).

For making quality pulse seeds available 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 and the total production was 468.54 q. ICAR-IIPR, Kanpur is directly supervising and monitoring this project in collaboration with ICAR-ATARI Kolkata.

A unique programme of ICAR, Farmer FIRST Programme, 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 higher return from the recommended models. During the year, a new centre namely, WBUAFS, Kolkata was brought under Farmer FIRST programme of this Zone.

In order to change the socio-economic condition of the backward classes through KVKs proved quite beneficial in all the tribal dominated districts in this zone. The Development Action Plan for Scheduled Tribe (10 KVKs) and Development Action Plan for Scheduled Caste (47 KVKs) 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 SC/STs. Altogether 114461 tribal farmers were trained under DAPST and 388065 farmers under DAPSC for practicing improved agricultural and allied practices.

Greater attention was given to empowerment of youth for involving them in the main stream of society through creating enabling environment conducive 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 1222 rural youth of 9 districts of this zone, 296 number of youth could establish entrepreneurial units in mushroom, fishery, lac, horticulture, vermi-compost, processing, poultry, goatary and apiary. The successful run of such commercial ventures has enabled them to earn 24-203% 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 funded project of NBB has been implemented in selected district 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 225 farmers and youth through 9 critically evaluated training programmes.

Agriculture Skill Council of India and DAFW had joined hands together with ICAR for 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 7 KVKs of Odisha and West Bengal could train 155 farmers and rural youth as per scheduled job roles.

The MGMG, a modified dimension of Lab-to-Land programme, was carried out to strengthen 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 20321 farmers scattered in 226 villages of this zone. The entire programme was monitored and coordinated by ICAR-ATARI Kolkata.

The natural farming was emphasized by the GoI and accordingly, the KVKs of this zone has implemented in their respective districts under the 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. A total of 45 training programmes were organized benefitting 1928 farmers.

The 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, 3148 ha could be brought under drone demonstration programme with the participation of 19248 farmers.

It was ensured through measures taken for nutritional security that the health indexes are properly maintained particularly among the rural women. In this Zone, 13 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 639 numbers of training programme and 934 nutrition related extension activities.

ICAR has taken up a project on formation and promotion of FPOs in collaboration with existing CBBOs and NCDC. In extending support to 10000 FPOs to be formed across the country, ICAR-ATARI, Kolkata is involved in forming four (4) such FPOs through KVK and ICAR Institute covering 2382 farmer members. 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.

Besides implementation of 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 459 on-fam trials in 4123 location to assess 316 technologies under major thematic areas. Similarly, 2148.25 ha of area could be brought under FLD programme of oilseed, pulse and other crops. The demonstration was carried out in the field of 12357 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 20-37% in oilseed, 12-62% in pulse and 6-50% in other crops. Such demonstration was also conducted in livestock, fishery, farm implements and other enterprises.

Another area where the KVKs excelled in providing appropriate skill and knowledge to the farmers, youth and extension functionaries was the training programme organized throughout the year. The knowledge and skill of 184592 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 13417 q of seeds of cereal, pulse, oilseed, vegetables and other were produced in addition to production of 53.41 lakh planting materials.

The KVKs 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 46136 number of soil samples to provide soil health card to 45185 farmers.

The KVKs are always encouraged to generate additional revenue out of various productive activities, particularly the collaborative execution of various program. In the year 2024, the KVKs generated revenue worth Rs. 559.01 lakh followed by enhancement of revolving fund up to Rs. 1051.92 lakh.

The prime responsibility of the DEEs having KVKs under their jurisdiction was to ensure the availability of improved/ developed technologies. In fulfilling the objectives, 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 such 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 2024, 1207 farmers obtained technological information, 618 available technology services and more than 10253 farmers collected quality inputs from ATIC.

Observance 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 Pakhwada', 'Hindi Pakhwada', 'Republic Day', 'World Intellectual Property Right Day', 'International Yoga Day', 'International Women's Day', 'Vigilance Awareness Week', 'Mahila Kisan Divas' and others.

The national government has created various online portals/ digital platforms 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, 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.

Under the programme associated with the PM-KISAN, the KVKs of this Zone covered 16316 farmers and other stakeholders during the 17th and 18th instalments' release. In the front of Activities under 100-Day Action Plan, a total of 289 training programmes of at least five days' duration were organized which benefitted 4739 farm women and 4668 farm youths. Under the PM-KUSUM initiative of the Ministry of New and Renewable Energy, 4 workshops were conducted with participation from 112 farmers, many of whom expressed interest in adopting solar energy systems. Under PPV & FRA programme, there was submission of more than 120 applications for registration of farmers' varieties covering various crops from A & N Islands, Odisha and West Bengal.

The multi-faceted activities of ICAR-ATARI Kolkata not only helped the farmers of this zone but also the agriculture students through RAWE program, agricultural professionals through ARS probationer's training, input dealers (DAESI), special initiatives of GoI like Activities under 100-Day Action Plan, release of PM-KISAN instalments and many others. The dedication of all categories of staff at ICAR-ATARI Kolkata was the driving force in accomplishing the set assignments as well as in fulfilling the stakeholders' requirements.

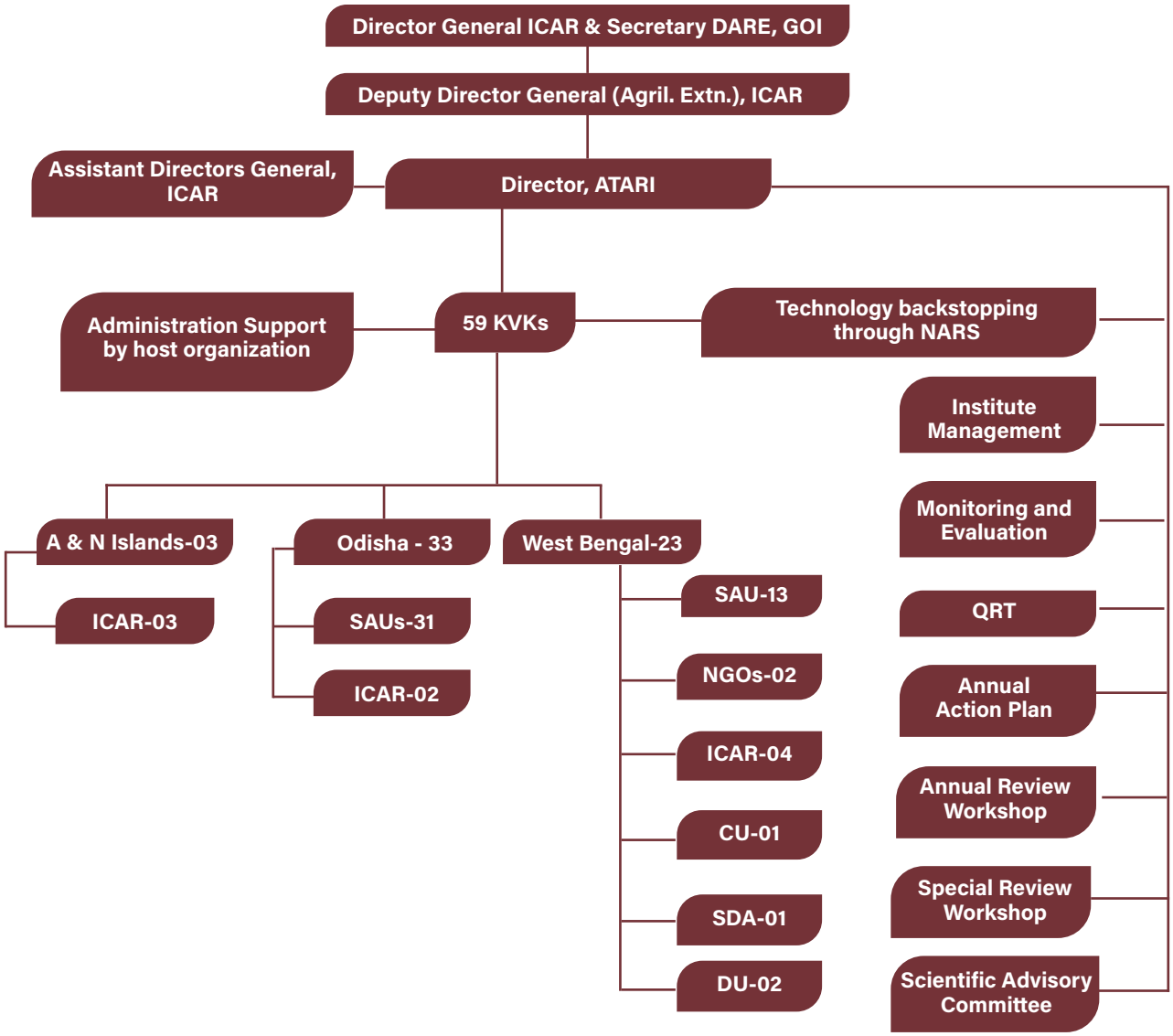
1.0 Introduction

In order to strengthen 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 Andaman & Nicobar Islands, Odisha and West Bengal.

1.1 Profile

ICAR-ATARI, 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 below through a concise chart.

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 10084.99 lakh during 2024 from ICAR-ATARI, Kolkata. Head-wise details are as follows:

Table: Budget in respect of ICAR-Agricultural Technology Application Research Institute & KVKs under Zone- V during 2024-25

(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	314.04	16.92	0.00	84.65	0.00	0.00	415.61	14.26	0.00	0.00	0.00	14.26	0.00	429.87
State Agricultural University														
OUAT, Bhubaneswar (31)	3481.57	50.30	12.30	273.13	135.00	223.00	4175.30	0.00	73.73	3.10	9.00	85.83	0.00	4261.13
UBKV, Coochbehar, West Bengal (5)	965.44	8.40	3.40	55.70	0.00	57.00	1089.94	7.50	15.14	0.50	0.00	23.14	0.00	1113.08
BCKV, Nadia, West Bengal (5)	738.50	7.50	3.90	54.30	0.00	58.00	862.20	0.00	34.21	0.50	0.00	34.71	0.00	896.91
WBUA&FS, Kolkata (3)	478.72	5.40	3.40	36.00	0.00	34.00	557.52	7.50	19.95	0.30	9.00	36.75	0.00	594.27
ICAR														
ICAR-CIARI, A&N Islands (3)	411.80	7.00	0.70	48.00	15.00	0.00	482.50	14.90	10.23	0.30	0.00	25.43	0.00	507.93
ICAR-CRRI, Cuttack, Orissa (1)	149.10	2.20	0.20	14.50	0.00	10.00	176.00	20.00	37.29	0.10	0.00	57.39	0.00	233.39
ICAR-CIFA, Bhubaneswar, Orissa (1)	179.27	1.50	0.30	10.00	0.00	11.00	202.07	20.00	10.00	0.10	0.00	30.10	0.00	232.17
CRIJAF, West Bengal (2)	408.22	3.50	0.60	17.50	0.00	20.50	450.32	10.00	0.00	0.20	0.00	10.20	0.00	460.52
ICAR-CISH, Lucknow (1)	109.53	2.00	0.20	9.50	0.00	8.00	129.23	20.00	6.50	0.10	0.00	26.60	0.00	155.83
ICAR-NDRI, Karnal (1)	119.06	2.00	0.20	10.50	0.00	8.00	139.76	20.00	6.50	0.10	0.00	26.60	0.00	166.36
Central Univerisity, Visva Bharati, West Bengal (1)	120.96	1.70	0.30	9.00	0.00	12.00	143.96	0.00	6.50	0.10	0.00	6.60	0.00	150.56
Deemed Univerisity, RKMVERI, West Bengal (2)	367.87	2.70	0.60	18.00	0.00	24.00	413.17	0.00	6.50	0.20	9.00	15.70	0.00	428.87
State Govt. Undertaking														
WBCADC, Kolkata (1)	23.35	1.00	0.20	8.00	0.00	10.50	43.05	0.00	5.94	0.10	0.00	6.04	0.00	49.09
NGO														
West Bengal (2)	322.56	3.20	0.60	19.00	0.00	24.00	369.36	0.00	35.45	0.20	0.00	35.65	0.00	405.01
GRAND TOTAL	**8189.99**	**115.32**	**26.90**	**667.78**	**150.00**	**500.00**	**9649.99**	**134.16**	**267.94**	**5.90**	**27.00**	**435.00**	**0.00**	**10084.99**

2.0 Krishi Vigyan Kendras

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 organisations. 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 journey of KVK started in the form of polytechnic for providing vocational training. Later on objectives of other programmes like National Demonstration, Lab to Land program 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 1990-92. 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, later 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, Murshidabad, Nadia, North 24 Pgs, South 24 Pgs and Malda.

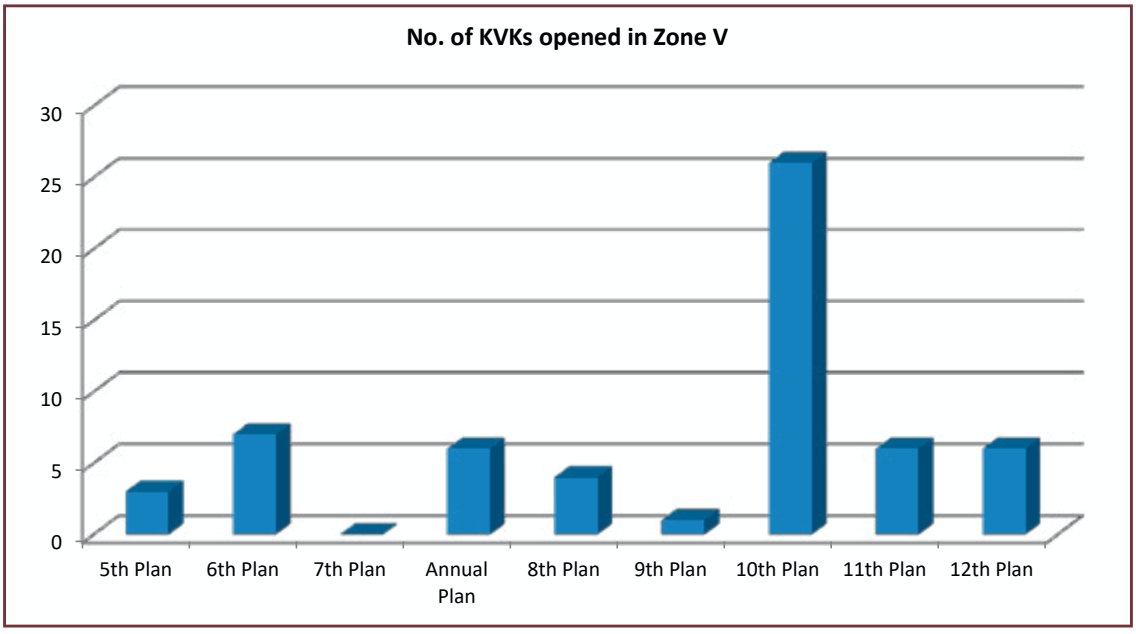


Fig: Plan wise growth of KVKs under Zone II

2.2 Mandate

The mandate of KVK has been changed many a time 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

With 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.

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 below.

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

Sl. No.	State/UT	Host Institution	Total
3.	West Bengal (23)	Bidhan Chandra Krishi Viswavidyalaya, Nadia	5
		Uttar Banga KrishiViswavidyalaya, 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
		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**

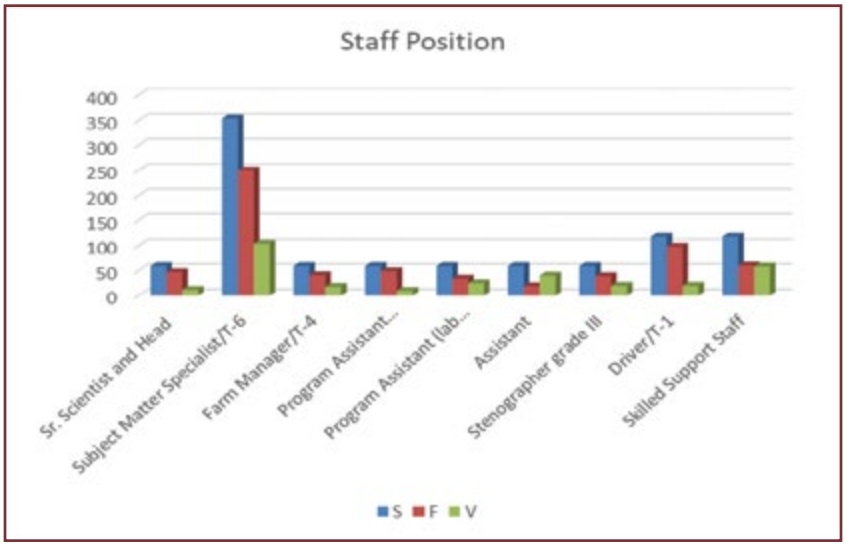
2.4 Manpower

The 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 KVKs under the host organizations other than ICAR, there has been recruitment but the ICAR-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 technican)/ T-4		
	S	F	V	S	F	V	S	F	V	S	F	V	S	F	V
A & N Islands	03	03	0	18	12	06	03	01	02	03	00	03	03	00	03
Odisha	33	25	8	198	135	63	33	23	10	33	31	02	33	19	14
West Bengal	23	19	04	138	103	35	23	17	6	23	18	05	23	15	08
Total	**59**	**47**	**12**	**354**	**250**	**104**	**59**	**41**	**18**	**59**	**49**	**10**	**59**	**34**	**25**



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	03	00	03	03	01	02	06	02	04	06	02	04	48	21	27
Odisha	33	01	32	33	26	07	66	63	03	66	25	41	528	348	180
West Bengal	23	18	05	23	12	11	46	33	13	46	33	13	368	268	100
Total	**59**	**19**	**40**	**59**	**39**	**20**	**118**	**98**	**20**	**118**	**60**	**58**	**944**	**637**	**307**

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

2.5 Infrastructure facilities

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 but is instrumental in enhancing farmers perception and confidence upon the KVK and inculcating enthuse in them to adopt the profitable technologies to the cause of enhancing their livelihood and income.

The matter of providing adequate infrastructure to the KVKs of this zone has been given priority to help KVKs discharge their responsibilities in a 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 below.

Table: Status of Infrastructure facilities

Name of the State	Administrative Building (Y/N)	Staff Qarteres (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 organia-tions)	Name of the unit(s) (Funded by other orga-niations)													
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 Areas

- 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 losses
- Crop diversification
- Promotion of Integrated Farming System (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 Resource Conservation Technologies (RCTs)
- 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 present 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.

Apart from 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, Ministry of Petroleum 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.

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.

Application of ICT 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 revised 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, NIFTD 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

The Agricultural Technology Application Research Institute, Kolkata is having total sanctioned staff strength of 18, out of which 10 were filled up on 31.12.2024.

Table: Staff strength of ATARI Kolkata

Category	Sanctioned	Filled
Director (RMP)	1	1
Scientific	6	4
Technical	1	1
Administrative	8	3
Skilled Supporting Staff (Gr. II)	2	1
Total	**18**	**10**

3.3 Ongoing Research Projects

The Research Advisory Committee for all ATARIs approved some research projects to be undertaken by the scientists of ATARIs. Some of the approved projects were in network mode across the country involving other ATARIs/Institutes. The 19th IMC-cum-IRC also approved two institute projects. The details are as follows:-

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.	Mainstreaming Non-Productive Cattle: Inclusive Development and Sustainable Integration into Rural Economy	ICAR-ATARI Kolkata	Principal Investigator: Dr. Avijit Haldar, Co-Investigators: Dr. Shyamal Kumar Mondal and Dr. Kalyan Sundar Das
2.	Delineation of the Chevon Value Chains of Black Bengal Goat and Development of a Plan to Improve the Profitability of the Rural Links	Institute project	Principal Investigator: Dr. Avijit Haldar, Co-Investigators: Dr. Kalyan Sundar Das
3.	Effect of adopting climate resilient livestock production technologies in different agro-climatic regions of eastern India	Institute project	Principal Investigator: Dr. Shyamal Kumar Mondal Co-Investigators: Dr. Kalyan Sundar Das, Dr. Avijit Haldar, Dr. Pradip Dey and NICRA Nodal Scientists of 6 KVKs

3.4 Research Achievement

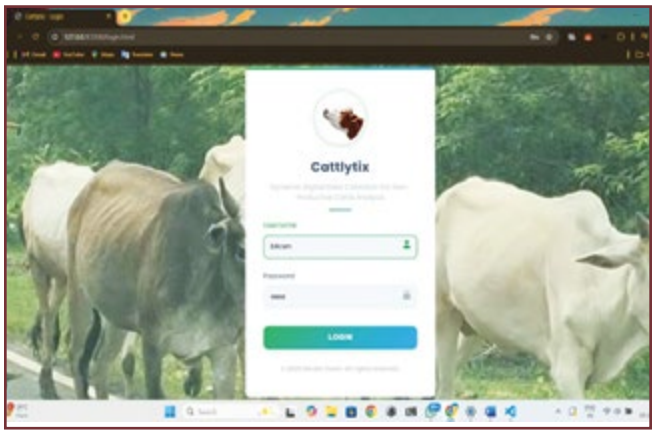
3.4.1 Mainstreaming Non-Productive Cattle: Inclusive Development and Sustainable Integration into Rural Economy

Principal Investigator: Dr. Avijit Haldar, Co-Investigators: Dr. Shyamal Kumar Mondal and Dr. Kalyan Sundar Das

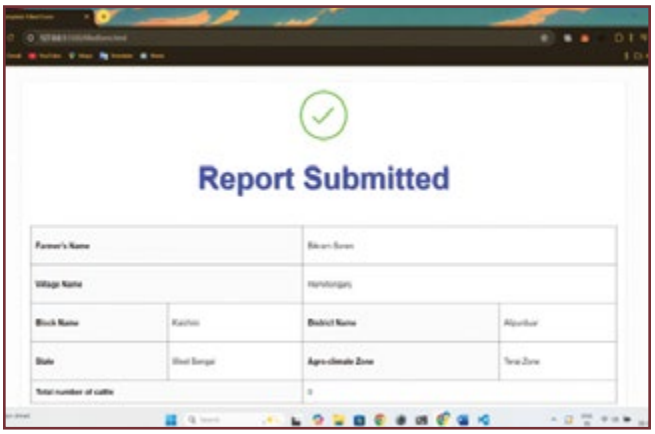
- Five online meetings were conducted involving 45 scientists and SMSs (Animal Science) of different institutes and KVKs to finalize the project plan of work.
- A multi-stage sampling procedure including two-stage stratified random sampling was conducted to select 23 villages as representatives for 23 ACZs of West Bengal (6), Odisha (5), Bihar (4) and Uttar Pradesh (8).
- Twenty-three awareness programmes were conducted at villages across West Bengal, Odisha, Bihar and Uttar Pradesh. The farm and farm women. The primary objective was to understand the current status of cattle population, identify issues related to non-productive cattle and assess the farmer's awareness and readiness to participate in scientific interventions aimed at reducing non-productivity in cattle.
- A first-hand survey was completed in 23 villages to understand the prevalence of non-productive cattle in the villages. The preliminary survey findings indicated that 20% to 45% of the total cattle were non-productive having different issues like pubertal anoestrus, post-partum anoestrus, repeat breeding and other health issues.
- A web-based smart, dynamic, digital form named "Cattlytix" for "Spatial data survey: A case in non-productive cattle mainstreaming" has been developed to address the issue of non-productive cattle that fail to conceive and contribute to milk production posing a major economic challenge for dairy farmers. "Cattlytix" can capture multi-dimensional data through an interactive, user-friendly questionnaire. To the best of our knowledge, "Cattlytix" is the first digital tool designed specifically to assess non-productive cattle at the individual farm level, integrating real-time data collection, scoring, and conditional logic for data-driven decision-making.

Awareness programme at Sangsay Khasmahal village of Kalimpong Block II in Kalimpong District of West Bengal under Hill Zone

Awareness programme at Charwa village of Block Chail in Kaushambi District of Uttar Pradesh under Central Plain Zone



A web-based smart, dynamic, digital form named "Cattlytix"



Data submission in "Cattlytix" form

3.4.2 Delineation of the Chevon Value Chains of Black Bengal Goat and Development of a Plan to Improve the Profitability of the Rural Links

Principal Investigator: Dr. Avijit Haldar, Co-Investigators: Dr. Kalyan Sundar Das

- The research was conducted in six (6) agro-climatic zones of West Bengal and ten (10) agro-climatic zones of Odisha where Black Bengal goats dominate in the supply chain.
- The study was conducted based on the intended stakeholders' perceptions across the chevon value chain through survey. There were many stakeholders/actors at different levels in chevon value chains. The actors like consumers, traders, butchers and farmers were identified using the snowball sampling technique.
- States, zones, districts, blocks, and gram panchayats were purposively selected based on goat population and feasibility.
- Different survey schedules were developed for capturing stakeholders' perceptions across the chevon value chain.

3.4.3 Effect of adopting climate resilient livestock production technologies in different agro-climatic regions of eastern India

Principal Investigator: Dr. Shyamal Kumar Mondal Co-Investigators: Dr. Kalyan Sundar Das, Dr. Avijit Haldar, Dr. Pradip Dey and NICRA Nodal Scientists of 6 KVKs

- The questionnaire (purposive and semi-structured) was developed keeping the objectives in view.

- Six KVKs (3 from Odisha and 3 from West Bengal) were selected and sensitized for the data collection.
- Survey schedule was supplied to KVKs for necessary data collection works.

3.5 Designs, Copyrights and MoUs etc.

3.5.1 Designs registered

ICAR-ATARI Kolkata during 2024 became a proud part of registering two designs of very specific devices which can revolutionize the transformation

of agriculture not only in Eastern India but the whole country. The first one was titled as 'Solar Powered Autonomous Weeding Device' with the registration number '414778-001' dated 24.04.2024 and the second one was on 'Non-Invasive Plant Stress Detector' bearing the registration number '429695-001' dated 07.09.2024.

3.5.2 MoU with WEBEL Kolkata

A MoU was signed between ICAR-ATARI Kolkata and West Bengal Electronics Industry Development Corporation Limited (WEBEL), Kolkata on 08.01.2024 to execute Proof of Concept (POC) on plant disease detection and soil quality analysis using artificial intelligence (AI) and machine learning (ML) Techniques to provide momentum for developing farmer-friendly system. Dr. P. Dey, Director, ATARI Kolkata and Mr. S. K. Das, MD, WEBEL, Kolkata signed the MoU on behalf of their organisations. This focused partnership between ICAR-ATARI and WEBEL will help in co-operation of scientific research and academic activities, organizing of joint research projects under Intramural research (IMR)/Extramural research

(EMR) and any other academic activities that of mutual benefits to both institutions.

3.5.3 MoU with AgroPreneurs Market Technologies Pvt Ltd (AMTPL), Ahmedabad

MoU was signed between ICAR-ATARI Kolkata and AgroPreneurs Market Technologies Pvt. Ltd. (AMTPL), Ahmedabad on 24.01.2024 to execute POC on development of women entrepreneurs in agri-business and procurement of farm-produce directly from farmers under the brand Grains Global. Director of this institute and Mr. Prasun Dey, Director, AMTPL, Ahmedabad signed the MoU on behalf of their organisations. The MoU focused partnership between ICAR-ATARI and AMTPL will help AgroPreneurs in finding ready market and to build their own network with farmers. Dr. P. Bandopadhyay, DEE, BCKV; Dr. A. Haldar, PS, ICAR-ATARI, Kolkata and Mr. S. Chatterjee, Co-Founder, AMTPL, Ahmedabad were also present.

3.5.4 MoU with National Institute of Homoeopathy (NIH), Kolkata

The office has also signed a MoU for advanced research on plant medicine research in Odisha and West Bengal with NIH, Kolkata under Ministry of AYUSH, GoI on 01.02.2024 to promote the plant-based medicines. Director, ICAR-ATARI, Kolkata and Dr. S. Singh, Director, NIH, Kolkata signed the MoU on behalf of their organizations. The Director,

ATARI Kolkata stated that this institute and NIH will be working together to improve food quality and cultivate more wholesome and nutritious crops, as well as to advance the agriculture and animal husbandry industries through the use of homoeopathic medicine. NIH will work to establish welfare medical camps in various KVKs and will gather data on health-related concerns in the area in order to develop future health management policies.

3.5.5 MoU with ICAR- CRRI Cuttack and Farmer Producer Co-operative Society Ltd.

On 2nd July, 2024, a MoU was signed among ICAR-Agricultural Technology Application Research Institute, Kolkata, ICAR-Central Rice Research Institute, Cuttack, Purva Baleswar 4S4R Farmer Producer Co-operative Society Ltd., Raghunath Rukmani Kuteera, Karanjia, Bhoisahi, Sadar, Remuna, Balasore, Odisha and Upakula Balasore 4S4R Farmer Producer Co-operative Society Ltd., Kuanrpur, Rasalpur, Balasore, Odisha for a period of 3 years. This MoU aims to work collaboratively for organizing training, frontline demonstration, exposure visit, awareness camp on agriculture and allied vocations for knowledge and skill development of the farmers on scientific agricultural practices including up-scaling promising technologies on agriculture and allied sectors, natural resource management and inculcating entrepreneurial development among the farming community for enhanced economic return under the jurisdiction of Farmer Producer Co-operative Society Ltd.

3.5.6 MoU with Bengal Jharkhand Development Cooperative Ltd. (BENJHARCO)

On 12th December, 2024, a MoU was signed among ICAR-Agricultural Technology Application Research Institute, Kolkata and Bengal- Jharkhand-Development Co-operative Ltd. (BENJHARC) for a period of 3 years. This MoU aims to work collaboratively to deliver the scientific and technological guidance by the FIRST PARTY through it's network of Krishi Vigyan Kendras (KVKs) under Zone-v for enhancing fish/ related production and development of fisheries/ aquaculture in West Bengal. The SECOND PARTY **is** responsible for project implementation and financial management including promotion of fisheries/ aquaculture production, development of processed and semi-processed items and marketing.

3.5.7 Copyright on Model Integrated Farming System in West Bengal

Copyright (2024) on Model Integrated Farming System in West Bengal, Registration Number SW-19646/2024, GoI was received by Satyendra Nath Mandal, Avijit Haldar, Upama Das, Pradip Dey, Kaushik Mukharjee, Ayan Das, Kunal Roy, Amitava Bandyopadhyay.


Extracts from the Register of Copyrights

Copyright Office, Government Of India

SW-19646/2024

4.0 Achievements of mandated activities

4.1 Technology Assessment

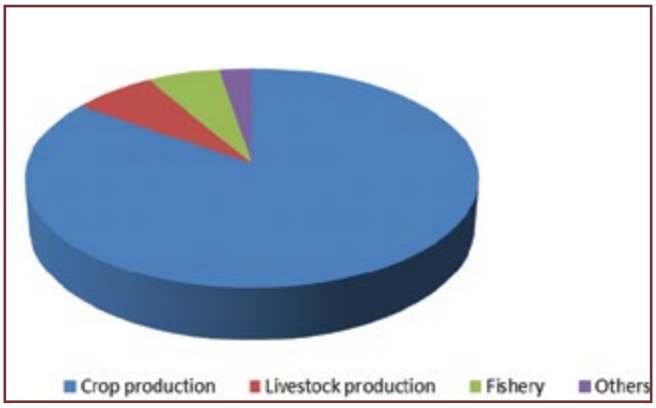
4.1.1 On-farm Trials

During the year 2024, 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

In the year 2024, 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.

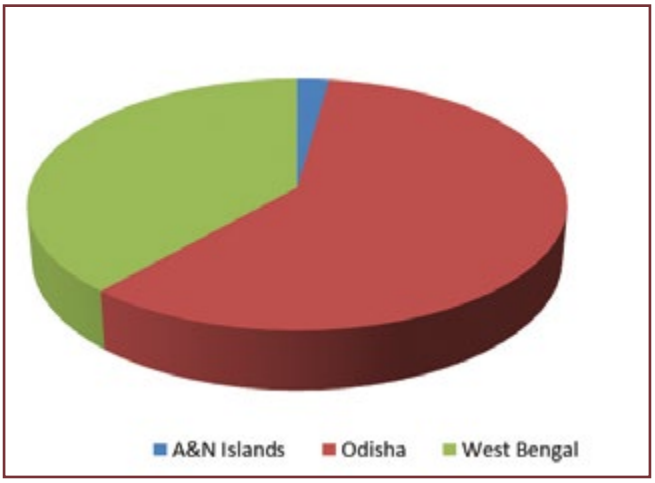


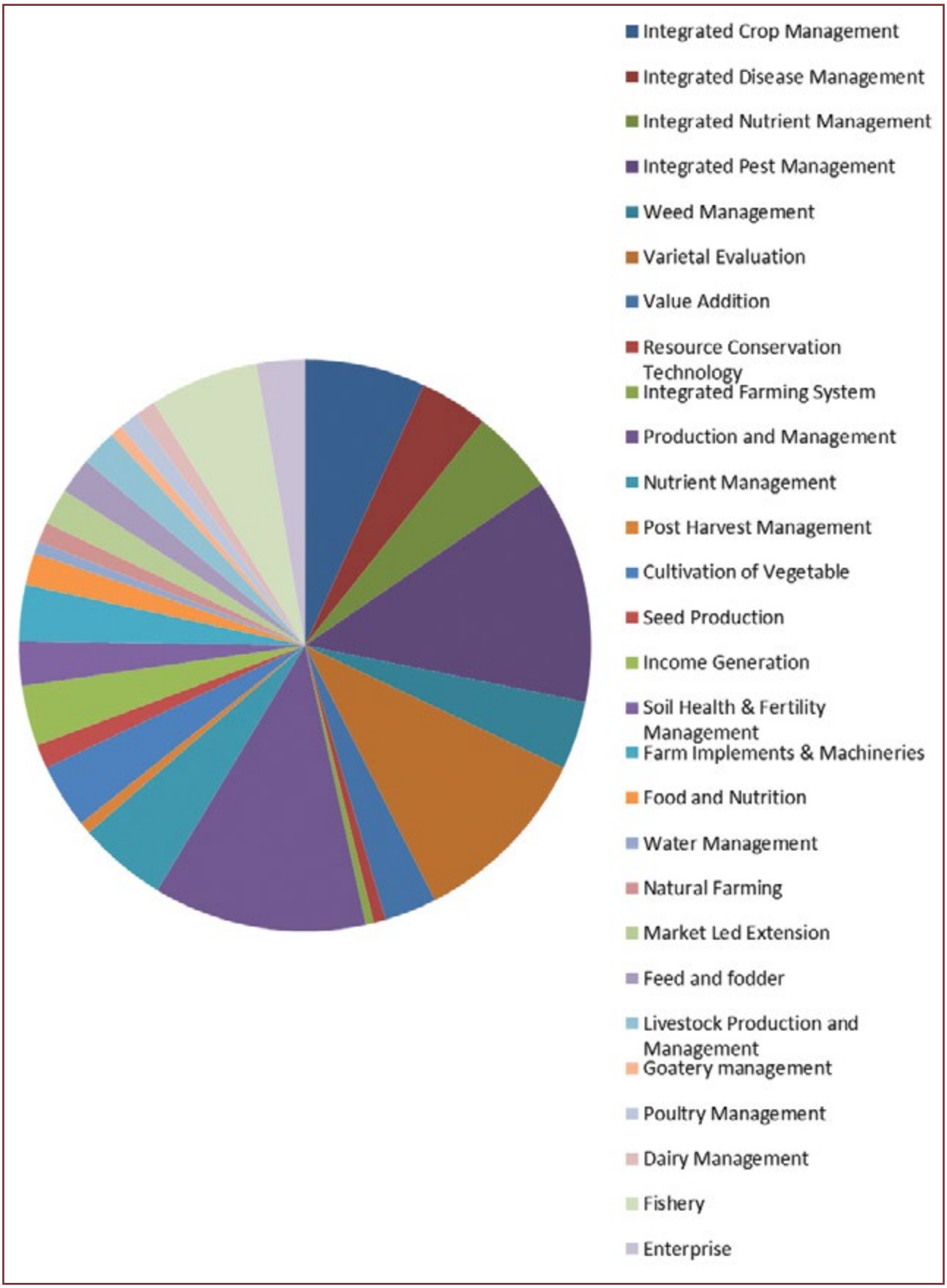
4.1.3 Thematic Area-wise Trials Conducted

More than 28 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 2024, the KVKs conducted 459 on-farm trials in 4123 locations to assess a total of 316 technologies. Among various thematic areas, technologies were tested through integrated pest management through 56 on-farm trials in 460 locations, followed by production and management (53 on-farm trials), varietal evaluation (46 on-farm trials), integrated crop management (30 on-farm trials), nutrient management (22 on-farm trials), integrated nutrient management (21 on-farm trials), integrated disease management (17 on-farm trials) and others. In livestock sector, the highest number (9 trials each) of on-farm trials was carried out in the areas of feed and fodder and livestock production and management followed by poultry management and dairy management (6 trials each) in a total of 313 locations. In fishery, 27 on-farm trials were conducted during this year involving composite fish culture and fish production and management in 216 locations. The distribution of on-farm trials based on thematic areas has been presented below.

4.1.4 State-wise Trials Conducted

In 2024, an analysis of on-farm trials conducted by various states showed that KVKs of Andaman and Nicobar Islands carried out a total of 10 on-farm trials distributed in 76 locations, the corresponding values for the states Odisha were 272 and 2573, and for West Bengal were 177 and 1474, respectively. In Andaman & Nicobar Islands, major thrust was on integrated crop management (3 trials) which was carried out in 20 locations. A total of 41 on-farm trials were conducted by KVKs of Odisha in varietal evaluation, while the KVKs of West Bengal carried out 5 on-farm trials on this thematic area. The other important areas for the KVKs of Odisha were production and management (33 trials), integrated pest management (32 on-farm trials), integrated nutrient management (15 on-farm trials) and income generation (15 on-farm trials) etc. In West Bengal, integrated pest management was the most important thematic area (22 on-farm trials) followed by production and management (19 on-farm trials




Integrated Crop Management
Integrated Disease Management
Integrated Nutrient Management
Integrated Pest Management
Weed Management
Varietal Evaluation
Value Addition
Resource Conservation Technology
Integrated Farming System
Production and Management
Nutrient Management
Post Harvest Management
Cultivation of Vegetable
Seed Production
Income Generation
Soil Health & Fertility Management
Farm Implements & Machineries
Food and Nutrition
Water Management
Natural Farming
Market Led Extension
Feed and fodder
Livestock Production and Management
Goatery management
Poultry Management
Dairy Management
Fishery
Enterprise

each), nutrient management (18 on-farm trials each), integrated crop management and fishery (15 on-farm trials each) etc. In the area of livestock production, KVKs of West Bengal took up 17 on-farm trials followed by KVKs of Odisha (14 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)	20	3	96	12	116	15	232	30
Integrated Disease Management (IDM)			97	13	31	4	128	17
Integrated Nutrient Management (INM)			111	15	42	6	153	21
Integrated Pest Management (IPM)	14	2	284	32	162	22	460	56
Weed Management (WM)			90	13	31	4	121	17
Varietal Evaluation (VE)			305	41	48	5	353	46
Value Addition (VA)	7	1	75	9	30	3	112	13
Resource Conservation Technology (RCT)			7	1	12	2	19	3
Integrated Farming System (IFS)					4	2	4	2
Production and Management (P&M)	14	1	267	33	156	19	437	53
Nutrient Management (NM)			29	4	131	18	160	22
Post-Harvest Management			14	2	7	1	21	3
Cultivation of Vegetable	7	1	35	5	65	10	107	16
Seed Production					46	6	46	6
Income Generation			130	15			130	15
Soil Health & Fertility Management			45	6	40	5	85	11
Farm Implements & Machineries (FIM)			79	11	25	3	104	14
Food and Nutrition (F&N)	7	1	18	2	63	5	88	8
Water Management(WM)			25	3			25	3
Natural Farming(NF)					56	5	56	5
Market Led Extension			330	8	5	1	335	9

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
Others	7	1	89	12	49	6	145	19
Total	**76**	**10**	**2126**	**237**	**1119**	**142**	**3321**	**389**
Fishery			91	12	125	15	216	27
Total	**-**	**-**	**91**	**12**	**125**	**15**	**216**	**27**
Feed and fodder			15	2	98	7	113	9
Livestock Production and Management			44	6	48	3	92	9
Goatery management			10	1	24	2	34	3
Poultry Management			29	4	10	1	39	5
Dairy Management			7	1	28	4	35	5
Total	**-**	**-**	**105**	**14**	**208**	**17**	**313**	**31**
Enterprise			251	9	22	3	273	12
Total	**-**	**-**	**251**	**9**	**22**	**3**	**273**	**12**
Grand Total	**76**	**10**	**2573**	**272**	**1474**	**177**	**4123**	**459**

4.1.5 Details of selected OFTs 2024

ANDAMAN AND NICOBAR ISLANDS

KVK North & Middle Andaman

Assessment of suitable long duration rice variety for North and Middle Andaman District of Andaman & Nicobar Islands

Thematic area: ***Varietal evaluation***

The yield of rice is very less due to lack of awareness on improved and non-lodging variety of rice. Due to heavy rainfall during grain filling to maturity stage lodging of rice plant is common in rice cultivable areas. To address this issue, KVK North & Middle Andaman undertook a multi-locational trial at 7 different locations of the district involving Farmers' Practice (FP), i.e., Jaya variety and two other long duration rice varieties, i.e., Technology Option-I (TO-I: CARI Dhan-9) and Technology Option-II (TO-II: ANR-40). The results revealed that ANR 40 recorded 5322.4 kg/ha grain yield and 6774.6 kg/ha straw yield due to its better growth attributes, which was 23.6% higher yield in comparison with FP and 16.6% higher yield in comparison with TO-I respectively. The highest yield of 5322.4 kg/ha was obtained in TO-II with the highest B:C ratio of 1.8 among the various options. In North and middle Andaman duration of rainfall is 5-6 month, therefore long duration of variety of rice (ANR 40) is suitable for cultivation in local climatic condition. Farmer's reaction was positive, as they observed improved yield potential, better pest resistance, and good adaptability to local conditions, encouraging wider adoption. However, during the harvesting period, unexpected rainfall was sometimes observed, which caused lodging.

Technology assessed:

FP: Jaya variety of rice

TO-I: CARI Dhan-9

TO-II: ANR-40

Source of Technology: ICAR-CIARI, Sri Vijaya Puram

Table: Performance evaluation of long duration rice varieties for North and Middle Andaman District

Technology option	No. of trials	Yield component		Yield (kg/ha)	Cost of cultivation (Rs./ha)	Gross return (Rs/ha)	Net return (Rs./ha)	B:C ratio
		No. of effective tillers/hill	Test wt. (100 grain wt.)					
FP	7	20	24.9	4305.7	42630.1	85920.1	43290.0	1.0
TO-I		21	25.9	4562.4	38920.1	91030.1	52110.0	1.3
TO-II		34	27.8	5322.4	37930.2	106109.6	68179.4	1.8

ODISHA

KVK Angul

Assessment of two different ethno-veterinary formulations for treatment of Lumpy Skin Disease (LSD) in cattle in Angul district

Thematic area: ***Livestock disease management***

Under semi-intensive dairy farming system of Angul district of Odisha, the occurrence of Lumpy Skin Disease (LSD) in local cattle population was identified as a potential problem. In order to solve this problem, KVK Angul carried out a multi-locational field trial at 8 different locations involving 24 calves affected with LSD of the district using two different ethno-veterinary formulations for the treatment of the disease as the local cattle population was not vaccinated against the disease due to non-availability of the vaccine. In this trial, FP was providing no treatment/ topical treatment for skin lesions with conventional ointments; TO-I: Prepare a paste by mixing betel leaves 10 nos., black pepper- 10 gm., salt-10 gm. (Mix this paste with jaggery. Day-1: Feed this one dose to infected animal every 3 hr interval. Day-2: Feed three doses daily from second day onwards for 2 weeks); and TO-II: Ingredients: Garlic- 2 pearls, coriander-10 g, Cumin-10 gm, Tulsi-1 handful, Dry cinnamon leaves- 10 g, Black pepper-10 g, Betel leaves- 5 nos, Shallots- 2 bulbs, Turmeric powder- 10 g, Chirata leaf powder-30 g, Sweet basil-1 handful, Neem leaves-1 handful, *Aegle marmalos* (Bel) leaves-1 handful, Jaggery-100 g. (Mix all the ingredients. Day-1: Feed this one dose to infected animal every 3 hr interval. Day-2: Feed two doses daily in the morning and evening from second day till conditions resolve). This was revealed from the trial that the average weight loss in calves after LSD was lowest in TO-II (2.0 vs. 20.8 kg.), the mortality rate was 0 in TO-I and TO-II as compared to 37.5% in FP while the B:C ratio of 1.20 was the highest in TO-I. It was concluded that the ethno-veterinary formulations have positive effect on LSD affected cattle and reduced mortality and weight loss in calves. The TO-I (Formulation made up of betel leave, black pepper and salt) provided promising result for LSD affected calves. Acceptability of this technology was initially low due to lack of awareness on

traditional medicines and severity of the disease. Research should be carried out on preparation of ready to use medicines using these ingredients for easy availability and convenience at farmer's site. Farmers were satisfied after observing the recovery of affected animals.

Technology assessed:

FP: Providing no treatment/ topical treatment for skin lesions with conventional ointments

TO-I: Preparing a paste by mixing betel leaves 10 nos., black pepper- 10 gm., salt-10 gm. (Mix this paste with jaggery. Day-1: Feed this one dose to infected animal every 3 hr interval. Day-2: Feed three doses daily from second day onwards for 2 weeks)

TO-II: Ingredients: Garlic- 2 pearls, coriander-10 g, Cumin-10 gm, Tulsi-1 handful, Dry cinnamon leaves- 10 g, Black pepper-10 g, Betel leaves- 5 nos, Shallots- 2 bulbs, Turmeric powder- 10 g, Chirata leaf powder-30 g, Sweet basil-1 handful, Neem leaves-1 handful, *Aegle marmalos* (Bel) leaves-1 handful, Jaggery-100 g. (Mix all the ingredients. Day-1: Feed this one dose to infected animal every 3 hr interval. Day-2: Feed two doses daily in the morning and evening from second day till conditions resolve).

Source of technology: NDDB, 2022

Table: Efficacy of two different ethno-veterinary formulations for treatment of Lumpy Skin Disease in cattle

Technology option	No. of trials	Yield component			Yield (q/8 calves)	Cost of cultivation (Rs./8 calves)	Gross return (Rs./8 calves)	Net return (Rs./8 calves)	B:C ratio
		Average weight loss in calves after LSD (kg)	Mortality rate (%)	Cost of intervention (Rs.)					
FP	8	20.8	37.5	1200	5	33600	20000	-13600	0.625
TO-I		3.3	0	350	7	26800	32000	5200	1.2
TO-II		2.0	0	680	7	29440	32000	2560	1.08

KVK Balasore

Evaluation of different supplementations for enhancing plankton production in *L. vannamei* rearing pond

Thematic area: *Fish production and management*

Low natural food (plankton) production in brackish water pond and poor growth of *L. vannamei* due to low dietary intake in the rearing ponds was addressed by KVK Balasore by undertaking a field trial at 7 different locations of the district by involving different supplementation which are used for boosting the plankton growth in the ponds and thereby enriching the feed resources for the fish. The trial involved assessing the technology options, i.e., FP: Improper use of fermented product from Rice bran + gur and yeast powder; TO-I: Use of Rice bran (20kg), Molasses (5 kg) and yeast powder (200gm) in 50 L water and kept for 48 hr with constant aeration and apply in pond @20 lit per acre; and TO-II: Use of fish-waste (CIBA-Plankton Plus) @ 30 PPM. Results showed that TO-II increased yield by 17.74% than FP with Rs. 194000 higher

return and the highest B:C ratio of 1.59. Farmers actively participated in this programme and were satisfied with the results. However, there was lack of awareness among the farmers regarding the use of latest technology initially.

Technology assessed:

FP: Improper use of fermented product from Rice bran + gur and yeast powder

TO-I: Use of Rice bran (20kg), Molasses (5 kg) and yeast powder (200gm) in 50 L water and kept for 48 hr with constant aeration and apply in pond @20 lit per acre

TO-II: Use of fish-waste (CIBA-Plankton Plus) @ 30 PPM

Source of technology: College of Fisheries, Rangailunda, 2017; ICAR-CIBA, 2019

Table: Performance of different supplementations for boosting plankton production in *L. vannamei* rearing pond

Technology option	No. of trials	Yield component % of Survivability	Yield (q/ha)	Cost of cultivation (Rs./ha)	Gross return (Rs./ha)	Net return (Rs./ha)	B:C ratio
FP	7	56.35	4.96	1087000	1587000	500000	1.46
TO-I		62.84	5.53	1152000	1769000	617000	1.53
TO-II		66.36	5.84	1175000	1869000	694000	1.59

KVK Bolangir

Assessment of performance of different weeding equipments in transplanted rice

Thematic area: *Farm mechanization*

Manual weeding in rice has become very labour intensive, drudgery prone and time-consuming operation. The weeding operation is again essential for getting the expected yield of the rice crop. In the given situation, KVK Bolangir came up with a multi-locational field trial at 7 different locations of the district involving the mechanized weeding operations. The trial involved comparison of the performance of FP: Manual weeding; TO-I: Mandwa Weeder; and TO-II: Wet Land Power Weeder in transplanted rice. It was revealed from the trial that TO-II was superior among the three options with the lowest labour requirement of 3 mandays/ha, the highest weeding index of 12.5, the highest yield of 43.3 q/ha with the highest B:C ratio of 2.05. It was recommended that power operated Wet Land Power Weeders were more efficient in weeding in transplanted rice. However, the row to row spacing is to be maintained at minimum 25cm.

Technology assessed:

FP: Manual/ Hand weeding

TO-I: Using Mandwa Weeder

TO-II: Using Wet Land Power Weeder

Source of technology: AICRP on ESA, CAET, OUAT, 2011 & 2013

Table: Performance of different weeding tools in transplanted rice

Technology option	No. of trials	Yield component			Weeding index	Yield (q/ha)	Cost of cultivation (Rs./ha)	Gross return (Rs/ha)	Net return (Rs./ha)	B:C ratio
		Field capacity (ha/h)	Labour requirement (mandays/ha)	Cost of operation (Rs/ha)						
FP	7	0.007	16	4600	5.2	40.8	42360	76220	33860	1.80
TO-I		0.018	7	2200	11.0	41.9	39810	76960	37150	1.93
TO-II		0.075	3	1450	12.4	43.3	38460	78810	40350	2.05

KVK Dhenkanal

Comparative assessment of different methods for sowing of ragi

Thematic area: ***Farm machinery***

In Dhenkanal district, due to adverse climatic situation sowing/ transplanting of ragi got delayed resulting in crop loss and low yield and transplanting was found to be time and labour consuming. In order to overcome this, KVK Dhenkanal conducted a field trial at 7 different locations for evaluating the performance of various methods of sowing/ transplanting of ragi. In this trial, FP was manual transplanting of ragi; TP-I was sowing ragi behind the plough; and TP-II was sowing ragi by OUAT 4 row bullock drawn seed drill. Results of the trial showed that TO-II yielded almost same quantity of ragi (as in FP) with the highest B:C ratio of 2.26. It was recommended that the TO-II was a successful technology for sowing of ragi in Dhenkanal district.

Technology assessed:

FP: Transplanting of ragi

TO-I: Sowing of ragi behind the plough

TO-II: Sowing of ragi by OUAT 4 row bullock drawn seed drill

Source of technology: OUAT, 2021

Table: Performance of different methods for sowing of ragi

Technology option	Yield (q/ha)	% increase in yield	Labour req for sowing (mandays/ ha)	Labour saving (%)	Cost of sowing / transplanting (Rs./ha)	Cost saving (%)	Net Return (Rs./ha)	B:C ratio
FP	8.9	-	25	-	10000	-	16050	1.67
TO-I	8.2	(-)7.8	10	60	6500	35	16400	1.8
TO-II	8.8	(-) 1.1	2.5	90	3500	65	22100	2.26

KVK Jagatsinghpur

Assessment of different fruit fly management measures in bitter gourd

Thematic area: ***Integrated pest management***

Low yield of bitter gourd due to high infestation of fruit flies has become a serious problem of vegetable growers in Jagatsinghpur district. Realizing this, KVK Jagatsinghpur undertook a multi-locational field trial at 7 different locations of the district involving the various management measures for controlling fruit fly in bitter gourd: FP (Soil application of Chlopyriphos); TO-I (Soil application of Chlorpyriphos 1.5% dust @ 25 kg/ ha at 30 DAG, application of poison bait (Jaggery 100 gm + Cartap hydrochloride 2 g + water 1.0 L), Cuelure @ 20 nos./ha., Periodical removal of damaged fruits); and TO-II (Placement of Food bait @ 20 nos./ha (mixture of 1kg cucumber pulp + 50g jaggery, 100 ml cow urine, 0.5L of water soaked overnight & diluted to 05 L + 10 ml Malathion) at 20 DAS, installation of Cuelure @ 25 nos./ha and spraying of Spinosad 45% SC @ 200 ml/ha twice at 45 & 60 DAS). The results revealed that TO-II was the best management option with the lowest infestation rate of 5.2% and the highest B:C ratio of 2.46. Active participation of farmer was found from planning to execution. Farmers were very much interested to use of IPM practice for reducing fruit fly infestation in bitter gourd.

Technology assessed:

FP: Soil application of Chlorpyriphos

TO-I: Soil application of Chlorpyriphos 1.5% dust @ 25kg/ha at 30 DAG, application of poison bait (Jaggery 100gm + Cartap hydrochloride 2g + water 1.0L), Cuelure @ 20 nos./ha., Periodical removal of damaged fruits

TO-II: Placement of Food bait @ 20 nos./ha (mixture of 1kg cucumber pulp + 50g jaggery, 100 ml cow urine, 0.5L of water soaked overnight & diluted to 05L + 10 ml Malathion) at 20 DAS, installation of Cuelure @ 25 nos./ha and spraying of Spinosad 45% SC @ 200 ml/ha twice at 45 & 60 DAS

Source of technology: OUAT, 2019; 2023

Table: Efficacy of different fruit fly management measures in bitter gourd

Technology option	No. of trials	Fruit infestation (%)	Yield (q/ ha)	% Change in yield	Gross Cost (Rs./ha)	Gross Return (Rs./ha)	Net Return (Rs./ha)	B:C ratio
FP	7	31.0	58.9		99800	176700	76900	1.77
TO-I		7.4	85.4	44.99	105400	256200	150800	2.43
TO-II		5.2	88.21	49.76	107200	264630	157430	2.46

KVK Jajpur

Assessment of effectiveness of different extension methods to access information on different crop (rice) production

Thematic area: ***Agricultural extension service***

Poor accessibility to accurate and timely information on technical knowledge/advisory in different production system has been identified as a potential problem of the district Jajpur. To address this issue, KVK Jajpur carried out a field trial involving the farmers who got the information on rice production from different channels of information dissemination. The trial included FP: Farmers getting information from peer group, input dealers, extension functionaries, mass media and KMA; TO-I: FP + Short Video Lecture+ Focus Group discussion; and TO-II: FP + Using of Rice "Xpert" App. It was found from the trial that the TO-II was superior over other options in terms of understanding, timeliness, suitability of technology and other related dissemination parameters. It was finally recommended that Rice "Xpert" app was found better over TO-I and FP. Farmers were directly involved in conducting OFT and group interaction and agreed to adopt the technology.

Technology assessed:

FP: Farmers getting information from peer group, input dealers, extension functionaries, mass media and KMA

TO-I: FP + Short Video Lecture+ Focus Group discussion

TO-II: FP + Using of Rice "Xpert" App

Source of Technology: OUAT, 2019

Table: Effectiveness of different extension methods to access information on different crop (rice) production*

Technology options	Understanding of the message (%)			Timeliness of information (%)			Suitability of technology (%)			Increase in knowledge (%)			User friendliness (%)		
	HU	PU	LU	T	U	NT	FA	PA	NA	A	D	U	MA	AP	LA
FP	18	54	18	9	33	48	9	27	54	21	6	63	12	24	**54**
TO-I	30	51	9	12	24	54	24	45	21	36	24	30	18	24	48
TO-II	57	27	6	78	6	6	54	27	27	51	24	15	63	15	**12**

*** HU-Highly understandable, PU-Partially understandable, LU-Less understandable; T-Timely, U-Undecided, NT-Not timely; FA-Fully applicable, PA-Partially applicable, NA-Not applicable; A-Agree, D-Disagree, U-Undecided; MA-Most appropriate, AP-Appropriate, LA-Less appropriate**

KVK Kalahandi

Assessment of various weed management practices in cotton in Kalahandi district

Thematic area: ***Weed management***

Cotton is a predominant cash crop of Kalahandi district of Odisha. But low yield of cotton has been attributed to severe weed infestation. To solve this problem, KVK Kalahandi conducted a field trial at 7 different locations of the district for assessing the performance of different weed management measures in cotton crop. In this trial, FP was manual weeding, TO-I was application of pyrithiabac sodium 6% + Quizalfop ethyl 4% @ 500ml/ha at 20 DAS as post emergence spray, and TO-II was pre-emergence application of pendimethalin @330ml/ha and post-emergence application of Quizalofop ethyl @1000ml/ha at 20 DAS. The results indicated that TO-II had WCE of 76% with cotton yield of 16.1 q/ha (50.5% yield increase over FP) and with the highest B:C ratio of 1.90. Farmers were much interested in the technology and their participation was encouraging as the farmers of neighbouring fields and villages also started using this technology.

Technology assessed:

FP: Manual weeding

TO-I: Application of pyrithiabac sodium 6% + Quizalfop ethyl 4% @ 500ml/ha at 20 DAS as post emergence spray

TO-II: Pre-emergence application of pendimethalin @330ml/ha and post-emergence application of Quizalofop ethyl @1000ml/ha at 20 DAS

Source of technology: CICR, 2018

Table: Performance of different weed management practices in cotton

Technology option	No. of trials	Yield component		% Change in Yield	Yield (q/ha)	Cost of cultivation (Rs./ha)	Gross return (Rs./ha)	Net return (Rs./ha)	B:C ratio
		Weed count/ m^2	WCE						
FP	7	7	56%	-	10.7	55500.00	80250.00	24750.00	**1.4**
TO-I		4	64%	24.3	13.3	58600.00	99750.00	41150.00	**1.7**
TO-II		2	76%	50.5	16.1	60700.00	120750.00	60050.00	**1.9**

KVK Khordha

Assessment of incorporation of minor carp in carp polyculture system

Thematic area: ***Fish production and management***

In Khordha district, the problem of under-utilization of pond carrying capacity generally led to low fish production. For optimum utilization of the carrying capacity of the rearing ponds, a multi-locational field trial was conducted by KVK Khordha by incorporating some minor carp species at different stocking densities. The Technology options were FP: Stocking of Catla, Rohu and Mrigal juveniles @8000/- per ha; TO-I: Stocking of Catla, Rohu and Mrigal juveniles @8000/ha + Incorporation of *Puntius gonionutus* @10% of the stocking density; and TO-II: Stocking of Catla, Rohu and Mrigal juveniles @8000/ha + Incorporation of *Puntius gonionutus* @20% of the stocking density. It was revealed from the trial that the highest fish yield was recorded in TO-II with the highest B:C ratio of 2.26. It was recommended that incorporation of *Puntius gonionutus* @20% of the stocking density of IMC (8000/ha) resulted in highest yield per unit area and profit by the farmers. The species could be incorporated in the existing culture system for better utilization of the pond's carrying capacity and additional income generation by the farmers. Availability of quality seed of *puntius gonionutus* was found to be a major constraint. However, farmers involved in the current assessment were convinced with the results by visualizing the faster growth of *Puntius gonionutus* during the initial six months of culture period and increase in total fish production. They are now more proactive to adopt the species in their existing pond based culture systems.

Technology assessed:

FP: Stocking of Catla, Rohu and Mrigal juveniles @8000/ha

TO-I: Stocking of Catla, Rohu and Mrigal juveniles @8000/ha + Incorporation of *Puntius gonionutus* @10% of the stocking density

TO-II: Stocking of Catla, Rohu and Mrigal juveniles @8000/ha + Incorporation of *Puntius gonionutus* @20% of the stocking density

Source of technology: ICAR-CIFA, 2023

Table: Effect of incorporation of minor carp (*Puntius gonionutus*) in carp polyculture system

Technology option	No. of trials	Yield component		Yield (kg/ha)	Cost of cultivation (Rs./ha)	Gross return (Rs./ha)	Net return (Rs./ha)	B:C ratio
		Avg wt (g)	Survival (%)					
FP	7	545	71.9	30.66	228600	489900	261300	2.14
TO-I		542 (IMC)+ 351 (PG)	73.7 (IMC)+ 83.6 (PG)	31.95 (IMC) + 2.34 (PG)	230700	509670	278970	2.21
TO-II		540 (IMC)+ 340 (PG)	72.4 (IMC)+ 76 (PG)	31.27 (IMC) + 4.14 (PG)	231600	522870	291270	2.26

KVK Malkangiri

Assessment of different varieties of papaya for increasing femaleness

Thematic area: ***Varietal evaluation***

Under vegetable-vegetable production system of Malkangiri district, low yield in papaya due to more number of male plants and less fruit setting has been identified as a major problem. In order to address this issue, KVK Malkangiri undertook a field trial at 7 different locations involving three different papaya varieties like (FP) Coorg Honey dew; (TO-I) Arka Prabhat (Average fruit weight 1.34 kg, Yield per plant 23.79 kg, Fruit length 21.24 cm, Fruit diameter 11.61cm, TSS 7.36 o Bricks, it is gynodioecious); and (TO-II) Red Lady (Vibrant salmon, coloured flesh with sweet aroma and melon like flavour, fruits are large, 3-5 cm. thick, oblong, it is parthenocarpic, gynodioecious). It was found from the trial that TO-I recorded the highest yield of 690 q/ha with the highest B:C ratio of 4.08. The variety, Arka Prabhat is a gynodioecious variety and has optimum yield followed by Red Lady. However, a problem of 5% PMV was observed, so research to control PMV is needed.

Technology assessed:

FP: Coorg Honey dew

TO-I: Arka Prabhat - Average fruit weight 1.34 kg, Yield per plant 23.79 kg, Fruit length 21.24 cm, Fruit diameter 11.61cm, TSS 7.36 o Bricks, gynodioecious

TO-II: Red Lady - Vibrant salmon, colored flesh with sweet aroma and melon like flavour, fruits are large, 3-5 cm. thick, oblong, it is parthenocarpic, gynodioecious

Source of technology: ICAR-IIHR, 2017




Table: Performance of different varieties of papaya

Technology option	No. of trials	Yield component			Yield (q/ha)	Cost of cultivation (Rs./ha)	Gross return (Rs/ha)	Net return (Rs./ha)	B:C ratio
		Plant Height (cm)	No of Fruit	Yield per plant (kg)					
FP	7	118.2	14	17.5	437.5	135000	350000	215000	2.59
TO-I		104.5	24	27.6	690	135000	552000	417000	4.08
TO-II		132.2	28	27.44	686	135000	548800	413800	4.06

KVK Sambalpur

Assessment of suitability of different chilli varieties for preparation of pickles

Thematic area: ***Value addition***

The problem of non-availability of suitable chilli variety for pickle preparation by Women SHG in Sambalpur district was addressed by KVK Sambalpur by undertaking a field trial at 13 different locations of the district involving three chilli varieties depending on the suitability for pickle preparation. The trial involved FP: Kuchinda chilli, TO-I: Swarna Tejaswini, and TO-II: Arka Nihira. The results after preparation of pickle showed that TO-II had the highest B:C ratio of 1.55. The ingredients for preparation of pickle were green chilli-1kg, salt-150gm, mustard (ground)-100gm, lime juice-200ml, fenugreek, cardamom, turmeric, cumin powder-15 gm each, mustard oil-400ml. The method of preparation of pickle was: Green chilli-washing-drying-making incision-mixing all spices in a little lime juice-mixing with chillies-filling into jar-adding lime juice and oil-keeping in sun for a week-storage.

Technology assessed:

FP: Cultivation of Kuchinda chilli for pickle

TO1: Cultivation of Swarna Tejaswini (Long, less pungent with a fruit weight of 15-20 gm, No. of fruits/plant-75-80, yield/plant-1.0-1.25 kg, yield-20-25 t/ha, suitable for pickle)

TO-II: Cultivation of Arka Nihira (Suitable for making chutney, curry and pickles, low pungency (0.29% Capsaicin). Yields about 23 t/ha of green chilli in a crop duration of 165 days)

Source of technology: ICAR RCER Research Centre Ranchi, 2020; ICAR-IIHR, 2023; Post-Harvest Technology Centre, TNAU, Coimbatore, 2023

Table: Evaluation of different chilli varieties for preparation of pickles

Technology option	No. of trials	Yield component		Cost of pickle preparation out of 1 kg green chilli (Rs.)	Gross return (Rs.)	Net return (Rs.)	B:C ratio
		Yield (kg/plant)	No. of fruits/plant				
FP	13	0.4	41	130	156	26	1.2
TO-I		0.7	58	180	252	72	1.4
TO-II		1.22	312	180	280	100	1.55

KVK Sundargarh-II

Evaluation of different herbicides for management of weeds in *rabi* onion

Thematic area: *Weed management*

High weed infestation in *rabi* onion has become a major problem for the onion growers of the district. Realizing this, KVK Sundargarh-II took up a field trial at 7 different locations of the district for assessing the efficacy of various herbicides in controlling the weed infestation. In this field trial, FP: Manual weeding; TO-I: Pre-mergence application of Pendimethalin 750 g/ha followed by application of Quizalophop-p-ethyl 50 g/ha at 20 DAT; and TO-II: Soil application of Oxyflurofen 23.5 EC @ 235g/ha before planting + one hand weeding at 55 DAT. It was revealed from the trial that TO-II recorded the highest yield of 214 q/ha with the lowest weed density and highest B:C ratio.

Technology assessed:

FP: Manual weeding

TO-I: Pre-mergence application of Pendimethalin 750 g/ha followed by application of Quizalophop-p-ethyl 50 g/ha at 20 DAT

TO-II: Soil application of Oxyflurofen 23.5 EC @ 235g/ha before planting + one hand weeding at 55 DAT

Source of technology: NHRDF, Nasik, 2014; ICAR-DOGR, Pune, 2011



Table: Efficacy of different herbicides for management of weeds in *rabi* onion

Technology option	No. of trials	Weed density no./m2	Yield (q/ha)	Cost of cultivation (Rs./ha)	Gross return (Rs./ha)	Net return (Rs./ha)	B:C ratio
FP	7	28	180	95000	216000	121000	2.27
TO-I		10	205	97500	246000	148500	2.52
TO-II		7	214	98500	256800	158300	2.61

WEST BENGAL

KVK Bankura

Evaluation of effect of applying zinc and boron on yield of Indian mustard (var-CS-60)

Thematic area: *Integrated nutrient management*

Deficiency of micronutrient has been identified as a potential cause of reducing the yield of mustard in Bankura district. To solve this problem, a multi-locational field trial was conducted by KVK Bankura at 4 different locations of the district. The technology options involved in the trial were FP: Recommended dose of NPK (80-40-40)/ha in different forms of available fertilizers; TO-I: Application of chelated zinc along with recommended dose of chemical fertilizers; TO-II: Application of boron along with recommended dose of chemical fertilizers; and TO-III: Application of chelated zinc and boron along with recommended dose of chemical fertilizers. The results revealed that TO-III recorded the highest yield of 17.0 q/ha and the highest B:C ratio of 2.07. Among the technology verified under OFT, TO-III showed better performance in terms of yield and net return/ha with the performing indicators like yield parameters, cost of cultivation, profitability,

quality parameters. TO-III should be recommended for micro level situation. Farmers were motivated to use micro nutrients at the recommended dose.

Technology assessed:

FP: Recommended dose of NPK (80-40-40)/ha in different forms of available fertilizers

TO-I: Application of chelated zinc along with recommended dose of chemical fertilizers

TO-II: Application of boron along with recommended dose of chemical fertilizers

TO-III: Application of chelated zinc and boron along with recommended dose of chemical fertilizers

Source of technology: IIT Kharagpur, 1996

Table: Effect of applying zinc and boron on yield of Indian mustard

Technology option	No. of trials	Yield component			Yield (q/ha)	Cost of cultivation (Rs./ha)	Gross return (Rs./ha)	Net return (Rs./ha)	B:C ratio
		No. of branches /plant	No. of siliqua/ branch	Test wt. (100 grain wt.)					
FP	4	5	46	0.442	15.0	43700.00	82500.00	38800.00	1.89
TO-I		5	50	0.445	15.0	44000.00	82500.00	38500.00	1.88
TO-II		6	55	0.443	15.5	44500.00	85250.00	40750.00	1.92
TO-III		6	58	0.455	17.0	45200.00	93500.00	48300.00	2.07

KVK Coochbehar

Assessment of different IPM modules against insect pests of lablab bean

Thematic area: ***Integrated pest management***

Reduction in yield due to infestation of insect pests in lablab bean has been major concern of the district. Sucking insect pests like aphid, jassid, white fly and borer pests are currently the limiting factor for lablab bean production in Coochbehar district. To overcome this, KVK Coochbehar carried out a field trial at 6 different locations of the district involving different IPM modules for control of insect pests in the crop. The trial included the options like FP: Use of Acephate 75% SP @ 0.75 gm/litre; TO-I: Alternate spraying at 7 days gap with Spiromesifen 22.9 SC @ 1 ml/litre followed by spraying with diafenthiuron 50 WP @ 1.25 gm/litre and flubendiamide 480 SC @ 0.2 ml/litre of water; TO-II: Alternate spraying at 7 days gap with Pyriproxyfen 10.8 EC @ 1 ml/litre followed by spraying with Chlorfenapyr 10 SC @ 1.5 ml/litre and Indoxacarb 14.5 SC @ 1 ml/litre of water; and TO-III: Application of neem oil (0.03%) @ 5 ml/litre water + Application of ash @ 20 gm/ plant at 3 days interval + frequent raking of the cop field + Application of Btk (*Bacillus thuringiensis* var. kurstaki) @ 1.5 gm/litre in the evening hours. The results obtained from the trial conducted on assessment of IPM modules against insect pests of lablab bean indicated that all the molecules were effective in providing the control of the insect pest over FP. Among the technologies tested, TO-I may be recommended on the basis of B:C ratio (2.12) followed by TO-II.

Technology assessed:

FP: Use of Acephate 75% SP @ 0.75 gm/litre

TO-I: Alternate spraying at 7 days gap with Spiromesifen 22.9 SC @ 1 ml/litre followed by spraying with diafenthiuron 50 WP @ 1.25 gm/litre and flubendiamide 480 SC @ 0.2 ml/litre of water

TO-II: Alternate spraying at 7 days gap with Pyriproxyfen 10.8 EC @ 1 ml/litre followed by spraying with Chlorfenapyr 10 SC @ 1.5 ml/litre and Indoxacarb 14.5 SC @ 1 ml/litre of water

TO-III: Application of neem oil (0.03%) @ 5 ml/ litre water + Application of ash @ 20 gm/plant at 3 days interval + frequent raking of the cop field + Application of Btk (*Bacillus thuringiensis* var. kurstaki) @ 1.5 gm/litre in the evening hours

Source of technology: UBKV, 2021

Table: Efficacy of different IPM modules against insect pests of lablab bean

Technology option	No. of trial	Insect pest incidence (%)	Yield (t/ha)	Cost of cultivation (Rs./ha)	Gross return (Rs/ha)	Net return (Rs./ha)	B:C ratio
FP	6	16.13	14.22	150200	284400	134200	1.89
TO-I		12.15	16.36	154350	327200	172850	2.12
TO-II		11.46	15.95	155800	319000	163200	2.05
TO-III		10.88	15.20	152700	304000	151300	1.99
CD at 5%			0.97				

KVK Jalpaiguri

Assessment of production performance of *Ghungroo* piglets reared through replacement feeding system

Thematic area: ***Feeding management***

For addressing the problem of loss of production and lower weight gain rate in *Ghungroo* piglets due to zero grain feeding system and low CP feeding practices, a multi-locational field trial was undertaken by KVK Jalpaiguri at 10 different locations of the district. The feeding technology options involved FP: Feeding of locally available grass, colocasia plants and leaves, kitchen waste, cassava roots etc.; TO-I: Feeding of standard concentrate feed with 25% local made rice bear waste; and TO-II: Feeding of standard concentrate feed with 50% local made rice bear waste. The trial assessed the FCE and average growth rate of *Ghungroo* piglets reared under replacement feeding system. The results demonstrated that piglets reared under TO-II exhibited superior average body weight gain compared to those in the FP and TO-I. This suggested that the nutritional composition and housing conditions in TO-II provided an optimal environment for growth and feed efficiency. Furthermore, piglets in the TO-II achieved a higher B:C ratio, indicating greater economic efficiency due to improved weight gain, reduced mortality and enhanced overall productivity.

Technology assessed:

FP: Feeding of locally available grass, colocasia plants and leaves, kitchen waste, cassava roots etc.

TO-I: Feeding of standard concentrate feed with 25% local made rice bear waste

TO-II: Feeding of standard concentrate feed with 50% local made rice bear waste

Source of technology: ICAR Research Complex for NEH Region, 2014




Table: Production performance of *Ghungroo* piglets reared through replacement feeding system

Technology option	No. of trials	Yield component		Cost of rearing (Rs./ unit)	Gross return (Rs./ unit)	Net return (Rs./ unit)	B:C ratio
		Average monthly body weight gain from 3-6 months (kg)	Litter size at first farrowing				
FP	10	13.80	6.45	3800.00	10800.00	7000.00	2.84
TO-I		15.90	6.70	4850.00	15400.00	10550.00	3.17
TO-II		18.50	6.95	5400.00	17380.00	11960.00	3.22

KVK Malda-I (Ratua)

Assessment of productivity and profitability of litchi by using different types of bagging materials

Thematic area: *Orchard management*

Low productivity in litchi due to physiological disorder and pest infestation has become a major concern for the litchi farmers of the district. In an attempt to solve this problem, KVK Malda-I (Ratua) undertook a field trial at 7 different locations of the district. The trial included FP: Litchi cultivation without using any bagging material; TO-I: Litchi cultivation using mosquito net; and TO-II: Litchi cultivation using brown paper bag/pink paper bag as a bagging material. The results showed that TO-II recorded the highest B:C ratio of 3.57. From the present trial, it was concluded that TO-II in litchi orchard was very much effective for good litchi production.

Technology assessed:

FP: Litchi cultivation without using any bagging material

TO-I: Litchi cultivation using mosquito net

TO-II: Litchi cultivation using brown paper bag/ pink paper bag as a bagging material

Source of technology: BCKV, 2011; ICAR-NRC Litchi, 2018

Table: Performance of different bagging materials on litchi production

Tech-nology option	No. of trials	Fruit re-tention (per cent)	Fruit cracking (per cent)	Pericarp sunburn (per cent)	Incidence of insects and dis-eases (per cent)	Fruit weight (g)	Fruit vol-ume (cm3)	Fruit yield (Kg/ plant)	Fruit yield (q/ ha)	% yield in-crease over FP	Cost of cultiva-tion (Rs./ ha)	Gross Return (Rs./ ha)	Net Return (Rs./ ha)	B:C ratio
FP	7	41.09	12.94	19.05	17.68	20.63	19.91	40.92	53.05	-	51988	128265	76277	2.46
TO-I		42.90	9.14	16.11	7.94	21.99	21.89	43.89	61.12	15.21	62678	187643	124965	2.99
TO-II		49.95	7.94	14.14	4.68	22.85	22.91	52.07	67.89	27.97	69593	248980	179387	3.57
S.Em.+		0.26	0.08	0.08	0.08	0.09	0.09	0.10	0.25					
C.D.@5%		0.84	0.23	0.24	0.25	0.29	0.28	0.31	0.77					

KVK Murshidabad-I (Jiaganj)

Evaluation of various measures for controlling root rot of black cumin in Murshidabad district

Thematic area: *Integrated disease management*

The black cumin is a very good remunerative spices crop of Murshidabad district. But its cultivation becomes difficult due to severe infestation of disease like root rot due to combined infection of bacteria and fungus. The precautionary as well as protective measures at right time along with some soil treatment are needed. But farmers are totally in dark about the disease, its impact and control measures. The trial is conducted to study the effect of different control measures. Black cumin was an important crop earlier and was cultivated in a large area but because of such destructive problem its cultivated area in some villages has almost become nil. To overcome this problem, a field trial was conducted by KVK Murshidabad-I (Jiaganj) at 7 different locations of the district involving the technology options like, FP: Seed sowing (No seed treatment, no use of biological pesticide); TO-I: Application of 2- 3 sprayings of Carbendazim 50% wp; TO-II: Applying 2-3 sprayings of Metiram 55% and Pyraclostrobin 5% WG; TO-III: Application of 2-3 sprayings of Trichoderma suspension (*T. viridae* + *T. harzianum*)-@ 5 g/L; and TO-IV: Use of Trichoderma suspension 2.5 kg (*T. viridae* + *T. harzianum*) mixed compost @ 50 kg/ ha. The result showed that the TO-III where biological pesticide are used for seed, soil and seedling treatment as well as applied to the main field, the disease infestation was very less (32%). The highest yield of 7.85q/ha along with highest B:C ratio was obtained in the TO-III.

Technology assessed:

FP: Seed sowing (No seed treatment, no use of biological pesticide)

TO-I: Application of 2- 3 sprayings of Carbendazim 50% wp

TO-II: Applying 2-3 sprayings of Metiram 55% and Pyraclostrobin 5% WG

TO-III: Application of 2-3 sprayings of Trichoderma suspension (*T. viridae* + *T. harzianum*)-@ 5 g/L

TO-IV: Use of Trichoderma suspension 2.5 kg (*T. viridae* + *T. harzianum*) mixed compost @ 50 kg/ ha

Source of technology: Kannur University, Kerala, 2022; Bangladesh Agricultural University, 2021






Table: Performance of various controlling measures of root rot of black cumin

Technology option	No. of trials	Yield (q/ ha)	Percentage (%) of disease infestation	Cost of cultivation (Rs./ ha)	Gross. Return (Rs./ ha)	Net Return (Rs./ ha)	B:C ratio
FP	7	4.25	58	65475.	127500	62025	1.95
TO-I		5.32	45	72800	159600	86800	2.19
TO-II		6.08	41	74000	182400	108400	2.46
TO-III		6.15	40	72025	184500	112475	2.56
TO-IV		7.85	32	78558	235500	156942	2.99
SEm.±		0.58	0.19				
CD@5%		1.82	0.85				

Selling price of seed @ Rs. 300/kg

KVK North 24 Paraganas-I (Ashokenagar)

Assessment of different levels of replacement of concentrate with Sajina-PKM1 (*Moringa oleifera*) leaves for post-weaning health of *Black Bengal* kids

Thematic area: ***Feeding management***

Poor growth of *Black Bengal* goat kid at post-weaning period has been attributed to improper nutrition and feeding management. This problem was addressed by KVK North 24 Paraganas-I (Ashokenagar) through carrying out a multi-locational field trial at 18 different locations of the district. The trial included FP: Traditional feeding management of young goat without any concentrate; TO-I: Supplementation of cultivated Sajina (PKM1; *Moringa oleifera*) leaves at post-weaning stage of kid for 28 days (20% replacement of concentrate); and TO-II: Supplementation of cultivated Sajina (PKM1; *Moringa oleifera*) leaves at post-weaning stage of kid for 28 days (50% replacement of concentrate). The results revealed that TO-III showed better health parameters, body growth and economic return as compared to other options. It was concluded that Sajina (PKM1; *Moringa oleifera*) leaves replacing concentrate feed @ 50% level could be beneficial as the farmers got benefitted through better health and weight gain of Black Bengal goat kids and therefore, it may be a better feeding option for smallholder goat farmers.

Technology assessed:

FP: Traditional feeding management of young goat without any concentrate

TO-I: Supplementation of cultivated Sajina (PKM1; *Moringa oleifera*) leaves at post-weaning stage of kid for 28 days (20% replacement of concentrate)

TO-II: Supplementation of cultivated Sajina (PKM1; *Moringa oleifera*) leaves at post-weaning stage of kid for 28 days (50% replacement of concentrate)

Source of technology: Sardar Krushinagar Dantiwada Agricultural University, Gujarat, 2017

Table: Performance of different levels of replacement of concentrate with Sajina-PKM1 (*Moringa oleifera*) leaves for post-weaning health of kid

Technology option	No. of trials	Parameter(s)			Cost of feed/ animal/day @28 Rs/ Kg and 100gm/day/kid and extra cost 5.00 rs/kid/day	Gross return as body weight gain based price (Rs/anima/dayl) @300 Rs/live animal Kg	Net return (Rs./ Animal/ day)	B:C Ratio
		Average weight gain (gm/ day	Hb%	TP%				
FP	18	32.5±3.38^{a}	10.33 ±1.33^{a}	7.13 ± 0.04^{a}	7.80	9.75	1.95	1.25
TO-I		35.08±2.49^{b}	10.38± 2.61^{a}	7.16 ±0.03^{b}	6.40	10.51	4.11	1.64

Technology option	No. of trials	Parameter(s)			Cost of feed/ animal/day @28 Rs/ Kg and 100gm/day/kid and extra cost 5.00 rs/kid/day	Gross return as body weight gain based price (Rs/anima/dayl) @300 Rs/live animal Kg	Net return (Rs./ Animal/ day)	B:C Ratio
		Average weight gain (gm/ day	Hb%	TP%				
TO-II		37.83±4.01^{b}	11.51±2.69^{b}	7.17±1.12^{b}	6.40	11.35	4.95	1.77
CD @5%		2.55	1.1	0.03				
P Value		P<0.05	P<0.05	P<0.05				

Values followed by different letters (a, b, c) within the same column differ significantly (P<0.05)

KVK Purulia

Standardization of recommended crop management strategies for improving the productivity of Sugarcane in Red laterite tracts of Purulia district

Thematic area: ***Integrated crop management***

In Purulia, Sugarcane is cultivated in about 886 ha, production 38744 MT and Av. productivity is 437 q/ha. Sugarcane is the major crop after Rice in about 12 moujas of Arsha Block in the foothill of Ayodhya Range (lies between 23°20′ and 23°15′ North Latitude and 86°15′ and 86°5′ East Longitude).In this Patch, Sugarcane is grown as a rainfed crop following in situ soil moisture conservation technique for the last 100 years or more. Here planting of sugarcane usually starts from 15th March and continuous upto 20th April and harvested during Feb to 15th March. From 1975 onwards they are growing Co-527. For the last 15 years they are observing gradual decrease in yield (80-100 t/ha to 40-50t/ha). Increased pest and disease problem that ultimately brought down their profit margin. Low profit leads to shifting to other less remunerative and new crop for the farmer. To address this, a field trial was conducted by KVK Purulia at 10 different locations involving the technology options like FP: Farmers plant three budded setts end to end of c.v. Co- 527 without sett treatment in shallow furrows 75 cm apart drenched by Chlorpyriphos and fertilized with IFFCO 10:26:26 @ 225 kg/ha followed by two top dressing with IFFCO 10:26:26@ 225 kg/ha at 45 DAP and @ 112.5 kg/ha at 90 DAP respectively. Hand weeding 7-8 timed at 15-20 days interval; TO-I: Planting three budded setts end to end of c.v. Co-0238 treated with Carbendazim + Mancozeb @ 2 gm per lit of water, in shallow furrows 1 m apart drenched by Chlorantraniliprole 18.5 S.L @ 180 ml in 300lit.of water per acre and fertilized with only Phosphate @ 100 kg./ha followed by top dressing at 30, 60 & 90 DAP with Nitrogen and Potash @ 50 kg and 33 kg/ha every time +Pre emergence (2-3 days of planting) application of Atrazin 50% @ 0.85 kg in 160 litres of water per acre + Two post emergence (30 DAP & 60 DAP) application of Metribuzin 300 gm + 2, 4 D Amine 1.5 litre in 200 litre of water per acre + application of Forate 10G @ 10 kg per acre at 60 DAP; and TO-II: Planting Settlings raised from sugarcane buds in Nursery of c.v. Co-0238 with same package of practices as TO-I. Results indicated that both the recommended crop management options gave significantly higher yield over Farmers practice. Among them, TO-III significantly increased different yield attributes compared to other two options while giving the highest number of millable canes (54.67/ha), maximum cane height (205 cm), cane diameter (2.12 cm) were recorded in TO-III and that resulted in the highest cane yield (72.10 t/ha) and highest economic benefit.

Technology assessed:

FP: Farmers plant three budded setts end to end of c.v. Co- 527 without sett treatment in shallow furrows 75 cm apart drenched by Chlorpyriphos and fertilized with IFFCO 10:26:26 @ 225 kg/ha followed by two top dressing with IFFCO 10:26:26@ 225 kg/ha at 45 DAP and @ 112.5 kg/ha at 90 DAP respectively. Hand weeding 7-8 timed at 15-20 days interval

TO-I: Planting three budded setts end to end of c.v. Co- 0238treated with Carbendazim + Mancozeb @

2gm per lit of water, in shallow furrows 1 m apart drenched by Chlorantraniliprole 18.5 S.L @ 180 ml in 300lit.of water per acre and fertilized with only Phosphate @ 100 kg./ha followed by top dressing at 30, 60 & 90 DAP with Nitrogen and Potash @ 50 kg and 33 kg/ha every time +Pre emergence (2-3 days of planting) application of Atrazin 50% @ 0.85 kg in 160 litres of water per acre + Two post emergence (30 DAP & 60 DAP) application of Metribuzin 300 gm + 2, 4 D Amine 1.5 litre in 200 litre of water per acre + application of Forate 10G @ 10 kg per acre at 60 DAP

TO-II: Planting Settlings raised from sugarcane buds in Nursery of c.v. Co-0238 with same package of practices as TO-I

Source of technology: ICAR-SBI, Coimbatore, 2018

Table: Performance of different recommended crop management strategies for improving productivity of sugarcane in Red laterite tracts of Purulia

D.O.S: 06-10.04.2024 **D.O.H: 1-10.02.2025** **No. of Replication: 10, cv. Co-0238**

Technology option	No. of trials	Yield component			Cane yield (t/ha)	Gross Cost (Rs./ha)	Gross return (Rs/ha)	Net return (Rs/ha)	B:C ratio
		Millable cane (,000/ha)	Cane diameter (cm)	Cane height (cm)					
FP	10	29.80	1.51	168	43.10	1,32,250	1,72,900	40,650	1.31
TO-I		45.30	2.02	192	64.70	1,52,900	2,59,800	1,06,900	1.70
TO-II		54.67	2.12	205	72.10	1,59,950	2,87,700	1,27,750	1.80
CD at 5%		8.52	NS	5.63	6.22				

KVK Uttar Dinajpur

Assessment of effect of cereal and millet based nutritional weaning food on children health

Thematic area: ***Women and child care***

Lack of dietary essentials leading to poor health and growth in children was identified as a potential problem of the district. In order to tackle this issue, a field trial was planned and conducted by KVK Uttar Dinajpur at 7 different locations of the district. In this trial, three types of supplementary foods were used – one was based on rice flakes, green gram, peanut and finger millet, second one was maize, wheat with malted finger millet flour and *Moringa oleifera* leaf powder and third type consisted of rice flake, maize, foxtail millet, buckwheat and peanuts. In each option, children of age group 6 months to 3 years were taken and provided with supplementary food for 4 months. Approximately 75-150 gm baby food was given per baby per day. Amount of food was varied according to age group. First, it was given twice a day and after 15 days food was given thrice a day in milk/ water according to availability. From the trial, it was revealed that the increase in weight gain was significant in all the cases as compared to FP. TO-II and TO-III performed better than other groups. It was observed that weight gain was significantly more in TO-I, TO-II and TO-III as compared to FP. Supplementary foods which were rich in essential dietary elements i.e. carbohydrates, protein and minerals etc. contributed to children's good health and significant increase in weight. Significant improvement in hair condition was also observed in almost all the cases. These formulations were very cost effective and costs ranged from Rs. 80 to 120 per kg of weaning food. The nutritive values of weaning foods were also analysed from CFTRI, Mysore and presented in Tables below.

Technology assessed:

FP: Inadequate dietary pattern, low intake of iron, vitamins etc.

TO-I: Nutritional supplement consists of Rice (flake), green gram pulse, finger millet, Peanut and sugar (proportion 4:2:2:1:1)

TO-II: Nutritional supplement consists of Maize, Wheat, finger millet(malted), *Moringa oleifera* leaf powder and sugar(proportion 3.5:3.5:1.5:1.5)

TO-III: Nutritional supplement consists of Rice (flake), Maize, green gram pulse, foxtail millet, buckwheat, peanut and sugar(proportion 3:2:1:1:1:1)

Source of Technology: UBKV, 2024

Table: Effect of low cost weaning foods on children health

Technology Option	No. of trials	Mean of Weight (in Kgs)		
		Before treatment	Intermediate (After 2 months)	After treatment
FP	7	8.562	8.62	9.183
TO-I		8.383	9.803	11.575
TO-II		8.285	11.016	12.536
TO-III		8.468	10.526	12.265
CD at 5%		Nonsignificant	1.242(S)	0.455(S)

Table: Nutritive value of different types of weaning foods*

Sl. No.	Parameters	TO-I	TO-II	TO-III
1.	Moisture, % by wt.	3.35	5.24	4.86
2.	Total Ash, % by wt.	1.96	1.64	2.20
3.	Fat, % by wt.	5.65	3.62	5.90
4.	Crude fibre, % by wt.	2.23	2.01	2.24
5.	Protein, % by wt.(Nx6.25)	11.23	10.65	12.17
6.	Carbohydrates, % by wt.	75.58	76.84	72.0
7.	Calorific value, K. cal/100gm	399	383	385
8.	Vitamin A, µg/g	0.22	0.37	BDL*of 0.15
9.	Vitamin D, µg/g	BDL*of 0.10	BDL*of 0.10	1.10
10.	Sodium(mg/100 g)	8.68	5.86	7.74
11.	Potassium(mg/100 g)	539.08	339.63	661.50
12.	Calcium (mg/100 g)	83.62	91.04	56.38
13.	Iron (mg/100 g)	6.41	4.93	5.87

* Nutritive value analysed at CFTRI, Mysore. BDL: Below Detection Level

4.2 Technology Demonstration

4.2.1 Frontline Demonstrations

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 very 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.

In 2024, the KVKs of Zone-V conducted Frontline Demonstration programme on oilseeds in 476.25 ha covering 2133 farmers. The area under demonstration in pulse was 282.88 ha which covered 1633 farmers. The coverage in crops like paddy, wheat, maize, brinjal, cauliflower, onion etc. was 1389.12 ha which involved 8591 farmers. As

a whole the KVKs of Zone V covered 2148.25 ha under demonstration in 2024 and benefitted 12357 farmers.

In state-wise analysis of Frontline Demonstrations, it was found that Odisha covered 213.80 ha in oilseeds, 37.30 ha in pulses and 282.13 ha in cereals, vegetables and other crops in 2024. Total coverage of demonstration was 533.23 ha in the state which benefitted 3132 farmers. In the state of West Bengal, an area of 262.45 ha in oilseeds 245.58 ha in pulses and 1104.97 ha in cereals, vegetable etc. were covered in 2024. Total coverage in West Bengal was 1613.00 ha under demonstration which benefitted 9218 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	7	2.02	7	2.02
Odisha	638	213.80	232	37.30	2262	282.13	3132	533.23
West Bengal	1495	262.45	1401	245.58	6322	1104.97	9218	1613.00
Total	**2133**	**476.25**	**1633**	**282.88**	**8591**	**1389.12**	**12357**	**2148.25**

4.2.2 Oilseeds

In 2024, total 476.25 ha area was covered under FLD on Oilseeds. Out of the total coverage, Oilseed was demonstrated 213.80 ha in Odisha and 262.45 ha in West Bengal. The farmers covered in West Bengal were 1495 and in Odisha it was 638. The demonstrated yield of groundnut was 19.14 q/ha in West Bengal with an increase in yield of 21.21%. In Odisha, the demonstration yield was 21.30 q/ha which is 22.34% higher than traditional variety. In mustard coverage were 95.50 ha in West Bengal and 40.00 ha in Odisha. The demonstrated yield was 17.94 q/ha in West Bengal while it was 8.95 q/ha in Odisha. The increase in yield was 21.29% in West Bengal and 31.04% in Odisha. Oilseeds crops like

sesame, sunflower also demonstrated by the KVKs of Odisha and West Bengal. The yield improvement in West Bengal, with demonstrations was 21.34% in sesame, 19.66% in sunflower whereas in Odisha 26.34% increase in sesame, 27.41% in Sunflower is observed. It was also found that the oilseed Niger in Odisha recorded the highest yield increase of 37.03% among all oilseed crops.

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	19	224	66.00	21.30	17.41	22.34
		West Bengal	11	630	131.12	19.14	15.79	21.21
		Total	30	854	197.12			
2	Mustard	Odisha	10	115	40.00	8.95	6.83	31.04
		West Bengal	16	596	95.50	17.94	14.79	21.29
		Total	26	711	135.50			
3	Sesame	Odisha	11	190	75.00	11.32	8.96	26.34
		West Bengal	4	231	33.30	18.74	15.45	21.34
		Total	15	421	108.30			
4	Sunflower	Odisha	6	83	27.60	13.11	10.29	27.41
		West Bengal	2	38	2.53	20.40	17.05	19.66
		Total	8	121	30.13			
5	Niger	Odisha	**2**	**26**	**5.2**	11.62	8.48	37.03
Grand Total			**81**	**2133**	**476.25**			

4.2.3 Pulses

In pulses, demonstration was conducted in 282.88 ha covering 1633 farmers. The major pulses demonstrated was Green Gram (49.20 ha) and Lentil (185.85 ha). In Green Gram increase in yield (5.73 q/ha) was 25.38 % in Odisha and 22.78 % (10.91 q/ha) in West Bengal. Lentil was demonstrated in West Bengal is 185.85 ha and average demonstrated yield was recorded 12.27 q/ha which was higher by 20.18 % of check yield. Pigeonpea, Cowpea and Gardenpea are also demonstrated in 5-7 ha under this programme. The yield performance and coverage of frontline demonstration are given below. Notably, the Pigeon pea crop in West Bengal recorded the highest yield increment to the tune of 71.43% among all the pulse crops.




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	6	63	10.00	6.31	4.88	29.30
		West Bengal	4	123	17.80	11.49	9.17	25.31
		Total	**10**	**186**	**27.80**			

Sl. No.	Crop	State	No. of KVKs	No. of Farmer	Area (ha)	Yield (q/ha)		% Increase
						Demo	Check	
2	Green Gram	Odisha	13	132	22.50	5.73	4.57	25.38
		West Bengal	6	184	26.70	10.91	8.88	22.78
		Total	**19**	**316**	**49.20**			
3	Lentil	West Bengal	12	968	185.85	12.27	10.21	20.18
		Total	**12**	**968**	**185.85**			
5	Pigeon pea	Odisha	2	10	2.00	6.80	4.20	61.90
		West Bengal	1	21	5.10	9.48	5.53	71.43
		Total	**3**	**31**	**7.10**			
6	Cowpea	Odisha	1	10	1.00	88.60	72.80	21.70
		Total	**1**	**10**	**1.00**			
7	Lathyrus	West Bengal	1	47	3.00	13.50	9.50	42.11
		Total	**1**	**47**	**3.00**			
8	Garden pea	Odisha	2	17	1.80	59.75	53.55	11.58
		West Bengal	2	58	7.13	11.54	9.17	25.93
		Total	**4**	**75**	**8.93**			
Grand Total			**50**	**1633**	**282.88**			

4.2.4 Other Crops

Different 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 685.78 ha covering 2441 farmers. Average yield increase was 13.99% in Odisha and 17.17% in West Bengal. Wheat and Maize are not a major crop in these states but to popularize these crops was demonstrated in 26 ha and 23.83 ha in West Bengal which showed average increase in yield of 19.51% and 28.30% in West Bengal.

Among 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 17.50 to 27.76% in brinjal, 21.93 to 18.36% in cauliflower, 13.34 to 29.28% in onion, 22.96 to 23.91% in tomato, 24.86 to 30.79% in








cabbage, 18.12 to 22.64% in cucumber in the state of West Bengal and Odisha.

Spices like turmeric was demonstrated in both the states of West Bengal and Odisha showing improvement of yield of 24.00 to 26.89% over the existing practices.

Fruit crops like mango and banana were demonstrated during 2024. Yield (Mango) increment with new technologies was 20.63% in West Bengal and 38.65% in Odisha. Banana in West Bengal showed 22.93% increase in yield.

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	34	364	53.50	44.56	39.09	13.99
		West Bengal	57	2077	632.28	47.50	40.54	17.17
		Total	**91**	**2441**	**685.78**			
2	Wheat	West Bengal	4	129	26.00	38.53	32.24	19.51
		Total	**4**	**129**	**26.00**			
3	Finger Millet	Odisha	10	103	16.00	14.71	11.57	27.14
		West Bengal	2	82	17.30	22.15	17.50	26.57
		Total	**12**	**185**	**33.30**			
4	Okra	Odisha	9	95	9.90	125.60	104.39	20.32
		West Bengal	3	39	1.61	169.96	140.88	20.64
		Total	**12**	**134**	**11.51**			
5	Bitter gourd	Odisha	8	83	10.00	106.30	90.14	17.93
		West Bengal	3	43	2.01	131.89	96.29	36.97
		Total	**11**	**126**	**12.01**			
6	Brinjal	Odisha	10	100	8.02	269.53	210.96	27.76
		West Bengal	10	250	16.95	344.16	292.90	17.50
		Total	**20**	**350**	**24.97**			
7	Broccoli	Odisha	1	10	1.00	243.00	162.00	50.00
		West Bengal	7	140	5.90	262.70	207.48	26.61
		Total	**8**	**150**	**6.90**			
8	Cabbage	Odisha	2	20	3.00	299.50	229.00	30.79
		West Bengal	2	20	0.54	275.25	220.45	24.86
		Total	**4**	**40**	**3.54**			
9	Capsicum	West Bengal	3	26	1.34	155.77	127.93	21.76
		Total	**3**	**26**	**1.34**			
10	Cauliflower	Odisha	9	102	12.00	211.40	178.61	18.36
		West Bengal	14	196	9.25	229.53	188.24	21.93
		Total	**23**	**298**	**21.25**			
11	Chilli	Odisha	13	141	13.40	116.71	97.19	20.08
		West Bengal	5	105	8.83	85.94	79.76	7.75
		Total	**18**	**246**	**22.23**			
12	Cucumber	Odisha	3	30	3.00	106.23	86.62	22.64
		West Bengal	4	135	10.40	364.12	308.25	18.12
		Total	**7**	**165**	**13.40**			

Sl. No.	Crop	State	No. of KVKs	No. of Farmer	Area (ha)	Yield (q/ha)		% Increase
						Demonstration	Check	
13	Drumstick	Odisha	2	20	2.00	59.50	45.30	31.35
		West Bengal	2	78	0.61	91.60	79.95	14.57
		Total	**4**	**98**	**2.61**			
14	Onion	Odisha	6	60	7.00	199.56	154.36	29.28
		West Bengal	3	35	3.30	249.42	220.06	13.34
		Total	**9**	**95**	**10.30**			
15	Pointed gourd	Odisha	6	57	6.60	203.51	169.68	19.94
		West Bengal	3	81	12.59	157.68	134.22	17.48
		Total	**9**	**138**	**19.19**			
16	Betel vine	Odisha	1	10	1.00	14.07	10.46	34.51
		West Bengal	1	5	0.50	28.30	21.96	28.87
		Total	**2**	**15**	**1.50**			
17	Sweet Corn	Odisha	1	10	2.00	118.70	86.50	37.23
		West Bengal	1	5	1.00	274.80	221.60	24.01
		Total	**2**	**15**	**3.00**			
18	Tomato	Odisha	16	150	16.77	327.63	264.40	23.91
		West Bengal	9	176	9.56	344.70	280.34	22.96
		Total	**25**	**326**	**26.32**			
19	Elephant Foot Yam	A & N Islands	2	7	2.02	323.45	256.90	25.91
		West Bengal	6	96	3.27	420.40	331.21	26.93
		Total	**8**	**103**	**5.29**			
20	Potato	Odisha	2	23	7.00	136.04	106.69	27.51
		West Bengal	5	143	11.30	294.54	254.44	15.76
		Total	**7**	**166**	**18.30**			
21	Sweet Potato	Odisha	3	30	2.04	134.13	106.86	25.52
		West Bengal	1	7	0.25	211.45	165.00	28.15
		Total	**4**	**37**	**2.29**			
22	Yard long Bean	Odisha	8	80	4.90	145.30	118.23	22.90
		Total	**8**	**80**	**4.90**			
23	Marigold	Odisha	5	50	3.80	207.40	173.50	19.54
		West Bengal	2	34	0.60	171.00	140.50	21.71
		Total	**7**	**84**	**4.40**			
24	Banana	West Bengal	5	120	97.33	73.33	59.65	22.93
		Total	**5**	**120**	**97.33**			
25	Dragon fruit	Odisha	2	23	0.55	59.97	51.29	16.92
		West Bengal	2	35	0.27	114.00	94.50	20.63
		Total	**4**	**58**	**0.82**			
26	Guava	Odisha	3	27	3.40	152.00	108.83	39.67
		West Bengal	2	22	5.00	278.60	239.80	16.18
		Total	**5**	**49**	**8.40**			
27	Mango	Odisha	8	75	10.40	85.56	61.71	38.65
		West Bengal	4	79	16.90	213.00	184.45	20.63
		Total	**12**	**154**	**27.30**			

Sl. No.	Crop	State	No. of KVKs	No. of Farmer	Area (ha)	Yield (q/ha)		% Increase
						Demonstration	Check	
28	Watermelon	Odisha	3	33	2.40	249.60	216.03	15.54
		Total	**3**	**33**	**2.40**			
29	Papaya	Odisha	2	20	2.40	371.65	295.15	25.92
		West Bengal	2	10	4.00	32.00	24.00	33.33
		Total	**4**	**30**	**6.40**			
30	Ginger	Odisha	3	30	3.00	214.66	203.20	5.64
		Total	**3**	**30**	**3.00**			
31	Turmeric	Odisha	4	43	4.00	126.92	100.02	26.89
		West Bengal	7	105	3.04	202.98	163.69	24.00
		Total	**11**	**148**	**7.04**			
32	Cotton	Odisha	3	30	4.00	14.21	10.06	41.25
		West Bengal	5	758	26.37	15.19	12.57	20.84
		Total	**8**	**788**	**30.37**			
33	Jute	Odisha	2	28	3.00	29.50	26.75	10.28
		West Bengal	12	536	96.16	31.69	27.64	14.65
		Total	**14**	**564**	**99.16**			
34	Maize	Odisha	29	322	51.10	53.11	43.21	22.91
		West Bengal	8	126	23.83	188.97	147.29	28.30
		Total	**37**	**448**	**74.93**			
35	Others	Odisha	9	93	14.96	127.62	104.12	22.56
		West Bengal	21	629	56.69	158.18	137.53	15.01
		Total	**30**	**722**	**71.65**			
Grand Total			**434**	**8591**	**1389.12**			

4.2.5 Livestock

Different 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 2363 livestock benefitting 2507 farmers. In the state of West Bengal, 1858 farmers were involved to demonstrate latest technology of 1958 animals/ livestock.






Table: Frontline Demonstration on Livestock

Sl. No.	Category	State	No. of KVKs	No. of Farmer	No. of units
1	Poultry	Odisha	22	521	282
		West Bengal	13	634	634
		Total	**35**	**1155**	**916**
2	Sheep and goat	Odisha	4	40	40
		West Bengal	10	273	363
		Total	**14**	**313**	**403**
3	Dairy	Odisha	5	43	43
		West Bengal	9	638	639
		Total	**14**	**681**	**682**
4	Duckery	Odisha	1	25	20
		West Bengal	7	162	162
		Total	**8**	**187**	**182**
5	Piggery	West Bengal	3	17	22
		Total	**3**	**17**	**22**
6	Feed and Fodder	Odisha	1	10	10
		West Bengal	2	82	86
		Total	**3**	**92**	**96**
7	Others	Odisha	1	10	10
		West Bengal	3	52	52
		Total	**4**	**62**	**62**
Grand Total			**81**	**2507**	**2363**

4.2.6 Fishery

Under fishery, demonstration was conducted on 475 units developed on Common carps, Composite fish, Ornamental fishes etc. benefiting 574 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	9	70	62
		West Bengal	5	25	25
		Total	**14**	**95**	**87**
2	Composite fish	Odisha	13	161	83
		West Bengal	12	125	122
		Total	**25**	**286**	**205**
3	Ornamental fishes	West Bengal	1	10	10
		Total	**1**	**10**	**10**

Sl. No.	Category	State	No. of KVKs	No. of Farmer	No. of units
4	Others	Odisha	7	70	70
		West Bengal	10	113	103
		Total	**17**	**183**	**173**
Grand Total			**57**	**574**	**475**

4.2.7 Enterprise

In 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 1872 farmers and rural youths along with 1672

Table: Frontline Demonstration on Enterprise

Sl. No.	Category	State	No. of KVKs	No. of Farmer	No. of units
1	Oyster mushroom	Odisha	10	120	117
		West Bengal	11	291	291
		Total	**21**	**411**	**408**

Sl. No.	Category	State	No. of KVKs	No. of Farmer	No. of units
2	Paddy straw mushroom	Odisha	9	122	144
		Total	**9**	**122**	**144**
3	Vermicompost	Odisha	2	15	15
		West Bengal	7	152	87
		Total	**9**	**167**	**102**
4	Apiculture	Odisha	3	22	22
		West Bengal	3	25	35
		Total	**6**	**47**	**57**
5	Nutritional Garden	Odisha	3	70	22
		West Bengal	3	192	192
		Total	**6**	**262**	**214**
6	Value Addition	A & N Islands	2	4	4
		Odisha	11	104	104
		West Bengal	12	223	137
		Total	**25**	**331**	**245**
7	Others	Odisha	31	355	433
		West Bengal	5	177	69
		Total	**36**	532	502
Grand Total			**112**	**1872**	**1672**

4.2.8 Implements

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, 239 demonstrations were organized involving 1023 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	10	12
		Odisha	18	614	143
		West Bengal	6	399	84
		Total	**25**	**1023**	**239**

4.2.9 Women Empowerment

The KVKs of Zone V conducted 1135 demonstrations on different aspects of women empowerment during the year 2024. 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	1	22
		Odisha	12	206
		West Bengal	15	485
		Total	**28**	**713**
2	Adolescent Girl	A & N Islands	3	24
		West Bengal	1	10
		Total	**4**	**34**
3	Other women	A & N Islands	2	13
		Odisha	7	45
		West Bengal	5	330
		Total	**14**	**388**
Grand Total			**46**	**1135**

4.3 Training

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, value addition and farm mechanization etc.

4.3.1 Consolidated achievements

All the 59 KVKs under ICAR-ATARI Kolkata organized 5127 training courses for the benefit of 153491 farmers and farm women, rural youth and extension functionaries during 2024. Out of total beneficiaries, 95839 was male (62.44%) and 57652 (37.56%) was female. A good number (38652) of SC farmers were also trained in the programme which constituted 33.63% total trainees; while the number of ST trained was 20650 which was 17.97% of total beneficiaries. The details are given in the table below.

Table: Summary of training programme conducted during 2024 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	71	660	698	1358	285	305	590	17	128	145	962	1131	2093
Odisha	2198	23377	23355	46712	3386	2535	5951	2444	1575	4019	29207	27465	56672
West Bengal	2858	45230	21618	66848	5872	4097	9969	14568	3331	17899	65670	29046	94716
Total	**5127**	**69267**	**45651**	**114918**	**9543**	**6967**	**16510**	**17029**	**5034**	**22063**	**95839**	**57652**	**153491**

State wise distribution of training programmes

i) Farmers and farm women

The state-wise analysis of training for farmers and farmwomen showed that Union Territory of A&N Islands conducted 48 courses for 1358 participants. In Odisha, 1669 courses were conducted for 46712 beneficiaries while in West Bengal 2096 courses were taken up for training of 66848 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	48	386	328	714	0	0	0	274	370	644	660	698	1358
Odisha	1669	13167	12012	25179	4447	5648	10095	5763	5695	11458	23377	23355	46712
West Bengal	2096	21879	7654	29533	17951	10606	28557	5239	3309	8548	45230	21618	66848
Total	**3813**	**35432**	**19994**	**55426**	**22398**	**16254**	**38652**	**11276**	**9374**	**20650**	**69267**	**45651**	**114918**

ii) Rural youth

Rural youths' skill and knowledge development through training 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 2024, 675 courses were organized for 16510 rural youths through on and off-campus training. Out of the total participants, 9543 (57.80%) was male and 6967 (42.20%) was female. Participation of SC in these programmes was 5101 which constituted 30.90% of the total trainees, while participation from ST was 3601 (21.81%).

State-wise analysis of the rural youth trained showed that West Bengal trained maximum rural girls (4097) which constitute about 41.10% of total trainees. The percentage of the rural girls was 51.69% in the Union Territory of A&N Islands and 43.10% 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 16 courses for 590 beneficiaries. Odisha organized 315 courses for 5951 beneficiaries and West Bengal organized 344 courses for 9969 beneficiaries which makes a total of 675 courses for 16510 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	16	150	160	310	0	0	0	135	145	280	285	305	590
Odisha	315	1618	1368	2986	588	523	1111	1180	674	1854	3386	2565	5951
West Bengal	344	2981	1531	4512	2222	1768	3990	669	798	1467	5872	4097	9969
Total	**675**	**4749**	**3059**	**7808**	**2810**	**2291**	**5101**	**1984**	**1617**	**3601**	**9543**	**6967**	**16510**

iii) Extension functionaries

The state level extension workers were interested in obtaining training from the Krishi Vigyan Kendras. Those extension functionaries were mainly VLWs, *Krishi Prayukti Sahayak* 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 418 courses involving 17899 extension functionaries while Odisha organized 214 courses for 4019 extension functionaries and A&N Islands organized 7 courses for 145 beneficiaries. Gender analysis of the trainees indicated that nearly 22.82% were female and 77.18% were male participants in 2024. The constitution of SC was 17.75% while ST was 12.13% 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	7	10	117	127	0	0	0	7	11	18	17	128	145
Odisha	214	1580	986	2566	382	288	670	482	301	783	2444	1575	4019
West Bengal	418	10632	2144	12776	2498	749	3247	1438	438	1876	14568	3331	17899
Total	**639**	**12222**	**3247**	**15469**	**2880**	**1037**	**3917**	**1927**	**750**	**2677**	**17029**	**5034**	**22063**

4.3.1.1 On- and Off-Campus Training Programmes

The KVKs of Zone V conducted training programmes 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 (5127) conducted in all categories, around 55.57% was in off-campus mode and 44.43% in on-campus mode. While 84654 participants received training in off-campus mode (55.15%) and 67355 (44.85%) received training in 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	1236	12296	5318	17614	8747	6016	14763	2951	2666	5617	24155	14049	38184
OFF	2577	23136	14676	37812	13651	10238	23889	8325	6708	15033	45112	31622	76734
Total	**3813**	**35432**	**19994**	**55426**	**22398**	**16254**	**38652**	**11276**	**9374**	**20650**	**69267**	**45651**	**114918**

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	495	3271	2288	5559	1808	1633	3441	1462	1013	2475	6541	4934	11475
OFF	180	1478	771	2249	1002	658	1660	522	604	1126	3002	2033	5035
Total	**675**	**4749**	**3059**	**7808**	**2810**	**2291**	**5101**	**1984**	**1617**	**3601**	**9543**	**6967**	**16510**

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	547	10770	2686	13456	2655	854	3509	1572	641	2213	14997	4181	19178
OFF	92	1452	561	2013	225	183	408	355	109	464	2032	853	2885
Total	**639**	**12222**	**3247**	**15469**	**2880**	**1037**	**3917**	**1927**	**750**	**2677**	**17029**	**5034**	**22063**

4.3.1.2 Thematic area-wise distribution of training programme

4.3.1.2.1 Farmers and farm women

An in-depth analysis of training programme on thematic area basis showed that under crop production category, training on integrated crop management was conducted for 132 courses involving 4211 participants while in weed management, 97 courses were organized for 2779 beneficiaries. In horticulture, important areas of training included off-season vegetable cultivation in which 60 trainings were organized for 1725 beneficiaries. In fruits cultivation, 160 trainings were organized for 4679 beneficiaries. Trainings were also organized on ornamental plants cultivation (42), plantation crops (37), tuber crops (23), spices (22), medicinal and aromatic plants (8). In soil health and fertility management, a large number (369) of training programmes were organized involving 11402 beneficiaries to address the issues of efficient fertilizer use and integrated nutrient management. In Livestock Production and Management, 338 courses were organized for 9999 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, 316 courses were organized for 10041 beneficiaries which included courses like income generation by rural women, value addition of fruits and vegetables. In Agricultural Engineering, 134 courses were organized for 3736 beneficiaries. In plant protection, 427 courses were organized for 12835 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, 279 courses were conducted involving 8631 farmers. In production of input, 183 courses were organized for 4891 farmers. In capacity building, 252 courses involving 7535 farmers and in agro-forestry, 46 courses for 1464 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		
		M	F	Total	M	F	Total	M	F	Total	M	F	Total
Crop Production													
Weed Management	97	922	403	1325	457	217	674	460	320	780	1839	940	2779
Resource Conservation Technologies	40	419	144	563	323	114	437	120	37	157	862	295	1157
Cropping Systems	54	509	179	688	388	133	521	175	106	281	1072	418	1490
Crop Diversification	47	422	184	606	466	161	627	142	40	182	1030	385	1415
Integrated Farming	40	338	194	532	182	116	298	112	86	198	632	396	1028
Micro irrigation/ irrigation	24	264	107	371	108	35	143	60	32	92	432	174	606
Seed production	89	1256	284	1540	701	242	943	173	74	247	2130	600	2730
Nursery management	31	309	119	428	226	148	374	92	72	164	627	339	966
Integrated Crop Management	132	1648	559	2207	905	402	1307	389	308	697	2942	1269	4211
Soil & water conservation	43	731	127	858	212	49	261	114	65	179	1057	241	1298
Integrated nutrient Management	88	795	469	1264	394	219	613	441	223	664	1630	911	2541
Production of organic inputs	51	548	251	799	343	135	478	66	89	155	957	475	1432
Others	72	989	347	1336	800	297	1097	247	154	401	2036	798	2834
Total	**808**	**9150**	**3367**	**12517**	**5505**	**2268**	**7773**	**2591**	**1606**	**4197**	**17246**	**7241**	**24487**
Horticulture													
a) Vegetable Crops													
Production of low volume and high value crops	63	422	213	635	408	293	701	228	240	468	1058	746	1804
Off-season vegetables	60	607	297	904	295	217	512	184	125	309	1086	639	1725
Nursery raising	36	209	171	380	203	222	425	132	176	308	544	569	1113
Exotic vegetables	14	129	93	222	111	49	160	46	18	64	286	160	446
Export potential vegetables	15	152	103	255	64	32	96	58	37	95	274	172	446
Grading and standardization	18	155	55	210	202	116	308	34	66	100	391	237	618
Protective cultivation	38	351	167	518	187	121	308	158	170	328	696	458	1154
Others	103	899	395	1294	738	536	1274	445	243	688	2082	1174	3256
Total (a)	**347**	**2924**	**1494**	**4418**	**2208**	**1586**	**3784**	**1285**	**1075**	**2360**	**6417**	**4155**	**10562**
b) Fruits													
Training and Pruning	15	88	33	121	52	32	84	58	69	127	198	134	332

Area of training	No. of Courses	No. of Participants											
		General			SC			ST			Grand Total		
		M	F	Total	M	F	Total	M	F	Total	M	F	Total
Layout and Management of Orchards	21	142	42	184	222	160	372	39	52	91	403	254	647
Cultivation of Fruit	47	540	197	737	262	226	488	161	110	271	963	533	1496
Management of young plants/orchards	12	102	70	172	38	19	57	24	35	59	164	124	288
Rejuvenation of old orchards	8	54	22	76	48	14	62	32	20	52	134	56	190
Export potential fruits	8	28	21	49	54	41	95	36	45	81	118	107	225
Micro irrigation systems of orchards	10	112	52	164	69	20	89	11	6	17	192	78	270
Plant propagation techniques	23	180	72	252	120	123	243	181	99	280	481	294	775
Others	16	133	58	191	85	102	187	46	32	78	264	192	456
Total (b)	**160**	**1379**	**567**	**1946**	**950**	**737**	**1677**	**588**	**468**	**1056**	**2917**	**1772**	**4679**
c) Ornamental Plants													
Nursery Management	12	110	45	155	124	50	174	15	3	18	249	98	347
Management of potted plants	1	8	9	17	5	6	11	2	0	2	15	15	30
Export potential of ornamental plants	3	11	21	32	16	9	25	11	8	19	38	38	76
Propagation techniques of Ornamental Plants	11	157	27	184	50	38	88	6	22	28	213	87	300
Others	15	141	30	171	122	122	244	18	20	38	281	172	453
Total (c)	**42**	**427**	**132**	**559**	**317**	**225**	**542**	**52**	**53**	**105**	**796**	**410**	**1206**
d) Plantation crops													
Production and Management technology	22	243	133	376	136	82	218	54	23	77	433	238	671
Processing and value addition	9	153	29	182	104	2	106	3	1	4	260	32	292
Others	6	100	37	137	79	30	109	15	2	17	194	69	263
Total (d)	**37**	**496**	**199**	**695**	**319**	**114**	**433**	**72**	**26**	**98**	**887**	**339**	**1226**
e) Tuber crops													
Production and Management technology	16	238	67	305	38	42	80	55	56	111	331	165	496
Processing and value addition	3	64	16	80	8	2	10	0	0	0	72	18	90
Others	4	87	21	108	16	0	16	1	4	5	104	25	129
Total (e)	**23**	**389**	**104**	**493**	**62**	**44**	**106**	**56**	**60**	**116**	**507**	**208**	**715**

Area of training	No. of Courses	No. of Participants											
		General			SC			ST			Grand Total		
		M	F	Total	M	F	Total	M	F	Total	M	F	Total
f) Spices													
Production and Management technology	18	116	42	158	76	89	165	86	50	136	278	181	459
Processing and value addition	4	18	12	30	25	13	38	0	0	0	43	25	68
Others	0	0	0	0	0	0	0	0	0	0	0	0	0
Total (f)	**22**	**134**	**54**	**188**	**101**	**102**	**203**	**86**	**50**	**136**	**321**	**206**	**527**
g) Medicinal and Aromatic Plants													
Nursery management	0	0	0	0	0	0	0	0	0	0	0	0	0
Production and management technology	6	59	14	73	22	19	41	24	6	30	105	39	144
Post harvest technology and value addition	0	0	0	0	0	0	0	0	0	0	0	0	0
Others	2	33	0	33	9	9	18	6	1	7	48	10	58
Total (g)	**8**	**92**	**14**	**106**	**31**	**28**	**59**	**30**	**7**	**37**	**153**	**49**	**202**
Total(a-g)	**639**	**5841**	**2564**	**8405**	**3988**	**2836**	**6824**	**2169**	**1739**	**3908**	**11998**	**7139**	**19117**
Soil Health and Fertility Management													
Soil fertility management	53	718	180	898	378	204	582	172	111	283	1268	495	1763
Integrated water management	12	110	66	176	54	42	96	20	22	42	184	130	314
Integrated Nutrient Management	88	694	256	950	450	265	715	449	233	682	1593	754	2347
Production and use of organic inputs	46	527	151	678	318	166	484	130	112	242	975	429	1404
Management of Problematic soils	22	349	97	446	139	50	189	56	21	77	544	168	712
Micro nutrient deficiency in crops	18	305	75	380	80	35	115	32	30	62	417	140	557
Nutrient Use Efficiency	15	124	68	192	79	40	119	45	40	85	248	148	396
Balance Use of fertilizer	26	336	110	446	100	27	127	119	44	163	555	181	736
Soil & water testing	30	381	129	510	194	104	298	125	82	207	700	315	1015
others	59	677	265	942	470	271	741	338	137	475	1485	673	2158
Total	**369**	**4221**	**1397**	**5618**	**2262**	**1204**	**3466**	**1486**	**832**	**2318**	**7969**	**3433**	**11402**
Livestock Production and Management													
Dairy Management	56	248	300	548	312	353	665	141	324	465	701	977	1678
Poultry Management	65	248	488	736	251	501	752	149	241	390	648	1230	1878
Piggery Management	26	21	18	39	287	110	397	66	119	185	374	247	621

Area of training	No. of Courses	No. of Participants											
		General			SC			ST			Grand Total		
		M	F	Total	M	F	Total	M	F	Total	M	F	Total
Rabbit Management	8	0	0	0	136	85	221	8	5	13	144	90	234
Animal Nutrition Management	32	165	224	389	266	222	488	49	70	119	480	516	996
Disease Management	47	283	232	515	363	321	684	105	121	226	751	674	1425
Feed & fodder technologies	48	173	308	481	187	369	556	88	200	288	448	877	1325
Production of quality animal products	19	166	38	204	129	63	192	29	30	59	324	131	455
Others	37	155	269	424	217	329	546	145	272	417	517	870	1387
Total	**338**	**1459**	**1877**	**3336**	**2148**	**2353**	**4501**	**780**	**1382**	**2162**	**4387**	**5612**	**9999**
Home Science/Women empowerment													
Household food security by kitchen gardening and nutrition gardening	53	243	693	936	90	371	461	86	241	327	419	1305	1724
Design and development of low/ minimum cost diet	21	200	205	405	50	132	182	50	68	118	300	405	705
Designing and development for high nutrient efficiency diet	20	200	140	340	157	212	369	50	56	106	407	408	815
Minimization of nutrient loss in processing	13	208	116	324	50	52	102	53	2	55	311	170	481
Processing & cooking	5	17	79	96	19	18	37	0	7	7	36	104	140
Gender mainstreaming through SHGs	10	0	165	165	0	90	90	0	90	90	0	345	345
Storage loss minimization techniques	8	9	102	111	24	130	154	0	9	9	33	241	274
Value addition	62	38	895	933	51	587	638	4	153	157	93	1635	1728
Women empowerment	37	36	552	588	27	381	408	8	56	64	71	989	1060
Location specific drudgery reduction technologies	21	41	247	288	41	156	197	1	119	120	83	522	605
Rural Crafts	4	3	51	54	4	47	51	2	3	5	9	101	110
Women and child care	15	25	368	393	32	237	269	4	43	47	61	648	709
Others	47	21	489	510	170	464	634	3	198	201	194	1151	1345
Total	**316**	**1041**	**4102**	**5143**	**715**	**2877**	**3592**	**261**	**1045**	**1306**	**2017**	**8024**	**10041**
Agril. Engineering													
Farm machinery & its maintenance	36	364	117	481	145	87	232	170	112	282	679	316	995

Area of training	No. of Courses	No. of Participants											
		General			SC			ST			Grand Total		
		M	F	Total	M	F	Total	M	F	Total	M	F	Total
Installation and maintenance of micro irrigation systems	16	223	53	276	122	31	153	10	28	38	355	112	467
Use of Plastics in farming practices	9	145	56	201	32	10	42	14	19	33	191	85	276
Production of small tools and implements	21	262	177	439	73	27	100	25	10	35	360	214	574
Repair and maintenance of farm machinery and implements	4	57	7	64	17	17	34	8	9	17	82	33	115
Small scale processing and value addition	9	61	59	120	38	13	51	31	45	76	130	117	247
Post Harvest Technology	18	226	84	310	63	86	149	32	30	62	321	200	521
Others	21	218	223	441	41	39	80	3	17	20	262	279	541
Total	**134**	**1556**	**776**	**2332**	**531**	**310**	**841**	**293**	**270**	**563**	**2380**	**1356**	**3736**
Plant Protection													
Integrated Pest Management	199	2123	1024	3147	1259	467	1726	761	472	1233	4143	1963	6106
Integrated Disease Management	118	1406	472	1878	608	180	788	346	281	627	2360	933	3293
Bio-control of pests and diseases	32	361	117	478	244	139	383	84	61	145	689	317	1006
Production of bio control agents and bio pesticides	22	294	158	452	174	51	225	21	11	32	489	220	709
Others	61	411	268	679	456	219	675	299	68	367	1166	555	1721
Total	**427**	**4510**	**2037**	**6547**	**2665**	**1009**	**3674**	**1511**	**893**	**2404**	**8847**	**3988**	**12835**
Fisheries													
Integrated fish farming	42	400	119	519	342	239	581	143	73	216	885	431	1316
Carp breeding and hatchery management	22	235	94	329	244	68	312	55	28	83	534	190	724
Carp fry and fingerling rearing	25	193	160	353	263	97	360	55	22	77	511	279	790
Composite fish culture	57	568	208	776	582	322	904	101	74	175	1251	604	1855
Hatchery management and culture of freshwater prawn	15	105	37	142	98	75	173	119	8	127	322	120	442
Breeding and culture of ornamental fishes	13	45	25	70	130	88	218	22	27	49	197	140	337
Portable plastic carp hatchery	3	17	6	23	30	2	32	3	0	3	50	8	58

Area of training	No. of Courses	No. of Participants											
		General			SC			ST			Grand Total		
		M	F	Total	M	F	Total	M	F	Total	M	F	Total
Pen culture of fish and prawn	10	72	17	89	105	36	141	42	61	103	219	114	333
Shrimp farming	8	43	29	72	55	73	128	4	6	10	102	108	210
Edible oyster farming	7	29	33	62	68	50	118	11	3	14	108	86	194
Pearl culture	8	85	77	162	48	15	63	4	2	6	137	94	231
Fish processing and value addition	16	159	76	235	117	87	204	47	15	62	323	178	501
Others	53	551	247	798	411	148	559	167	116	283	1129	511	1640
Total	**279**	**2502**	**1128**	**3630**	**2493**	**1300**	**3793**	**773**	**435**	**1208**	**5768**	**2863**	**8631**
Production of Input at site													
Seed Production	30	156	39	195	119	43	162	271	74	345	546	156	702
Planting material production	9	92	36	128	60	14	74	30	22	52	182	72	254
Bio-agents production	4	44	0	44	48	0	48	20	0	20	112	0	112
Bio-pesticides production	11	92	108	200	45	37	82	20	23	43	157	168	325
Bio-fertilizer production	9	118	7	125	86	16	102	40	3	43	244	26	270
Vermi-compost production	32	267	113	380	163	184	347	40	76	116	470	373	843
Organic manures production	6	53	3	56	69	19	88	37	15	52	159	37	196
Production of fry and fingerlings	5	25	15	40	15	10	25	10	10	20	50	35	85
Production of Bee-colonies and wax sheets	4	44	0	44	48	0	48	20	0	20	112	0	112
Small tools and implements	4	44	0	44	48	0	48	20	0	20	112	0	112
Production of livestock feed and fodder	11	221	52	273	55	51	106	56	2	58	332	105	437
Production of Fish feed	1	5	45	50	0	0	0	0	0	0	5	45	50
Mushroom production	52	268	355	623	88	360	448	9	148	157	365	863	1228
Apiculture	3	13	28	41	33	18	51	9	9	18	55	55	110
Others	2	12	15	27	11	17	28	0	0	0	23	32	55
Total	**183**	**1454**	**816**	**2270**	**888**	**769**	**1657**	**582**	**382**	**964**	**2924**	**1967**	**4891**
Capacity Building and Group Dynamics													
Leadership development	23	252	120	372	113	61	174	67	55	122	432	236	668
Group dynamics	51	802	278	1080	131	276	407	101	99	200	1034	653	1687

Area of training	No. of Courses	No. of Participants											
		General			SC			ST			Grand Total		
		M	F	Total	M	F	Total	M	F	Total	M	F	Total
Formation and Management of SHGs	28	97	338	435	71	173	244	33	82	115	201	593	794
Mobilization of social capital	17	220	82	302	77	54	131	43	25	68	340	161	501
Entrepreneurial development of farmers/youths	40	330	163	493	162	205	367	137	144	281	629	512	1141
WTO and IPR issues	16	157	145	302	55	14	69	46	34	80	258	193	451
Others	77	869	359	1228	285	331	616	262	187	449	1416	877	2293
Total	**252**	**2727**	**1485**	**4212**	**894**	**1114**	**2008**	**689**	**626**	**1315**	**4310**	**3225**	**7535**
Agro forestry													
Production technologies	11	173	70	243	59	10	69	27	16	43	259	96	355
Nursery management	6	79	32	111	31	17	48	18	25	43	128	74	202
Integrated Farming Systems	18	249	89	338	84	113	197	16	20	36	349	222	571
Others	11	110	112	222	32	4	36	43	35	78	185	151	336
Total	46	611	303	914	206	144	350	104	96	200	921	543	1464
Others (Pl. specify)	22	360	142	502	103	70	173	37	68	105	500	280	780
Grand Total	**3813**	**35432**	**19994**	**55426**	**22398**	**16254**	**38652**	**11276**	**9374**	**20650**	**69267**	**45671**	**114918**

4.3.1.2.2 Rural youth

During the year 2024, 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 675 courses for 16510 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, 63 courses were organized for 1484 beneficiaries while in beekeeping, 46 courses were organized for 1034 youths. Other courses organized were for production of organic inputs (43), nursery management of horticultural crops (39), seed production (36), vermiculture (29), fry and fingerling rearing (29) value addition (27) 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		
		M	F	Total	M	F	Total	M	F	Total	M	F	Total
Nursery management of horticultural crops	39	310	205	515	119	75	194	142	111	253	571	391	962
Training and pruning of orchards	7	44	14	58	25	5	30	51	17	68	120	36	156
Protected cultivation of vegetable crops	21	168	103	271	44	17	61	79	46	125	291	166	457
Commercial fruit production	10	45	34	79	27	34	61	47	33	80	119	101	220

Area of training	No. of Courses	No. of Participants											
		General			SC			ST			Grand Total		
		M	F	Total	M	F	Total	M	F	Total	M	F	Total
Integrated farming	19	113	84	197	50	20	70	120	47	167	283	151	434
Seed production	36	361	118	479	170	98	268	80	27	107	611	243	854
Production of organic inputs	43	342	228	570	113	128	241	166	90	256	621	446	1067
Planting material production	24	141	140	281	83	74	157	78	80	158	302	294	596
Vermiculture	29	251	92	343	149	57	206	104	131	235	504	280	784
Mushroom Production	63	432	428	860	191	242	433	88	103	191	711	773	1484
Beekeeping	46	316	100	416	245	123	368	133	117	250	694	340	1034
Sericulture	10	121	22	143	37	18	55	48	61	109	206	101	307
Repair and maintenance of farm machinery and implements	18	117	47	164	73	34	107	78	21	99	268	102	370
Value addition	27	106	179	285	59	125	184	33	84	117	198	388	586
Small scale processing	6	43	42	85	28	2	30	15	15	30	86	59	145
Post Harvest Technology	14	105	55	160	57	62	119	17	27	44	179	144	323
Tailoring and Stitching	2	15	5	20	0	25	25	0	0	0	15	30	45
Rural Crafts	7	25	13	38	9	76	85	1	7	8	35	96	131
Production of quality animal products	3	15	13	28	17	61	78	4	1	5	36	75	111
Dairying	6	53	38	91	16	18	34	18	7	25	87	63	150
Sheep and goat rearing	17	167	61	228	108	68	176	49	13	62	324	142	466
Quail farming	3	24	36	60	10	22	32	5	6	11	39	64	103
Piggery	4	21	7	28	56	35	91	6	1	7	83	43	126
Rabbit farming	0	0	0	0	0	0	0	0	0	0	0	0	0
Poultry production	21	205	109	314	95	70	165	29	13	42	329	192	521
Ornamental fisheries	9	70	54	124	32	28	60	16	17	33	118	99	217
Composite fish culture	18	64	103	167	125	98	223	32	10	42	221	211	432
Freshwater prawn culture	7	60	38	98	49	47	96	30	25	55	139	110	249
Shrimp farming	8	13	27	40	57	34	91	45	5	50	115	66	181
Pearl culture	6	4	24	28	33	20	53	30	6	36	67	50	117
Cold water fisheries	11	19	12	31	43	53	96	47	75	122	109	140	249
Fish harvest and processing technology	12	58	42	100	66	67	133	46	11	57	170	120	290
Fry and fingerling rearing	29	152	145	297	126	101	227	67	101	168	345	347	692
Others	100	769	441	1210	498	354	852	280	309	589	1547	1104	2651
Total	**675**	**4749**	**3059**	**7808**	**2810**	**2291**	**5101**	**1984**	**1617**	**3601**	**9543**	**6967**	**16510**

4.3.1.2.3 Extension functionaries

The extension officials 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 2024, a total of 639 courses were organized for 22063 extension functionaries under Zone V. The areas of training were Productivity enhancement in field crops (63), Integrated Pest Management (61), protected cultivation technology (40), integrated nutrient management (37), group dynamics and farmers organization (36), household food security (32), production and use of organic inputs (29), rejuvenation of old orchards (24), management in farm animals (24), capacity building for ICT application (22), and livestock feed and fodder production (19) 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		
		M	F	Total	M	F	Total	M	F	Total	M	F	Total
Productivity enhancement in field crops	63	1543	428	1971	501	148	649	129	60	189	2173	636	2809
Integrated Pest Management	61	1465	378	1843	460	104	564	116	44	160	2041	526	2567
Integrated Nutrient management	37	652	217	869	167	160	327	173	45	218	992	422	1414
Rejuvenation of old orchards	24	396	122	518	73	26	99	116	25	141	585	173	758
Protected cultivation technology	40	738	178	916	167	80	247	194	44	238	1099	302	1401
Production and use of organic inputs	29	390	105	495	183	71	254	55	25	80	628	201	829
Care and maintenance of farm machinery and implements	18	370	74	444	106	23	129	61	7	68	537	104	641
Gender mainstreaming through SHGs	12	219	79	298	113	46	159	22	13	35	354	138	492
Formation and Management of SHGs	4	78	24	102	10	1	11	20	4	24	108	29	137
Women and Child care	9	87	83	170	17	7	24	33	6	39	137	96	233
Low cost and nutrient efficient diet designing	15	103	136	239	35	23	58	32	23	55	170	182	352
Group Dynamics and farmers organization	36	659	156	815	138	42	180	58	54	112	855	252	1107
Information networking among farmers	14	222	46	268	42	5	47	56	10	66	320	61	381
Capacity building for ICT application	22	314	78	392	46	9	55	41	17	58	401	104	505
Management in farm animals	24	461	96	557	47	22	69	122	33	155	630	151	781
Livestock feed and fodder production	19	273	92	365	82	21	103	89	43	132	444	156	600
Household food security	32	300	186	486	115	62	177	32	105	137	447	353	800
Other	182	3952	769	4721	578	187	765	578	192	770	5108	1148	6256
TOTAL	**639**	**12222**	**3247**	**15469**	**2880**	**1037**	**3917**	**1927**	**750**	**2677**	**17029**	**5034**	**22063**

4.3.2 Sponsored Training Programme

In this Zone, the KVKs 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 2024, the KVKs conducted sponsored 642 training programmes for 22851 beneficiaries with the fund support from different organizations. Out of these, 18626 were male (81.51%) and 18.49% were female beneficiaries (4225). The composition of SC/ST in those training programmes was 27.79%.

The major courses covered in these programmes were crop production and management (447) for 15210 participants, livestock and fishery (112) for 4207 participants and agricultural extension (51) for 2822 participants and others.

State-wise analysis showed that Union Territory of A&N Islands, organized 1 courses for 14 participants, while Odisha organized 117 courses for 3375 participants and West Bengal organized 524 courses for 19462 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	General			SC			ST			Grand Total		
		M	F	T	M	F	T	M	F	T	M	F	Total
Crop production and management													
Increasing production and productivity of crops	67	1331	153	1484	174	24	198	54	22	76	1559	199	1758
Commercial production of vegetables	38	763	162	925	295	232	527	46	76	122	1104	470	1574
Production and value addition	18	305	42	347	2	4	6	14	13	27	321	59	380
Fruit Plants	15	391	42	433	44	13	57	9	10	19	444	65	509
Ornamental plants	10	44	1	45	32	41	73	34	155	189	110	197	307
Spices crops	2	46	3	49	65	39	104	14	8	22	125	50	175
Soil health and fertility management	57	1236	292	1528	491	195	686	84	66	150	1811	553	2364
Production of Inputs at site	22	612	56	668	44	9	53	15	11	26	671	76	747
Methods of protective cultivation	42	1103	121	1224	143	11	154	93	23	116	1339	155	1494
Others (pl. specify)	176	3253	680	3933	1384	396	1780	147	42	189	4784	1118	5902
Total	**447**	**9084**	**1552**	**10636**	**2674**	**964**	**3638**	**510**	**426**	**936**	**12268**	**2942**	**15210**
Post-harvest technology and value addition													
Processing and value addition	5	8	29	37	34	8	42	10	30	40	52	67	119
Others (pl. specify)	8	39	0	39	6	0	6	15	0	15	60	0	60
Total	**13**	**47**	**29**	**76**	**40**	**8**	**48**	**25**	**30**	**55**	**112**	**67**	**179**
Farm machinery													
Farm machinery, tools and implements	5	128	15	143	22	4	26	0	0	0	150	19	169
Others (pl. specify)	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	**5**	**128**	15	143	22	4	26	0	0	0	150	19	169

Area of training	No. of courses	General			SC			ST			Grand Total		
		M	F	T	M	F	T	M	F	T	M	F	Total
Livestock and fisheries													
Livestock production and management	42	1059	22	1081	36	158	194	32	19	51	1127	199	1326
Animal Nutrition Management	8	297	43	340	2	0	2	17	11	28	316	54	370
Animal Disease Management	1	107	0	107	0	0	0	0	0	0	107	0	107
Fisheries Nutrition	5	56	101	157	12	11	23	9	6	15	77	118	195
Fisheries Management	36	908	15	923	425	230	655	26	5	31	1359	250	1609
Others (pl. specify)	20	168	156	324	163	86	249	13	14	27	344	256	600
Total	**112**	**2595**	**337**	**2932**	**638**	**485**	**1123**	**97**	**55**	**152**	3330	877	4207
Home Science													
Household nutritional security	0	0	0	0	0	0	0	0	0	0	0	0	0
Economic empowerment of women	3	0	12	12	0	8	8	0	40	40	0	60	60
Drudgery reduction of women	0	0	0	0	0	0	0	0	0	0	0	0	0
Others (pl. specify)	11	96	50	146	13	22	35	13	10	23	122	82	204
Total	**14**	**96**	**62**	**158**	**13**	**30**	43	13	50	63	122	142	264
Agricultural Extension													
Capacity Building and Group Dynamics	26	828	18	846	29	3	32	3	0	3	860	21	881
Others (pl. specify)	25	1684	100	1784	56	25	81	44	32	76	1784	157	1941
Total	**51**	**2512**	**118**	**2630**	**85**	**28**	**113**	**47**	**32**	**79**	**2644**	**178**	**2822**
Grand Total	**642**	**14462**	**2113**	**16575**	**3472**	**1519**	**4991**	**692**	**593**	**1285**	**18626**	**4225**	**22851**

4.3.3 Vocational Training Programme

The vocational training programmes at KVK level 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 2024, 293 vocational training programmes were conducted by the KVKs of Zone V for benefit of 8250 beneficiaries. Among these West Bengal organized 133 courses for 4323 beneficiaries and Odisha conducted 156 courses for 3796 beneficiaries, while in A & N Islands, 4 courses were organised for 131 participants. Among the courses, integrated crop management was most sought after by the beneficiaries. A total of 33 such courses were organized for 2120 beneficiaries. While the course on mushroom cultivation gained favour among the rural youths and 821 rural youths were trained through 32 courses. Other courses that gained popularity were commercial vegetable production (552 participants), value addition (442 participants), vermicomposting (360 participants) and others. In these training programmes, a good number (2919) of SC/ST got trained which constituted 35.38% of the total beneficiaries. It was found that about 25.79% trainees got employed through the self-employment/ other modes of employment.

Table: Vocational training conducted by KVKs of Zone V

Area of Training	No. of courses	No of Participants									Grand Total			Employment Status		
		Other			SC			ST						Self-Employed	Other Employment	Total
		M	F	T	M	F	T	M	F	T	M	F	T			
Crop production and management																
Commercial floriculture	2	2	1	3	7	3	10	2	2	4	11	6	17	0	0	0
Commercial fruit production	8	58	67	125	17	19	36	9	10	19	84	96	180	41	16	57
Commercial vegetable production	26	268	139	354	81	58	156	31	24	41	380	222	552	136	47	183
Integrated crop management	33	320	84	1258	259	88	652	43	15	188	622	187	2120	48	15	63
Organic farming	22	209	110	179	57	38	55	28	23	31	294	171	265	52	25	77
Other	17	161	90	360	70	33	134	28	18	73	259	141	567	126	38	164
Total	**108**	**1018**	**491**	**2279**	**491**	**239**	**1043**	**141**	**92**	**356**	**1650**	**823**	**3701**	**403**	**141**	**544**
Post-harvest technology and value addition																
Value addition	18	96	204	300	22	63	85	15	42	57	133	309	442	34	39	73
Others (pl. specify)	2	13	24	37	4	14	18	2	3	5	19	41	60	3	1	4
Total	**20**	**109**	**228**	**337**	**26**	**77**	**103**	**17**	**45**	**62**	**152**	**350**	**502**	**37**	**40**	**77**
Livestock and fisheries																
Dairy farming	7	36	47	83	9	11	20	8	8	16	53	66	119	15	10	25
Composite fish culture	12	155	59	214	44	17	61	22	9	31	221	85	306	151	138	289
Sheep and goat rearing	3	31	5	36	21	9	30	4	1	5	56	15	71	29	5	34
Piggery	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poultry farming	11	59	75	134	15	18	33	7	10	17	81	103	184	59	11	70
Others (pl. specify)	6	62	20	82	67	18	85	9	3	12	138	41	179	29	26	55
Total	**39**	**343**	**206**	**549**	**156**	**73**	**229**	**50**	**31**	**81**	**549**	**310**	**859**	**283**	**190**	**473**
Income generation activities																
Vermicomposting	17	132	119	251	36	35	71	20	18	38	188	172	360	73	48	121
Production of bioagents, biopesticides,	14	180	62	242	41	18	59	21	12	33	242	92	334	35	14	49
biofertilizers etc.	5	34	91	125	9	26	35	5	13	18	48	130	178	37	30	67
Repair and maintenance of farm machinery & implements	7	103	36	139	30	11	41	8	4	12	141	51	192	48	15	63

Area of Training	No. of courses	No of Participants									Grand Total			Employment Status		
		Other			SC			ST						Self-Employed	Other Employment	Total
		M	F	T	M	F	T	M	F	T	M	F	T			
Rural Crafts	3	0	10	10	0	43	43	0	1	1	0	54	54	0	0	0
Seed production	6	68	21	89	22	7	29	12	4	16	102	32	134	45	29	74
Sericulture	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mushroom cultivation	32	182	379	561	54	121	175	27	58	85	263	558	821	288	70	358
Nursery, grafting etc.	3	33	16	49	13	22	35	2	1	3	49	38	87	19	19	38
Tailoring, stitching, embroidery, dying etc.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Agril. Para-workers, para-vet training	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	27	223	176	399	89	84	173	33	26	59	345	287	632	134	37	171
Total	**114**	**955**	**910**	**1865**	**294**	**367**	**661**	**128**	**137**	**265**	**1378**	**1414**	**2792**	**679**	**262**	**941**
Agricultural Extension																
Capacity building and group dynamics	10	74	126	200	21	36	57	10	19	29	105	181	286	37	36	73
Others (pl. specify)	2	55	22	77	16	6	22	8	3	11	79	31	110	12	8	20
Total	**12**	**129**	**148**	**277**	37	42	79	18	22	40	184	212	396	49	44	93
Grand Total	**293**	**2554**	**1983**	**5307**	**1004**	**798**	**2115**	**354**	**327**	**804**	**3913**	**3109**	**8250**	**1451**	**677**	**2128**

4.4 Extension Programmes

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 52719 numbers of activities involving 2227916 farmers and extension officials in the state of West Bengal, Odisha and A&N Islands. Among these beneficiaries 2191638 were farmers and 36278 were extension officials. Analysis of the gender-wise participation showed that 35.82% was women beneficiaries, which is almost 1/3 of the male beneficiaries. A number of extension officials (3800) paid visit to the KVKs and interacted with them regarding the latest technologies. Farmers in large number (89458) 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 6845 visit were made by the scientists and during the course of visit 47990 farmers consulted with the scientists. KVKs conducted Kisan Gosthies for creating awareness of the different technologies and 157 such Kisan Gosthies were organized for 8443 beneficiaries.

Under ICAR-ATARI Kolkata, the KVKs also participated in 171 Kisan Melas and 379 numbers of exhibition which benefited 44204 and 44526 beneficiaries, respectively. Different technologies and successful cases were also exhibited through arranging film show for 25591 participants. Farmers seminar, workshop was also organized for creating awareness about different programmes and government schemes. In the year 2024, 712 seminars and 2407 workshops were organized to cover 9045 and 8874 farmers, respectively. Advisory services were one of the most popular services sought by the farmers. In the year, 8047 such services were offered by the KVK staff for the interest of 883313 beneficiaries. Camps and clinics were also organized to show the farmers about the latest technologies through 120 soil health camps and 3064 animal health camps, 72 agri-mobile clinics were organized to benefit 5959, 35421 and 2510 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, 659 such meetings were

organized for benefits of 33161 rural people. The objective of the KVKs to create awareness regarding the government programmes was fulfilled by involving farmers and rural people with the KVKs by observation of different programmes viz., celebration of important days like Mahila Kisan Divas, Swachhta Hi Seva, International Women's Day etc.

4.4.1 State-wise details of Extension Activities conducted

State-wise analysis of the extension activities showed that the KVKs of A&N Islands conducted various extension activities for the benefit of 16048 participants. Maximum number of participants (5631) benefitted from Advisory Services. Method Demonstrations were provided to 1582 participants and Farmers visit to KVK was done by 271 participants as well as celebration of important days by 508 participants.

West Bengal with 23 KVKs organized various extension activities for benefit of 1126142 farmers, farm women, rural youth and extension functionaries. Major extension activities included advisory services (123031), Kisan Mela (29929), animal health camps (31945), farmers visit to KVK (40609) etc.

All the 33 KVKs of Odisha carried out different extension activities involving 1085726 participants. The highest participation was in advisory services (754651), the next being farmers' visit to KVK (52378). Other important extension activities organized by KVKs of Odisha included scientists' visit to farmers' field (33898), Lectures delivered as resource persons (35872), Exhibition (39515) etc.

Table: Extension activities organised by KVKs of Zone-V

Nature of Extension Activity	No. of activities	Farmers				Extension Officials			Total		
		M	F	Total	SC/ ST (% of total)	M	F	Total	M	F	Total
Field Day	554	14360	7049	21409	40.05	407	212	619	14767	7261	22028
Kisan Mela	171	28266	15212	43478	33.82	505	221	726	28771	15433	44204
Kisan Ghosthi	157	4655	3425	8080	26.04	214	149	363	4869	3574	8443
Exhibition	379	27285	15393	42678	28.29	1149	699	1848	28434	16092	44526
Film Show	796	16135	8607	24742	33.91	598	251	849	16733	8858	25591
Method Demonstrations	832	12217	8279	20496	50.78	496	243	739	12713	8522	21235
Farmers Seminar	712	6284	2761	9045	16.40	186	75	261	6470	2836	9306
Workshop	2407	6443	2431	8874	20.75	540	224	764	6983	2655	9638
Group meetings	648	9179	7374	16553	32.80	666	258	924	9845	7632	17477
Lectures delivered as resource persons	1490	29848	15092	44940	30.89	1474	843	2317	31322	15935	47257
Advisory Services	8047	611609	262056	873665	42.16	6189	3459	9648	617798	265515	883313
Scientific visit to farmers field	6845	33305	14685	47990	37.87	1031	741	1772	34336	15426	49762
Farmers visit to KVK	19736	58584	30874	89458	36.23	3205	595	3800	61789	31469	93258
Diagnostic visits	2471	22711	10487	33198	18.25	1771	828	2599	24482	11315	35797
Exposure visits	456	7505	3690	11195	16.50	457	413	870	7962	4103	12065
Ex-trainees Sammelan	112	2120	1076	3196	9.02	501	218	719	2621	1294	3915
Soil health Camp	120	3279	1665	4944	13.88	881	134	1015	4160	1799	5959
Animal Health Camp	3064	16200	18469	34669	14.12	603	149	752	16803	18618	35421
Agri mobile clinic	72	1647	735	2382	3.53	97	31	128	1744	766	2510
Soil test campaigns	101	2698	872	3570	8.27	115	69	184	2813	941	3754

Nature of Extension Activity	No. of activities	Farmers				Extension Officials			Total		
		M	F	Total	SC/ ST (% of total)	M	F	Total	M	F	Total
Farm Science Club Conveners meet	76	1766	847	2613	6.94	56	19	75	1822	866	2688
Self Help Group Conveners meetings	133	650	2618	3268	11.02	86	55	141	736	2673	3409
Mahila Mandals Conveners meetings	79	3328	2402	5730	7.24	90	119	209	3418	2521	5939
Celebration of important days (specify)	391	14115	8917	23032	35.51	940	443	1383	15055	9360	24415
Sankalp Se Siddhi	34	2267	1724	3991	5.25	135	77	212	2402	1801	4203
Swatchta Hi Sewa	448	7397	6331	13728	17.04	622	250	872	8019	6581	14600
Mahila Kisan Divas	59	806	1672	2478	14.18	87	84	171	893	1756	2649
Any Other (Specify)	2329	461881	330355	792236	41.00	1542	776	2318	463423	331131	794554
Total	**52719**	**1406540**	**785098**	**2191638**	**23.28**	**24643**	**11635**	**36278**	**1431183**	**796733**	**2227916**





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

Nature of Extension Activity	A & N Islands			Odisha			West Bengal			Total		
	M	F	Total	M	F	Total	M	F	Total	M	F	Total
Field Day	122	212	334	6997	3970	10967	7648	3079	10727	14767	7261	22028
Kisan Mela	970	1105	2075	7810	4390	12200	19991	9938	29929	28771	15433	44204
Kisan Ghosthi	192	260	452	2069	1408	3477	2608	1906	4514	4869	3574	8443
Exhibition	500	720	1220	25426	14089	39515	2508	1283	3791	28434	16092	44526
Film Show	175	230	405	10623	5412	16035	5935	3216	9151	16733	8858	25591

Nature of Extension Activity	A & N Islands			Odisha			West Bengal			Total		
	M	F	Total	M	F	Total	M	F	Total	M	F	Total
Method Demonstrations	656	926	1582	6038	3597	9635	6019	3999	10018	12713	8522	21235
Farmers Seminar	0	0	0	2423	1392	3815	4047	1444	5491	6470	2836	9306
Workshop	277	107	384	2147	1247	3394	4559	1301	5860	6983	2655	9638
Group meetings	384	297	681	5461	5010	10471	4000	2325	6325	9845	7632	17477
Lectures delivered as resource persons	434	293	727	23625	12247	35872	7263	3395	10658	31322	15935	47257
Advisory Services	3836	1795	5631	518764	235887	754651	95198	27833	123031	617798	265515	883313
Scientific visit to farmers field	120	46	166	22930	10968	33898	11286	4412	15698	34336	15426	49762
Farmers visit to KVK	174	97	271	33516	18862	52378	28099	12510	40609	61789	31469	93258
Diagnostic visits	27	9	36	16307	7111	23418	8148	4195	12343	24482	11315	35797
Exposure visits	114	113	227	4203	2289	6492	3645	1701	5346	7962	4103	12065
Ex-trainees Sammelan	0	0	0	615	300	915	2006	994	3000	2621	1294	3915
Soil health Camp	0	0	0	1861	940	2801	2299	859	3158	4160	1799	5959
Animal Health Camp	0	0	0	2027	1449	3476	14776	17169	31945	16803	18618	35421
Agri-mobile clinic	0	0	0	724	326	1050	1020	440	1460	1744	766	2510
Soil test campaigns	0	0	0	1828	504	2332	985	437	1422	2813	941	3754
Farm Science Club Conveners meet	0	0	0	491	133	624	1331	733	2064	1822	866	2688
Self Help Group Conveners meetings	0	0	0	232	2322	2554	504	351	855	736	2673	3409
Mahila Mandals Conveners meetings	0	0	0	1905	1565	3470	1513	956	2469	3418	2521	5939
Celebration of important days (specify)	284	224	508	8264	6076	14340	6507	3060	9567	15055	9360	24415
Sankalp Se Siddhi	0	0	0	1895	1566	3461	507	235	742	2402	1801	4203
Swatchta Hi Sewa	229	212	441	4414	4085	8499	3376	2284	5660	8019	6581	14600
Mahila Kisan Divas	3	16	19	252	1106	1358	638	634	1272	893	1756	2649
Any Other (Specify)	471	418	889	15051	9577	24628	447901	321136	769037	463423	331131	794554
Total	**8968**	**7080**	**16048**	**727898**	**357828**	**1085726**	**694317**	**431825**	**1126142**	**1431183**	**796733**	**2227916**

4.4.2 Other Extension Activities

The KVKs under Zone V also gave extensive coverage of their programme through social network and print media. A total of 11405 Extension Literatures were developed while 714 news coverage in newspaper, 230 TV talks and 166 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	714
Radio talks	166
TV talks	230
Popular articles	149
Extension Literature	11405
Other, if any	57
TOTAL	**12721**

5.0 Production of Seed, Planting Materials and Bio-Products

5.1 Seed Production

The seed production programme of KVKs 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 159.94 q seeds which benefited 638 farmers and earned Rs.329242/- in 2024. Odisha produced 4095.28 q seeds, West Bengal produced 9161.83 q seeds in 2024. Total value of seeds was about Rs. 55722267/- which benefitted more than 16122 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	10.1	60800	36	149.84	268442	602	159.94	329242	638
2	Odisha	193	752700	2	3902.28	10516071	938	4095.28	11268771	940
3	West Bengal	7284.65	36523514	6307	1877.18	7600740	8237	9161.83	44124254	14544
Total		**7487.75**	**37337014**	**6345**	**5929.30**	**18385253**	**9777**	**13417.05**	**55722267**	**16122**

Total production of seed in cereals was 9245.73 q, which benefitted 5798 farmers. After cereals, 1661.69 q pulse seed production was given importance and 564.27 q seed of black gram, 638.81 q lentil, 156.16 q green gram seeds were produced through village and KVK seed production programme. In oilseeds, 428.26 q of sesame, 344.94 q of mustard, and 230.28 q 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	3989.91	10955750	1267	5224	15069299	4084	9213.91	26025049	5351
	Wheat	0	0	0	14.6	74200	46	14.6	74200	46
	Maize	0	0	0	17.22	112727	401	17.22	112727	401
	Total	**3989.91**	**10955750**	**1267**	**5255.82**	**15256226**	**4531**	**9245.73**	**26211976**	**5798**
Oilseeds	Mustard	297.5	3774000	888	47.44	432755	2622	344.94	4206755	3510
	Toria	0	0	0	2.8	26740	20	2.8	26740	20
	Linseed	0	0	0	0	0	0	0	0	0
	Niger	0	0	0	13	91520	26	13	91520	26

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
	Sesame	400.8	4675000	621	27.46	397330	366	428.26	5072330	987
	Groundnut	218.28	1980080	304	12	155900	80	230.28	2135980	384
	Soybean	0	0	0	0.5	7500	15	0.5	7500	15
	Rai	0	0	0	0	0	0	0	0	0
	Sun Flower	0	0	0	3.55	12450	0	3.55	12450	0
	Toria	0	0	0	0	0	0	0	0	0
	Total	**916.58**	**10429080**	**1813**	**106.75**	**1124195**	**3129**	**1023.33**	**11553275**	**4942**
Pulses	Redgram	9.5	102000	63	0	0	0	9.5	102000	63
	Chickpea	280	2940000	421	12.95	31500	27	292.95	2971500	448
	Lentil	622.5	6418604	1310	16.31	239780	381	638.81	6658384	1691
	Greengram	141.2	562880	259	14.96	196140	338	156.16	759020	597
	Blackgram	545.8	5561900	1055	18.47	238500	289	564.27	5800400	1344
	Pea	0	0	0	0	0	0	0	0	0
	Cowpea	0	0	0	0	0	0	0	0	0
	Rajmash	0	0	0	0	0	0	0	0	0
	Total	**1599**	**15585384**	**3108**	**62.69**	**705920**	**1035**	**1661.69**	**16291304**	**4143**
Commercial crops	Potato	924.5	60000	16	1	800	2	925.5	60800	18
	Sugarcane	0	0	0	0	0	0	0	0	0
	Total	**924.5**	**60000**	**16**	**1**	**800**	**2**	**925.5**	**60800**	**18**
Vegetables	Okra	0.66	297000	101	30.25	16815	0	30.91	313815	101
	Tomato	0	0	0	35.51	35164	107	35.51	35164	107
	Palak	0	0	0	0	0	0	0	0	0
	Radish	0	0	0	2.6	1300	0	2.6	1300	0
	Onion	54	0	0	0	0	0	54	0	0
	chilli	0	0	0	39.82	32206	78	39.82	32206	78
	Brinjal	0.1	800	30	34.05	27172	131	34.15	27972	161
	Lobia	0	0	0	0.8	3200	7	0.8	3200	7
	Total	**54.76**	**297800**	**131**	**143.03**	**115857**	**323**	**197.79**	**413657**	**454**
Spices	Coriander	0	0	0	0	0	0	0	0	0
	Ginger	0	0	0	8.5	20000	0	8.5	20000	0
	Methi	0	0	0	0	0	0	0	0	0
	Turmeric	0	0	0	244.75	740000	143	244.75	740000	143
	Fenugrick	0	0	0	0	0	0	0	0	0
	Total	**0**	**0**	**0**	**253.25**	**760000**	**143**	**253.25**	**760000**	**143**
Fodder crop seeds	Rice Bean	0	0	0	1.45	11600	37	1.45	11600	37
	Barseem	0	0	0	0	0	0	0	0	0
	Total	**0**	**0**	**0**	**1.45**	**11600**	**37**	**1.45**	**11600**	**37**
Fiber crops	Jute	0	0	0	0	0	0	0	0	0
	Sunhemp	0	0	0	8.23	36117	45	8.23	36117	45
	Total	**0**	**0**	**0**	**8.23**	**36117**	**45**	**8.23**	**36117**	**45**
Forest Species		0	0	0	32.40	86090	183	32.40	86090	183
Others	Dhaincha	0	0	0	45.7	223248	274	45.7	223248	274
	Broom Stick	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
	Elephant Footyam	3	9000	10	18.98	65200	75	21.98	74200	85
	Sisbania	0	0	0	0	0	0	0	0	0
	Total	3	9000	10	64.68	288448	349	67.68	297448	359
Grand Total		**7487.75**	**37337014**	**6345**	**5929.30**	**18385253**	**9777**	**13417.05**	**55722267**	**16122**

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	35	140000	74	3856.75	10242109	283	5322.16	15642940	4994	**9213.91**	**26025049**	**5351**
Wheat	0	0	0	0	0	0	14.6	74200	46	**14.6**	**74200**	**46**
Maize	0	0	0	9.55	55297	142	7.67	57430	259	**17.22**	**112727**	**401**
Total	**35**	**140000**	**74**	**3866.3**	**10297406**	**425**	**5344.43**	**15774570**	**5299**	**9245.73**	**26211976**	**5798**
Oilseeds												
Mustard	0	0	0	4.3	40000	39	340.64	4166755	3471	**344.94**	**4206755**	**3510**
Toria	0	0	0	2.8	26740	20	0	0	0	**2.8**	**26740**	**20**
Linseed	0	0	0	0	0	0	0	0	0	**0**	**0**	**0**
Niger	0	0	0	13	91520	26	0	0	0	**13**	**91520**	**26**
Sesame	0	0	0	1.2	18120	85	427.06	5054210	902	**428.26**	**5072330**	**987**
Groundnut	0	0	0	0	0	0	230.28	2135980	384	**230.28**	**2135980**	**384**
Soybean	0	0	0	0	0	0	0.5	7500	15	**0.5**	**7500**	**15**
Rai	0	0	0	0	0	0	0	0	0	**0**	**0**	**0**
Sun Flower	0	0	0	0	0	0	3.55	12450	0	**3.55**	**12450**	**0**
Toria	0	0	0	0	0	0	0	0	0	**0**	**0**	**0**
Total	**0**	**0**	**0**	**21.3**	**176380**	**170**	**1002.03**	**11376895**	**4772**	**1023.33**	**11553275**	**4942**
Pulses												
Redgram	0	0	0	0	0	0	9.5	102000	63	**9.5**	**102000**	**63**
Chickpea	0	0	0	0	0	0	292.95	2971500	448	**292.95**	**2971500**	**448**
Lentil	0	0	0	0	0	0	638.81	6658384	1691	**638.81**	**6658384**	**1691**
Greengram	2	30000	51	0	0	0	154.16	729020	546	**156.16**	**759020**	**597**
Blackgram	0	0	0	0	0	0	564.27	5800400	1344	**564.27**	**5800400**	**1344**
Pea	0	0	0	0	0	0	0	0	0	**0**	**0**	**0**
Cowpea	0	0	0	0	0	0	0	0	0	**0**	**0**	**0**
Rajmash	0	0	0	0	0	0	0	0	0	**0**	**0**	**0**
Total	**2**	**30000**	**51**	**0**	**0**	**0**	**1659.69**	**16261304**	**4092**	**1661.69**	**16291304**	**4143**
Commercial crops												
Potato	0	0	0	0	0	0	925.5	60800	18	**925.5**	**60800**	**18**
Sugarcane	0	0	0	0	0	0	0	0	0	**0**	**0**	**0**
Total	**0**	**0**	**0**	**0**	**0**	**0**	**925.5**	**60800**	**18**	**925.5**	**60800**	**18**
Vegetables												
Okra	0	0	0	0	0	0	30.91	313815	101	**30.91**	**313815**	**101**
Tomato	18.63	14904	107	0	0	0	16.88	20260	0	**35.51**	**35164**	**107**
Palak	0	0	0	0	0	0	0	0	0	**0**	**0**	**0**

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
Radish	0	0	0	0	0	0	2.6	1300	0	**2.6**	**1300**	**0**
Onion	0	0	0	0	0	0	54	0	0	**54**	**0**	**0**
chilli	39.32	31456	62	0	0	0	0.5	750	16	**39.82**	**32206**	**78**
Brinjal	32.59	26792	161	0	0	0	1.56	1180	0	**34.15**	**27972**	**161**
Lobia	0	0	0	0	0	0	0.8	3200	7	**0.8**	**3200**	**7**
Total	**90.54**	**73152**	**330**	**0**	**0**	**0**	**107.25**	**340505**	**124**	**197.79**	**413657**	**454**
Spices												
Coriander	0	0	0	0	0	0	0	0	0	**0**	**0**	**0**
Ginger	0	0	0	4.5	0	0	4	20000	0	**8.5**	**20000**	**0**
Methi	0	0	0	0	0	0	0	0	0	**0**	**0**	**0**
Turmeric	0	0	0	171.25	577500	53	73.5	162500	90	**244.75**	**740000**	**143**
Fenugrick	0	0	0	0	0	0	0	0	0	**0**	**0**	**0**
Total	**0**	**0**	**0**	**175.75**	**577500**	**53**	**77.5**	**182500**	**90**	**253.25**	**760000**	**143**
Forest Species	32.40	86090	183	0	0	0	0	0	0	32.40	86090	183
Fodder crop seeds												
Rice Bean	0	0	0	0	0	0	1.45	11600	37	**1.45**	**11600**	**37**
Barseem	0	0	0	0	0	0	0	0	0	**0**	**0**	**0**
Total	0	0	0	0	0	0	1.45	11600	37	1.45	11600	37
Fiber crops												
Jute	0	0	0	0	0	0	0	0	0	**0**	**0**	**0**
Sunhemp	0	0	0	8.23	36117	45	0	0	0	**8.23**	**36117**	**45**
Total	**0**	**0**	**0**	**8.23**	**36117**	**45**	**0**	**0**	**0**	**8.23**	**36117**	**45**
Others												
Dhaincha	0	0	0	23.7	181368	247	22	41880	27	**45.7**	**223248**	**274**
Broom Stick	0	0	0	0	0	0	0	0	0	**0**	**0**	**0**
Elephant Footyam	0	0	0	0	0	0	21.98	74200	85	**21.98**	**74200**	**85**
Sisbania	0	0	0	0	0	0	0	0	0	**0**	**0**	**0**
Total	**0**	**0**	**0**	**23.7**	**181368**	**247**	**43.98**	**116080**	**112**	**67.68**	**297448**	**359**
Grand Total	**159.94**	**329242**	**638**	**4095.28**	**11268771**	**940**	**9161.83**	**44124254**	**14544**	**13417.05**	**55722267**	**16122**






5.2 Planting Material Production

A very good 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 2024, KVKs of Zone V produced 53.4127 lakh planting materials of graft, gooties, sapling, seedlings and bulbs of fruits and vegetables and earned Rs. 141.83266 lakh which benefitted 54639 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 30842 number of planting materials, Odisha produced 3579243 number of planting materials and West Bengal produced 1731185 number of planting materials in the year 2024.




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	685591	760457.5	6345	138169	236084	850	823760	996541.5	7195
	Cabbage	0	0	0	184776	328844.5	3587	140299	1737757	773	325075	2066601.5	4360
	Tomato	2965	15720	196	429008	981747.5	6296	305902	262974	1150	737875	1260441.5	7642
	Brinjal	10327	26616	522	283311	452267	6083	293282	255477	1020	586920	734360	7625
	Chilli	5488	31904	155	445029	498351.5	5746	278210	298994	935	728727	829249.5	6836
	Onion	0	0	0	1130881	343103	2918	74726	194970	473	1205607	538073	3391
	Others	0	0	0	224803	281549	2793	265879	878257	871	490682	1159806	3664
	Total	**18780**	**74240**	**873**	**3383399**	**3646320**	**33768**	**1496467**	**3864513**	**6072**	**4898646**	**7585073**	**40713**
Fruits	Mango	0	0	0	5519	157530	393	14170	804170	1099	19689	961700	1492
	Guava	26	2600	15	4710	66110	753	8777	410450	530	13513	479160	1298
	Lime	1648	14730	131	14140	101534	598	21852	293850	706	37640	410114	1435
	Papaya	430	1050	32	44796	773090	1746	15035	149100	117	60261	923240	1895
	Banana	104	2700	32	3904	42659	507	10600	102000	212	14608	147359	751
	Others	137	30140	39	10184	205100	1509	53638	1292620	801	63959	1527860	2349
	Total	**2345**	**51220**	**249**	**83253**	**1346023**	**5506**	**124072**	**3052190**	**3465**	**209670**	**4449433**	**9220**
Ornamental plants	Ornamental plants	403	18000	97	30561	72345	181	26850	96100	82	57814	186445	360
	Total	**403**	**18000**	**97**	**30561**	**72345**	**181**	**26850**	**96100**	**82**	**57814**	**186445**	**360**
Medicinal and Aromatic	Medicinal and Aromatic	1645	49350	20	10563	24410	737	4820	10000	43	17028	83760	800
	Total	**1645**	**49350**	**20**	**10563**	**24410**	**737**	**4820**	**10000**	**43**	**17028**	**83760**	**800**

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		
Plantation	Plantation	7047	211410	141	7509	182915	382	24550	338050	283	39106	732375	806
	Total	**7047**	**211410**	**141**	**7509**	**182915**	**382**	**24550**	**338050**	**283**	**39106**	**732375**	**806**
Spices	Turmeric	43	860	0	3125	33875	22	9192	262225	238	12360	296960	260
	Others	0	0	0	0	0	0	0	0	0	0	0	0
	Total	**43**	**860**	**0**	**3125**	**33875**	**22**	**9192**	**262225**	**238**	**12360**	**296960**	**260**
Tuber	Elephant yams	323	13960	6	1036	25731	35	5939	229496	117	7298	269187	158
	Total	323	13960	6	1036	25731	35	5939	229496	117	7298	269187	158
Fodder crop saplings	Fodder crop saplings	67	5360	0	300	4500	34	7455	21090	68	7822	30950	102
	Total	**67**	**5360**	**0**	**300**	**4500**	**34**	**7455**	**21090**	**68**	**7822**	**30950**	**102**
Forest Species	Forest Species	0	0	0	15243	107575	865	7300	59250	59	22543	166825	924
	Total	**0**	**0**	**0**	**15243**	**107575**	**865**	**7300**	**59250**	**59**	**22543**	**166825**	**924**
Others, pl. specify	Others	189	47250	32	44254	300608	1120	24540	34400	144	68983	382258	1296
	Total	**189**	**47250**	**32**	**44254**	**300608**	**1120**	**24540**	**34400**	**144**	**68983**	**382258**	**1296**
Grand Total		**30842**	**471650**	**1418**	**3579243**	**5744302**	**42650**	**1731185**	**7967314**	**10571**	**5341270**	**14183266**	**54639**

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, 27567 kg of bio-fertilizers and 5252 kg of bio-agent were produced which benefitted 2003 farmers and earned a value of Rs. 654609/- in 2024. In West Bengal 67031 kg of bio-agent and 16418 kg of bio-fertilizers were produced which benefitted 1124 farmers and earned Rs.1319770/- in 2024. In A & N Islands, 510 kg of bio-agent and 100kg of bio-fungicides were produced which benefitted 95 farmers and earned Rs. 23500/- in 2024. The total production of bio-products was 330836.35 kg in 2024 under Zone V which benefitted 8447 farmers and earned value of Rs. 4416763/-.

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	20265	62700	89	27567	465695	1628	16418	817770	606	**64250**	**1346165**	**2323**
Bio-pesticide	378	9560	119	4026	93000	593	18465	301955	1088	**22869**	**404515**	**1800**
Bio-fungicide	100	3000	25	23885	162160	356	1593	247500	72	**25578**	**412660**	**453**
Bio-agents	510	20500	70	5252.6	188914	375	67031	502000	518	**72793.6**	**711414**	**963**
Others, please specify.	140	4900	58	27648.75	281054	1023	117557	1256055	1827	**145345.75**	**1542009**	**2908**
Total	**21393**	**100660**	**361**	**88379.35**	**1190823**	**3975**	**221064**	**3125280**	**4111**	**330836.35**	**4416763**	**8447**

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 2024, total production of poultry was 1613 in the UT of A & N Islands. It benefitted 30 farmers and earned Rs. 8065/-. In the state of Odisha, 40246 dual purpose birds (layer + broiler) chicks, 1800 broiler chicks, 4137 ducks, 1012000 fingerlings of major carps, Indian carp (128576.5), Spawn (1051289) were produced which makes total production of 2747167.55 livestock and fish produced in the state of Odisha in 2024. It benefitted 2461 farmers and earned revenue of Rs. 5214361/-. In the state of West Bengal, Duck production was 260, Broiler production was 50187, Turkey production was 1452, Cow production was 16, Goat production was 232 and in fish production, 2477010 no. of Indian Carp was produced followed by 40000 Spawn. Total production of livestock and fish was 4150006 in 2024 in the state of West Bengal. It benefitted 3340 farmers and earned Rs. 8251729/-. In the entire Zone V, the total production of livestock and fish was 6898786 number in 2024 which benefitted 5831 farmers and earned more than Rs. 13474155/-.








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	16	260000	0	16	260000	0
Buffaloes	0	0	0	0	0	0	0	0	0	0	0	0
Calves	0	0	0	1	2000	0	9	75090	1	10	77090	1
Others (Pl. specify)	0	0	0	0	0	0	0	0	0	0	0	0
Total	**0**	**0**	**0**	**1**	**2000**	**0**	**25**	**335090**	**1**	**26**	**337090**	**1**
Small ruminants										0	0	0
Sheep	0	0	0	0	0	0	44	39000	0	44	39000	0
Goat	0	0	0	0	0	0	232	616960	83	232	616960	83
Other, please specify	0	0	0	0	0	0	0	0	0	0	0	0
Total	**0**	**0**	**0**	**0**	**0**	**0**	**276**	**655960**	**83**	**276**	**655960**	**83**
Poultry										**0**	**0**	**0**
Broilers	0	0	0	1800	112500	116	50187	541318	41	51987	653818	157
Layers	0	0	0	10360	442010	51	3130	144308	145	13490	586318	196
Duals (broiler and layer)	0	0	0	40246	2965505	811	2177	175136	87	42423	3140641	898
Japanese Quail	0	0	0	2658	157360	10	0	0	0	2658	157360	10
Turkey	0	0	0	33	20550	0	1452	190100	47	1485	210650	47
Emu	0	0	0	2153	152815	0	11	1980	1	2164	154795	1
Ducks	0	0	0	4137	333385	48	260	17500	33	4397	350885	81
Others (Pl. specify)	1613	8065	30	3092	200920	50	33652	1508797	1527	38357	1717782	1607
Total	**1613**	**8065**	**30**	**64479**	**4385045**	**1086**	**90869**	**2579139**	**1881**	**156961**	**6972249**	**2997**
Piggery										**0**	**0**	**0**
Piglet	0	0	0	1	20000	1	52	253500	25	53	273500	26
Hog	0	0	0	0	0	0	4	73000	4	4	73000	4
Others (Pl. specify)	0	0	0	0	0	0	0	0	0	0	0	0
Total	**0**	**0**	**0**	**1**	**20000**	**1**	**56**	**326500**	**29**	**57**	**346500**	**30**
Fisheries										**0**	**0**	**0**
Indian carp	0	0	0	128576	85096	80	2477010	962240	287	2605586	1047336	367
Exotic carp	0	0	0	200	0	0	966960	28000	39	967160	28000	39
Mixed carp	0	0	0	489000	0	65	0	0	0	489000	0	65
Fish fingerlings	0	0	0	1012000	609233	664	560200	1315300	399	1572200	1924533	1063
Spawn	0	0	0	1051289	67950	279	40000	5000	10	1091289	72950	289
Others (Pl. specify)	0	0	0	1621	45037.1	286	14610	2044500	611	16231	2089537.1	897
Total	**0**	**0**	**0**	**2682686**	**807316.1**	**1374**	**4058780**	**4355040**	**1346**	**6741466**	**5162356.1**	**2720**
Grand Total	**1613**	**8065**	**30**	**2747167.55**	**5214361.1**	**2461**	**4150006**	**8251729**	**3340**	**6898786**	**13474155.10**	**5831**

6.0 Soil, Water and Plant sample analysis

For reducing the inefficient use of fertilizers and managing 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.

Around 45185 farmers in this Zone were benefited from the testing of 46136 soil samples from 1215 villages (8446 through tiny soil testing kits/ labs and 37360 through soil testing laboratory). Farmers have to pay a minimum fee to have each soil sample tested. As a result, KVKs under ICAR-ATARI Kolkata made almost Rs. 73.40 lakh during the year.

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

State	Number of soil samples analysed			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	10	10	10	8	1200
Odisha	3742	6512	10515	25232	526	51860
West Bengal	4704	30838	35611	19943	681	7287001
Total	**8446**	**37360**	**46136**	**45185**	**1215**	**7340061**

7.0 Soil Health Cards distribution and observance of World Soil Day

Nodal Scientist: Dr. S.K. Mondal

Every year on December 5th, World Soil Day is observed to raise awareness of the value of good soil and to promote the sustainable use of soil resources. "Caring for Soils: Measure, Monitor, Manage" is this year's theme. The theme emphasizes the importance of accurate soil data and information for understanding soil characteristics and supporting informed decisions on sustainable soil management for food security. It highlights the need to measure soil properties, monitor changes over time, and implement effective management practices to ensure healthy and productive soils. The vital connection between soil and water is essential to our survival. Our ecosystems are held together by soil water, which is essential for plants to absorb nutrients. Our agricultural systems are built on this symbiotic interdependence. However, human activity and climate change are causing our soils to deteriorate, which is putting an excessive amount of strain on our water supply. Erosion disturbs the natural equilibrium by reducing water availability and infiltration for all life.

Sustainable soil management practices that enhance soil health include crop rotation, minimal tillage, greater water infiltration and storage, decreased erosion and pollution, and the addition of organic matter. Because these techniques

improve soil fertility, preserve soil biodiversity, and aid in carbon storage, they are crucial in the fight against climate change.

All the KVKs of Zone-V distributed the soil health cards among the farmers. A total of 2452 numbers of Soil Health Cards were distributed on World Soil Day, Dec 5, 2024 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.




KVK	No of Participants	No of VIPs attended	SHC issued & Distributed	No of farmers benefitted
A & N Islands	85	1	50	165
Odisha	2413	87	1765	3066
West Bengal	534	8	637	981
Total	**3032**	**96**	**2452**	**4212**

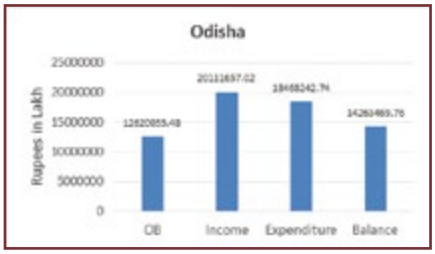
8.0 Revenue generation

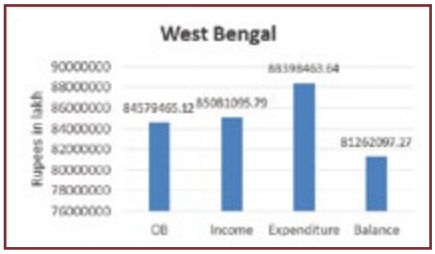
Under ICAR-ATARI Kolkata, the KVK scientists were actively involved in receiving funds from a large number of external sources through sanctioned projects *i.e.* organizing additional training programmes, research projects, building infrastructural facilities and so on which helped in supporting and strengthening of their KVKs. During the year 2024 KVKs of this zone managed to receive funds from the State Department of Agriculture, NABARD, ATMA, and many others. A total of ₹559.01 lakh revenue was generated by the KVKs of ICAR-ATARI Kolkata (Zone V). Out of this A&N islands KVKs generated ₹2.28 lakh, Odisha KVKs of ₹ 8.84 lakh and the rest was generated by West Bengal KVKs amounting ₹ 547.88 lakh during the year.

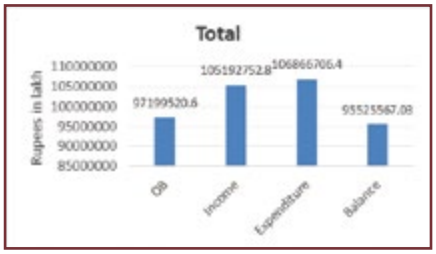
9.0 Revolving fund status

KVKs of this Zone play animportant 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 2024-25 it was seen that, at gross, the KVKs started the year with Rs. 971.99 lakh. Then they have earned Rs. 1051.92 lakh but spent Rs. 1068.66 lakh. As a result, this year they have completed with Rs. 955.25lakh in hand. Out of this the major share is contributed by West Bengal KVKs. In case of Odisha KVKs, they have decreased 14% of their revolving fund as a whole from the previous financial year.







10.0 Publication by KVKs

KVK scientists devote a lot of efforts into creating and publishing research papers, technical bulletins, newsletters, popular articles, leaflets/pamphlets, DVDs/CDs, and other materials in 2024 to showcase the findings of their studies and other connected endeavours. Other KVKs, SAUs, ICAR institutes, line departments, ATMA, NABARD, other agencies, farmers, and other stakeholders were given access to these materials.Out of the 1413 publications generated by the KVK staff in this Zone, there were 112 research papers, 80 symposium papers, 72 newsletters, 80 popular article, 47 books, 76 book chapters, 152 extension pamphlets/literature, 130 bulletins, 554 technical reports, and 108 were published electronically. Total copies in circulation were 109385. There were 450 recipients of the 44 publications that the KVKs of the Andaman and Nicobar Islands released. The KVKs in West Bengal and Odisha, on the other hand, produced 432 and 937 publications, respectively. There were 29694 and 79241 circulations in the respective states over that period.

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	4	0	2	61	721	19	47	43	13	**112**	**764**	**34**
Seminar/ conference/ symposia papers	7	0	2	50	1299	17	23	71	11	**80**	**1370**	**30**
Books	0	0	0	33	13030	8	14	771	6	**47**	**13801**	**14**
Bulletins	0	0	0	105	11350	7	25	21	6	**130**	**11371**	**13**
News letter	0	0	0	35	15050	23	37	0	6	**72**	**15050**	**29**
Popular Articles	2	0	1	45	7100	13	33	3506	8	**80**	**10606**	**22**
Book Chapter	23	0	0	26	3200	7	27	1703	9	**76**	**4903**	**16**

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
Extension Pamphlets/ literature	8	450	2	68	24700	18	76	20207	15	**152**	**45357**	**35**
Technical reports	0	0	0	437	1748	16	117	170	12	**554**	**1918**	**28**
Electronic Publication (CD/DVD etc)	0	0	0	77	1043	14	31	3202	8	**108**	**4245**	**22**
others	0	0	0	0	0	0	2	0	1	**2**	**0**	**1**
Total	**44**	**450**	**7**	**937**	**79241**	**142**	**432**	**29694**	**95**	**1413**	**109385**	**244**

11.0 Scientific Advisory Committee meetings

The Scientific Advisory Committee (SAC) Meeting is held annually by the KVKs to complete the Action Plan for the following year. The committee is composed of representatives from the following organizations, in compliance with ICAR guidelines: State Agricultural Universities, district development departments, ICAR-ATARI Kolkata, the Host Organization, other ICAR Institutes in the surrounding areas, media professionals, financial institutions, progressive farmers and farm women, and others. Every member who had been nominated was guaranteed to be present at the meeting. In the year 2024, the KVKs conducted fifty-seven SAC meetings. Thirty-three KVKs in the state of Odisha held thirty-three SAC meetings, compared to twenty-one KVKs in the state of West Bengal. On the other hand, three meetings were held during that period by three KVKs from the Andaman and Nicobar Islands. During the meeting, 1765 persons were present.

Sl. No.	State/UT	No. of SAC meeting	No. of participants
01.	A & N Islands	3	126
02.	Odisha	33	1088
03.	West Bengal	21	551
Total		57	1765




12.0 Technology Backstopping by Directorates of Extension Education

Nodal Scientist: Dr. K. S. Das

The KVKs of ICAR-ATARI Kolkata conducted round the year activities like on-farm-trial (OFT), front line demonstration (FLD), training programmes, hands-on-training, health camps, special programmes etc. under the supervision of Directors/ Dean, Extension Education of concerned State Agricultural Universities (SAUs) to transfer latest agricultural technologies from Research Institutes/ Agricultural Universities to the farming community and to cater the needs of the farmers in the district through feedback system. For efficient transfer and use of technologies, 59 KVKs of ICAR-ATARI Kolkata were distributed under the jurisdiction of 4 DEEs irrespective of any host organization of KVK. The Extension Directorate of Odisha i.e. University of Agriculture and Technology (OUAT), Bhubaneswar was allotted with 33 KVKs; Uttar Banga Krishi Viswavidyalaya (UBKV), Pundibari with 6 KVKs; Bidhan Chandra Krishi Viswavidyalaya (BCKV), Mohanpur with 17 KVKs and West Bengal University of Animal and Fishery Sciences (WBUAFS), Belgachhia with 3 KVKs. During the year 2024, DEEs under ATARI Kolkata played active role in supplying seeds, planting materials, package of management practices for agriculture, livestock and fish farming, printed literatures, organizing HRD trainings for KVK personnel and so on.

All the Directorate of Extension education under ATARI Kolkata organized HRD programmes throughout the year 2024 to meet out the demand of KVK personnel, to enrich their skill for efficient transfer of technologies and to make the newly recruited staff of KVK aware of mandate and functioning of KVKs. During the period of report, a total of 21 HRD programmes involving 190 KVKs for 2390 KVK personnel were conducted on skill training, scientific livestock/fish production, disease/pest management in crops, farmer-scientist interface, digital documentation and research methodology, SLREC meeting, operational modalities of KVKs, scientific animal husbandry and agri-horticultural practices, conducting ARYA/CFLD on pulses and oilseeds, ICT application in agriculture, soil health management, EPF, refreshers courses and many others. The maximum number of programmes (10) were conducted by WBUAFS, Kolkata followed by UBKV, Pundibari (6 programmes); OUAT, Bhubaneswar (5 programmes) and BCKV, Nadia (1 programme).

During the year 2024, the DEEs/ Dean, Extension Education and their officials visited KVKs for 243 occasions for different programmes including SAC meeting, field days celebration, workshops/ seminars, technology week celebration, interaction meetings, training programmes, inaugural meeting of DAESI, *Rabi* and *Kharif* campaign, '*World Soil Day*' celebration, special programme celebration and many more. The Dean, Extension Education of Odisha state visited their KVKs for 97 times, WBUAFS for 61 times, BCKV for 50 times and UBKV for 35 times. The total numbers of KVKs visited by Dean/Directors, Extension Education during 2024 were noted to be 124.

The overseeing of KVK activities by the DEEs had crucial role in assessing the technological needs of KVKs and in making the KVKs empowered with latest knowledge and skills. During the year 2024, the DEE officials of OUAT visited their OFT fields for 72 occasions and FLD fields for 96 occasions to monitor the performance of newly released variety crops, to check disease and pest incidences, to monitor research plots andfarmers' feedback etc. The officials of WBUAFS officials visited 12 times for their OFT fields and 14 times for FLD fields to know the disease/pest incidences in crops and livestock including poultry, to monitor whether recently released seeds were used in the KVK and farmers' field, to check soil test-based fertilizer use and so on. The Directorate officials of UBKV visited their OFT and FLD fields for 9 times each to know the performance of crops in different experimental

conditions, to check record of experimental data, to monitor farmers' address by scientists of KVK etc. On the other hand, BCKV made OFT and FLD field visit for 6 and 8 occasions, respectively to see the performance of crops, to check experimental fields as per SAC recommendations, to attend programmes of demonstrations etc. A total of 34 visits (maximum 20 visits by OUAT) were made by the officials of all four Directorates for special purposes like monitoring various activities related to ARYA, NICRA, ATMA and RKVY for large scale demonstrations, promotion of mushroom cultivation, seed and vegetable production etc.

During the year 2024, ICAR-ATARI Kolkata implemented total 61 technologies involving 794 KVKs through four Extension Directorates. The Directorate of OUAT implemented maximum (26) technologies soil test- based fertilizer application, farm mechanization, poly-mulching, disease management in rice, low-cost poly tunnel for seedling raising, trellis system in vegetables, intercropping/ multitier cropping, micronutrient application in vegetables, introduction of wilt tolerant tomato variety, pest and disease management in horticultural crops, oyster mushroom cultivation, paddy straw mushroom cultivation, introduction of poultry breed *Kadaknath*, feed management in cattle, pisciculture, stored grain pest management, off-season vegetable cultivation, kharif onion cultivation, post-harvest handling and value addition, nutritional garden, drudgery reducing equipment, promoting high value crops cultivation, promoting millets cultivation etc. involving a total of 719 KVKs.The Directorate of UBKV implemented 15 technologies through their 28 KVKs. Some important technologies were- zero tillage of maize, assessment of integrated plant nutrient supply



system in *Aman* rice, eco-friendly arrangement of brinjal fruit and shoot borer through the use of ITK along with least application of chemicals, disease management technology of rice, assessment of effects of probiotics on the survival and growth of IMC under polyculture system, introduction of suitable variety of strawberry in hills, introduction of multi-storied cropping by planting arecanuts, black pepper and turmeric on same piece of land, preparation of winning food to address malnutrition, waste in to wealth, commercial honey bee rearing (*A. mellifera*), assessment of nutritional supplement to enhance the production of oyster mushroom, assessment the efficacy of different organic manures on growth performance of IMC assessment of integrated pest management of fruit fly in cucurbitaceous crop (cucumber/gourd). The Directorate of WBUAFS implemented 14 technologies viz. selective breeding programme for small animals to avoid inbreeding depression, implementation of superior germplasm of *Black Bengal* goat, preparation of value added product from small animals, developing poultry and fish products, scientific management of *Ghungroo* pig breed, restoration of soil health and mass production of vermicompost, ornamental fish rearing in pond ecosystem, seasonal fodder cultivation technology, area specific integrated farming system model, climate smart animal husbandry practices with special emphasis on area specific mineral mixture, adoption of superior quality of *Vanaraja* chicks, application of divided dose of lime for water treatment for fish culture, brooding management of poultry chicks and brood fish management for augmenting productivity etc. which involved their 41 KVKs. On the other hand, the Directorate of BCKV implemented 6 technologies involving 8 KVKs. Out of those, *Rhizobiumspp.* mass multiplication, orchard rejuvenation, packagingof vermicompost, applicationof bio-fertilizer in differentcrops, mushroom productiontechnologies were important.

All the Directorates under ICAR-ATARI Kolkata were actively engaged in publishing various literatures in English, Bengali and Odia language covering all aspects of agriculture, livestock and fishery sector for the benefit of farmers. In the year 2024, a total of 2 technology inventories, one each by WBUAFS and OUAT, were published. Nine technological inventories (WBUAFS- 8 and UBKV-1) were updated during that period.

The Directorates also supplied different technological products to total 217 KVKs. Out of which, supply of seeds to 41 KVKs, planting materials and bio-products to 36 KVKs, bio-products to38 KVKs, livestock/poultry breed to 40 KVKs, livestock/poultry products to 7 KVKs, area specific mineral mixture/ mushroom/ fish fry/ fingerlings/yearlings etc. to 55 KVKs during the year 2024.

13.0 Agricultural Technology Information Centre (ATIC)

Nodal Scientist: Dr. K. S. Das

The Agricultural Technology Information Centres (ATICs) were being operated as a '*single window*' system which were generally established at the entrance of any Agricultural Universities/ ICAR Institutes. The main purposes of ATICs were to make available updated technology information including inputs and products related to agriculture, horticulture, livestock and fisheries; to provide solution to the agricultural famers for their specific problems; and to help the farmers including other stakeholders under one umbrella. During the year 2024, five ATICs under ICAR-ATARI Kolkata were in operation at- a) ICAR-Central Island Agricultural Research Institute (ICAR-CIARI), Port Blair, Andaman and Nicobar Islands; b) ICAR-Central Institute of Freshwater Aquaculture (CIFA), Bhubaneswar; c) Odisha University of Agriculture and Technology (OUAT), Bhubaneswar; d) Bidhan Chandra Krishi Viswavidyalaya (BCKV), Mohanpur, West Bengal and e) Uttar Banga Krishi Viswavidyalaya (UBKV), Pundibari, West Bengal.

The ATICs were facilitated with reception counter, exhibition/ technology museum, touch screen kiosk, sales counter, farmers' feedback register, conference hall for farmers' interaction, cafeteria and so on. However, during the year 2024, 3890 farmers visited ATICs from different corner of the state under this Zone. Maximum farmers (2000) visited for technology products followed by technology information (1207 farmers), technology services (618 farmers) and other purposes (65 farmers). The ATIC visit was highest for UBKV (2265 farmers) followed by BCKV (800 farmers), ICAR-CIFA (634 farmers) and OUAT (191 farmers) during the period of report.

As per technology information was concerned, about 2000 farmers used Kisan call centre to get the information on varieties/ hybrids (104), disease management (622), pest management (670), agro-techniques (165), post-harvest technology and value addition (31), soil and water conservation (72) and animal husbandry including fisheries (336). The information was also provided to the farmers through interaction during field day celebration, farmer-scientist interface, field demonstration and many other occasions.

Various types of publications i.e. books, technical bulletins, CDs etc. were supplied to the farmers and other stake holders to update agricultural knowledge. The literatures were made available at minimum price or free of cost from the ATICs. During the year 2024, 1258 books and 3571 technical bulletins were sold which benefitted 5018 farmers. An amount of Rs. 65010/- in the form of revenue was generated.

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 2024, 1864 q seeds, 35241 no. of planting materials, 1023 q bio-products, 235 q aromatic rice, 58kg arecanut, 68 pieces green coconut, 23 packet baby corn and 29 packet turmeric were supplied to the farmers through different ATICs. From the sale of those products, 10253 farmers were benefitted and Rs. 1469054/- revenue was generated.

From different ATICs under ICAR-ATARI Kolkata, 400 soil and water samples were tested and 740 plants were diagnosed for different diseases which benefitted 2240 farmers during the period.

14.0 Flagship Programmes

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

Nodal Scientist: Dr. S.K. Mondal

The demand for food is rising as a result of dietary changes and population growth worldwide. Crop yields are plateauing in many parts of the world, the ocean is getting worse, and natural resources including soils, water, and biodiversity are quickly depleting. Production is finding it more difficult to keep up with these developments. According to a 2020 estimate, 690 million people, or 8.9 percent of the world's population, are undernourished, an increase of almost 60 million in just five years. Because the globe would need to produce over 70% more food by 2050 to feed the predicted 9 billion people, the problem of ensuring food security will only get worse.

The National Initiative on Climate Resilient Agriculture (NICRA), a Flagship Network Project of the Indian Council of Agricultural Research, was introduced in February 2011 during the XI Plan and is now known as "National Innovations in Climate Resilient Agriculture" (NICRA) during the XII Plan. Given that climate change is an ongoing problem, more attention must be paid to this crucial subject going forward. In light of this, a single strategy has been reinforced, and attempts have been made to expand on the initiative implemented during the 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

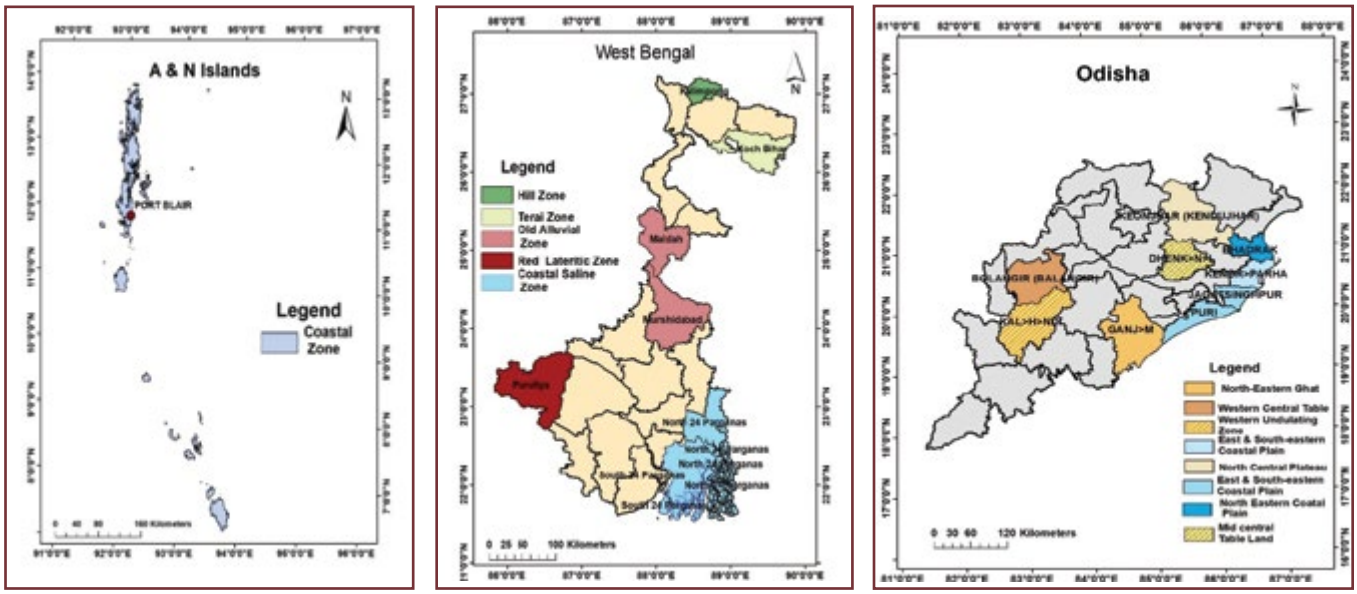


Fig: NICRA-TDC Project implementing sites

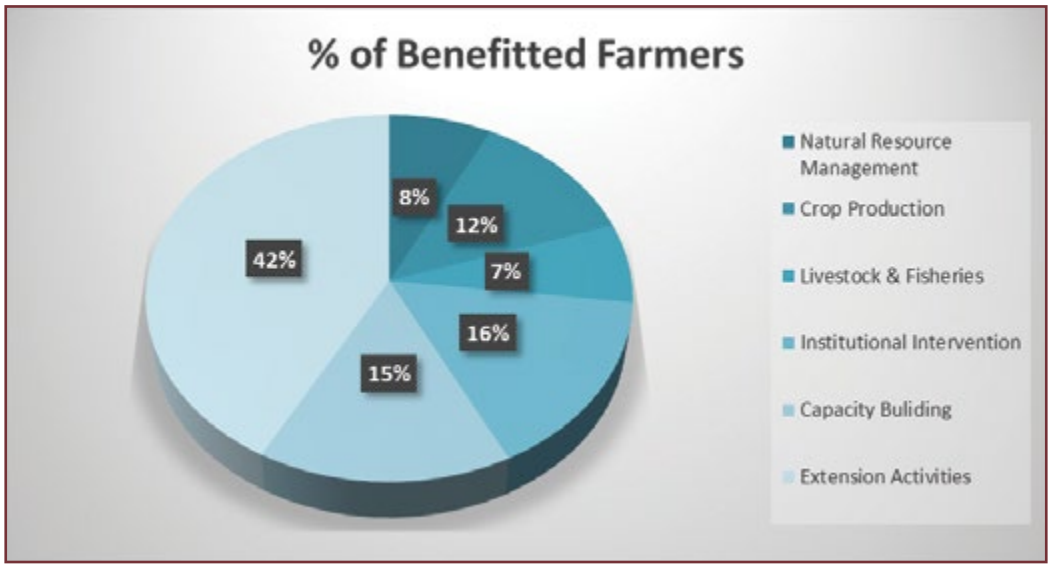


Fig: % of Benefitted Farmers under different component of NICRA-TDC

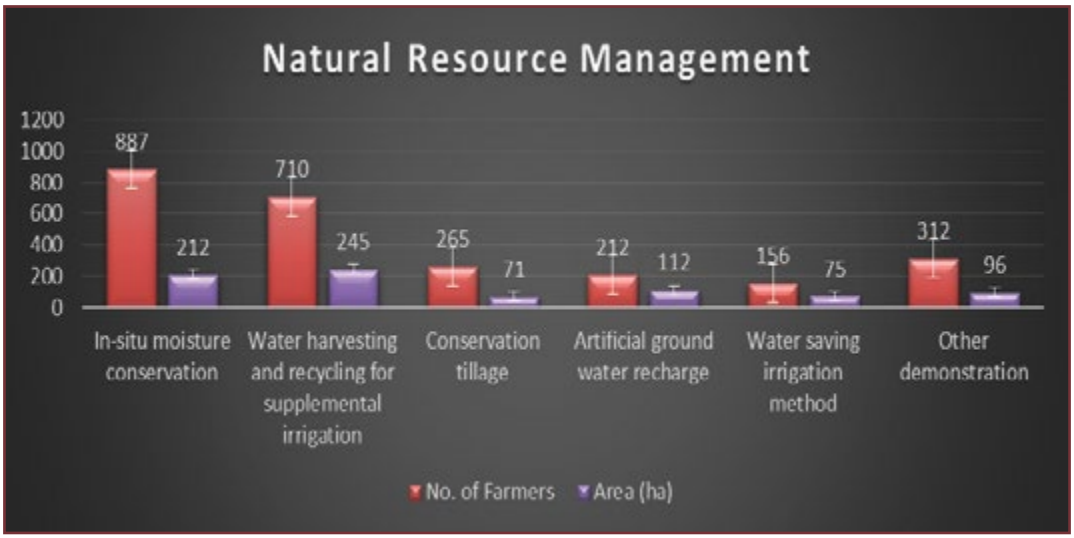
climate vulnerabilities like droughts, erratic rainfall, heat wave, flood, cyclonic storm. Plan of action, accordingly, was prepared for its implementation through executing technological interventions to initiate crop production, resource conservation, livestock and fish rearing, water harvesting *etc*. in the vulnerable villages of KVK districts.

Components of National Innovations on Climate Resilient Agriculture Programme in various module

benefitting 33934 farmers (NRM- 2542, Crop Production-4215, Livestock and Fisheries- 2361, Institutional Interventions- 5321, Capacity Building- 5250 and Extension Activities- 14245).

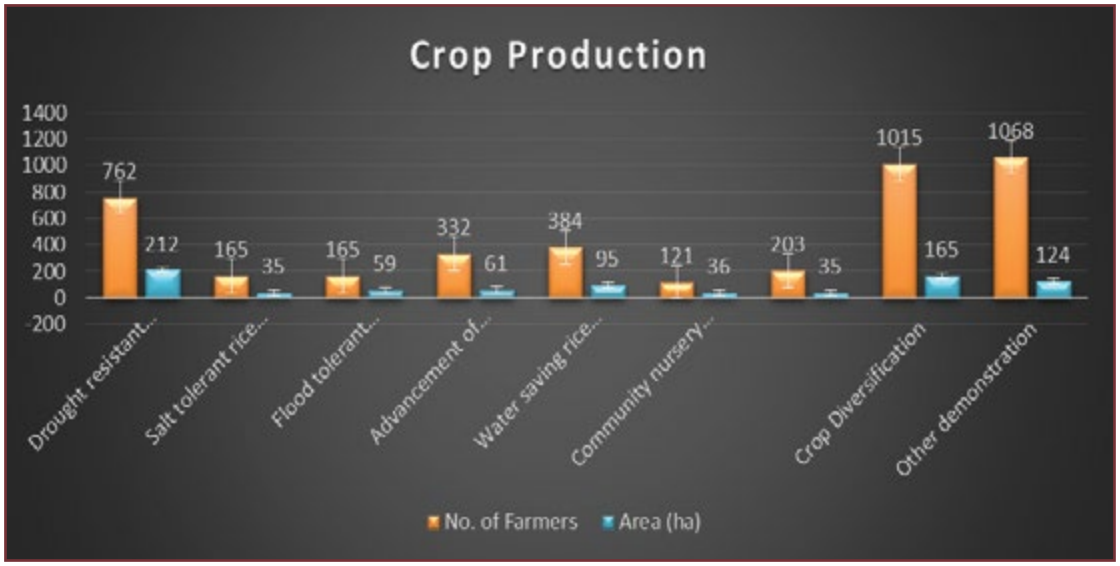
Natural Resource Management

In seventeen NICRA-adopted villages, including 212 hectares with 887 farmers, various demonstrations of in-situ moisture conservation techniques, including summer ploughing, green manuring, zero tillage, organic mulching, etc., have been carried out. The farmers of A&N Island were significantly impacted by the Broad Bed and Furrow intervention. To improve water efficiency and prevent water logging, maize is seeded using the ridge and furrow technique. To improve water efficiency and prevent water logging, maize is seeded using the ridge and furrow technique. The various KVKs demonstrated water collection and recycling for supplemental irrigation in adopted villages by rehabilitating ponds, wells, and canals, as well as creating bunds. More than 71 hectares of land farmed by 265 farmers successfully used the conservation tillage approach for resource conservation using wheat, lentils, and chickpeas. 212 farmer farms across 112 hectares in NICRA-adopted areas showcased the use of micro-lift irrigation for rice, LEWA for rice, RBF for brinjal, and spray irrigation. A total of 74 new and 55 repaired rainwater harvesting structures have been built, offering 565 hectares of protected irrigation potential and a combined storage capacity of 1.05 million cubic meters. This method raised cropping intensity by as much as 250%. Field bundling, water management, and SRI via subsoiler in rice, which are all seen on farmer's fields, are examples of artificial ground water recharge techniques. This module provided 811 hectares of land worth of benefits to 2542 different farmers in total. Number of farmers and area covered of different intervention under this module are as follow:



Crop Production

A variety of area-specific strategies were put into place under the Crop Production module, including exhibiting drought, salt, and flood-tolerant/resistant cultivars; delaying the Rabi crop planting dates to avoid terminal heat stress; employing water-saving paddy cultivation methods like SRI, aerobic, and direct seedling; establishing community nurseries to postpone the monsoon; introducing new crops and crop diversification; and offering custodial care. 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 762 farmer fields over 212 hectares. A total of 35 ha were used to test 165 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 332 farms cover 61 hectares of land owned by farmers. A 36 hectare area was covered for spaced-out community nurseries of rice, brinjal, cauliflower, and tomato, with the aim of benefiting 121 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 165 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 4215 farmers in total, covering 822 hectares of land. Number of farmers and area covered of different intervention under this module are as follow:






Livestock and Fisheries

Numerous livestock-focused interventions were put into place, including breeding better animals, controlling the balance of feed and fodder using mineral mixtures, making silage and feed blocks, feeding azollas, enhancing shelters to reduce heat stress in livestock, and maintaining fish ponds and tanks during periods of excess and water scarcity.For survival, animals in rainfed regions require a consistent source of dry or green feed. Conditions of low precipitation and delayed onset were observed in several states. The total amount of land planted with pulses and millets, which are crucial for producing fodder in rainfed areas, has decreased. Silage and rice-bean fodder production increased on farmer farms. Community lands employ a large number of farmers for various forms of fodder production, were on show in a number of adopted villages. The 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. Poultry and dairy animals performed better in better shelter with adequate space. It has been demonstrated that better shelter reduces heat stress, increasing the survival rate of dairy and poultry raised in backyards. A total of 2361 number of farmers are benefitted from this module.

Institutional Intervention

Commodity groups, seed and fodder banks, custom hiring for timely operations, communal selling, irrigation, community nursery rearing, and awareness-raising are examples of institutional interventions that have been implemented in nearly all NICRA village areas. This intervention has benefited a total of 5321 individuals. A power tiller, reaper, water pump, raised bed planter, sprayer, zero-till drill, and weeder are just a few of the many agricultural equipment that can be found at Custom Hiring Centre. Farmers can receive weather forecasts from Automatic Weather Station (AWS).

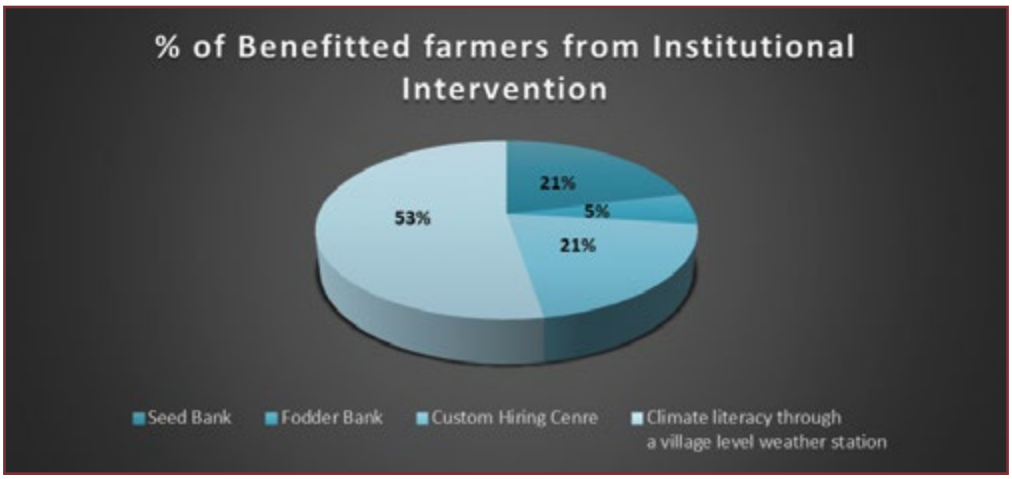


Fig: % of benefitted farmers from Institutional Intervention

Village Climate Risk Management Committee (VCRMC)

The Village Climate Risk Management Committee (VCRMC) was created following in-depth talks with the villagers about the strategies to be used under this program and how to lessen the villages' climatic vulnerabilities. VCRMC's operations began when the President of VCRMC and the Head of the relevant KVK jointly opened a bank account in their names. Together with managing the special rental of various farm equipments, VCRMC also worked with the KVK to make important decisions about the technical interventions that would be implemented in the village. At Custom Hiring Centre, you can find farm equipment including a power tiller, thresher, reaper, water pump, zero-till drill, raised bed planter, sprayer, and weeder.

Custom hiring of farm implements and machinery at NICRA adopted villages

The VCRMC supervised the custom hiring of various farm tools and implements, which has grown to be very popular with the farmers and has generated a significant amount of revenue, in addition to consulting the KVK when making crucial decisions about the technological interventions to be implemented in the village. In order to adapt to climate change, agricultural activities must be timely, especially when planting and working across cultural boundaries. The widespread use of resilient techniques for retaining in situ soil moisture and draining surplus water in heavy soils depends on having access to equipment for planting on raised beds, broad bed furrows, and ridge-furrows. 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 levellers, reapers, threshers, cultivators, rotavators, pumpsets, zero-till drills, Happy Seeders, BBF planters, drum seeders, multicrop planters, power weeders, mechanical weeders, chaff cutters, conoweeders, duster, sprayers, levellers, FIRB planters, sub-soilers, zero-till ferti-seed, disc harrows, bucket levellers, reapers, threshers, scrubbers, and other equipment.

Table: Revenue generated through Custom Hiring Centres and VCRMC in KVKs during 2024

Sl. No.	Name of KVK	Revenue Generated (Rs.)	
		From Custom Hiring Centres	Total Under VCRMC
1	Bhadrak	8700	19250
2	Bolangir	11200	11200
3	Dhenkanal	8500	8500
4	Ganjam I	12420	0
5	Jagatsinghpur	76000	76000
6	Kalahandi	3660	3840
7	Kendrapara	16700	10400
8	Keonjhar	1500	1500
9	Puri	18500	82000
10	Coochbehar	18800	78600
11	Darjeeling	0	2340
12	Malda	1500	5380
13	Murshidabad	18467	32246
14	Purulia	25600	118500
15	North 24 Parganas	42000	148000
16	South 24 Parganas	125694	125694
17	Port Blair	91320	91320
Total		**480561**	**814770**




Capacity building

The thematic areas covered by 5250 (2932 farmers and 2318 farm women) farmers include 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 management.

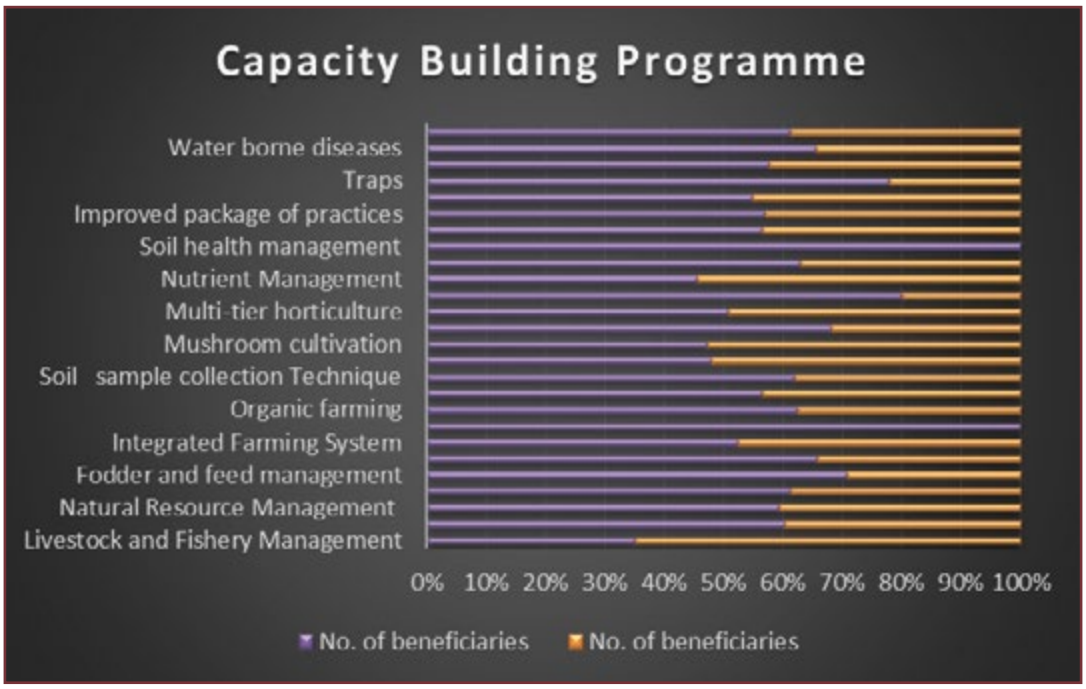


Fig: Beneficiaries under Capacity Building Programme

Extension activities

A total of 510 Extension activities covering a range of topics were provided to 14245 working farmers (8798 men and 5447 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 kisan mela were some of the extension activities that were carried out. World Soil Day was marked on December 5, 2024, in the appropriate KVK, and a large number of 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	44	580	312	892
Group meetings	26	521	296	817
Field day	25	444	320	764
Exposure visits	29	560	230	790
Awareness Campaigns	31	613	510	1123
ICT based extension services	20	475	256	731
Diagnostic visit	56	505	290	795
Field Visit	16	614	395	1009
World Environment Day Celebration	18	450	290	740
Live Webcasting	20	349	303	652
Strengthening SHGs	12	0	410	410
Strengthening kisan clubs	12	101	80	181
Other Training Courses	51	910	345	1255
KMAS Services	11	151	78	229
Popular extension literature	35	452	325	777
Animal Health Camp	55	990	293	1283
NICRA Workshop	1	67	22	89
Scientist visit to field	36	356	280	636
Kisan Mela	12	660	412	1072
Total	**510**	**8798**	**5447**	**14245**

Convergence by NICRA with ongoing development programmes

NICRA KVKs conducted a large number of Convergence mode interventions throughout the year. Funding from a number of development programs allowed successful community initiatives to be scaled up. Through a large number of convergence programs, the NICRA established

KVK with ongoing development plans or schemes in 2024. Prominent development schemes include the SCSP, the MGNREGA, the Forest Department, the Irrigation Department, the Sundarban Development Board, the ICAR Institutes, and several state departments. Throughout the year, a substantial amount has been generated using these schemes.

14.2 Cluster Frontline Demonstrations (CFLD)

14.2.1 Oilseeds

Nodal Scientist: Dr. P.P. Pal and Dr. A. Haldar

The Cluster Frontline Demonstration (CFLD) on Oilseeds programme has been a flagship initiative

of the Department of Agriculture & Farmers Welfare (DA&FW) since its inception in 2015–16, aimed at boosting oilseed production and improving farmers' livelihoods. In West Bengal and Odisha, the programme has been effectively implemented by ICAR-ATARI, Kolkata, through an extensive network of Krishi Vigyan Kendras (KVKs).Over

the years, KVKs have successfully demonstrated a wide array of improved technologies under this initiative. These include the adoption of high-yielding varieties, scientific seed treatment,

Integrated Pest Management (IPM), Integrated Nutrient Management (INM), and efficient irrigation techniques. These interventions have not only enhanced crop productivity, but also promoted sustainable farming practices.

During the summer season 2024, 34 KVKs in West Bengal (18) and Odisha (16) conducted a total of 621 ha under CFLDs on oilseeds programme. Among the various oilseed crops during summer season (Table 1), sesame received the highest focus, with 1,065 demonstrations conducted across 256 ha in West Bengal and 150 ha in Odisha. These demonstrations resulted in remarkable yield improvements, with increases of 32.42% in West

Bengal and 32.03% in Odisha compared to farmers' traditional practices. Among sesame varieties, **Suprava, Unnat Rama,** and **Smarak** performed exceptionally well, with yield improvements between **30% and33%**. Sunflower cultivation also

saw strong promotion during the summer season. A total of 475 demonstrations were carried out, covering 110 ha in West Bengal and 80 ha in Odisha. The results were quite encouraging, with yield increases of 36.13% in West Bengal and 43.36% in Odisha. The **Sunflower variety KBSH-78 and MFSH-17** showed a yield increase of **40-45%**. For groundnut, 64 CFLDs were conducted over 25 ha in Odisha, which recorded a yield improvement of 38.42%. Groundnut varieties **Dharani** and **Kadri Lepakshi** recorded significant yield gains ranging from **32% to 36%**.These results clearly highlight the positive impact of CFLDs in disseminating improved technologies and farming practices, contributing to enhanced productivity and better returns for farmers during the summer cropping season.

Table: State- and crop-wise performance of CFLD Oilseeds during summer 2024

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	Sesame	815	326	690	256	10.17	7.68	32.42	2.49
		Sunflower	400	160	275	110	13.94	10.24	36.13	3.7
2	Odisha	Sesame	400	160	375	150	8.12	6.15	32.03	2.97
		Sunflower	375	150	200	80	14.38	10.03	43.36	4.35
		Groundnut	64	25	64	25	23.49	16.97	38.42	6.52
Total			**2054**	**821**	**1604**	**621**				

In the Kharif season of 2024, 24 KVKs in West Bengal (8) and Odisha (16) conducted a total of 3,380 demonstrations under the CFLD Oilseeds

programme. These covered 400 ha in West Bengal and 860 ha in Odisha. Among the oilseed crops (Table 2), sesame had the highest number

of demonstrations (1,823), followed by groundnut (1,257) and niger (300). Sesame varieties Suprava,

Unnat Rama, and Smarak delivered impressive gain yield increase of 35–40%.In West Bengal, sesame

recorded the highest yield improvement at 43.29%, while in Odisha, the increase was 35%. Yield gains in groundnut were also noteworthy, standing at

32.05% in West Bengal and 32.9% in Odisha. Notably, groundnut varieties Dharani and Kadri Lepakshi achieved yield increases of 34–37%. In the case of niger, a yield improvement of 29.03% was observed in Odisha. Niger variety Utkal Niger-150 showed 29.03% increase in yield. These outcomes highlight the effectiveness of CFLD interventions in enhancing oilseed productivity during the Kharif season and demonstrate the value of adopting improved technologies at the farm level. The programme has led to a consistent increase in both yield and farmers' net income, earning widespread recognition and appreciation from the farming community. Its visible impact on productivity and profitability has significantly encouraged the wider adoption of these technologies, thereby contributing to the overall goal of achieving self-reliance in oilseed production and improving the economic well-being of farmers in the region.

Table: State- and crop-wise performance of CFLD Oilseeds during Kharif 2024

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	280	700	220	757	23.81	18.03	32.05	5.78
		Sesame	180	450	180	665	8.01	5.59	43.29	2.42
2	Odisha	Groundnut	320	800	200	500	20.56	15.47	32.90	5.09
		Sesame	640	1600	540	1158	6.21	4.6	35.0	1.61
		Niger	120	300	120	300	4.0	3.1	29.03	0.9
	Total		**1540**	**3850**	**1260**	**3380**				

14.2.2 Oilseed Model Village Programme

Nodal Scientist: Dr. P.P. Pal and Dr. A. Haldar

India ranks among the world's top consumers of edible oils; however, domestic production has not kept pace with the rising demand, leading to a significant reliance on imports. This dependence makes the country vulnerable to global price fluctuations and disruptions in international supply chains. Additionally, challenges such as climate change, volatile food prices, and the degradation of natural resources underscore the urgent need for more sustainable and efficient agricultural practices in oilseed cultivation. The Oilseed Model Village (OMV) initiative has been introduced to address these concerns by promoting best practices that enhance productivity and reduce import dependency. OMVs focus on environmentally sustainable methods, including Integrated Pest Management (IPM), water conservation, and soil health management, all of which contribute to long-term agricultural sustainability. By increasing domestic oilseed production through such initiatives, India can strengthen its food and nutritional security, reduce its exposure to global market uncertainties, and progress towards a more self-reliant and resilient agricultural economy.

Oilseed Model Village (OMV) programme has been successfully implemented in total of 12 KVKs, including 6 KVKs of West Bengal (Birbhum, Coochbehar, Malda, Murshidabad Additional,

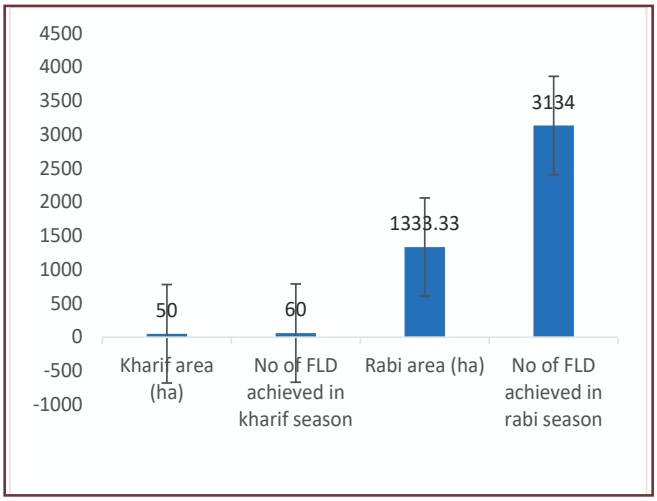


Fig: Total achieved area and demonstration under OMV programme during kharif and rabi season in 2024-25

Purba Medinipur and Uttar Dinajpur) and 6 KVKs of Odisha (Bargarh, Dhenkanal, Kandhamal, Keonjhar, Puri and Mayurbhanj 1) in 2024-2025. OMV was successfully implemented in 1383.33 ha for kharif and rabi season (Fig. 1), while the target was 2400 ha including summer season.

During kharif season, 50 ha land was covered with sesame crop (var. Suprava) involving 60 farmers by Dhenkanal KVK (Table 1). The yield of sesame under demonstration was recorded at 642 kg/ha, reflecting a 52.49% increase in yield compared to the check yield (421 kg/ha).

Table: State- and crop-wise performance of OMV during kharif season in 2024-25

Name of KVK	Crop	Variety Used	No. of FLD achieved		Area (ha)		Yield (kg/ha)		
			Target	Achieved	Target	Achieved	Demo	Local check	Increase in yield (%)
Dhenkanal KVK	Sesame	Suprava	125	60	50	50	642	421	52.49

The Table below showed state- and crop-wise performance of OMV during rabi season in 2024-25. In the rabi season, oilseed coverage expanded to 1333.33 ha out of a targeted area of 1575 ha, facilitated by 3134 demonstrations. In West Bengal,

533.33 ha was covered under rabi season with the participation of 1753 farmers. Mustard was covered in 363.33 ha through 1369 demonstrations. The

average yield of mustard reached 1432.8 kg/ha, reflecting a 27.21% increase compared to the check

plot. Groundnut was demonstrated by 2 KVKs, with an average yield of 3540 kg/ha benefiting 384 farmers, which indicated a 23.09% increase in yield.

In Odisha, 800 ha was covered under oilseeds in rabi season through 1381 demonstrations. Mustard was cultivated in 400 ha with the involvement of 558 farmers. Average yield of mustard was 688.5 kg/ha, which recorded 43.41% increase in yield. Groundnut was cultivated in 350 ha through 698 demonstrations, with an average yield of 2164.67 kg/ha, which was 37.11% higher than the check yield. Sunflower was cultivated on 50 ha by one KVK during the rabi season through 125 demonstrations, with an average yield recorded at 1340.10 kg/ha, marking a 63.40% increase over the check yield.

Sesame variety 'Suprava', Groundnut variety 'Kadri Lepakshi (K 1812)' and Mustard variety 'Pan Sweta', 'CS 60' etc exhibited better performances in terms of growth and yield. Eight on-campus and 46 off-

campus trainings on scientific cultivation and promotion of Oilseeds were organized by KVKs. A total of 251 number of diagnostics visits and 27 number of field days was conducted by KVKs. To monitor, investigate and evaluate the OMV activities, 4 numbers of field visits were conducted by ICAR-ATARI, Kolkata.

Table: State- and crop-wise performance of OMV during rabi season in 2024-25

Crop	Name of KVK	Variety	No. of FLD		Area (ha)		Yield (kg/ha)		
			Targets	Achieved	Targets	Achieved	Demo	Local	% increase in yield
West Bengal									
Mustard	Birbhum, Coochbehar, Malda, Murshidabad Additional, Purba Medinipur	PM-28, CS 60, PM 30, Pan Sweta	1524	1369	505	363.33	1432.8	1069.2	27.21
Ground Nut	Murshidabad Additional, Purba Medinipur	Kadiri lepakshi (K 1812)	390	384	220	170	3540	2875	23.09
Odisha									
Mustard	Bargarh, Dhenkanal, Kandhamal, Keonjhar	Sushree, PM 30	748	558	450	400	688.5	502.75	43.41
Ground nut	Dhenkanal, Mayurbhanj 1, Puri	Kadiri lepakshi (K 1812)	798	698	350	350	2164.67	1634.67	37.11
Sunflower	Kandhamal	KBSH 78	125	125	50	50	1340.10	820	63.43
Total			**3585**	**3134**	**1575**	**1333.33**			

14.2.3 Pulses

Nodal Scientist: Dr. P.P. Pal and Dr. A. Haldar

India is the world's largest producer and consumer of pulses, the Government of India aims to achieve self-sufficiency in pulses by 2027–2028. In countries like Canada, Australia, and Myanmar, a significant

portion of the pulses produced are intended for Indian consumption. About 2.5–3 million tonnes of pulses are imported by the Indian government each year to meet domestic demand. In order to close the gap between edible pulse production and consumption, Department of Agriculture and

Farmers Welfare, GoI approved the Cluster Front Line Demonstration (CFLD) initiative on pulses in all Agricultural Technology Application Research Institutes (ATARI). Similar to this, ICAR-ATARI, Kolkata carried out this programme through KVKs with the aim of increasing pulse production

and productivity using location-specific tested technologies and suitable upgraded varieties.

The CFLD programme on pulses, especially lentil was implemented with a 100% achievement of fulfilling the target of 200 ha coverage in two districts involving 4 KVKs in West Bengal (Nadia, Nadia Addl., Murshidabad and Murshidabad Addl.) under Zone V during the rabi season of 2024-25. The varieties L-4717 (Pusa Ageti) and IPL-220 resulted 12 to 24 per cent increase in average

yield when compared to farmer's practice. Recent technologies like to seed treatment, line sowing, integrated nutrient management, micronutrients like Zn & S application, use of herbicide, integrated pest management were demonstrated in farmers' field for these demonstrations. About 739 farmers were benefited by exploring new varieties and new technologies for pulse cultivation. KVKs organized 12 field days and 16 on-campus and off-campus training. The details are given in table below:

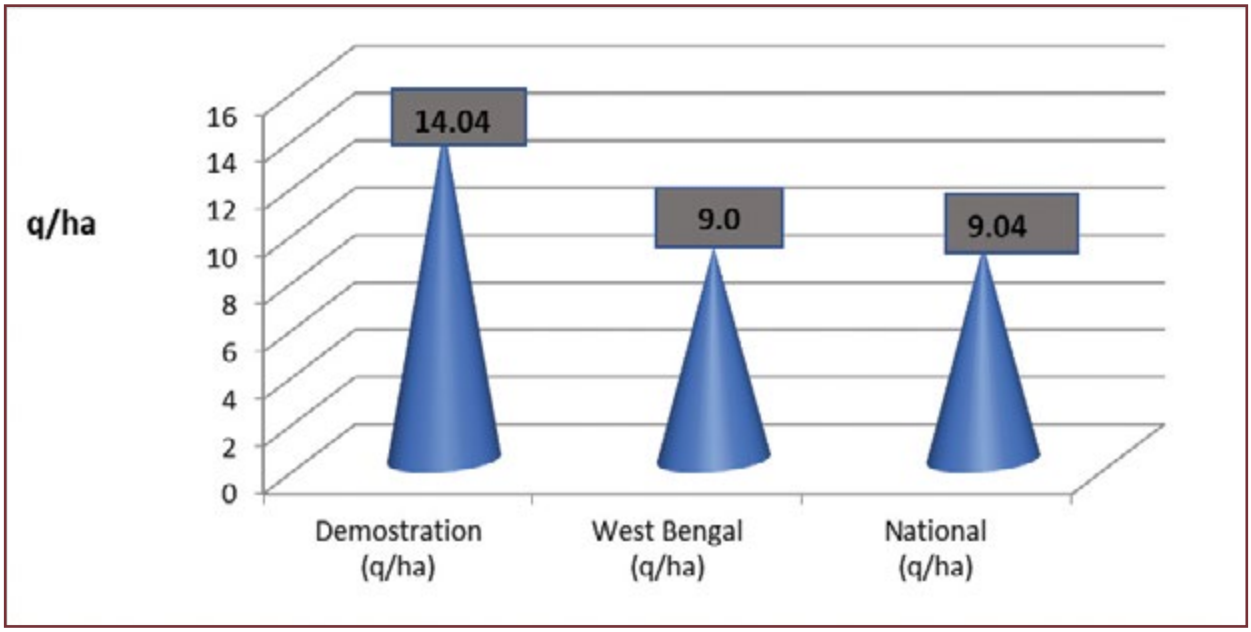


Fig: Comparison of demonstration yield with state and national yield of Lentil

Table: Cluster Frontline Demonstration on Lentil (rabi)

Name of crop	State	Target of FLD approved		Achievements of FLD		Yield (q/ha)		Increase % over check	Difference in yield (q/ha)
		No. of Demo.	Area (ha)	No. of Demo.	Area (ha)	Demo	Check		
Lentil	West Bengal	500	200	500	200	14.04	11.19	25.45	2.85
Total		**500**	**200**	**500**	**200**	**14.04**	**11.19**	**25.45**	**2.85**

Success Story for CFLD Pulses 2024-25

Name of KVK — Murshidabad KVK

Name of Farmer & Address — **Sairul Hoque**
Vill - Sekhpara, PO+PS-Bhagwangola,
Dist. - Murshidabad

Crop and variety — Lentil, Var.-IPL-220

Details of technology demonstrated — Application of RDF @ 30:60:60 per hectare and Seed inoculation with Consortia Biofertilizer @ 20ml/kg seed. Foliar spray of Zinc EDTA 12% @ 1gm/l and Boron 20% @ 2gm/l of water at the pre flowering and pod development stage.

Success point — Yield increases as well as increase in net income through adoption of high yielding fortified lentil variety IPL-220 and disease resistance.

Farmer feedback

1. The seed yield increased from 12.10 quintal to 14.30 quintal per hectare.
2. More number of branches and pod formation.
3. Less infestation of wilt.
4. More tasty than local variety.

Yield (q/ha)

- Potential yield of variety — 14 quintal/ha
- District average (Previous year) — 10.50 quintal/ha
- State average (Previous year) — 10.35 quintal/ha

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

Used Practice	Yield (q/ha)	Gross cost (Rs/ha)	Gross income (Rs/ha)	Net income (Rs/ha)	B:C ratio
Farmer practices	12.10	33450	78600	45150	2.35
Demonstration	14.30	33750	91800	58050	2.72
% Increase in yield	18.20				

14.2.4 Ensuring pulses sufficiency in India by capitalizing the Pulse Model Village (PMV) approach

Nodal Scientist: Dr. P.P. Pal and Dr. A. Haldar

Pulses remain the third largest imported agricultural commodities after edible oils and fresh fruits. For making the country self-reliant in pulses, it is imperative to sustain recent growth in pulse production. Any increase in area would also have a positive impact on nutrition, human health and environment and thus would aid achieving the country's commitments to the Sustainable Development Goals (SDGs).The production of pulses is influenced by a number of factors, including unfavourable weather, unusual soil, various agronomic restrictions, pests and diseases, regulatory concerns, credit, and pulse marketing. India's pulse production has been locked in a vicious cycle of low and unpredictable yields. Farmers are less inclined to cultivate pulses on fertile, irrigated land because of the low and variable yields and poor per hectare returns. The key contributing factors to these crops' output stagnation include limited irrigation, increased price volatility, production risk, and inadequate adoption of production technologies. Interventions

by the government as part of the expected supply response to the pulse shortage did not completely solve the issue.

To achieve self-sufficiency in pulses, quality and timely supply of seed of farmers preferred varieties, Pulse Model Village (PMV) programme has been initiated in 4 districts of Odisha, namely, Angul, Jajpur, Kalahandi and Nuapada. The PMV concept is an extension of CFLD aiming at

adoption of a whole-village approach for pulse crop promotion and developing self-sustaining pulse production clusters at the village level. PMV aims to significantly improve pulse production, processing and marketing within a selected village by building robust backward and forward linkages

and make the Model village for pulse production. The PMV approach involves the establishment of pilot villages where best practices in pulse cultivation, processing, and marketing shall be demonstrated and disseminated in the village itself and out scaled in the surrounding areas. Besides providing high-yielding quality seeds, and advanced technologies scientific agronomic practices, an aim of PMV is to establish the farmer groups and cooperativesfor better market linkage and input supply.

The PMV programme was implemented in 4 districts of Odisha (Angul, Jajpur, Kalahandi and Nuapada) during 2024-25. Two village clusters in each district were selected. In every village cluster, 150 ha was covered across all three cropping seasons. The KVKs were linked with the state and central level seed production agencies for arranging quality seeds, other related inputs and ensuring the certification through proper registration and monitoring of seed production fields by these

agencies. The major focus was on pigeon pea and black gram (kharif), lentil and blackgram (rabi) and black gram (spring/summer). In kharif season, the targeted area of 530 ha was brought under demonstration of pigeonpea (320ha) and blackgram (210ha). The promising varieties taken up were PRG 176, LRG 52, LBG 787. For pigeonpea, the average percentage increase in yield was 35-

38%, while blackgram showed an increase of 21-38%. Lentil and blackgram were demonstrated in rabi season in 510 ha. Out of 1200 ha target area, 1040 ha was covered by pulses model village as depicted in the table below.

Table: Pulse Model Villages under ICAR-ATARI Kolkata during 2024

Sl. no	Name of KVK	Name of Crop	Kharif				Rabi				Target (ha)	Conducted (ha)
			Allotted		Conducted		Allotted		Conducted			
			Area (ha)	Demo (no.)	Area (ha)	Demo (no.)	Area (ha)	Demo (no.)	Area (ha)	Demo (no.)		
1	Jajpur	Lentil	0	0	0	0	150	375	150	375	150	150
		Blackgram	0	0	0	0	150	375	150	375	150	150
	Sub-total		**0**	**0**	**0**	**0**	**300**	**750**	**300**	**750**	**300**	**300**
2	Kalahandi	Pigeonpea	120	300	120	300	0	0	0	0	120	120
		Blackgram	130	325	130	325	0	0	0	0	130	130
		Lentil	0	0	0	0	50	125	50	125	50	50
	Sub-total		**250**	**625**	**250**	**625**	**50**	**125**	**50**	**125**	**300**	**300**
3	Angul	Pigeonpea	100	250	100	250	0	0	0	0	100	100
		Blackgram	40	100	40	100	160	400	0	0	200	40
	Sub-total		**140**	**350**	**140**	**350**	**160**	**400**	**0**	**0**	**300**	**140**
4	Nuapada	Pigeonpea	100	250	100	250	0	0	0	0	100	100
		Blackgram	40	100	40	100	40	100	40	100	80	80
		Lentil	0	0	0	0	120	300	120	300	120	120
	Sub-total		**140**	**350**	**140**	**350**	**160**	**400**	**160**	**400**	**300**	300
	Total		**530**	**1325**	**530**	**1325**	**670**	**1675**	**510**	**1275**	**1200**	**1040**

14.2.5 KRISHI MApper Mobile App

Nodal Scientist: Dr. P.P. Pal

KRISHI MApper Mobile App is a geospatial mobile and web application for geo-fencing of agricultural land, geo-tagging of land area and collection of baselines land-based scheme data to ensure right benefits reach the right beneficiaries and there is transparency in the system. It is a user-friendly platform that enables valuable insights for improved farm management and evidence-based monitoring. KRISHI MApper platform helps the users to view the consolidated and comprehensive information pertaining to farmer's agricultural activities across schemes. It allows for the geo-tagging of individual CFLD plots, creating a digital map of the demonstration area. Additionally, the application makes geo-fencing easier, which improves accuracy by enabling the demarcation of the demonstration area's limits. The CFLD program was effectively monitored on real-time information and geospatial data. For both crops, namely oilseeds and pulses, 3517 beneficiaries had registered using this application as part of the CFLD program.

National Food Security Mission, Department of Agriculture & Farmers Welfare

|| KRISHI MAPPER GEO REFERENCING REPORT ||

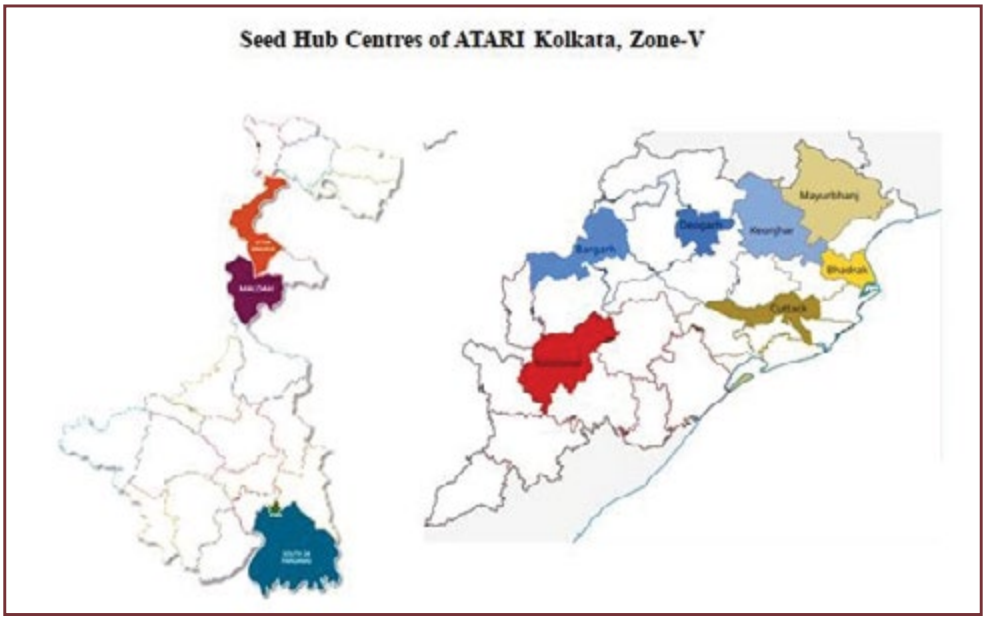
S. No.	Financial Year	Crops Group	ATARI	Organization (KVKs)	Total No. of Beneficiary
1	2024-2025	Pulses	ATARI Zone V	Murshidabad, Nadia, Nadia (Addl.)	249
2	2024-2025	Oilseeds	ATARI Zone V	Sambalpur, Rayagarh, Nuapada, Mayurbhanj I, Malkangiri, Ganjam I, Gajapati ,Deogarh, Angul, Purulia, Purba Medinipur, North 24 Parganas, Nadia (Addl.), Murshidabad (Addl.), Murshidabad, Malda, Birbhum, Bankura	3268
	Total				**3517**

14.3 Seed Hubs for Increasing Indigenous Production of Pulses in India

Nodal Scientist: Dr. P.P. Pal and Dr. A. Haldar

A key component of raising pulse productivity is the availability of high-quality seed locally. To ensure a reliable and consistent supply of high-quality seeds to farmers, the Department of Agriculture and Farmers Welfare, Government of India, has taken the initiative to create Seed-Hubs as part of the ICAR project "Creation of seed hubs for increasing indigenous production of pulses in India."

As the project's Nodal Agency, ICAR-IIPR, Kanpur is in charge of establishing seed hubs and provide technical assistance to ensure high-quality seed production. In the first year of the project, each seed hub was allotted a one-time grant of Rs. 50 lakhs to build infrastructure (a seed processing plant and storage facility). Additionally, each seed centre has been given Rs. 100 lakhs as a revolving fund to cover various expenses related to seed production, procurement, and processing in 2016–18. The money made from the sale of seeds can be used by Seed-Hub to build additional facilities, hire staff, and other things that are necessary to increase the production of high-quality pulse seeds.



There are ten (10) seed hubs under ICAR-ATARI, Kolkata, Zone V, three (03) seed hubs in West Bengal (Narendrapur, CISH-Malda, and Uttar Dinajpur) and seven (07) seed hubs in Odisha (Baragarh, Bhadrak, Cuttack, Deogarh, Kalahandi, Keonjhar, and Mayurbhanj I). A quantity of 468.54 q of seeds was produced in the years 2024, of foundation and certified seeds of blackgram, greengram, pigeonpea, lentil and lathyrus.

Table: Seed Production Report of Seed Hub Centres of ATARI-Kolkata during 2024

Sl. No.	Seed centre Name	Season	Crop	Variety	Target (q)	Production (q)	Category of Seed
1	Bargarh	Kharif	Arhar	Amaravati	100	14	C/S
		Rabi	Green gram	Virat	100	22.4	C/S
2	Deogarh	Rabi	Green gram	Virat	20	3.34	F/S
3	Uttar Dinajpur	Spring	Greengram	IPM – 2-03, IPM – 2-14 IPM-410-3	250	19.2	F/S & C/S
			Blackgram	PU-7, PU-8, VBN-9, IPU-10-26, IPU-11-02	250	89.4	F/S & C/S
		Rabi	Lentil	KLS-122, IPL 220, L -4717, PL-9 7 KLS-320	50	5.2	F/S & C/S
			Lathyrus	Bidhan Khesari-1	100	50	TLS
				Mahateora		60	C/S
Total					**1070**	**468.54**	

14.4 Farmer FIRST Programme

Nodal Scientist: Dr. K.S. Das

The Farmer FIRST Programme was an ICAR initiative that moved beyond mere production and productivity to prioritize smallholder agriculture and the complex, diverse and risk-prone realities faced by the majority of farmers. The program focused on enhancing the interface between farmers and scientists by emphasizing resource management, climate-resilient agriculture, production management, storage, market, supply chains, value chains, innovation systems, information systems etc. Farmer FIRST provided a platform for researchers, extension professionals and farmers to collaborate and found solutions to common problems such as production and natural resource management, where farmers might lack expertise or solutions. Through the initiative, farmers could share their experiences and innovative ideas, while researchers and extension professionals offered scientific and technical knowledge. This farmer-centric approach enabled joint problem-solving and ensured that solutions were tailored to farmers' specific needs and realities.

In addition to four FFP centres under this zone, the Council sanctioned a new centre at West Bengal University of Animal & Fishery Sciences (WBUA&FS), Kolkata on February, 2025 under FFP. The details of five projects are shown in the following table.

Sl. No.	Name of the project (Institute/ University)	Name of the PI/ Nodal Scientist of the project	Fund allocated during 2024-25 (Rs. in lakh)	Fund utilized during 2024-25 (Rs. in lakh)
01.	Increasing productivity and sustaining the rice-based production system through Farmer FIRST approach (*ICAR- Central Rice Research Institute, Cuttack*)	Dr. B. Mondal, Pr. Scientist	12.938	12.924
02.	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	12.938	12.938
03.	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	12.938	12.938
04.	Enhancing farm productivity & profitability with 'Farmer FIRST' focus in Khordha district of Odisha (OUAT, Bhubaneswar)	Prof. B. K. Mahapatra (Head, Agronomy	12.938	12.938
05.	Livelihood Empowerment & Entrepreneurship Through Scientific Animal Husbandry & Allied Intervention Practices *(WBUAFS-West Bengal University of Animal & Fishery Sciences, Kolkata)*	Dr. S. Biswas, Professor, Deptt. of Veterinary & Animal Husbandry Extension Education	1.050	1.050

Sl. No.	Name of the project (Institute/ University)	Name of the PI/ Nodal Scientist of the project	Fund allocated during 2024-25 (Rs. in lakh)	Fund utilized during 2024-25 (Rs. in lakh)
06.	*ICAR-Agricultural Technology Application Research Institute (ATARI) Kolkata* as Nodal Institute	Dr. K. S. Das, Pr. Scientist	6.198	6.193
Total			**59.000**	**58.981**

One Zonal Review Workshop in hybrid mode were organised by this office for five FFP Institutes/ Universities to review the physical/financial progress (2024-25) of the projects and to finalize the action plan (2025-26). One monitoring field visits involving PIs/Co-PIs/SRFs/FAs of two 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 year 2024-25, 2152 farm families were involved in 699demonstrations under crop, horticulture, livestock/fisheries, IFS, enterprise and NRM modules. Throughout the year a total of 75 programmes on various extension activities were conducted which benefitted 3221farmers.

Salient achievements of projects

The institute-wise salient achievements of FFP during the year 2024-25 have been presented below.

ICAR-CIFA, Bhubaneswar

ICAR-CIFA, Bhubaneswar organized four Farmer-Scientist Interaction Programs in Taraboi, Barijanga, Turintira and Purohitpur village which benefitted 560 farmers. Kisan Diwas was celebrated on 23rd Dec., 2024 at Barijanga. On 10th July, 2024, National Fish Farmers' Day was celebrated with 30 FFP farmers. Mr. A. K. Swain received the Progressive Fish Farmers' Award on 13th July. An exhibition facilitated interaction with Union Minister Rajiv Ranjan Singh and MoS George Kurian on 12th September. A Kisan Mela was organized for 460 participants and out of total farmers participated, 150 were from 14 FFP villages on 29th Jan., 2025. Field monitoring visit was done by Dr. K. S. Das, Nodal Scientist of FFP, ATARI Kolkata for three villages and he also participated interface meeting on 28th Feb., 2025. During 2024–25, ICAR-CIFA, Bhubaneswar implemented FFP across six villages in Khordha district namely, Loi, Barijanga, Purohitpur (Balianta block), and Bramhanakhandi, Taraboi, Turintira (Balipatna block) benefiting 256 small/marginal/SC/ ST/women farmers. Under Farmer-Scientist Interface, 4 interaction programs, 85 field visits and 5 field days were conducted which covered total 1453 farmers in the district. Module-wise achievements are given below.

Crop based module: Integrated nutrient management in paddy was adopted in 50 ac land by 45 farmers which resulted an average yield of 6 t/ha with a net return of Rs. 55000/- and B:C ratio of 1.68.

Fishery based module: Scientific fish farming covered 15 acres and benefited 110 farmers. It yielded 3 t/ha with a net return of Rs. 239900/- per ha and B:C ratio of 2.14 over traditional farming

(2.3 t/ha, Rs. 1,46,900 and B:C 1.84, respectively). Recommended practice and carp seed rearing yielded 1100 kg/ha fingerlings and 1800 kg/ha

grow-out fish with net income of Rs. 328600/- and B:C ratio of 2.79 compared to traditional culture (fry to grow out 2500 kg/ha, Rs. 179100/- and B:C ratio of 2.09, respectively).

Horticulture based module: The horticulture module included several improved varieties of different vegetables. Cauliflower (thermo-insensitive var. *Fujiyama*) cultivation in 2 ac by 35 farmers that produced 20 t/ha and fetched Rs. 208660/- with B:C ratio of 2.28 against local varieties yielded 18 t/ha and earned Rs. 165674/- with B:C 1.72. French bean (*Arka arjuna* and *Arka sharath*) was cultivated in 2.5 ac by 35 farmers which yielded 14 t/ha and resulted earning of Rs. 461950/- per ha with B:C 2.71 against 10 t/ha, Rs.

279250/- and B:C-1.64, respectively from older varieties (*Arka komal* and *Arka suvidha*). In addition, bitter gourd (*Rushaan*) was cultivated in 6.5 ac land which yielded 8 t/ha and fetched Rs. 243856/- with B:C ratio of 1.56 compared to the respective value of 6.5 t/ha, Rs. 168750/-, B:C:: 1.08:1.0 from US 1315 Nunhemps. Improved pumpkin and okra (*Ritika*) yielded 25 t/ha and 16.55 t/ha, earned Rs. 241667/- and Rs. 445916.67/ha, and B:C- 4.14 and 4.34, respectively.

Livestock based module: Poultry birds (*Vanaraja* and *RIR* breed*)* were reared under backyard system by 12 farmers which involved 20 birds per farmer. Per unit/farmer resulted 60 kg meat, earning of Rs. 9000/- with B:C ratio of 1.53 compared to the traditional practice (45 kg, Rs. 6,750/- and 1.08, respectively).

IFS based module: The integrated farming system module established six fish-based IFS units across 15 ac area which involved eight farmers.

Enterprise based module: Paddy straw mushroom were cultivated by 8 farmers during the period. During 6 months, a total of 6 tonnes mushroom was produced from 10,000 beds which generated a total income of Rs. 500000/-.

Moreover, stories of successful farmers in Odia were documented and published in the form of booklet and distributed among farmers. The FFP portal was updated and three articles were published in *Indian Farming*, *Neelitima*, and *Krishi Jagaran.*

ICAR-CRRI, Cuttack

The **Farmer FIRST Programme** was carried out by ICAR-CRRI, Cuttack in eight cluster villages- Satyabhamapur, Ganeswarapur, Biswanathpur, Laxminarayanpur, Ganapur, Purushottampur, Gopinathpur and Malihata which were located in Salepur block of Cuttack district. Over 1200 farmers and farm women were involved in a field trial aimed at strengthening the connection between farmers and scientists, promoting the development and application of agricultural technologies, especially for small and marginal landholders. The programme emphasized the active participation of farmers in research and technology adoption. To ensure the benefits reach farmers effectively, various modules were introduced to support comprehensive research focused on improving their welfare.

Crop based module: In this module, several high-yielding rice varieties, such as *CR Dhan 312, CR Dhan 911, Swarna Sub-1,* and *Sarala*, were introduced to farmers by providing improved package of practices through *'Pre-kharif training programme on improved rice cultivation practices including seed treatment*' during the *kharif* season of 2024, spread over 65 ac land. *Trichoderma viridae*, a bio-fungicide for seed and soil treatment, was also demonstrated and distributed. Among the varieties, the newly adopted aromatic rice variety, *CR Dhan 911 (Vasudev)*, achieved an impressive yield of 3.5 tons per ha, marked 40% increase in yield over local aromatic variety, *Sitabhoga*. This variety also yielded a significant net return of Rs. 125000/- per ha and achieved an outstanding benefit-cost ratio of 3.41.

Horticulture based module: A selection of horticultural crops, including ridge gourd *(Akshaya),* okra *(Shivansh),* pumpkin *(Paradise),* cucumber *(Rainy Special),* and watermelon *(Vaishnabi)*, were demonstrated to 77 farmers and farm women in 40 acre land. Additionally, the innovative commercial single row nylon net trellis technique was introduced for cultivating bitter gourd and pointed

gourd and the detail guidance was provided to the farmers through *'Skill training programme on grafted vine vegetable cultivation'*. As a result, farmers are now generating a net income of Rs. 4.5 to 5 lakh per acre annually from pointed gourd cultivation and Rs. 1.5 to 1.8 lakh per acre annually from bitter gourd cultivation.

Livestock based module: Demonstration and distribution of 500 kg mineral mixtures (*Agrimin Forte*®) to 150 dairy farmers which aimed to boost milk production and enhance health and productivity of cattle in dairy and goat farming. Additionally, dual-purpose backyard poultry farming was demonstrated to 38 farmers in which the experts highlighted the potential of poultry for both egg and meat production in one-day training programme on *'Commercial poultry production and nutrition management in animals*' along with the

distributions of key essential inputs, such as high-quality feed, durable feeders, drinkers and crucial vaccines which were provided to empower the farmers for successful poultry farming.

IFS based module: Two models were developed under IFS module by integrating all aspects of agriculture through an innovative approach. The first model focused on a holistic farming system that combined horticulture, fishery, dairy and poultry farming within a single area. In this setup, farmers adopted poultry farming, using its excreta as a valuable feed for fish, which were initially reared using bio-flock technology for sustainable fish farming. This approach significantly boosted farm income in rural areas. The second model evolved into a more refined poultry-fishery-based IFS system, a technique that transformed rural agriculture and enhanced the livelihood income of farmers.

Enterprise based module: In this module, vermi-composting were demonstrated with 40 beds

among 40 farmers which aimed at converting organic waste into nutrient-rich vermi-compost to improve soil fertility with minimizing dependence on chemical fertilizers and providing farmers with an additional source of income through the sale of compost and vermi-worms to other farmers and in the open market. Additionally, one hands-on- demonstration of paneer pressing machines (9 units) was conducted for nine women farmer

groups who were involved in dairy business to empower them for generating additional income. The program also showcased pulverizing machines (2 units) for two women farmers' groups which

enabled them to produce value-added products from raw agricultural materials. That initiative encouraged greater economic participation by women.

ICAR-IIWM, Bhubaneswar

Under the programme, various research and extension activities were undertaken in the adopted village cluster comprising three tribal dominated villages namely, *Haridamada*, *Barapita* and *Jamujhari* in Khordha district of Odisha involving total 408 households.

Crop based module: Demonstrations on HYV paddy varieties were conducted by providing 6.0 qt. of paddy seeds of 8 varieties [*CR Dhan-324* (High Protein), *CR Dhan-314*, *CR Dhan-313*, *CR Dhan-312*, *CR Dhan-317*, *CR Dhan-206*, *CR Dhan-310* and *Khitish*] covering 50 acres area in summer season and 12.0 q of HYV paddy seeds of 3 varieties [*MTU-1061*, *MTU-7029* and *Mrunalini*] in 75.0 acres benefiting 100 farmers during *kharif* season 2024 in the FFP adopted villages. Also, line transplanting with young seedlings in 40.0 ac area, paddy seedling root dip treatment with the endophytic bio-fertilizer *Azotobactor chroococcum* (*NRRI-Endo-N-Tech*) was demonstrated by covering 60 acres and pulse demonstrations with green gram (var: *Sikha*) treated with nitrogen-fixing *Rhizobium* culture in 8.0 acres in the rice-fallow cropping system. Critical inputs like 10 kg of *Trichoderma viridae* bio-agent for seed treatment; green gram seeds (var: *Sikha*)-80 kg; *Rhizobium* culture-4 kg were provided for higher productivity. An analysis of the performance of transplanted *kharif* 2024 rice varieties revealed that '*MTU 1061*' gave maximum grain yield of 6.7 t/h (14.33% advantage over local check '*Pooja*') with a B:C ratio of 2.72, followed by '*Mrunalini*' with 6.4 t/h (9.22% advantage) and *MTU 7029* with 6.13 t/h (5.04% advantage) as against '*Pooja*' with 5.86 t/h. The physical water productivity (0.73 kg/m^3) as well as economic water productivity (Rs 16.6/ m^3) was also recorded highest in case of '*MTU 1061*'. In short, the replacement of *Pooja* with *MTU 1061* resulted in (i) 14.3% increase in grain yield, (ii) 12.5% reduction in cost of production, (iii) 24.3 % increase in net return and (iv) 14.3% increase in water productivity.

NRM based module: Under this module, demonstrations were conducted on IIWM-developed technologies, namely, 'Optimum dyke

height structures' in farmers' paddy fields (18 nos.) for increasing crop and water productivity; 'Dug out

sunken ponds' (3 nos.) for rainwater conservation and multiple use of harvested water, pond-based Mini IFS models with components like aquaculture, fruits and vegetables and life-saving irrigation through piped conveyance. Also, demonstration of water conservation through polythene mulching

was conducted in farmers' fields involving over 10 adopted farmers and farmwomen under adopted cluster.Critical inputs like 4 nos. pump sets (4.0 HP-3 nos., 5 HP-1 no.) along with irrigation pipes were distributed to the farmers of three adopted villages.

Horticulture based module: Demonstrations on hybrid vegetables cultivation in both rainy season with 7 vegetable crops(bitter gourd, ridge gourd, okra, cucumber, radish, pumpkin and chilli)and

rabi season9 vegetable crops(coriander, palak, cauliflower, cabbage, amaranthus, onion, beans, cowpea, radish, and chili) were conducted covering 17 acres and involving 130 beneficiaries in three adopted villages of Khordha district. Vegetable seeds like 7 types of rainy season hybrid varieties and 9 types of *rabi* season, pro-trays-100 nos., coco-peat-20 kg; coconut saplings-60 nos. and papaya saplings-80 nos. (var. *Red Lady*) were provided as

critical inputs. The performance analysis revealed that brinjal crop (var. *VNR harsh*) gave maximum net return of Rs. 656850 t/h with fruit yield of 28.07 t/h (B:C ratio - 6.2) followed by bitter gourd with Rs. 381430 t/h (B:C ratio - 6.5). Demonstration on improved IIHR-Nutri-Gardens kits (150 kits) for backyard nutri-gardens for nutritional security of family members was carried out benefiting 150 farm families in three adopted villages of Khordha district.

Enterprise based module: Demonstration on paddy straw mushroom, oyster mushroom farming and vermi-composting were conducted under the enterprise module in three adopted villages of Khordha district. As critical inputs, total 500 bottles of mushroom spawns, required polythene and 4 vermi-composting beds along with required quantity of earthworms were provided to the farmers of adopted villages.

Livestock based module: Demonstration on poultry chicks of four strains (*Vejaguda, Vanaraja, Rhode Island Red* and *Kaveri*)- 2639 nos., feeders-60 nos., drinkers- 60 nos., poultry feed- 500 kg with

required vaccines and food supplements; mineral mixture for enhancing milk production- 200 kg; and need-based pesticides, fish seeds-3500 nos. (catla-2000, rohu-900 and mrigal- 600), 2 vermi-beds with 1 kg worm and need-based pesticides etc. were distributed which benefitted over 1950 beneficiary farmers. The adult birds of *RIR* strain produced an average of 205 eggs/year followed by *Kaveri* (146 egg/year) and *Vanaraja* (137 egg/year). However, the average body weight of adult *Vanaraja* was recorded highest with 3.07 kg followed by *Vejaguda* with 2.53 kg and *RIR* with 2.43 kg.

Capacity building/ HRD/ training of farmers: In order to build up farmers' capacity for advanced

farming and water management practices, seven skill-based training-cum-demonstration programmes were conducted covering various crops, enterprises and water management technologies which benefitted 446 farmers, farm women and rural youths. In addition, critical inputs and regular technical backstopping were provided to all the adopted farmers including farm women.

Awards and recognitions: Following farmers from FFP adopted villages won various awards/ recognitions.

- Smt. Mina Mahanta was awarded with the prestigious *'IARI Innovative Farmer 2024'* during the *'Innovative Farmers Meet'* held at ICAR-IARI, New Delhi on 6th June, 2024.
- Nine farmers including farmwomen were felicitated during *'World Soil Day 2024'* celebration by ICAR-IIWM, Bhubaneswar on 5th December, 2024.

A farmers-scientists interaction meet-cum-monitoring field visit programme was conducted on 27th February, 2025 along with Dr. K. S. Das, Nodal Scientist, FFP, ATARI Kolkata and PI/Co-PIs/other project staff. Another interaction-cum-

field visit was organized for QRT of ICAR-IIWM, Bhubaneswar under the leadership of Dr. V.N. Sharda, Chairman, Other members, Director of the Institute and project scientists who visited farmers' fields of Haridamada village on 8th October, 2024. The team observed various demonstration units such as mini-IFS model, HYV paddy fields, rainy

season hybrid vegetable cultivation, vegetables in broad bed and furrow, polythene mulching, dugout sunken pond for water conservation and optimum dike height structures in rice fields etc. and interacted with >50 beneficiary farmers and farm women. Later, a special plantation drive under the *'Ek Ped Maa Ke Naam'* was organized with the planting of mango saplings by the dignitaries in the orchard of an adopted farmer. The programme was coordinated by Dr. S.K. Mishra, Dr. P. Sahu and Ms. I. A. Sahoo.

OUAT, Bhubaneswar

During the year 2024, OUAT, Bhubaneswar conducted various activities in 4 old adopted villages i.e. Govindapur, Gopalpur, Brahmapura and Brahmapurapatna under Govindapur GP in Begunia block of the Khordha district, Odisha and 2 new adopted villages i.e. Lokipur and Brahmapura-II under the same block. Module-wise achievements are described as under.

Crop based module: The HYV of paddy (cv. *Kalachampa*) was cultivated by 75 farmers in 20 ha area which gave yield of 48 q/ha with net return of Rs. 47500/-. Seed production of *Kalachampa* variety was also taken up in participatory mode involving 10 selected farmers covering 11.4 ha area. Green manuring practices were popularized in adopted villages as INM in paddywhich was converged with Govt. of Odisha and tricho-cards in paddy were also used for IPM in paddy.

Horticulture based module: Mostly off-season cultivation of vegetables with improved package of practices enhanced the productivity and profitability of the system. Improved package of practices with quality seeds of vegetables like pumpkin, potato, cucumber, brinjal, tomato and hybrid papaya were promoted in convergence with State Horticulture Department, Govt. of Odisha. The details of achievements under horticulture module have been presented in the following table.

Crop variety	Area (ha)	HH (no.)	Yield (q/ha)	Net return (Rs.)
Papaya hybrid-*Red Lady 782*	2	12	253	168000/-
Papaya + pointed gourd in trellis	2	10	312 (PEY*)	212000/-
Brinjal	1	15	325	210000/-
Bitter gourd	1	12	315	215000/-
Tomato	1	10	250	125000/-

Crop variety	Area (ha)	HH (no.)	Yield (q/ha)	Net return (Rs.)
Potato	4	22	219	113000/-
Pumpkin 2.5		27	248	288500/-
Cucumber	3	15	215	218450/-
Marigold (root cuttings)	0.56	04	60	80000/-

*PEY (Papaya Equivalent Yield)

Livestock based module:

Dairy: The dairy animals were prescribed with vaccination for diseases like HS, BQ and FMD, advised for routine de-worming and mineral mixture/vitamins supplementation in the feed. Few de-worming medicines and vitamins were also prescribed and demonstrated in animal health camp. Training regarding scientific dairy farming, nutritional management and adopting hygienic measures for improved animal health care were given to the livestock owners. It was observed that after intervention, the milk production was increased from 2 lit/day to 3-5 lit/day and farmers income rose from Rs. 1910/- per month to Rs. 3290/- per month from last year. Vaccinations of milch cows were done in convergence with State Govt. Animal Husbandry Department.

Goatery: There was improvement of average birth weight of kids from 1.53 kg to 1.85 kg compared to last year's birth weight in animals of newly adopted villages. Similarly, increased weaning (90 days) weight of kids were also recorded from 3.03 kg to 3.77 kg because of adopting scientific management practices by the farmers. Improvement in slaughter weight was noted as 40% (5-7 kg/ animal) and that led to increase in net income of farmer from Rs. 3250/- to Rs. 5950/-.

Backyard poultry: The beneficiaries were provided with 21 days old chicks to promote backyard poultry in convergence with Govt. of Odisha. The chicks were vaccinated with vitamins and

supplemented with feeds for proper growth. The project intervention enhanced the profit from Rs. 50400/- to Rs. 89600/- to the farmers and provided employment to the unemployed youths.

Enterprise based module: The details of various activities, conducted under this module in adopted villages, are presented in the following table.

Name of enterprise	Nature of intervention	Net income (Rs.)
Mushroom spawn production unit (14 progressive farmers)	2790 paddy straw spawn bottles (235 contaminated, 2334 sold @ Rs.15-18/- per bottle)	25010/- (gross income-35010/- and cost of production-1000/-)
Value addition of oyster mushroom	Over the normal practice of growing oyster mushroom, the advanced practice of value addition by drying and powder making of oyster mushroom was done.	12000/- from selling oyster mushroom and 10000/- from value added products of oyster mushroom

Name of enterprise	Nature of intervention	Net income (Rs.)
Spawn production using paddy seeds (14 progressive farmers)	2350 paddy straw spawn bottles (115 contaminated, 2221 sold @ Rs. 15-18/- per bottle)	26265/- (gross income- 33315/- and cost of production- 7050/-)
Flour mill	Grinding of spices and condiments	Rs.22000/- to Rs. 25000/- per year
Dal mill	Splitting of green gram, black gram, dal etc.	Rs.35000/- to Rs. 50000/- per year
Badi making machine	With involvement of 10 farm women in a group during their off time, value addition of black gram was taken up by badi making.	Rs. 10000/- to 12000/- per month

It was very pertinent to mention that using low-cost 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 and the spawn quantity was increased by 15%. Demonstration of vermi-compost led to additional annual income of Rs. 13415/- to the farmers. About 25 vermin- bags were distributed to 30 beneficiaries in convergence with State Govt. Department.

WBUAFS, Kolkata

During the last quarter of 2024-25, the council sanctioned a new centre at West Bengal University of Animal & Fishery Sciences, Kolkata under this Zone. Dr. T.K. Datta, Hon'ble Vice-Chancellor, WBUAFS entrusted the responsibility to Dr. Sukanta Biswas, Associate Professor and Head, Dept. of Veterinary and A.H. Extension Education, F/O-Veterinary and Animal Sciences, WBUAFS, Kolkata as Principal Investigator of the FFP Project on 18th February, 2025.

The PI presented the Action Plan for the year 2024-25 and 2025-26 during Annual Review Workshop of the FFP Projects held at ICAR-ATARI Kolkata on 22.02.2025. In the proposed Action Plan, PI requested an amount of Rs. 1.05 lakh from ICAR-ATARI Kolkata for conducting a baseline survey of about approx. 900 farm families in 3 adopted

villages viz. Ayeshpur, Baksha and Dakshin Duttapara of Haringhata block, Nadia, West Bengal for the financial year 2024-25.

The baseline survey of about 1001 farm families was completed through a pilot tested developed interview schedule to know the socio-economic

status along with perceived constraints of the villagers in relation to their sustainable livelihood practices in terms of livestock, fishery, horticulture and allied sectors. Simultaneously, a participatory rural appraisal (PRA) survey and focus group discussion (FGD) event was organized in the adopted villages to identify various socio-economic andbio-physical constraints for taking module wise specific intervention plans through various innovative and cost-effective technological practices for sustainable livelihood improvement of the stakeholders.

Among 1001 farm families, 422 families were from Ayeshpur village, 319 from Baksha village and 260 from Dakshin Duttapara village. The survey revealed that stakeholders of village Ayeshpur maintained livelihood predominantly on small scale dairy/goat farming, homestead horticulture

and fish farming, whereas, in Baksha villages, they were dependant on small scale agri-horticulture, dairy, goat and fish farming. On the other hand, in Dakshin Duttapara village, small scale goat farming, commercial broiler farming, tuberose cultivation, vermicomposting and fish farming were found to be predominant. Lack of quality inputs like seeds and livestock/poultry germplasm, high cost of raw materials, lack of credit facility, marketing network, non-remunerative price of agriculture and livestock produce due to involvement of middlemen, increased disease incidence in livestock and fish farming etc. were the problems of farmers in all the FFP adopted villages which needed immediate attention for increasing income from agricultural production.

14.5 Development action plan for scheduled tribes (DAPST)

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

For the first time, Tribal Sub Plan (TSP) was implemented in India during Fifth Five Year Plan (1974-1979). The purpose 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 merging of Plan and Non-Plan, TSP was renamed as Scheduled Tribe Component (STC) by Ministry of Finance in the year 2021-22 and the monitoring of STC plan was done by the Ministry of Tribal Affairs. In the year 2022-23, STC was renamed 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 namely, Gajapati, Kandhamal, Mayurbhanj-I and II, Malkangiri, Nabarangapur, Raygada, Sundargarh-I and II from Odisha state

and Nicobar from Andaman & Nicobar Islands were identified under this scheme. A sum of Rs. 230.00 lakh fund was allotted to above 10 KVKs for conducting various activities- agricultural farming, horticulture, animal husbandry, dairy development, fish production, kitchen gardening, vocational training and many others for tribal community

of this zone. Out of total fund, Rs. 29.73 lakh was allocated for Andaman & Nicobar Islands KVK and Rs. 200.27 lakh was allocated for Odisha KVKs. The achievements of physical output and outcome under DAPST by the KVKs of ATARI Kolkata during 2024 have been shown in the following table.

Table: Achievements of physical output and outcome under DAPST during 2024

Activity	Unit	During the year 2024	
		Achievements	No. of benefitted farmers
Trainings (Capacity building/skill development etc.)	No.	563	13620
On-farm trials (OFTs)	No.	78	641
Front line demonstrations (FLDs)	No.	1996	1996
Awareness camps, exposure visits etc.	No.	474	18947
Input distribution			
Seeds	Quintals	1132.03	4135
Planting materials	No.	1004805	38771
Mushroom spawns, bio-fertilizers etc.	Packets	15929	1280
Honey bee colonies	No.	49	79
Livestock strain and fish fingerlings	No.	32147	1758
Assets	No.	3683	1336
Infrastructure/civil works/ponds etc.	No.	7	41
Setting up plant nursery/seed farm/hatchery	No.	14	77
Fertilizer (NPK)/secondary fertilizers/micronutrients	Tonnes	5.60	714
FYM/vermicompost	Tonnes	14.4	554
Plant protection chemicals	Kg	237.6	707
Animal feeds and fodders	Tonnes	7.20	699
Animal medicines	Doses	2156	983

Activity	Unit	During the year 2024	
		Achievements	No. of benefitted farmers
Services/facilitation			
Animal health camps	No.	35	936
Artificial insemination / vaccination	No.	380	490
Testing samples of soil, plant, water, feed, fodder and livestock disease diagnosis	No.	3780	9481
Promotion of agri-entrepreneurship	No.	92	412
Promotion of IFS, IOS, Natural Farming, Nutri-garden, Orchards etc.	No.	312	4705
Distribution of literature	No.	17689	21580
Total			**114461**

During the period from January to December, 2024, a substantial number (3683) of assets in the form of sprayer, ridge maker, pump set, weeder, store

bins, drip irrigation set, poultry feeder/ drinker etc. were created which benefitted 1336 tribal farmers.

The KVKs of tribal districts conducted 78 OFTs and 1996 FLDs for implementing latest technologies related to agriculture in those above districts.

More than 13620 farmers were trained and 18947 farmers took participation in various awareness

camps, exposure visits etc. conducted by 10 KVKs. The KVKs produced 1132 quintals seed, 10.05 lakh planting materials and 32147 livestock strains and

fingerlings which benefitted 4135, 38771 and 1758 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 21580 farmers got benefit from receiving various literatures related to agricultural farming during the period.

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

e-utthaan Development Action Plan for Scheduled Castes Department of Social Justice and Empowerment DAPSC

Nodal Officer: Dr. S.K. Mondal

In a collaborative approach, Indian Council of Agricultural Research and Ministry of Social Justice& Empowerment, GoI implemented 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 2024, under ICAR-ATARI Kolkata a total of 47 KVKs (24 from Odisha and 23 from West

Bengal) were involved in this programme. The OFTs (185), FLDs (2811), Training (40741 farmers) and extension activities (116000 farmers) were conducted under this programme. Considerable quantity of seeds (1183 q), planting materials (9.02 lakhs), fish fingerlings (12.50 lakhs) and other inputs were distributed among 0.96 lakh farmers.

A total of 59217 farmers were benefitted from the activities like animal health camps, vaccination and soil sample analysis etc. Around 68511farmers were given the extension literature and about 3127 man-months of employment were generated. Total budget during 2024-25 was Rs. 680.00 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 2024

Activity	Unit	During the year 2024	
		Achievements	No. of benefitted farmers
Trainings (Capacity building/skill development etc.)	No.	1621	40741
On-farm trials (OFTs)	No.	185	1592
Front line demonstrations (FLDs)	No.	2811	2811
Awareness camps, exposure visits etc.	No.	3005	116000
Input distribution			
Seeds	Quintals	1182.94	16971
Planting materials	No.	902087	50680
Mushroom spawns, bio-fertilizers etc.	Packets	43627	1661
Honey bee colonies	No.	190	190
Livestock strain and fish fingerlings	No.	1249806	15312
Assets	No.	1147	1141
Infrastructure/civil works/ponds etc.	No.	60	254
Setting up plant nursery/seed farm/hatchery	No.	57	207
Fertilizer (NPK)/secondary fertilizers/micronutrients	Tonnes	25.3	2160
FYM/vermicompost	Tonnes	71.5	2269
Plant protection chemicals	Kg	1928.3	3040

Activity	Unit	During the year 2024	
		Achievements	No. of benefitted farmers
Animal feeds and fodders	Tonnes	24.3	864
Animal medicines	Doses	7072	1608
Services/facilitation			
Animal health camps	No.	608	20309
Artificial insemination / vaccination	No.	4070	2043
Testing samples of soil, plant, water, feed, fodder and livestock disease diagnosis	No.	25513	32063
Promotion of agri-entrepreneurship	No.	143	833
Promotion of IFS, IOFS, Natural Farming, Nutrigarden, kitchen garden, orchards etc.	No.	857	3969
Distribution of literature	No.	68511	68511
Employment generation for livelihood	Man-months	3127	2836
Total			**388065**

14.7 Attracting and Retaining Youth in Agriculture (ARYA)

Nodal Scientist: Dr. P.P. Pal and Dr. A. Haldar

India, a global agricultural leader, relies heavily on its agrarian sector, which supports over 70% of rural households (FAO, 2022) and contributes significantly to the national income expected to reach $600 billion by 2030 (IBEF, 2024). With over 65% of its population under 35, India has a unique demographic advantage. However, rural youth face a paradox of unemployment and untapped potential in agribusiness. To curb migration and ensure sustainable livelihoods, it's crucial to attract and retain youth in agriculture through targeted strategies and entrepreneurship in agro-based rural enterprises. The ARYA (Attracting and Retaining Youth in Agriculture) project, an ICAR initiative, promotes agriculture-based livelihoods among rural youth through income-generating enterprises. In 2024–25, the project was implemented through 9 KVKs in West Bengal and Odisha as shown in Fig. below.

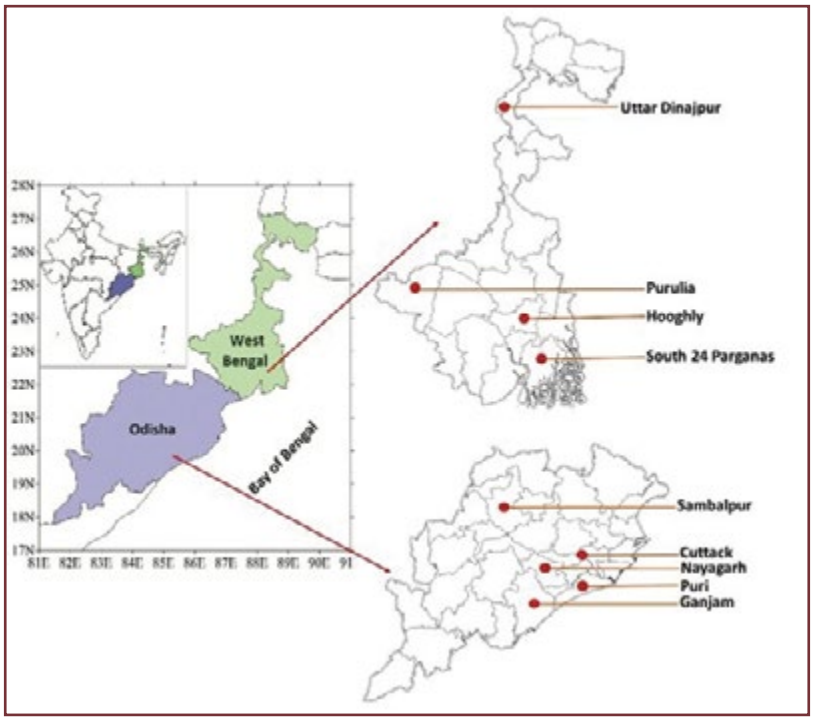


Fig.: ARYA implementing KVKs of West Bengal and Odisha under ICAR-ATARI Kolkata

A total of 63 training programmes were conducted, benefiting 1,222 rural youth and leading to the establishment of 296 new entrepreneurial units (Table 1). Among all the KVKs, highest number of units was developed in Sambalpur (65) followed by Ganjam-I (58), Nayagarh (42), Purulia (42), Uttar Dinajpur (31), Hooghly (26), Puri (20), Cuttack (12) and Nimpith (0). In 2024, a sanctioned budget of ₹60 lakh, of which ₹59.99 lakh was utilized. Regardless of KVKs, out of nine (09) enterprises, highest number of youth were involved in mushroom enterprise (296) followed by poultry enterprise (273) depicted in Fig. Notably, female participation was highest in scientific lac cultivation (75%), while male participation peaked in fishery (87%) as shown in following Fig.

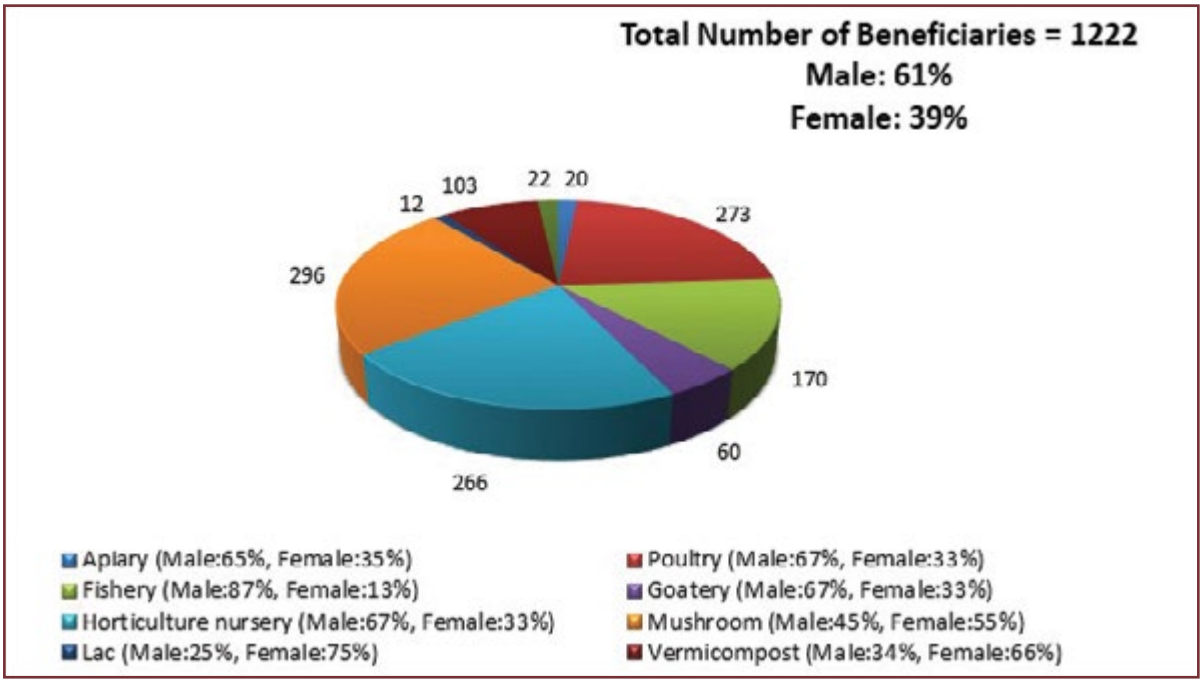


Fig.: Enterprise-wise percentage of male and female ARYA beneficiaries of West Bengal and Odisha

Table: Training and horizontal spread of ARYA activities

Name of the Enterprise	No. of Training	No. of youth trained	No. of entrepreneurial unit established and running successfully
A. Hooghly KVK			
Horticulture nursery	2	60	5
Poultry	2	58	7
Mushroom	2	60	8
Vermicompost	2	53	6
B. Purulia KVK			
Lac cultivation	2	12	12
Vermicompost	1	10	10
Horticulture nursery	1	11	10
Goatery	1	10	10

Name of the Enterprise	No. of Training	No. of youth trained	No. of entrepreneurial unit established and running successfully
C. Uttar Dinajpur KVK			
Mushroom	1	20	10
Vermicompost	2	40	9
Fish Hatchery	2	30	10
Pineapple Processing	1	22	2
D. Nimpith KVK			
Fish Hatchery	2	60	0
Horticulture nursery	2	60	0
Mushroom	2	60	0
Poultry	2	60	0
E. Cuttack KVK			
Mushroom	1	30	4
Poultry	5	25	3
Goatery	2	50	2
Horticulture nursery	1	25	3
F. Nayagarh KVK			
Poultry	1	20	3
Mushroom	2	20	13
Fish Hatchery	1	20	13
Horticulture nursery	1	20	13
G. Sambalpur KVK			
Poultry	3	60	20
Mushroom	3	60	25
Horticulture nursery	3	60	20
H. Ganjam-I KVK			
Fish Hatchery	2	30	19
Poultry	2	30	10
Mushroom	2	30	12
Horticulture nursery	2	30	17
I. Puri KVK			
Mushroom	1	16	5
Poultry	1	20	5
Apiary	1	20	5
Fish Hatchery	2	30	5
Total	**63**	**1222**	**296**

The contribution of the ARYA project in terms of employment generation and horizontal spread is illustrated in above Fig. It is evident that the highest employment generation occurred in the mushroom sector (36.4%), followed by goatery (26.6%), horticulture nursery (19.4%), fishery (5%), vermi-compost (4.3%), poultry (3.9%), scientific lac cultivation (3.6%), pineapple processing (0.7%), and apiary (0.1%). However, the scenario differs slightly when considering the horizontal

spread of enterprises. Mushroom again led with the widest spread (38%), followed by poultry (18%), horticulture nursery (18%), fishery (11%), vermi-compost (9%), pineapple processing (2%), scientific lac cultivation (1%), goatery (1%), and apiary (3%).

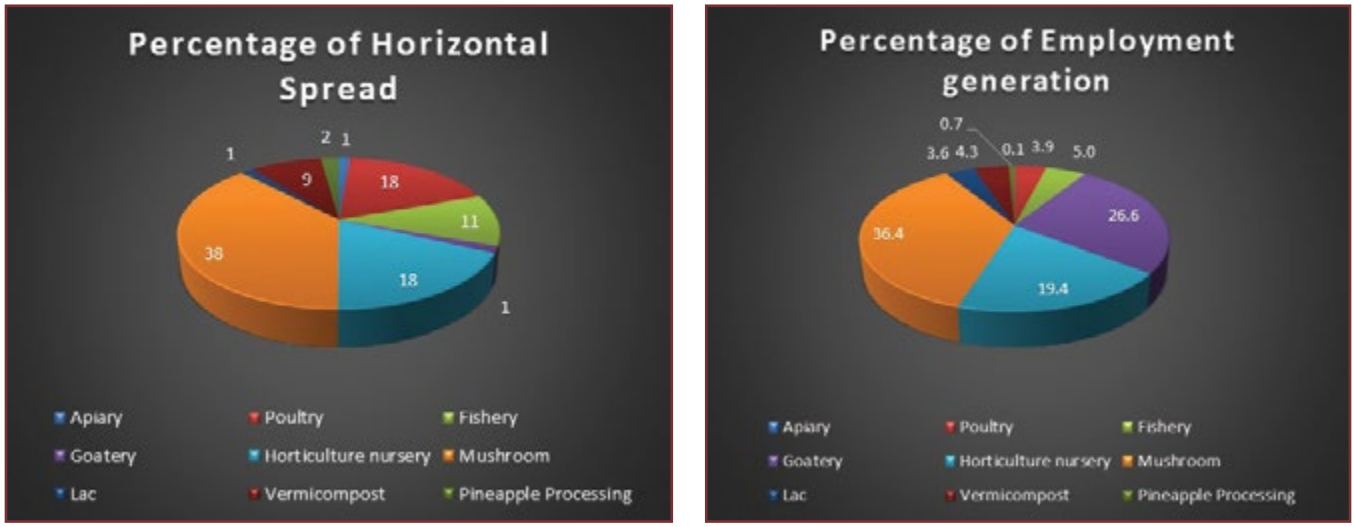


Fig.: Percentage of employment generation and horizontal spread under ARYA during 2024

In 2024, a total of 47 ARYA youth submitted Detailed Project Reports (DPRs), out of which loans were sanctioned to 6 individuals. The positive impact of the ARYA project on the income of rural youth is evident from the noticeable change in their annual earnings. As shown in Fig., all nine enterprises reported income growth over the past year. The highest profit increase was observed in scientific lac cultivation (203%), followed by apiary (183%), backyard poultry (158%), mushroom cultivation (114%), horticulture nursery (107%), vermi-composting (77%), fisheries (52%), goat rearing (30%), and pineapple processing (24%). These figures clearly demonstrate the project's significant contribution to income generation, employment creation, and overall livelihood improvement.

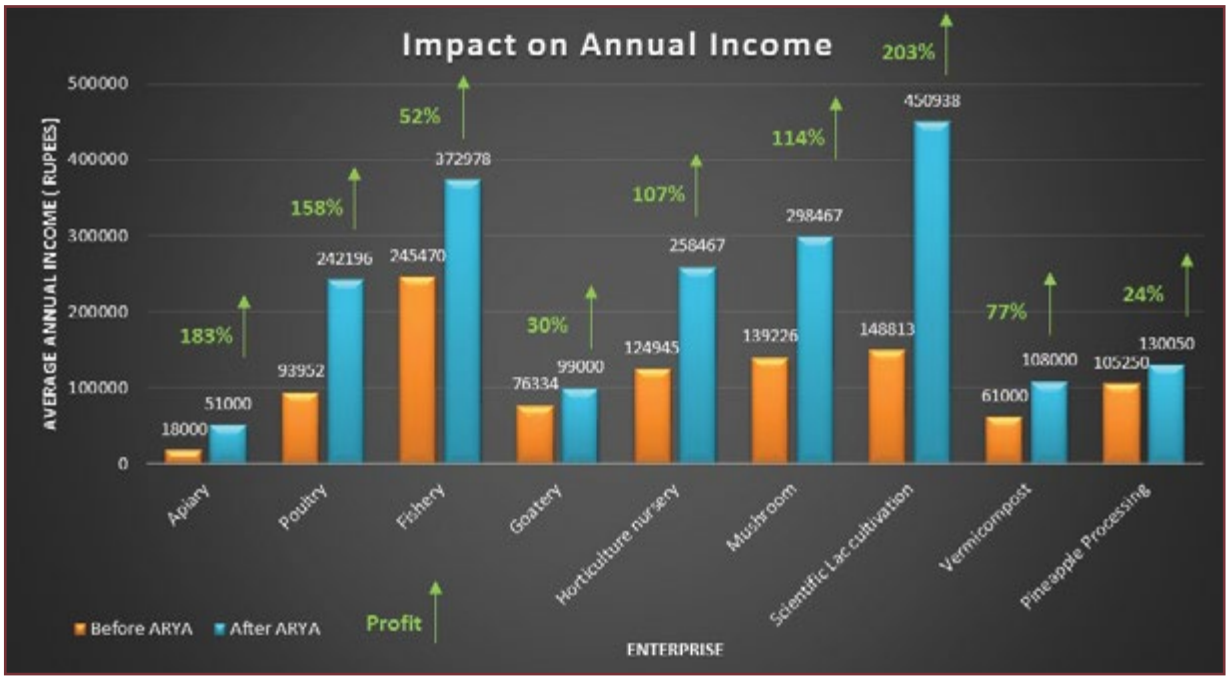


Fig.: Impact on annual income of ARYA youth

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 and action photographs of different enterprises under ARYA project.

14.8 *Mera Gaon Mera Gaurav* Programme

Nodal Scientist: Dr. P.P. Pal

Mera Gaon Mera Gaurav (MGMG) is a flagship program launched by the Indian Council of Agricultural Research (ICAR) in 2015 to strengthen the connection between agricultural scientists and rural communities. Under this initiative, teams of scientists from ICAR institutes, KVKs and State Agricultural Universities are assigned to adopt villages and work directly with farmers. Each team, comprising four scientists, is responsible for 4–5 villages. The primary objective of the program is to accelerate the transfer of agricultural technologies from research institutions to farmers' fields, enhancing productivity, sustainability, and rural incomes. To achieve this, scientists regularly visit adopted villages and engage with farmers through field demonstrations, training sessions, and awareness campaigns. These activities focus on modern farming techniques, optimal resource use, and the effective implementation of government schemes. The program emphasizes personalized support, frequent communication (including mobile and media outreach), and continuous monitoring of outcomes like yield improvements and income levels. ICAR-ATARI Kolkata is responsible for supervising and executing this project in the A&N Islands, Odisha, and West Bengal, with assistance from many other ICAR institutes, a regional research station, and SAUs.

Table: Achievements of *Mera Gaon Mera Gaurav* Programme during 2024

State	Groups/Teams	Scientists involved	Villages covered	Field activities	Messages/ advisory sent	Farmers benefited
A & N Islands	11	46	19	28	43	887
Odisha	43	175	113	304	301	11310
West Bengal	45	183	94	196	306	8124
Total	99	404	226	528	650	20321

14.9 Celebration of Swachhta Pakhwada 2024 (*Swachhta Hi Seva*)

Nodal Scientist: Dr. S.K. Mondal

a) Celebration of Swachhta Pakhwada 2024 (*Swachhata Hi Seva*)

During 2024, 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. 18.50 lakh was sanctioned and utilized in the Zone.A total of 48784 participants took part in various swachhta related activities during the Pakhwada in this zone. 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 17 September 2024 to 02 October 2024 (*Swachhta Hi Seva*)

Sl. No.	List of activities	No. of KVKs participated	Period/ Dates	Total No. of Participants	No. of KVK employees participated	Action photographs
1.	• Taking Swachhta pledge in office of ICAR-ATARI Kolkata	-	17.09.2024	27	27	
2.	• Taking Swachhta pledge in offices • Ek Ped Maa Ke Naam plantation • Rally on 'Swachhta Hi Seva, 2024'	59	17.09.2024	1785	694	
3.	• Swachhata Class/Swachhata Ki Pathshaala at schools • Swachhata Quizzes at Schools	31	18.09.2024	1484	215	

Sl. No.	List of activities	No. of KVKs participated	Period/ Dates	Total No. of Participants	No. of KVK employees participated	Action photographs
4.	• Dialogues and discussions promoting awareness and community involvement in cleanliness initiatives of young farmers • Preparation of plant protection trap out of non-degradable wastes yellow sticky trap, fruit fly trap, blue sticky trap using use and throw bottles, tins, broken pot, plastic etc. • Farmers Rally	21	19.09.2024	747	120	
5.	• Shramdaan including discussions promoting awareness and community involvement in cleanliness initiatives at ICAR-ATARI Kolkata	-	20.09.2024	24	24	
6.	• Waste to Art at Sanitation Parks/Selfie points at villages • SWM assets beautified with Wall Paintings	10	20.09.2024	240	63	
7.	• Human Chain: Symbolic events where people join hands to raise awareness and demonstrate commitment to cleanliness and sanitation at ICAR-ATARI Kolkata	-	21.09.2024	24	24	
8.	• Human Chain: Symbolic events where people join hands to raise awareness and demonstrate commitment to cleanliness and sanitation • Reduce, Reuse, Recycle activities aligned to Mission LiFE (Lifestyle for Environment)	12	21.09.2024	422	81	

Sl. No.	List of activities	No. of KVKs participated	Period/ Dates	Total No. of Participants	No. of KVK employees participated	Action photographs
9.	• Mega Cleanliness Drives with citizen participation & partner mobilization: Cleaning activities are as follows: i. Offices & institutional buildings ii. Commercial and Market areas iii. Educational institutions iv. Public transport hubs, major roads & highways, railway tracks v. Sanctuaries, zoo areas, trekking and camping sites	10	22.09.2024	270	80	
10.	• Cleaning of tourist spots, religious & spiritual places (Coordinate with government departments, tourism bodies, and educational institutions for comprehensive participation)	10	23.09.2024	345	58	
11.	• Generally neglected garbage points, Difficult to clean as part of regular Swachhata / cleanliness drives, Posing environmental, health & hygiene risk	13	24.09.2024	448	81	
12.	• To recognize the most unique and inspiring initiatives taken by local bodies to integrate citizens with Swachhata, local art, music & culture	12	25.09.2024	393	53	
13.	• Felicitation of SafaiMitras/ Sanitation Workers at ICAR-ATARI Kolkata	-	26.09.2024	24	24	
14.	• Preventive Health Check-upsorganized as part of the Shivirs/Camps to benefit sanitation workers & their families	13	26.09.2024	512	82	
15.	• Access to Health Facilities & Services to ensure better quality of life for SafaiMitras/ Sanitation workers and their dependents	21	27.09.2024	830	126	
16.	• Distribution of PPE Kits & safety gear to safeguard the sanitation workers from occupational hazards. • Mega Cleanliness Drive aim to tackle general swachhata challenges across local bodies through partners from various sectors	11	28.09.2024	187	66	

Sl. No.	List of activities	No. of KVKs participated	Period/ Dates	Total No. of Participants	No. of KVK employees participated	Action photographs
17.	• Social welfare linkages & registration of sanitation workers and their families to benefit them with various social schemes must be ensured by local bodies	5	29.09.2024	132	14	
18.	• Involve Religious leaders - cleanliness drives in religious places • Organization of press conference for highlighting the activities of Swachhta Hi Seva by involving all stakeholders including farmers/ VIPs/ press and electronic media	11	30.09.2024	415	82	
19.	• Health check-ups of SafaiMitras/ sanitation workers at ICAR-ATARI Kolkata	-	01.10.2024	6	6	
20.	• Talent Showcase • Storytelling Sessions • Waste to Wealth workshops • Creating products made of upcycled materials to champion the principles of 'Reduce, Reuse, Recycle'	12	01.10.2024	589	96	
21.	• Swachhta Bharat Diwas ' • As part of the annual Swachh Bharat Diwas celebrations, simultaneous celebration events on 2nd October across villages and cities	17	02.10.2024	973	138	

b) Taking 'Swachhta Pledge'

The *'Swachhta Pledge'* was a commitment which was inspired by the Swachh Bharat Abhiyan (Clean India Mission) and was launched by the GoI to

promote cleanliness and hygiene. The staffs of this office including the scientists, research fellows and the administrative staffs participated in the pledge at the conference hall on 17.09.2024. The pledge encouraged individuals to take responsibility for

the cleanliness of their surroundings, to adopt a proactive role in maintaining a clean environment and emphasized the personal accountability, where each person vowed to avoid littering, segregate

waste and support initiatives aimed at waste management, recycling, and promoting sanitation. By taking the *'Swachhta Action Pledge'*, individuals not only promised to contribute to cleanliness at a local level but also to inspire others to follow suit, creating a ripple effect of positive change in communities across the country.

c) Human Chain as a part of 'Swacchta Hi Seva 2024' programme

A human chain was formed at ATARI Kolkata, under the *'Swachhta Pakhwada'* campaign, with every hand holding the torch of cleanliness for sending a powerful message to the society.

The main objective of this event was to raise awareness among the institute's members and the surrounding community about the importance of cleanliness and its mental and physical benefits. All scientists, officials including project staff of the institute enthusiastically participated in this event on 20.09.2024. The Director, Dr. Pradip Dey,

emphasized that cleanliness, an integral part of life, was not only protected us from diseases but also purified us both internally and externally. He

called for the abandonment of single-use plastics and urged everyone to take steps toward a cleaner and greener future.

d) Organization of '*Safai Mitra* Camp'

The *'Safai Mitra Camp'* was organized by ATARI Kolkata on 26.09.2024 under the theme *'Swabhav Swachhata, Sanskar Swachhata,'* was not just a

symbol of social responsibility but also a sensitive and artistic initiative that highlighted the deep connection between cleanliness and respect. The

camp was a beautiful example of the institute's gratitude towards sanitation workers and its commitment to their welfare. In his thought-provoking speech, Director of the institute presented the role of sanitation workers as the foundation of nation-building. Dr. Dey emphasized

the concept of *'One Health'* programme for improving quality of life.

At the camp, sanitation workers were provided with fruit baskets and personal safety kits like gloves,

masks soap etc. which was not only a measure to protect their physical health but also a vibrant appreciation of their contribution. The message *'Cleanliness: The first step towards a better society'* was conveyed through that campaign. The event was attended by all the staff of the institute. Dr. S. K. Mondal, Pr. Scientist conducted the program and Dr. P. P. Pal, Pr. Scientist expressed gratitude at the end.

e) Swachhta Action Plan related activities

All the 59 KVKs of this Zone undertook the activities related to Swachhta Action Plan like Microbial based Agricultural Waste Management using Vermicomposting and other Swachhta activities during 2024 and the details are given in the table below.

Table: SAP Activities undertaken by ATARI/ KVKs of Zone V during 2024

(Activity) No. of adopted villages (For Microbial based Agricultural Waste Management using Vermicomposting)	Types of major Activity conducted (Excluding Vermicompost activity) Swachhta Pakhwada, Cleaning, Awareness Workshop etc.	Expenditure (Rs.in Lakhs) (January - December, 2024)
714 units	**Total no. of activities: 2137** • Raise awareness about hygiene and sanitation, crop residue management, and entrepreneurship development through agro-waste management, cleaning village road, office premises, demo-units of KVKs etc. • Personal hygiene and utilization of Agri-waste • Regular Cleaning Operations in Office and Farm and Hands-on training on Waste Management as part of Regular training programme • Cleaning of village road and office premises and demo units • Cleaning drive for office and store room waste, cleaning demo unit of KVK campus, Awareness on swachhta • Swachhta Pledge, Ek Ped Maa Ke Naam, Engagement with School Children, Interaction with SHGs, Human Chain, Cleanliness drive in School, Special cleanliness drive in Office • Cleaning of Office premises, celebration of Swachha Bharat Diwas, Awareness programme at School • Awareness programme, cleanliness drive, tree plantation, crop residue recycling, weeding, cleaning of unutilized areas • Improving agro waste management and income generation and Increasing awareness of health management • Swachhata activities at School with Students regarding cleanness activities for prevention of diarrohea, Utilizing farm waste and kitchen waste for key hole nutrition garden, Use of organic waste materials and cow dung for vermin compost production, Special measures for disaster management during November at coastal region • Swachhta Pakhwada, Swachhta Hi Seva organized • Awareness on Swachhata, Cleaning of village street and temple, KVK campus • Crop residue management, and entrepreneurship development through agro-waste management, cleaning village road , office premises, demo units of KVKs etc. • Personal hygiene and utilization of Agri waste • Regular Cleaning Operations in Office and Farm and Hands on training on Waste Management as part of Regular training programme • Cleaning of village road and office premises and demo units • Cleaning drive for office and store room waste, cleaning demo unit of KVK campus	30.95

f) Conducting Special Campaign 4.0 during 2nd to 31st October 2024

In an attempt to give special attention to identify pendency, manage office records efficiently (both physical and e-files), conduct cleanliness drives in office and dispose official scraps effectively, Special Campaign 4.0 was launched by GoI during the period from 02.10.2024 to 31.10.2024. ICAR-ATARI Kolkata and all the KVKs under it organized the Campaign very meticulously. The targets for the campaign were achieved during the period. No pendency in case of VIP/ MP references was recorded. A total of 259 physical files were reviewed and 33 files were weeded out in the Zone. About 50 e-files were reviewed and all were closed in time. Cleanliness drives (217 in no.) were conducted in office/ farm premises and approximately 1046 sq. ft. of space was freed by disposing office scraps (about 2.1 tonnes) resulting in a revenue earning of around Rs. 15028/-.

Photographs before the campaign

Photographs after the campaign


SWACHHATA
HI SEVA 2024


SWACHHATA
HI SEVA 2024

14.10 Promotion of Bee Keeping with Oilseed Mission

Nodal Scientist: Dr. A. Haldar

Murshidabad district in West Bengal has strong potential for oilseed cultivation due to its fertile Gangetic alluvial soil, good moisture retention, and favourable climate. Oilseeds like mustard, sesame, groundnut, and sunflower fit well into existing cropping systems, enhancing land use and cropping intensity. Promoting oilseeds here supports food and nutritional security, incomes, sustainability, and aligns with national priorities on oilseed mission for self-reliance. Integrating trainings and seminars on apiculture within the Oilseed Mission framework in Murshidabad

is both strategic and synergistic to achieve higher oilseed productivity and sustainable rural livelihoods through honey production. Bees as natural pollinators play a vital role in increasing the productivity of oilseed crops like mustard and sunflower. The role of bees in agriculture, maintaining biodiversity, sustainable livelihoods and food security has been widely demonstrated. Studies show that bee pollination can increase oilseed yields by 15–30%, thus directly contributing to the core objectives of the Oilseed Mission. Though native *Apis cerena* bees are abundant, scientific beekeeping remains limited, while *Apis mellifera* dominates commercial apiculture in the state.

Integrating apiculture offers additional income through honey and wax production, supplementing earnings from oilseed farming. This is particularly impactful in Murshidabad, where small and marginal farmers dominate and are in need of diversified income sources. Many farmers in the district are unaware of scientific apiculture practices or the benefits of bee pollination. Trainings can bridge this gap by providing knowledge on bee-box placement and management, information on the role of bees in crop productivity and exposure to marketing avenues for honey. Seminars can bring together stakeholders like agronomists, apiculture experts, buyers, and policymakers to create convergence. Keeping in view the agro-climatic situations, socio-economic condition and geographical location, the National Bee Board (NBB) Sponsored project on "Trainings and seminar integrated with oilseed mission for enhancing honey production along with increasing productivity of oil-seeds" has been implemented by Dhaanyaganga KVK (Additional) at Sargachhi, Murshidabad, West Bengal.

A total of 9 trainings was organized with the participation of 225 trainees to build the capacity of rural youth and women in all aspects of apiculture. The participants became knowledgeable about honey bee rearing, collection, processing and

marketing of honey and all by-products (bee wax, pollen, propolis and royal jelly) as an entrepreneurial option. The training programmes also created awareness among the rural youth/ practicing young farmers about the role of honey bee in agriculture, particularly in increasing productivity

of oilseeds. The most significant achievements of the training included effective skill development on scientific beekeeping, enthusiasm and interest creation among the rural youth, especially women. Seminar provided a great platform to beekeepers, farmers, apiculture experts, buyers and other

stakeholders for promotion of holistic growth of scientific beekeeping industry for income and employment generation. Out of total sanctioned and released of Rs. 20.50 lakh from NBB, Rs. 15.75 lakh (76.82%) was utilized. The integration of trainings and seminars on apiculture within the Oilseed Mission framework in Murshidabad is a cost-effective, knowledge-driven strategy to achieve higher oilseed productivity and sustainable rural livelihoods through honey production. Successful implementation of the project activities in Murshidabad can serve as a model for other districts with similar agro-

ecological conditions, enhancing the mission's impact at the state level. It represents a classic example of agri-allied sector convergence, boosting both farm output and income security.

14.11 Cereal Systems Initiative for South Asia (CSISA) Phase-IV

Nodal Scientist: Dr. P.P. Pal and Dr. A. Haldar

The Cereal Systems Initiative for South Asia (CSISA) is a science-driven project aimed at improving cereal production across the region. It focuses on

intensive cereal-based cropping systems involving rice, wheat, and maize crops that serve as a primary source of food and income for millions and form the backbone of rural economies in South Asia.

The slowing growth in cereal production, both in terms of grain and crop residue, is a major concern for the region. This challenge is compounded by issues such as resource degradation, labour shortages, and climate variability, all of which threaten food security and rural livelihoods. To address these challenges, CSISA promotes sustainable intensification technologies and improved management practices. The initiative seeks to enhance productivity, increase farm incomes, and minimize environmental impacts. While operating as an innovation hub in Bangladesh, India, and Nepal, CSISA works to deliver scalable, science-based solutions for transforming cereal-based agriculture in South Asia.

Six KVKs of Odisha namely, Ganjam-I, Mayurbhanj-I, Bhadrak, Bargarh, Kalahandi and Puri implemented Cereal Systems Initiative for

South Asia (CSISA) project aiming to improve cereal production that include rice, wheat, and/ or maize in South Asia through the promotion of resource conserving practices, technologies

and services that increase yield with less water, labour and input cost. KVKs mainly evaluated the performances of suitable short duration new varieties, weed management, effect of agronomic and genetic bio-fortification approaches in manual puddled transplanted rice in kharif, diversification with pulses, oilseed, minor-millets in the rain-fed rice ecologies of Odisha. A good number (182) of farmer's-oriented programmes (75 field day, 24 public harvest, 33 trainings, 17 travelling seminars, 23 workshops/ meetings, 7 exposure visits and 3 exhibitions) were conducted by KVKs of Odisha. A Landscape Diagnostic Survey (LDS) on pulse crops with proforma developed by CSISA was carried out involving 5 KVKs of West Bengal and 5 KVKs of Odisha.

14.12 Promotion of Natural Farming

Nodal Scientist: Dr. A. Haldar

With the global population expected to reach 10 billion by 2050, agriculture faces the dual challenge of increasing food production while reducing environmental harm. Conventional farming has led to deforestation, water scarcity, biodiversity loss, and high greenhouse gas emissions. In response, sustainable practices like natural farming, which avoid chemical use and rely on local resources, are gaining attention. To promote this, the Department of Agriculture & Farmers Welfare launched the "Out Scaling of Natural Farming through Krishi Vigyan Kendras" project in 17 districts of Odisha, 13 districts of West Bengal and 1 district of A & N Islands involving 34 KVKs under Zone V since 2022–23. Natural farming is a sustainable agricultural method that avoids synthetic fertilizers, pesticides, and intensive tillage, relying instead on natural ecosystem processes to enhance soil health, biodiversity, and crop productivity.

The project has created huge awareness at the grass roots level on natural farming practices. To fulfil the target of a 100-day training programme, a total of 34 KVKs successfully completed 39 three-day trainings on Natural Farming from 07.07.2024 to 15.10.2024 in West Bengal, Odisha, and Andaman & Nicobar Islands, with the participation of a total of 1696 farmers. Additionally, 6 KVKs organised five-day trainings, where 232 farmers participated.

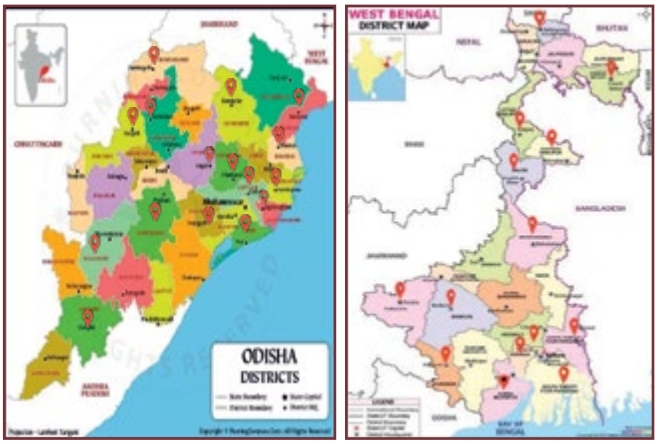


Fig.: Natural Framing Project implementing KVKs of Zone V

The farmers have witnessed positive outputs of natural farming to get the higher BC ratio for most of the crops grown like Brinjal, Tomato, Radish, Cauliflower, Carrot, Cucumber, Okra at the farmer's field under demonstration programme.

Case study on natural farming in Koraput district, Odisha

The present case study focuses on Shri Tripati Hanjaria, a 38-year-old farmer from Hanjaraguda village in Semiliguda block of Koraput district, Odisha, and his successful adoption of natural farming practices. Conducted as a case study in 2024, the research aimed to explore the methods and outcomes of natural farming through a close examination of Tripati's agricultural journey.

Tripati transitioned to natural farming in 2022 after attending a training session organized by KVK, Koraput. He initially cultivated millets and off-season vegetables, experimenting with intercropping and organic inputs like vermicompost and farmyard manure (FYM), though the early results did not meet expectations. Over two years, however, he

emerged as a pioneer in his village by expanding his natural farming practices to include maize and beans as intercrops in vegetable cultivation. He adopted various natural farming techniques such as *Beejamrutha*, *Jeevamrutha*, and other botanical formulations like *Neemastra*, *Brahmastra*, and *Agniastra* to improve crop health and yield. With Participatory Guarantee System (PGS) certification, Tripati gained local and district-wide recognition, enabling him to market his produce at premium prices, thereby increasing his income.

His success has inspired fellow farmers in the area to embrace natural farming as a way to reduce cultivation costs and improve livelihoods. Looking ahead, Tripati plans to expand his operations, adopt innovative practices, and strengthen his marketing strategies. He also aims to raise consumer

awareness about naturally grown produce to boost demand. Through his dedication, Tripati aspires to build a self-reliant agricultural ecosystem that benefits both his family and the wider community.


PGS - India

Scope Certificate

PGS-India National Standards
For Organic Production

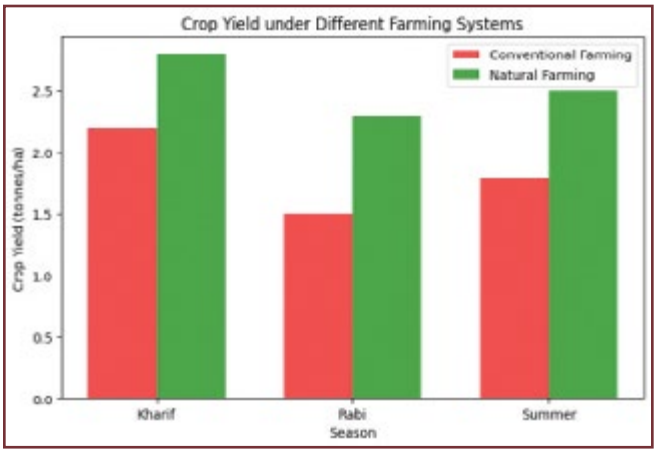
This Scope Certificate

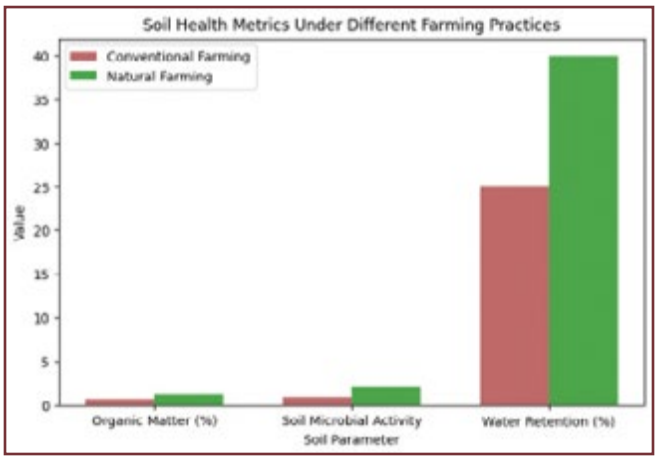
Case study on natural farming in Bankura district, West Bengal

Bankura, West Bengal, is heavily dependent on agriculture for livelihood. However, the overuse of chemical fertilizers and pesticides has degraded soil quality, reduced crop yields, and increased production costs. As a result, the conventional farming model is becoming unsustainable, prompting farmers worldwide to explore eco-friendly alternatives. Natural farming, rooted in biological inputs, soil conservation, and biodiversity restoration, offers a promising solution.

This case study highlights a 32-years Shri Sufal Ghosh's transition from chemical to natural farming in Sonamukhi Block, Bankura, West Bengal. Faced with declining soil fertility and rising costs, Shri Ghosh adopted natural farming methods, including *Jeevamritha* application, *Beejamritha* seed treatment, mulching, and natural pest control. Shri Ghosh practices a mixed-cropping system that helps maintain soil fertility and minimizes pest infestations. His farm is designed as a self-

sufficient and sustainable unit, incorporating diverse cropping zones, bio-mulching areas, and livestock grazing fields. To maximize yield and reduce pest risks, Shri Ghosh adopts a multi-cropping strategy with seasonal crop rotations. He





cultivates paddy and seasonal vegetables during kharif season, green gram during summer and

pigeon pea, oilseeds, and seasonal vegetables during rabi season. He practices intercropping across seasons. This diversified approach prevents soil nutrient depletion, promotes nutrient recycling, and minimizes the spread of pests and diseases.

Despite some initial yield fluctuations, he observed greater crop resilience and long-term financial sustainability. Shri Ghosh's experience demonstrates the economic, environmental, and social benefits of natural farming. By replacing chemical inputs with natural alternatives, he reduced input costs by 60%, improved soil health, and achieved sustainable yields. His success illustrates that natural farming can enhance productivity, lower costs, improve farmer self-reliance, and reduce environmental damage making it a viable path toward food security, soil restoration, and climate resilience.

14.13 Agri-Drone Project

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 that is used in agricultural operations, mostly for crop growth and production monitoring and yield optimization. Drones used for agriculture can gather data on soil differences, crop health, and crop growth stages. Agri-drones are a state-of-the-art technology that can also be used to spray pesticides, which lowers the cost and usage of chemicals. They can also be used to assess crop health and monitor weed, disease, and insect infestations in real time over a large region, allowing for prompt management methods.

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

State	Name of KVK	Name of ICAR Institute	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 Islands		ICAR-CIARI Port Blair	

Table: Details of Drone Demonstration during 2024

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	22	6500	3147.9	411	19248

Numerous agricultural chores, including the application of agrochemicals, nutrients, and insecticides and weedicides, are carried out by agri-drone technology. These Kisan Drone Demonstrations exhibited a number of benefits, such as reduced labour expenses, time and water savings, and an efficient spraying technique.

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 2024. 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 2024, 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 January 2024 to December 2024. 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 116 rural youth were trained under this programme.

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	5	39	18	4	2	12	3	55	23	78
Odisha	3	6	2	3	1	16	10	25	13	38
Grand Total	**8**	**45**	**20**	**7**	**3**	**28**	**13**	**80**	**36**	**116**



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 7060 farmers/ rural youth were trained under this programme.

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	187	376	622	104	265	1458	546	1938	1433	**3371**
Odisha	211	419	500	359	516	1186	680	1964	1696	**3660**
A & N Islands	2	3	0	1	0	23	2	27	2	**29**
Grand Total	**400**	**798**	**1122**	**464**	**781**	**2667**	**1228**	**3929**	**3131**	**7060**



15.3 HRD programme by ATARI Kolkata

ICAR-ATARI, Kolkata conducted 47 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 during 2024

Sl. No.	Name of the programme(s)	No. of scientist(s)/ staff attended
1	Online and offline meeting of scientific advisory committee (SAC)of KVKs of this zone	6
2	Online and offline review meetings/ workshops of various schemes/projects of ICAR-ATARI Kolkata	10
3	NAAS strategy workshop on carbon farming Chaired by Hon'ble Secretary, DARE & DG, ICAR	1
4	Online and offline meeting with DG/DDGs/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 various issues	10
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	Online meeting on eHRMS 2.0 technical issues organized by ICAR, New Delhi	5
8	Screening committee/selection committee meeting of various posts of KVKs of this zone	5
9	Invited lectures by scientists of ICAR-ATARI Kolkata at different conferences/workshops/ programmes	5
10	Online meeting on Vikshit Bharat @2047 with ICAR, New Delhi	15
11	Online review meeting on RKVY short term training and RPL training organized by the Council	3
12	Online meeting on 2ndinstitute-ATARI-KVKinterface meeting organized by ICAR-IVRI, Uttar Pradesh	5
13	Online meeting with JS (INM), Min. of DA&FW and JS (I &TB), Min. of Education & Literacy on soil health management in 1000 schools	2
14	Institute management committee meeting of ATARI Kolkata and other ICAR institutes	4
15	Online meeting for celebrating Bharat Ratna Award to Prof. M. S. Swaminathan organized by ICAR-IARI, Pusa, New Delhi	15
16	Selection committee meeting as Chairman/Member for selecting SRF/YP-I/Project Associates/ Project Assistants of different projects at ICAR-ATARI Kolkata and other Institutes	7
17	Awareness-cum-capacity building programme on quality assurance of soil testing labs under soil health card scheme at ICAR-CRIJAf, Barrackpore	1
18	Meeting of PPVFRA and facilitating the submission of GI etc. by KVKs at ICAR-CISH, Malda	1
19	Offline and online research advisory committee (RAC) meeting of network projects at NAARM, Hyderabad organized by AE Division, ICAR in collaboration with ATARI Hyderabad	4
20	Regional Committee Meeting (RCM-II) organized by ICAR-CRRI, Cuttack	1
21	Offline and online meetings with PIs/CC-PIs/SSHs of ATARIs/KVKs of different network projects	5
22	Zonal review workshop of KVKs under Zone V organized by ATARI Kolkata in collaboration with Puri KVK, Odisha at Puri	8
23	Online and offline zonal review meetings/workshops of various schemes/projects of ICAR-ATARI Kolkata	10

Sl. No.	Name of the programme(s)	No. of scientist(s)/ staff attended
24	Meetings as an expert of committee member organized by various other institutes/KVKs for promotion of personnel/award of degree/IRC etc.	5
25	Online and offline meeting/review 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 organized by AE Division, ICAR, New Delhi	10
26	Review meeting with PIs/CO-PIs of different institute projects	4
27	Online meeting on 100-days and five-year action plan with DDG/ADGs (AE)/Director ATARIs/ Scientists of the Division/ATARIs organized by AE Division, ICAR, New Delhi	10
28	Online and offline scientific advisory committee (SAC) meeting of KVKs	6
29	Selection committee meeting as Chairman/Member for selecting manpower at this institute and at the KVKs of this zone	6
30	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
31	Online meeting for orientation of KVKs to support Mass Drug Administration (MDA) Phase-II campaign for eliminating Lymphatic Filariasis (LF) disease in humans organized by AE Division, ICAR, New Delhi	2
32	Regional advisory group (RAG) meeting at NABARD, West Bengal Regional Office, Kolkata organized by NABARD, Kolkata	1
33	Online programme regarding celebration of 96th ICAR Foundation and Technology Day at ICAR, New Delhi organized by ICAR, New Delhi.	15
34	Five days management development programme (MDP) programme for SSHs of KVKs of this zone at ICAR-ATARI Kolkata	9
35	Meeting with Director, ICAR-ATARI Kolkata on various issues	12
36	Programmes to celebrate various important days organized by the Council/ATARI Kolkata/KVKs of this Zone	15
37	Online meeting with INM Section, DA&FW, GoI to discuss on *'National mission on natural farming (NMNF)'* organized by Ministry of DA&FW, GoI	4
38	Online inception meeting on PM-KUSUM Component A with ASCI, Gurgaon organized by ICAR, New Delhi	3
39	Online preparatory meeting on *'Ek Ped Maa Ke Naam'* with Addl. Secretary, DA&FW organized by Ministry of DA&FW, New Delhi	3
40	Online meeting on block contingency plan under NICRA organized by ICAR-CRIDA, Hyderabad	3
41	Workshop on technology prioritization for agriculture and allied sectors at ICAR-CRIJAF, Barrackpore, West Bengal	2
42	Online meeting of stakeholder consultation meet on *'Transforming agricultural research: enhancing role of private sector'* organized by ICAR, New Delhi	4
43	Online meeting on 100 Years of INSA, Ranchi, Jharkhand organized by ICAR-INSA, Ranchi	12
44	Online training programmes at Karmayogi iGOT platform	7
45	GIZ World Soil Day Conference organized by FAI at New Delhi	1
46	Other meetings on various issues	18

16.0 Ongoing Programmes

16.1 Formation and Promotion of FPOs

Nodal Scientist: Dr. A. Haldar

Agriculture is the mainstay of India's economy, supporting around 58% of the population. The country has over 92 million small farms—about 21% of the global total, mostly small and marginal holdings that make up 86.21% of all farms, but operate only 47.34% of the land. These holdings are shrinking across generations, raising concerns about their viability. Small farmers face challenges like limited access to inputs, credit, irrigation, markets, and government support. Poor infrastructure and market linkages reduce their income potential and bargaining power. To address these issues, the Government of India launched the "Formation and Promotion of 10,000 Farmer Producer Organisations (FPOs)" through National Cooperative Development Corporation (NCDC). FPOs aim to empower small farmers by improving access to inputs, finance, technology, and markets through collective action.

Since 2021–22, the Agricultural Extension Division of ICAR, New Delhi, has been implementing the FPO promotion project through ATARIs and KVKs/ICAR Institutes as Cluster Based Business Organisations (CBBOs), with support from NCDC. CBBOs operate at the block level and play a key role in forming and supporting FPOs from cluster identification and registration to training, business planning, and institutional linkages. They also provide technical guidance on areas like crop production, value addition, marketing, finance, Information and Communications Technology (ICT) and Management Information System (MIS), and compliance, ensuring the overall development and sustainability of FPOs.

The NCDC funded Central Sector Scheme, "Formation and Promotion of 10,000 Farmer Producer Organisations" has been implemented successfully with the formation of four FPOs in Balasore and Nuapada districts of Odisha under the guidance of two CBBOs, namely ICAR-CRRI, Cuttack and KVK, Nuapada, respectively under Zone V. All four FPOs in Balasore and Nuapada districts of Odisha got the registration number. A total of 2382 are the shareholders in these 4 FPOs with the receipt of Rs. 34.98 lakh as equity grant. Two CBBOs conducted 16 training programmes to mobilize/ aware the shareholders/ farmers on functioning of FPO and build the capacity of the shareholders on different technical aspects of commodity wise business and entrepreneurship development in agro-based enterprises. This project facilitated the development of a sustainable income-oriented farming, access to various inputs, value addition, processing, packaging and collective marketing platform for the smallholder farmers. 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 2024

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)	Total Equity Grant Received (in lakh)
ICAR-NRRI, Cuttack	Purba Baleswar 4S4R FPO	Remuna, Balasore	Registration Number: 1418/ BLSDT.24.09.2021 Dated 24.09.21	Total-750 (Male- 418 & Female-332)	3	Rice (39000Kg)- Rs.13,57,200/- Fruits & Vegetables sell (76900Kg)- Rs.45,19,550/- Profit- Rs. 3,78,921/-	15.00	15.0
	Upakula Baleswar 4S4RFPO	Balasore Sadar, Balasore	Registration Number: 1419/ BLS Dated 26.07.22	Total:750 (Male-457 & Female-293)	3	Paddy(160000Kg)- Rs.40,00,000/- Vegetables (5000Kg)- Rs.10,00,000/- Profit-2,10,000/-	15.00	15.0
KVK, Nuapada, OUAT	Sidheswar FPO	Komna, Nuapada	Registration Number: 43/NPD Dated 02.06.22	Total: 401 (Male: 338 & Female: 63)	5	Paddy seed (482 Q): 76,000/- Cotton seed (20 Q): 3,80,00/- Pulse (117 Q): stock in hand Groundnut (180 Q): 72,000/-	11.65	3.24
	Sibashakti FPO	Boden, Nuapada	Registration Number: 44/NPD Dated 02.06.22	Total: 481 (Male: 351 & Female:130)	5	Paddy seed (200 Q): 22,000/- Millet (88 Q): 17,000/- Groundnut (150 Q): 56,000/-	14.15	1.74

Purva Baleswar 4S4R FPO, Remuna, Balasore

This FPO developed 3 products (Puffed Rice, Noni Juice and Soya Paneer) including vegetable production and selling. It introduced new variant such as puffed rice without soda to cater to different consumer segments. FPO now serves over 25-30 shops in local markets with consistently high satisfaction ratings, thanks to our commitment to quality and value. The organization established link with retailers and e-commerce platforms like e-NAM and ONDC to widen distribution channels also revenue generated through ONDC. It sold 40 liters of Noni Juice, contributing to the planting of over 1,000 trees through FPO. It sold 10 quintals of soya paneer, with additional curd production from soya milk for marketing. Approximately 20 acres of land are dedicated to floriculture, while 50 acres are utilized for potato production.

Upakula Balasore 4S4R FPO, Balasore Sadar, Balasore

This FPO established automatic Agarbati Machine at the cost of Rs.1.13 lakh and Automatic Paper Plate Machine at the cost of Rs. 0.85 lakh. It sold paddy seeds worth Rs.10.50 lakh and puffed rice

worth Rs. 2.04 lakh and vegetables worth Rs. 10.00 lakh. This took over a 4 TPH Seed Processing Plant in shape of Lease Agreement for enhancing the seed business. A super mart is set to open in the market through FPO, with a total investment of Rs. 40.00 lakh of which Rs.10.00 lakh have already been invested.


Sidheswar FPO, Komna, Nuapada

The farmers are earning upto 20-25 per cent more than the earning reported by individual farmer. FPO started Cotton (Var. BS-30) seed production and pulse production. It participated in 1st District level convergence meeting and conducted exposure visits of FPO members.


Sibashakti FPO, Boden, Nuapada

The farmers are earning upto 20-25 per cent more than the earning reported by individual farmer. The FPO sold millet and groundnuts. It participated in 1st District level convergence meeting and conducted exposure visits of FPO members.


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 DA&FW, ICAR 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 Organic grower, Mushroom grower, Harvest and post-harvest machine assistant technician and Garden keeper etc. In this front, the KVKs of this Zone carried out a total of 7 training during 2024 covering 155 farmers and rural youth. A total of Rs. 16.07 lakhs was spent by the KVKs out of allocated fund of Rs. 41.74 lakhs (during 2023-24). 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	3	8	14	22	30	23	53	38	37	75	762050
West Bengal	4	12	12	24	43	13	56	55	25	80	845500
Total	**7**	**20**	**26**	**46**	**73**	**36**	**109**	**93**	**62**	**155**	**1607550**

16.2.2 ASCI RPL Skill Development Training Programme (duration of 3 days)

During 2024, in a joint effort of DA&FW, ICAR and ASCI, short duration (3 days) skill development training courses (Recognition of Prior Learning) were provided to practising farmers of younger age for inculcating the skill development in the field of entrepreneurial agricultural activities like Gardener, Mushroom grower, Vermi-compost producer etc. In this front, the KVKs of this Zone conducted a total of 7 training programmes during 2024 covering 280 farmers and rural youth. A total of Rs. 5.88 lakhs was spent by the KVKs out of fund allocated during 2023-24. The details of the training are given in the table below.

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	5	37	45	82	54	64	118	91	109	200	420000
West Bengal	2	13	37	50	17	13	30	30	50	80	168000
Total	**7**	**50**	**82**	**132**	**71**	**77**	**148**	**121**	**159**	**280**	**588000**

16.2.3 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 like scientific goat keeping, mushroom production, scientific cultivation of fruits etc. during the period under report. Seventy one training programmes were undertaken by KVKs of this Zone covering 2588 participants with a budget expenditure of Rs. 70.88 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	35	0	20	20	75000
Odisha	9	312	236	119	355	814000
West Bengal	61	2998	1222	991	2213	6198750
Total	**71**	**3345**	**1458**	**1130**	**2588**	**7087750**

16.3 National Farmers' Portal (*mKisan* Portal)

Nodal Scientist: Dr. K. S. Das

With the advancement of information technology (IT), farmers of remote areas of our country who had limited access to traditional media, were facilitated with the receipt of latest information and knowledge on various agricultural operations through various means like mobiles, internet, touch screen kiosks, agri-clinics, mass media, common service centres, kisan call centres etc. The *mKisan Portal* platform was such a GoI initiative for leveraging IT to deliver agricultural information to the farmers via SMS. The portal was accessible at https://mkisan.gov.in/ and offered various farmer-centric services like Kisan Call Centres, buyer-seller interfaces and information on farm mechanization. All Government Organizations e.g., KVKs, Meteorological Department, SAUs, ICAR Institutes, Department of Animal Husbandry, Dairying and Fisheries and others were providing information/ services/ advisories to the farmers engaged in agriculture by sending SMSs in their language using this platform.

The KVKs of this Zone were provided information on crops, seeds, pesticides, farmers' insurance, farm machineries, storage, fertilizers, livestock, fisheries, market price of agricultural produce, package of practices, various extension activities, weather forecasts, disease incidences, awareness etc. to the farmers of their concerned district through SMSs. During the year 2024, KVKs of Odisha and West Bengal sent 1148 and 696 messages, respectively which benefitted more than 1.83crore farmers. The state-wise distribution of messages by the KVKs and number of benefitted farmers during the year 2024 have been presented in the following table.

Table: State-wise distribution of messages by KVKs and number of benefitted farmers during 2024

Messages on	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
Crops	619	7984651	219	609691	**838**	**8594342**
Livestock	96	1321271	67	236496	**163**	**1557767**
Fishery	84	1366738	83	230822	**167**	**1597560**
Weather	164	2243933	242	321439	**406**	**2565372**
Marketing	39	569680	32	207409	**71**	**777089**
Awareness	86	1470536	24	223623	**110**	**1694159**
Other enterprises	60	1284432	29	230824	**89**	**1515256**
Total	**1148**	**16241241**	**696**	**2060304**	**1844**	**18301545**

16.4 Implementation of Public Financial management System (PFMS)

Nodal Officer: Mr. S. Mukharjee

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 and Platform, providing end-to-end financial management services to all stakeholders. 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 (4232). 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 2024-25, an amount of Rs.189500000 was released through scheme 4232 and Rs.828012000 was released through scheme 1270.

Fig.: Real time monitoring of releases and various fund flow mechanisms

16.5 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. Later on, 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. During 2024, a total of 13 KVKs of this Zone were involved in these activities benefitting 1780 farmers/ farm women. The details of the activities conducted during 2024 have been tabulated below.

Table: State wise details of nutri-sensitive agricultural activities during 2024

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	1	9	0	12	0	37	151	209
Odisha	33	10	58	12	19	16	319	492	916
West Bengal	23	2	34	28	11	8	283	291	655
Total	**59**	**13**	**101**	**40**	**42**	**24**	**639**	**934**	**1780**

Table: Nutri-sensitive agricultural activities undertaken during 2024 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	1	0	2	2	3	10	199	209
Odisha	10	4	128	16	24	115	801	916
West Bengal	2	2	48	18	12	110	545	655
Total	**13**	**6**	**178**	**36**	**39**	**235**	**1545**	**1780**

16.6 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*.

16.7 *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, learning resources, geo-spatial data etc. During the year 2024, documents including books, annual reports, newsletters, technical bulletins etc. published by the scientists of this institute were uploaded in *KRISHI* Portal for wide circulation among readers.The portal can be accessed at *http://krishi.icar.gov.in.*

16.8 Krishi Vigyan Kendra Knowledge Network or *KVK* Portal

Nodal Scientist: Dr. K. S. Das

The Krishi Vigyan Kendra (KVK), popularly known as *'One Stop Shop'* in the district, served as knowledge and resource centre of agricultural technologies and was linking the NARS with extension system and famers. During the year 2024, GoI 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 was accessed through logging in- *http://kvk.icar.gov.in.* It was developed in such a way that it could 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 created very good 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) was registered with ATARI Kolkata and the information was 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 KVKs through online meetings (hybrid mode), mails, WhatsApp messages to upload latest 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.

16.9 Kisan Sarathi

Nodal Scientist: Dr. A. Haldar and Dr. K. S. Das

'*Kisan Sarathi*'is an Information Communication and Technology (ICT) based interface online platform powered by Interactive Information Dissemination System (IIDS) for supporting agriculture at a local niche with a national perspective to facilitate farmers to get 'right information at right time' in their desired language. 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 ICAR to facilitate farmers to get 'right information at right time' in their desired language.

'*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 11.97 lakh farmers of this Zone V have already been registered from different districts of Odisha, West Bengal, A & N Islands. Fifty-nine KVKs with 228 experts of KVKs under ICAR-ATARI Kolkata have been registered. '*Kisan Sarathi*' platform definitely empowered farmers with technological interventions on crop, livestock, fisheries etc. The farmers could interact and availed personalized advisories on agriculture and allied areas directly from the respective scientists of KVKs of Zone V. Around 25% calls/ queries were answered in 2024. This initiative helped in addressing the location specific information needs of the farmers. Under

'*Kisan Sarathi*' platform, a total of 1297964 farmers of this Zone V have already been registered from different districts of Andaman & Nicobar Islands, Odisha and West Bengal. Fifty-nine KVKs with 250 experts of KVKs under ICAR-ATARI Kolkata have been registered. A total of 105279 calls/ queries have been made in 2024. This initiative of '*Kisan Sarathi*' definitely empowers farmers with technological interventions to reach farmers in remote areas.

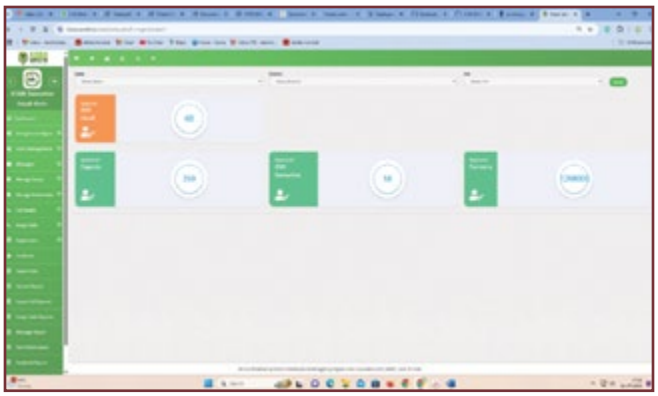


Table: Details of farmers registered under '*Kisan Sarathi*'

Sl. No.	State	Registered Farmers	Max. (KVK)	Min. (KVK)
1	A & N Islands	4807	2469 (Nicobar)	935(N & M Andaman)
2	Odisha	542490	52463 (Kendrapada)	2563 (Nabarangapur)
3	West Bengal	750667	105841 (Nadia Addi.)	1491 (Kalimpong)
Total		**1297964**		

16.10 Social Media Coverage

In today's digitally connected world, social media has transformed the way people communicate and share information across all sectors, including agriculture. Platforms like Facebook, X (formerly Twitter), and WhatsApp have become powerful tools for farmers to exchange knowledge, experiences, and best practices. ICAR-ATARI Kolkata has effectively harnessed the potential of X through its official account (@AtariKolkata) to share vital updates on ongoing research, technological breakthroughs, outreach initiatives, and institutional events with a wider audience. Throughout the year 2024, the account served as a key communication channel for disseminating information related to Government schemes, projects, seminars, workshops, and meetings organized by the KVKs and this office.

The platform was actively used to share valuable content on crop, livestock and fishery management practices, highlighting innovations in production, sustainable farming, secondary agriculture and productivity enhancement. Those efforts not only kept the followers well-informed but also fostered engagement with Government officials, other ICAR institutes, State Departments, NGOs and progressive farmers across the country.Regular updates were also provided on national initiatives in the zone. Visits of eminent personalities were also tweeted. To enhance greater visibility of the KVKs, their posts were also reposted by the handle of ATARI Kolkata. At present, all 59 KVKs under ICAR-ATARI Kolkata maintain official X accounts to showcase their district-level activities. In the past year alone, ICAR-ATARI Kolkata posted 756 original and reposted tweets, which garnered over 1000 retweets and 1500 likes- demonstrating strong interest and support from the agricultural community. The account currently has about 185 followers.

17.0 Other Programmes

17.1 Celebration of 'Republic Day 2024'

ICAR-ATARI Kolkata proudly celebrated the 75th Republic Day of India on 26.01.2024. The day began with the ceremonial flag-hoisting by the Director in the office courtyard. As the tricolor fluttered against the morning sky, the melodious rendition of the national anthem resonated through the air. The Director, Dr. P. Dey remarked how the nation has achieved the great democracy and republic after its freedom struggle and how we need to uphold it for the next generation. The day was concluded by some refreshment at the conference hall.

17.2 Celebration of 'World Intellectual Property Day 2024'

A virtual meeting was held on 29.04.2024 on the occasion of *'World Intellectual Property Rights Day 2024'*to celebrate and raise awareness about the importance of intellectual property (IP) rights at the seminar hall of ICAR-ATARI Kolkata. The program

was chaired by Dr. P. Dey, Director of this institute. It featured a presentation by Dr. (Mrs.) Sanchita Ganguli, a patent attorney from S. Majumdar & Co., a renowned Intellectual Property firm. All the principal scientists and project staffs were physically present in the meeting. The meeting was attended by KVK scientists of this zone through virtual mode where the significance of IP in the field of agricultural research were highlighted. The program was concluded with a vote of thanks from Dr. P.P. Pal, PS, ICAR-ATARI Kolkata.

17.3 Celebration of 'Bharat Ratna award of Prof. M. S. Swaminathan 2024'

ICAR-IARI, New Delhi jointly with NAAS organized a special celebration on 13.02.2024 in recognition

of the conferment of the prestigious Bharat Ratna Award to Prof. M. S. Swaminathan. The program was coordinated by Dr. H. Pathak, President of NAAS and DG, ICAR and Dr. A. K. Singh, Director, ICAR-IARI, New Delhi. They emphasized how

the agricultural landscape of India has been profoundly changed by Prof. Swaminathan's visionary leadership and inventive approach. Dr. T. Mohapatra, Dr. R. B. Singh, and Dr. R. S. Paroda, Founder of TAAS, were among the other dignitaries present on the event. Live telecast was attended by all the staff of this office. Attending the session, all of the staffs cherished the knowledge and experience that the distinguished scientists provided.

17.4 Celebration of 'International Yoga Day 2024'

On the eve of *'International Yoga Day 2024'* a yoga practice program was organized in the Director's

room of ICAR-ATARI Kolkata on 21.06.2024. All scientists and project staff of the institute enthusiastically participated in the program and easily performed various yoga poses demonstrated by the yoga instructor- Ms. Kusumika Roy, project staff of the institute. Dr. P. Dey, Director of the institute, presided over the yoga practice program.

He expounded this year's theme *'Yoga for Self and Society'* and wished all the workers with a better mind-body unison and healthy living. The program concluded with a small luncheon containing fresh seasonal foods.

17.5 Celebration of 'International Women Day 2024'

Invest in women-accelerate progress with this theme like each year, on 08.03.2024, the world marks International Women's Day (IWD) to renew our collective commitment to achieving gender equality. The office of ICAR-ATARI Kolkata has also organized a program on this eve. Dr. (Mrs.) Lopamudra Haldar, Professor, WBUAFS has chaired the occasion as chief guest. The program was attended by all the office staff.

17.6 Celebration of 'ICAR Foundation Day 2024'

The 96th foundation day of ICAR was organized by ICAR at New Delhi on 16.07.2024. The ICAR Institutes pan India celebrated this day from their institute.

The scientists, research fellows, administrative staffs and other have joined the program in

virtual mode. Along with many delegates, in this program Hon'ble Union Agriculture Minister and DG, ICAR emphasized on the need of climate smart agriculture. They explained how the drone and natural farming might revolutionize the future farming in India. Many scientists and progressive

farmers were awarded during this ceremony.

17.7 Conducting Management Development Programme (MDP) 2024

ICAR-ATARI Kolkata Hosted 3rd and final Phase of MDP for five newly recruited SSHs of KVKs from A & N Islands, Odisha and West Bengal of Zone-V on 27-31.12.2024. The entire program, consisted of three phases was jointly planned and implemented by the Agricultural Extension Division of ICAR, ICAR-NAARM, and ICAR-ATARIs exclusively for the newly recruited SSHs of KVKs. The trainees explored key topics including the organization and management of ATARI, five-year targets for KVKs, information and knowledge management, and the

administration of Central Sector Schemes. They undertook assignments focused on advancing the ODOP initiative for their respective districts and leveraging their disciplinary expertise for local development. Additionally, they collaborated to design a joint project addressing malnutrition through agricultural systems for potential external funding. As part of the project development

process, they visited South 24 Parganas KVK, Narendrapur. Reflecting on their experiences from the previous two phases, the trainees shared how those insights had served as a source of inspiration and motivation. In the valedictory session, Dr. P. Dey, Director, ATARI Kolkata emphasized the need for KVKs to serve as district agri-tech epicenters, promoting nature-friendly technologies to achieve national aspirations by 2047. Dr. A. Haldar, PS coordinated the programme and Dr. S. K. Mondal from this office delivered vote of thanks.

17.8 Celebration of 'Independence Day 2024'

The 78th Independence Day of India was celebrated with great enthusiasm and a spirit of patriotism at the office of ICAR-ATARI Kolkata on 15.08.2024. The day began with the unfurling of the national flag by the Director Dr. Pradip Dey, followed by the

singing of the national anthem. Scientists, research scholars and other staffs were gathered in the office premises to witness the ceremony, and the atmosphere was filled with pride and unity. A short speech was delivered by Dr. Dey, who highlighted the significance of Independence Day and the sacrifices made by freedom fighters to achieve India's independence. The speech emphasized the importance of unity, progress, and collective responsibility towards nation-building.

17.9 भाकृअनुप-अटारी कोलकाता में हिंदी पखवाड़ा समापन समारोह

भाकृअनुप-कृषि प्रौद्योगिकी अनुप्रयोग अनुसंधान संस्थान, कोलकाता द्वारा राजभाषा हिंदी के प्रति संस्थान की प्रतिबद्धता और समर्पण को समर्पित हिंदी पखवाड़ा *2024* (*14-28 सितम्बर, 2024*) का समापन समारोह बड़े हर्षोल्लास के साथ संपन्न हुआ। राजभाषा हिंदी के अनुपालन और हिंदी के प्रसार के उद्देश्य से आयोजित हिंदी पखवाड़ा का समापन समारोह संपन्न हुआ।

मुख्य अतिथि डॉ. डी. बी. शाक्यवार, निदेशक, भाकृअनुप-राष्ट्रीय प्राकृतिक रेशा अभियांत्रिकी एवं प्रौद्योगिकी संस्थान, कोलकाता, ने अपने संबोधन में राजभाषा नीति के प्रावधानों और सरकारी कार्यों में हिंदी के व्यापक उपयोग पर जोर दिया। उन्होंने कहा कि सभी कार्मिकों को बिना किसी झिझक के हिंदी को अपने दैनिक जीवन और कार्यक्षेत्र में अपनाना चाहिए।

समारोह की अध्यक्षता करते हुए संस्थान के निदेशक, डॉ. प्रदीप डे ने कहा कि एक प्रतिष्ठित सरकारी संस्थान होने के नाते, हमें राजभाषा नीति के कार्यान्वयन में महत्वपूर्ण योगदान देना चाहिए। उन्होंने सभी से आग्रह किया कि वे आधिकारिक संचार और दैनिक कार्यों में हिंदी का अधिकाधिक उपयोग करें। डॉ. डे ने हिंदी भाषा की ऐतिहासिक और सांस्कृतिक धरोहर पर प्रकाश डालते हुए कहा कि हिंदी, फारसी और भारतीय संस्कृतियों के संगम का प्रतीक होते हुए, धीरे-धीरे एकता की भाषा बनकर समाजों और राष्ट्रों को जोड़ती जा रही है।

इस अवसर पर संस्थान के सभी वैज्ञानिक, अधिकारी और परियोजना कर्मचारी उपस्थित रहे। कार्यक्रम का कुशल संचालन डॉ. एस. के. मंडल, प्रधान वैज्ञानिक एवं हिंदी नोडल अधिकारी ने किया, और धन्यवाद ज्ञापन डॉ. के. एस. दास, प्रधान वैज्ञानिक ने प्रस्तुत किया।

17.10 Observation of 'Vigilance Awareness 2024' Week

The 'Vigilance Awareness Week 2024', as a prelude to the three-month campaign on preventive vigilance, was inaugurated on 28.10.2024 at ICAR-ATARI Kolkata with the objective to raise awareness about the importance of vigilance in driving both organizational and national progress. The theme during 2024 was *'Culture of Integrity for Nation's prosperity'.* The programme was initiated by administering an integrity pledge to all Staff by Dr. P. Dey, Director of this office. The Chief Guest and Keynote Speaker- Dr. S. S. Singh, DEE, RLB CAU, Jhansi, UP and Former Director, ATARI Kolkata dealt with various aspects of vigilance and preventive. He thanked the office for orchestrating such meaningful event, a beacon of vigilance awareness illuminating every corner of the Institute. Dr. P. Dey, Director, in his presidential address, told that preventive vigilance was the cornerstone of good governance. He simplified this year's theme as building a culture of integrity

for national strength and prosperity, highlighting the Public Interest Disclosure and Protection of Informers (PIDPI) resolution in protecting complainants' identities through confidentiality. During the campaign period of *'Vigilance Awareness Week 2024'*, various activities were planned at the Institute and its KVKs. In 20 KVKs of Odisha, 785 persons participated in the discussion on various vigilance awareness whereas in West Bengal, 17 KVKs involved 614 farmers to discuss on develop corruption free country, panel discussion, debate and drawing competition about the importance of vigilance. In A & N Islands, different programmes were also organized in 3 KVKs with 35 participants.

17.11 BSF Personnel Training

The BSF personnel in their respective districts were trained by the KVK scientists in a variety of agricultural and related technologies, such

as horticultural production, grafting techniques, honey production, mushroom cultivation, hi-tech agriculture, livestock rearing, fish rearing,

and many more. The KVKs established excellent communication between local citizens and army troops. In 2024, 88 BSF troops received training from four KVKs from the state of West Bengal.

17.12 Rural Agricultural Work Experience (RAWE) Programme

Nodal Scientist: Dr. A. Haldar

In India, the Rural Agricultural Work Experience (RAWE) program offers graduate agricultural students an opportunity to gain hands-on experience in farming and rural life. Through this program, students engage directly with farm families, using extension tools to disseminate the latest agricultural technologies and identify field-level challenges faced by farmers. RAWE also provides students with the opportunity to observe and participate in the implementation

of various ongoing agricultural and rural development programs, helping bridge the gap between academic knowledge and real-world

agricultural practices. The program begins with an orientation session designed to enhance students' competence and confidence in addressing practical agricultural issues. It prepares them to tackle real-life challenges in the field and equips them with the skills needed for effective problem-solving in rural

and farming communities. The objectives are to bridge the gap between theory and field realities, to equip graduates to be change agents in rural areas, to promote development of self-employment and entrepreneurial skills, and to prepare students for roles in rural advisory, agribusiness, policy, or extension.

RAWE students of this Zone from different agricultural institutes/universities took training from 30 KVKs of West Bengal and Odisha. Altogether 16 KVKs of West Bengal and 14 KVKs of Odisha imparted the training to those RAWE

students. The number of trained students was 899, out of which 538 students were from West Bengal and 361 students were from Odisha. In this training programme, the participating students stayed for 30 to 90 days for carrying out different training module scheduled by KVKs. The students were exposed to different activities of KVK like nursery management, seed production and certification, mass multiplication of *Trichoderma*/ *Pseudomonas*, bio fertilizer 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.

17.13 Agriculture Knowledge in Rural School

Nodal Scientist: Dr. P. P. Pal

Agriculture is facing a significant threat due to the declining interest of youth in entering the agricultural sector, which could impact the process

of agrarian regeneration. The representation of agriculture in rural areas is also an important factor, as the image of agriculture can vary widely in these settings. Schools and Teachers play a crucial role in shaping the agricultural image

among students. KVK Scientists from 19 KVKs in this Zone organized agriculture classes to draw in school children. The various area /topics covered

are importance of sustainable agriculture, natural & organic farming, soil testing and health, crop management, special interest on zero energy

cool chamber, water harvesting, backyard nutrition garden management, medicinal plants, environmental awareness, farming and on personal and household health & hygiene, nutritional and

clinical value of vegetables and fruits, Swachhta campaign etc. About 56 numbers of Primary and Higher Secondary School, Jawahar Navodaya

Vidyalaya, Kendriya Vidyalaya and Agropoltechnic participated in this programme throughout the year. Different teaching aids like audio-visual aids, power point presentation, oral presentation, display model, method demonstration, quiz, debate, video show, interactive lecture etc.

Table: Details of students trained under KVKs in rural school programme

Sl. No.	State	No. of student trained	No. of days stayed
1	Odisha	361	30-90
2	West Bengal	538	30-90
	Total	**899**	

17.14 Mahila Kisan Diwas

Mahila Kisan Diwas is observed across India on October 15 every year. The UN declared International Day of Rural Women on October 15, 2007 in recognition of rural women's contributions

to agriculture and development. In 2016, the Ministry of Agriculture and Farmers Welfare of the Government of India officially declared October 15 as Mahila Kisan Diwas. Main purpose of the

Mahila Kisan Divas is to acknowledge, promote and strengthen the contribution of women in agriculture and allied sectors. This day recognizes and honours the pivotal role that women play in Indian agriculture and rural development. This programme encompasses a variety of activities, including discussion and training on nutritional

gardening, mushroom cultivation, production of organic fertilizers, natural farming, and millet cultivation. Additionally, it involves Swachhata activities, the promotion of Self-Help Group (SHG) initiatives, demonstrations on integrated farming, cultural and recreational events with local farm women, and awareness programmes aimed at fostering entrepreneurship development among farm women through various income-generating

activities. On 15th October 2024, a total of 41 KVKs from West Bengal, Odisha and Andaman & Nicobar Islands observed Mahila Kisan Diwas with active participation. The celebrations held across 137 villages during the year, were graced by the presence of 18 VIPs, describing the vital role of women in agriculture and rural development.

Table: State-wise details of observing Mahila Kisan Divas

State	No. of KVKs organized Programme	No. of villages Involved	No. of Participants	No. of VIPs
West Bengal	13	53	955	7
Odisha	27	83	1573	11
A&N Islands	1	1	19	0
Total	**41**	**137**	**2547**	**18**

18.0 New Initiatives

18.1 PM-KISAN Programme

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

The PM-KISAN programme was organized at Varanasi, UP on 18th June, 2024 to release the 17th instalment of *'PM-KISAN Samman Nidhi Scheme'* for 9.26 crore farmers amounting to over Rs. 20000/- crore and also to distribute the

certificates to more than 30000 SHGs trained as Krishi Sakhis to work as para extension worker. On the 50 selected KVKs, special event was organized

where large number of farmers joined the event. The farmers were sensitized about the good agricultural practices, new emerging technologies

in the agricultural field, practicing climate resilient agriculture etc. The similar programme was

also organized on 5th October, 2024 at Washim, Maharashtra to release 18th instalment of *'PM-KISAN Samman Nidhi Scheme'* for 9.40 crore farmers

amounting to over Rs. 20000/- crore through DBT. In both the programmes, a substantial number of VIPs, over 1 lakh Primary Agricultural Cooperative Societies and 5 lakh Common Service Centres witnessed the programmes along with huge number of farmers. Two-way communications for

the interaction of Hon'ble PM of India with farmers of selected districts were made. The details of farmers and VIPs participated in PM- KISAN programme during 2024 have been presented in the following table. The state-wise participation details for this zone and other 10 zones across the country were compiled by ICAR-ATARI Kolkata and finally, was submitted to the Council.

Table: State-wise participation details of PM-KISAN Programme during 2024

State/UT	No. of instalment released (date)	No. of KVKs	No. of farmers participated		No. of VIPs attended the event at KVKs				Total no. of participants
			Male	Female	Ministers	MPs	MLAs	Senior Officers	
A & N Islands	17th (18.06.2024)	3	162	165	0	1	0	14	**342**
	18th (05.10.2024)		130	165	0	1	0	13	309
Odisha	17th (18.06.2024)	33	3639	2758	11	14	23	447	**6892**
	18th (05.10.2024)		2453	1248	1	11	16	377	4106
West Bengal	17th (18.06.2024)	23	1545	1566	2	1	0	79	**3193**
	18th (05.10.2024)		810	559	0	0	0	105	**1474**
Total		**59**	**8739**	**6461**	**14**	**28**	**39**	**1035**	**16316**

18.2 Protection of Plant Varieties and Farmers' Rights Act Programme

Nodal Scientist: Dr. P. P. Pal and Dr. A. Haldar

The Protection of Plant Varieties and Farmers' Rights Act (PPV & FRA) seeks to address the rights of plant breeders and farmers on an equal footing. It affirms the necessity of recognizing and protecting the rights of farmers with respect to the contribution they make in conserving, improving and making Plant Genetic Resources

(PGR) available for the development of new plant varieties. The objectives of the Plant Varieties and Farmers' Rights Act (2001) were- i) to establish an effective system for the protection of plant varieties, the rights of farmers and plant breeders and to encourage the development of new varieties

of plants, ii) to recognize and protect the rights of farmers in respect of their contributions made at any time in conserving, improving and making available plant genetic resources for the development of

new plant varieties, iii) to accelerate agricultural development in the country, protect plant breeders' rights; stimulate investment for research and development both in public & private sector for the development new of plant varieties, and iv) to

facilitate the growth of seed industry in the country which will ensure the availability of high quality seeds and planting material to the farmers.

A Workshop-cum-Awareness Programme on PPv & FRA-cum-Agro-Biodiversity Exhibition were organized 28th August, 2024 by ICAR-ATARI Kolkata in collaboration with OUAT, Bhubaneswar at KVK Puri, Odisha. Dr. T. Mohapatra, Chairperson

of PPVFRA, New Delhi and Chief Guest, acknowledged the vital role of farmers, particularly in tribal areas, as stewards of traditional varieties and landraces. He emphasized the profound future potential in protecting these farmers' varieties, especially by integrating them into value chains and exploring their commercialization opportunities. Dr. P. Dey, Director of ICAR-ATARI, Kolkata, underscored the vital importance of preserving traditional varieties, which are the living treasures of our agricultural heritage. Dr. D. K. Agarwal, Registrar-General of PPVFRA, emphasized the profound importance of PPVFRA. He passionately urged farmers to register their cherished varieties, thereby unlocking the rights and benefits that this landmark Act bestows upon them. An interactive session was held, farmers shared the challenges they face in conserving traditional varieties. They also highlighted the need for financial support for in-situ conservation efforts. A few champion farmers were felicitated with certificates and

mementos for their exemplary role in conserving traditional varieties. The event saw the submission of more than 120 applications for registration of farmers' varieties covering various crops from the A and N Islands, Odisha and West Bengal. An exhibition showcasing traditional varieties of rice, pulses, millets, and other crops was also held.

18.3 Activities under 100-Day Action Plan

Nodal Scientist: Dr. P. P. Pal, Dr. A. Haldar, Dr. S. K. Mondal and Dr. K. S. Das

As part of a strategic initiative by Division of Agricultural Extension, of ICAR, ATARI Kolkata implemented a 100-Day Action Plan from 8th July to 15th October, 2024 to empower farmers and to strengthen the agricultural ecosystem. The overarching goal of the campaign was to enhance

farmers' knowledge, build capacity and promote sustainable and market-linked agricultural practices across various regions.

A total of 14 KVKs actively engaged in facilitating these initiatives. Efforts were made to support 10 FPOs by assisting them in branding, packaging,

establishing market linkages and preparing for financial support. Similarly, 4 SHGs received support for market integration. To strengthen digital connectivity and ease of services, linkages were also established between 14 KVKs and CSCs.

Skill development (ASCI) was a key component of the action plan, with a focus on empowering rural youth and farm women. A total of 289 training

programmes of at least five days' duration were organized which benefitted 4739 farm women and 4668 farm youths. Those programmes were designed to equip participants with practical knowledge and vocational skills relevant to agriculture and allied sectors.

Natural farming and climate-resilient agriculture were also given priority during the campaign. Under the natural farming component, 39 training programmes were conducted involving 1696 farmers. In addition, NICRA project facilitated 91 training programmes that covered 2805 farmers. Furthermore, 147 demonstrations on climate-resilient technologies were carried out under NICRA during the *Kharif* season, covering a total area of 1203 acre. To promote crop diversification, a significant number of cluster front line demonstrations were undertaken. Those included 6453 demonstrations on pulses which covered 3150 acre and 12257 demonstrations on oilseeds

which covered 6052 acres. Technology-driven initiatives were another highlight of the action plan. Under the INM programme, 99 demonstrations were conducted using drone technology, covering

a total area of 1,084.8 acres. These demonstrations showcased precision agriculture techniques and efficient nutrient application methods. Several flagship government programmes were integrated into the campaign. Under the PM-KUSUM initiative

of the Ministry of New and Renewable Energy, 4 workshops were conducted with participation from 112 farmers, many of whom expressed interest in adopting solar energy systems. As part of the 5H Partnership Extension model, 10 teleconsultations were provided to farmers through CSCs. Custom Hiring Centers, established in NICRA village clusters, were also extended equipment rental services to local farmers which generated a revenue of ₹ 60,240 through such services.

19.0 Selected Success Stories

19.1 KVK South 24 Paraganas-I (Nimpith)

Revolutionizing cotton cultivation: Journey of a farmer towards success

Shri Debasis Giri is an educated (Masters in Geography), small, innovative and progressive farmer who joined with his father to help in agriculture in 2016 after completion his study. During *kharif* season he cultivates high yielding paddy like Pratiksha, Swarna Shreya, Ranjit Sub-1 etc. Shri Giri grow the vegetables like brinjal, bitter gourd, bottle gourd, ridge gourd, cow pea etc. by using the pond water throughout the year. In the *rabi* season he has been cultivating cotton in an area 1.47 ha for the last 5 years. Shri Giri always applied organic manures and bio-fertilizers for his cotton cultivation. He uses chemical fertilizers based on soil test reports.

For crop protection, bio pesticides and bio agents like Trichoderma, Pseudomonas etc. is used as a

seed treating agent. He uses chemical fertilizers like urea, SSP, MOP and DAP to the field as well as he used water soluble fertilizers (13:0:45) to

the crop during vegetative stage for better yield. For controlling of sucking pests like aphid, jassid, thrips & white fly he used chemical pesticides like

Azadirachtin (Neem oil), Thiamethoxametc and for lepidopteran pests during flowering and early boll formation stage he used Chlorantraniliprole and Emamectin benzoate.

Shri D. Giri is a progressive farmer and innovative agricultural farmer. He is a hard worker and has leadership quality. He advices other farmers on

soil testing and on the use of bio-fertilizers and bio-pesticides for different crops. Following a rich harvest of the crop and high return, the many farmers of this village adopted the technology in the next year and they got very good return as a result of which they readily accepted the technology. Not only in this village, cotton cultivation has an immense impact on the farming community of Sundarbans by increasing the yield. The sustainable technology has not only augmented the productivity of cotton but also improve the standard of living of the farmers by increasing their income per unit area. The farmers are also able to save one third of water which is utilized in other summer crops. Thus, it also generated additional man days. The technology which was initially demonstrated in two villages in Patharpratima block in the year 2010-11 has now spread to a number of villages through training, demonstrations and field days implemented by the KVK as well as Dept. of Agriculture, GoWB.

Initially, the farmers were reluctant to adopt the cotton cultivation in coastal belts of Sundarbans because they thought that the technology will be labour intensive as a result of which the cost of cultivation will be more and the yield will not be sufficient enough to make it a viable enterprise. Shri Giri of Herombo Gopalpur village was trained on cotton cultivation technology by RAKVK scientists and he adopted the cultivation in his own field in rabi summer season. In 2024, he harvested 28 quintals of kapas /0.93ha and achieved about Rs.65086/- net return from the same land which previously remained fallows.

Impact factor	Before adoption	After adoption
Crop/Agricultural Practice	Fallow	Cotton
Yield of Crop/product	-	30 q/ha
Sale value	-	Rs.124500/- per ha
Input cost	-	Rs.21840/- per ha
Labor cost	-	Rs.24825/- per ha
Any other cost (Irrigation)	-	Rs.8100/- per ha
Net saving/Net profit	-	Rs.69735/- per ha

19.2 KVK Nadia-I (Gayeshpur)

Becoming India's first net-zero certified Krishi Vigyan Kendra

Krishi Vigyan Kendra Nadia under BCKV, located in West Bengal under the jurisdiction of ICAR-ATARI Kolkata, has made history by becoming India's first net-zero certified KVK. Awarded the prestigious Sustainable Agriculture Carbon Footprint Certificate by UK-based certifying agency i-NoCarbon Limited, Nadia KVK has

achieved a remarkable feat with a net carbon footprint of (-) 74.99 metric tonnes CO2e. The estimation of Carbon foot print of Nadia KVK was accounted for different activities during the year 2022 and 2023 and the certification was done

in 2024.The assessment of Nadia KVK's carbon footprint revealed key contributors to greenhouse gas emissions, including electricity consumption, livestock rearing, and on-farm activities. However, through sustainable agricultural practices and extension programs, Nadia KVK successfully mitigated these emissions.

The journey began with KVK's sustainable intervention of the Clean Food Net Zero Model, implemented in collaboration with IORF, which emerged as a significant contributor to carbon mitigation. Along with this effort different sustainable management practices and activities towards synthetic nitrogen fertilizer reduction under FLD and OFT programmes also helped to reduce significant carbon footprint. The MoU between ICAR-ATARI, Kolkata, and IORF further accelerated this initiative, driving innovation in sustainable agriculture and carbon foot print reduction. By promoting pesticide- free and sustainable farming practices, coupled with

the application of Novcom compost (a process developed by IORF), this initiative showcased remarkable results in reducing carbon emissions. In addition to on-farm activities, the preservation of trees and management of perennial horticultural plants within Nadia KVK's premises contributed

significantly to carbon sequestration. Altogether, these efforts resulted in a net carbon saving of 74.99 metric tonnes CO2e, highlighting NadiaKVK's commitment to sustainable agriculture and environmental stewardship.

The KVK Net Zero Model, integrated with the Clean Food Net Zero (CFNZ) Program, provides a transformative pathway for Corporate Social Responsibility (CSR), Net Zero compliance, carbon credit generation, and soil restoration. This model, validated through the IBM-IORF Sustainability Accelerator Project, is a proven approach to carbon neutrality. With its adaptability to Voluntary carbon market (VCM) projects, aligned with India's sustainability vision, it stands as a first-of-its-kind initiative, setting a global benchmark. Considering the 731 Krishi Vigyan Kendras (KVKs) spread across the country, this initiative will help India move closer to a greener, more resilient future.

19.3 KVK Howrah

Cultivation of high value exotic vegetables made a farmer successful

Shri Bhudeb Polle of Village- Khaspur, PO- Bahira, PS- Uluberia, Howrah earlier practised traditional cultivation of rice and vegetables, which was less profitable and his life was so miserable. After he established contact with KVK Howrah, his interest on cultivation of high value vegetable crops as well

as SRI method of rice cultivation was considered by the KVK as his strength and he was advised to practise the same. Now, the farmer has only one bigha of upland and one bigha of low land. From this small holding he is earning more than one lakh per annum. He is growing Golden berry in 8 katha of lands which give him profit around Rs. 25000/-. He also grows chilli, parshley, red lettuce and get higher return. In his lowland he grows paddy in boro season through SRI and earn 15% more yield

as compared to conventional system. His cost of production of all the crops are: Rs. 18000- excluding family labour cost. His gross income is Rs. 120000/-. His success inspired the fellow farmers and they are also practicing same type of farming. He is now one of the Board of Directors of Desher Mati FPC. Presently, about 40 farmers of his locality following SRI paddy cultivation and around 20 farmers started growing high value exotic vegetables.

19.4 KVK Dakshin Dinajpur

Transformation from an engineer to a millionare through scientific fish farming

Maa Lakshmi Fish Farm is one success story of two friends – Mr. Prabodh Kumar Das and Mr. Sandip Roy. A fish hatchery at Khanpur, Dakshin Dinajpur. A fish hatchery, which include breeding, hatching and rearing of catfishes: Singhi, Magur, Tengra,

Pabda and amur carp. Sandip and Prabodh, they both are from Dakshin Dinajpur. They are 36 and 29 years old respectively. They both are well educated. Sandip was an engineering student. He completed his B.Tech on Civil Engineering from Calcutta Institute of Technology in the year of 2016. Prabodh, his friend completed his graduation from Balurghat College in the year 2009.After completing their study, they decided to start their carrier with business because of various socio-economic reasons. One of the reasons is family income to support his higher education and the other is availability of jobs in the home state. This forced them to take their family responsibility on their hand.

Sandip started a small hatchery in his home in 2018. At that time, he had no commercial setup for the hatchery. Initially, he began breeding Singhi in small plastic pots used for household purposes. He used brooders from the local fish markets to accomplish this task. Since they lacked the necessary equipment at the time, the hatchling

production was insufficient to meet marketing standards. After finishing his studies, he decided to start his own business because it was time to begin earning money and taking on responsibilities for his family. He started the construction of hatchery setup in the land owned by his father in the year 2020 after getting trained from Dakshin Dinajpur Krishi Vigyan Kendra under Uttar Banga Krishi Viswavidyalaya, Majhian regarding the breeding technique of catfishes in the year of 2019. However, he faced many socio-economic challenges like labours, transportation of construction materials, capital due to sudden outbreak of Pandemic Covid-19 followed by Nation-wide lockdown in 2020-2021. On the other hand, Prabodh began his journey at home with a Biofloc culture since 2019. He established his business after receiving training from Patna in 2018. Unfortunately, he had

suffered many losses in his business and did not have enough money to start something new at that time. So, he was driven to join his friend Sandip's hatchery business with some small investments.

In the year of 2021, they jointly started the new startup with name "Maa Lakhsmi Fish Farm" in an area of 3 bigha land adjacent to Hili highway. Presently they have four rectangular and two circular breeding tank, two ante tank and two ward tank which are well connected with inflow, out flow, and water supplies. In addition, they have two hatching pits and five rearing ponds to grow seeds up to marketable fry or fingerling sizes. The seeds that are produced and exported are Singhi (*Heteropneustes fossilis*), Magur (*Clarias batrachus*), Pabda (*Ompok bimaculatus*), and Tengra (*Mystus tengara*), Koi (*Anabas cobojius)* and occasionally Amur Carp (*Cyprinus carpio*).

Now-a-days, this is the very successful and renowned hatchery in this district. In addition, they have the popularity out of this district as well as outside the state. At this moment, they export their seeds to districts such as Nadia, Kolkata, Siliguri, Cooch Behar, Malda, Norh 24 Parganas, and beyond across the state to Assam, Bihar, and Punjab, with an expected turnover of 30 lakhs per year, from which they profit by one-third.

Yesterday's Sandip and Prabodh become successful businessmen today! They are running a thriving fish hatchery in Khanpur. Now they are financially stable and take the responsibilities of their families. As an accomplished businessman, they are well respected to their community. Now, they have the plan to expand their business and export value. At this moment, they have two workers in their farm. However, they intend to expand their business and its exports throughout the country, employing additional workers in the future to provide livelihoods to the local community. Moreover, they are involved in numerous social activities and share their knowledge with several individuals in the community.

19.5 KVK Birbhum

Pig rearing with *Ghungroo* breed brought smile to farmer's face

Shri Chunku Kisku from Village- Kumorpara, PO-Kankutia, Block- Bolpur Sriniketan, aged 45 years, was a progressive pig farmer of village Kumorpara of Birbhum District of West Bengal. Earlier, his

main source of income was agriculture and fishery. Later on, he realized that pigs could provide liquid money during his financial crisis. He began to rear desi pig with traditional management and rearing practices which results in small litter size, lower growth rate and less economic return. During this period, he started visiting KVK Birbhum-how about pig farming.

He procured five *Ghungroo* piglet (1 male and 4 female) from KVK Birbhum. He began to rear 10 improved pig breed (2 male & 8 female) also. Within

11-12 months each sow delivered 8-10 nos. of piglets in the first batch. In this way he developed 120 pigs for fattening in his farm. Scientific interventions like feed and health care management provided by Rathindra Krishi Vigyan Kendra. Besides he collected left over food from hotel and cultivated green vegetables like pumpkin, Colocasia, potato, radish etc for pig feeding. He used rice husk procured from his agricultural land for pig feeding. Routine deworming and vaccination were done by KVK Birbhum.

KVK Birbhum provided five *Ghungroo* piglet (1 male & 4 female), concentrate feed, medicine. Piglets were supplemented with oral iron preparation to prevent piglet anaemia. Vaccination against swine fever was done in collaboration with Birbhum Animal Resource Development Department. He is presently gaining a net income of Rs. 190000/- per annum from his piggery unit. He sold 70 nos. of pigs in a year. Pigs were sold at Rs. 13000-15000/- each for the improved pig breed depending upon the body weight. *Ghungroo* pig attained 80 kg body

weight at 8 months of age and each sow delivered 8-14 piglets in each birth. Income from his piggery unit motivates other farmers and rural youth from different villages of Birbhum district. There is huge demand of quality piglets both for Ghungroo and improved pig breed in this district.

19.6 KVK Rayagada

IFS Unit enhanced livelihood status of a tribal farmer

Shri Pradip Kumar Mandangi of Village - L. L. Pur, Block- Gudari, Distt.- Rayagada, State- Odisha was growing paddy, cotton, pigeon pea, greengram, sesame and ragi in 1 ha round the year from where he got Rs. 40000/- per annum. After intervention

of KVK and Line departments for technological guidance and financial support, Shri Mandangi received an amount of Rs. 80000/- from different field crops and Rs. 133000/- from other units. Therefore, Shri Mandangi is now getting around Rs. 213000/- per annum from the above said units. Shri Mandangi is a showcase for his model IFS

unit with higher return. Presently he is motivating farmers and farm women as well as rural youth of different blocks to adopt on 1 acre model of IFS unit. He cultivates the crops by using less quantity of chemical fertilizers and more use of organic manure which are no adverse impact on atmospheric condition. KVK assessed and

demonstrated improved varieties of rice, pigeon pea, sweet corn, greengram, blackgram, sesame, ragi and introduced high value vegetable in his IFS unit and also demonstrated on IDM, INM and IPDM in different fruits and vegetables. Under IFS he is also having fishery, poultry, duckery, dairy and mushroom unit.

19.7 KVK Nuapada

Floriculture alongwith IFS increased the farmers' income

Shri Debendra Pradhan of Darlimunda, Nuapada, Odisha possesses around 30 acres of land. He dedicates approx. 20 acres to paddy cultivation and

kudo millet in 5 acres. Additionally, he cultivates mango on 1 acre, and groundnut as well as potato on 0.5 acre. For the past three years, he has been growing marigold on one ha of land. Besides crop cultivation, he also has a pond for fingerlings production and maintains two milch cows. From

all his components he is earning more than Rs. 6.0 lakhs annually. His social impact has been increased

in work quality and networking. He is open to new technologies and regularly consults KVK scientists and line department officials for any issues in his

field. This proactive approach has allowed him to gain substantial practical knowledge in agriculture. Around 5 more numbers of farmers have started

marigold farming in the nearby villages. Shri Pradhan is not only an inspiration, but also a source of hope for farmers in the area who wish to take up farming for living.

19.8 KVK Nabarangpur

Dairy based integrated farming with mushroom cultivation fetched more profit

Shri Karna Santa of Village-Durkiguda, Block-Jharigaon, Distt.- Nabarangpur, Odisha is a

successful dairy farmer. He is also growing around 1500 beds of oyster mushroom round the year and net profit from mushroom is about Rs. 375000/- per annum. Apart from this, he is operating 3 ac of rice, 3 ac of maize, 0.5 ac of fishery, 1 ac of tomato and 1

ac of brinjal from which he is getting a net profit of Rs. 63000/-, Rs. 95000/-, Rs. 45000/-, Rs. 70000/- and Rs. 65000/-, respectively. He is getting a net profit of Rs. 7.13 lakh (approx.) from his farming. Many farmers of his village and adjacent villages are following his techniques of farming with attractive return. Out of them 8 farmers already started their farm with proper guidance of KVK Scientist. He is cultivating crops in scientific ways in consultation with KVK scientists, he is producing vermicompost using crop residues and cowdung and applied in his crops in order to minimize environmental pollution. About 8 nos. of farmers have already started mushroom cultivation seeing the attractive profit from his mushroom cultivation.

19.9 KVK Khordha

KVK's leveraging Government schemes for maximum benefit to farmers

The Department of Soil Conservation and Watershed Development, Government of Odisha,

has popularized the 'Farm Pond' concept to address water scarcity and promote rainwater conservation for agriculture and allied sectors. Water is

crucial during critical stages of plant growth, making its management essential for enhancing crop production. Under this scheme, water-harvesting structures or ponds are constructed to store rainwater. Additionally, integrating crop

cultivation on the dyke and rearing fish in the ponds can significantly boost farmers' income and production. In collaboration with the Department

of Soil Conservation and Watershed Development, KVK has implemented these water-harvesting structures at Barasahinala village in the Begunia block of Khordha, focusing on scientific fish culture by women's SHGs from the SC category.

The KVK engaged actively with the community group and recommended leasing the newly excavated pond for aquaculture activities. Following this, water samples were tested at ICAR-CIFA, Bhubaneswarand the pond was treated with lime and fertilizers to enhance its primary productivity. Upon correcting the water quality parameters,

3000 IMC fingerlings were supplied by KVK and stocked in the 1.0 ac pond. To support efficient and sustainable fish farming, essential inputs were provided to the group members, including 600 kg

of floating fish feed, 200 kg of lime, and one 100 m fish drag net. On-site training sessions, as well as campus-based workshops, were conducted by KVK Khordha to educate the members on scientific pond management practices.

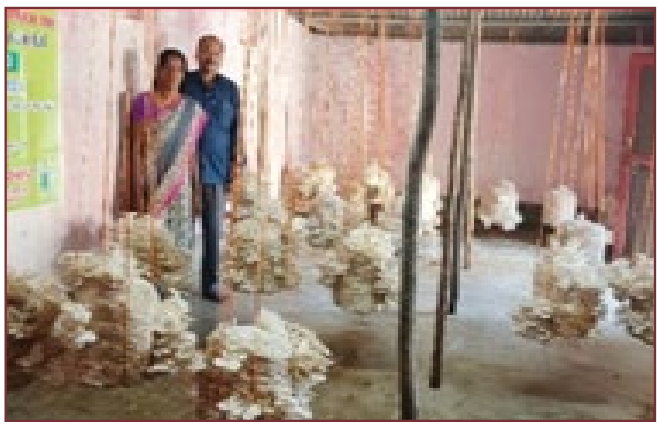
Given the pond's limited water retention capacity, the group was advised to implement a strategy of partial harvesting. Regular field visits by KVK ensured continuous scientific guidance and timely remedial interventions. As a result of these concerted efforts, the community pond achieved a commendable fish production of 2.86 tons per hectare. The collaborative initiative between KVK Khordha and the Department of Soil Conservation and Watershed Development, Government of Odisha, has significantly empowered the community group to adopt scientific fish culture practices. This joint effort has enabled the group to effectively utilize the common water resource, achieving the dual benefits of enhanced fish production and improved crop irrigation.

19.10 KVK Kandhamal

An inspiration for farm women towards low budget and high profit mushroom farming

Mrs. Biruma Digal, 42 years old, is a self-empowered woman, involved in mushroom production from last four years. She resides at Bandapanga village of Baliguda block of Kandhamal district. Before starting mushroom cultivation, she used to do household works and helped her husband in poultry farming. But she was not happy

with that due to low income and marketing problem. Then, she thought of doing something new that is of low budget and high profit farming. However, lack of technical knowledge, she heeded the advice of a fellow farmer and approached KVK, Kandhamal with the aim of getting technological guidance and to do farming to support her husband, thereby improving her financial and livelihood prospects.



After getting one day training on 'Oyster mushroom cultivation' at KVK Kandhamal, G. Udayagiri, she started producing oyster mushroom in small scale by getting spawn from KVK. Inspired by her initial

success, enduring support from her husband and guidance of KVK scientists, she established a shade-net mushroom production unit in her residence and started producing both paddy straw and oyster mushroom round the year. She has also benefited with various initial inputs required for mushroom cultivation through TSP and other demonstration programme of KVK. Later she attended a 7 days skill training of rural youth (STRY) programme on Mushroom cultivation during 2023-24 at KVK, Kandhamal and achieved certificate as a Master Trainer in Mushroom cultivation. Presently, her

average yield increases from 0.5 to 0.9 kg and from 1.5 to 2.5 kg per paddy straw mushroom bed (21 days per cycle) and oyster mushroom bag (60 days per cycle), respectively. Introducing mechanized straw cutting for mushroom cultivation has led to reduced labour, time, and drudgery, with an annual cost saving of Rs. 24000/-. Now her earnings from mushroom is about Rs. 12000/- per month and her annual income has now increased to an average of Rs. 150000/-.

Mrs. Biruma Digal has achieved success as a Mushroom grower and is recognised as a self-driven to profitable farming that provides financial support to her family. Her family's economic and livelihood standard increased by the extra income from mushroom cultivation i.e., Rs 9000/- Rs. 10000/- per month. Her progress is now providing an inspiration to other farm women and rural youths of that area to take up mushroom cultivation as a profitable agricultural venture. This motivated them to retain and undertake agriculture as a profession for earning their livelihood. As a Certified Trainer, she also provides training to farm women and rural youths in adjacent villages, urging them to embrace mushroom farming through the assistance of KVK Scientists and experts.

19.11 KVK Ganjam-II

Marketing through FPC helped small and marginal farmers in increasing profit

Ujaleswar Farmers Producer Company Ltd strengthened its position in the third year of its existence with continuous support of the NABARD and other government line departments, WOTR,

the cluster-based business organisation and facilitating agency. The Company expanded its horizon within 135 villages of Digapahandi block with a membership of 750 shareholders with the unconditional support of its active Board of Directors. It continuously got technological support from KVK Ganjam-II. The representatives of the Company participated in several district and state level events. It is recognised and felicitated by

NABARD, KVK Ganjam-II and OUAT. The company aims to touch more than Rs. one crore business in coming years and serve the small and marginal farmers. The FPC was formed in the year 2021 with

major products marketed through it as Pulses, Groundnut, Paddy, Cotton, Goat, Fertiliser etc. The physical and financial Progress is gradually increasing since inception with the current annual turnover of Rs. 4989915/-. Ujaleswar FPCL was formed under Central Sector Scheme (CSS) for

converting Krishi into Atmanirbhar Krishi and got govt. grant of Rs. 30 lakh. NABARD also supported for formation and strengthening of FPC. This FPC opened a Custom Hiring Centre with the support of State Agriculture Department and a Mini Dal mill was established. Value Chain Clusters on oilseeds were developed in Chikiti, Digaphandi and Sanakhemundi blocks with the support of NMEO-OS (National mission on edible oils) for providing high-quality seeds, advisory services on weather and pest management, procurement of seeds from small and marginal farmers.

Younger and better educated farmers of 25 to 35 years age were more likely to accept the concept of Farmer Producer Company. Farmers realized the

benefits of marketing their products through FPC and are inclined to join the FPCs. The FPC performed a wide range of activities like supply of agri-inputs /fertiliser, seed production, processing, marketing, post-harvest management, maintenance of agro-service and custom hiring centres, provision of technical support to the farmer members etc. The FPO created interest among shareholder for expanding the activity of FPO and to strengthen the members technically, frequent awareness, exposure visit programmes were planned to be organized. Technological support was provided from KVK Ganjam-II. To create better infrastructure with storage facilities and better supply chain in the farmer producer company integrated pack house and refrigerated van applied under OIIPCRA Scheme for betterment of farming community. The FPO planned to produce ragi and other millet in the coming years.

19.12 KVK Puri

Scientific mushroom production turned a young farmer to entrepreneur

Shri Santosh Kumar Bastia, a young and dynamic entrepreneur from the Suhagpur village of the Pipili block, has emerged as an inspiring figure in the field of mushroom cultivation. Harnessing scientific methods, institutional support, and sheer determination, he transformed a modest 0.56 ac land into a highly productive mushroom unit that now serves as a model for rural entrepreneurship. Recognizing the potential of mushroom farming, Shri Santosh adopted innovative interventions under expert guidance like construction of a shade net house for optimal growing conditions,

temperature and humidity regulation for year-round cultivation, introduction of Oyster Mushroom (*Hypsizygous ulmarius*) cultivation in winter and value addition through dry mushroom production

as well as establishment of a quality spawn production unit for paddy straw mushrooms. With the implementation of focused interventions, Santosh's integrated mushroom unit achieved remarkable production levels, including 24000 bottles of spawn, 200 quintals of paddy straw mushrooms, 100 quintals of oyster mushrooms, and 5 quintals of dry mushrooms annually. This diversified model resulted in a total production cost of ₹ 4640000/- and a gross return of ₹ 7000000/- yielding a net income of ₹ 2360000/-. Notably, the dry mushroom component recorded the highest B:C ratio of 2.66.

The mushroom unit not only transformed Shri Santosh's livelihood but also emerged as a hub of local employment, currently engaging 15 SHG women members and 8 rural youths, thereby fostering empowerment and economic stability within the village. Its success story and innovative model drew international recognition, with dignitaries such as Dr. U.S. Nagothu (NIBIO, Norway), Dr. I. H. Kristensen (NIBIO, Norway),

and Dr. T.N. Bwana (TARI, Tanzania) visiting the unit and commending its impactful contribution to rural development and sustainable livelihood

generation. Shri Santosh Kumar Bastia's journey showcases how scientific interventions, training, and dedication can turn challenges into opportunities. His story serves as a beacon of hope and a replicable model for rural youth and SHG women seeking sustainable livelihoods through climate-resilient agriculture. Around 47 youths adoted this enterprise in Pipili Block.

19.13 KVK Boudh

Vegetable grower brought success through natural way

Shri Gouri Shankar Sahu is a young and energetic farmer of Village - Butupali, Distt. - Boudh, Odisha. Shri Sahu has always been passionate about vegetable cultivation. He is more open to adopt modern/ non-traditional farm practices to produce

good quality produce in a sustainable way. In recent years, Govt. has taken so many initiatives to promote natural farming to address food security, climate change, environment degradation. Being a young responsible farmer of future, he was motivated and came to KVK Boudh to share his thoughts about natural farming and take guidance from scientist in a training conducted at KVK Boudh. Earlier, he followed inorganic method to produce vegetables

in his kitchen garden due to lack of knowledge to control disease pest in natural method. From 2023 onwards he shifted from chemical vegetable cultivation in his kitchen garden to cow-based farming in 2 acres in his new field. Initially, he used to buy Jeevamrut and Handikhata from Krishi Mitra. In the year ahead by taking the guidance from KVK

scientist regarding preparation, time and dose of application, now he is buying only cowdung and cow urine and preparing natural products by himself. But, he realized the fact that with a single cow one can practice natural farming in 30 acres of land. The farmer opined that by nourishing field and plant with Jeevamruta, soil became changed

in its colour and rich in organic matter and using Handikhata in onion, okra, cabbage resulted into more healthy looks of the vegetables and no disease insect pest attack, besides giving good yield. He also shared his experience that harvesting time became a week earlier than normal crop. But initially the yield declined in terms of 10-20 kg/ ac, however, due to quality produce he is adjusting that by getting premium price/each kgs of vegetables. For onion, cabbage and chilli he got good returns around Rs. 200000/- to Rs. 225000/- lakhs from 2 acres of land.

He heartily desired to popularise the adoption of natural farming practices for vegetable cultivation in nearby areas. Being a young farmer, his thoughts are pioneering and become a wonderful example to establish a disease free and well-fed society by producing healthy food. Now, he is a torchbearer among farmers to adopt natural farming practices in his area. Now-a-days, farmers are more income oriented. For more yield and more income, they are applying excessive amount of chemical fertilizer, insecticides, pesticides and herbicides without knowing its impact on soil and environment. In addition to this, various illiterate based practices like 'stubble burning' in field itself, cause changes in soil temperature, organic matter content results in decline of microbial biomass. But now by taking the training from KVK on natural farming he is preparing compost from waste like plant residues, kitchen waste, fruits and vegetables from field which is a sustainable way to utilise the waste material of agriculture field without affecting the environment.

Considering the importance of natural farming and self-realized facts like, improved soil health enrichment with earth warm population in his field and economic return (which is double than chemical based farming), he created awareness by sharing his healthy crop photos, harvested fresh vegetables with no insect pest damage. Now, he has motivated ten more young vegetable growers and five rice grower to adopt this natural farming in his locality.

19.14 KVK Malkangiri

Advanced and modern horticultural practices improved livelihood

Shri Ratan Mandal is a progressive farmer of Village-MV-15, Block- Malkangiri, Distt.- Malkangiri, Odisha. His keen interest in vegetable production in a more

scientific and modern way brought him in contact with KVK Malkangiri. With the technological support from KVK Malkangiri, he practiced the modern/ advanced technologies of horticultural farming like IPM in Cucumber, cultivation of Okra variety Kashi Chaman and production with grafted tomato and

brinjal. Adoption of off-season vegetables, advance horticulture technology poly mulch with in-line drip, Use of GI trellis, Use of Broad spectrum inset-pest & disease control majors, use of biological pest control medicines as per suggestion of KVK,

Scientist. Using these advanced technologies in his 1.6 ha of land resulted in a net profit of Rs. 520000/- per annum with the gross return of Rs. 740000/- by investing Rs. 220000/-. Modern/ advanced horticultural production has a excellent social impact on other farmers. They showed their interest by seeing the effect, profit and aesthetic value of the produce and were motivated to grow quality vegetables. Vegetation round the year has greenery effect alongwith making the environment healthy by modern horticulture farm mechanism; as well as use of biological agents made the soil and environment healthy. KVK Malkangiri was able to spread the technology through demonstration of IPM, IDM strategies in approximately 4 ha of land and further by observing the successful cauliflower farming other farmers spread it in another 5 ha of land.

19.15 KVK Nicobar

Okra Hybrid Arka Nikita: A Farming Revolution in Nicobar District, transforming agriculture in India's southernmost region

Exploring new farming techniques and crop varieties for the transformation of horticulture in India's southernmost region has been guided by KVK Nicobar. With its technological support through introduction of Okra Hybrid Arka Nikita, Mr. Patrick of Village- Tapoiming, Car Nicobar, Nicobar, A & N Islands practiced the okra farming. On a well-managed 3000 m^2 plot, Mr. Patrick achieved an impressive yield of 33.9 quintals of produce.

With a selling price of Rs 80 per kg, the gross return amounted to a substantial Rs. 271200/-. After covering the cost of cultivation, which was Rs. 90000/-, the farmer earned a remarkable net profit

of Rs. 181200/-. This success story highlighted a strong B:C ratio of 2.61, demonstrating the efficiency and profitability of the operation.

Patrick's success in organic Bhindi cultivation had a ripple effect on the local community in Car Nicobar. many farmers visited Patrick's farm to learn about his techniques and to see the first-hand benefits of cultivating high-yielding Arka Nikita varieties through organic farming. Mr. Patrick's adoption of organic farming practices has significantly reduced the dependence on synthetic inputs. By using farmyard manure, compost, and organic pest control methods, he has improved soil health and biodiversity on his land. The sustainable cultivation of high-yielding Arka Nikita contributed to lower carbon emissions and promoted eco-friendly farming, aligning with conservation goals in island ecosystems. Mr. Patrick's model farm has inspired several local farmers in and around Tapoiming village to adopt organic farming techniques. His success with the Arka Nikita variety has led to informal farmer-to-farmer knowledge transfer. There is also growing interest among Self-Help Groups (SHGs) to replicate his practices and potentially expand into value addition and direct marketing, indicating both horizontal expansion and scope for vertical integration.

20.0 Publications

20.1 Research Articles

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20.5 Book Chapters

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20.6 Abstracts Presented Published in Seminar/ Conference/ Workshop etc.

Borkotoky D, Samajdar T, Das K S and Mondal S K. 2024. Evaluation of various duck breeds for egg quality and economics under backyard system in North 24 Parganas district of West Bengal. Abstract in compendium of XXXII Annual Conference of Society of Animal Physiologist of India & International Symposium on *'Advances in physiological research in omics era for sustainable animal production and livelihood security under the changing climate scenario'* organized by ICAR-CIRC, Meerut in collaboration with SAPI held at Meerut on 27th to 29th November, 2024, pp: 46.

Dash L, Sahoo S K, Das K S and Mondal S K. 2024. Effect of feeding concentrate mixture on reproductive performance of crossbred heifers in Keonjhar district, Odisha. Abstract in compendium of XXXII Annual Conference of Society of Animal Physiologist of India & International Symposium on *'Advances in physiological research in omics era for sustainable animal production and livelihood security under the changing climate scenario'* organized by ICAR-CIRC, Meerut in collaboration with SAPI held at Meerut on 27th to 29th November, 2024, pp: 34.

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20.7 Important News Items Published at ICAR Website

- 'Felicitation-cum-Exposure visit of ATL School'
- *'भाकृअनुप-अटारी, कोलकाता में अंतर्राष्ट्रीय योग दिवस का आयोजन'*
- 'Annual Zonal Workshop of NICRA-TDC organized by ICAR-ATARI Kolkata'
- 'World Ocean Day 2024'
- 'World Environment Day 2024'
- 'Secretary (DARE) & Director General (ICAR) visits ICAR-ATARI, Kolkata'
- 'Inauguration of Rural Outreach Odyssey for Amrit Interns'
- 'Celebration of International Day for Biological Diversity 2024'
- 'Seminar organized on World Bee Day 2024'
- 'DG (ICAR) visits progressive farmers guided by Nimbudera ICAR-KVK'
- 'Dr. Himanshu Pathak visits ICAR-KVK, Port Blair'
- 'ICAR-ATARI, Kolkata organises a Workshop on Intellectual Property Rights'
- 'Zonal Workshop of the Farmer FIRST Programme'
- 'Secretary (DARE) and Director General (ICAR) inaugurate the voyage of the ICAR- KVK Golden Jubilee Torch in Zone-V'
- 'Workshop-cum-Capacity Building Programme on Natural Farming'
- 'Strategic Planning Meeting to Promote Natural Farming to Grassroots'
- 'Inauguration of Diploma in Agricultural Extension Services for Input Dealers'
- 'HRD programme on Emerging Crop Management Strategies in Weather Induced Stresses'
- 'Natural Farming: Rapidly getting accepted by the farmers in North Bengal'
- 'ICAR-ATARI, Kolkata Celebrates International Women's Day'
- 'Skill Development Workshop under SCSP'
- 'Input distribution programme under Cluster Frontline Demonstration on Oilseeds'
- 'Field day-cum- input distribution programme'
- 'ICAR-ATARI organises Zonal Workshop on Natural Farming Project in collaboration with Rathindra KVK and Visva-Bharati'

- 'ICAR-ATARI Kolkata organises the Annual Review Workshop of Flagship ARYA Project'
- 'ICAR-ATARI Kolkata, organises Krishi Mela'
- 'Mega Input/Kit Distribution-cum-Awareness Programme under SCSP'
- 'Third Phase of MDP for KVK Heads Inaugurated'
- 'ICAR-ATARI, Kolkata signs MoU with BENJHARC to revolutionize aquaculture in rural areas and strengthen cooperative movements'
- 'Certification Course on 'Integrated Nutrient Management for Fertilizer Dealers' Inaugurated
- *'प्रधानमंत्री किसान ऊर्जा सुरक्षा एवं उत्थान महाभियान योजना पर जागरूकता कार्यशाला का आयोजन'*
- *'भाकृअनुप-अटारी द्वारा कृत्रिम बुद्धिमत्ता एवं मशीन लर्निंग पर संगोष्ठी का आयोजन'*
- *'प्रधानमंत्री किसान ऊर्जा सुरक्षा एवं उत्थान महाभियान योजना पर जागरूकता कार्यशाला का आयोजन'*
- 'Vigilance Awareness Week 2024 to spread awareness and nurture a culture of integrity'
- 'Awareness programme organised on the occasion of Ganga Utsav 2024 for Conservation and Culture'
- 'e-Agroadvisory to empower farmers in post-DANA Cyclone recovery in West Bengal and Odisha'
- 'International Day of Rural Women celebrated'
- *'गांधी जयंती के अवसर पर भाकृअनुप-केवीके में ''एकीकृत संचार तथा जागरूकता कार्यक्रम एवं वृक्षारोपण'' का आयोजन'*
- *'हिंदी के रंग में रंगे भाकृअनुप-अटारी का हिंदी पखवाड़ा संपन्न'*
- *'अनुसूचित जाति उप-योजना के तहत लॉन्च कार्यशाला का आयोजन'*
- *'भाकृअनुप-अटारी, कोलकाता में सफाई मित्र सुरक्षा शिविर आयोजित'*
- *'भाकृअनुप-अटारी, कोलकाता में 'स्वच्छता पखवाड़ा' के तहत मानव श्रृंखला निर्माण कार्यक्रम आयोजित'*
- 'Annual Zonal Workshop of ICARKVKs under ICAR-ATARI Kolkata organized'
- 'DDG, ICAR visits ICAR-KVK Puri, Odisha'
- 'Workshop-cum-Awareness Programme on Protection of Plant Varieties and Farmer's Rights Act 2001'
- 'भाकृअनुप-अटारी द्वारा केवीके में 'एक पेड़ मां के नाम' समर्पित पौध वितरण कार्यक्रम का सफल आयोजन'
- 'e-Pashu Chikitsha Shivir, focusing on animal health and deworming during the monsoon season, organized'
- 'Seminar on Strengthening Farmers Producer Companies and Co-operative Societies Organized'
- 'ICAR-ATARI, Kolkata, Hosts Third Phase of MDP for ICAR-KVK Heads of Zone-V'
- 'DG, ICAR inaugurates multiple establishments at Ramakrishna Mission Vidyapith, Purulia'
- 'Review-cum-convergence meet organized'
- 'MFOI Samridh Kisan Utsav'
- 'Awareness campaign for farmers on PM-KUSUM Component B'
- 'Seminar-cum-Awareness Programme on the occasion of World Zoonoses Day'

21.0 Awards and Recognitions

- Dr. S. K. Mondal, Pr. Scientist received *'Certificate of Appreciation/Excellence Award'* as reviewer for *'Uttar Pradesh Journal of Zoology'*, *'Asian Journal of Agricultural Extension'*, *'Economics and Sociology'*, *'Asian Journal of Advances in Agricultural Research'*, *'Journal of Experimental Agriculture International'*, *'International Journal of Environment and Climate Change'* and for peer-reviewing of book chapter during the period.
- Dr. K. S. Das, Pr. Scientist received *'Reviewer Excellence Award'* from ARCC, Karnal, Haryana as reviewer for*'Indian Journal of Animal Research'*. Dr. Das has been selected as Member, Editorial Board of *'Asian Journal of Dairy and Food Research'*.
- Dr. S. K. Mondal, Pr. Scientist was recognised with Certificate of Excellence for peer-reviewing for the *'Asian Journal of Research and Review in Agriculture'*, *'Journal of Scientific Research and Reports'* and *'Asian Journal of Biochemistry, Genetics and Molecular Biology'* during the year 2024.
- Dr. K. S. Das, Pr. Scientist was recognised with *'Reviewer Excellence Award'* for the *'Indian Journal of Animal Research'* and a Certificate each for the *'Discover Animals'* and *'Scientific Reports'* for peer-reviewing during the year 2024.

22.0 Distinguished Visitors

Date	Name of the person	Purpose of visit
09.01.2024	Sh. S. K. Das, Managing Director, WEBEL, Kolkata	MoU
11.01.2024	Sh. G. P. Sharma, Joint Secretary, Finance, ICAR, New Delhi	Interaction with ICAR-ATARI Kolkata and KVK Scientists
24.01.2024	Mr. P. Dey, Director, AMTPL, Ahmedabad	MoU
01.02.2024	Dr. S. Singh, Director, NIH, Kolkata	MoU
12.03.2024	Dr. A. Sarangi, Director, ICAR-IIWM, Bhubaneswar	Zonal Review Workshop of FFP
28.03.2024	Dr. A. Bandyopadhyay, Former National Coordinator, NASF, ICAR, New Delhi	Interactive meeting on strategic planning of Natural Farming
31.03.2024	Dr. Himanshu Pathak, Hon'ble Secretary, DARE and DG, ICAR, New Delhi	Inaugural programme on the voyage of KVK Golden Jubilee Torch
10.04.2024	Dr. H. K. Senapati, Chairman, ZMC, NICRA-TDC, ICAR-ATARI Kolkata	Review meeting of NICRA-TDC

Date	Name of the person	Purpose of visit
24.05.2024	Prof. C. Kole, Former Vice-Chancellor, BCKV, Nadia	Interactive meeting on the sustainability of farmers' income
03.06.2024	Dr. Himanshu Pathak, Hon'ble Secretary, DARE and DG, ICAR, New Delhi	Visit and interactive meeting with ATARI Kolkata staff
27.09.2024	Dr. D. B. Shakyawar, Director, ICAR-NINFET, Kolkata	Hindi Pakhwada 2024
28.10.2024	Dr. S. S. Singh, DEE, RLB CAU, Jhansi, UP and Former Director	Vigilance Awareness Week
08.11.2024	Dr. Jajati Mandal, Lecturer, School of Science, Engineering, and Environment, University of Salford, Manchester, UK	Seminar on artificial intelligence and machine learning









23.0 Personnel (As on 31.12.2024)

Staff position of ICAR-ATARI Kolkata as on 31.12.2024 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	Sh. S. Mukherjee	AF&AO
7	Shri A.D. Banik	Assistant
8	Shri D. Debnath	Driver (T-2)
9	Shri S. Saha	UDC
10	Smt. A. Roy	SSS
11	Ms. J. Basak	SRF, CFLD-Pulse
12	Ms. R. Bhattacharya	SRF, NICRA
13	Dr. S. Ghosh	SRF, NEMA
14	Ms. B. Ghosh	SRF, CFLD-Oilseed
15	Dr. S. Das	SRF, ARYA
16	Dr. Ankita Begam	SRF, FFP
17	Shri S. Khutia	YP-II
18	Shri S. Nandi	Project Assistant, GKMS
19	Shri S. Paul	DEO, CSISA
20	Shri A. Dewanji	YP-II
21	Mr. Salim Sahaji	YP-I, Natural Farming
22	Mr. Purbendu Samanta	YP-I, Natural Farming
23	Mr. S. Das	DEO, CFLD Oilseeds

23.1 Joining

- Mr. A. Dewanji has joined this institute as YP-II on 01.08.2024.
- Mr. S. Khutia has joined this institute as YP-II on 05.08.2024.
- Sh. S. Mukherjee joined this institute as AF&AO on 06.08.2024.
- Mr. S. Das has joined this institute as DEO, CFLD on Pulses on 20.12.2024.

23.2 Relieving

- Mrs. A. Mazumdar, I/C, AF&AO of this Institute and FAO, ICAR-NINFET, Kolkata has been relieved on 30.08.2024.

भाकृअनुप-कृषि प्रौद्योगिकी अनुप्रयोग अनुसंधान संस्थान कोलकाता

भूमि विहार परिसर, ब्लॉक - जीबी सेक्टर III, साल्ट लेक कोलकाता

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