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2021

ANNUAL REPORT



ICAR-AGRICULTURAL TECHNOLOGY APPLICATION RESEARCH INSTITUTE KOLKATA

BHUMI VIHAR COMPLEX, BLOCK- GB, SECTOR- III, SALT LAKE, KOLKATA,
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Annual Report

2021



ICAR - Agricultural Technology Application Research Institute Kolkata- Zone V
Indian Council of Agricultural Research
Salt Lake, Kolkata- 700 097



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PREFACE



The chronicle of accomplishments with respect to assigned duties and responsibilities is reflected in the yearly progress report of any scientific institute. Accordingly, the Annual Report 2021 of ICAR-Agricultural Technology Application Research Institute (ICAR-ATARI) Kolkata deals with the fulfilment of set target of 59 KVKs spread across the Union Territory of Andaman & Nicobar Islands and the states of Odisha and West Bengal run under the administrative control of State Agricultural Universities, Central Universities, Deemed to be Universities, Indian Council of Agricultural Research Institutes, State Department as well as Non-Government Organizations. The report also portrays the effectiveness of technical guidance provided at ATARI level, supervision done and technological backstopping provided by Directorates of Extension Education of SAUs as per its jurisdiction and efficiency of host organization in creating adequate infrastructure, staff recruitment and ensuring congenial atmosphere to enable the KVKs to excel in improving agricultural situation of the farming community of this zone.

Compilation of Annual Report 2021 of ICAR-ATARI Kolkata has encompassed all the related areas of KVK functioning including the detailed account of mandated activities like training, on-farm trial, frontline demonstration, extension activities, soil testing, seed and planting material production, fish fingerlings and animal breed production and others. Such elaboration will help in understanding the sphere of KVK activities as well as its reach among the farmers of far-flung areas.

With the launching of a number of flagship programmes by Department of Agriculture Cooperation & Farmers Welfare and ICAR, New Delhi, the KVKs under the direct supervision of ICAR-ATARI Kolkata are addressing various

farming practices, non-farming enterprises, climate, entrepreneurship development, Swachh Bharat Mission, Tribal development and many more related areas which have been adequately depicted in this Annual report with precise information and quality photographs to provide the desired clarity. Likewise, the contribution of Directorates of Extension Education of SAUs in overseeing the KVK functioning, ensuring technological backstopping, developing human resources and performance of ATICs have been given proper weightage in this compilation.

Information about various events like Swachhta Hi Suraksha, Celebration of Vigilance Week etc. organized at ICAR-ATARI Kolkata has also been incorporated in this documentation with special emphasis on digitization. A glimpse of TSA, PFMS, regular uploading of data in various portals and other relevant information has been recorded in the Annual Report 2021.

Bringing out this publication incorporating vast array of agricultural development initiatives and newly approved research projects within the stipulated time has become possible only due to help and corporation extended by all concerned. As the Director of ICAR-ATARI Kolkata, I thankfully acknowledge the guidance received from Division of Agricultural Extension, Indian Council of Agricultural Research, New Delhi and help, assistance and cooperation received from all Host Organizations, Deans/ Directors of Extension Education, entire KVK fraternity of this zone and all the staff of ICAR-ATARI Kolkata including the project staff of the institute.

Subrata Kumar Roy

Director



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कार्यकारी सारांश

भाकृअनुप का कृषि विस्तार विभाग एक किसान-अनुकूल, किसान-केंद्रित और किसान-उन्मुख अनुसंधान के साथ-साथ विस्तार नेटवर्क बनाने के लिए पूरे भारत में संपूर्ण केवीके प्रणाली को आगे बढ़ाने के लिए शीर्ष स्तर पर महत्वपूर्ण भूमिका निभाता है। इस प्रयास को 731 केवीके, कई प्रमुख कार्यक्रमों और 11 कृषि तकनीकी अनुसंधान संस्थानों द्वारा समर्थित है जो सभी राज्यों को कवर करते हुए 11 क्षेत्रों में स्थित हैं। अटारी इन राज्यों में स्थित विभिन्न संस्थानों के साथ निरंतर चर्चा और समन्वय करके किसानों के सामाजिक, आर्थिक और संबंधित पहलुओं को समझने में मदद करते हैं। अटारी उनकी आकांक्षाओं के अनुरूप कार्य योजना तैयार करने में भी मदद करते हैं और यह सुनिश्चित करते हैं कि कृषि विज्ञान केंद्र के सभी प्रयास कृषक समुदाय की आजीविका की बेहतरी के लिए निर्देशित हैं। वर्तमान में, भाकृअनुप-अटारी कोलकाता अंडमान और निकोबार द्वीप समूह, ओडिशा और पश्चिम बंगाल के 59 केवीके की निगरानी, मूल्यांकन और मार्गदर्शन करने की जिम्मेदारी रखता है।

अटारी मुख्य रूप से कृषि विस्तार अनुसंधान और ज्ञान प्रबंधन के साथ-साथ प्रौद्योगिकी अनुप्रयोग और फ्रंटलाइन विस्तार शिक्षा कार्यक्रम के समन्वय और निगरानी को मजबूत करने पर ध्यान केंद्रित करते हैं। दूसरी ओर, केवीके इसके व्यापक अनुप्रयोग और क्षमता निर्माण को बढ़ाने के लिए प्रौद्योगिकी मूल्यांकन और प्रदर्शन पर ध्यान केंद्रित करते हैं। केवीके को कृषक समुदाय की बदलती आवश्यकता के अनुसार ज्ञान, संसाधन और क्षमता विकास केंद्र के एकल खिड़की की रूप में काम करना है। संशोधित जनादेश को प्राप्त करने के लिए, केवीके ने छोटे और सीमांत किसानों, ग्रामीण युवाओं और अन्य हितधारकों की आकांक्षाओं को पूरा करने के लिए गतिविधियों को कई गुना बढ़ा दिया है। केवीके की किसानों के दरवाजे पर सूचना और प्रौद्योगिकी सहायता देने की क्षमता ने उन्हें जमीनी स्तर पर अनुसंधान और विस्तार के बीच एक महत्वपूर्ण कड़ी बना दिया है।

वर्ष 2021 के दौरान जोन-V के तहत 59 केवीके के प्रदर्शन का मूल्यांकन इंगित करता है कि केवीके प्रशिक्षण, ऑन-फार्म परीक्षण, फ्रंटलाइन प्रदर्शन, बीज और रोपण सामग्री उत्पादन, मिट्टी के नमूना विश्लेषण और अन्य क्षेत्रों में सभी अनिवार्य गतिविधियों के लक्ष्य को प्राप्त कर सकते हैं। केवीके ने फसल प्रबंधन, पशुधन प्रबंधन, मछली पालन, कीट-कीट प्रबंधन, कठिन परिश्रम में कमी, भंडारण तकनीक आदि से संबंधित प्रौद्योगिकियों का आकलन किया। इसके लिए पूरे क्षेत्र में 7457 विभिन्न स्थानों पर किए गए 433 ऑन फार्म परीक्षणों के माध्यम से। सफल प्रौद्योगिकियों को फिर से कृषि प्रदर्शन के रूप में मूल्यांकन किया गया और फिर इसे प्रौद्योगिकी कैप्सूल के रूप में राज्य विस्तार प्रणाली की मुख्यधारा में शामिल किया गया। क्षेत्र की व्यापक कृषि-पारिस्थितिकी स्थिति के अनुरूप विकसित प्रौद्योगिकी के आवश्यक सुधार/संशोधन के लिए अनुसंधान प्रणाली की प्रतिक्रिया भी प्रदान की जाती है।

केवीके ने प्रमुख दलहन और तिलहन फसलों की उत्पादकता बढ़ाने और फसलों में बीज प्रतिस्थापन अनुपात में सुधार करने के लिए नई जारी किस्मों की उत्पादन क्षमता के साथ-साथ प्रथाओं के मानकीकृत पैकेज को स्थापित करने के लिए दलहन, तिलहन और अन्य फसलों में फ्रंटलाइन प्रदर्शन आयोजित किए। इस प्रक्रिया में, केवीके ने 9278 किसानों की भागीदारी के साथ इस तरह के प्रदर्शन कार्यक्रमों के तहत 1674.27 हेक्टेयर लाया। किसानों के क्षेत्र में दर्ज प्रदर्शन ने उपज और लाभ-लागत अनुपात के मामले में स्थानीय किस्मों की तुलना में नई किस्मों की श्रेष्ठता का संकेत दिया। प्रदर्शन कार्यक्रमों में विस्तार कार्यकर्ताओं की भागीदारी ने

कृषक समुदाय के लाभ के लिए इसके बड़े पैमाने पर प्रसार का मार्ग प्रशस्त किया। केवीके द्वारा क्रमशः 2000 और 625 कार्यक्रमों के माध्यम से 6840 और 548 इकाइयों में पशुधन और मत्स्य पालन पर प्रदर्शन किया गया था। इसी तरह उद्यमों और उपकरणों में भी निर्धारित अवधि के दौरान क्रमशः 2699 और 125 इकाइयों का प्रदर्शन किया गया।

किसानों और कृषि महिलाओं, ग्रामीण युवाओं और विस्तार कार्यकर्ताओं के लिए क्षमता विकास केवीके कामकाज का अभिन्न अंग है। ज्ञान और कौशल प्रदान करने के लिए, केवीके ने फसल उत्पादन, बागवानी, मृदा स्वास्थ्य प्रबंधन, कृषि इंजीनियरिंग, पशुधन और मत्स्य पालन, गृह विज्ञान, कृषि विस्तार और कई अन्य पहलुओं को कवर करते हुए 112290 किसानों और कृषि महिलाओं के लिए 3887 पाठ्यक्रम आयोजित किए। तथापि, ग्रामीण युवाओं के संबंध में क्षमता निर्माण के केवल ऐसे क्षेत्रों का चयन किया गया जो कृषि और गैर-कृषि उद्यमों में स्वरोजगार प्रदान कर सकें। कोविड-19 महामारी की स्थिति के कारण कई कार्यक्रम ऑनलाइन मोड के माध्यम से आयोजित किए गए। इस प्रक्रिया में लड़कियों सहित 13676 ग्रामीण युवाओं को 629 पाठ्यक्रमों के माध्यम से प्रशिक्षित किया गया। विस्तार कर्मियों के क्षमता निर्माण के लिए चुने गए क्षेत्र कृषि, पशुपालन और मत्स्य क्षेत्र थे। केवीके ने 18829 प्रतिभागियों के लिए ऐसे 625 पाठ्यक्रम संचालित किए। इसके अलावा, केवीके ने युवाओं को स्वरोजगार बनाने के लिए तुलनात्मक रूप से लंबी अवधि के व्यावसायिक प्रशिक्षण कार्यक्रम भी आयोजित किए। क्षमता विकास कार्यक्रम में केवीके की क्षमता को सरकार द्वारा मान्यता दी गई है। और अन्य संगठन जैसे संगठन अपने पदाधिकारियों के ज्ञान और कौशल विकास के लिए केवीके पर अधिक से अधिक निर्भर हैं। विभिन्न विस्तार गतिविधियों के माध्यम से किसानों के बीच बड़े पैमाने पर जागरूकता का आयोजन केवीके की एक और उल्लेखनीय उपलब्धि थी। रिपोर्ट की गई अवधि के दौरान, केवीके ने 1366393 किसानों, विस्तार कार्यकर्ताओं और अन्य लोगों की भागीदारी के साथ 50711 ऐसी विस्तार गतिविधियों का आयोजन किया।

किसानों को गुणवत्तापूर्ण बीज और रोपण सामग्री की आपूर्ति केवीके का एक अन्य महत्वपूर्ण उद्देश्य है, जिसे या तो केवीके फार्म में या बीज ग्राम कार्यक्रम के माध्यम से पूरा किया जाता है। केवीके ने समय पर बीजों की अनुपलब्धता के मुद्दे को संबोधित करने के लिए उल्लिखित अवधि के दौरान प्रमुख अनाज और फसलों/सब्जियों के 20946.62 किंवटल गुणवत्ता वाले बीजों का उत्पादन किया। केवीके ने फल फसलों, सब्जियों, फूलों, वन प्रजातियों की 59.80 लाख रोपण सामग्री/रोपण का भी उत्पादन किया। आदि गुणवत्तापूर्ण उत्पादन के लिए। कृषि क्षेत्र में जैव-उत्पाद का उपयोग पर्यावरण की दृष्टि से तेजी से लोकप्रिय हो रहा है और कृषि विज्ञान केंद्रों ने 6063 किसानों को उपलब्ध कराने के लिए विभिन्न जैव-सूत्रीकरण का 252907.20 किलोग्राम उत्पादन किया। केवीके द्वारा 52251119 ऐसे उत्पादों के उत्पादन के माध्यम से गुणवत्ता पशुधन तनाव, मछली फिंगरलिंग और स्पॉन उत्पादन को भी पर्याप्त महत्व दिया गया था।

मिट्टी और पानी के विश्लेषण में, केवीके ने किसानों को मृदा स्वास्थ्य कार्ड प्रदान करने के लिए पूरे क्षेत्र में 48580 नमूनों का विश्लेषण किया और 1123759/- रुपये का राजस्व अर्जित किया। मिट्टी और जल परीक्षण ने किसानों को फसलों

में रासायनिक उर्वरकों का विवेकपूर्ण उपयोग करने, फसल उत्पादकता बढ़ाने और मिट्टी के स्वास्थ्य को बनाए रखने में सक्षम बनाया। अनिवार्य गतिविधियों के अलावा, केवीके ने विश्व मृदा दिवस, पर्यावरण दिवस, राष्ट्रीय विज्ञान दिवस, विश्व पशु चिकित्सा दिवस और अन्य जैसे कृषक समुदाय के बीच जागरूकता पैदा करने के साधन के रूप में विशेष दिन / सप्ताह भी मनाया। इस तरह के समारोहों ने अच्छी संख्या में प्रतिभागियों को आकर्षित किया और किसानों के बीच ऐसे कार्यक्रमों के लाभ को प्रदर्शित करने का अवसर प्रदान किया। केवीके ने जिला स्तर पर विभिन्न अभिसरण कार्यक्रमों के माध्यम से 2.52 करोड़ रुपये का राजस्व भी अर्जित किया। इस तरह के समर्थन से कृषि विज्ञान केंद्रों को मौजूदा कृषि स्थिति में सुधार के लिए जिले के दूर-दराज के क्षेत्रों तक अपनी पहुंच बढ़ाने में मदद मिलती है।

वांछित उद्देश्यों की पूर्ति सुनिश्चित करने के लिए भाकृअनुप-अटारी के माध्यम से अच्छी संख्या में प्रमुख कार्यक्रमों का कार्यान्वयन पिछले एक वर्ष के दौरान भाकृअनुप-अटारी कोलकाता की मुख्य गतिविधि रही है। कार्यक्रमों के निरंतर पर्यवेक्षण ने न केवल गुणवत्तापूर्ण उत्पादन लाया है बल्कि कृषि समुदाय और नीति निर्माताओं के बीच उच्चतम स्तर पर केवीके को एक घरेलू नाम बना दिया है।

तिलहन और दलहनी फसलों दोनों के लिए एनएफएसएम द्वारा प्रायोजित क्लस्टर्ड फ्रंटलाइन डिमॉन्स्ट्रेशन (सीएफएलडी) कार्यक्रम का कार्यान्वयन, चावल परती के उपयोग पर विशेष जोर देने के साथ उत्पादकता बढ़ाने के लिए पिछले एक वर्ष के दौरान दर्ज की गई एक और उपलब्धि रही है। तिलहन में, औसत उपज दर्ज की गई 34-69% की सीमा में थी। दलहनी फसलों में भी तीनों मौसमों में अधिक उपज देखी गई। खरीफ, रबी और गर्मी के उपज में औसत वृद्धि 25 से 64% के बीच थी।

गुणवत्ता वाले दलहन बीजों की आपूर्ति बढ़ाने के लिए 10 चयनित केवीके चरण में दलहन बीज हब स्थापित किया गया था। इस क्षेत्र में, ये 10 बीज केंद्र तीन फसल मौसमों को कवर करते हुए वर्ष भर में पहचानी गई दलहनी फसलों के बीज उत्पादन में लगे हुए हैं। बीज उत्पादन के लिए पहचानी गई फसलें थीं अरहर, हरा चना, काला चना, चना, मसूर और मटर।

किसान पहला कार्यक्रम (एफएफपी) वर्ष 2015-16 में कृषि विस्तार प्रभाग, आईसीएआर, नई दिल्ली द्वारा केवीके योजना के तहत शुरू किया गया था। इसे सफलतापूर्वक लागू किया गया और लगातार पांच वर्षों तक यानी 2015-16 से 2019-20 तक चला। परिणामस्वरूप, कार्यक्रम को वर्ष 2020-21 के दौरान तीन आईसीएआर संस्थानों (आईसीएआर-एनआरआरआई, कटक; आईसीएआर-सीआईएफए, भुवनेश्वर और आईसीएआर-आईआईडब्ल्यूएम, भुवनेश्वर) और आईसीएआर के तहत एक राज्य कृषि विश्वविद्यालय (ओयूएटी, भुवनेश्वर) के लिए विस्तारित किया गया था। अटारी कोलकाता। COVID-19 महामारी की स्थितियों के कारण, क्षेत्र स्तर पर गतिविधियाँ बुरी तरह प्रभावित हुईं। लेकिन, संक्रमण को रोकने के लिए सभी COVID प्रोटोकॉल का पालन करते हुए गोद लिए गए गांवों में अपने लक्ष्यों को पूरा करने के लिए कार्यान्वयन केंद्रों के सभी संबंधित वैज्ञानिकों द्वारा अत्यधिक प्रयास किए गए। इस कार्यक्रम का सार यह है कि किसान अनुसंधान समस्या की पहचान, प्राथमिकता, प्रयोग के संचालन और किसानों के खेतों में इसके प्रबंधन में महत्वपूर्ण भूमिका निभाते हैं। धान में एकीकृत पोषक तत्व प्रबंधन, नई किस्मों की शुरूआत, मछली को पूरक आहार, कुक्कुट नस्लों को लोकप्रिय बनाना, जल प्रबंधन विधियों में सुधार, टिशू कल्चर केला, परियोजना क्षेत्र में मिनी दाल मिल, संस्थानों/एसएयू द्वारा कार्यान्वित कुछ हस्तक्षेप हैं। इस परियोजना के माध्यम से चयनित किसानों/कृषि परिवारों की आजीविका में समग्र सुधार। इस क्षेत्र में 2021 के दौरान चार परियोजनाएं शुरू की गईं।

ग्रामीण युवाओं को कृषि आधारित व्यवसाय में बनाए रखना देश भर के नीति निर्माताओं के लिए एक चुनौती है। एक उपयुक्त उपाय खोजने के लिए, कृषि में युवाओं को आकर्षित करना और बनाए रखना (आरवाईए) - भारतीय कृषि अनुसंधान परिषद की एक परियोजना इस क्षेत्र के 9 केवीके के माध्यम से आईसीएआर-अटारी कोलकाता द्वारा कार्यान्वित की जाती है। जिलों में व्यावसायिक उद्यम बनाने के अवसर के आधार पर चयनित युवाओं को चरणबद्ध तरीके से वित्तीय और तकनीकी सहायता प्रदान करने के लिए उद्यमों का चयन किया गया है। केवीके के प्रयासों और भाकृअनुप-अटारी कोलकाता के पर्यवेक्षण ने ग्रामीण युवाओं को स्थिर वार्षिक आय बढ़ाने के लिए 308 उद्यम स्थापित करने में सक्षम बनाया है। इस परियोजना की सफलता ने अन्य ग्रामीण युवाओं को भी अपनी आजीविका के लिए गैर-कृषि उद्यमों को अपनाने के लिए प्रेरित किया है।

मेरा गांव मेरा गौरव के नाम से संशोधित लैब-टू-लैंड कार्यक्रम आईसीएआर-अटारी कोलकाता द्वारा लगभग सभी आईसीएआर संस्थानों, क्षेत्रीय केंद्रों और राज्य कृषि विश्वविद्यालय के सक्रिय सहयोग से नोडल संस्थान के रूप में संचालित एक और सफल प्रमुख कार्यक्रम है। यह क्षेत्र इनपुट, सूचना और तकनीकी सहायता प्रदान करने के अलावा, इस कार्यक्रम में शामिल वैज्ञानिक गैर-सरकारी संगठनों, एसएचजी, पंचायत, राज्य के अंगों और कृषि विकास गतिविधियों से जुड़े अन्य हितधारकों के साथ प्रभावी और कार्यात्मक संबंध भी विकसित कर सकते हैं। किसानों के मोर्चे पर, 383 वैज्ञानिकों ने 17976 किसानों के लाभ के लिए 490 विभिन्न क्षेत्र गतिविधियों को अंजाम देने के लिए 284 गांवों को कवर किया। यह उपलब्धि विशेष प्रशंसा की पात्र है क्योंकि वैज्ञानिकों की गतिशीलता कोविड -19 को देखते हुए एक निश्चित सीमा तक सीमित थी।

मधुमक्खी पालन एक महत्वपूर्ण कृषि गतिविधि के रूप में सामने आया है जो ग्रामीण युवाओं के बीच स्वरोजगार और उद्यमिता के साथ-साथ अभ्यास करने वाले किसानों के लिए सहायक आय का मार्ग दिखाता है। अटारी कोलकाता को कुल रु. 6448050/- वित्तीय वर्ष 2021-22 के दौरान अटारी कोलकाता के तहत 15 केवीके द्वारा वैज्ञानिक मधुमक्खी पालन पर प्रशिक्षण आयोजित करने के लिए। सभी 15 केवीके ने 7 दिनों में से प्रत्येक में 26 शारीरिक प्रशिक्षण आयोजित किए, जिसमें प्रति प्रशिक्षण 25 प्रतिभागियों के एक बैच के साथ 653 प्रतिभागी शामिल थे और 5 केवीके ने वैज्ञानिक मधुमक्खी पालन पर कुल 163 प्रतिभागियों के साथ 3 दिनों के ऑनलाइन प्रशिक्षण का आयोजन किया। मधुमक्खी पालन का प्रशिक्षण प्राप्त करने के बाद कुल 116 प्रशिक्षुओं ने वैज्ञानिक मधुमक्खी पालन को एक नए उद्यम के रूप में शुरू किया है।

राष्ट्रीय सहकारी विकास निगम (एनसीडीसी) क्लस्टर आधारित व्यावसायिक संगठनों (सीबीबीओ) के माध्यम से केंद्रीय क्षेत्र की योजना, "10,000 किसान उत्पादक संगठनों का गठन और संवर्धन" के तहत एक कार्यान्वयन एजेंसी (आईए) है, जो पेशेवर संगठन हैं जो एनसीडीसी द्वारा कार्य करने के लिए लगे हुए हैं। इस योजना के तहत एफपीओ के गठन और पोषण के लिए ब्लॉक स्तर पर। रुपये की राशि। 2021-22 के दौरान परिषद से 800000/- प्राप्त हुए हैं और रु. 400000/- प्रत्येक को एफपीओ के गठन के लिए दो सीबीबीओ, यानी आईसीएआर-राष्ट्रीय चावल अनुसंधान संस्थान, कटक और केवीके, नुआपाड़ा को दिया गया है। इस कार्यक्रम से अब तक 730 सदस्य जुड़े हुए हैं।

2022 तक किसानों की आय (डीएफआई) को दोगुना करने के लिए भारत सरकार (जीओआई) की घोषणा और इसके कार्यान्वयन का कृषि संकट को कम करने के लिए समयबद्ध तरीके से किसानों को आय सुरक्षा की भावना का एहसास करने के



लिए लगभग आधी आबादी पर सीधा प्रभाव पड़ता है। और किसानों के कल्याण को बढ़ावा देना। तदनुसार, भाकृअनुप-अटारी, कोलकाता, जोन V के अंतर्गत अंडमान और निकोबार द्वीप समूह, ओडिशा और पश्चिम बंगाल के केवीके ने गांवों का चयन किया है और डीएफआई प्राप्त करने के लिए विभिन्न गतिविधियां शुरू की हैं। इस क्षेत्र में डीएफआई पर कुल 6181 डीएफआई की सफलता की कहानियों का दस्तावेजीकरण किया गया है। 2016-17 से 2021-22 के बीच आय को दोगुना या अधिक करने के लिए कृषि, पशुपालन, मत्स्य पालन, कृषि और गैर-कृषि क्षेत्रों में कई हस्तक्षेप किए गए हैं।

‘पश्चिम बंगाल के नए जलोढ़ क्षेत्र में किसानों की आय को दोगुना करने के लिए कृषि वानिकी और मूल्य श्रृंखला प्रबंधन’ नामक एक नाबार्ड वित्त पोषित परियोजना को केवीके नेटवर्क के माध्यम से पुरबा मेदिनीपुर, पश्चिम बंगाल जिले के पंसकुरा ब्लॉक के छह गांवों में लागू किया गया है। 2021-22 से 2023-24 तक 3 वर्षों की अवधि के दौरान 300 कृषि परिवार (प्रत्येक गाँव के 50 परिवार)। मिट्टी के कटाव को रोकने के लिए, मिट्टी की नमी को संरक्षित करने और मिट्टी की उर्वरता बढ़ाने के लिए, ग्रामीण लोगों के लिए रोजगार के अवसर पैदा करने और भूमि का कुशलतापूर्वक प्रबंधन करने के लिए ताकि सिस्टम किसानों की आय को दोगुना करने में योगदान दे सके। परियोजना के तहत दो प्रकार के कृषि-वानिकी मॉडल स्थापित करने का प्रयास किया गया है। वर्तमान में लगभग 300 किसानों को शामिल करते हुए विभिन्न मॉडलों का प्रयास किया जा रहा है। कई जागरूकता और प्रशिक्षण कार्यक्रम आयोजित किए गए हैं।

नाबार्ड द्वारा वित्त पोषित एक अन्य परियोजना, जिसका शीर्षक है, ‘पश्चिम बंगाल के छह कृषि-जलवायु क्षेत्रों में मॉडल एकीकृत खेती के लिए क्षेत्र विकास योजनाओं और क्षेत्र-विशिष्ट सॉफ्टवेयर टेम्पलेट का विकास’ अगस्त 2021 के महीने से प्रचालन में है। परियोजना का उद्देश्य है पश्चिम बंगाल के छह कृषि-जलवायु क्षेत्रों में आईएफ के क्षेत्र-विशिष्ट मौजूदा मॉडलों की तकनीकी व्यवहार्यता और आर्थिक व्यवहार्यता का पता लगाने के लिए और मॉडल एकीकृत खेती (एमआईएफ) के लिए सॉफ्टवेयर टेम्पलेट विकसित करना। कार्य प्रगति पर है। एसडब्ल्यूओटी विकल्पों/कारकों के प्राथमिक चयन के लिए एक व्यवस्थित डेस्क अध्ययन पूरा किया गया था। प्रत्येक एसडब्ल्यूओटी घटक/समूह सामान्य विशेषताओं और/या क्षेत्र-विशिष्ट विशेषताओं जैसे तकनीकी, आर्थिक, पर्यावरण, सामाजिक आदि जैसे विभिन्न पहलुओं को कवर करने के तहत मूल्यांकन किया गया था। पश्चिम बंगाल के छह कृषि-जलवायु क्षेत्रों में कुल 60 मौजूदा आईएफ को पहले ही पश्चिम बंगाल के विभिन्न जिलों में स्थित 16 केवीके द्वारा 15 जिलों में यादृच्छिक रूप से चुना जा चुका है। SWOT विश्लेषण के लिए डेटा संग्रह प्रगति पर है। विश्लेषणात्मक पदानुक्रम प्रक्रिया (एएचपी) का उपयोग करके मात्रात्मक एसडब्ल्यूओटी विश्लेषण के लिए प्रयास किया जाएगा।

‘पूर्वी भारत में पशुधन उत्पादन और किसानों की आय बढ़ाने के लिए केवीके के क्षमता विकास कार्यक्रमों पर एक अध्ययन’ नामक परियोजना को पशुधन के संदर्भ में केवीके के विभिन्न क्षमता विकास कार्यक्रमों (सीडीपी) की प्रासंगिकता का पता लगाने के लिए अनुमोदित और शुरू किया गया है। उत्पादन और किसानों की आय और पूर्वी भारत में विशेष कृषि-जलवायु क्षेत्र के लिए निर्णय लेने की प्रक्रिया के लिए विश्वसनीय डेटाबेस उपलब्ध कराना। आगे के विश्लेषण के लिए पूर्वी भारत के 18 केवीके से पशुधन खेती के क्षमता विकास कार्यक्रमों पर डेटा एकत्र किया गया है और इच्छित हितधारकों की धारणाओं और कार्यक्रम के परिणामों के आधार पर सीडीपी की एक टाइपोलॉजी को चित्रित किया गया है, सीडीपी की रैंकिंग, मौजूदा सीडीपी की सापेक्ष प्रासंगिकता का आकलन किया गया है। केवीके प्रणाली और पशुधन उत्पादन

और किसानों की आय पर सीडीपी के योगदान का पता लगाना। प्रशिक्षणार्थियों की आय पर किसानों, फील्ड स्तर के कर्मचारियों और विशेषज्ञों द्वारा अनुभव किए जाने वाले प्रभाव के रास्ते की पहचान करने के लिए एक छोटा पायलट अध्ययन पूरा किया गया है। फ़र्जी लॉजिक कॉम्पिटिव मैपिंग (FCM) का उपयोग धातु के नक्शे विकसित करने के लिए किया गया है जो विभिन्न मार्गों को इंगित करता है जिसके माध्यम से प्रशिक्षण किसान की आय पर प्रभाव डालता है।

‘किसान सारथी’ एक सूचना संचार और प्रौद्योगिकी (आईसीटी) आधारित इंटरफेस प्लेटफॉर्म है जो स्थानीय स्तर पर कृषि का समर्थन करने के लिए एक राष्ट्रीय परिप्रेक्ष्य के साथ 16 जुलाई 2021 को शुरू किया गया है और किसानों की सुविधा के लिए भारतीय कृषि अनुसंधान परिषद (आईसीएआर) के 93 वें स्थापना दिवस समारोह पर है। अपनी वांछित भाषा में ‘सही समय पर सही जानकारी’ प्राप्त करने के लिए। ‘किसान सारथी’ प्लेटफॉर्म के तहत, 2021-22 के दौरान आईसीएआर-अटारी कोलकाता के तहत केवीके के 178 विशेषज्ञों के साथ 59 केवीके पंजीकृत किए गए हैं। इस क्षेत्र के कुल 233 किसानों को पहले ही अंडमान और निकोबार द्वीप समूह, ओडिशा और के विभिन्न जिलों से पंजीकृत किया जा चुका है। पश्चिम बंगाल। अब तक कुल 54 कॉल/प्रश्न किए जा चुके हैं। किसान सारथी की यह पहल दूर-दराज के क्षेत्रों में किसानों तक पहुंचने के लिए तकनीकी हस्तक्षेप से किसानों को सशक्त बनाएगी।

अनुसूचित जनजाति घटक (एसटीसी) पूर्व जनजातीय उप-योजना (टीएसपी) का मुख्य उद्देश्य अनुसूचित जनजातियों के विकास के लिए केंद्रीय मंत्रालयों/विभागों में सामान्य क्षेत्रों से कम से कम उनकी जनसंख्या के अनुपात में परिव्यय और लाभों के प्रवाह को व्यवस्थित करना था। , भौतिक और वित्तीय दोनों दृष्टि से। तदनुसार, जनजातीय मामलों के मंत्रालय, भारत सरकार ने जनजातीय लोगों को जीवन की बेहतर गुणवत्ता प्रदान करने के लिए देश भर में आदिवासी बहुल जिलों की पहचान की। आठ आदिवासी बहुल जिलों में दस केवीके, यानी अंडमान और निकोबार द्वीप समूह के एक जिले (निकोबार) और ओडिशा राज्य के सात (गजपति, कंधमाल, मयूरभंज-I और II, मलकानगिरी, नबरंगपुर, रायगडा, सुंदरगढ़-I और II) की पहचान की गई थी। वर्ष 2021 के दौरान एसटीसी कार्यक्रम के तहत इस क्षेत्र से उन 10 केवीके को फसल खेती, बागवानी, पशुपालन, डेयरी विकास, व्यावसायिक प्रशिक्षण, रसोई बागवानी, मछली उत्पादन जैसी विभिन्न गतिविधियों के संचालन के लिए 364 लाख रुपये की राशि आवंटित की गई थी। और कई अन्य जनजातीय लोगों के लाभ के लिए किए गए आकलन से संकेत मिलता है कि 2021 के दौरान 14142 किसानों के लाभ के लिए 259 आदिवासी गांवों को इस परियोजना के तहत लाया गया है।

जलवायु अनुकूल कृषि में राष्ट्रीय नवान्वेषण एक ऐसा कार्यक्रम है जो आईसीएआर-अटारी कोलकाता द्वारा निगरानी किए जाने वाले 9 केवीके के माध्यम से जोन V में चल रहा है। ग्रीष्म जुलाई, हरी खाद, शून्य जुलाई, जैविक मल्लिंग, बीबीएफएस, कार्बन सीक्वेस्ट्रेशन के बाद पानी बचाने वाली सिंचाई विधियों, कृत्रिम भूजल पुनर्भरण, बड़े पैमाने पर जल संचयन संरचनाओं का निर्माण, तालाबों का नवीनीकरण आदि जैसे तकनीकी घटकों का सफल कार्यान्वयन नहीं हुआ है। न केवल निम्न गांवों में सकारात्मक प्रभाव डाला बल्कि किसानों के लाभ के लिए अन्य जिलों में इसके विस्तार का मार्ग प्रशस्त किया। वैकल्पिक फसल पद्धति को लोकप्रिय बनाने, उपयुक्त फसल किस्मों की शुरुआत, सामुदायिक नर्सरी जैसी नवीन विधियों, चारे की खेती पर जोर, वीसीआरएमसी के निर्माण और कस्टम हायरिंग सिस्टम और इस कार्यक्रम के माध्यम से किए गए अन्य घटकों ने कमजोर जिलों के किसानों को अत्यधिक लाभान्वित किया है।

ओडिशा और पश्चिम बंगाल के 16 चयनित केवीके के माध्यम से जिला एग्रोमेट यूनिट (डीएएमयू) की स्थापना के माध्यम से ग्रामीण कृषि मौसम सेवा शुरू की गई थी। महत्वपूर्ण गतिविधि, दूसरों के बीच, मौसम पूर्वानुमान संबंधी संदेश थी। अभी तक केवीके ग्रामीण कृषि मौसम सेवा के तहत अच्छी तरह से काम कर रहे हैं। केवीके ने मौसम संबंधी अग्रिम जानकारी प्रदान करने के लिए 'मेघदूत' और 'दामिनी' मोबाइल ऐप को भी लोकप्रिय बनाया।

कौशल प्रशिक्षण प्रदान करके उद्यमिता के विकास पर भारतीय कृषि कौशल परिषद (एएससीआई) के साथ इस क्षेत्र के चयनित केवीके द्वारा 2016-17 से एक सहयोगी कार्यक्रम चलाया जा रहा है। केवीके स्तर पर बाद में प्रशिक्षण प्रदान करने के लिए कुछ प्रशिक्षकों के प्रशिक्षण कार्यक्रम भी आयोजित किए गए। वर्ष 2021 के दौरान, कोई नया कार्यक्रम नहीं सौंपा गया था, हालांकि केवीके ने COVID प्रतिबंधों के कारण कम अवधि के कुछ कौशल विकास कार्यक्रम शुरू किए हैं।

प्राकृतिक संसाधन आधार के संरक्षण, खेती की लागत कम करने, किसानों की आय बढ़ाने और किसानों की बेहतर आजीविका सुनिश्चित करने पर जोर देने के साथ अनाज आधारित फसल प्रणाली में सुधार के मद्देनजर आईसीएआर के सहयोग से सीएसआईएसए (दक्षिण एशिया में अनाज प्रणाली पहल) परियोजना का संचालन किया जा रहा है। इस क्षेत्र के ओडिशा (कटक, मयूरभंज-I, भद्रक, पुरी, बालसोर) के 5 केवीके इस वर्ष के दौरान चावल पर Zn परीक्षण ऑन-फार्म मूल्यांकन के रूप में आयोजित किया गया था।

भाकृअनुप-अटारी कोलकाता द्वारा निगरानी किए गए केवीके नॉलेज पोर्टल ने दूरदराज के क्षेत्रों के किसानों को केवीके के कामकाज के बारे में जानने और बेहतर कृषि और संबद्ध प्रथाओं के लिए सूचना समर्थन मांगने में मदद की है। केवीके किसानों को इस तरह की घटनाओं के बारे में जानने और समीक्षा और निगरानी की सुविधा के लिए इस पोर्टल में उपलब्ध सुविधाओं, अतीत और आगामी घटनाओं, प्रथाओं के पैकेज, कार्यान्वित कार्यक्रमों का विवरण, मासिक प्रदर्शन रिपोर्ट आदि से संबंधित जानकारी डाल रहे हैं। राष्ट्रीय स्तरा साथ ही, कृषि पोर्टल भी नियमित रूप से प्रौद्योगिकी, प्रकाशन, प्रयोगात्मक डेटा, अवलोकन डेटा, सर्वेक्षण डेटा और भू-पोर्टल के साथ अपलोड किया जाता है। यह भंडार कृषि और संबद्ध क्षेत्रों के बारे में जानकारी की एक मेटाडेटा सूची है जो कि किसानों, शोधकर्ताओं और योजनाकारों द्वारा आसान पहुंच के लिए आईसीएआर संस्थानों/एसएयू में उपलब्ध है।

इसके अलावा, रिपोर्ट की अवधि के दौरान, भाकृअनुप-अटारी कोलकाता तीसरे पक्ष के मूल्यांकन अध्ययन, एफपीओ के गठन के ऑनलाइन कार्यक्रम, एमएसएमई से मूल्यवर्धन कार्यक्रम और विभिन्न सरकार के लाइव वेबकारिस्टिंग के संचालन में भी शामिल था। कार्यक्रम आदि। किसानों द्वारा बड़े पैमाने पर प्रौद्योगिकी अपनाने, पीएम किसान योजना का वीडियो अपलोड करने और अन्य प्रगति के कुछ मामले इस अवधि के दौरान केवीके द्वारा किसानों के नवाचारों और सफलता की कहानियों के साथ दर्ज किए गए थे।

राज्य कृषि / पशु और मत्स्य विज्ञान विश्वविद्यालय के विस्तार शिक्षा निदेशालय ने केवीके की गतिविधियों की देखरेख और केवीके कर्मियों के ज्ञान को लगातार अद्यतन करने के लिए विभिन्न कार्यक्रमों के आयोजन में पर्याप्त रूप से समर्थन किया है। किसानों को आईसीएआर संस्थानों और एसएयू के तहत संचालित एटीआईसी के माध्यम से सूचना और तकनीकी सहायता भी प्रदान की गई है। समग्र कृषि और ग्रामीण विकास के लिए जिलों के भरोसेमंद ग्रामीण संगठन बनने के लिए अधिक से अधिक किसान-अनुकूल पहल करने के लिए सभी संबंधितों के संचयी प्रयास ने केवीके को विकसित किया है।

भाकृअनुप-अटारी कोलकाता एक ओर अपने जनादेश को पूरा करने और दूसरी ओर कृषक समुदाय की बेहतर के लिए सभी अनिवार्य और अन्य गतिविधियों को शुरू करने के लिए कृषि विज्ञान केंद्रों और विस्तार शिक्षा निदेशालयों को समर्थन देने में गहन रूप से शामिल रहा है। आवश्यकता आधारित बुनियादी ढांचा और वित्तीय सहायता प्रदान करने के अलावा, आईसीएआर-अटारी स्तर और केवीके दोनों पर भी संपूर्ण वित्तीय प्रबंधन प्रणाली के लिए डिजिटलीकरण किया गया है। केवीके द्वारा किए गए प्रमुख कार्यक्रमों के प्रदर्शन का आकलन करने के लिए सैक बैठक में भाग लेने और प्रदर्शन क्षेत्र के दौरे के माध्यम से मौके पर मूल्यांकन भी किया गया है। केवीके कर्मियों के लिए उन्नत कृषि और संबद्ध प्रथाओं के बारे में अपने ज्ञान को तेज करने के लिए आईसीएआर-अटारी कोलकाता की ओर से मानव संसाधन विकास एक नियमित विशेषता रही है। केंद्र सरकार की किसान हितैषी योजनाएं संसाधन गरीब किसानों द्वारा अपने स्वयं के विकास के लिए ऐसे कार्यक्रमों का लाभ लेने के लिए बड़ी संख्या में किसानों के बीच पर्याप्त प्रचार किया गया है। कई प्रमुख कार्यक्रमों में प्राप्त सफलता को राज्य विस्तार तंत्र द्वारा बड़े पैमाने पर एक्सट्रपलेशन के लिए दोहराया गया है। कई राज्यों, केंद्र और अन्य संगठनों के साथ प्रभावी अभिसरण और सहयोग ने भी केवीके को उत्पादक उद्देश्य में इसके उपयोग के लिए अतिरिक्त संसाधन/राजस्व अर्जित करने में मदद की है। भाकृअनुप-अटारी कोलकाता के स्तर पर विकसित कार्य योजना और अत्यंत ईमानदारी के साथ इसके क्रियान्वयन ने इस क्षेत्र के कृषि विज्ञान केंद्रों को कृषि को बदलने के लिए एक शक्तिशाली उपकरण बना दिया है।

भाकृअनुप-अटारी कोलकाता की अन्य महत्वपूर्ण उपलब्धियों में 2022 तक किसानों की आय को दोगुना करने की दिशा में ओडिशा और पश्चिम बंगाल राज्यों के लिए कार्यान्वयन योग्य कार्य योजना को अंतिम रूप देना शामिल है। कार्य योजना एसएयू, आईसीएआर संस्थानों, राज्य सरकार के परामर्श से तैयार की गई थी। अधिकारियों, केवीके कर्मियों और अन्य हितधारकों। किसानों की आय दोगुनी करने को वास्तविकता बनाने के लिए खेती की लागत में कमी, सुनिश्चित एमएसपी, कृषि मशीनीकरण, फसल विविधीकरण, फसल के बाद के नुकसान में कमी, कोल्ड स्टोरेज, मार्केटिंग इंटेलिजेंस, आईसीटी के उपयोग सहित बुनियादी सुविधाओं की सुविधा जैसे उपायों का सुझाव दिया गया था।



EXECUTIVE SUMMARY

Division of Agricultural Extension of ICAR is instrumental at the Apex Level to carry forward the entire KVK system across India for creating a farmer-friendly, farmer-centric and farmer-oriented research as well as extension network. The endeavor is aptly supported by 731 KVKs, a number of flagship programmes and 11 Agricultural Technology Application Research Institutes located in XI Zones covering all the states. ATARIs help in understanding the social, economic and related aspects of the farmers by continuous discussion and coordinating with different Institutes located in these states. ATARIs also help in preparation of action plan to suit their aspiration and ensure that all the efforts of KVKs are directed towards the betterment of livelihood of the farming community. Presently, ICAR-ATARI Kolkata vests with the responsibility to monitor, evaluate and guide 59 KVKs of A & N Islands, Odisha and West Bengal.

ATARIs primarily focus on strengthening agricultural extension research and knowledge management along with coordination and monitoring of technology application and frontline extension education programme. The KVKs on the other hand, concentrate on technology assessment and demonstration for its wider application and to enhance capacity building. KVKs are to serve as single window knowledge, resource and capacity development centre as per the changing requirement of the farming community. To achieve the modified mandate, the KVKs have extended activities many-fold in meeting up the aspiration of small and marginal farmers, rural youths and other stakeholders. The ability of KVKs to deliver information and technology support at the doorstep of the farmers has made them an important link between research and extension at the grass root level.

An evaluation of the performance of 59 KVKs under Zone-V during the year 2021 indicates that the KVKs could achieve the target of all the mandated activities in the areas of training, on-farm trial, frontline demonstration, seed and planting material production, soil sample analysis and others. The KVKs assessed technologies pertaining to crop management, livestock management, fish culture, insect-pest management, drudgery reduction, storage technique etc. through 433 number of on farm trials conducted in 7457 different locations across

the zone. The successful technologies were again evaluated as farm demonstration before feeding it to mainstream state extension system in the form of technology capsules. The feedback to research system is also provided for the necessary improvement/modification of the developed technology to suit the wider agro-ecological situation of the zone.

KVKs conducted frontline demonstrations in pulse, oilseed and other crops to establish the production potentiality of the newly released varieties as well as standardized package of practices to enhance the productivity of major pulse and oilseed crops and to improve the seed replacement ratio in the crops. In the process, the KVKs brought 1674.27 ha under such demonstration programmes with the involvement of 9278 number of farmers. The performance recorded in the farmers' field indicated the superiority of the new varieties over local varieties in terms of yield and benefit-cost ratio. The involvement of extension functionaries in the demonstration programmes paved the way for its large-scale dissemination for the benefit of the farming community. Demonstration on livestock and fishery was also carried out by the KVKs in 6840 and 548 units through 2000 and 625 number of programmes, respectively. Likewise, in enterprises and implements, 2699 and 125 units, respectively, were also demonstrated during the stipulated period.

Capacity development for the farmers and farmwomen, rural youth and extension functionaries is the integral part of KVK functioning. For imparting knowledge and skill, the KVKs organized 3887 number of courses for 112290 farmers and farmwomen covering various aspects of crop production, horticulture, soil health management, agricultural engineering, livestock & fishery, home science, agricultural extension and many more. In respect of rural youths, however, only such areas of capacity building were selected that could provide self-employment in farm and off-farm enterprises. Due to Covid-19 pandemic situation many of the programmes was conducted through online mode. In this process, 13676 rural youths including girls were trained through 629 number of courses. Areas selected for the capacity building of extension personnel were agriculture, animal husbandry and fishery field. The KVKs conducted 625 such courses for 18829 participants. In addition, the KVKs

also organized vocational training programmes of comparatively longer duration to make youths self-employed. The potentiality of KVKs in capacity development programme has been recognized by Govt. and other organizations as such organizations are more and more depending on KVKs for knowledge and skill development of its functionaries. For organizing large-scale awareness among farmers through various extension activities was another notable achievement of the KVKs. During the period reported upon, the KVKs conducted 50711 number of such extension activities with the involvement of 1366393 farmers, extension functionaries and others.

Quality seed and planting materials supply to the farmers is another important objective of the KVKs which is met up either producing seeds at KVK farm or through seed village programme. The KVKs during the mentioned period produced 20946.62 q of quality seeds of major cereals and crops/ vegetables for addressing the issue of non-availability of seeds in time. KVKs also produced 59.80 lakh planting materials/ seedlings of fruit crops, vegetables, flower, forest sp. etc. for quality production. Use of bio-product in agricultural field is becoming fast popular from environmental point of view and the KVKs produced 252907.20 kg of different bio-formulation to make available to 6063 number of farmers. Quality livestock strain, fish fingerling and spawn production was also given adequate importance by the KVKs through production of 52251119 number of such produce.

In soil and water analysis, the KVKs analyzed 48580 number of samples across the zone to provide soil health card to the farmers and earned revenue of Rs.1123759/-. The soil and water testing enabled the farmers to judiciously utilize chemical fertilizer in crops, increase crop productivity and to sustain soil health. Apart from the mandated activities, the KVKs also celebrated special day/ week as a means to create awareness among farming community like world soil day, environmental day, national science day, world veterinary day and others. Such celebrations attracted good number of participants and provide the opportunity to showcase the benefit of such programmes among the farmers. The KVKs also generated revenue worth Rs.2.52 crore through various convergence programmes at the district level. Such support helps the KVKs in extending its reach to the far-flung areas of the district to improve the existing agricultural situation.

Implementation of a good number of flagship programme through ICAR-ATARI to ensure the fulfillment of the desired objectives has been the core activity on the part of ICAR-ATARI Kolkata during last one year. Continuous supervision of the programmes has not only brought quality output but also made KVKs a household name among the farming community and policy makers at the highest level.

Implementation of Clustered Frontline Demonstration (CFLD) programme sponsored by NFSM both for oilseed and pulse crops to enhance the productivity with particular emphasis on to utilize rice fallow has been another achievement recorded during last one year. In oilseed, average yield recorded was in the range of 34-69%. Higher yield was also observed in pulse crops during all three seasons, viz. kharif, rabi and summer. The average increase in yield was in the range of 25 to 64%.

Pulse seed hub was established in 10 selected KVKs Step to increase the supply of quality pulse seeds. In this zone, these 10 seed hubs are engaged in producing seeds of identified pulse crops throughout the year covering three cropping seasons. The crops identified for seed production were pigeon pea, green gram, black gram, chick pea, lentil and field pea.

Farmer FIRST Programme (FFP) was launched in the year 2015-16 by Agricultural Extension Division, ICAR, New Delhi under KVK scheme. It was successfully implemented and run for consecutive five years i.e. from 2015-16 to 2019-20. As a result, the programme was extended during the year 2020-21 for three ICAR Institutes (ICAR-NRRI, Cuttack; ICAR-CIFA, Bhubaneswar and ICAR-IIWM, Bhubaneswar) and one State Agricultural University (OUAT, Bhubaneswar) under ICAR-ATARI Kolkata. Due to COVID-19 Pandemic situations, the activities at the field level were severely affected. But, utmost efforts were made by all the concerned scientists of implementing centers to fulfill their targets in the adopted villages by following all COVID protocols to prevent infection. The essence of this programme is that farmers play the key role in research problem identification, prioritization, conduct of experiment and its management in farmers' fields. Integrated nutrient management in paddy, introduction of newer varieties, supplementary feeding to fish, popularization of poultry breeds, improved water management methods, tissue culture banana, mini dal mill in the project area are some of the interventions



executed by the institutes/ SAU to bring overall improvement in livelihood of the selected farmers/ farm families through this project. Four projects were undertaken in this Zone during 2021.

Retaining rural youths in farm-led vocation is one of the challenges for policy makers across the country. To find a suitable measure, Attracting and Retaining Youth in Agriculture (ARYA) - a project of Indian Council of Agricultural Research is implemented by ICAR-ATARI Kolkata through 9 KVKs of this zone. Based on the opportunity to create commercial venture in the districts, enterprises have been selected to provide financial and technical support to the identified youths in a phased manner. The efforts of KVK and supervision of ICAR-ATARI Kolkata have enabled rural youths to establish 308 number of enterprises for enhanced annual income in a sustained manner. The success of this project has motivated other rural youths also to take off-farm enterprises for their livelihood.

The modified Lab-to-Land programme in the name of Mera Gaon Mera Gaurav is another successful flagship programme carried out by ICAR-ATARI Kolkata as the Nodal Institute in active collaboration with almost all the ICAR Institutes, Regional Centres and State Agricultural University located in this zone. Apart from providing input, information and technological support, the scientists involved in this programme could also develop effective and functional linkages with NGOs, SHGs, Panchayat, state organs and other stakeholders associated with agricultural development activities. In the farmers front, 383 scientists covered 284 villages to carry out 490 different field activities for the benefit of 17976 farmers. The achievement deserves special appreciation as the mobility of the scientists was restricted to a certain extent in view of Covid -19.

Beekeeping has come up as an important agricultural activity that shows the way of self-employment and entrepreneurship among the rural youth as well as subsidiary income for the practicing farmers. ATARI Kolkata received a total Rs. 6448050/- during 2021-22 financial year from the Council for organizing training on scientific beekeeping by 15 KVKs under ATARI Kolkata. All 15 KVKs conducted 26 physical trainings each of 7 days involving 653 participants with a batch of 25 participants per training and 5 KVKs organized online training of 3 Days with a total of 163 participants on scientific beekeeping. A total of 116 trainees have started scientific beekeeping as a

new venture after receiving beekeeping training.

The National Cooperative Development Corporation (NCDC) is an Implementing Agency (IA) under the Central Sector Scheme, "Formation and Promotion of 10,000 Farmer Producer Organisations" through Cluster Based Business Organisations (CBBOs) who are professional organisations that are engaged by NCDC to function at the Block level for formation and nurturing of FPOs under this scheme. A sum of Rs. 800000/- has been received from the Council during 2021-22 and Rs. 400000/- each has been given to two CBBOs, i.e. ICAR-National Rice Research Institute, Cuttack and KVK, Nuapada for the formation of FPOs. Till now, 730 members are connected with this program.

The announcement of Government of India (GoI) to double farmers' income (DFI) by 2022 and its implementation have a direct impact on almost half of the population to realize a sense of income security to farmers in a time bound manner to reduce agrarian distress and promote farmers' welfare. Accordingly, KVKs of Andaman and Nicobar Islands, Odisha and West Bengal under ICAR-ATARI, Kolkata, Zone V have selected villages and undertaken various activities for achieving DFI. A total of 6181 numbers of DFI success stories on DFI have been documented in this zone. To make the income double or more between 2016-17 to 2021-22, a number of interventions have been made in agriculture, animal husbandry, fishery, farm and non-farm sectors.

A NABARD funded project entitled, 'Agro Forestry and Value Chain Management for Doubling Farmers' Income in New Alluvial Region of West Bengal' is implemented through the KVK network in Purba Medinipur, West Bengal at six villages from Panskura block of the district Purba Medinipur involving 300 farm families (50 families from each village) during a period of 3 years from 2021- 22 to 2023- 24. The objectives of the project are to utilize the available farm resources properly, to maximize per unit production of food, fodder and fuel, to check soil erosion, conserve soil moisture and increase the soil fertility, to generate employment opportunities for rural people and to manage land efficiently so that the system can contribute in doubling farmers' income. An attempt has been made to establish two kinds of agro-forestry model under the project. Various models are currently being attempted involving about 300 farmers. A number of awareness and training programmes have been organized.

Another NABARD funded project entitled, 'Formulation of Area Development Schemes and Development of Area-Specific Software Template for Model Integrated Farming across Six Agro-Climatic Regions of West Bengal' is in operation since the month of August 2021. The objective of the project is to explore technical feasibility and economic viability of the area-specific existing models of IF across six agro-climatic regions of West Bengal and develop the Software Template for Model Integrated Farming (MIF). The work is in progress. A systematic desk study was completed for primary selection of SWOT alternatives/ factors. Under each SWOT component/ group common features and/ or region-specific unique feature(s) covering different aspects like technological, economic, environmental, social etc were assessed. A total of 60 existing IFs in six agro-climatic regions of West Bengal has already been selected randomly in 15 districts by 16 KVKs located in different districts of West Bengal. Data collection for SWOT analysis is in progress. An attempt will be made for a quantitative SWOT analysis using Analytic Hierarchy Process (AHP).

The project entitled, 'A Study on Capacity Development Programs of the KVKs for Augmenting Livestock Production and Farmers' Income in Eastern India' has been approved and undertaken to explore the relevance of various Capacity Development Programs (CDPs) of the KVKs in terms of livestock production and farmers' income and make available reliable database for decision-making process for particular agro-climatic region in Eastern India. Data on capacity development programs of livestock farming have been collected from 18 KVKs of Eastern India for further analysis and delineating a typology of CDPs based on the intended stakeholders' perceptions and program outcomes, ranking the CDPs, assessing the relative relevance of existing CDPs of the KVK system and figuring out the contribution of CDPs on livestock production and income of the farmers. A small pilot study has been completed to identify the pathways of training's impact on trainees' incomes as perceived by the farmers, field-level staff and experts. Fuzzy Logic Cognitive Mapping (FCM) has been used to develop mental maps which indicate various pathways through which training exerts effects on a farmer's income.

'Kisan Sarathi' is an Information Communication and Technology (ICT) based interface platform for supporting agriculture at a local niche with a national perspective launched on 16th July 2021

and on 93rd Foundation Day celebration of Indian Council of Agriculture Research (ICAR) to facilitate farmers to get 'right information at right time' in their desired language. Under 'Kisan Sarathi' platform, 59 KVKs with 178 experts of KVKs under ICAR-ATARI Kolkata have been registered during 2021- 22. A total of 233 farmers of this zone have already been registered from different districts of Andaman & Nicobar Islands, Odisha and West Bengal. A total of 54 calls/ queries have been made so far. This initiative of Kisan Sarathi will empower farmers with technological interventions to reach farmers in remote areas.

The main objectives of Scheduled Tribe Component (STC) erstwhile Tribal Sub-Plan (TSP) was to channelize the flow of outlays and benefits from the general sectors in the Central Ministries/ Departments for the development of Schedules Tribes at least in proportion to their population, both in physical and financial terms. Accordingly, Ministry of Tribal Affairs, GoI identified tribal dominated districts across the country to provide the tribal people a better quality of life. Ten KVKs in eight tribal dominated districts, i.e., one district (Nicobar) from Andaman & Nicobar Islands and seven (Gajapati, Kandhamal, Mayurbhanj-I and II, Malkangiri, Nabarangapur, Raygada, Sundergarh-I and II) from Odisha state were identified from this Zone under STC programme during the year 2021. An amount of Rs.364 lakh fund was allotted to those 10 KVKs to conduct different activities like crop farming, horticulture, animal husbandry, dairy development, vocational training, kitchen gardening, fish production, and many others towards the benefit of tribal people. The assessment done indicates that 259 tribal villages have been brought under this project for the benefit of 14142 farmers during 2021.

National Innovations in Climate Resilient Agriculture is one such programme in operation in Zone V through 9 KVKs monitored by ICAR-ATARI Kolkata. Successful implementation of technology components like summer ploughing, green manuring, zero tillage, organic mulching, BBFS, carbon sequestration followed by water saving irrigation methods, artificial ground water recharge, creation of large-scale water harvesting structures, renovation of ponds etc. have not only created positive impact in the NICRA villages but also paved the way for its out scaling in other districts for the benefit of the farmers. Popularization of alternate cropping pattern, introduction of suitable

crop varieties, innovative methods like community nursery, emphasis on fodder cultivation, creation of VCRMC and custom hiring system and other components carried out through this programme have immensely benefitted the farmers of vulnerable districts.

Gramin Krishi Mausam Sewa through establishment of District AgroMet Unit (DAMU) was initiated through 16 selected KVKs of Odisha and West Bengal. The significant activity, among others, was weather forecast related messaging. As of now KVKs are functioning well under Gramin Krishi Mausam Sewa. KVK popularized 'Meghdoot' and 'Damini' mobile app also to provide advance weather related information.

A collaborative programme with Agriculture Skill Council of India (ASCI) on development of entrepreneurship through imparting skill training is being carried out since 2016-17 by selected KVKs of this zone. A few Training of Trainers programmes were also organized for providing subsequent training at KVK level. During the year 2021, no new programmes were assigned, however KVKs have taken up some skill development programmes of shorter duration due to COVID restrictions.

In view of improving cereal based cropping system with emphasis on conserving natural resource base, reducing cost of cultivation, augmenting farmers income and ensuring better livelihood of the farmers, CSISA (Cereal System Initiative in South Asia) project in collaboration with ICAR is under operation in 5 KVKs of Odisha (Cuttack, Mayurbhanj-I, Bhadrak, Puri, Balsore) of this zone. During this year Zn trial on Rice was conducted as an on-farm evaluation.

KVK Knowledge Portal monitored by ICAR-ATARI Kolkata has helped a large number of farmers from remote areas to know about KVK functioning and solicit information support for improved agriculture and allied practices. The KVKs are putting up information related to facilities available, past and upcoming events, package of practices, details of programmes implemented, monthly performance report etc. in this portal for the farmers to know about such events and to facilitate the review and monitoring at the national level. Alongside, KRISHI Portal is also regularly uploaded with technology, publication, experimental data, observational data, survey data and geo-portal. This repository is a metadata inventory of information regarding agriculture and allied sectors which is available

at ICAR Institutes/ SAUs for its easy access by the farmers, researchers and planners.

Besides, during the period under report, ICAR-ATARI Kolkata was also involved in conducting third party evaluation study, online programme of the formation of FPO, Value addition programme from MSME and Live Webcasting of various Govt. programmes etc. Some cases of large-scale technology adoption by the farmers, uploading video of P M Kisan Yojana and other progress were recorded by KVKs during this period alongwith the farmers' innovations and success stories.

Directorates of Extension Education of State Agricultural/ Animal & Fishery Science University have adequately extended supporting hands in overseeing the activities of KVKs and organizing various programmes to continuously update the knowledge of KVK personnel. Information and technological support have also been provided through the ATICs operating under ICAR Institutes and SAU to the farmers. The cumulative endeavour of all concerned has developed the KVKs to take up a greater number of farmer-friendly initiatives to become the trustworthy rural organization of the districts for the overall agricultural and rural development.

ICAR-ATARI Kolkata has been intensely involved in carrying out its mandate in one hand and extending support to KVKs and Directorates of Extension Education for taking up all the mandated and other activities for the betterment of farming community in the other. Apart from providing need based infrastructure and financial support, digitization has been done for entire financial management system both at ICAR-ATARI level and KVK as well. On the spot evaluation has also been carried out through attending SAC meeting and visit to demonstration field to assess the performance of flagship programmes carried out by KVKs. Human Resource Development has been a regular feature on the part of ICAR-ATARI Kolkata for the KVK personnel to sharpen their knowledge about advanced agricultural and allied practices. Farmer-friendly schemes of central Govt. have been given adequate publicity among large number of farmers to take the benefit of such programmes by the resource poor farmers for their own development. The success achieved in a number of flagship programme has been replicated by the state extension mechanism for its large-scale extrapolation. Effective convergence



and collaboration with a number of State, Central and other organizations have also helped KVKs earn additional resources/ revenue for its use in productive purpose. The plan of work developed at the level of ICAR-ATARI Kolkata and its execution with utmost sincerity have made the KVKs of this zone a powerful tool to transform the agriculture.

Other significant achievements of ICAR-ATARI Kolkata include finalization of implementable action plan for the states of Odisha and West Bengal

towards doubling farmer's income by 2022. The plan of action was prepared in consultation with SAUs, ICAR Institutes, State Govt. officials, KVK personnel and other stakeholders. Measures like reduction in cost of cultivation, ensured MSP, farm mechanization, crop diversification, reduction in post-harvest loss, infrastructure facility including cold storage, marketing intelligence, use of ICT etc. were suggested to make doubling farmers income a reality.



1.0 INTRODUCTION

In a view 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 A&N Islands, Odisha and West Bengal.

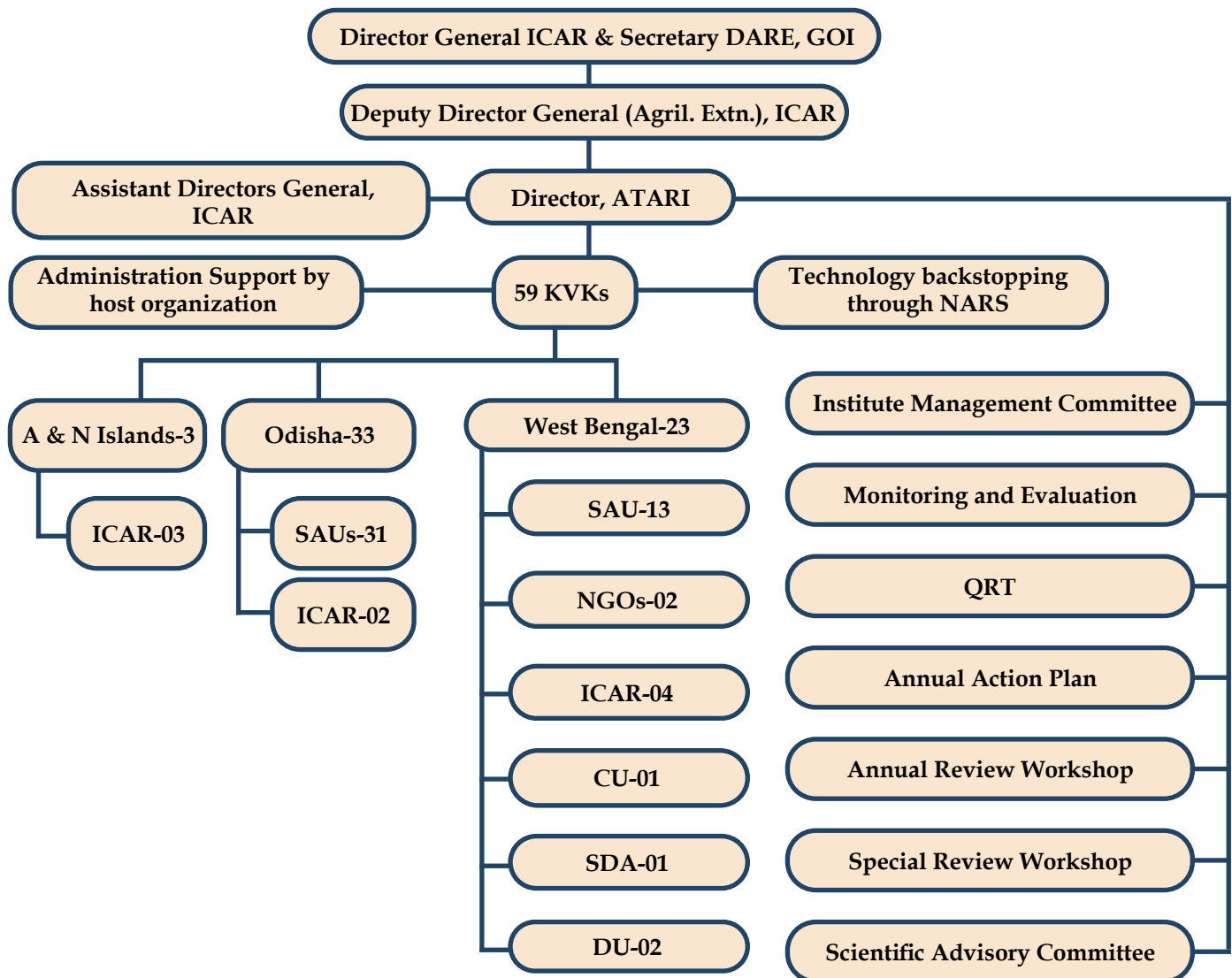
1.1 Profile :

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. The Zonal Project Directorate (erstwhile Zonal Coordinating Unit), Zone-II was established in 1979 to monitor and evaluate the Lab-to-Land Programme of ICAR. Initially operational jurisdiction was West Bengal, Orissa and A & N Islands. In 1991, Bihar was included in place of Orissa. Zonal Coordinating Unit was upgraded to Zonal Project Directorate in the year 2009. Since July 2015, this Directorate has been renamed as ICAR-Agricultural Technology Application Research Institute Kolkata.

In 2017, ICAR constructed 11 ATARIs by redistributing the states. The ATARI at Kolkata has been renamed as ATARI, Zone V including the State of Odisha, West Bengal and A & N Islands (59 KVKs).

1.2 Organizational Structure :



1.3 Budget Provision:

Providing 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 10071.91 lakh during 2021 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 2021

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.	Ve- hicle	Total		
ICAR-ATARI, Kolkata	344.20	2.78	0.00	49.92	0.00	0.00	396.90	3.50	0.00	0.00	0.00	3.50	0.00	400.40
State Agricultural University														
OUAT, Bhubaneswar (31)	3059.87	39.00	13.35	301.00	135.50	298.00	3846.72	72.28	379.51	3.10	27.00	481.89	0.00	4328.61
UBKV, Cooch-behar, West Bengal (5)	887.88	7.10	3.53	36.22	0.00	133.00	1067.73	9.80	27.00	0.50	9.00	46.30	0.00	1114.03
BCKV, Nadia, West Bengal (4)	788.16	6.20	3.40	28.09	0.00	136.00	961.85	11.80	42.58	0.50	0.00	54.88	0.00	1016.73
WBUA&FS, Kolkata (3)	478.28	5.10	3.40	16.00	0.00	81.00	583.78	6.53	22.50	0.30	0.00	29.33	0.00	613.11
ICAR														
ICAR-CIARI, A&N Islands (3)	379.67	6.68	0.90	43.58	13.50	9.50	453.83	4.90	129.46	0.30	0.00	134.66	0.00	588.49
ICAR-CRRI, Cuttack, Orissa (1)	90.00	1.50	0.30	11.50	0.00	13.00	116.30	1.50	60.67	0.10	0.00	62.27	0.00	178.57
ICAR-CIFA, Bhubaneswar, Orissa (1)	164.30	0.30	0.10	13.50	0.00	15.00	193.20	1.70	12.93	0.10	0.00	14.73	0.00	207.93
CRIJAF, West Bengal (2)	233.14	1.90	0.00	6.90	0.00	47.00	288.94	4.00	57.12	0.20	9.00	70.32	0.00	359.26
ICAR-CISH, Lucknow (1)	24.00	1.00	0.30	2.00	0.00	21.50	48.80	2.50	27.42	0.10	0.00	30.02	0.00	78.82
ICAR-NDRI, Karnal (1)	4.50	0.80	0.20	2.50	0.00	21.00	29.00	3.20	14.00	0.10	0.00	17.30	0.00	46.30
Central University, Visva Bharati, West Bengal (1)	166.00	1.50	0.30	4.30	0.00	26.00	198.10	2.80	4.00	0.10	0.00	6.90	0.00	205.00
Deemed University, RK-MVERI, West Bengal (2)	343.43	2.10	0.60	11.00	0.00	58.00	415.13	5.00	11.94	0.20	0.00	17.14	0.00	432.27



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.	Ve- hicle	Total		
State Govt. Undertaking														
WBCADC, Kolkata (1)	51.40	0.55	0.30	2.00	0.00	18.00	72.25	1.50	4.00	0.10	0.00	5.60	0.00	77.85
NGO														
West Bengal (2)	328.08	1.70	0.60	6.00	0.00	58.00	394.38	4.00	25.96	0.20	0.00	30.16	0.00	424.54
GRAND TOTAL	7342.91	78.21	27.28	534.51	149.00	935.00	9066.91	135.01	819.09	5.90	45.00	1005.00	0.00	10071.91

2.0 Krishi Vigyan Kendras:

With the advent 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 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, Krishi Vigyan Kendra is working as the link between National Agricultural Research System (NARS) and Transfer of Technology System (TOT) through effective convergence with state and other organs. Apart from the set mandated 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 Lab to Land, National Demonstration etc. were merged into an institutional shape in the form of Krishi Vigyan Kendra. 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 but 26 KVKs were established during X Five Year plan. In the next two Five Year plan period, 6 KVK each were established in this zone. However, in XII Five Year plan, 5 additional KVKs were established in 5 large districts of West Bengal namely, Murshidabad, Nadia, North 24 Pgs, South 24 Pgs and Malda.

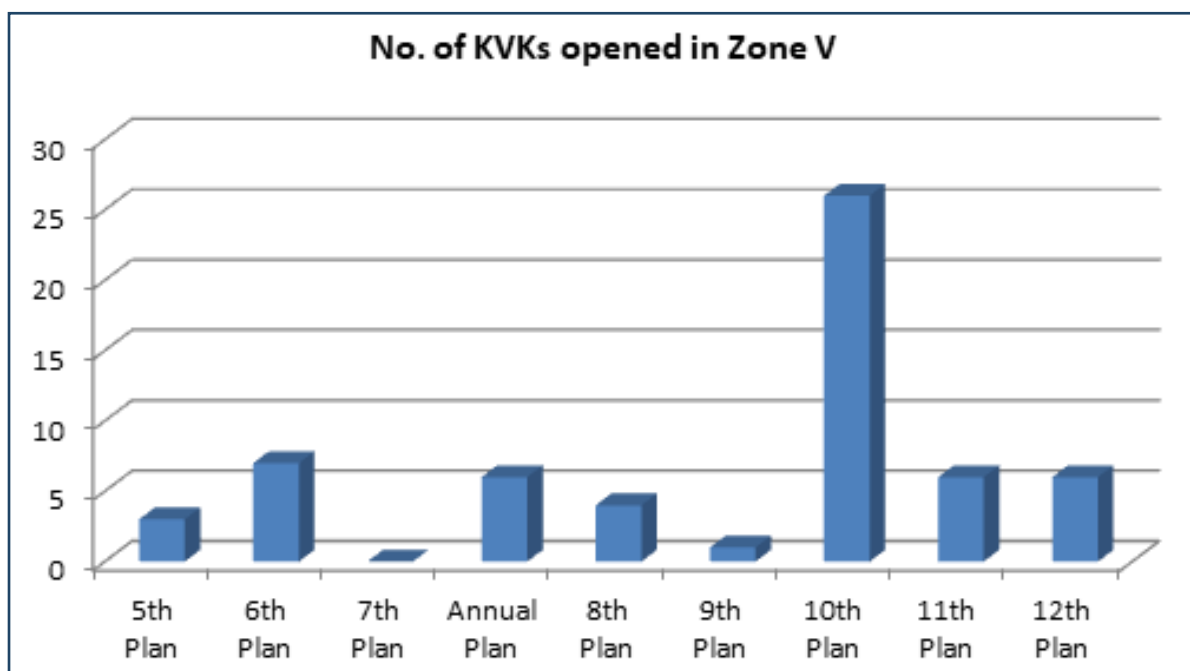


Fig: Plan wise growth of KVKs under Zone V

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 clientele.
- 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 the creation of three new ATARIs and subsequent readjustment of states under each ATARI, the KVKs of Odisha, West Bengal and A&N 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 33 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	33	31	2	-	-	-	-	33
West Bengal	23	13	4	2	1	2	1	23
Total	59	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 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.	Wes Bengal (23)	Bidhan Chandra Krishi Viswavidyalaya, Nadia	5
		Uttar Banga Krishi Viswavidyalaya, Coochbehar	5
		West Bengal University of Animal & Fishery Sciences, Kolakta	3
		Visva Bharati, 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 non-ICAR run KVKs, there has been recruitment but the ICAR-run KVKs are still suffering due to skeleton staff strength. The summary of staff position is given below.

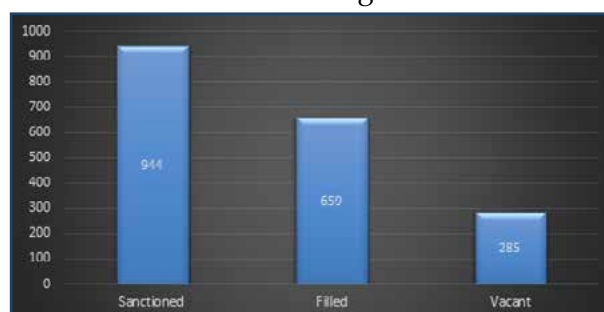
**Table: State-wise Staff position at KVKs under ICAR-ATARI, Kolkata
Scientific and Technical**

S. No.	Name of the State	Sr. Scientist and Head			Subject Matter Specialist/T-6			Farm Manager/T-4			Program Assistant (computer)/T-4			Program Assistant (lab technician)/ T-4		
		S	F	V	S	F	V	S	F	V	S	F	V	S	F	V
1	A & N Islands	3	1	2	18	5	13	3	1	2	3	0	3	3	0	3
2	Odisha	33	24	9	198	133	65	33	23	10	33	30	3	33	21	12
3	West Bengal	23	20	3	138	96	42	23	18	5	23	19	4	23	16	7
Total		59	45	14	354	234	120	59	42	17	59	49	10	59	37	22

Administrative staff

Name of the State	Assistant			Stenographer grade III			Driver/T-1			Skilled Support Staff			Total		
	S	F	V	S	F	V	S	F	V	S	F	V	S	F	V
A & N Islands	3	0	3	3	1	2	6	4	2	6	2	4	48	14	34
Odisha	33	0	33	33	27	6	66	65	1	66	49	17	528	372	156
West Bengal	23	16	7	23	14	9	46	38	8	46	36	10	368	273	95
Total	59	16	43	59	42	17	118	107	11	118	87	31	944	659	285

Filled and Vacant Staff Position in KVKs of Zone V during 2021



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

S. No.	Name of the State/ UT	Ad-mini Building	Farm-ers Hos-tel	Staff Quar-ters	De-mons. Unit	Soil test Lab	Rain Water har-vesting structure	Inte-grated farming system	Min-imal pro-cess-ing facil-ity	E-con-nect-ivity (ER-NET)	Carp Hatch-ery	So-lar pan-el	Tech-nol-ogy Infor-mation Unit	Micro Irr-iga-tion facil-ity	Trac-tor	Four-Wheel-er	Two-Wheel-er
1	A & N Is-lands	1	1	1	2	1	1	0	0	3	1	0	0	0	1	2	6
2	Odis-ha	32	30	19	116	27	0	14	4	8	10	0	3	3	30	30	49
3	West Ben-gal	22	22	16	54	13	9	10	8	4	7	1	5	5	22	23	38
Grand Total		56	53	36	172	41	10	24	12	15	18	1	8	8	53	55	93

2.6 Thrust Area:

- Enhancement of water use efficiency through micro-irrigation system
- Varietal substitution of field crops
- Economic improvement of farm women
- Drudger reduction
- Value addition and minimization of post harvest loss crop diversification
- Promotion of IFS
- Improvement of livestock sector with feed and other management practices
- Soil health management
- Popularization of fodder production technology
- Management practices in fishery
- Application of RCT
- Application of ICT towards agricultural development
- 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 Krishi Vigyan Kendras 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 13 were filled up on 31.03.2022.

Table: Staff strength of ATARI, Kolkata

Category	Sanctioned	Filled
Director (RMP)	1	0
Scientific	6	6
Technical	1	1
Administrative	8	5
Skilled Supporting Staff (Gr. II)	2	1
Total	18	13

3.3 Institute Management Committee:

The Fourteenth Institute Management Committee (IMC) Meeting was conducted on 8th October, 2021 at ICAR-ATARI Kolkata. The meeting started with formal welcome by Dr. F. H. Rahman, Pr.

Scientist-cum-Member Secretary of IMC. Dr. S.K. Roy, Director, ICAR-ATARI Kolkata shared some of the salient achievements of ICAR-ATARI Kolkata during recent times. The IMC members discussed the agenda items in details and approved by following necessary codal formalities.



3.4 Ongoing Research Projects of ICAR-ATARI Kolkata during 2021

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

Sl. No.	Title of the project	Lead Centre/ Institute	Name PI and Co-PI/ CCPI from ICAR-ATARI Kolkata
1.	Impact of technological interventions of KVKs on socio-economic empowerment and sustainable livelihood security of tribal farmers	ICAR-ATARI Guwahati	Co-PI: Dr. K.S. Das
2.	Network project on Aspirational Districts programme	ICAR-ATARI Kolkata	PI: Dr. S.K. Roy Co-PI: Dr. K.S. Das
3.	Measuring impact of climate resilient technologies in different agro-climatic zones in India: A study in NICRA project areas	ICAR-ATARI Hyderabad	Co-PI: Dr. F.H. Rahman
4.	Impact of ARYA on promotion of agri-preneurship and alternative livelihoods	ICAR-ATARI Bengaluru	Co-PI: Dr. P.P. Pal
5.	Impact assessment of selected interventions by KVK under Doubling Farmers' Income for enhancing farmers' income	ICAR-ATARI Jodhpur	Co-PI: Dr. A. Haldar
6.	Assessing dietary diversity, consumption pattern and nutritional security in Nutri-SMART Villages- A step towards vocal for local	ICAR-ATARI Jabalpur	Co-PI: Dr. S.K. Mondal
6.	A study on capacity development programs of the KVKs for augmenting livestock production and farmers' income in eastern India	Inter-Institutional Project	PI: Dr. A. Haldar Co-PIs: Dr. P.P. Pal, Dr. S.K. Mondal, Dr. K.S. Das
7.	Assessing appropriate delivery pathways of agriculture and allied technology dissemination in eastern India	Inter-Institutional Project	PI: Dr. P.P. Pal Co-PIs: Dr. S.K. Roy, Dr. A. Haldar, Dr. S.K. Mondal, Dr. F.H. Rahman, Dr. K.S. Das

4.0 Achievements:

4.1 Technology Assessment:

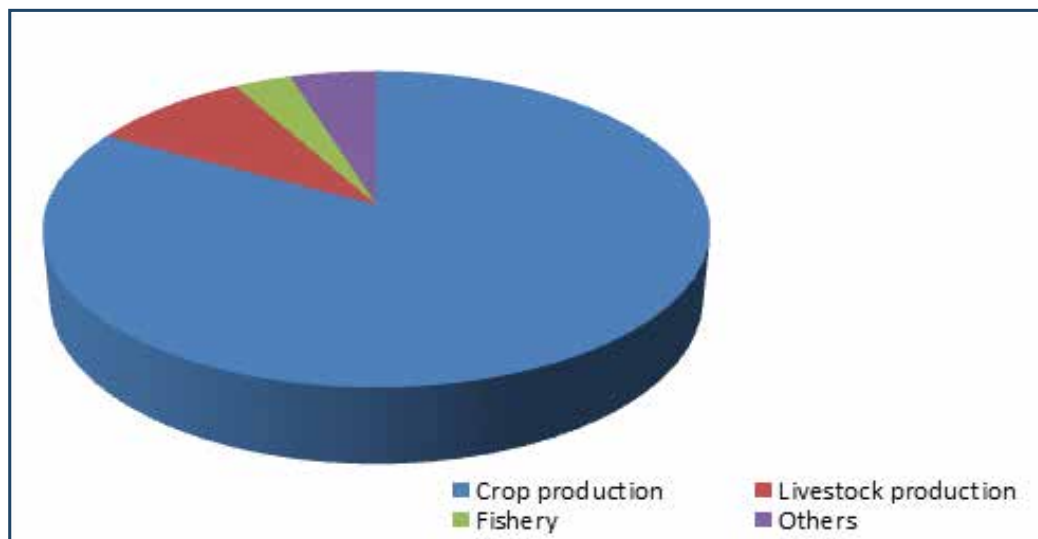
4.1.1 On-farm Trials:

All 59 KVKs under ICAR-ATARI Kolkata, spread over Andaman & Nicobar Islands, Odisha and West Bengal, worked towards 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 Area-wise Trials Conducted:

During 2021, 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 refinement of the technologies through either KVKs or the research institutions. The assessed technologies included those in the areas of crop production and management, crop improvement through varietal trials, insect-pest and disease management, nutrient management, feed and fodder management, livestock production and health management, farm mechanization, drudgery reduction, value addition, fish production, women empowerment, income generating agri-enterprises and other areas. More than 25 various thematic areas were identified for assessment technologies and presented in following table.



4.1.3 Thematic Area-wise Trials Conducted:

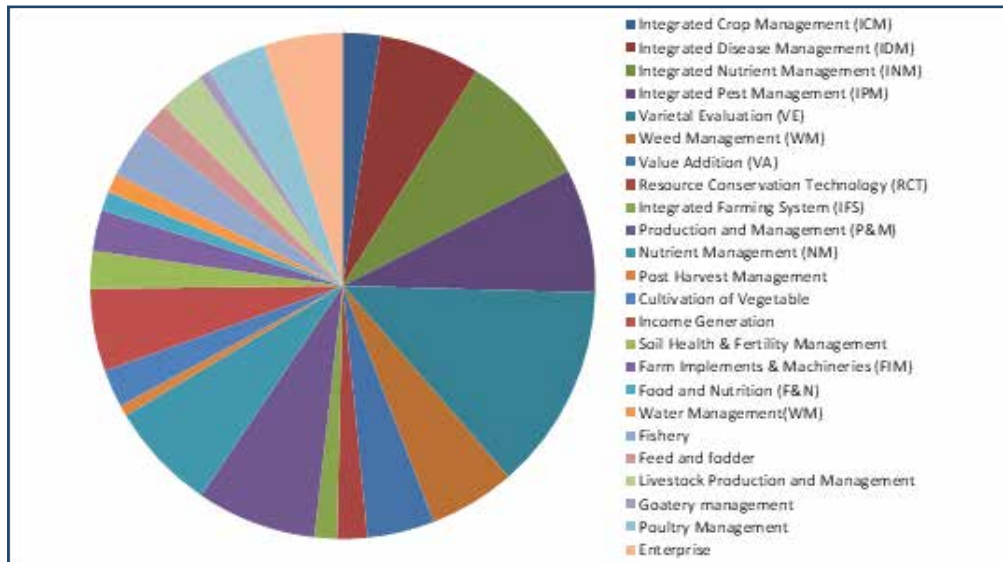
Improved technologies related to crop production, livestock production, fish production, drudgery reduction, farm mechanization, women empowerment, post-harvest management and value addition etc. have been assessed to provide technological solution to the farming community pertaining to various aspects of agriculture and allied areas. During the year 2021, the KVKs

conducted 433 on-farm trials in 7457 locations to assess a total of 298 technologies. Among various thematic areas, technologies were tested in varietal evaluation through 55 on-farm trials involving 886 farmers, followed by integrated nutrient management (36 on-farm trials), integrated pest management (33 on-farm trials) and others. In livestock sector, the highest number (16) of on-farm trials was conducted in the area of livestock production and management including poultry



and goat farming involving 792 farmers. In fishery, 14 on-farm trials were conducted during this year involving composite fish culture and fish production and management benefitting 230

farmers. The on-farm trials conducted in crop, livestock and fishery sectors have been presented below.



4.1.4 State-wise Trials Conducted:

Analysis of on-farm trials conducted by various states showed that KVKs of Andaman and Nicobar Islands carried out a total of 14 on-farm trials distributed in 90 locations, the corresponding values for the states Odisha were 256 and 4798, and for West Bengal were 163 and 2569, respectively. A total of 42 on-farm trials were conducted by KVKs of Odisha in varietal evaluation, while the KVKs of West Bengal carried out 12 on-farm trials on this thematic area. The other important areas for the KVKs of Odisha were integrated nutrient management (23 on-farm trials), integrated pest management (18 on-farm trials), integrated disease management (18 on-farm trials), income generation (18 on-farm trials) and weed management (17 on-farm trials) etc. In West

Bengal, production and management was the most important thematic area (19 on-farm trials) followed by integrated pest management (15 on-farm trials), livestock production and management (15 on-farm trials), integrated nutrient management (13 on-farm trials) and nutrient management (13 on-farm trials) etc. In the area of livestock production and management, KVKs of Odisha took up 21 on-farm trials followed by KVKs of West Bengal (15 on-farm trials) and KVKs of Andaman and Nicobar Islands (3 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.

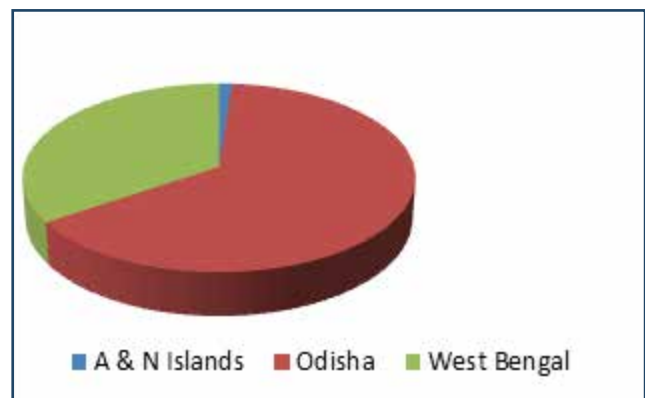
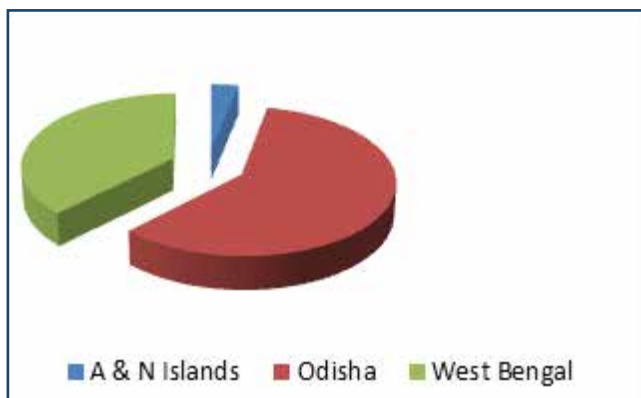


Table: State-wise details of on-farm trials conducted by the KVKs

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)	0	0	83	4	57	6	140	10
Integrated Disease Management (IDM)	0	0	347	18	199	9	546	27
Integrated Nutrient Management (INM)	0	0	437	23	147	13	584	36
Integrated Pest Management (IPM)	0	0	275	18	154	15	429	33
Varietal Evaluation (VE)	7	1	725	42	154	12	886	55
Weed Management (WM)	0	0	336	17	52	6	388	23
Value Addition (VA)	2	2	289	15	8	1	299	18
Resource Conservation Technology (RCT)	0	0	70	3	89	5	159	8
Integrated Farming System (IFS)	0	0	7	1	60	5	67	6
Production and Management (P&M)	26	2	160	11	204	19	390	32
Nutrient Management (NM)	17	3	243	13	129	13	389	29
Post Harvest Management	0	0	51	2	21	1	72	3
Cultivation of Vegetable	21	1	112	6	26	3	159	10
Income Generation	0	0	387	18	212	4	599	22
Soil Health & Fertility Management	0	0	51	2	85	8	136	10
Farm Implements & Machineries (FIM)	0	0	163	10	10	1	173	11
Food and Nutrition (F&N)	0	0	63	3	9	2	72	5
Water Management(WM)	14	2	28	2	10	1	52	5
Others	0	0	222	7	185	9	407	16
Total	87	11	4049	215	1811	133	5947	359
Fishery	0	0	61	4	169	10	230	14
Total	0	0	61	4	169	10	230	14
Feed and fodder	1	1	49	4	127	3	177	8
Livestock Production and Management	0	0	171	7	63	5	234	12
Goatery management	0	0	0	0	36	3	36	3
Poultry Management	2	2	203	10	317	4	522	16
Total	3	3	423	21	543	15	969	39
Enterprise	0	0	265	16	46	5	311	21
Total	0	0	265	16	46	5	311	21
Grand Total	90	14	4798	256	2569	163	7457	433

4.1.5 Details of Selected On-farm Trials

ODISHA

Balasore KVK

Thematic area: *Varietal evaluation*

Assessment of climate smart rice cultivars

Yield loss due to both submergence and drought prevailing during the same cropping season was identified as a major problem in the district of Balasore. In order to address the issue, KVK Balasore conducted a multi-locational field trial on assessing the most suitable climate-smart rice cultivar for the district. The trial was conducted in 7 different locations of the district taking Swarna variety of rice as control (Farmers' practice: FP) and the varieties like CR Dhan 801 (Technology option-I: TO-I) and CR Dhan 802 (Technology option-II: TO-II) were various technologies for assessment. TO-I has short bold grain with a test weight of 20.5 g having

maturity duration of 140 days. It gives about 6.3 t ha⁻¹ yield under normal condition and 4 t ha⁻¹ yield under submergence while 2.9 t ha⁻¹ under drought conditions. Again, TO-II has short bold grain with a test weight of 19.0 g having maturity duration of 139 days. It produces an average yield of 6.5 t ha⁻¹ under normal condition and 4.3 t ha⁻¹ under submergence while 2.3 t ha⁻¹ under drought conditions. The results of the trial showed that CR Dhan-802 (TO-II) gave 19.7 % increase in yield over the Farmers' variety Swarna where there was submergence over a period of 1 week. It can be concluded that the submergence tolerant rice cultivar (TO-II) gave higher yield in flood affected area with the highest B:C ratio of 1.94.

Technology assessed:

FP: Cultivation of Swarna variety

TO-I: Cultivation of CR Dhan 801

TO-II: Cultivation of CR Dhan 802

Source of Technology: ICAR-NRRI, 2019

Table: Performance of climate smart rice cultivars during submergence as well as drought during the same crop season

Technology option	No. of trials	Yield component			Disease/ insect pest incidence (%)	Yield (q/ha)	Cost of cultivation (Rs./ha)	Gross return (Rs/ha)	Net return (Rs./ha)	B:C ratio
		No. of effective tillers/hill	No. of spikelet per panicle	Test wt. (100 grain wt.)						
FP	7	8.0	84	18.3	32	38.6	48000	74884	26884	1.56
TO-II	7	10.3	96	21.5	16	46.5	48000	90210	42210	1.87
TO-II	7	10.5	105	21.8	11	48.1	48000	93314	45314	1.94

Dhenkanal KVK

Thematic area: *Varietal evaluation*

Assessment of different marigold varieties for increasing flower yield

Floriculture has been practised by the farmers of Dhenkanal as a result crop diversification efforts and remunerative flower market. However, it has been often confronted with the problem of low yield of marigold. To solve this, KVK Dhenkanal took up a varietal trial to see the performance of different improved marigold varieties in 7 locations of the

district. It was found from the trial that Bidhan Marigold 2 (TO-II) variety has better production potential than farmers' existing variety (Rani Macadam). The highest B:C ratio was observed to be 1.54 in TO-II.

Technology assessed:

FP: Rani Macadam

TO-I: Pusa Narangi

TO-II: Bidhan Marigold-2

Source of Technology: ICAR-IARI, 2012; BCKV, 2013

Table: Varietal performance of marigold flower

Technology option	No. of trials	Yield component		Cost of cultivation (Rs./ha)	Gross return (Rs/ha)	Net return (Rs./ha)	B:C ratio
		Flower per plant	Yield (g/ha)				
FP	7	63	217.9	130000	152530	22530	1.38
TO-I	7	75	250.4	131000	186000	55000	1.41
TO-II	7	108	290.2	134000	207000	73000	1.54

Jagatsinghpur KVK

Thematic area: *Feed management*

Evaluation of inclusion of broken rice as a substitute for maize in poultry feed

Poor growth rate of growing chicks due to poor feed provisioning and low profitability because of high cost of commercially available poultry feed have been identified as a problem of poultry rearers in Jagatsinghpur district. To solve this problem, KV Jagatsinghpur conducted a field trial at 10 different locations of the district. The results of the trial revealed that TO-II i.e., inclusion of broken rice at 20% level is effective in ensuring body weight gain in chicks with more profit.

Technology assessed:

FP: Provisioning of feed with ground maize 50%, GNOC 23%, fish meal 10%, wheat bran 15%, Broken rice 0%, Di calcium phosphate 1%, vitamins amino acids 1.6%, salt 0.4%

TO-I: Provisioning of feed with ground maize 35%, GNOC 23%, fish meal 10%, wheat bran 15%, Broken rice 15%, Di calcium phosphate 1%, vitamins amino acids 1.6%, salt 0.4%.

TO-II: Provisioning of feed with ground maize 30 %, GNOC 23%, fish meal 10%, wheat bran 15%, Broken rice 20%, Di calcium phosphate 1%, vitamins amino acids 1.6%, salt 0.4%.

Source of Technology: ICAR-CIWA, 2016

Table: Effect of including broken rice in maize-based poultry feed

Technology option	No. of trials	Yield component			Mortality rate	Feed cost/ chick/ 1 st month	Gross return (Rs/ 10 birds)	Net return ((Rs/ 10 birds)	B:C ratio
		Body weight at 15 days	Body weight at 30 days	Body weight at 45 days					
FP	10	168	405	735	9.5	35.6	800	194	1.32
TO-I	10	179	434	784	5.5	33.60	800	214	1.36
TO-II	10	175	397	742	8.5	32.10	800	229	1.40

Jajpur KVK

Thematic area: *Farm mechanization*

Assessment of Tractor drawn Paddy Thresher for bundle straw production

High labour cost of threshing paddy, and non-availability of bundle straw as per demand of the district have been identified as the major problem. To address the same, a field trial was taken up by the KVK Jajpur at 7 different locations of the district. It was revealed that Tractor drawn Paddy Thresher

was suitable for bundle straw production. But it was also found that some paddy which is used to bind the paddy bundle was not threshed.

Technology assessed:

FP: Power paddy thresher

TO-I: Tractor driven Axial flow Thresher and Winnowing

TO-II: Tractor driven whole straw paddy thresher

Source of Technology: OUAT, 2015-16

Table: Performance of Tractor-drawn paddy thresher for bundle straw production

Technology option	No. of trials	Yield component		Yield (q/ha)	Cost of cultivation (Rs./ha)	Gross return (Rs/ha)	Net return (Rs./ha)	BC ratio
		Field capacity (q/h)	Cost of threshing (Rs/q.)					
FP	7	0.7	237.50	43.5	32500	54375	21875	1.64
TO-I	7	9.06	175.50	43.5	29300	54375	25075	1.85
TO-II	7	4.48	168	43.5	27800	54375	26575	1.95

Khordha KVK

Thematic area: *Production and management technology*

Assessment of Intercropping of Greater Yam with Sweet Corn

Less profit from mono-cropping of Yam was encountered by the farmers of Khordha district. In an attempt to ameliorate this, KVK Khordha took up a field trial on intercropping with maize and sweet corn at 6 different locations of the district. The Yam variety Orissa Elite was sown in a spacing of 90cm (R-R) and 75cm (P-P) and the maize and sweet corn seeds were sown in the intra row spacing @ 2 plants within 75cm P-P spacing of yam. Fertilizer @ 80:80:100kg NPK/ha was applied to both the crop. It was found that the yield of maize cobs and yam tuber was 31920 number and 177.8q/ha in TO-I (Intercropping of Greater Yam with Maize) whereas yield of sweet corn cobs and yam tuber was 30800

number and 177.8q/ha in TO-II (Intercropping of Greater Yam with sweet corn). In FP (Mono cropping of Greater Yam), the yield of yam was 214.8q/ha. Though the yield of yam in solo cropping was more, i.e., Rs. 429600, the intercropping yielded much higher return to the farmer in TO-II, i.e., Rs. 571200 (Rs. 215600 from Sweet corn and Rs. 355600 from yam). Therefore, it is evident that intercropping of yam variety Orissa Elite with sweet corn is highly remunerative and can be adopted in rain fed up and up-medium lands of Khordha district.

Technology assessed:

FP: Mono-cropping of Greater Yam

TO-I: Intercropping of Greater Yam with Maize

TO-II: Intercropping of Greater Yam with Sweet Corn

Source of Technology: Regional Centre of ICAR-CTCRI, Bhubaneswar

Table: Performance of the intercropping of yam with different crops

Technology option	No. of trials	Yield component			Disease/ insect pest incidence (%)	Yield (q/ha)	Cost of cultivation (Rs./ha)	Gross return (Rs/ha)	Net return (Rs./ha)	B:C ratio
		Fresh tuber wt/ plant (Kg)	Ave no. of cobs / plant	Market Price/ Kg tuber and per piece cob (Rs)						
FP	6	1.45	0	20/kg	Very less	214.8	148000	429600	281600	2.90
TO-I	6	1.2	1.2	20/kg and Rs 5/ cob	Very less	177.8	152000	515200	360200	3.39
TO-II	6	1.2	1.1	20/kg and Rs7/cob	Very less	177.8	157000	571200	416200	3.64

Malkangiri KVK

Thematic area: *Integrated pest management*

Assessment of various techniques of shoot and fruit borer management in brinjal

Low yield due to heavy infestation of fruit and shoot borer in brinjal has been found in Malkangiri district. Besides, there was lack of awareness among the farmers about the management of shoot and fruit

borer in brinjal and so they followed the traditional methods for its management. In order to address this, KVK Malkangiri carried out a field trial at 7 different locations of the district. Results revealed that TO-I gave the best performance in terms of yield, pest incidence and the B:C ratio.

Technology assessed:

FP: Non-judicious use of pesticides (Chloropyrifos,

Triazophos@2ml/ltr) to control shoot and fruit borer in brinjal

TO-I: Application of Flubendiamide 480 SC @ 78.70 g ai/ha and Rynaxypyr 20 SC @ 33.33g ai/ha to

control brinjal shoot and fruit borer

TO-II: Application of Rynaxypyr (0.3 ml/l) application to control brinjal shoot and fruit borer

Source of Technology: OUAT 2017-18; IIHR 2009-10

Table: Performance of various techniques for controlling shoot and fruit borer in brinjal

Technology option	No. of trials	Fruit infestation (%)	Yield (q/ha)	Cost of cultivation (Rs./ha)	Gross return (Rs/ha)	Net return (Rs./ha)	BC ratio
FP	7	21.61	164.2	105,470	2,13460	1,07990	2.02
TO-I		10.32	218.0	114,470	2,83400	1,68930	2.4
TO-II		15.05	189.3	108,470	2,46090	1,37620	2.3

Mayurbhanj-I KVK

Thematic area: Market led extension

Assessment of different planting time for better market price of Tomato

Distress sale of tomato has been a problem of the farmers of Mayurbhanj district due to spurt of yield during the same period by all the farmers as well as higher availability in market. In search of an alternative to this, KVK Mayurbhanj-I conducted a field trial at 7 different locations of its jurisdiction by advancing or postponing the planting time of tomato. The trial indicated that planting of tomato seedling 15 days after completion of normal planting

period fetched higher price in market. Farmers are generally showing high interest in this technology as they are earning more income than their previous practice.

Technology assessed:

FP: Planting of seedling during normal planting period

TO-I: Planting of seedling 15 days before onset of normal planting period

TO-II: Planting of seedling 15 days after completion of normal planting period

Source of Technology: Post Harvest Technology Centre, TNAU, 2015

Table: Effect of altering planting period of tomato on the market price

Technology option	No. of trials	Yield component			Cost of cultivation (Rs./ha)	Gross return (Rs/ha)	Net return (Rs./ha)	B:C ratio
		Plant height (cm) at peak harvest stage	No. of fruits/plant (after final picking)	Yield (q/ha)				
FP	7	90.1	30	340.70	79560	340700	261140	4:20
TO-I	7	90.7	32	342.67	79700	359803	280103	4:51
TO-II	7	90.0	28	349.15	78490	418980	340490	5:33

Nabarangpur KVK

Thematic area: Resource conservation technology

Assessment of application of thiourea and salicylic acid against water stress in maize

Maize is a major crop of Nabarangpur district covering a considerable area. Stress due to lack of water has been problem causing lower yield of the crop. To overcome this, KVK Nabarangpur took up a field trial at 7 different locations of the district involving various applications of thiourea and salicylic acid as well as Pusa Hydrogel. The findings of the trial showed that basal application of Pusa Hydrogel @ 2.5 Kg/ha alongwith foliar application

of thiourea @1000 mg/lit at 45 DAS.

Technology assessed:

FP: No application of Thiourea/ Salicylic acid

TO-I: Foliar spraying of Thiourea @1000 mg /lit of water at 45 DAS

TO-II: Foliar spraying of Salicylic acid @100 mg /lit of water at 40 DAS and 60 DAS

TO-III: Basal application of Pusa Hydrogel @ 2.5 Kg/ha + Foliar application of thiourea @1000 mg/lit at 45 DAS

Source of Technology: PAU 2020; IARI 2011



Table: Evaluation of application of thiourea and salicylic acid on maize

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)	Cob girth (cm)	100-grain wt.(g)					
FP	7	117.75	15.8	24.75	46.25	30000	64750	34750	1.85
TO-I	7	136.65	15.95	25.3	52.75	30000	73850	43850	2.11
TO-II	7	135.25	15.90	25.35	53.15	30000	74410	44410	2.13
TO-III	7	152.90	16.50	25.7	55.45	30000	77630	47630	2.22

Rayagada KVK

Thematic area: Varietal evaluation

Assessment of different rice variety to increase yield
Low yield of rice due to cultivation of existing old variety of rice has been identified by the KVK Rayagada and to solve this, a field trial was conducted at 7 different locations of the district involving the FP (Lalat variety of rice), TO-I (MTU-1010) and TO-II (Pratibha). The technologies tested through the trial showed that medium duration rice var. Pratibha gave 12.9% higher yield than farmers var. Lalat. Pratibha was seen to be suitable for rain-fed medium land, maturity: 120-125 days and

Table: Performance of various rice varieties

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 effective tillers/hill	No. of spikelet per panicle	Test wt. (100 grain wt.)					
FP	7	9.2	131.1	2.45	39.8	56000	77212	21212	1.38
TO-I		10.5	167.4	2.47	42.5	56000	82450	26450	1.47
TO-II		12.4	181.2	2.93	48.7	56000	94478	38478	1.69

Sambalpur KVK

Thematic area: Varietal evaluation

Assessment of finger millet varieties in rainfed upland situation
It was found that in Sambalpur district, the finger millet had a relative low productivity due to use of locally available varieties. To overcome this problem, KVK Sambalpur took up a field trial at 10 different locations of the district. Results revealed that TO-I (Arjun variety) gave the highest B:C ratio of 1.87.

resistant to leaf blast, brown spot and sheath rot. But some of the demerits were less fertility percentage and not-eye-catching at maturity stage. Farmers preferred this variety due to its duration (medium) and high yield which is suitable for medium land.

Technology assessed:

FP: Existing variety of rice, Lalat

TO-I: Variety MTU-1010, duration-120 days, medium bold grain, yield-40-45q/ha.

TO-II: Variety Pratibha, duration-120-125 days, long slender grain, yield-52-55q/ha.

Source of Technology: SLREC, OUAT 2016

Technology assessed:

FP: Cultivation of locally available varieties

TO-I: Cultivation of finger millet variety Arjun (OEB 526): Maturity duration 110 days and average yield 20.7 q/ha with moderate resistance to leaf, neck and finger blast and brown seed.

TO-II: Cultivation of finger millet variety Bhairabi : Maturity duration 110 days with average yield 17.6q/ha having moderate resistance to leaf, neck and brown seed.

Source of Technology: AICRP on Millet, CPR

Table: Yield performance of different finger millet varieties

Technology option	No. of trials	No. of effective tillers/hill	Disease/ insect pest incidence (%)	Yield (q/ha)	Cost of cultivation (Rs./ha)	Gross return (Rs/ha)	Net return (Rs./ha)	B:C ratio
FP	10	1.54	17	6.71	14000	23485	9485	1.67
TO1	10	2.5	8	9.22	17200	32270	15070	1.87
TO2	10	2.0	11	8.74	17200	30590	13390	1.77

Sundargarh-II KVK

Thematic area: *Income generation*

Assessment of different methods of pasteurization of straw for controlling INKCAPS in paddy straw mushroom bed

Lack of knowledge on pasteurization of substrate for controlling competitive mould (INKCAPS) has been a problem of mushroom cultivation in Sundargarh district. In order to address the issue, a field trial was carried out by the KVK Sundargarh-II at 7 different locations of the jurisdiction. The findings of the trial showed that the pre-soaking of substrate in 2% Calcium Carbonate for 6 hours lowered the

INKCAPS infection.

Technology assessed:

FP: No pasteurization of straw medium for bed preparation

TO-I: Soaking of substrates in boiled water in 70-80 OC for 30 minutes

TO-II: Soaking of substrates in 2% calcium carbonate for 6 hours

TO-III: Soaking of substrates in 0.02% bleaching powder for 6 hours

Source of Technology: CTMRT 2012

Table: Performance of different pasteurization techniques for straw bed preparation for mushroom

Technology option	No. of trials	% of incidence of INKCAPS	Yield (g/Bed)	Biological efficiency (%)	Cost of cultivation (Rs.)	Gross return (Rs.)	Net return (Rs.)	B:C ratio
FP	7	40.30	480	4.8	120	222	102	1.85
TO1	7	15.50	1040	11.4	125	350	103	2.8
TO2	7	5.00	1250	12.5	125	294	125	2.35
TO3	7	8.5	900	9.0	125	180	55	1.50

ANDAMAN & NICOBAR ISLANDS

Nicobar KVK

Thematic area: *Feed management*

Evaluation of supplementation of minerals and vitamins for enhancing growth of Teresa Goats

The Nicobarese generally rear Teresa goats in traditional way with least management and no nutritional supplementation. This may be affecting overall body-weight gain of Teresa goats in field conditions compared to farm conditions. The supplementation of mineral mixture and vitamins may boost the overall body weight gain in goats which may improve the family income through goat farming. For testing of the effect of supplementation of mineral mixture and vitamins on the body weight gain in

goats and thus improving the economic status of tribal farmers, an OFT was designed with four technology options at 6 different locations. The result revealed that supplementation of vitamin (B complex) and mineral mixture (together) improved the body weight of Teresa goats at farmer's field. The average body weight at six months of age in different treatments *viz.* FP, TO-I, TO-II and TO-III were in the tune of 12.06 kg, 14.34 kg, 14.29 kg and 15.01 kg, respectively. The average net income from above mentioned treatments were in the tune of Rs. 2124/-, Rs. 2936/-, Rs. 2966/- and Rs. 3154/- and B:C ratio of 1.76, 2.05, 2.08 and 2.11, respectively. It was indicated that the combined supplementation of vitamin (B complex) and mineral mixture had a positive effect on body weight gain in Teresa

goats and ultimately led to higher economic returns.

Technology assessed:

FP: Free grazing with traditional farming with no extra nutritional supplementation

TO-I: FP + 5g mineral mixture for 3 months

TO-II: FP + vitamins (B Complex) for 3 months

TO-III: FP + 5g mineral mixture and vitamins (B Complex) for 3 months.

Source of Technology: ICAR-CIARI Port Blair

Table : Effect of supplementation of minerals and vitamins in Teresa Goats

Technology options	No. of trials	Average Bwt at 3 months (Kg)	Average Bwt at 6 months (Kg)	Average Gross Cost (Rs.)	Average Gross Income (Rs.)	Average Net Income (Rs.)	B:C Ratio
FP	6	7.36	12.06	2700	4824	2124	1.79
TO-I	6	7.31	14.34	2800	5736	2936	2.05
TO-II	6	7.18	14.29	2750	5716	2966	2.08
TO-III	6	7.40	15.01	2850	6004	3154	2.11



WEST BENGAL

Bankura KVK

Thematic area: Varietal evaluation

Assessment of rice varieties for tolerance to infestation of BPH/ WBPH during kharif season

Lower rice yield due to high Brown Plant Hopper/ White Backed Plant Hopper (BPH/ WBPH) infestation was identified as a major problem of rice growers of Bankura district during kharif season. In order to get rid of the problem, a field trial was conducted by KVK Bankura at 7 different locations of the district. The results of the trial revealed that the rice varieties evaluated for their tolerance to the infestation of BPH (*Nilaparvata lugens*) and/ or WBPH (*Sogatella furcifera*) showed varied reaction. Based on effective tillers per hills, it was observed that among the three variety of rice, Pratiksha (TO-I) showed the highest performance (17), while Rajdeep

(TO-II) obtained moderate no. of tillers (16) and the lowest no. (14) was recorded in Swarna variety (FP). Pratiksha var. (TO-I) showed comparatively more tolerance level (12%) and potential yield (52 q/ha). Other two var., i.e., Rajdeep (TO-II) and Swarna (FP) recorded moderate to low tolerance. Test weight of grain varied from 24 g to 23 g. Pratiksha var. of rice paddy was superior than Rajdeep and Swarna and its B:C ratio was 2.48. From the results of the trial, it was concluded that TO-I showed better performance than TO-II and FP.

Technology assessed:

FP: Cultivation of Swarna (7029) variety of rice

TO-I: Cultivation of tolerant var. Pratiksha

TO-II: Cultivation of tolerant var. Rajdeep

Source of Technology: AICRP on Rice, 2015; ICAR-NRRI, 2002

Table: Performance of three rice varieties in terms of BPH/WBPH tolerance

Technology option	No. of trials	Yield component		Disease/ insect pest incidence (%)	Yield (q/ha)	Cost of cultivation (Rs./ha)	Gross return (Rs/ha)	Net return (Rs./ha)	B:C ratio
		No. of effective tillers/hill	Test wt. (100 grain wt.)						
FP	7	14	24	18	46	28000	68000	40000	2.42
TO-I		17	23	12	52	30000	74500	44500	2.48
TO-II		16	23	15	48	29000	71050	43500	2.45

Coochbehar KVK

Thematic area: *Production and management technology*

Assessment of optimum planting material size for ginger

Ginger is an important cash crop of Coochbehar district. For ginger cultivation using large quantity of planting materials involves higher cost of cultivation and less net return. To overcome this problem, a field trial was planned and conducted by KVK Coochbehar at 7 different locations. Raising ginger seedling about 5-6 g sprouting single bud rhizome and later transplanting them in the main field showed faster vegetative growth, more tillering and large rhizome development in comparison to conventional methods. This may be due to screening of active and vigorous rhizome bud in

the early stage and providing congenial growth condition for the seedlings. Sowing of single bud rhizome directly in the field caused poor or no sprouting rhizomes. Highest B:C ratio (2.35) was recorded with TO-II (5-6 g Single bud rhizome planted at plug tray and later transplanted to main field) as compared to lower B:C ratio in case of large rhizome size with double buds directly planted in the main field.

Technology assessed:

FP: 30-35 gm seed rhizome along with buds

TO-I: 20-25 g seed rhizome along with 1-2 buds

TO-II: 5-6 gm micro-rhizome along with one bud planted in plug tray and later transplanted in main field

Source of Technology: ICAR-IISR, Kozhikode, Kerala.

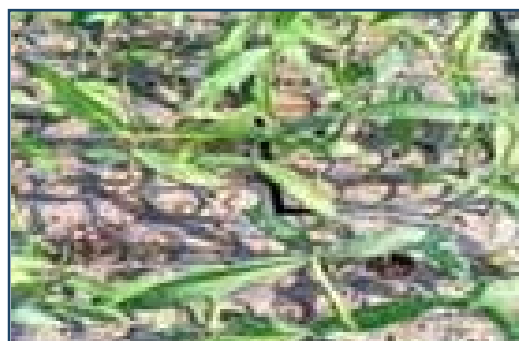
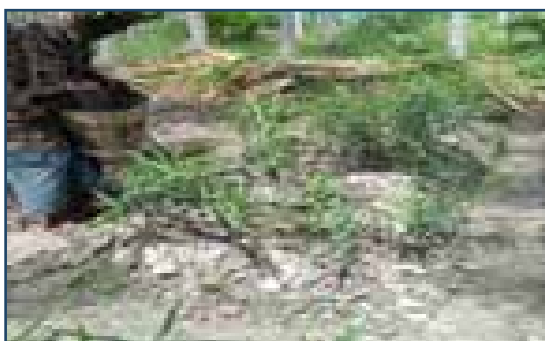
Table: Evaluation of different sizes of planting materials/ methods of cultivation in ginger

Technology option	No. of trials	Yield (t/ha)	Cost of cultivation (Rs./ha)	Gross return (Rs/ha)	Net return (Rs./ha)	B:C ratio
FP	7	9.55	240000	382000	142000	1.59
TO-I		11.98	268000	478000	210000	1.78
TO-II		11.58	197000	463000	266000	2.35

Technology option	No. of trials	Yield (t/ha)	Cost of cultivation (Rs./ha)	Gross return (Rs/ha)	Net return (Rs./ha)	B:C ratio
CD at 5%	-	1.47	-	-	-	-

Table: Growth comparison of various methods of cultivation in ginger

Sl. No.	Growth phase	FP	TO-II
1.	Sprouting phase	20-25 DAP	Plants have 3-4 leaves (30-35 days old)
2.	Vegetative phase		
i)	leaf no	30-45 leaves per clump	50-60 leaves per clump
ii)	Tillering stage	5-7 tillers/clump	8-14 tillers/clump
3.	diseases pest infestation	More susceptible	less susceptible in 5-6 g wt. bud than 20-25 g wt. bud



Jalpaiguri KVK

Thematic area: Fishery

Assessment of application of lime and banana stem for changing water pH, alkalinity and fish growth rate in fish culture pond

Because of acidic pH of water, poor growth rate of fishes in fish culture ponds was a major problem identified in Jalpaiguri district. To address this issue, various technologies were tested through a field trial at 10 different locations of the district by KVK Jalpaiguri. It was revealed that

application of Banana stem (TO-II) was more profitable with B:C ratio 1.53 than using lime in recommended dose (TO-I) due to less cost of cultivation.

Technology assessed:

FP: Injudicious application of Lime @ 75kg/ha

TO-I: Application of lime (recommended dose) @ 175 kg/ha (pH based)

TO-II: Application of banana stem (pH based)

Source of Technology: Journal of Indigenous Technical Knowledge, 2006.

Table: Evaluation of application of lime and banana stem for altering water pH, alkalinity and fish growth rate

Technology option	No. of trials	Yield parameters			Cost of cultivation (Rs/ha)	Gross return (Rs/ha)	Net return (Rs/ha)	B:C ratio
		pH	Alkalinity (ppm)	Fish yield (ton/ ha)				
FP	10	6.4	37	1.58	178200	199110	20910	1.11
TO-I		7.6	116	2.70	253800	327900	74100	1.29
TO-II		7.9	126	2.31	188100	288850	100750	1.53

Murshidabad-I KVK (Jiaganj)

Thematic area: Fishery

Effect of stocking density on growth performance of Gulsha tengra (*Mystus cavasius*, Hamilton-1822) in monoculture biofloc tank system

Indiscriminate stocking density maintained in biofloc tank (BFT) system, improper fish growth and high fish mortality were identified as the problem of Murshidabad district for the fishes cultured in BFT system. In order to address this, one On-farm trial (OFT) was carried out in 10 numbers of farmers'

pond in 3 adoptive villages. The initial average length (cm) and average weight (g) of Gulsha tengra fish seed were 7.33 cm and 2.35 g recorded and distributed as a critical input for this demonstration. This species of catfish was introduced as a high value fish species in biofloc system. The trial was going on for 150 days and water quality parameters like pH, DO (mg L⁻¹), Temperature (°C), TAN (mg L⁻¹), Nitrite (NO₂) (mg L⁻¹), Nitrate (NO₃) (mg L⁻¹), Floc volume (ml L⁻¹) were recorded during progress of this culture. The following growth performance of Gulsha tengra was recorded. Performance of gulsha tengra (*Mystus cavasius*) in BFT system was done on the basis of stocking density. In this trial, the highest avg. weight (g) and length (cm) were 25.17 g and 15.2 cm found in TO-II and lowest avg. weight (g)

and length (cm) were 15.54 g and 12.28 cm found in TO-III.

Technology assessed:

FP: 9000 nos. fry/10000 liter with C:N ratio 20:1

TO-I: 6000 nos. fry/10000 liter with C:N ratio 20:1 (Initial development phase) and 6:1 (In maintenance phase)

TO-II: 8000 nos. fry/10000 liter with C:N ratio 20:1 (Initial development phase) and 6:1 (In maintenance phase)

TO-III: 10000 nos. fry/10000 liter with C:N ratio 20:1 (Initial development phase) and 6:1 (In maintenance phase)

Source of Technology: ICAR-CIFE, Mumbai

Table: Performance of Gulsha tengra (*Mystus cavasius*) in BFT system

Technology option	No. of trial	Yield (q/cycle)	Cost of cultivation (Rs./ cycle)	Gross. Return (Rs./ cycle)	Net Return (Rs./ cycle)	B:C ratio
FP	10	2.31	58250.0	94710.0	36460.0	1.62
TO-I		2.25	49500.0	93375.0	43875.0	1.89
TO-II		2.89	52200.0	122825.0	70625.0	2.35
TO-III		2.22	64600.0	91300.0	26700.0	1.41

Fish selling price @Rs. 410.0 per kg to 425 per kg according to the harvesting size of fishes

Table: Performance parameters under this BFT system

Performance parameters	FP	TO-II
pH	7.9	7.5
DO (mg/l)	4.3 mg/l	4.6 mg/l
Disease's incidence	Dropsy and myxobolus diseases	No disease found
Survivability %	77	79
Floc volume	20 ml/l grow out culture period	15 ml/l grow out culture period



North 24 Parganas-I KVK (Ashokenagar)

Thematic area: *Integrated disease management*

Evaluation of different chemicals for management of Sigatoka leaf spot disease of banana caused by *Mycosphaerella spp.*

The Sigatoka leaf spot disease is the major foliar disease affecting the productivity of banana in the district of North 24 Parganas. To get rid of this, a field trial was conducted by KVK North 24 Parganas-I at 8 different locations of the district. Among all the technologies, TO-II (Four sprays of combination of Mineral oil 1% + tebuconazole 50% + trifloxystrobin 25% WG @0.5 g/l with the onset of the disease at 30 days interval) was proved to be effective and

resulted the lowest per cent diseases index (16.12%) compared to control (26.85%). This technology also gave a fairly good B:C ratio of 1.55 with the highest yield (49.55t/ha).

Technology assessed:

FP: Spaying of Mancozeb 78% WP or Carbedazim 50%WP

TO-I: Four sprays in combination of mineral oil 1% + propiconazole 0.05% (18.52%) with the onset of the disease at 30 days interval

TO-II: Four sprays in combination of mineral oil 1% + tebuconazole 50% + trifloxystrobin 25% WG @0.5 g/l with the onset of the disease at 30 days interval

Source of Technology: BCKV, West Bengal

Technology option	No. of trial	Pooled Per cent Disease Index (PDI)	Disease reduction over control (%)	Yield (t/ha)	Cost of Cultivation (Rs.)	Gross Return (Rs.)	B:C ratio	
FP	8	26.85	27.29	34.24	492075	516679	1.05	
TO-I		21.06	30.22	42.09	493725	714085	1.45	
TO-II		16.12	46.59	49.55	495370	862150	1.55	
SEm.±		-	0.45	-	-	-	-	-
CD@5%		1.32	-	-	-	-	-	-

Price: Rs. 15500/t

Purulia KVK

Thematic area: *Plant protection (Integrated disease management)*

Assessment of bio-effectiveness of low cost eco-friendly pesticide formulations against diseases of Tasar silk worm

In Purulia district of West Bengal rearing of tasar silk worm dates back to early 20th century and had been a common practice of the rural community especially among the tribal farmers. However, unscientific conventional rearing practice has led to more losses than return which thereby forced farmers to shift to other more profitable farming options leaving tasar cultivation to some very limited pockets of the district. Tasar silkworm rearing is done outdoor, as a result of which optimum cocoon yield is drastically reduced due to several fungal, bacterial and viral diseases of tasar silkworm. Curative measures to keep in check the pest and diseases of silkworm cannot be undertaken and one has to rely on preventive measures to deal with the pest and

disease management for which proper knowledge and skill is mandatory. The results revealed that all the technology options put into assessment reduced disease infection of tasar silkworms significantly over farmers practice and thereby increased yield of cocoons. TO-III (Foliar spray of Jeevan Sudha only on branches where larvae are feeding once in each 1st, 2nd and 3rd instar+ Dusting with Tasar Keet Ousadh (T.K.O) on silkworm body during transfer of worms) was found to be the best with an yield of 46833 number of cocoons with low infection of silkworms viz., 25.00% and thereby causing a disease reduction by 58.56% over that of existing FP. This TO is closely followed by TO-II (Foliar dusting of branches and below growing bushes with Jeevan Suraksha once in 2nd and 3rd instar+ T.K.O application on body of silkworm during transfer of worms) and TO-I (Foliar spray of Jeevan Sudha only on branches where larvae are feeding once in each 1st, 2nd and 3rd instar+ Dusting with Jeevan Suraksha during transfer of worm during 4th and 5th instar) respectively. These disease management options are

inexpensive and can be prepared using botanicals or kitchen items and thus are highly effective and remunerative for tasar cultivation. Thus Technology option I can be recommended and promoted further in areas of tasar cultivation in Purulia.

Technology assessed:

FP: Farmers are mostly unaware of the diseases of tasar silk worm and do not undertake any management options for management of diseases of tasar silk worm

TO-I: Foliar spray of Jeevan Sudha only on branches where larvae are feeding once in each 1st, 2nd and

3rd instar+ Dusting with Jeevan Suraksha during transfer of worm during 4th and 5th instar

TO-II: Foliar dusting of branches and below growing bushes with Jeevan Suraksha once in 2nd and 3rd instar+ T.K.O application on body of silkworm during transfer of worms

TO-III: Foliar spray of Jeevan Sudha only on branches where larvae are feeding once in each 1st, 2nd and 3rd instar+ Dusting with Tasar Keet Ousadh (T.K.O) on silkworm body during transfer of worms

Source of Technology: Central Tasar Research and Training Institute (CTR & TI)

Table: Bio-effectiveness of low cost eco-friendly pesticide formulations against diseases of Tasar silk worm in Purulia district of West Bengal

Technology option	No. of trials	Yield of cocoon (no./ha)	% infection of silkworms	% reduction in disease	Gross Cost of cultivation (Rs./ha)	Gross return (Rs./ha)	Net return (Rs./ha)	B:C ratio
FP	10	24094	52.9	0.00	34793	54452	19660	1.57
TO-I		38746	30.2	54.89	39403	87566	48163	2.22
TO-II		41419	27.4	56.38	39934	93607	53673	2.34
TO-III		46833	25.0	58.56	39256	105844	66588	2.70
CD at 5%		2.23						

Date of brushing of silkworms: 29.08.2020-31.08.2020; Date of harvest of cocoons : 12.10.2020 onwards; Tasar Ecorace: Daba

South 24 Parganas-I KVK (Nimpith)

Thematic area: *Pollination management in vegetable crop*

Assessment of artificial pollination methods in cucurbits (Cucumber and bitter gourd) for better fruit setting and yield improvement

Low productivity of cucurbits due to poor pollination was identified as a problem in North 24 Parganas district. TO SOLVE THIS, KVK South 24 Parganas-I (Nimpith) carried out a field trial at 7 different locations of the jurisdiction. Results of the trial showed that all TO-I, II and III performed better over FP. However, TO-I and II were superior over other treatments with respect to yield, net return and B:C ratio. Due to ease of application, TO-I is

recommended for farmers' level use.

Technology assessed:

FP: Use of synthetic auxin hormone for better fruit setting

TO-I: Spraying of pollen mixture (pollen of 300 - 500 number of fresh male flower + 15 g boron powder 20% + 25 g glucose + 10 lt water) upon freshly opened female flower in the morning (between 6 am to 8 am) @ 10 lt per 10 Decimal land area

TO-II: Hand pollination by dropper (pollen of 50 fresh male flower + 1.5 g boron powder 20% + 2.5 g glucose - all in 1 liter water) upon freshly opened female flower in the morning (between 6 am to 8 am) @ 1-2 drop per flower

TO-III: Hand pollination with fresh male flower @ 1 male flower to 10 female flowers

Source of Technology: Vegetable Science, 2009; University of California. Leaflet 21242



Table: Effect of artificial pollination methods on yield performance of cucurbits

Treatment	Replication	Fruit set percentage	Avg. Marketable yield (g/plant)	Avg. weight of unmarketable fruit (g/plant)	Marketable Yield (Q/ha)	BC ratio
FP	7	72.8	1695	432	107.6	1.84
TO-I		86.1	2237	147	122.3	1.95
TO-II		89.3	2567	84	131.4	1.79
TO-III		88.7	2452	97	127.7	1.67

Uttar Dinajpur KVK

Thematic area: Women and child care

Assessment of cereal and millet based Ready To Eat (RTE) nutritional supplement on farmwomen and teenage girls' health

Physiological anemia and other associated complications due to lack of dietary supplements (mal-/ under-nutrition) had been identified as a major constraint affecting human health in general and women and child health in particular in Uttar Dinajpur district. Malnutrition, due to deficiencies of calories, protein, vitamins, and minerals and other poor health and social status, affects millions of women and adolescent girls around the world. Malnutrition, a serious health concern, threatens the survival of Indian mothers and their children. Adequate nutrition is thus an essential cornerstone to maintain the healthy health of any individual, especially for women. Baby born to malnourished women faces multiple complications, including cognitive impairments, short stature, lower resistance to infections, and a higher risk of disease and death throughout their lives. Women are more prone to nutritional deficiencies than men due to the fact of women's reproductive biology, low social status, poverty and lack of education. The two most common nutritional deficiencies in the women worldwide are iron deficiency and anaemia. Around 80% of the Indian pregnant women suffer from iron deficiency anaemia's. Nutritional deficiencies, including iron and iodine deficiencies and low intake of essential nutrients could enhance the chances of having a low birth-weight infant, as well as impaired fetal development in pregnant women. Low intake of nutrition during girls' childhood may cause stunted growth, which in turn leads to higher risks of complications during and following childbirth. Mental impairments impede physical development and harm school performance is the common consequences of iodine deficiency

among adolescent girls.

In order to address this, KVK Uttar Dinajpur took up on-farm trial on Ready to Eat cereal and millet based supplement and their impact on farmwomen and adolescent girls' health. In this trial, two types of supplementary foods were used - one was based on wheat, buckwheat, finger millet and Moringa oleifera leaves and the other one was flaked rice with Bengal gram pulse, buckwheat and moringa leaf powder. In each treatment 8 farmwomen (age group 35 to 45 years) and 8 teenage girls were taken and provided with supplementary food for 4 months. Approximately 100 to 150 gm supplementary food was given per respondent per day. The results revealed that the increase in Hb level was significant in all the cases as compared to farmer's practice. TO-II performed better than control and TO-I. It was observed that Hb level was significantly more in TO-I and TO-II as compared to FP. Supplementary foods which were rich in essential dietary elements i.e. carbohydrates, protein and minerals etc. contributed to overall good health. The nutritive values of supplementary foods were also analyzed from CFTRI, Mysore and presented.

Technology assessed:

FP: No practice of taking fortified foods and supplements (Inadequate dietary pattern, low intake of iron, vitamins etc.)

TO-I: Nutritional supplement consist of wheat, buckwheat, finger millet and moringa leaf powder (Proportion 6:2:2)

TO-II: Nutritional supplement consist of Rice (flaked), Bengal gram pulse, buckwheat, finger millet and moringa leaf powder (Proportion 4:2:2:2)

Source of Technology: Journal articles and Reviews on nutritional deficiency

Table: Effect of cereal and millet based Ready To Eat (RTE) nutritional supplement on farmwomen and teenage girls' health

Technology Option	No. of trials	Farmwomen (Mean of Hb)		Teenage girls (Mean of Hb)	
		Before treatment	After treatment	Before treatment	After treatment
FP	8	10.50	10.30	10.20	9.89
TO-I		10.64	12.65	9.80	11.77
TO-II		10.06	12.85	10.06	12.08
CD		NS	0.742*	NS	0.632*

Hb: Haemoglobin; CD: Critical difference; NS: Non-significant; * P<0.05.

Table: Nutritive value* of RTE food supplement used in TO-I and TO-II

Sl. No.	Parameters	TO-I	TO-II
1.	Moisture, % by wt.	3.8	3.8
2.	Total Ash, % by wt.	1.8	1.8
3.	Protein, % by wt.(Nx6.25)	8.5	8.2
4.	Fat, % by wt.	2.7	2.9
5.	Crude fibre, % by wt.	3.7	3.1
6.	Carbohydrates, % by wt.	79.6	80.2
7.	Calorific value, K. cal/100gm	376	380
8.	Iron, mg/100gm	7.1	12.2
9.	Calcium, mg/100gm	84.9	83.3

* Nutritive value analyzed at CFTRI, Mysore.

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 on oilseeds. The demonstrations are made on the latest technologies and varieties less than 10 years old with direct supervision of NARS scientist in the farmers' field. This programme is popular among the farmers as there is no other programme of oilseeds and pulses within the reach of the farmers which update the knowledge and technique of the oilseeds and pulse 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 2021, the KVKs of Zone-V, conducted Frontline Demonstration programme on oilseeds in 534.3 ha covering 2082 farmers. The area under demonstration in pulse was 218.33 ha which covered 1197 farmers. The coverage in crops like paddy, wheat, maize, brinjal, cauliflower, onion etc. was 921.64 ha which involved 5999 farmers. As a whole the KVKs of Zone V covered 1674.27 ha under demonstration in 2021 and benefitted 9278 farmers.

In state-wise analysis of Frontline Demonstrations showed Odisha covered 158.5 ha in oilseeds, 45.5 ha in pulses and 309.32 ha in cereals, vegetables and other crops in 2021. Total coverage of demonstration was 513.32 ha in the state which benefitted 2875 farmers. In the state of West Bengal, an area of 375.8 ha in oilseeds 171.63 ha in pulses and 608.26 ha in cereals, vegetable etc. were covered in 2021. Total coverage in West Bengal was 1155.69 ha under demonstration which benefitted 6381 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	3	1.2	19	4.06	22	5.26
Odisha	496	158.5	305	45.5	2074	309.32	2875	513.32
West Bengal	1586	375.8	889	171.63	3906	608.26	6381	1155.69
Total	2082	534.3	1197	218.33	5999	921.64	9278	1674.27

4.2.2 Oilseeds

In 2021 total 534.3 ha area was covered under FLD on Oilseeds. Out of the total coverage, Oilseed was demonstrated 158.5 ha in Odisha and 375.8 ha in West Bengal. The farmers covered in West Bengal were 1586 and in Odisha it was 496. The demonstrated yield of groundnut was 31.69 q/ha in West Bengal with an increase in yield of 23.78%. In Odisha, the demonstration yield was 19.13q/ha which is 22% higher than traditional variety. In

mustard coverage were 275.8 ha in West Bengal and 1 ha in Odisha. The demonstrated yield was 14.8 q/ha in West Bengal while it was 8.5 q/ha in Odisha. The increase in yield was 40.1% in West Bengal and 85% in Odisha. Oilseeds crops like sesame, sunflower and niger also demonstrated by the KVKs of Odisha and West Bengal. The yield improvement in West Bengal, with demonstrations was 14.14% in sesame, 10.81% in sunflower whereas in Odisha 30.5% increase in sesame, 45.35 % in Sunflower and 40.74% in Niger is observed.

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	14	279	85.5	19.13	15.68	22
		West Bengal	3	100	25	31.69	25.6	23.78
		Total	17	379	110.5	25.41	20.64	23.11
2	Mustard	Odisha	1	10	1	8.5	4.6	85
		West Bengal	12	1196	275.8	14.8	10.57	40.1
		Total	13	1206	276.8	11.65	7.6	53.2
4	Sesame	Odisha	6	157	65	6.63	5.08	30.5
		West Bengal	4	185	48	11.54	10.11	14.14
		Total	10	342	113	9.1	7.6	19.73
5	Sunflower	Odisha	1	30	5	18.75	12.9	45.35
		West Bengal	3	105	27	15.12	32.41	10.81
		Total	4	135	32	16.94	22.65	33.7
6	Niger	Odisha	2	20	2	3.8	2.7	40.74
		Total	2	20	2	3.8	2.7	40.74
Grand Total			46	2082	534.3			



4.2.3 Pulses:

In pulses, demonstration was conducted in 218.33 ha covering 1197 farmers. The major pulses demonstrated was blackgram (81.63 ha) and lentil (69.5 ha). In greengram increase in yield (1.32 q/ha) was 26.95% in Odisha and 32.36% (2.09 q/ha)

in West Bengal. Lentil was demonstrated in West Bengal is 69.5 ha and average demonstrated yield was recorded 11.95q/ha which was higher by 30.6% of check yield. Pigeon pea and Chickpea are also demonstrated in 9-15 ha under this programme. The yield performance and coverage of frontline demonstration are given below.

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	7	121	22.1	6.64	5.01	32.53
		West Bengal	5	269	59.53	8.48	5.87	44.3
		Total		390	81.63	7.56	5.44	38.88
2	Green Gram	Odisha	12	80	11	6.21	4.89	26.95
		West Bengal	4	140	23.1	8.57	6.48	32.36
		Total		220	34.1	7.39	5.68	30.03
3	Lentil	West Bengal	9	384	69.5	11.95	9.15	30.6
		Total		384	69.5	11.95	9.15	30.6
4	Chick pea	West Bengal	2	77	15.5	13.56	10.53	28.79
		Total		77	15.5	13.56	10.53	28.79
5	Pigeon pea	Odisha	7	70	9.4	14.14	10.78	31.26
		Total		70	9.4	14.14	10.78	31.26
6	Cowpea	A&N Islands	1	3	1.2	4.55	3.15	44.4
		Total		3	1.2	4.55	3.15	44.44
7	Lathyrus	West Bengal	1	19	4	10.5	7.5	40
		Total		19	4	10.5	7.5	40
8	Garden pea	Odisha	1	34	3	108.5	70.8	53.25
		Total		34	3	108.5	70.8	53.25
Grand Total				1197	218.33			



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 390.04 ha covering 1777 farmers. Average yield increase was 16.7% in Odisha and 19.0% in West Bengal. Wheat and maize is not a major crop in these states but to popularize these crops was demonstrated in 17 ha and 30 ha in West Bengal and 19.4 ha in Odisha which showed average increase in yield of 15.2% and 29.2% in West Bengal and 31.1% in Odisha.

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 18.2 to 46.1% in brinjal, 17.0 to 26.2% in cauliflower, 12.0 to 30.8% in onion, 23.4 to 35.3% in tomato, 24.5 to 45.7% in cabbage, 26.8 to 43.2% 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 28.6 to 56.7% over the existing practices.

Fruit crops like mango and banana were demonstrated during 2021. Yield increment with new technologies was 32.2% in Odisha and 21.2% in West Bengal. Banana in Odisha showed 19.9% increase in yield and in West Bengal 21.6%.

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	Cauliflower	Odisha	12	114	15.9	223.75	177.29	26.20
		West Bengal	5	139	7.54	263.60	225.28	17.01
		Total	17	253	23.44			
2	Chilli	Odisha	10	101	9.52	183.67	153.32	19.80
		West Bengal	2	23	0.75	53.20	47.80	11.30
		Total	12	124	10.27			
3	Drumstick	Odisha	2	15	0.8	321	200	60.5
		West Bengal	1	148	2.00	42.00	27.00	55.56
		Total	3	163	2.80			
4	Tomato	A & N Islands	2	6	1.98	36.2	28.5	27.02
		Odisha	16	208	19.22	322.06	237.98	35.33
		West Bengal	9	212	13.99	406.89	329.76	23.39
		Total	27	426	35.19			

Sl. No.	Crop	State	No. of KVKs	No. of Farmer	Area (ha)	Yield (q/ha)		% Increase
						Demonstration	Check	
5	Rice	Odisha	21	423	85.1	43.07	36.92	16.69
		West Bengal	14	1354	304.94	47.10	39.68	19.04
		Total	35	1777	390.04			
6	Banana	Odisha	5	45	5	301.36	251.24	19.95
		West Bengal	4	80	8.76	373.87	307.53	21.57
		Total	9	125	13.76			
7	Pointed gourd	Odisha	4	36	2.56	152.83	131.13	16.55
		West Bengal	2	13	6.68	194.76	145.48	33.87
		Total	6	49	9.24			
8	Brinjal	A & N Islands	1	1	0.02	190	130	46.15
		Odisha	10	125	21.52	302.34	241.91	24.98
		West Bengal	5	52	5.8	350.00	296.00	18.24
		Total	16	178	27.34			
9	Onion	Odisha	5	60	5.92	238.20	182.05	30.84
		West Bengal	3	33	4.52	288.5	257.5	12.04
		Total	8	93	10.44			
10	Finger Millet	Odisha	5	60	9.00	12.04	8.99	34.00
		Total	5	60	9.00			
11	Mango	Odisha	6	55	9.90	79.24	59.92	32.23
		West Bengal	5	90	21.39	239.39	197.51	21.20
		Total	11	145	31.29			
12	Cucumber	Odisha	1	10	2.50	76.75	53.59	43.22
		West Bengal	6	157	14.73	245.84	193.88	26.80
		Total	7	157	17.23			
13	Broccoli	Odisha	2	20	2.00	181.50	134.50	34.94
		West Bengal	4	93	3.81	228.92	170.98	33.89
		Total	6	113	5.81			
14	Sweet Potato	A & N Islands	1	3	0.5			
		Odisha	2	20	1.40	278.00	196.00	41.84
		West Bengal	1	7	0.25	201.35	138.00	45.91
		Total	4	30	2.15			
15	Potato	West Bengal	2	97	15.93	678.20	571.20	37.32
		Total	2	97	15.93			
16	Okra	Odisha	9	103	11.2	146.011	122.851	18.8521054
		Total	9	103	11.20			
17	Bitter gourd	Odisha	3	47	4.40	559.60	456.87	22.49
		West Bengal	4	102	6.39	275.99	225.15	22.58
		Total	7	149	10.79			



Sl. No.	Crop	State	No. of KVKs	No. of Farmer	Area (ha)	Yield (q/ha)		% Increase
						Demonstration	Check	
18	Elephant Foot Yam	Odisha	3	30	3.40	324.13	218.93	48.05
		West Bengal	6	177	3.89	559.52	394.46	41.84
		Total	9	207	7.29			
19	Maize	Odisha	7	90	19.40	75.83	57.84	31.09
		West Bengal	6	131	17.00	147.23	113.94	29.21
		Total	13	221	36.40			
20	Marigold	Odisha	7	75	6.58	116.73	92.19	26.62
		West Bengal	3	34	0.81	142.54	104.78	36.04
		Total	10	109	7.39			
21	Jute	Odisha	1	10	2.00	18.30	16.40	11.59
		West Bengal	6	200	72.20	29.66	25.39	16.85
		Total	7	210	74.20			
22	Wheat	West Bengal	2	145	30.00	40.61	35.24	15.24
		Total	2	145	30.00			
23	Capsicum	Odisha	1	10	1.00	172.50	125.00	38.00
		West Bengal	3	36	1.53	158.57	125.03	26.82
		Total	4	46	2.53			
24	Cabbage	Odisha	3	32	3.50	367.35	252.15	45.69
		West Bengal	2	20	0.17	250.20	200.95	24.51
		Total	5	52	3.67			
25	Turmeric	Odisha	1	10	1.00	223.40	142.60	56.66
		West Bengal	4	61	1.96	219.29	170.46	28.65
		Total	5	71	2.96			
26	Sweet Corn	West Bengal	2	20	2.00	121.10	103.20	17.34
		Total	2	20	2.00			
27	Bottle Gourd	Odisha	2	20	2.00	290.00	252.00	15.08
		West Bengal	1	10	1.00	110.00	58.00	89.66
		Total	3	30	3.00			
28	Dragon fruit	West Bengal	3	39	1.35	68.00	56.00	21.43
		Total	3	39	1.35			
29	Summer squash	West Bengal	3	57	2.25	244.50	202.00	21.04
		Total	3	57	2.25			
30	Cotton	Odisha	2	10	1	21.03	15.93	32.03
		Total	2	10	1			
31	Litchi	Odisha	2	20	4.00	31.20	24.80	25.81
		Total	2	20	4.00			
32	Cashew	Odisha	2	15	4.00	8.72	6.73	29.57
		Total	2	15	4.00			

Sl. No.	Crop	State	No. of KVKs	No. of Farmer	Area (ha)	Yield (q/ha)		% Increase
						Demonstration	Check	
33	Ragi	Odisha	2	15	6.00	16.32	11.26	44.96
		Total	2	15	6.00			
34	Others	A & N Islands	2	9	1.56	109.00	82.00	32.93
		Odisha	15	295	49.50	147.22	92.10	59.85
		West Bengal	10	386	56.61	190.23	136.87	38.99
		Total	27	690	107.67			
Grand Total			285	5999	921.64			



4.2.5 Livestock:

Different areas in livestock management like new breed introduction, livestock feed formulation with locally available materials, deworming, vaccinations, health management measures were demonstrated by the KVKs of A & N Islands, Odisha and West

Bengal. Demonstration was made on 320 livestock involving 34 farmers in A&N Islands. In Odisha, demonstrations were made on 2892 livestock benefitting 811 farmers. In the state of West Bengal, 1155 farmers were involved to demonstrate latest technology of 3628 animals/livestock.

Table: Frontline Demonstration on Livestock

Sl. No.	Category	State	No. of KVKs	No. of Farmer	No. of units
1	Poultry	A & N Islands	1	31	310
		Odisha	21	525	2216
		West Bengal	10	321	1366
		Total	32	877	3892
2	Sheep and goat	A & N Islands	1	1	5
		Odisha	6	71	275
		West Bengal	8	107	376
		Total	15	179	656
3	Dairy	Odisha	5	45	120
		West Bengal	1	21	21
		Total	6	66	141
4	Duckery	Odisha	7	80	170
		West Bengal	4	207	807
		Total	11	287	977
5	Cow	Odisha	4	35	56
		West Bengal	2	375	929
		Total	6	410	985

Sl. No.	Category	State	No. of KVKs	No. of Farmer	No. of units
6	Others	A & N Islands	1	2	5
		Odisha	3	55	55
		West Bengal	6	124	129
		Total	10	181	189
Grand Total			80	2000	6840



4.2.6 Fishery:

In fishery, demonstration was conducted on 548

units developed on Common carps, Composite fish, Ornamental fishes etc benefiting 625 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	6	96	84
		West Bengal	2	139	139
		Total	8	235	223
2	Composite fish	Odisha	6	89	81
		West Bengal	6	107	107
		Total	12	196	188
3	Ornamental fishes	West Bengal	1	20	22
		Total	1	20	22
4	Others	Odisha	7	108	51
		West Bengal	3	66	64
		Total	10	174	115
Grand Total			31	625	548



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 2029 farmers and rural youths in this zone.

Table: Frontline Demonstration on Enterprise

Sl. No.	Category	State	No. of KVKs	No. of Farmer	No. of units
1	Oyster mushroom	A & N Islands	1	2	2
		Odisha	13	185	1015
		West Bengal	7	323	323
		Total	21	510	1340
2	Paddy straw mushroom	Odisha	12	155	645
		Total	12	155	645
3	Vermicompost	Odisha	7	59	59
		West Bengal	6	222	103
		Total	13	281	162
4	Apiculture	Odisha	4	30	30
		West Bengal	4	59	75
		Total	8	89	105
5	Nutritional Garden	Odisha	7	60	60
		Total	7	60	60
6	Value Addition	Odisha	4	55	55
		West Bengal	1	7	1
		Total	5	62	56
7	Sericulture	Odisha	2	15	15
		Total	2	15	15
8	Others	A & N Islands	1	2	2
		Odisha	12	224	147
		West Bengal	11	631	167
		Total	24	857	316
Grand Total			92	2029	2699



4.2.8 Implements:

Agriculture 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, 125 demonstrations were organized involving 534 farmers, mostly in the state of West Bengal.

Table: Frontline Demonstration on Implements

Sl. No.	Category	State	No. of KVKs	No. of Farmer	No. of units/No
1	Implement	A & N Islands	2	25	18
		Odisha	20	341	73
		West Bengal	7	168	34
		Total	29	534	125



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, fishery and value addition etc.

Table: Summary of training programme conducted 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	47	388	694	1082	51	234	285	15	21	36	454	949	1403
Odisha	2283	26212	20137	46349	3883	1980	5863	1890	972	2862	31985	23089	55074
West Bengal	2811	43409	21450	64859	5011	2517	7528	13279	2652	15931	61699	26619	88318
TOTAL:	5141	70009	42281	112290	8945	4731	13676	15184	3645	18829	94138	50657	144795

4.3.1 Consolidated achievements

The KVKs of Zone V organized 3887 training courses for the benefit of 112290 farmers and farm women during 2021. Out of total beneficiaries, 70009 was male (62.35%) and 42281 (37.65%) was female.

A good number (35995) of SC farmers were also trained in the programme which constituted 32.05% total trainees. While the number of ST trained was 21456 which was 19.11% of total beneficiaries. The details are given in the table below.

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

State	No. of Courses	No. of Participants											
		Other			SC			ST			Grand Total		
		M	F	T	M	F	T	M	F	T	M	F	T
A & N Island	35	332	588	920	0	0	0	56	106	162	388	694	1082
Odisha	1751	14883	9527	24410	4421	4707	9128	6908	5903	12811	26212	20137	46349
West Bengal	2101	22078	7431	29509	16882	9985	26867	4449	4034	8483	43409	21450	64859
TOTAL:	3887	37293	17546	54839	21303	14692	35995	11413	10043	21456	70009	42281	112290

State-wise analysis of training for farmers and farmwomen showed that Union Territory of A&N Islands conducted 35 courses for 1082 participants. In Odisha, 1751 courses were conducted for 46349 beneficiaries while in West Bengal 2101 courses were taken up for training of 64859 beneficiaries.

Skill development through training of rural youth was one of the most important objectives of the KVKs to generate rural employment. Mushroom production, production of organic inputs, seed production, value addition, dairy farming, poultry farming, fish seed production, repair and maintenance of farm machines and bee keeping were the most preferred areas for rural youth training. The KVKs conducted those training programme generally on on-campus mode. Farmers got trained in the latest technologies in those programmes.

In the year 2021, 629 courses were organized for 13676

rural youths and girls through on and off-campus training. Out of the total participants 8945 (65.40%) was rural youth and 4731 (34.60%) was rural girls. Participation of SC in these programmes was 4849 which constituted 35.46% of the total trainees, while participation from ST was 2694 (19.70%).

State-wise analysis of the rural youth trained showed that West Bengal trained maximum rural girls 2517 which constitute about 33.43% of total trainees. The percentage of the rural girls was 82.10% in the Union Territory of A&N Islands and 33.77% in the state of Odisha. A significant number of training programme was organized by the states for rural youth and girls. Union territory of A & N Islands organized 10 courses for 285 beneficiaries. Odisha organized 351 courses for 5863 beneficiaries and West Bengal organized 268 courses for 7528 beneficiaries which makes a total of 629 courses for 13676 beneficiaries.

Table: State-wise training programme conducted for rural youths and girls in Zone V

State	No. of Courses	No. of Participants											
		Other			SC			ST			Grand Total		
		M	F	T	M	F	T	M	F	T	M	F	T
A & N Island	10	51	234	285	0	0	0	0	0	0	51	234	285
Odisha	351	2176	1012	3188	648	325	973	1059	643	1702	3883	1980	5863
West Bengal	268	1794	866	2660	2519	1357	3876	698	294	992	5011	2517	7528
TOTAL:	629	4021	2112	6133	3167	1682	4849	1757	937	2694	8945	4731	13676

The extension functionaries in state level 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 442 courses involving 15931 extension

functionaries while Odisha organized 181 courses for 2862 extension functionaries and A&N Islands organized 2 courses for 36 beneficiaries. Gender analysis of the trainees indicated that nearly 19.36% were female and 80.64% were male participants in 2021. The constitution of SC was 20.14% while ST was 8.58% 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											
		Other			SC			ST			Grand Total		
		M	F	T	M	F	T	M	F	T	M	F	T
A & N Island	2	15	21	36	0	0	0	0	0	0	15	21	36
Odisha	181	1489	699	2188	187	148	335	214	125	339	1890	972	2862
West Bengal	442	9637	1559	11196	2608	850	3458	1034	243	1277	13279	2652	15931
TOTAL:	625	11141	2279	13420	2795	998	3793	1248	368	1616	15184	3645	18829

4.3.1.1 On-and Off- Campus training

The training programmes conducted by the KVKs of Zone V were in both on-campus and off-campus mode. Due to lack of accommodation facilities some of the trainings were organized in off-campus mode.

Out of total training programmes (3887) conducted in all categories, around 70.05% was in off-campus mode and 29.95% in on-campus mode. While 77214 participants received training on off-campus mode (68.76%) and 35076 (31.24%) received training on on-campus mode.

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

Farmers and Farm Women

State/UT	No. of Courses	No. of Participants											
		Other			SC			ST			Grand Total		
		M	F	T	M	F	T	M	F	T	M	F	T
ON	1164	13210	4612	17822	7732	4376	12108	3121	2025	5146	24063	11013	35076
OFF	2723	24083	12934	37017	13571	10316	23887	8292	8018	16310	45946	31268	77214
Total	3887	37293	17546	54839	21303	14692	35995	11413	10043	21456	70009	42281	112290

Rural Youth and Girls

State/UT	No. of Courses	No. of Participants											
		Other			SC			ST			Grand Total		
		M	F	T	M	F	T	M	F	T	M	F	T
ON	469	2950	1336	4286	2276	1179	3455	1313	666	1979	6539	3181	9720
OFF	160	1071	776	1847	891	503	1394	444	271	715	2406	1550	3956
Total	629	4021	2112	6133	3167	1682	4849	1757	937	2694	8945	4731	13676

Extension Functionaries

State/UT	No. of Courses	No. of Participants											
		Other			SC			ST			Grand Total		
		M	F	T	M	F	T	M	F	T	M	F	T
ON	528	10079	1914	11993	2330	714	3044	700	205	905	13109	2833	15942
OFF	97	1062	365	1427	465	284	749	548	163	711	2075	812	2887
Total	625	11141	2279	13420	2795	998	3793	1248	368	1616	15184	3645	18829

4.3.1.2 Thematic area-wise training programme

Further classification of training programme on thematic area basis showed that under crop production category, training on integrated crop management was conducted for 117 courses involving 3436 participants while in Weed Management, 89 courses were organized for 2544 beneficiaries. In Horticulture, important areas of training included Training and Pruning in Vegetables which 59 trainings were organized for 2021 beneficiaries. In fruits cultivation, 119 trainings were organized for 3147 beneficiaries. Trainings were also organized on ornamental plants cultivation (36), plantation crops (19), tuber crops (21), spices (39), medicinal and aromatic plants (11). In soil health and fertility management, a large number (397) of training programmes were organized involving 11188 beneficiaries to address the issues of efficient fertilizer use and integrated nutrient management.

In Livestock Production and Management, 386 courses were organized for 10785 beneficiaries which included dairy management, poultry management, piggery management etc. It showed the importance of those issues for the farmers in the districts. In Home Science, 352 courses were organized for 10160 beneficiaries which included courses like income generation by rural women, value addition of fruits and vegetables. In Agricultural Engineering, 137 courses were organized for 3934 beneficiaries. In plant protection, 489 courses were organized for 13526 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, 283 courses were conducted involving 9033 farmers. In production of input, 132 courses were organized for 3289 farmers. In capacity building, 225 courses involving 7629 farmers and in agro-forestry, 63 courses for 1800 farmers were organized.

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

Area of training	No. of Courses	No. of Participants											
		Other			SC			ST			Grand Total		
		M	F	T	M	F	T	M	F	T	M	F	T
Crop Production													
Weed Management	89	1083	401	1484	466	201	667	257	136	393	1806	738	2544
Resource Conservation Technologies	37	539	137	676	540	156	696	95	34	129	1174	327	1501
Cropping Systems	37	327	118	445	176	73	249	83	44	127	586	235	821
Crop Diversification	52	611	182	793	389	130	519	155	93	248	1155	405	1560
Integrated Farming	47	597	143	740	397	152	549	137	106	243	1131	401	1532
Water management	47	780	176	956	171	76	247	56	60	116	1007	312	1319
Seed production	78	966	262	1228	426	177	603	275	116	391	1667	555	2222
Nursery management	70	834	474	1308	362	247	609	142	106	248	1338	827	2165
Integrated Crop Management	117	1262	329	1591	835	254	1089	510	246	756	2607	829	3436
Fodder production	54	431	157	588	267	99	366	316	146	462	1014	402	1416
Production of organic inputs	69	639	300	939	346	175	521	240	127	367	1225	602	1827

Area of training	No. of Courses	No. of Participants											
		Other			SC			ST			Grand Total		
		M	F	T	M	F	T	M	F	T	M	F	T
Others, (cultivation of crops)	78	760	329	1089	358	209	567	267	191	458	1385	729	2114
Total	775	8829	3008	11837	4733	1949	6682	2533	1405	3938	16095	6362	22457
Horticulture													
a) Vegetable Crops													
Integrated nutrient management	21	315	65	380	88	42	130	59	50	109	462	157	619
Water management	6	90	3	93	24	3	27	13	23	36	127	29	156
Enterprise development	15	157	62	219	139	66	205	28	8	36	324	136	460
Skill development	7	109	37	146	56	14	70	35	1	36	200	52	252
Yield increment	16	288	37	325	127	40	167	19	0	19	434	77	511
Production of low volume and high value crops	55	458	234	692	401	212	613	150	89	239	1009	535	1544
Off-season vegetables	41	383	108	491	181	125	306	126	160	286	690	393	1083
Nursery raising	48	385	261	646	281	143	424	90	135	225	756	539	1295
Export potential vegetables	23	186	102	288	152	25	177	48	85	133	386	212	598
Grading and standardization	13	107	25	132	67	41	108	83	38	121	257	104	361
Protective cultivation (Green Houses, Shade Net etc.)	12	144	36	180	134	44	178	31	13	44	309	93	402
Others, if any (Cultivation of Vegetable)	58	598	175	773	297	248	545	159	119	278	1054	542	1596
Training and Pruning	59	924	306	1230	290	156	446	231	114	345	1445	576	2021
Total (a)	374	4144	1451	5595	2237	1159	3396	1072	835	1907	7453	3445	10898
b) Fruits													
Layout and Management of Orchards	25	156	82	238	171	146	317	43	62	105	370	290	660
Cultivation of Fruit	38	276	173	449	258	114	372	113	130	243	647	417	1064
Management of young plants/ orchards	7	57	22	79	32	22	54	18	22	40	107	66	173
Rejuvenation of old orchards	7	49	28	77	39	15	54	20	8	28	108	51	159

Area of training	No. of Courses	No. of Participants											
		Other			SC			ST			Grand Total		
		M	F	T	M	F	T	M	F	T	M	F	T
Export potential fruits	7	39	14	53	61	11	72	22	8	30	122	33	155
Micro irrigation systems of orchards	4	66	5	71	17	5	22	12	5	17	95	15	110
Plant propagation techniques	10	84	38	122	69	25	94	7	15	22	160	78	238
Others, if any (INM)	21	192	73	265	112	79	191	88	44	132	392	196	588
Total (b)	119	919	435	1354	759	417	1176	323	294	617	2001	1146	3147
c) Ornamental Plants													
Nursery Management	6	58	28	86	33	16	49	16	9	25	107	53	160
Management of potted plants	1	0	0	0	0	0	0	18	7	25	18	7	25
Export potential of ornamental plants	8	48	38	86	34	36	70	27	17	44	109	91	200
Propagation techniques of Ornamental Plants	3	27	6	33	5	7	12	22	8	30	54	21	75
Others, if any	18	219	62	281	75	39	114	67	31	98	361	132	493
Total (c)	36	352	134	486	147	98	245	150	72	222	649	304	953
d) Plantation crops													
Production and Management technology	10	158	25	183	81	35	116	7	5	12	246	65	311
Processing and value addition	5	62	30	92	21	11	32	16	12	28	99	53	152
Others, if any	4	51	24	75	14	2	16	5	13	18	70	39	109
Total (d)	19	271	79	350	116	48	164	28	30	58	415	157	572
e) Tuber crops													
Production and Management technology	18	190	83	273	75	32	107	66	47	113	331	162	493
Processing and value addition	1	26	0	26	0	4	4	0	0	0	26	4	30
Others, if any	2	14	2	16	18	4	22	15	2	17	47	8	55
Total (e)	21	230	85	315	93	40	133	81	49	130	404	174	578
f) Spices													
Production and Management technology	25	238	72	310	142	83	225	58	50	108	438	205	643

Area of training	No. of Courses	No. of Participants											
		Other			SC			ST			Grand Total		
		M	F	T	M	F	T	M	F	T	M	F	T
Processing and value addition	12	155	113	268	70	56	126	0	0	0	225	169	394
Others, if any	2	4	2	6	18	7	25	20	15	35	42	24	66
Total (f)	39	397	187	584	230	146	376	78	65	143	705	398	1103
g) Medicinal and Aromatic Plants													
Nursery management	0	0	0	0	0	0	0	0	0	0	0	0	0
Production and management technology	4	62	15	77	12	9	21	3	3	6	77	27	104
Post harvest technology and value addition	7	99	40	139	43	19	62	3	2	5	145	61	206
Others, if any	0	0	0	0	0	0	0	0	0	0	0	0	0
Total (g)	11	161	55	216	55	28	83	6	5	11	222	88	310
Total(a-g)	619	6474	2426	8900	3637	1936	5573	1738	1350	3088	11849	5712	17561
Soil Health and Fertility Management													
Soil fertility management	50	583	183	766	281	110	391	141	72	213	1005	365	1370
Soil and Water Conservation	18	152	106	258	58	63	121	67	30	97	277	199	476
Integrated Nutrient Management	79	994	178	1172	390	166	556	288	159	447	1672	503	2175
Production and use of organic inputs	55	560	330	890	258	146	404	132	140	272	950	616	1566
Management of Problematic soils	35	548	65	613	115	16	131	153	33	186	816	114	930
Micro nutrient deficiency in crops	26	271	108	379	79	33	112	166	61	227	516	202	718
Nutrient Use Efficiency	24	296	67	363	89	59	148	121	17	138	506	143	649
Soil and Water Testing	43	570	120	690	317	105	422	194	25	219	1081	250	1331
Others, if any	67	884	344	1228	222	150	372	258	115	373	1364	609	1973
Total	397	4858	1501	6359	1809	848	2657	1520	652	2172	8187	3001	11188
Livestock Production and Management													
Dairy Management	88	837	596	1433	428	366	794	223	264	487	1488	1226	2714
Poultry Management	80	519	341	860	504	483	987	113	200	313	1136	1024	2160
Piggery Management	18	29	19	48	95	53	148	49	121	170	173	193	366

Area of training	No. of Courses	No. of Participants											
		Other			SC			ST			Grand Total		
		M	F	T	M	F	T	M	F	T	M	F	T
Rabbit Management	14	99	138	237	94	92	186	14	8	22	207	238	445
Disease Management	53	231	184	415	395	512	907	95	88	183	721	784	1505
Feed management	53	181	236	417	339	331	670	160	211	371	680	778	1458
Production of quality animal products	45	272	305	577	168	184	352	66	74	140	506	563	1069
Others, if any Goat farming	35	179	198	377	251	254	505	72	114	186	502	566	1068
Total	386	2347	2017	4364	2274	2275	4549	792	1080	1872	5413	5372	10785
Home Science/Women empowerment													
Household food security by kitchen gardening and nutrition gardening	67	302	550	852	116	578	694	95	380	475	513	1508	2021
Design and development of low/minimum cost diet	12	27	175	202	13	66	79	2	8	10	42	249	291
Designing and development for high nutrient efficiency diet	8	16	125	141	4	43	47	5	17	22	25	185	210
Minimization of nutrient loss in processing	14	27	163	190	20	159	179	2	23	25	49	345	394
Gender mainstreaming through SHGs	15	218	106	324	73	69	142	54	10	64	345	185	530
Storage loss minimization techniques	20	78	118	196	12	224	236	17	106	123	107	448	555
Enterprise development	19	17	175	192	27	128	155	0	113	113	44	416	460
Value addition	73	420	856	1276	120	310	430	115	346	461	655	1512	2167
Income generation activities for empowerment of rural Women	37	38	438	476	6	406	412	5	174	179	49	1018	1067
Location specific drudgery reduction technologies	16	2	185	187	21	89	110	19	119	138	42	393	435
Rural Crafts	1	0	5	5	0	15	15	0	5	5	0	25	25



Area of training	No. of Courses	No. of Participants											
		Other			SC			ST			Grand Total		
		M	F	T	M	F	T	M	F	T	M	F	T
Capacity building	21	56	252	308	81	174	255	24	85	109	161	511	672
Women and child care	10	9	92	101	0	107	107	1	81	82	10	280	290
Others, if any	39	27	354	381	136	327	463	29	170	199	192	851	1043
Total	352	1237	3594	4831	629	2695	3324	368	1637	2005	2234	7926	10160
Agril. Engineering													
Installation and maintenance of micro irrigation systems	42	224	132	356	43	38	81	410	296	706	677	466	1143
Use of Plastics in farming practices	10	68	44	112	10	18	28	38	82	120	116	144	260
Production of small tools and implements	12	172	70	242	26	13	39	36	18	54	234	101	335
Repair and maintenance of farm machinery and implements	19	177	101	278	112	45	157	89	65	154	378	211	589
Small scale processing and value addition	9	105	33	138	16	44	60	27	5	32	148	82	230
Post Harvest Technology	19	81	133	214	63	53	116	169	75	244	313	261	574
Others, if any	26	140	219	359	262	121	383	23	38	61	425	378	803
Total	137	967	732	1699	532	332	864	792	579	1371	2291	1643	3934
Plant Protection													
Integrated Pest Management	227	2372	684	3056	1511	505	2016	735	374	1109	4618	1563	6181
Integrated Disease Management	147	1797	394	2191	778	211	989	634	252	886	3209	857	4066
Bio-control of pests and diseases	41	451	97	548	366	100	466	106	81	187	923	278	1201
Production of bio control agents and bio pesticides	25	258	90	348	177	70	247	50	32	82	485	192	677
Others, if any	49	362	251	613	333	156	489	188	111	299	883	518	1401
Total	489	5240	1516	6756	3165	1042	4207	1713	850	2563	10118	3408	13526
Fisheries													
Integrated fish farming	46	500	223	723	244	318	562	80	190	270	824	731	1555



Area of training	No. of Courses	No. of Participants											
		Other			SC			ST			Grand Total		
		M	F	T	M	F	T	M	F	T	M	F	T
Carp breeding and hatchery management	16	110	44	154	183	75	258	23	15	38	316	134	450
Carp fry and fingerling rearing	32	287	264	551	221	217	438	38	54	92	546	535	1081
Composite fish culture & fish disease	79	880	440	1320	811	365	1176	95	55	150	1786	860	2646
Fish feed preparation & its application to fish pond, like nursery, rearing & stocking pond	11	65	5	70	242	45	287	1	0	1	308	50	358
Hatchery management and culture of freshwater prawn	6	48	20	68	9	6	15	158	15	173	215	41	256
Breeding and culture of ornamental fishes	12	109	54	163	126	46	172	10	7	17	245	107	352
Portable plastic carp hatchery	4	21	18	39	50	20	70	7	4	11	78	42	120
Pen culture of fish and prawn	4	25	12	37	62	8	70	4	0	4	91	20	111
Shrimp farming	4	62	3	65	47	4	51	4	0	4	113	7	120
Edible oyster farming	14	164	18	182	114	26	140	50	12	62	328	56	384
Pearl culture	12	108	44	152	70	18	88	22	11	33	200	73	273
Fish processing and value addition	16	239	54	293	128	66	194	18	16	34	385	136	521
Others, if any	27	234	94	328	352	82	434	9	35	44	595	211	806
Total	283	2852	1293	4145	2659	1296	3955	519	414	933	6030	3003	9033
Production of Input at site													
Seed Production	32	215	39	254	96	43	139	142	28	170	453	110	563
Planting material production	6	84	15	99	63	2	65	23	0	23	170	17	187
Bio-agents production	4	44	0	44	48	0	48	20	0	20	112	0	112
Bio-pesticides production	8	55	45	100	45	30	75	20	20	40	120	95	215
Bio-fertilizer production	7	89	5	94	58	0	58	30	0	30	177	5	182

Area of training	No. of Courses	No. of Participants											
		Other			SC			ST			Grand Total		
		M	F	T	M	F	T	M	F	T	M	F	T
Vermi-compost production	18	171	81	252	56	34	90	43	76	119	270	191	461
Organic manures production	7	63	4	67	54	0	54	36	34	70	153	38	191
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	0	0	0	0	0	0	0	0	0	0	0	0	0
Small tools and implements	1	4	2	6	2	2	4	10	5	15	16	9	25
Production of livestock feed and fodder	4	44	0	44	48	0	48	20	0	20	112	0	112
Production of Fish feed	11	44	18	62	48	115	163	20	42	62	112	175	287
Others, if any	29	245	132	377	115	240	355	78	59	137	438	431	869
Total	132	1083	356	1439	648	476	1124	452	274	726	2183	1106	3289
Capacity Building and Group Dynamics													
Leadership development	18	253	81	334	75	25	100	25	17	42	353	123	476
Group dynamics	42	602	144	746	224	100	324	36	38	74	862	282	1144
Formation and Management of SHGs	26	140	203	343	28	211	239	23	82	105	191	496	687
Mobilization of social capital	26	104	38	142	41	612	653	62	549	611	207	1199	1406
Entrepreneurial development of farmers/youths	30	356	106	462	114	72	186	100	89	189	570	267	837
WTO and IPR issues	3	45	30	75	17	2	19	3	2	5	65	34	99
Others, if any	80	1030	208	1238	207	635	842	78	822	900	1315	1665	2980
Total	225	2530	810	3340	706	1657	2363	327	1599	1926	3563	4066	7629
Agro forestry													
Production technologies	18	122	88	210	47	37	84	97	99	196	266	224	490
Nursery management	14	166	24	190	90	19	109	61	35	96	317	78	395
Integrated Farming Systems	31	325	107	432	177	84	261	159	63	222	661	254	915

Area of training	No. of Courses	No. of Participants											
		Other			SC			ST			Grand Total		
		M	F	T	M	F	T	M	F	T	M	F	T
Total	63	613	219	832	314	140	454	317	197	514	1244	556	1800
Others (Pl. specify)	29	263	74	337	197	46	243	342	6	348	802	126	928
Grand Total	3887	37293	17546	54839	21303	14692	35995	11413	10043	21456	70009	42281	112290

4.3.2 Rural Youth:

Considering the employment generation of the rural youth and girls in the rural areas, training programmes for rural youth and girls were organized by the KVKs of this Zone during 2021. The KVKs of Zone V conducted 629 courses for 13676 beneficiaries for rural youth and girls in A&N Islands, West Bengal and Odisha. Trainings were organized both in on- and off-campus mode. In mushroom production, 52 courses were organized for 1043 beneficiaries while in production of organic inputs, 42 courses were organized for 775 youths. Other courses organized were for Vermi-culture (40), Sericulture (31), Planting material production, Commercial fruit production, Poultry production (25 each) and others. The details are given in the following table.

Table: Thematic area wise training programme for rural youth and girls

Area of training	No. of Courses	No. of Participants											
		Other			SC			ST			Grand Total		
		M	F	T	M	F	T	M	F	T	M	F	T
Mushroom Production	52	306	206	512	230	166	396	77	58	135	613	430	1043
Bee-keeping	17	149	32	181	107	33	140	18	11	29	274	76	350
Integrated farming	19	137	40	177	133	34	167	66	30	96	336	104	440
Seed production	22	147	36	183	99	59	158	105	25	130	351	120	471
Production of organic inputs	42	253	143	396	198	65	263	75	41	116	526	249	775
Planting material production	25	155	62	217	121	35	156	72	47	119	348	144	492
Vermi-culture	40	243	129	372	212	81	293	150	48	198	605	258	863
Sericulture	31	216	118	334	124	81	205	64	54	118	404	253	657
Protected cultivation of vegetable crops	24	123	83	206	80	33	113	90	30	120	293	146	439
Commercial fruit production	25	97	96	193	71	71	142	29	53	82	197	220	417
Repair and maintenance of farm machinery and implements	20	103	48	151	113	30	143	39	91	130	255	169	424
Nursery Management of Horticulture crops	19	110	69	179	56	43	99	48	56	104	214	168	382
Training and pruning of orchards	13	89	51	140	44	8	52	28	16	44	161	75	236
Value addition	20	80	78	158	18	78	96	73	49	122	171	205	376



Area of training	No. of Courses	No. of Participants											
		Other			SC			ST			Grand Total		
		M	F	T	M	F	T	M	F	T	M	F	T
Production of quality animal products	7	15	25	40	12	17	29	15	12	27	42	54	96
Dairying	23	118	44	162	154	58	212	44	17	61	316	119	435
Sheep and goat rearing	13	92	37	129	151	50	201	25	7	32	268	94	362
Quail farming	8	110	27	137	50	45	95	15	0	15	175	72	247
Piggery	6	24	5	29	69	12	81	32	23	55	125	40	165
Rabbit farming	6	17	40	57	24	17	41	5	18	23	46	75	121
Poultry production	25	146	115	261	161	132	293	46	36	82	353	283	636
Ornamental fisheries	12	89	53	142	42	58	100	12	15	27	143	126	269
Para vets	9	72	15	87	78	31	109	23	15	38	173	61	234
Para extension workers	5	43	2	45	36	4	40	19	6	25	98	12	110
Composite fish culture	4	55	10	65	4	9	13	1	31	32	60	50	110
Freshwater prawn culture	2	26	0	26	12	26	38	0	2	2	38	28	66
Shrimp farming	3	9	12	21	39	16	55	0	0	0	48	28	76
Pearl culture	1	0	15	15	0	10	10	0	3	3	0	28	28
Cold water fisheries	3	33	12	45	26	3	29	6	0	6	65	15	80
Fish harvest and processing technology	3	13	3	16	18	6	24	4	1	5	35	10	45
Fry and fingerling rearing	9	64	40	104	52	12	64	0	10	10	116	62	178
Small scale processing	7	51	43	94	32	25	57	22	0	22	105	68	173
Post Harvest Technology	11	53	32	85	96	41	137	53	2	55	202	75	277
Tailoring and Stitching	9	77	36	113	94	13	107	42	4	46	213	53	266
Rural Crafts	13	97	51	148	91	93	184	39	0	39	227	144	371
Enterprise development	20	219	40	259	52	12	64	43	36	79	314	88	402
Others if any (ICT application in agriculture)	61	390	264	654	268	175	443	377	90	467	1035	529	1564
TOTAL	629	4021	2112	6133	3167	1682	4849	1757	937	2694	8945	4731	13676

4.3.3 Extension Functionaries:

Extension functionaries of state department of agriculture and veterinary 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 2021, a total of 625 courses were organized for 18829 extension functionaries under Zone V. The areas of training were integrated pest management (120), productivity enhancement in field crop (91), integrated nutrient management

(62), protected cultivation (38) and rejuvenation of old orchards (22) 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	T	M	F	T	M	F	T	M	F	T
Productivity enhancement in field crops	91	1929	267	2196	369	71	440	206	24	230	2504	362	2866
Integrated Pest Management	120	2184	581	2765	514	219	733	248	37	285	2946	837	3783
Integrated Nutrient management	62	1268	174	1442	257	47	304	176	48	224	1701	269	1970
Rejuvenation of old orchards	22	375	43	418	90	52	142	34	13	47	499	108	607
Value addition	17	251	59	310	57	3	60	4	2	6	312	64	376
Protected cultivation technology	38	574	117	691	175	31	206	33	8	41	782	156	938
Formation and Management of SHGs	10	191	46	237	21	18	39	0	7	7	212	71	283
Group Dynamics and farmers organization	16	208	63	271	52	37	89	11	16	27	271	116	387
Information networking among farmers	10	172	23	195	56	16	72	11	5	16	239	44	283
Capacity building for ICT application	21	292	71	363	51	25	76	84	85	169	427	181	608
Care and maintenance of farm machinery and implements	14	234	41	275	83	33	116	11	6	17	328	80	408
WTO and IPR issues	8	123	18	141	72	35	107	8	0	8	203	53	256
Management in farm animals	15	223	33	256	87	54	141	7	15	22	317	102	419
Livestock feed and fodder production	9	113	10	123	34	14	48	22	4	26	169	28	197
Household food security	12	127	108	235	65	34	99	24	5	29	216	147	363
Women and Child care	12	142	39	181	93	33	126	15	12	27	250	84	334
Low cost and nutrient efficient diet designing	19	184	126	310	137	63	200	21	12	33	342	201	543

Area of training	No. of Courses	No. of Participants											
		General			SC			ST			Grand Total		
		M	F	T	M	F	T	M	F	T	M	F	T
Production and use of organic inputs	12	150	44	194	25	12	37	20	15	35	195	71	266
Gender mainstreaming through SHGs	16	265	73	338	52	12	64	39	20	59	356	105	461
Crop intensification	17	317	59	376	45	17	62	70	5	75	432	81	513
Others if any	84	1819	284	2103	460	172	632	204	29	233	2483	485	2968
TOTAL	625	11141	2279	13420	2795	998	3793	1248	368	1616	15184	3645	18829

4.3.4 Sponsored Training Programme:

KVKs of this Zone trained farmers on various aspects of agriculture and allied sectors using their own resources as well as the resources received from the different organizations. A number of government and other non-government organizations were associated to conduct different kinds of trainings for different clienteles. Even different state governments, central government boards, 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 2021, the KVKs conducted sponsored 374 training programmes for 12073 beneficiaries with the fund support from different organizations. Out of these 10404, 86.17% were male and 13.83% were

female beneficiaries (1669). The composition of SC/ST in those training programme was 17.00%.

The major courses covered in these programmes were production and value addition in fruits etc. (106) for 2569 participants, agricultural extension (94) for 3226, crop production (88) for 3228 participants, livestock and fishery (46) for 1719 participants and others.

State-wise analysis showed that Union Territory of A&N Islands, organized 9 courses for 354 participants, while West Bengal organized 269 courses for 9515 participants and Odisha organized 96 courses for 2204 participants. It indicated that sponsoring organization preferred KVKs for getting their clientele trained for benefit of their organization.

Table: Sponsored training programmes conducted by KVKs of Zone V

State	No. of Courses	No. of Participants											
		Other			SC			ST			Grand Total		
		M	F	T	M	F	T	M	F	T	M	F	T
A & N Island	9	119	235	354	0	0	0	0	0	0	119	235	354
Odisha	96	1355	311	1666	166	95	261	152	125	277	1673	531	2204
West Bengal	269	7474	527	8001	1064	279	1343	74	97	171	8612	903	9515
TOTAL:	374	8948	1073	10021	1230	374	1604	226	222	448	10404	1669	12073

Table: Thematic area-wise sponsored training program conducted by KVKs of Zone V

Area of training	No. of courses	No. of Participants												
		Other			SC			ST			Grand Total			
		M	F	T	M	F	T	M	F	T	Male	Female	Total	
Crop production and management														
Increasing production and productivity of crops	65	1860	178	2038	272	49	321	3	1	4	2135	228	2363	



Area of training	No. of courses	No. of Participants											Grand Total	
		Other			SC			ST			Male	Female	Total	
		M	F	T	M	F	T	M	F	T				
Commercial production of vegetables	23	673	73	746	87	20	107	5	7	12	765	100	865	
Total	88	2533	251	2784	359	69	428	8	8	16	2900	328	3228	
Production and value addition	0	0	0	0	0	0	0	0	0	0	0	0	0	
Fruit Plants	12	290	24	314	73	9	82	2	0	2	365	33	398	
Ornamental plants	0	0	0	0	0	0	0	0	0	0	0	0	0	
Spices crops	1	32	0	32	4	0	4	1	0	1	37	0	37	
Soil health and fertility management	13	376	36	412	42	7	49	8	2	10	426	45	471	
Production of Inputs at site	5	30	39	69	17	22	39	9	21	30	56	82	138	
Methods of protective cultivation	1	1	0	1	8	1	9	0	0	0	9	1	10	
Others (pl. specify)	74	722	165	887	382	145	527	85	16	101	1201	314	1515	
Total	106	1451	264	1715	526	184	710	105	39	144	2082	487	2569	
Post harvest technology and value addition	0	0	0	0	0	0	0	0	0	0	0	0	0	
Processing and value addition	1	0	50	50	0	0	0	0	0	0	0	50	50	
Others (pl. specify)	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total	1	0	50	50	0	0	0	0	0	0	0	50	50	
Farm machinery	0	0	0	0	0	0	0	0	0	0	0	0	0	
Farm machinery, tools and implements	1	16	9	25	0	0	0	0	0	0	0	16	9	
Others (pl. specify)	12	172	52	224	62	43	105	21	10	31	255	105	360	
Total	13	188	61	249	62	43	105	21	10	31	271	114	385	
Livestock and fisheries	0	0	0	0	0	0	0	0	0	0	0	0	0	
Livestock production and management	26	787	183	970	13	9	22	7	2	9	807	194	1001	
Animal Nutrition Management	0	0	0	0	0	0	0	0	0	0	0	0	0	
Animal Disease Management	0	0	0	0	0	0	0	0	0	0	0	0	0	
Fisheries Nutrition	1	50	0	50	0	0	0	0	0	0	50	0	50	
Fisheries Management	12	391	2	393	30	5	35	2	0	2	423	7	430	
Others (pl. specify)	7	126	37	163	43	10	53	13	9	22	188	50	238	
Total	46	1354	222	1576	86	24	110	22	11	33	1462	257	1719	
Home Science	0	0	0	0	0	0	0	0	0	0	0	0	0	
Household nutritional security	2	31	0	31	0	3	3	12	14	26	43	17	60	



Area of training	No. of courses	No. of Participants											
		Other			SC			ST			Grand Total		
		M	F	T	M	F	T	M	F	T	Male	Female	Total
Economic empowerment of women	5	160	0	160	0	0	0	0	21	21	160	21	181
Drudgery reduction of women	1	0	3	3	0	5	5	5	7	12	5	15	20
Others (pl. specify)	18	570	21	591	14	6	20	12	12	24	597	38	635
Total	26	761	24	785	14	14	28	29	54	83	804	92	896
Agricultural Extension	0	0	0	0	0	0	0	0	0	0	0	0	0
Capacity Building and Group Dynamics	49	1454	60	1514	66	15	81	29	23	52	1549	98	1647
Others (pl. specify)	45	1207	141	1348	117	25	142	12	77	89	1336	243	1579
Total	94	2661	201	2862	183	40	223	41	100	141	2885	341	3226
GRAND TOTAL	374	8948	1073	10021	1230	374	1604	226	222	448	10404	1669	12073

4.3.5 Vocational Training Programme:

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

In the year 2021, 617 vocational training programmes were conducted by the KVKs of Zone V for benefit

of 3950 beneficiaries. Among these West Bengal organized 314 courses for 2340 beneficiaries and Odisha conducted 294 courses for 1519 beneficiaries, while in A & N Islands, 9 courses were organised for 91 participants. Among the courses Commercial vegetable production was most sought by the beneficiaries. A total of 102 such courses were organized for 468 beneficiaries out of which, 305 farmers were employed. While the course on mushroom cultivation gained favour among the rural youths and 346 rural youths and girls were trained through 90 courses. Other courses that gained popularity were Composite fish culture (330 participants), vermicomposting (215 participants), poultry farming (202 participants) and others. In these training programmes, a good number (1741) of SC/ST got trained which constitute 44.07% of the total beneficiaries.

Table: Vocational training conducted by KVKs of Zone V

State	No. of Courses	No. of Participants									Self employed after training			No. of persons employed else where
		Other			SC/ST			Total			Type of units	No. of units	No. of persons employed	
		M	F	T	M	F	T	M	F	T				
A & N Island	9	20	71	91	0	0	0	20	71	91	0	0	0	0
Odisha	294	650	432	1082	261	176	437	911	608	1519	135	392	407	54
West Bengal	314	659	377	1036	596	708	1304	1255	1085	2340	340	1572	1701	95

State	No. of Courses	No. of Participants									Self employed after training			No. of persons employed elsewhere
		Other			SC/ST			Total			Type of units	No. of units	No. of persons employed	
		M	F	T	M	F	T	M	F	T				
TOTAL:	617	1329	880	2209	857	884	1741	2186	1764	3950	475	1964	2108	149

Table: Thematic area-wise Vocational training program conducted by KVKs of Zone V

Area of Training	No. of courses	No. of Participants									Self employed after training			No. of persons employed elsewhere	
		Other			SC/ST			Grand Total			Type of units	No. of units	No. of persons employed		
		M	F	T	M	F	T	M	F	T					
Crop production and management	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Commercial floriculture	7	7	6	13	4	3	7	11	9	20	2	5	8	0	
Commercial fruit production	11	40	9	49	17	54	71	57	58	115	3	95	119	0	
Commercial vegetable production	102	165	99	264	67	147	214	232	236	468	24	287	298	7	
Total	120	212	114	326	88	204	292	300	318	618	29	387	425	7	
Integrated crop management	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Organic farming	9	22	3	25	9	1	10	31	4	35	2	24	24	0	
Others (pl. specify)	62	129	40	169	71	20	91	190	61	251	40	53	87	0	
Total	71	151	43	194	80	21	101	231	64	295	42	77	111	0	
Post harvest technology and value addition	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Value addition	11	0	40	40	0	52	52	0	87	87	4	67	75	0	
Others (pl. specify)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total	11	0	40	40	0	52	52	0	92	92	4	67	75	0	
Livestock and fisheries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Dairy farming	12	16	13	29	8	13	21	22	19	41	5	29	31	5	
Composite fish culture	17	142	71	213	61	162	223	203	127	330	4	571	421	47	
Sheep and goat rearing	17	38	15	53	43	9	52	55	34	89	29	38	66	4	
Piggery	7	13	0	13	5	0	5	18	14	32	1	22	22	2	
Poultry farming	32	78	54	132	238	225	463	100	102	202	40	220	256	8	
Others (pl. specify)	39	138	53	191	87	26	113	200	138	338	75	36	105	6	
Total	124	425	206	631	442	435	877	867	641	1508	154	916	901	72	
Income generation activities	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Vermicomposting	43	107	46	153	44	18	62	151	64	215	12	56	62	13	
Production of bio-agents, bio-pesticides, bio-fertilizers etc.	7	11	20	31	15	5	20	10	16	26	17	19	35	0	



Area of Training	No. of courses	No. of Participants									Self employed after training			No. of persons employed else where
		Other			SC/ST			Grand Total			Type of units	No. of units	No. of persons employed	
		M	F	T	M	F	T	M	F	T				
Repair and maintenance of farm machinery and implements	62	88	70	158	37	15	52	125	85	210	10	37	38	7
Rural Crafts	12	0	21	21	0	9	9	0	30	30	2	1	6	0
Seed production	13	43	21	64	16	9	25	48	28	76	16	15	32	2
Sericulture	1	11	2	13	1	0	1	1	0	1	13	2	15	0
Mushroom cultivation	90	155	178	333	63	70	133	142	204	346	108	318	296	20
Nursery, grafting etc.	1	12	7	19	0	0	0	12	7	19	0	0	0	0
Tailoring, stitching, embroidery, dying etc.	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
Others (pl. specify)	43	85	63	148	59	26	85	95	83	178	61	53	98	13
Total	272	512	428	940	235	152	387	747	580	1327	239	501	582	55
Agricultural Extension	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Capacity building and group dynamics	10	18	11	29	7	4	11	25	15	40	3	2	8	3
Others (pl. specify)	9	11	38	49	5	16	21	16	54	70	4	14	6	12
Total	19	29	49	78	12	20	32	41	69	110	7	16	14	15
Grand Total	617	1329	880	2209	857	884	1741	2186	1764	3950	475	1964	2108	149

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 50711 numbers of activities involving 1366393 farmers and extension officials in the state of West Bengal, Odisha and A&N Islands. Among these beneficiaries 1321713 were farmers and 44680 were extension officials. Analysis of the gender-wise participation showed that 29.57% was women beneficiaries, which is almost 1/3 of the male beneficiaries. A number of extension officials (1140) paid visit to

the KVKs and interacted with them regarding the latest technologies. Farmers in large number (56980) visited the KVKs and took knowledge about the latest technologies available in the KVK farm and nearby villages. Scientists or the KVK also regularly visited the farmers field. A total of 6507 visit were made by the scientists and during the course of visit 112252 farmers consulted with the scientists. KVKs conducted Kisan goshties for creating awareness of the different technologies and 467 such Kishan goshties were organized for 5610 beneficiaries.

KVKs also participated in 352 Kisan Melas and 124 numbers of exhibition which benefited 11406 and 17141 beneficiaries, respectively. Different technologies and successful cases were also exhibited through arranging film show for 12440 participants. Farmers seminar, workshop were also organized for creating awareness about different programmes and government schemes. In the year

2021, 79 seminars and 99 workshops were organized to cover 2564 and 5395 farmers, respectively. Advisory services were one of the most popular services sought by the farmers. In the year, 9569 such services were offered by the KVK staff for the interest of 873787 beneficiaries. Camps and clinics were also organized to show the farmers about the latest technologies through 53 soil health camps and 1420 animal health camps, 67 agri-mobile clinics were organized to benefit 2989, 58856 and 2647 beneficiaries, respectively. Farm Service Club, Group Meeting, Self help group meeting and Mahila Mandals meetings were organized to make contact of large numbers of farmers, rural youth to the KVKs, 734 such meetings were organized for benefits of 18727 rural people. Involving farmers and rural people with the KVKs by observation of different programmes like celebration of important days, mahila divas, Swachhta Hi Suraksha, International Women's Day was the objective of the KVK to create awareness regarding the government programmes.

4.4.1 State-wise details of Extension Activities conducted

State-wise analysis of the extension activities

Table: Extension activities organised by KVKs of Zone-V

Nature of Extension Activity	No. of activities	Farmers				Extension Officials			Total		
		M	F	T	SC/ST (% of total)	M	F	T	M	F	T
Field Day	727	11739	6440	18179	33.83	447	162	609	12186	6602	18788
Kisan Mela	352	7762	3082	10844	11.6	474	88	562	8236	3170	11406
Kisan Ghosthi	467	2611	2051	4662	19.95	903	45	948	3514	2096	5610
Exhibition	124	10929	5464	16393	15.74	483	265	748	11412	5729	17141
Film Show	519	7758	4252	12010	19.98	290	140	430	8048	4392	12440
Method Demonstrations	539	6555	3546	10101	20.38	455	169	624	7010	3715	10725
Farmers Seminar	79	1643	778	2421	20.11	108	35	143	1751	813	2564
Workshop	99	3199	1861	5060	18.36	220	115	335	3419	1976	5395
Group meetings	488	6020	3291	9311	17.16	328	168	496	6348	3459	9807
Lectures delivered as resource persons	1179	20768	10747	31515	20.15	1199	750	1949	21967	11497	33464
Advisory Services	9569	616876	228086	844962	27.89	22843	5982	28825	639719	234068	873787
Scientific visit to farmers field	6507	74723	37529	112252	40.15	1375	512	1887	76098	38041	114139
Farmers visit to KVK	22477	37392	19588	56980	32.9	819	321	1140	38211	19909	58120

showed that the KVKs of A&N Islands conducted various extension activities for the benefit of 5153 participants. Maximum number of participants (1483) benefitted from Advisory Services. Mahila Mandals Conveners meetings were provided to 781 participants and Farmers visit to KVK was done by 618 participants as well as celebration of important days by 515 participants.

West Bengal with 23 KVKs organized various extension activities for benefit of 573768 farmers, farm women, rural youth and extension functionaries. Major extension activities included advisory services (288585), scientist visit to farmers field (75738), animal health camps (57096), farmers visit to KVK (19998) etc.

All the 33 KVKs of Odisha carried out different extension activities involving 787472 participants. The highest participation was in advisory services (583719), the next being scientists' visit to farmers' field (38140). Other important extension activities organized by KVKs of Odisha included farmers' visit to KVK (37504), Lectures delivered as resource persons (23257), Exhibition (12353) etc.



Nature of Extension Activity	No. of activities	Farmers				Extension Officials			Total		
		M	F	T	SC/ST (% of total)	M	F	T	M	F	T
Diagnostic visits	3745	12080	4783	16863	19.41	1057	715	1772	13137	5498	18635
Exposure visits	547	5172	2298	7470	15.95	259	97	356	5431	2395	7826
Ex-trainees Sammelan	78	1577	656	2233	8.71	89	22	111	1666	678	2344
Soil health Camp	53	2125	717	2842	9.64	107	40	147	2232	757	2989
Animal Health Camp	1420	28243	30429	58672	12.46	150	34	184	28393	30463	58856
Agri mobile clinic	67	1512	966	2478	6.13	136	33	169	1648	999	2647
Soil test campaigns	115	2403	848	3251	10.94	102	31	133	2505	879	3384
Farm Science Club Conveners meet	63	1321	230	1551	8.59	74	22	96	1395	252	1647
Self Help Group Conveners meetings	145	2908	2373	5281	13.61	90	99	189	2998	2472	5470
Mahila Mandals Conveners meetings	38	675	1082	1757	6	33	13	46	708	1095	1803
Celebration of important days (specify)	328	8444	5282	13726	24.77	461	199	660	8905	5481	14386
Sankalp Se Siddhi	71	1923	1565	3488	18.77	347	76	423	2270	1641	3911
Swatchta Hi Sewa	372	6370	2962	9332	27.86	411	118	529	6781	3080	9861
Mahila Kisan Divas	107	2709	2467	5176	31.83	158	122	280	2867	2589	5456
Any Other (Specify)	436	42865	10038	52903	31.82	591	298	889	43456	10336	53792
Total	50711	928302	393411	1321713	19.45	34009	10671	44680	962311	404082	1366393

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

Nature of Extension Activity	A & N Islands			Odisha			West Bengal			Total		
	M	F	T	M	F	T	M	F	T	M	F	T
Field Day	55	69	124	5746	3300	9046	6385	3233	9618	12186	6602	18788
Kisan Mela	0	0	0	3298	1519	4817	4938	1651	6589	8236	3170	11406
Kisan Ghosthi	103	111	214	838	484	1322	2573	1501	4074	3514	2096	5610
Exhibition	4	23	27	8705	3648	12353	2703	2058	4761	11412	5729	17141
Film Show	54	63	117	5472	3114	8586	2522	1215	3737	8048	4392	12440
Method Demonstrations	40	45	85	4085	2647	6732	2885	1023	3908	7010	3715	10725
Farmers Seminar	9	9	18	1006	558	1564	736	246	982	1751	813	2564
Workshop	65	10	75	1935	890	2825	1419	1076	2495	3419	1976	5395

Nature of Extension Activity	A & N Islands			Odisha			West Bengal			Total		
	M	F	T	M	F	T	M	F	T	M	F	T
Group meetings	41	33	74	4147	2049	6196	2160	1377	3537	6348	3459	9807
Lectures delivered as resource persons	76	48	124	14252	9005	23257	7639	2444	10083	21967	11497	33464
Advisory Services	841	642	1483	394867	188852	583719	244011	44574	288585	639719	234068	873787
Scientific visit to farmers field	145	116	261	25970	12170	38140	49983	25755	75738	76098	38041	114139
Farmers visit to KVK	410	208	618	23977	13527	37504	13824	6174	19998	38211	19909	58120
Diagnostic visits	25	24	49	8461	3744	12205	4651	1730	6381	13137	5498	18635
Exposure visits	25	27	52	2102	1436	3538	3304	932	4236	5431	2395	7826
Ex-trainees Sammelan	0	0	0	830	388	1218	836	290	1126	1666	678	2344
Soil health Camp	10	34	44	1304	414	1718	918	309	1227	2232	757	2989
Animal Health Camp	31	37	68	1204	488	1692	27158	29938	57096	28393	30463	58856
Agri mobile clinic	0	0	0	686	252	938	962	747	1709	1648	999	2647
Soil test campaigns	0	0	0	1776	640	2416	729	239	968	2505	879	3384
Farm Science Club Conveners meet	14	2	16	752	126	878	629	124	753	1395	252	1647
Self Help Group Conveners meetings	2	23	25	835	1345	2180	2161	1104	3265	2998	2472	5470
Mahila Mandals Conveners meetings	335	446	781	63	435	498	310	214	524	708	1095	1803
Celebration of important days (specify)	296	219	515	4611	3726	8337	3998	1536	5534	8905	5481	14386
Sankalp Se Siddhi	72	91	163	1644	951	2595	554	599	1153	2270	1641	3911
Swatchta Hi Sewa	8	8	16	2377	1487	3864	4396	1585	5981	6781	3080	9861
Mahila Kisan Divas	0	109	109	1270	1514	2784	1597	966	2563	2867	2589	5456
Any Other (Specify)	20	75	95	3736	2814	6550	39700	7447	47147	43456	10336	53792
Total	2681	2472	5153	525949	261523	787472	433681	140087	573768	962311	404082	1366393

4.4.2 Other Extension Activities

The KVKs of Zone V also gave extensive coverage of their programme through social network and print media. A total of 5737 Extension Literatures were

developed while 703 news coverage in newspaper, 205 TV talks and 172 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	703
Radio talks	172
TV talks	205
Popular articles	157
Extension Literature	5737
Other, if any	127
TOTAL	7101

5.0 Production of Seed, Planting Materials and Bio-Products

5.1 Seed Production:

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

recently released varieties of different crops, thus helps in spread of such varieties.

State-wise analysis of seed production programme showed that A&N Islands produced 14.26 q seeds which benefitted 73 farmers and earned Rs.49910/- in 2021. Odisha produced 3290.97 q seeds, West Bengal produced 17641.39 q seeds in 2021. Total value of seeds was about Rs.40812342/- which benefitted more than 1433 farmers to get seeds of recent varieties.

Table: State-wise total Seed production by KVKs

Sl. No.	State	Village Seed			KVK seed			Total		
		Quantity of seed (q)	Value (Rs)	No. of farmers	Quantity of seed (q)	Value (Rs)	No. of farmers	Quantity of seed (q)	Value (Rs)	No. of farmers
1	A & N Islands	0	0	0	14.26	49910	0	14.26	49910	0
2	Odisha	12.1	111804	25	3278.87	8401788	0	3290.97	8513592	25
3	West Bengal	4908.58	25571575	1408	12732.81	6677265	0	17641.39	32248840	1408
	Total	4920.68	25683379	1433	16025.94	15128963	0	20946.62	40812342	1433

The total production of seed in rice was 17659.82 q which benefitted 7411 farmers. After rice, pulse seed production was given importance and 741.00 q seed of black gram, 665.33 q lentil, 328.9 q green

gram seeds were produced through village and KVK seed production programme. In oilseeds, 529.16 q of sesame, 323.53 q of mustard, and 180.6 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	2505.75	5436240	547	15154.07	12996912	0	17659.82	18433152	547
	Wheat	16	160000	16	3	10500	0	19	170500	16
	Maize	0	0	0	84.9	19900	0	84.9	19900	0
	Total	2521.75	5596240	563	15241.97	13027312	0	17763.72	18623552	563
Oilseeds	Mustard	243.3	1602500	98	80.23	341380	0	323.53	1943880	98
	Toria	0	0	0	0	0	0	0	0	0
	Linseed	2.2	16000	5	1	6900	0	3.2	22900	5
	Niger	0	0	0	0.8	6698	0	0.8	6698	0
	Sesame	426.6	3895000	78	102.56	141150	0	529.16	4036150	78
	Groundnut	174.95	978175	105	5.65	31920	0	180.6	1010095	105
	Soybean	0	0	0	0	0	0	0	0	0
	Rai	0	0	0	0	0	0	0	0	0
	Sun Flower	0	0	0	2.33	84620	0	2.33	84620	0
	Toria	0	0	0	0	0	0	0	0	0
	Total	847.05	6491675	286	192.57	612668	0	1039.62	7104343	286
	Pulses	Redgram	10	85300	16	1.6	15248	0	11.6	100548
Chickpea		68	442000	70	0	0	0	68	442000	70
Lentil		604.63	5967960	134	60.7	240100	0	665.33	6208060	134
Greengram		142.95	1050500	72	186.02	224850	0	328.97	1275350	72
Blackgram		694.2	5877900	218	46.8	230684	0	741	6108584	218
Pea		12.1	111804	25	0	0	0	12.1	111804	25
Cowpea		0	0	0	0	0	0	0	0	0
Rajmash		0	0	0	0	0	0	0	0	0
Total	1531.88	13535464	535	295.12	710882	0	1827	14246346	535	
Commercial crops	Potato	0	0	41	15.3	46300	0	15.3	46300	41
	Sugarcane	0	0	0	65	16900	0	65	16900	0
	Total	0	0	41	80.3	63200	0	80.3	63200	41
Vegetables	Okra	0	0	0	0.2	10000	0	0.2	10000	0
	Tomato	0	0	0	0	0	0	0	0	0
	Palak	0	0	0	0	0	0	0	0	0
	Radish	0	0	0	0	0	0	0	0	0
	Onion	0	0	0	0	0	0	0	0	0
	chilli	0	0	0	0	0	0	0	0	0
	Brinjal	0	0	0	0	0	0	0	0	0
	Lobia	0	0	0	3	12900	0	3	12900	0
Total	0	0	0	3.2	22900	0	3.2	22900	0	
Spices	Coriander	0	0	0	0	0	0	0	0	0
	Ginger	0	0	0	0.6	4200	0	0.6	4200	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
	Methi	0	0	0	0	0	0	0	0	0
	Turmeric	0	0	0	46.5	142500	0	46.5	142500	0
	Fenugrick	0	0	0	0	0	0	0	0	0
	Total	0	0	0	47.1	146700	0	47.1	146700	0
Fodder crop seeds	Rice Bean	0	0	0	2	10686	0	2	10686	0
	Barseem	0	0	0	2.5	14175	0	2.5	14175	0
	Total	0	0	0	4.5	24861	0	4.5	24861	0
Fiber crops	Jute	0	0	0	0	0	0	0	0	0
	Sunhemp	0	0	0	7.4	42180	0	7.4	42180	0
	Total	0	0	0	7.4	42180	0	7.4	42180	0
Others	Dhaincha	0	0	0	7.35	29150	0	7.35	29150	0
	Broom Stick	0	0	0	0.9	0	0	0.9	0	0
	Elephant Footyam	20	60000	8	144.12	446710	0	164.12	506710	8
	Sisbania	0	0	0	1.41	2400	0	1.41	2400	0
	Total	20	60000	8	153.78	478260	0	173.78	538260	8
Total		4920.68	25683379	1433	16025.94	15128963	0	20946.62	40812342	1433

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	14.26	49910	0	3172.1	8138557	0	14473.46	10244685	547	17659.82	18433152	547
Wheat	0	0	0	0	0	0	19	170500	16	19	170500	16
Maize	0	0	0	0	0	0	84.9	19900	0	84.9	19900	0
Total	14.26	49910	0	3172.1	8138557	0	14577.36	10435085	563	17763.72	18623552	563
Oilseeds												
Mustard	0	0	0	0	0	0	323.53	1943880	98	323.53	1943880	98
Toria	0	0	0	0	0	0	0	0	0	0	0	0
Linseed	0	0	0	1	6900	0	2.2	16000	5	3.2	22900	5
Niger	0	0	0	0.8	6698	0	0	0	0	0.8	6698	0
Sesame	0	0	0	0	0	0	529.16	4036150	78	529.16	4036150	78
Groundnut	0	0	0	0	0	0	180.6	1010095	105	180.6	1010095	105
Soybean	0	0	0	0	0	0	0	0	0	0	0	0
Rai	0	0	0	0	0	0	0	0	0	0	0	0
Sun Flower	0	0	0	0	0	0	2.33	84620	0	2.33	84620	0
Toria	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
Total	0	0	0	1.8	13598	0	1037.82	7090745	286	1039.62	7104343	286
Pulses												
Redgram	0	0	0	1.6	15248	0	10	85300	16	11.6	100548	16
Chickpea	0	0	0	0	0	0	68	442000	70	68	442000	70
Lentil	0	0	0	0	0	0	665.33	6208060	134	665.33	6208060	134
Greengram	0	0	0	2.4	24000	0	326.57	1251350	72	328.97	1275350	72
Blackgram	0	0	0	10.72	80794	0	730.28	6027790	218	741	6108584	218
Pea	0	0	0	12.1	111804	25	0	0	0	12.1	111804	25
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	0	0	0	26.82	231846	25	1800.18	14014500	510	1827	14246346	535
Commercial crops												
Potato	0	0	0	0	0	0	15.3	46300	41	15.3	46300	41
Sugarcane	0	0	0	65	16900	0	0	0	0	65	16900	0
Total	0	0	0	65	16900	0	15.3	46300	41	80.3	63200	41
Vegetables												
Okra	0	0	0	0	0	0	0.2	10000	0	0.2	10000	0
Tomato	0	0	0	0	0	0	0	0	0	0	0	0
Palak	0	0	0	0	0	0	0	0	0	0	0	0
Radish	0	0	0	0	0	0	0	0	0	0	0	0
Onion	0	0	0	0	0	0	0	0	0	0	0	0
chilli	0	0	0	0	0	0	0	0	0	0	0	0
Brinjal	0	0	0	0	0	0	0	0	0	0	0	0
Lobia	0	0	0	0	0	0	3	12900	0	3	12900	0
Total	0	0	0	0	0	0	3.2	22900	0	3.2	22900	0
Spices												
Coriander	0	0	0	0	0	0	0	0	0	0	0	0
Ginger	0	0	0	0	0	0	0.6	4200	0	0.6	4200	0
Methi	0	0	0	0	0	0	0	0	0	0	0	0
Turmeric	0	0	0	9	31500	0	37.5	111000	0	46.5	142500	0
Fenugrick	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	9	31500	0	38.1	115200	0	47.1	146700	0
Fodder crop seeds												
Rice Bean	0	0	0	2	10686	0	0	0	0	2	10686	0
Barseem	0	0	0	2.5	14175	0	0	0	0	2.5	14175	0
Total	0	0	0	4.5	24861	0	0	0	0	4.5	24861	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
Fiber crops												
Jute	0	0	0	0	0	0	0	0	0	0	0	0
Sunhemp	0	0	0	7.4	42180	0	0	0	0	7.4	42180	0
Total	0	0	0	7.4	42180	0	0	0	0	7.4	42180	0
Others												
Dhaincha	0	0	0	4.35	14150	0	3	15000	0	7.35	29150	0
Broom Stick	0	0	0	0	0	0	0.9	0	0	0.9	0	0
Elephant Footyam	0	0	0	0	0	0	164.12	506710	8	164.12	506710	8
Sisbania	0	0	0	0	0	0	1.41	2400	0	1.41	2400	0
Total	0	0	0	4.35	14150	0	169.43	524110	8	173.78	538260	8
Total	14.26	49910	0	3290.97	8513592	25	17641.39	32248840	1408	20946.62	40812342	1433

5.2 Planting Material Production

Number of fruits and vegetable crops are grown in the states of West Bengal, Odisha and A&N Islands. Very few nurseries are available in these states which supply quality planting materials to the farmers. To address this problem KVKs took up planting material production programme in the district level to provide direct access to the farmers to the planting materials. In the year 2021, KVKs of Zone V produced 59.8 lakh planting materials of graft, gooties, sapling, seedlings and bulbs of fruits

and vegetables and earned Rs.113.08 lakh which benefitted 39893 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 3800 number of planting materials, Odisha produced 4314926 number of planting materials and West Bengal produced 1660460 number of planting materials in the year 2021.

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	148004	419666.5	3006	131847	225870	974	279851	645536.5	3980
	Cabbage	0	0	0	128459	191407	2196	168279	268451	776	296738	459858	2972
	Tomato	733	6380	179	567732	1014017	3942	267834	586185	932	836299	1606582	5053
	Brinjal	1012	7848	194	429321	590416	3203	248736	535757	812	679069	1134021	4209
	Chilli	765	5816	187	260630	474300.5	3365	266361	247408	602	527756	727524.5	4154
	Onion	0	0	0	2451827	227770	2494	95357	142800	482	2547184	370570	2976
	Others	0	0	0	143723	279912	1277	122055	417505	671	265778	697417	1948
	Total	2510	20044	560	4129696	3197489	19483	1300469	2423976	5249	5432675	5641509	25292

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		
Fruits	Man-go	0	0	0	2368	58630	292	40785	407572	426	43153	466202	718
	Guava	55	5580	27	1566	62775	109	19556	279702	520	21177	348057	656
	Lime	3	150	1	1340	37365	74	42278	774030	730	43621	811545	805
	Papa-ya	413	3480	137	45123	834569	1882	52554	376710	417	98090	1214759	2436
	Ba-nana	75	2625	12	3942	51525	469	27610	239900	341	31627	294050	822
	Others	2	100	1	10255	260381	890	41934	441150	1445	52191	701631	2336
	Total	548	11935	178	64594	1305245	3716	224717	2519064	3879	289859	3836244	7773
Ornamental plants	Orna-mental plants	250	10000	40	24547	44210	102	33895	173525	282	58692	227735	424
	Total	250	10000	40	24547	44210	102	33895	173525	282	58692	227735	424
Medicinal and Aromatic	Med-icinal and Aromatic	0	0	0	769	31410	105	5800	35250	92	6569	66660	197
	Total	0	0	0	769	31410	105	5800	35250	92	6569	66660	197
Plantation	Plan-tation	150	1500	8	1769	29035	178	17700	266500	857	19619	297035	1043
	Total	150	1500	8	1769	29035	178	17700	266500	857	19619	297035	1043
Spices	Tur-meric	0	0	0	129	9465	16	4681	214805	220	4810	224270	236
	Others	0	0	0	0	0	0	50	10000	19	50	10000	19
	Total	0	0	0	129	9465	16	4731	224805	239	4860	234270	255
Tuber	Ele-phant yams	0	0	0	20850	17550	40	4470	553850	542	25320	571400	582
	Total	0	0	0	20850	17550	40	4470	553850	542	25320	571400	582
Fodder crop sap-plings	Fod-der crop sap-plings	0	0	0	21515	31965	138	45172	88240	121	66687	120205	259
	Total	0	0	0	21515	31965	138	45172	88240	121	66687	120205	259
Forest Species	Forest Species	325	2600	4	3898	41620	1265	4870	34950	219	9093	79170	1488
	Total	325	2600	4	3898	41620	1265	4870	34950	219	9093	79170	1488
Others, pl. specify	Others	17	460	2	47159	191348	2287	18636	41722	291	65812	233530	2580
	Total	17	460	2	47159	191348	2287	18636	41722	291	65812	233530	2580
Grand Total		3800	46539	792	4314926	4899337	27330	1660460	6361882	11771	5979186	11307758	39893



5.3 Production of Bio-Product

There is lot of demand of organic fertilizers at village level 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 vermicompost and bio-fertilizer in large scale. In the state of Odisha, 28444 kg

of biofertilizers and 8407.7 kg of bio-agent were produced which benefitted 1360 farmers and earned a value of Rs.587585/- in 2021. In West Bengal 49050 kg of bio-agent and 49000 kg of biofertilizers were produced which benefitted 2682 farmers and earned Rs.486835/- in 2021. The total production of bio products was 252907.2 kg in 2021 under zone V which benefitted 6063 farmers and earned value of Rs.1942589/-.

Table: Production of bio-product by KVKs

Name of the product	A & N Islands			Odisha			West Bengal			Total		
	Quantity (Kg.)	Value (Rs.)	Number of farmers	Quantity (Kg.)	Value (Rs.)	Number of farmers	Quantity (Kg.)	Value (Rs.)	Number of farmers	Quantity (Kg.)	Value (Rs.)	Number of farmers
Bio-fertilizers	0	0	0	28444	423385	999	49000	431835	2652	77444	855220	3651
Bio-pesticide	100	18000	53	854.5	25450	22	1673	64580	213	2627.5	108030	288
Bio-fungicide	0	0	0	0	0	0	3265.5	45000	58	3265.5	45000	58
Bio-agents	120	5400	60	8407.7	164200	361	49050	55000	30	57577.7	224600	451
Others, please specify.	0	0	0	9153.5	260000	488	102839	449739	1127	111992.5	709739	1615
Total	220	23400	113	46859.7	873035	1870	205827.5	1046154	4080	252907.2	1942589	6063

5.4 Livestock And Fishery

Livestock strains, like chicks, eggs, piglets, fingerlings, spawns etc. are supplied to the farmers by KVKs through their livestock production programmes. In the year 2021, A&N Islands produced 3058 chicks, 120 Indian carp. which earned Rs.21736/- after making available to the farmers. In the state of Odisha 55311 chicks, 9347 layer chicks, 7602 broiler chicks, 6511 ducks, 2251000 fingerlings of major carps, Mixed carp (57000), Spawn (24868.5) were produced which makes total production of 2446697

livestock and fish produced in the state of Odisha in 2021. It benefitted 5956 farmers and earned revenue of Rs.6502458/-. In the state of West Bengal chick production was 40030, Japanese Quail was 3606 and in fish production, 37164635 no. of Indian Carp was produced followed by 1850000 exotic carp. Total production of livestock and fish was 49799048 in 2021 in the state of West Bengal. It benefitted 3879 farmers and earned Rs.7258185/-. In the entire Zone V, the total production of livestock and fish was 52251119 number in 2021 which benefitted 10051 farmers and earned Rs. 13782379/-.

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	26	530000	7	26	530000	7
Buffaloes	0	0	0	0	0	0	0	0	0	0	0	0
Calves	0	0	0	0	0	0	26	320000	2	26	320000	2



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		
Others (Pl. specify)	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	52	850000	9	52	850000	9
Small ruminants												
Sheep	0	0	0	0	0	0	58	192000	63	58	192000	63
Goat	0	0	0	5	13900	4	495	1075400	137	500	1089300	141
Other, please specify	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	5	13900	4	553	1267400	200	558	1281300	204
Poultry												
Broilers	0	0	0	7602	611480	396	40030	408213	44	47632	1019693	440
Layers	0	0	0	9347	722380	509	205	94350	1295	9552	816730	1804
Duals (broiler and layer)	3058	12232	97	55311	3174185	3084	2877	414890	195	61246	3601307	3376
Japanese Quail	0	0	0	1363	46360	5	3606	15738	254	4969	62098	259
Turkey	0	0	0	151	53780	0	400	70000	105	551	123780	105
Emu	0	0	0	0	0	0	0	0	0	0	0	0
Ducks	0	0	0	6511	407910	130	4397	145495	152	10908	553405	282
Others (Pl. specify)	2196	8784	116	2419	129235	209	8425	446102	412	13040	584121	737
Total	5254	21016	213	82704	5145330	4333	59940	1594788	2457	147898	6761134	7003
Piggery												
Piglet	0	0	0	0	0	0	80	361500	12	80	361500	12
Hog	0	0	0	0	0	0	0	0	0	0	0	0
Others (Pl. specify)	0	0	0	0	0	0	333	1665	17	333	1665	17
Total	0	0	0	0	0	0	413	363165	29	413	363165	29
Fisheries												
Indian carp	120	720	3	1119	115470	169	37164635	784447	309	37165874	900637	481
Exotic carp	0	0	0	12500	15000	36	1850000	58090	16	1862500	73090	52
Mixed carp	0	0	0	57000	48450	129	198950	460000	223	255950	508450	352
Fish fingerlings	0	0	0	2251000	727872	542	72865	301550	222	2323865	1029422	764
Spawn	0	0	0	24868.5	355586	660	50020	50000	41	74888.5	405586	701
Others (Pl. specify)	0	0	0	17500.5	80850	83	10401620	1528745	373	10419120.5	1609595	456
Total	120	720	3	2363988	1343228	1619	49738090	3182832	1184	52102198	4526780	2806
Grand Total	5374	21736	216	2446697	6502458	5956	49799048	7258185	3879	52251119	13782379	10051

6.0 Soil, Water and Plant Sample Analysis

Scientists engaged in the KVKs under ATARI Kolkata motivated farmers through conducting various awareness and training programmes for testing soil before cultivation in their land to decrease indiscriminate use of fertilizers, and to control environmental and other health hazards. Besides those, scientists tested a large number of water samples in their KVK laboratories taken by

the farmers for quality analysis. A total of 48580 soilsamples (6593 through mini soil testing kit/labs and 41987 through soil testing laboratory) were tested from 1750 villages which benefitted total 53066 farmers in this Zone. A minimum amount was charged from farmers for testing each soil sample. Thus, KVKs of ICAR-ATARI Kolkata earned about Rs. 11.24 lakh during the period.

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

State	Number of soil samples analyzed			No. of Farmers	No. of Villages	Amount realized (in Rs.)
	Through mini soil testing kit/labs	Through soil testing laboratory	Total			
A & N Islands	0	85	85	75	15	0
Odisha	4296	3043	7339	14776	538	6830
West Bengal	2297	38859	41156	38215	1197	1116929
Total	6593	41987	48580	53066	1750	1123759

7.0 Soil Health Cards Distribution and Observance of World Soil Day

Nodal Scientist: Dr. F. H. Rahman

There are nearly 1000 Soil Testing Laboratories in India, which in the present scenario are not sufficient to cater the soil testing needs of the farming sector. Moreover since the access to these laboratories is beyond the reach of many farmers owing to the distances between the villages and the laboratory location and of course the transportation costs involved, most of the farmers do not get their soils tested. Also the awareness among the farmers to check the health of their soils is a major concern. As a result, farmers seldom get their soils tested, and even if they get it tested, they don't get the reports on time i.e., before sowing/planting of their crops, and thus continue to use fertilizers in an ad hoc manner depending upon their resources and availability of the fertilizers in the market. Such indiscriminate or inadequate use of fertilizers over the years without soil testing is considered as one of the major reasons for the deterioration of soil fertility at a large scale. There was a long felt need of a quantitative

soil test kit and bring the awareness among farmers of the benefits of soil testing and controlled usage of fertilizer and thus save the health of their soil. December 5 is declared as 'World Soil Day' by the International Union of Soil Sciences and to celebrate the importance of soil as a critical component of the natural system and as a vital contributor to human wellbeing, all the KVKs have organized Seminar/symposia/workshop. The World Soil Day campaign aims to connect people with soil and raise awareness on their critical importance in our lives. One of the several ways of connecting people with soils is to restore and preserve the soil health. All the KVKs of Zone-V distributed the soil health cards among the farmers. A total of 12780 numbers of Soil Health Cards were prepared during the year, out of which 1005 nos. SHCs were distributed on World Soil Day, Dec 5, 2021 by the public representatives like MP/MLAs and others in the respective KVKs. State wise distribution of soil health cards are presented in the following table.

Table: Soil Health Card prepared and distributed during the year

KVK	No of soil samples collected	No. of samples analyzed	SHC issued	No of Farmers benefitted
A & N Islands	85	105	105	105
Odisha	3325	3325	5685	5685
West Bengal	3510	3510	6990	6990
Total	6920	6920	12780	12780



8.0 Revenue Generation:

The KVK scientists under ATARI Kolkata were actively involved in receiving funds from a large number of external sources through sanctioning 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 2021, KVKs of this zone managed to

receive funds from State Department of Agriculture, Central Government, RKVY, NABARD, ATMA and many others. A total of Rs. 251 lakh revenue was generated by the KVKs of ICAR-ATARI. Out of this, Andaman and Nicobar Islands KVKs generated fund of Rs. 0.60 lakh, Odisha KVKs of Rs. 6.53 lakh and West Bengal KVKs of Rs. 244.58 lakh.

Table: Revenue generation by KVKs

State/UT	Amount (Rs.)
A & N Islands	59,801
Odisha	6,52,981
West Bengal	2,44,58,245
Total	2,51,71,027

9.0 Revolving fund status

Sl. No.	State	Opening balance as on 1 st April	Income during the year	Expenditure during the year	Net balance in hand as on 1 st April of each year (Kind + cash)
1	Odisha	5959670.51	20114249	15460716	10613203.51
2	West Bengal	107559872.2	31309725	42814250	96055347.2
	Total	113519542.71	51423974	58274966	106668550.51

10.0 Publication by KVKs

During 2021, KVK scientists were actively engaged in preparing and publishing research papers, technical bulletins, newsletters, popular articles, leaflets/ pamphlets, DVD/CD etc. to highlight the achievements of research and other related activities and to make it available to other KVKs, SAUs, ICAR institutes, line departments, ATMA, NABARD, other agencies, farmers and other stake holders. A total of 49377 publications comprising of 109 research papers, 41 symposia papers, 8280 newsletters, 2079 popular articles, 4645 books,

2308 book chapters, 27154 extension pamphlets/ literature, 3046 bulletins, 441 technical reports and 709 electronic publications were made by the KVK personnel of this Zone. The total number of circulation was 80465. The Andaman & Nicobar Islands KVKs have published 41 publications which was circulated among 30 beneficiaries. Similarly, KVKs of Odisha and West Bengal state published 24588 and 24748 publications, respectively. In the respective state, number of circulation was 31923 and 48512 during the period.

Table: Publication by KVKs under ICAR-ATARI, Kolkata

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	7	0	3	53	250	11	49	0	14	109	250	28
Seminar/ conference/ Symposia papers	1	0	1	5	150	4	35	4	10	41	154	15
Books	1	0	1	4397	2195	11	247	1169	11	4645	3364	23
Bulletins	0	0	0	1327	1195	6	1719	1618	6	3046	2813	12
News letter	0	0	0	7870	10946	24	410	403	4	8280	11349	28
Popular Articles	1	0	1	2024	2500	11	54	1104	13	2079	3604	25
Book Chapter	1	0	1	2265	2252	9	42	129	9	2308	2381	19
Extension Pamphlets / literature	30	30	1	5376	9676	20	21748	29418	17	27154	39124	38
Technical reports	0	0	0	275	204	20	166	12	10	441	216	30
Electronic Publication (CD/ DVD etc)	0	0	0	481	310	13	228	4655	10	709	4965	23
Others	0	0	0	515	2245	5	50	10000	3	565	12245	8
Total	41	30	8	24588	31923	134	24748	48512	107	49377	80465	249

11.0 Scientific Advisory Committee Meetings

The Scientific Advisory Committee (SAC) Meeting is being organized by the KVKs every year to finalize the Action Plan for the coming year. As per the guidelines of ICAR, the committee comprises of representatives from ICAR-ATAR Kolkata, Host Organization, other nearby ICAR Institutes, State Agricultural Universities, development departments of the district, media personnel, financial institutions, progressive farmers and farm women and others. It was assured that all nominated members were present in the meeting. During the year 2021, out of total 59 KVKs of ICAR-ATARI Kolkata conducted 53 SAC meeting. Thirty-three KVKs of Odisha state conducted 33 SAC meeting and 23 KVKs of West Bengal state conducted 17 meeting. Whereas, 3 KVKs of Andaman & Nicobar Islands conducted one meeting during the period. The meeting was attended by 1509 participants.

Sl. No.	State/UT	No. of SAC meeting	No. of participants
1	A & N Islands	3	96
2	Odisha	33	1038
3	West Bengal	17	375
Total		53	1509

12.0 Technology Backstopping by Directorates of Extension Education

The Directors/ Dean of Extension Education (DEEs) of State Agricultural Universities (SAUs) under this Zone played important role to transfer latest agricultural technologies which were available at various Research Institutes and SAUs for agricultural farmers through conducting on-farm trials (OFTs), front line demonstrations (FLDs), training programmes, hands-on-trainings and other related activities at their KVKs during the year 2021. All fifty nine KVKs under ICAR-ATARI Kolkata were distributed under the jurisdiction of four DEEs irrespective of any host organizations. The Extension Directorate of Odisha University of Agriculture and Technology (OUAT), Bhubaneswar had been allotted with 33 KVKs; Bidhan Chandra Krishi Viswavidyalaya (BCKV), Mohanpur with 17 KVKs; Uttar Banga Krishi Viswavidyalaya (UBKV), Pundibari with 6 KVKs and West Bengal University of Animal and Fishery Sciences (WBUAFS), Belgachhia with 3 KVKs.

The year 2021 was very stressful to every human being in this globe/ country as the time was passing through the COVID-19 pandemic and repeated lockdown situations. People were worried about their health, regular jobs, source of income, production/ marketing of agricultural produce, arrangement of

food for their families and so on. Under this adverse situations, all the Directorates conducted HRD programmes, meetings, workshops, exposure visits and interface meetings considering the demands of KVK personnel for improving their skills.

All the Directorates under ICAR-ATARI Kolkata organised 20 different HRD programmes involving 237 KVKs during 2021 which benefitted 2584 KVK personnel. Maximum programme (7) was conducted by OUAT, Bhubaneswar followed by WBUAFS, Kolkata (6 programmes), BCKV (4 programmes) and UBKV, Pundibari (3 programmes). The area of training programmes/ workshops/ meetings were on crop improvement, production and management; hydroponics and protected cultivation; entrepreneurship development through hi-tech horticulture; strengthening of KVK activities; scientific agri-horticultural practices, animal husbandry/aqua-cultural practices to augment small farmers' income; dissemination of agricultural related advisories; upscaling of various resilience related technologies; review meetings; workshops on physical and financial progress; finalizing action plan of KVKs and many more.

The DEEs and/ or their officials visited their KVKs for 162 occasions to attend various programmes viz.

SAC meeting, celebration of field day, technology week, 'World Soil Day', 'Swatchh Bharat', 'World Women Day', inaugurating training programmes/workshops, DAESI programme, Rabi campaign, Kharif campaign etc. organized by their KVKs. Due to COVID-19 pandemic situations in the country, visits were restricted from all aspects. However, the officials from DEE, OUAT, Bhubaneswar visited their KVKs for 48 times involving 43 KVKs, from WBUAFS 58 times involving 23 KVK, from UBKV for 26 times with 12 KVKs and from BCKV for 30 times with 11 KVKs during the period under report.

During the year 2021, frequent visits of OFT and FLD fields pertaining to KVKs and farmers' were made by DEE officials to oversee KVK field activities, to provide technical advices and to enrich knowledge and skill of KVK personnel. The Directorate officials from BCKV, Mohanpur visited OFT fields for 9 occasions and FLD for 17 occasions to conduct multi-location trials, to promote coloured capsicum at farmers' fields, to collect seed materials and to use in further breeding programmes, to cultivate conventional crops with conventional methods and so on. The farmers' feedback was found to be positive. Similarly, UBKV officials visited OFT for 8 times and FLD fields for 15 times to identify area specific problems of agricultural farmers and to provide their solutions, to maintain data/records, to maintain experimental fields, to collect farmers' feedback etc. The number of field visits by the officials of WBUAFS, Belgachhia were noted to be 14 and 16 for OFT and FLD, respectively to monitor the performance of experimental animals under different experimental conditions, to compare the performance of experimental and control fields, to maintain experimental data including records, to suggest and to note farmers' feedback. On the other hand, OUAT, Bhubaneswar officials visited OFT and FLD fields for 20 and 42 times, respectively to monitor the performance of different new crop varieties with line department officials, to assess the performance of crops under different management strategies, to check adoption of new poultry breed like *Kadakhnath* and *Vanraja*, to check new technology adoption by farmers, to check appropriate display with banner/board of experimental fields, to verify the process of data collection and maintenance, to

collect farmers' feedback etc. In addition, BCKV officials monitored orchard development, land shaping at the KVKs through 5 visits. The officials of WBUAFS visited thrice to see the performance of low-cost mini fish hatchery for IMC, to assess field demonstration sponsored by ATMA and demonstration units sponsored by RKVY. Not only that, OUAT officials visited a substantial number (6) of times to monitor different activities related to NICRA, ARYA, Biotech-Kisan activities etc.

As per implementation of technologies were concerned, the Directorate of BCKV, Mohanpur evaluated about 15 technologies involving 50 KVKs. Out of those technologies, pre-emergence application of Pendimethalin and application of Imazethapyr, cultivation of off-season pui with artificial lighting of red colour, growing luna sankhi in salt effected areas, introduction of '*Bidhan Kusum*' variety of EFY, promotion of high-yielding banana variety G-9, management of thrips in watermelon, application of bio-fertilizer on disease management and yield of groundnut, use of seed-storage container to increase storability of cucumber seeds, seed priming for increasing yield of lentil in irrigated farming situation of new alluvial soil, application of boron and sulphur fertilization for increasing yield and quality of mustard in rabi season, eco-friendly management of fruit fly in cucurbits, promotion of mushroom production technology, marigold cultivation etc. were important. The UBKV, Pundibari implemented 31 technologies in 20 KVKs viz. effect of planting dates on performance of onion in old alluvial zone of West Bengal, performance of watermelon varieties in the river bed, eco-friendly arrangement of brinjal fruit and shoot borer by using ITK, efficacy of organic fish farming for sustainability, assessment of effects of probiotics on the survival and growth of IMC under polyculture system, fruit fly management in cucurbitaceous crops, boron application to enhance the productivity of chilli, assessing probiotics in fish culture at pond, improving parboiling technology for quality enhancement of rice grain to increase consumer acceptability of scented and non-scented rice varieties of Uttar Dinajpur district, enhancing ginger production through integrated disease management of rhizome rot complex, introducing suitable variety

of strawberry in hills, nutritional management of Darjeeling Mandarin, providing heat sources for new born piglets during winter months to reduce mortality, suitable housing system for poultry under backyard farming in hills, value addition of ginger, sensor based smart irrigation system, cultivation of organic manure before transplanting in the main field, introduction of multi-storeyed cropping by planting arecanuts, blackpepper and turmeric on same piece of land, commercial honey bee rearing, performance of watermelon varieties in the river bed and so on.

The Directorate of WBUAFS, Belgachhia implemented 10 technologies involving 40 KVKs. Selective breeding programme for small animals to avoid inbreeding depression, preparation of value added product from small animals and poultry, scientific management of *Ghoongroo* pig breed, restoring soil health and mass production of vermicompost, ornamental fish rearing in pond eco system, seasonal fodder cultivation technology, area specific integrated farming system model etc. were among the important technologies. Similarly, OUAT, Bhubaneswar Directorate implemented 26 technologies spreading 240 KVKs. The important technologies were- introduction of drought tolerant paddy variety, introduction of bio-fertilized rice variety, organic cultivation of aromatic rice, introduction of BPH tolerant paddy variety '*Hasant*', introduction of ragi var. '*Arjun*', introduction of triple resistant tomato variety, micronutrient

application of vegetables, off-season vegetable cultivation, trellis system in vegetables, *Kharif* onion cultivation, introduction of transplanting method in watermelon, farm mechanization, production of paddy straw mushroom by use of crumpled straw, conducting pisciculture, artificial brooding management in chicks, introduction of poultry breed *Kadakhnath*, establishing and popularizing '*Nutri-garden*', value addition and many others.

All the Extension Directorates of this Zone published and updated total 16 technology inventories. In addition, they published a large number of literatures in the form of newsletter, magazine, booklet, diary, bulletin etc. in English and local languages (Bengali and Odia) related to agriculture for the farmers. The Directorate of WBUAFS, Belgachhia published/updated maximum 13 inventories during the year 2021 followed by BCKV (8 in no.), OUAT (4 in no.) and UBKV (1 in no.). Supply of updated technologies and technological products viz. seeds, planting materials, bio-products, livestock/ poultry breeds, mineral mixture for animals, fish spawn/ fingerlings, mushroom spawn etc. to the KVKs were also the part of activities of all the Extension Directorates under ICAR-ATARI Kolkata. A total of 163 KVKs received various technological products from their respective Directorates. Considering the individual Directorate, OUAT supplied their products to 131 KVKs, WBUAFS to 20 KVKs and BCKV to 12 KVKs during the period under report.

13.0 Agricultural Technology Information Centre (ATIC)

The Agricultural Technology Information Centres (ATICS) are being operated as a '*single window*' system usually situated at the entrance of any Agricultural Universities/ ICAR Institutes. The main purposes of ATICS are to provide solution to the agricultural farmers for their specific problems, to make available updated technology information including inputs and products related to agriculture, horticulture, livestock and fisheries etc. and to help the farmers including other stakeholders under one umbrella. During the year 2021, 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.

All the ATICS were facilitated with reception counter, touch screen kiosk, exhibition/ technology museum, sales counter, farmers' feedback register, conference hall for farmers' interaction, cafeteria etc. Due to COVID-19 pandemic situations, visits



of farmers to the ATICs and other common places were restricted to prevent the spread of infection imposing a series of lockdowns. However, during the year 2021, 7111 farmers visited ATICs from different corner of the state under this Zone. Maximum farmers (2883) visited for technology services followed by for technology information (1723 farmers), for other purposes (1400 farmers) and for technology products (1105 farmers). The ATIC of BCKV was visited by 4855 farmers which was maximum followed by ICAR-CIFA (1230 farmers), UBKV (755 farmers), ICAR-CIARI (225 farmers) and OUAT (46 farmers) during the period under report.

As per technology information was concerned, about 3614 farmers used Kisan call centre to get the information on varieties/ hybrids (1045), disease management (494), pest management (569), post-harvest technology and value addition (295), agro-techniques (617), soil and water conservation (310) and animal husbandry including fisheries (284). A total of 17 farmers got benefit from video showing in the ATICs. Twenty one farmers met their queries through sending letters to the concerned authorities of the ATICs. Under ICAR-ATARI Kolkata, training programmes for 2634 farmers/ technocrats/ students were conducted at the ATICs to update the knowledge of the trainee participants. Maximum farmers were interested on agro-techniques (1277), whereas, soil and water conservation was preferred by 354 persons, disease management by 352 persons, pest management by 298 persons, varieties by 164 persons, post-harvest technology and value-addition by 107 persons and animal husbandry including fisheries by 82 persons.

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 2021, 1146 books and 2500 technical bulletins were sold which benefitted 3904 farmers. An amount of Rs. 18770/- in the form of revenue was generated.

Like previous years, the ATICs were a potential source of supplying various technological products viz. seeds, planting materials, livestock, poultry birds, table fishes/ fish fingerlings, bio-products (neem cake) and so on. About 847.4 q seed, 83275 planting materials, 3746 poultry birds, 280 livestock, 3210 kg fishes/ fish fingerlings, 950 kg fish feed, 1600 kg yam, 10 q bio-products and 3282 kg other items were sold to the farmers from different ATICs. A total of around 10679 farmers were benefitted from sale of those technological products and a worth of Rs. 4.06 lakh revenue was generated.

From different ATICs under ICAR-ATARI Kolkata, 608 soil and water samples were tested and 220 plants were diagnosed for different diseases. Not only that, apart from various technological services to other departments of the concerned institutes, 250 animals were vaccinated against various diseases from ATICs. A total of 1273 farmers got benefit from various technology services during the period.

14.0 HRD Programme by ATARI

ICAR-ATARI, Kolkata conducted 72 HRD programmes during the year for updating knowledge and skill of the KVK staff. The details are

given in following Table.

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

Sl. No.	Name of the programme(s)	No. of scientist(s)/ staff attended
1	Online action plan (2021-22) review workshop for KVKs of Odisha	6
2	Online action plan (2021-22) review workshop for KVKs of A & N Islands and West Bengal	6
3	Online meeting on various network projects and institute projects approved by RAC, ICAR, New Delhi	6

Sl. No.	Name of the programme(s)	No. of scientist(s)/ staff attended
4	Online scientific advisory committee (SAC) meeting of different KVKs	6
5	Online orientation programme for the KVKs selected for FPO formation organized by National Cooperative Development Corporation (NCDC), New Delhi	2
6	Online NICRA workshop of ICAR-ATARI Kolkata	5
7	Meeting as committee member for scrutinizing application for the post of SSH, Nimpith KVK at ICAR-ATARI Kolkata	4
8	Online review meeting of officers and staff of ICAR H.Q., Institutes of ICAR, ASRB and DARE addressed by DG, ICAR organized by the Council	10
9	Online meeting on BE (2021-22) of NEMA project organized by AE Division, ICAR, New Delhi	4
10	Online meeting on training-cum-awareness programme on Fisheries and aquaculture with reference to Pradhan Mantri Matsya Sampad Yojana (PMMSY)	2
11	Online meeting of NITI Aayog in collaboration with Galilee International Management Institute, Israel	1
12	Online six monthly review meeting of the XXV th ICAR Regional Committee-II	2
13	Online special public lecture of Dr. A. K. Srivastava, Member, ASRB, New Delhi and President, National Academy of Dairy Sciences, India on 'Animal health and productivity' organized by ICAR, CAFRI and ISAF	3
14	Online special lecture on 'One health and COVID Awareness' delivered by Dr. S. V. S. Malik, Head, VPH, IVRI, Izatnagar organized by Cuttack KVK, Odisha	2
15	Online workshop on various issues of KRISHI portal as Nodal Officer organized by Dr. R. Prasad, Director, ICAR-IASRI, New Delhi	1
16	Attended various meeting as chairman/ committee member at ICAR-ATARI Kolkata	10
17	Online brainstorming session on 'Gender and Nutrition based Extension in Agriculture'	6
18	Online review meeting for KVKs of West Bengal on landscape diagnostic survey under CSISA organized by ICAR-ATARI Kolkata	6
19	Coordinated a meeting of the Director, ATARI Kolkata with State govt officials of project-Unnati	2
20	Meeting with the Vice Chancellor and DEE of BCKV Mohanpur	3
21	Meeting with Director/CAO of ICAR-CRIJAF, Barrackpore for DAMU posts recruitment	2
22	Online meeting on NICRA revised estimate 2020-21	4
23	Online 8 th annual convention and National webinar of SFE	2
24	Video conferencing of regional committee meeting (RCM)-VI	2
25	Webinar on 'Millet processing and value addition' organised by MoFPI, IIFPT and PMFME under Azadi ka Amrit Mahotsav	3
26	Online seminar on balanced used of fertilizer campaign in collaboration with NBSSLUP, Kolkata	2
27	Meeting with Dr. R. K. Samanta, Chairman of QRT on various issues organized by ICAR-ATARI Kolkata	12
28	Webinar on 'Alleviating malnutrition and promoting gender equity through rural poultry production in India' organized by ICAR-CIWA, Bhubaneswar	3
29	Meeting for selection of SMS in Animal Science for transfer in KVK, Barackpore, North 24 Parganas at ICAR- CRIJAF, Barackpore, North 24 Parganas	1
30	Meeting as committee member for MACP promotion of Mrs. S. Pal of ICAR-ATARI Kolkata	4
31	Other meetings/ workshop/ seminars as committee member(s) on various issues	12
32	Online 'Annual Zonal Workshop 2021 for KVKs under Zone V' through zoom videoconferencing organized by ICAR-ATARI Kolkata	10
33	Online meeting as PI/ Co-PI of various network projects and institute projects approved by RAC organized by different ATARIs	6



Sl. No.	Name of the programme(s)	No. of scientist(s)/ staff attended
34	Dr. P. Das, Former DDG (AE) and Chairman, RAC, ICAR, New Delhi	6
35	Selection committee meeting for selecting manpower at ICAR-ATARI Kolkata and different KVKs	9
36	Meeting for scrutinizing application for various post of ICAR-ATARI Kolkata and KVKs at ATARI Kolkata	6
37	Online and offline scientific advisory committee (SAC) meeting of different KVKs	6
38	The DPC meeting for various posts of ICAR-ATARI Kolkata	8
39	Online farmers' awareness programme on 'Antibiotic Resistance' to celebrate 'World Antimicrobial Awareness Week 2021' through audio mode organized by KVK Birbhum, WB	1
40	Live telecasting of Hon'ble Prime Minister's interaction programme with farmers and scientists on 'Climate resilient varieties, technologies and practices' organized by ICAR-NRRI, Cuttack	4
41	Online interaction meeting with Secretary, DARE and DG, ICAR organized by the council	6
42	Meeting with 'Parliamentary Standing Committee for Hindi' at ICAR-ATARI Kolkata	14
43	Online meeting of DG/DDG/ Director, ICAR-NDRI, Karnal on the eve of 'National Milk Day 2021' organized by ICAR-NDRI, Karnal	4
44	Live telecast of Hon'ble PM's address on 'Zero budget natural farming' at Anand, Gujarat organized by Govt. of Gujarat	6
45	Online meeting of KRISHI Portal organized by ICAR-IASRI, New Delhi	1
46	Online team meeting on 'ARYA National Network Research Project' organized by ICAR-ATARI Bangalore	1
47	Online 21 days national training programme on 'Entrepreneurship strategies in agriculture, horticulture, animal husbandry and allied sectors for economic development of India' organized by DEE, UBKV, Coochbehar, WB and Agro Environmental Development Society, Rampur, UP	2
48	Inaugural ceremony of ICAR-ATARI Patna administrative building at Patna organized by ICAR-ATARI Patna	3
49	Online meeting 'Mera Gaon Mera Gaurav' for ICAR institutes and SAUs of eastern zone (A.& N. Islands, Odisha and West Bengal) organized by ICAR-ATARI Kolkata	2
50	Meeting with Director and other staff of ICAR-ATARI Kolkata on various issues	6
51	Superannuation programme of Dr. S. S. Singh, Former Director, ICAR-ATARI Kolkata organized at ICAR-ATARI Kolkata	20
52	Meeting with the Director and WB state govt officials for the project 'Unnati'	2
53	Online annual review workshop of 'Gramin Krishi Mausam Sewa (GKMS)' for the KVKs of this zone organized by ICAR-ATARI Kolkata	3
54	Online zonal workshop for KVKs under Zone IX and organized by concerned ATARI	1
55	Directors conference of Indian Council of Agricultural Research (ICAR)	1
56	Webinar on 'Kisan Sarathi' organized by Division of ICT, Govt. of India	1
57	Online foundation day and award ceremony of the ICAR	2
58	Launching programme of 'Agro forestry and value chain management for doubling farmers' income in new alluvial region of West Bengal' project funded by NABARD, Kolkata organized by ICAR-ATARI Kolkata and Purba Medinipur KVK	2
59	Meeting on DESAI programme organized at KVK Birbhum	1
60	Online IMC meeting of ICAR-ATARI Barapani organized by ICAR-ATARI Barapani	1
61	Virtual meeting with ATARI and KVKs for developing a collaborative framework for cattle improvement under SCSP/ TSP	1
62	Online meeting with ATARIs on 'Development of collaborative framework for cattle improvement under SCSP/ TSP'	1

Sl. No.	Name of the programme(s)	No. of scientist(s)/ staff attended
63	Divisional meeting with DDG (AE), ICAR, New Delhi and Director, ATARIs on EFC, budget utilization, DFI and other issues organized by Agril. Ext. Division, New Delhi	3
64	Online inaugural ceremony of ICAR-ATARI Guwahati administrative building at Guwahati organized by ATARI Guwahati	1
65	Online training programme on ' <i>Scientific dairy farming for sustainable economic security</i> ' organized by ICAR- ATARI Kolkata and ICAR- NDRI, ERS, Kalyani	1
66	Online training programme on ' <i>Livestock: A game changer in agricultural farming practices</i> ' organized by DEE, UBKV, Coochbehar, WB and Agro Environmental Development Society, Rampur	1
67	Webinar on CCS Conduct Rules delivered by Mr. A. Roy, Former Joint Director, NAARM, Hyderabad to observe ' <i>Vigilance Awareness Week 2021</i> ' organized by ICAR- ATARI, Kolkata	2
68	Online meeting on FPO formation organized by National Cooperative Development Corporation (NCDC), New Delhi	2
69	Online 5 days advanced training on ' <i>Poultry and duck farming</i> ' organized by ICAR- ATARI Kolkata and ICAR- Directorate of Poultry Research, Hyderabad	1
70	Virtual meeting pertaining to review of mechanisms to ensure probity among government servants organized by Agricultural Extension Division, ICAR, New Delhi	2
71	National Webinar on ' <i>Integrated Farming System for sustainable livelihood and nutritional security</i> ' ICAR- Indian Institute of Farming Systems Research Modipuram, Meerut	2
72	Other meetings/ workshop/ seminars as committee member(s) on various issues	10

15.0 Flagship Programmes

15.1 National Innovations In Climate Resilient Agriculture- Technology Demonstration Component (NICRA-TDC)

Nodal Scientist: Dr. F.H. Rahman

A nation-wide project, National Innovations on Climate Resilient Agriculture (NICRA), has been working since 2011 to address this challenge by application of science and technology. This project of ICAR aims to enhance resilience of Indian agriculture to climate change and climate vulnerability through strategic research and technology demonstration. 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 enhance the pace of adoption of these resilient technologies. On-farm participatory demonstrations for climate resilience are being implemented in village clusters through KVKs in 151 climatically vulnerable districts across the country. Around 100 more KVKs have been added in the Technology Demonstration Component of the Project from this year. The emphasis has been on capturing and improving the understanding on performance

of technologies in different agro-ecologies and farming systems. This also facilitates identification of what constitutes climate resilience in different bio-physical and socio-economic contexts. NICRA KVKs prepared and implemented village level contingency crop plans and measures. Technology Demonstration Component (TDC) of NICRA offers a great opportunity to work with farmers to address current climate variability with matching responses. Getting existing technologies into the hands of small and marginal farmers and developing new technologies like drought or flood tolerant crops to meet the demands of a changing climate also come under the purview of NICRA programme.

Climatic vulnerability of selected seven KVK districts of West Bengal, Odisha and Union Territory of A & N Islands at district level regionally coordinated by ICAR-Agricultural Technology Application Research Institute Kolkata (ATARIs) forward definite requirement in terms of technological support, human resource development and overall empowerment of farming community to enable them to cope up with climate vulnerabilities like droughts, erratic rainfall, heat wave, flood, cyclonic storm. Ten more KVKs in this Zone have been added

from this year in this TDC component of the Project. Enhancing the adaptive capacity and building resilience of the farming communities is important in the context of climate variability and to cope with these extreme events effectively. The NICRA village was selected based on vulnerability of agriculture to climatic variability. The multidisciplinary team of KVK analyzed the constraints related to climatic variability based on secondary weather data, resource situation, farming systems and agricultural yields in the past few years. Thus the interventions executed in NICRA villages by the NICRA-KVKs through the intervention like Natural Resource Management, Crop Production, Livestock, Institutional Intervention, Capacity Building and Extension Activities have not only enabled the farmers to cope up climatic vulnerability as well as it plays a key role in farmers' adaptive capacity along with sustainable agricultural production.

Natural Resource Management

Total 788 numbers of farmers were benefited covering 152 ha land from this module. Different demonstration like summer ploughing, green manuring, zero tillage, organic mulching *etc.* under In-situ moisture conservation technologies have been demonstrated in 17 NICRA adopted



villages covering 69.7 ha among 85 no. of farmers. The technologies followed mainly by zero tillage



operation. More than 17 ha have been brought under Broad Bed and Furrow intervention with significant impact among the farmers in A&N Island. Ridge and furrow method sowing of maize to increase water use efficiency and to avoid water logging. *Water harvesting and recycling for supplemental irrigation* through renovation of pond, well and canal, sand check dam, making bund, 5% model *etc.* were demonstrated in adopted villages by the



different KVKs involving 109 numbers of farmers. *Zero tillage technology* successfully implemented in more than 39 ha area of 101 numbers of farmers under wheat, lentil and chickpea as Resource Conservation means. Water saving irrigation methods like sprinkler irrigation, LEWA in rice, RBF in brinjal, micro-lift irrigation in rice demonstrated



in NICRA adopted villages covering an area of 21 ha in 77 farmers' fields. There were 16 new rainwater harvesting structures have been developed and 20 numbers renovated which could store 178562 cu m of water having protective irrigation potential 188 ha. This intervention increased the cropping intensity to the maximum extent upto 255%. Around 169 q compost prepared from solid wastes

was added to the soil through which 21000 carbon sequestrations was done during 2021-22. Artificial ground water recharge done by field bunding, water management and through SRI by sub soiler in rice covering 17.8 ha area in 37 farmers' fields. Ground water recharge through SRI by sub-soiler recorded highest rice yield (54.5 q/ha) and benefit: cost ratio (2.35). Land shaping with *ail* cultivation and rain water harvesting structure have been constructed covering 2.74 ha area during post *kharif* to mitigate the scarcity of irrigation water, increase in soil carbon and reduce soil salinity.

Crop Production

Different area specific intervention were taken by *viz*; demonstration of drought, salt and flood tolerant/resistant varieties, advancement of planting dates of *rabi* crops to avoid terminal heat stress, water saving paddy cultivation methods like SRI, aerobic, direct seedling, community nurseries for delayed monsoon, location specific intercropping systems with high



sustainable yield index, introduction of new crops/ crop diversification, custom hiring centres for timely planting, low temperature tolerance, promotion of pulses utilizing post-monsoon rainfall, integrated crop/pest/disease management, growing vegetables as contingency crop, integrated



crop management, integrated disease management, contingency crop, were covered which benefitted 1521 farmers. Drought tolerant rice varieties like



Sahbhagi, Anjali, Naveen, Abhishek were demonstrated in 69.5 ha areas of 410 number of farmers' field. Salt tolerant varieties of paddy like *Gosaba 5, CARI Dhan-5, Usar Dhan-5, Jarava, Geetanjali, SR-26B, Amalmona* were demonstrated in 11.3 ha area in 89 farmers' fields. *Jarava, Geetanjali and Amalmona* varieties proved maximum salt tolerant potential by giving highest yield of 34.5 q/ha and more economic return (BC ratio of 2.33). Flood tolerant varieties of rice like *Swarna sub 1, sabita, dudheswar* were demonstrated in 15 ha area in 74 farmers' field by giving yield of 36.5 q/ha with an economic return 2.33. To avoid terminal heat stress in crops like rice, wheat, lentil, mustard, potato, *etc.* were sown in 12 days advance during *rabi* season. These demonstrations were carried out in adopted villages involving 115 number of farmers' fields with an area of 26.0 ha land. An area of 21.5 ha was covered for staggered community nurseries of rice, brinjal, cauliflower, tomato which benefitted 185 numbers farmers. Introducing different crops like *Ol (var. HYV Gajendra); Cauliflower (var. MSN-16) Rice (var. Pusa Bold, Pusa 362); Tomato (var. Param F1); etc* in Kendrapara, Jharsaguda as less water requiring crop

as contingent crop planning during deficit rainfall in *kharif*. An area of 137.2 ha was covered for crop diversification of rice, brinjal, cauliflower, lentil, cabbage which benefitted 650 numbers of farmers. In Jharsuguda, Sonapur and Ganjam ridge and furrow practice is followed in large scale. Cabbage, cauliflower, brinjal, tomato, chili, cowpea, bottle gourd in total areas around 52 ha with a high average annual income. Crop diversification by hybrid maize is carried out. Near about 66 farmers have adopted in those districts. Various intercropping systems were demonstrated in regions which are prone to drought. Intercropping systems are considered as one of the important adaptation mechanism for variable rainfall situations. Intervention on location specific intercropping was demonstrated in almost all adopted villages. Total 1432 numbers of farmers were benefitted covering 271.8 ha of land.

Livestock and Fisheries

Livestock and Fisheries module comprising various livestock centric interventions were carried out which include use of community lands for fodder production during drought/flood, improved fodder/feed storage methods, improved shelters



for reducing heat stress in livestock, management of fish ponds/tanks during water scarcity and excess water, breed up-gradation, balanced feed



and fodder management through mineral mixture, feed blocks and silage making, azolla feeding, breed



animal health management through deworming and vaccination, fish pond cleaning and fish farming, pig farming, clean milk and fodder production. These interventions benefitted 321 livestock owner with 2654 animals in vaccination programme. Adequate supply of fodder, either green or dry,



is crucial to the livelihoods of livestock in rainfed areas. Delayed onset and deficit rainfall conditions were experienced in several states. There was reduction in area under millets and pulses, which are important to meet the fodder requirements in the rainfed areas. Short and medium duration fodder cultivars of several crops and fodder species both in *kharif* and *rabi* seasons were demonstrated in farmers' fields under rainfed and limited irrigation conditions to support income and cash flow from animal husbandry Improved fodder of rice bean and silage making were demonstrated in farmers fields. *Community lands* of an area of 115.3 ha involving 221 number of farmers utilized for different fodder production were demonstrated in different adopted villages. *Berseem, oat, sudan chari, maize, hybrid napier* were the major fodder produced in the programme. Of all these demonstration legume Sudan grass

showed maximum benefit return (B: C: 5.21). Silage making for 127 numbers and 7.5 ha of units showed very promising results. Vaccination camps were organized against FMD of cattle, PPR against goat, Ranikhet of poultry, BQ vaccine, deworming *etc.* in adopted villages. Mortality rate reduce up to the extent of 90% and average increase in cattle milk yield up to 45% have been recorded after the vaccination camps organized. Demonstration of rural backyard poultry (*kuroiler, Nicobari fowl, vanraja, kadaknath, khaki Campbell* duck, T X D breed of pig, mineral mixture and *azolla* as cattle feed were carried out. Improved ornamental bird was introduced through this intervention which also showed very promising results. *Improved Poultry shed* recorded low mortality rate and in shady area reduced heat stress. Standard spacing in improved shed resulted better performance in poultry and dairy animals. Interventions to reduce heat stress for higher survivability of backyard poultry and dairy animals were demonstrated of improved shelter.

Institutional Intervention

Institutional interventions including seed bank, fodder bank, commodity groups, custom hiring for



timely operations, community nursery raising, irrigation, collective marketing climate literacy through a village level weather station and awareness developed

in almost all NICRA villages. A total of 38 units have been developed covering of 159 ha area of 1304 number of farmers. Custom Hiring Centre has the provision of various farm implements



like Power tiller, Thresher, Reaper, Water pump, Zero-till Drill, Raised bed planter, Sprayer, Weeder *etc.* There

is a provision of Mini Automatic Weather Station (AWS) through which farmers are provided weather forecasting data.

Village Climate Risk Management Committee (VCRMC)

Village Climate Risk Management Committee (VCRMC) was constituted after discussion with



the villagers about the mitigation of the climatic vulnerabilities of the villages and the strategies to be adopted under this programme. VCRMC became operational with opening of a bank account in their name being jointly handled by the President



of VCRMC and the Head of the KVK concerned. VCRMC manages the custom hiring centre for farm implements and micro-irrigation systems, seed and fodder bank, community nurseries, collection of farmers share in planting material and inputs, establishment of small weather station in the village, participation of farmers in capacity development programs and exposure visits to learning sites. Institutional interventions including seed bank, fodder bank, commodity groups, custom hiring for timely operations, community nursery raising, irrigation, collective marketing climate

literacy through a village level weather station and awareness developed among the farmers in the Zone.

Custom Hiring of farm implements and machinery at nicra adopted villages

The custom hiring of farm tools and implements was being supervised by VCRMC apart from taking important decisions on the technological interventions to be implemented at the village in consultation with the KVK have now become



immensely popular among the farmers and substantial amount has also been generated. Timeliness of agricultural operations is crucial to cope with climate variability, especially in case of sowing and inter-cultural operations. Access to implements for planting in ridge-furrow,



broad bed furrow and raised beds is essential for widespread adoption of resilient practices for *in situ* soil moisture conservation and drainage of excess water in heavy soils. In rainfed areas, availability of such farm implements to small and marginal



farmers is important. Similarly in irrigated areas, residue management of *kharif* crops through zero till cultivation of *rabi* crops reduces the problem of burning of residues and adds to the improvement of soil health and increases water use efficiency. The rates for hiring the machines /implements are decided by the members of VCRMC. This committee also uses the revenue generated from hiring charges and deposits in a bank account opened in the name of VCRMC. The revenue is used for repair and maintenance of the implements and 25% share is earmarked as a sustainability fund. Different types of farm machinery are stocked in the CHCs, the most popular being Zero till drill, Happy seeder, BBF planter, drum seeder, multi crop planter, power weeder, mechanical weeder, chaff cutter, cono-weeder, duster, sprayer, leveler, FIRB planter, sub-soiler, zero-till ferti-seed, disc harrow, reaper, thresher, cultivator, rotavator, pump set *etc.*

Capacity building

A total 138 courses were conducted under Capacity Building on various thematic areas benefitting 2932 farmers and farmwomen (2650 males and 282 females) during 2021. Thematic areas cover on 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 machineries and implements, integrated farming system, fodder and feed management, lac cultivation drudgery reduction with farm implements for woman, value addition, human nutrition and child care, rodent control *etc.*

Extension activities

A total of 178 Extension Activities on various thematic areas benefiting 7650 practicing farmers (3955 males and 3695 females) during the reporting period. The extension activities were conducted on



method demonstrations, agro advisory services, awareness animal health camp, Kishan Chaupal, Kishan Gosthi, resource conservation technologies, celebration field and farmers' days, diagnostic visits, school student visit, group discussion, World Earth Day, technology week, kishan mela *etc.* December 5, 2021 was observed as World Soil Day in the respective KVK and distributed a total of 1005 soil health cards among the farmers of NICRA villages.

Convergence by NICRA with ongoing Development Programmes

Resource Generation through Convergence with ongoing other development schemes is one of the most significant activities achieved by all the NICRA KVKs since the inception of the project. A good number number of convergence programmes was carried out by each of the NICRA implementing KVK



Annual-cum-concluding workshop, NICRA-TDC Project held on June 23, 2021

Concluding Zonal Workshop of NICRA KVKs of Zone V was organized by ICAR-Agricultural Technology Application Research Institute Kolkata on June 23, 2021 on virtual mode under the chairmanship of Dr. V. K. Sing, Director, CRIDA. The workshop was attended by Prof. H. K. Senapati, Chairman of ZMC, Dr. S. K. Roy, Director, ICAR-ATARI, Kolkata, Dr. P.K Pal, DEE, UBKV, Dr. P.J Mishra, DEE, OUAT, Dr. JVNS Prasad, Coordinator, NICRA-TDC, CRIDA, Dr. F. H. Rahman, Nodal Officer, NICRA-TDC, Dr. Amit Phonglosa, JDEE, OUAT and Heads of nine NICRA KVKs of the zone. The Heads of new six NICRA-KVKs of the zone and scientists from CRIDA Hyderabad also attended the workshop.

The workshop started with welcome address by Dr. S. K. Roy, Director, ICAR-ATARI, Kolkata and he highlighted the overall impact of the NICRA project in Zone V.

Dr. F. H. Rahman, Principal Scientist, ATARI, Kolkata has delivered his lecture depicting all the salient achievements of this project within this Zone. He has elaborately detailed different prospects of different climate resilient models that are being used in the KVKs of this Zone. He has praised few KVK teams for their dedicated approach towards this

with ongoing development schemes. The prominent development schemes are MGNREGA, National Micro and Minor Irrigation Scheme, Pradhan Mantri Gram Sadak Yojana, Backward Rural Grant Fund, Sunderban Development Board, NFSM, IWMP, IVRI, ICAR-DWR, Forest Department *etc.* NICRA KVKs being a part of the different convergence programmes during 2021.



Project but he has expressed his concerns also on the issue of discontinuance of the project in some cases.

Dr. P.K Pal, DEE, UBKV, West Bengal enlightened the house with the social impact assessment studies in the NICRA KVKs of the zone taking into consideration both life and livelihood prospects.

Dr. P.J Mishra, DEE, OUAT, Odisha expressed his gratitude to CRIDA, Hyderabad for extending all possible guidance to the KVKs for upscaling the resilient technologies. He highlighted the adoption of farm pond excavation and promotion of drought, salinity and submergence tolerant rice varieties by the state Government of Odisha.

Dr. JVNS Prasad, Coordinator, NICRA-TDC, CRIDA, Hyderabad stressed upon up-scaling of low cost promising technologies to neighbouring villages and documentation of success stories. He also emphasized that development of different models of entrepreneurship with focus on custom hiring centres, seed bank and primary level of value addition.

Prof. H. K. Senapati, Chairman of the Zonal Monitoring Committee has appreciated the overall performance NICRA has provided so far in these states and the positive impacts it has created so far upon the farming community. He has suggested to cover me and more area under this project in future

and assured to help in all ways possible. He has encouraged the KVK personnels to be indulged in this venture and to have proper area based strategy.

Dr. V. K. Sing, Director, CRIDA, in his opening remarks, emphasised on farming system typology based planning and then its implementation through a family based approach. He appreciated the convergence programmes with Government schemes in the States of Bihar and Orissa. He urged for more crop diversity in the areas of rice based farming systems. In case of outgoing NICRA KVKs he suggested that the VCRMC should be encouraged to utilize the VCRMC fund for further upscale of the custom hiring centre.

The opening session ended with the release of publication of NICRA News Letter.

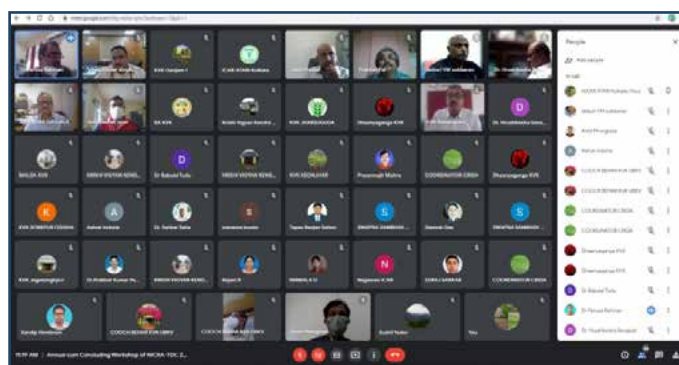
Technical session

The technical session was chaired by Dr. V. K. Sing, Director, CRIDA and co-chaired by Dr. S. K. Roy, Director, ICAR-ATARI, along with Prof. H. K. Senapati, Dr. P. Mishra, Prof. P. K. Paul, Dr. JVNS Prasad, CRIDA and Dr. F. H. Rahman as the panellists.

Heads of NICRA- KVKs presented salient achievements of out scaled technologies during the last ten years and Action Plan of 2021-22.

Salient Suggestions came out during deliberation

- Acidic and Saline soil management must be taken into consideration under NRM
- IFS must be developed with suitable predominant components namely Pond based and Horticulture based IFS
- Beekeeping can also be incorporated according to the flora availability
- Identification of the adopted village according to soil type, soil fertility, stress situation is very important.
- Liasoning with the state line department officials and showcasing the resilient technologies
- Convergence for up-scaling the resilient technologies
- Success stories of resilient technologies in NICRA villages are to be compiled and published for onward submission to GoI
- Crop diversification and crop intensification must be incorporated
- Quality publications are to be framed
- Comprehensive action plan must be prepared for addressing multiple climatic issues
- Minimum two number of new villages are to be adopted in the new phase
- Convergence with Watershed project and MGNREGA for better implementation of NRM activities





15.2 Cluster Frontline Demonstrations

15.2.1 Oilseeds

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

Cluster frontline demonstration on oilseeds is a unique approach under NFSM to make India self sufficient in oil production. The project has been

started since 2015-16. In 2021 Clustered frontline demonstration on Oilseeds was conducted on groundnut, rapeseed & mustard, sesame, soybean, sunflower and Niger by the KVKs of Odisha & West Bengal under the supervision of ICAR-ATARI Kolkata. The total area covered by CFLD oilseeds during 2021-22 is 870 ha and the total no. of demonstrations was 2237.

Table: State and crop wise performance of CFLD Oilseeds during Kharif 2021: (CFLD Regular Programme)

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		
West Bengal	Groundnut	125	50	135	50	22.86	15.83	44.37	7.02
	Sesame	50	20	80	20	9.425	6.51	44.77	2.9
	Soybean	25	10	30	10	13.28	11.9	11.59	1.38
Odisha	Groundnut	225	90	226	90	20.54	15.55	32.09	4.99
	Sesame	150	60	166	60	5.94	4.44	33.78	1.5
	Niger	50	20	50	20	4.74	3.5	35.42	1.24
Total		625	250	687	250				

In Kharif season total 80 ha was covered by CFLD Oilseeds in West Bengal and 170 ha in Odisha. Groundnut covered 50 ha in West Bengal and 90 ha in Odisha whereas sesame covered 20 ha in West Bengal and 60 ha in Odisha. Soybean and niger are demonstrated in 10 ha and 20 ha area respectively in West Bengal and Odisha during Kharif season. A total 687 no. of demonstrations (250 ha) was conducted during Kharif season. The maximum yield increase percentage is observed in case of

sesame (44.77%) followed by groundnut 44.37% and soybean 11.59%. In Odisha the maximum yield increase is observed in Niger i.e 35.42%, followed by sesame 33.78% and groundnut 32.09%.

Most successful technology application under CFLD on Groundnut during Kharif 2021

Demonstrated Technology:-Introduction of improved variety Dharani (TCGS-1043) along with micronutrient application at 30 and 45 DAS and one spray of lambda cyhalothrin @ 1 ml/litre

Name of KVK	Cooch Behar KVK
Crop and variety	Groundnut var. Dharani (TCGS-1043)
Name of farmer & address	Protipad Deb, Village- RuierKuthi, Vetaguri, Dinhata-I Block, Cooch Behar, West Bengal
Details of technology demonstrated	Improved variety Dharani (TCGS-1043) + Micronutrient application at 30 and 45 DAS + one spray of lambda cyhalothrin @ 1 ml/litre
Success point	Timely planting of Groundnut, careful and timely intercultural operation was carried out.
Farmerfeedback	Bold seeded Groundnut. Mr. Deb is satisfied with the varietal performance and yield obtained.
Yield (q/ha) Potential yield of variety District average (Previous year) State average (Previous year)	Demo yield: 27.25 q/ha Potential yield: 30 q/ha District average: 16.2q/ha State average yield: 19.54 q/ha

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

Used Practice	Yield (g/ha)	Gross cost (Rs/ha)	Gross income (Rs/ha)	Net income (Rs/ha)	B:C ratio
Farmer practices	14.4	18400.00	24726.00	6326.00	1.34
Demonstration	27.25	24000.00	43128.00	19128.00	1.79
% Increase in yield	47.15%				



Table: State and crop wise performance of CFLD Oilseeds during Rabi 2022: (CFLD Regular Programme)

State	Crop	Target of CFLD Approved		Achievements of FLD		Yield (q/ha)		Increase %	Difference in yield (q/ha)
		No. of Demo	Area (ha)	No. of Demo	Area (ha)	Demo	Local		
West Bengal	Groundnut	125	50	125	50	18.72	13.97	34	4.75
	Rapeseed & Mustard	625	250	625	250	14.6	8.63	69.1	5.97
	Sunflower	25	10	25	10	13.59	10.67	27.36	2.92
Odisha	Groundnut	400	160	400	160	18.74	14.19	32.06	4.55
	Rapeseed & Mustard	375	150	375	150	8.87	5.51	60.98	3.36
Total		1550	620	1550	620				

In Rabi season rapeseed and mustard covered maximum area (250 ha) in West Bengal followed

by groundnut 50 ha and sunflower 10 ha. In Odisha groundnut covered the maximum area (160 ha)



followed by rapeseed and mustard in 150 ha during Rabi season. A total 1550 no. of demonstrations (620



ha) was conducted in Rabi season. The yield increase percentage of groundnut in Odisha is around 32% over farmers' practice and in West Bengal the yield increase percentage is 34%. During Rabi season in West Bengal maximum yield increase i.e. 69.1% is observed in rapeseed & mustard followed by groundnut 34% and sunflower 27.36%.

Table: State and crop wise performance of CFLD Oilseeds during 2022: (CFLD Regular Programme)

State	Crop	Area(ha)		Yield(q/ha)		% In-crease	Net returns(Rs.)		BC Ratio
		Target	Achieve.	Demo	FP		Demo	FP	
Odisha	Groundnut	250	250	19.64	14.87	32.07	64690.1	40117.55	1.61
	Sesame	60	60	5.94	4.44	33.78	19101.6	11545.66	0.60
	Rapeseed & Mustard	150	150	8.87	5.51	60.98	36538	18070	2.02
	Niger	20	20	4.74	3.5	35.42	14623.5	8240	1.77
West Bengal	Groundnut	100	100	20.79	14.9	39.53	59231.5	36723.75	1.61
	Sesame	20	20	9.425	6.51	33.78	31600	30336.6	1.04
	Soybean	10	10	13.28	11.9	11.59	35562	22350	1.59
	Rapeseed & Mustard	250	250	14.6	8.63	69.1	23900	16142.5	1.48
	Sunflower	10	10	13.59	10.67	27.36	35110	23641	1.48

The benefit cost ratio of rapeseed and mustard was 2.02 in Odisha and 1.48 in West Bengal. In the case of groundnut, sesame, niger, sunflower and soybean was 1.61, 1.04, 1.24, 1.48 and 1.38 respectively. The high yielding varieties demonstrated under CFLD Oilseeds are TG 51, Devi, Dharani of groundnut, PM 30, NCHB-101, Kesari Gold of mustard, GT10, Suprava and savitri of sesame, Utkal niger 150 of niger, PS1368 of Soybean and LG30801 of sunflower.

15.2.2 Pulses:

Nodal Scientists: Dr. S.K. Roy and Dr. F.H. Rahman

Cluster frontline demonstration (CFLDs) are demonstrated for the production potential of newly released technologies on the farmer's fields at a different location in a given farming system and organized farming and extension activities for farmer and extension workers for the dissemination of various technologies. The CFLD on Pulses programme during *Kharif* 2022, pigeonpea, blackgram, greengram were taken up for demonstration as per the communication

received from DA & FW. Altogether 530 ha were allotted for *kharif* pulses out of which 530 ha could be finally brought under demonstration programme in Odisha and West Bengal. A total of 1325 demonstrations were conducted to cover 530 ha area in these two states. The varieties like PRG 176 (*Ujwala*), LRG-52, LRG-41 were in pigeon pea, PU 31, RU 03-04, WBU 109 in blackgram and IPM -02-03, IPM-02-14, SML-668, Sukumar in green gram was demonstration in 2021-22. 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. Performance analysis of individual pulse crop indicates that in pigeonpea resulted 38 per cent increase in average yield increase in Odisha and 33.94 per cent in West Bengal. In West Bengal, blackgram was covered in large area of 230 ha because of its popularity. Increase in average yield of blackgram in West Bengal was 33.4 per cent. The average increase of demonstrated yield of

blackgram was of 36 per cent Odisha. In greengram, the average increase in demonstration yield was

42.6 % in West Bengal whereas was 38.49 per cent in Odisha. The details are given in table below:

Table: Cluster Frontline Demonstration on Kharif Pulses during 2021-22

SI No	Crop	State	Target of FLDs		Achievements of FLDs		Yield (q/ha)		Yield increase (%)	Difference between demon and local (q/ha)
			No. of Demos	Area (ha)	No. of Demos	Area (ha)	Demo	Local		
1	Pigeon pea	Odisha	375	150	375	150	11.88	8.61	38.01	3.27
		West Bengal	75	30	75	30	14.6	10.9	33.94	3.70
2	Greengram	Odisha	100	40	100	40	6.33	5.07	25.0	1.27
		West Bengal	75	30	75	30	9.35	6.56	42.60	2.79
3	Blackgram	Odisha	125	50	75	50	7.22	5.3	36.16	1.92
		West Bengal	575	230	575	230	9.93	7.17	38.49	2.76
Total kharif crops			1325	530	1325	530				



In *summer* season, green gram is main pulse crop grown in West Bengal. A total area of 120 ha (100 ha in West Bengal and 20 ha in A&N Islands) were covered by these two states in summer season. The *summer* blackgram demonstrated in 50 ha area in West Bengal.

Table: Cluster Frontline Demonstration on Summer Pulses during 2022

SI No	Crop	State	Target of FLDs		Achievements of FLDs	
			No. of Demos	Area (ha)	No. of Demos	Area (ha)
4	Green gram	West Bengal	325	130	250	100
		A&N Islands	50	20	50	20
5	Black gram	West Bengal	125	50	125	50
		A&N Islands	25	10	25	10

15.3 Farmer FIRST Programme:

Nodal Scientist: Dr. K. S. Das

During the year 2021-22, Farmer FIRST Programme (FFP) was implemented in three ICAR Institutes (ICAR-NRRI, Cuttack; ICAR-CIFA, Bhubaneswar and ICAR-IIWM, Bhubaneswar) and one State Agricultural University (OUAT, Bhubaneswar). Although the second and third wave of COVID-19 pandemic continued during the period, maximum efforts were given by the team of all 4 project implementing centres under ICAR-ATARI Kolkata to conduct various activities in their adopted villages following all COVID protocols to prevent the spread of infection. The ICAR-ATARI Kolkata organized Zonal Review Workshop to monitor the achievements for the period 2020-21 and Action Plan 2021-22 of FFP centres. Not only that, each centre prepared a substantial numbers of success cases/

stories of agricultural farmers in the prescribed proforma of the Council considering doubling farmers' income (DFI) which were ultimately

submitted to the responsible ATARI for publication. The details of budgetary allocation and salient achievements of FFP have been given as under.

Details of Farmer FIRST Programme under ICAR-ATARI Kolkata during 2021-22

Sl. No.	Name of the project (Institute/ University)	Name of the PI/ Nodal Scientist of the project	Fund allotted during 2021-22 (Rs. in lakh)	Fund utilized during 2021-22 (Rs. in lakh)
1.	Increasing productivity and sustaining the rice-based production system through Farmer FIRST approach (ICAR-National Rice Research Institute, Cuttack)	Dr. S. K. Mishra Pr. Scientist	18.50	18.66
2.	Promoting improved agriculture and allied sector technologies in Khordha district through Farmer FIRST Project (ICAR-Central Institute Freshwater Aquaculture, Bhubaneswar)	Dr. H. K. De Pr. Scientist	21.00	20.90
3.	Enhancing water and livelihoods security and improving water productivity in tribal dominated paddy fallow rainfed agro-eco system of Odisha (ICAR-Indian Institute of Water Management, Bhubaneswar)	Dr. P. Nanda Pr. Scientist (upto 07.12.2021) Dr. D. Sethi Sr. Scientist (after 08.12.2021)	18.50	12.81
4.	Enhancing Farm Productivity & Profitability with 'Farmer-FIRST' focus in Khordha district of Odisha (OUAT, Bhubaneswar)	Dr. R. K. Paikaray Professor	18.00	18.00
5.	ICAR-Agricultural Technology Application Research Institute (ATARI) Kolkata	Dr. K. S. Das Pr. Scientist-cum-Member-Secretary	7.50	6.68
Total			83.50	77.05

Salient achievements of projects:

15.3.1 ICAR-NRRI, Cuttack

During the year 2021-22, various activities under FFP were conducted in four adopted villages i.e. Laxminarayanpur, Satyabhamapur, Ganeswarpur and Biswanathpur of Block- Salipur, District- Cuttack, Odisha. Under crop-based module, varietal demonstrations of 6 most promising rice varieties e.g. 'Pooja', 'Swarna Sub-1', 'CR Dhan 800', 'Pradhandhan (CR Dhan 409)' with complete package of practices during Kharif 2021 covering over 40 ha area with 10-15 kg

seed mini-kits along with partial amount of fertilizers and need-based pesticides; demonstrations on raising mat type rice nursery using rice seedling trays (250 nos.) followed by transplanting through 8-row power tiller operated rice transplanter; demonstrations of *Trichoderma viridae* as a biofungicide for seed and soil treatment for suppression of various diseases caused by fungal pathogens @10gms/kg; demonstrations of *Pseudomonas* as a bio-agent for seed and soil treatment for suppression of various diseases caused



by fungal infections @10gms/lit; demonstrations on pesticide management in rice through application of pre- and post-emergence; demonstrations of solar based alternate energy light trap (AELT) 24 x 7 for monitoring and mass trapping of major insects invented by ICAR-NRRI scientists; and training of farmers to use android-based trilingual 'RiceXpert' Mobile App (in English, Hindi and Odia) developed by the Institute as a decision support system at all operational levels in rice farming systems were provided to each of the 195 farmers covering 4 villages.

Under Horticulture-based module, demonstrations on vegetables i.e. cucumber (rain special), pumpkin (*Barshati*), bitter gourd (*US 1315*), tomato (*Rohit*), okra (*Radhika*), ridge gourd (*NZ 1001*), French bean (*Yuwika*), pointed gourd saplings (*Swarna Alaukik*), ivy gourd (*AN Kunkhi*), grafted brinjal, spine gourd (*A.N. Shanti*) cultivation were done for 254 farmers including women. Considering demonstrations on fruits, watermelon (*Dolly*), papaya (*Red Lady*), mango grafted (*Dasheri*) and guava goola (*Pant Prabhat*) were undertaken for 17 farmers/ farm women.



Demonstrations were conducted and critical input like mineral mixture for proper metabolic functions of cows, goats and poultry were supplied among 150 livestock farmers under Animal Husbandry-based module in all adopted villages. As a part of enterprise-based module, demonstrations for 100 farm women @ 10-50 beds each on paddy straw mushroom and technical backstopping for ten FFP promoted mushroom entrepreneurs; agro-shade net house construction of eight farmers to control

the incidental sun light falling upon the mushroom bed; and demonstrations/ distribution of honey bee



boxes for 20 beneficiary farmers along with technical backstopping were provided under Farmer FIRST Programme during the period.

Under capacity building and extension activities, training-cum-demonstration on bee keeping for entrepreneurship development for 22 farmers, NRRI light trap for rice insect pest management for 41 farmers, integrated crop management techniques in *Kharif* rice for 83 farmers, integrated pest management in rice for 81 farmers, 'Nutri-garden' and tree plantation on the occasion of 'International Year of Millets 2023' for 65 farmers and use of improved technologies in Horticultural crops for enhancing farm productivity and profitability for 75 farmers were conducted. Crop cutting experiments and rice field day demonstrations of high yielding rice varieties during *Kharif* season for 14 farmers were organized. Not only that, field visit and farmers' interaction meet were also organized during the monitoring visits of Dr. V. V. Sadamate, Hon'ble

RAC Member with 115 farmers and of FFP Team, ICAR-NAARM, Hyderabad with 89 farmers. The 'Kisan Diwas 2022' with 58 farmers and 'World Pulses Day 2022' on the topic 'Pulses to empower youth in

achieving sustainable agri-food system' with 38 farmers were celebrated under this programme.

15.3.2 ICAR-CIFA, Bhubaneswar

The Farmer FIRST project has covered four villages



in Khordha district i.e. Anthuari, Purohitpur (Block-Balianta); Siddha Kutila and Brahman Khandi (Block-Balipatna). Those villages were newly selected for FY 2021-22. Under the component 'Scientists-Farmers Interface', 35 programmes including field days, farmers-scientists interface, capacity building programmes etc. were organised involving 970 beneficiaries. Six modules were demonstrated involving modules on improved technologies of crop, horticulture, IFS, aquaculture and 'Nutri-garden'. Under horticulture-based module, thermo-insensitive variety of cauliflower var. 'Fujiyama' and bush type of French bean var. 'Falguni' were introduced in 1 ha and 1.25 ha, respectively involving 70 farmers. Fish-based integrated farming system module was developed in 2 ha area involving 3 progressive farmers from adopted villages. Under green gram in rice fallow, 20 ha area was demonstrated involving 120 farmers (av. yield was

5.0 q/ha). To aware about nutritional security of the adopted farmers, 10 farmers were provided with a seed kit developed by ICAR-IIHR, Bangalore which consisted of 8 different varieties of vegetables grown in 'Nutri-garden' for home consumption. Scientific fish farming was demonstrated in 6 ha area covering 6 community ponds and 16 individual ponds.

Institute Advisory Committee meeting and site planning and monitoring group meeting were held on 30th October, 2021. For strengthening 'Bhargabi Fish Farmers Producers Company Limited', one stop aqua shop was established for catering to the requirements viz. quality fish seed, feed, medicines and other inputs of the member farmers at a single point. That aqua shop would also act as a sales outlet for quality fish being produced by the member.

Technology assemblage



Sl. No.	Components	No. of farmers	Area covered (ha)
1	Scientific fish farming	166	6
2	Fish based integrated farming system	3	2
3	Introduction of cauliflower var. <i>Fujiyama</i>	30	1
4	Introduction of bush type French bean var. <i>Falguni</i>	40	1.25

Sl. No.	Components	No. of farmers	Area covered (ha)
5	Green gram in rice fallow	120	20
6	Nutri-garden	10	-
	Total	369	30.25

A team from ICAR-NAARM, Hyderabad consisting of Dr. P. Vekatesan; Dr. N. Sivaramane and Mrs. B. Kalyanivisited the demonstration sites and

monitored the progress of the project in the adopted villages. The team also documented some successful demonstrations like bush type French bean and fish based integrated farming system.



15.3.3 ICAR-IIWM, Bhubaneswar

The project was implemented in Khuntapingu, Malarpada and Jamuda villages in Saharpada block of Keonjhar district, Odisha. The project implemented through NRM, crop, horticulture and livestock-based modules. Under NRM based module, application of polythene mulching in vegetable crops and banana plantation for preventing evaporative water loss and

saving irrigation water was demonstrated in fields of 42 farmers in three villages. Under horticulture-based module, sprinkler irrigation was used to supply water in vegetable crops by 14 farmers. Line transplantation was demonstrated in the fields of 30 farmers, of which most of the farmers also practiced traditional transplantation in parts of their fields. A comparison between the two methods was recorded which has been given as under.

Components	Traditional transplantation	Line transplantation
No. of farmers	40	30
Total area under cultivation	110.8 ac	29.8 ac
Total production under cultivation	2156 q	630 q
Production/ ha	48.64 q	52.85 q
Average cost (Rs.) of cultivation/ ha	41270	33150
Average net income (Rs.)/ ha	53092	69379

Vegetable seedlings viz. brinjal var. *Mahy Green* (5000 in nos.), tomato var. *Mahy 701* (3000 in nos.), chilli var. *VNR 305* (5000 in nos.), capsicum var. *NS 292* (2000 in nos.), cabbage var. *Mahy 139* (2000 in nos.) and cauliflower var. *NS 555* (2000 in nos.) were distributed among 200 farmers as critical input for diversification of paddy-fallow agro-ecosystem. Besides, seeds of cowpea var. *Gomti*, ridge gourd var. *Jaipur Long*, amaranthus, okra var. *Julli*, raddish var. *Pusa Chetki* and planting materials of yam were also provided as critical input for demonstrating 'Nutri-

garden' by women farmers for backyard cultivation. Around 3500 banana saplings were provided to demonstrate banana cultivation under polythene mulching and drip irrigation as a sustainable option for short duration fruit production. Application of pheromone traps, yellow sticky traps and neem based pesticides were demonstrated among the selected farmers. The traps were also installed in the fields of vegetable farmers and the results were recorded. However, income from vegetable cultivation under FFP (2021-22) has been presented below.

Components	Brinjal	Bitter guard	Okra	Tomato	Cabbage
No. of farmers	15	6	5	7	7
Total area (ac) under cultivation	3.33	1.38	0.76	1.15	0.91
Total production (q) under cultivation	274	56	37.1	108.5	86.7
Production/ ha	206.01 q	101.81 q	123.66 q	235.86 q	240.83 q
Average cost (Rs.) of cultivation/ ha	51000	75000	42000	45000	65000
Average net income (Rs.)/ ha	567030	332240	205320	426720	657490

Under livestock based module, 600 *Kadakhnath* and 560 *Aseel* poultry chicks of 28 days age were provided to the livestock farmers to demonstrate backyard poultry farming as a source of income and

source of nutrition. The mortality rate and growth performance of 2 selected birds are given below. Among those, the performance of *Kadakhnath* birds was found to be better than *Aseel* birds.

Sl. No.	Breed	Sex	Body weight at 7 months of age	Range (kg)	Mortality rate (%)
1	Kadakhnath	Male (n=53)	Mean=1.618 SD=0.230	1.1 to 2.24	8.83 (53 out of 600)
		Female (n=44)	Mean=1.173 SD=0.223	0.75 to 1.57	
2	Aseel	Male (n=47)	Mean=1.436 SD= 0.245	1.05 to 2.18	15.53 (87 out of 560)
		Female (n=48)	Mean=1.116 SD=0.199	0.73 to 1.515	

Throughout the period under report, the weather bulleting, as per IMD-OUAT, was made available to the farmers in local Odia language. The photos of insect and pest infestation in farmers' fields were shared in the *WhatsApp* group of FFP project and suggestions from experts were timely communicated to the concerned farmers. Three trainings involving

310 farmers were conducted in Khuntapingu, Jamuda and Malarpada village. Ten publications of different activities of Farmer FIRST programme were also published in local newspapers. Success stories of 25 farmers were recorded considering doubling farmers' income and communicated to ICAR-ATARI Kolkata.



15.3.4 OUAT, Bhubaneswar

During the year 2021-22, the Farmer FIRST Programme under OUAT, Bhubaneswar was implemented in Gobindpur, Gopalpur, Brahampura and Brahampurapatna village of Khordha district, Odisha. Under crop-based

module, demonstrations were taken up on rice var. *SwarnaSub1* in an area of 50 ha involving 150 households. The variety gave average grain yield of 6.25t/ha, net return of Rs. 42500/- per ha with B:C of 2.75 against 4.24t/ha, net return of Rs. 27000/- per ha with B:C of 2.30 in case of existing variety '*Swarna*'

under medium land condition. Demonstrations on rice var. 'Sarala' were also conducted in an area of 30 ha involving 100 households. The variety gave average grain yield of 4.03 t/ha, net return of Rs. 24250/- per ha with B:C of 1.67 against grain yield of 2.0t/ha, net return of Rs. 5000/- per ha with B:C of 1.20 in case of local variety 'Mayarkantha' under



low land condition. On the other hand, demonstrations of rice var. 'Lalat' in 2.5 ha for 12 households were conducted. The variety gave average grain yield of 2.91t/ha, net return of Rs. 23200/- per ha and B:C of

1.66. The YMV resistant green gram var. 'IPM 02-14' in rice-fallows was introduced and demonstrations were taken up in 20 ha area involving 75 households. The variety gave average grain yield of 0.36 t/ha, net return of Rs. 6400/- per ha with B:C of 1.8.

Under horticulture-based module, a series of demonstrations were conducted during the period to intensify the production of various horticultural crops e.g. hybrid pumpkin, hybrid cucumber,



hybrid bitter gourd, leafy vegetables (Amranthus), hybrid tomato and hybrid papaya. The hybrid pumpkin Tokita hybrid 'Vimal' was demonstrated in 8 ha involving 50 households. The hybrid pumpkin gave average fruit yield of 32.5t/ha with an expenditure of Rs. 122250/- and net profit of about Rs. 250000/- per ha. The hybrid cucumber 'Rajmata' (Arnnapurna hybrid) in 4.2 ha involving 20

households. The average fruit yield was recorded to be 20.7 t per ha with av. net profit of around Rs. 196429/- per ha (Av. expenditure was Rs. 114286/- per ha and av. income was Rs. 310715/- per ha). The hybrid bitter gourd var. 'VNR-21' was demonstrated in 2 ha for 10 households which gave av. net profit of Rs. 97500/- per ha. Demonstrations were taken up on leafy vegetables (Amranthus) in 2.5 ha involving 25 households. The av. net profit was noted as Rs. 69000/- per ha within one month time. As a part of demonstration, hybrid tomato var. 'VNR Samridhi' was also conducted in 0.4 ha involving 10 households. The hybrid gave av. fruit yield of 21.9 t/ha with net profit of Rs. 151667/- (av. expenditure- Rs. 89444/- per ha vs. av. income- Rs. 241111/- per ha). Similarly, demonstration of hybrid papaya 'Red lady' resulted av. fruit yield of 29.2 t/ha with net profit of Rs. 109600/- per ha. A total area of 2.5 ha was covered which involved 13 households.

As per livestock-based module was concerned, 'Pallishree' strain was introduced for backyard poultry rearing under FFP activities. A total of 300



chicks aged between 3-4 weeks old were provided to 30 households @ 10 birds per household. The



birds were reared for a period of 7 weeks and the mean body weight of the birds was 2 kg/bird. The mortality was totally avoided by taking care of birds through feeding and proper health care. Each farmer realised a gross income of Rs. 5330/-



and a net profit of Rs. 4430/- from 10 birds. Animal health camp was organized for 65 beneficiaries of adopted villages. The farmers were also trained for introducing crossbred dairy cowsto enhance milk production and to manage dairy cows and goats for better health, production and reproduction.

To improve the skill and scientific knowledge of agricultural farmers, a total of 100 farmers were trained for integrated nutrient management on rice-green gram cropping system at their villages, 30 farmers on mushroom spawn production and 50 farmers on value addition and preservation of oyster and paddy straw mushroom at CTMRT, OUAT, Bhubaneswar during the period.



15.4 CSISA-ICAR Collaboration Project Phase-III

Nodal Officer: Dr. S.K. Roy

A collaborative project with Cereal System Initiative for South Asia was implemented in 6 KVKs of Odisha namely, Cuttack , Khordha , Mayurbhanj-I , Bhadrak , Puri and Balasore as Phase III expansion of the project initiated in the year 2008. The 3rd Phase



programme was exclusively planned to assess crop response to Zn fertilizer application during Kharif 2021 in the selected districts of Odisha.



Zinc is an essential plant nutrient required for several biochemical processes in rice plant, including chlorophyll production and membrane integrity. Thus, Zn deficiencies affect plant growth and significantly reduce the yield when the soil supply of Zn is low or in adverse soil conditions (such as continuous flooding) prevent plant uptake



of Zn. Zinc deficiency in submerged rice soils is very common owing to the combined effect of increased pH, HCO_3^- , and S^{2-} formation. More than 60% of soils are reported to be deficient in available Zn,



and soil application of Zn (ZnSO_4) or foliar spray of ZnSO_4 has been in recommendation. But crop response to Zn fertilizer application is governed by many factors including wide soil variability



and management practices which are not properly documented or not accessible.

The experiment conducted in different districts of Odisha indicates that application of Zn - coated DAP/MOP/Urea + foliar spray of 0.5% Zinc sulphate increased the grain yield to 50.4 q/ha whereas Zinc as basal followed by foliar application enhanced the yield to 49.4 q/ha. However, soil application of Zn @ 25 kg/ha + foliar spray of 0.5% Zinc sulphate did not enhanced the average grain yield when applied in DRR Dhan 49 variety.



15.5 Scheduled Tribe Component (STC)

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

The Scheduled Tribe Component (STC) erstwhile Tribal Sub Plan (TSP) is being implemented 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. In the year 2021, Ministry of Tribal Affairs, GoI identified tribal



dominated districts in India for providing better quality of life to tribal people. Under this Zone, eight tribal dominated districts were identified for this scheme during the year 2021. A total of 10 KVKs (one from Nicobar and nine from Odisha i.e. Nicobar,



Gajapati, Kandhamal, Mayurbhanj-I, Mayurbhanj-II, Malkangiri, Nabarangapur, Rayagada, Sundargarh-I and Sundargarh-II conducted different activities in those above mentioned districts.

A sum of Rs. 324.00 lakh fund was allotted to above ten KVKs for conducting various activities e.g. agricultural farming, kitchen gardening, animal husbandry, horticulture, dairy development, fish

production, vocational training and many others for tribal people. Out of total fund, Rs. 13.60 lakh was allocated for Andaman and Nicobar Islands KVK and rest Rs. 310.40 lakh was allocated for Odisha state KVKs. During the year 2021, fifteen villages



of Nicobar district and 244 villages of 9 districts of Odisha were covered under this programme which benefitted 2222 and 14920 tribal farmers, respectively.

The achievements of physical output and outcome under STC by the KVKs of ATARI Kolkata during

2021 have been presented in the table. Considering the achievements of physical output, 3343 number of various assets like sprayer, ridge maker, pump set, weeder, store bins, drip irrigation set, poultry feeder/ drinker and others were created for the benefit of tribal farmers during the year 2021. In spite of COVID-19 pandemic and continue lockdown situations, KVKs worked day and night for the benefits of tribal farmers. The KVKs of tribal districts conducted 96 OFTs and 1244 FLDs for overall agricultural development in the districts. More than 12000 farmers were trained and more than 45000 farmers took participation in various extension activities conducted by the KVKs. The KVKs produced 128.03 tonnes seed, 7.33 lakh planting materials and more than 44000 livestock strains and fingerlings. About 557 programmes on 'Swachha Bharat Abhiyaan', 'Agriculture Knowledge in Rural School', 'Planting Materials Distribution', 'Vaccination Camp', 'Animal Health Camp', 'Mahila Kisan Diwas' etc. by 10 KVKs were also the part of this programme.

Achievements of physical output under STC during 2021

Sl. No.	Description	Total achievements
1	Asset creation (in number; Sprayer, ridge maker, pump set, weeder etc.)	3343
2	On-farm trials (Number)	96
3	Frontline demonstrations (Number)	1244
4	No. of training program conducted for farmers, farm women	471
5	Farmers training (in lakh)	0.12041
6	No. of training program conducted for Extension personnel	33
7	Training of extension personnel (in lakh)	0.00564
8	Participants in extension activities (in lakh)	0.45214
9	Production of seed (in quintals)	1280.32
10	Production of planting material (in lakh)	7.3338
11	Production of livestock strains and finger lings (in lakh)	0.44460
12	Testing of soil, water, plant, manures samples (in lakh)	0.02761
13	Mobile agro-advisory to farmers (in lakh)	12.65989
14	No. of other programmes (Swachha Bharat Abhiyaan, agriculture knowledge in rural school, planting materials distribution, vaccination camp, animal health camp, Mahila Kisan Divas etc.)	557

As per the achievements of physical outcome of STC during the year 2021 was concerned, the table showed that 10538 farmers upgraded their knowledge and skills and 1529 farmers were benefitted from testing soil and water samples to use balanced fertilizer in

their fields. The programme also helped to increase the availability of quality seed, planting materials, livestock strains and fish fingerlings in the tribal districts.



Achievements of physical outcome under STC during the year 2021

Sl. No.	Description	Unit	Total achievements
1	Number of Technologies Identified after Assessment	Number	37
2	Upgraded Skills and Knowledge of farmers	Number	10538
3	Oriented extension personnel in frontier areas of agricultural technology	Number	773
4	Increased availability of quality seed	Quintal	1640.59
5	Increased availability of quality Planting material	Number	718535
6	Increased availability of live-stock strains and fingerlings	Number	31336
7	Testing of Soil & water samples for balance fertilizer use	Number	1529

15.6 Attracting and Retaining Youth in Agriculture (ARYA)

Nodal Scientists: Dr. P.P. Pal

According to the United Nations World Health Organization, by 2030, six out of every ten people will live in a city, and by 2050, this proportion will rise to seven out of ten people, implying that more young people are moving to cities and towns to find work than ever before. In this context, involving rural youth in agriculture has become a topic of concern recently, and it has risen to the top of the development agenda as a result of increased apprehension about the situation. In a country like India, where the majority of young people live in rural areas, agriculture must be utilized to benefit the country, produce jobs, and balance population density in rural and urban areas.

In this respect, it is vital to persuade young people that agriculture is not a life of toil, suffering, and poverty, but rather a noble profession that will ensure our future food security and generate employment. We can introduce a new generation to the farms by finding young people and demonstrating the possibilities of agriculture as a prestigious as well as

rewarding activity. Attracting and retaining youth in agriculture is a flagship programme of the Indian Council of Agricultural Research in New Delhi, which aims to promote and empower rural youth across the country in various agriculture and related sectors. This project was started with the goal of motivating the unemployed rural youth with skill and associated support to work in on and off farm enterprises.

In this zone, during 2021-22 altogether nine KVKs namely, Nimpith, Hooghly, Uttar Dinajpur and Purulia from West Bengal and Nayagarh, Sambalpur, Ganjam-1, Puri, and Cuttack from Odisha are involved in carrying out this programme. The achievements of the project have been assessed against different parameters like increased number of participants, average seasonal/ yearly income, additional manpower creation and support of various organizations towards entrepreneurship development. The total number of training conducted this year increased substantially, and as a result, the number of youths got benefited increased as well. The below given table indicates the positive changes among the youths in respect of the stated parameters.

Table: Training and horizontal spread of ARYA activities

Name of the Enterprise	No. of Training in 2021	No. of youth trained in 2021	No. of enterprises established in 2021
A. Nimpith KVK			
Fish Hatchery	1	25	6
Horticulture nursery	1	20	6
B. Purulia KVK			
Lac cultivation	4	60	14
Vermicompost	1	20	6
Horticulture nursery	1	20	4
Goatery	1	45	5
C. Uttar Dinajpur KVK			
Mushroom	3	60	3
Vermicompost	3	60	10
Fish Hatchery	1	25	4
Horticulture nursery	2	45	1
D. Hooghly KVK			
Horticulture nursery	2	25	5
Poultry	2	25	6
Mushroom	2	25	6
Vermicompost	2	25	5
E. Cuttack KVK			
Mushroom	2	40	10
Poultry	1	20	10
Goatery	1	20	6
Horticulture nursery	1	40	3
F. Nayagarh KVK			
Poultry	2	40	20
Mushroom	2	40	20
Fish Hatchery	2	40	20
G. Sambalpur KVK			
Poultry	1	45	15
Mushroom	1	15	3
Horticulture nursery	1	10	10
H. Ganjam-I KVK			
Fish Hatchery	2	30	4
Poultry	2	40	10
Mushroom	2	40	19
Horticulture nursery	2	30	12
I. Puri KVK			
Mushroom	2	40	15
Poultry	2	40	25
Apiary	2	40	10
Fish Hatchery	2	35	15

The findings of the performance in respect of youth involved and enterprise developed is presented graphically. It is observed that irrespective of KVKs, out of eight (08) enterprises, highest and lowest number of units were developed in Backyard Poultry (86) and Apiary (10) enterprise, respectively.

Irrespective of enterprises, among the nine (09) KVKs, highest number of units were developed in Puri KVK (65) followed by Nayagarh (60), Ganjam-I (45), Cuttack (29), Purulia (29), Sambalpur (28), Hooghly (22), Uttar Dinajpur (18) and Nimpith (12).

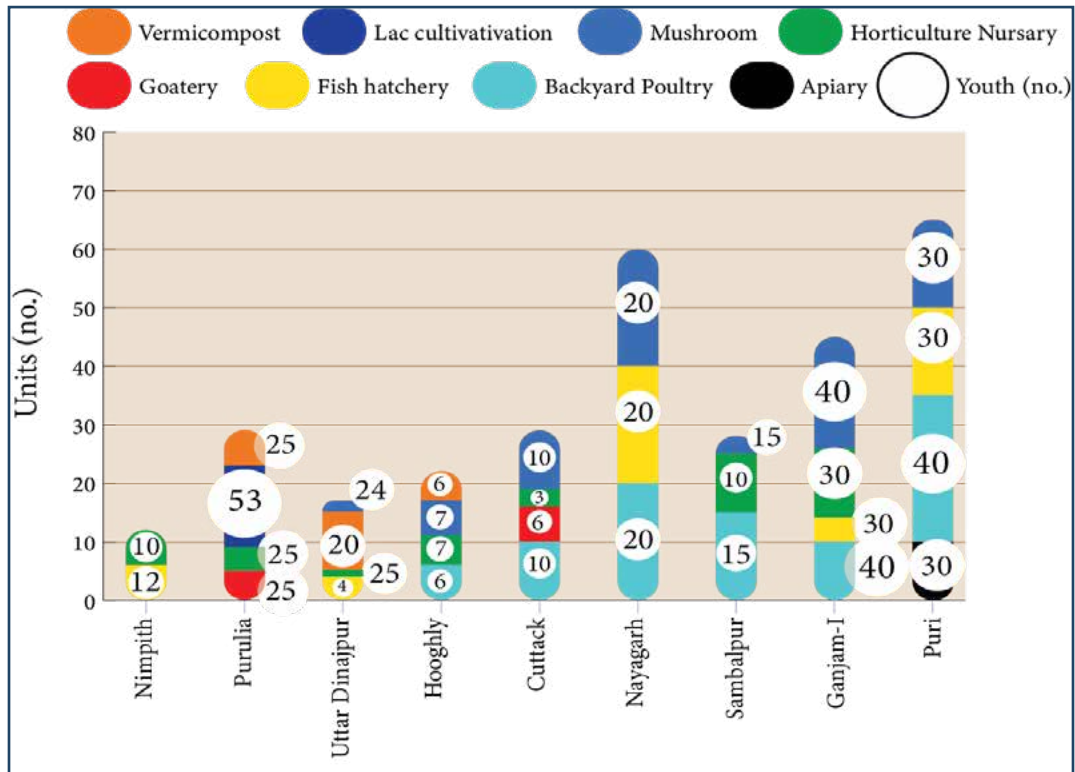


Figure. The number of enterprises formed and youths associated with them under the project ARYA in West Bengal and Odisha

Moreover, the impact of this initiative was clear from the improvement in the livelihood of rural youth - in most of the beneficiaries it was seen that the youth were able to earn more than their previous earning.

The income from eight (08) different enterprises before and after adopting ARYA are given in the following table.

Table: Impact of implementing ARYA during 2021

Sl. No.	Name of the Enterprise	Income (Rs.)	
		Before adopting ARYA	After adopting ARYA
1	Apiary	0.00	12088.00
2	Backyard poultry	48000.00	198000.00
3	Fish hatchery	70000.00	185000.00
4	Goatery	30000.00	185000.00
5	Horticulture nursery	176560.00	363670.00
6	Lac cultivation	50000.00	145000.00
7	Mushroom cultivation	72000.00	270000.00
8	Vermicompost production	42000.00	110000.00



Lac cultivation



Horticulture nursery



Vermicompost production



Mushroom cultivation



Backyard poultry



Fish hatchery

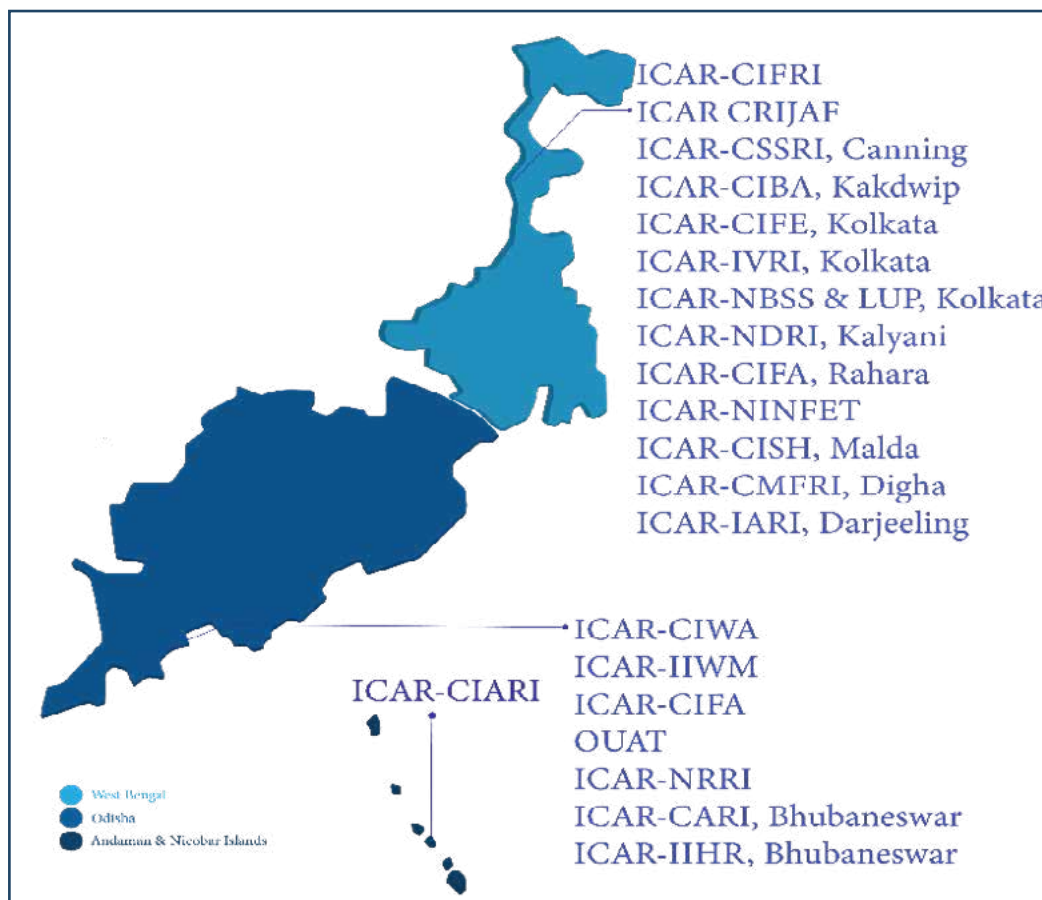
15.7 Mera Gaon Mera Gaurav Programme

Nodal Scientist: Dr. P.P. Pal

India has gone through several agricultural revolutions from the era of independence. That has gradually made the country's food production higher. However, to achieve the self-sufficiency and better livelihood for Indian farmers more works are yet to be done. Small farmers put forth their desire on various forums to have timely information on investment in agriculture, loans, availability of other basic amenities, market rates, extension activities and facilities provided by different agencies, new research findings and technologies, etc. Presently, various agencies are working in agriculture and farmers are keen to know about the services provided by them. The technologies developed and refined by research institutes, agricultural universities, private and other organizations are accepted and

adopted to various extents by farming community. Therefore, the awareness among farmers about the organizations and their programmes need to be created on regular basis. Hon'ble Prime Minister of India had launched a program called Mera Gaon Mera Gaurav (MGMG) in 2015 in order to strengthen the bond between scientific development and their implementing section, especially in the field of agricultural production. It is an innovative program planned to promote the direct interface of scientists with the farmers to hasten the lab to land process. The objective of this scheme is to provide farmers with required information, knowledge and advisories on regular basis by adopting villages.

In the zone of Odisha, WB and Andaman & Nicobar islands, ICAR-ATARI Kolkata is monitoring this project and implementing with help of several other ICAR institutes, regional centers and SAUs.



Different institutes and regional research centers collaborating with ICAR-ATARI Kolkata for implementing MGMG programme at Odisha, WB and A&N islands.

Scientists have also created awareness among farmers about climate resilient agriculture, other customized services, protective measures and related issues of local and national importance. In this process of social transformation, scientists involved local Panchayats, development agencies, NGOs and private organizations. In addition, scientists encourage the ideology of good agricultural techniques for producing good quality agricultural products.

During 2020-2021 the country has witnessed rapid widespread of novel corona virus and consecutive

lockdowns. Due to that reason GoI imposed lockdown and restrictions in movability. So, the scientists were not able to go on-site at regular interval, still with use of ICT the information and guidance were spread among farmers. In this year, under MGMG programme a total of 53 groups were formed. Altogether 383 scientists are involved in this programme and 284 villages were covered for strengthening interface with farmers. The details of activities undertaken during this period under MGMG programme are given below.

State	Total no of groups/ teams	No of scientists	No of villages covered	No of field activities	No of messages/ advisory sent	Farmers benefited
West Bengal	24	210	161	253	270	10522
Odisha	19	130	93	155	170	5301
A&N Islands	10	43	30	82	286	2153
Total	53	383	284	490	726	17976



Activities of different organizations under MGMG programme

15.8 Celebration of Swachhta Pakhwada 2021(Swachhata Hi Suraksha)

Nodal Scientist: Dr. S.K. Mondal

During 2021, various Swachhta activities were

conducted by ICAR-ATARI Kolkata as well as its constituent KVKs in spite of COVID-19 restrictions. For various Swachhta Action Plan (SAP) activities a total of Rs. 9.00 lakh was sanctioned and utilized in the Zone. The details have been given below

Celebration of SwachhtaPakhwada 16 to 31 December, 2021 – ‘Swachhta Hi Suraksha’.

Sl. No	Date	Activities	ICAR - ATARI Kolkata, Zone - V		
			No. of KVKs Involved	No. of Participants (Farmers/ Staffs/ other Participants)	No. of VIPs attended the program
1	16.12.2021	Display of banner at prominent places, taking Swachhata pledge, Stock taking & briefing of the activities to be organized during the Pakhwada, plantation of trees.	52	624	50
2	17.12.2021	Basic maintenance: Stock taking on digitization of office records/ e-office implementation. Cleanliness drive including cleaning of offices, corridors and premises. Review of progress on weeding out old records, disposing of old and obsolete furniture's, junk materials and white washing/painting.	43	344	38
3	18.12.2021	Sanitation and SWM Cleanliness and sanitation drive in the villages adopted under the Mera Gaon Mera Gaurav Programme and/or other schemes by ICAR Institutes/KVKs involving village community. Reviewing the progress made under ongoing Swachhta activities including implementation of Swachhta Action Plan (SAP) & providing at the spot solutions.	26	236	22
4	19.12.2021	Sanitation and SWM Cleanliness and sanitation drive within campuses and surroundings including residential colonies, common market places. Stock taking of biodegradable and non-biodegradable waste disposal status and providing on the spot solutions.	12	127	10
5	20.12.2021	Stock taking of waste management & other activities including utilization of organic wastes/ generation of wealth from waste, polythene free status, composting of kitchen and home waste materials. Promoting clean & green technologies and organic farming practices in kitchen gardens of residential colonies and at least one nearby village and proving on the spot technology solutions.	9	38	3
6	21.12.2021	Campaign on cleaning of sewerage & water lines, awareness on recycling of waste water, water harvesting for agriculture/ horticulture application/ kitchen gardens in residential colonies/ 1-2 nearby villages.	7	43	6



Sl. No	Date	Activities	ICAR - ATARI Kolkata, Zone - V		
			No. of KVKs Involved	No. of Participants (Farmers/ Staffs/ other Participants)	No. of VIPs attended the program
7	22.12.2021	Organising Workshops, exhibitions, technology demonstrations on agricultural technologies for conversion of waste to wealth, safe disposal of all kinds of wastes. Debate on Swachhata at the DARE/ICAR establishments, Seminars, awareness camps, rallies, street plays and expert talks	47	705	42
8	23.12.2021	Celebration of Special Day - Kisan Diwas (Farmer's Day) - 23 December inviting farmers. Experience sharing on Swachhata initiatives by farmers and civil society officials. Felicitating farmers/ civil society officials for exemplary initiatives on Swachhata.	25	141	21
9	24.12.2021	Swachhta Awareness at local level (organizing Sanitation Campaigns involving and with the help of the farmers, farm women and village youth in new villages not adopted under any scheme by Institutes/ establishments.	27	378	21
10	25.12.2021	Cleaning of public places, community market places and/or nearby tourist/selected spots.	11	53	9
11	26.12.2021	Fostering healthy competition: Organising Webinar, VC meetings, competition and rewarding best offices/ residential areas/ campuses on cleanliness. Quiz, essay & drawing competitions for school children, village youth.	10	38	7
12	27.12.2021	Awareness on waste management & other activities including utilization of organic wastes/ generation of wealth from waste, polythene free status. Curb the use of Single Use plastic (SUP) and discourage the use of plastic in the office. Composting of kitchen and home waste materials, promoting clean & green technologies and organic farming practices in new area.	13	156	6
13	28.12.2021	Campaign on cleaning of sewerage & water lines, awareness on recycling of waste water, water harvesting for agriculture/ horticulture application/ kitchen gardens in residential colonies. Outside campuses/ nearby villages with the involvement of local/ village communities.	14	129	12
14	29.12.2021	Visits of community waste disposal sites/ compost pits, cleaning and creating awareness on treatment & safe disposal of bio-degradable/ non-bio-degradable wastes by involving civil/ farming community.	8	34	5
15	30.12.2021	Involvement of VIP/ VVIPs (Union Ministers, MPs and other dignitaries) in the Swachhta activities, Involvement of print and electronic media may be ensured so that adequate publicity is given to the Swachhta Pakhwada.	-	-	-
16	31.12.2021	Organization of press conference for highlighting the activities of Swachh Bharat Pakhwada by involving all stake holders including farmers/ VIPs/ press and electronic media.	-	-	-



15.9 Krishi Vigyan Kendra (KVK) Knowledge Network/KVK Portal

Nodal Scientist: Dr. K.S. Das

The Krishi Vigyan Kendras (KVKs) are serving as knowledge and resource centre of agricultural technologies and have been linked the NARS with extension system and famers. The Government of India launched 'KVK Portal or KVK Knowledge Network' in the year 2016-17 to collect and to upload various agricultural activities conducted by the KVKs at their respective districts as a source of information for farmers. The main objectives were- i) to access information related to KVKs by the farmers and other stake holders from one place at the National Level, ii) to review and monitor the functioning of KVKs against the mandates and objectives, and iii) to provide the information and advisory to the farmers. The portal can be accessed through logging in- <http://kvik.icar.gov.in>. It has been

designed in such a way that it can be monitored with ease from Ministry Level to Farmers' doorstep depending upon its use. Since then, the portal is being enriched with different kinds of features e.g. facilities available with the KVKs, KVK profile, package of practices for production of crops/ horticulture/ livestock/ fisheries, past/ongoing/ future events, monthly progress report, news items, national programmes, sending messages etc. All 59 KVKs (3 from Andaman & Nicobar Islands, 33 from Odisha and 23 from West Bengal) of this Zone have uploaded 9906 events during the year 2021. Three KVKs updated none different facilities available with them. Not only that, 9 KVKs added new package of practices on crop, livestock, fisheries and horticulture. As per KVK profile was concerned, employee detail was updated by maximum (25) KVKs followed by posts (5 KVKs), fish/resources (4 KVKs each), crops (3 KVKs) and finance/appliances available with them (1 KVK each).

Sl. No.	Zone Name	Total No. of KVK	No. of Events added by KVKs	No. of Facilities added by KVKs		No. of KVKs filed Report on Package of Practices					No. of KVKs filed Profile Report					
				No. of KVK	No. of Facility added	Crop	Livestock	Fisheries	Horticulture	Employee	Post	Finance	Soil Health	Appliances	Crops	Resources
1	KARNATAKA ZONE-IV KVKs	33	9906 (22332)	3 (33)	9 (401)	2 (43)	1 (23)	1 (17)	2 (34)	23 (38)	3 (34)	1 (46)	2 (42)	1 (21)	2 (38)	4 (37)

Note: In the table, values which are shown within the brackets indicate the cumulative values

15.10 KRISHI Portal

Nodal Scientist: Dr. K.S. Das

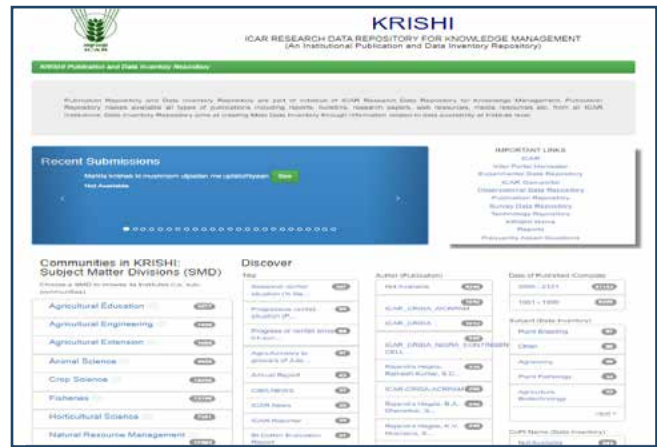
One platform of data inventory repository, the Knowledge Based Resources Information Systems Hub for Innovations in Agriculture (KRISHI) Portal, has been developed by Indian Council of

Agricultural Research (ICAR) to bring knowledge resources to the farmers, researchers, planners and many others at one place. The portal has a centralized data repository system of ICAR consisting of technology, data generated through experiments/ surveys/observational studies, geo-spatial data, publications, learning resources etc. The portal can



be accessed at <http://krishi.icar.gov.in>. During the year 2021, all the documents including books, annual reports, newsletters, technical bulletins etc. which

were published by this institute were uploaded in *KRISHIPortal* for making available for the readers/ stakeholders.



15.11 Scientific Beekeeping Training

Nodal Scientist: Dr. Avijit Halder

The importance of bee keeping is enormous. Without bees, agriculture is almost impossible. Bees are well known for pollination and the service of pollinating flowers is necessary for sustainable agricultural farming. There is a famous quote from Albert Einstein “If the bee disappeared off the

acceptable agro-based enterprise, particularly for socioeconomic development of landless, small and marginal farmers as well as unemployed rural youth. Thus, beekeeping has come up as an important agricultural activity which shows the way of self-employment and entrepreneurship among the rural youth as well as subsidiary income for the practicing farmers.

In view of the importance of beekeeping, DAC & FW, GoI has sanctioned Rs. 921.15 lakh/- to the ICAR in the month of January 2021 for organizing 600 trainings (500 physical and 100 online trainings) on scientific beekeeping by 100 KVKs across the country under National Beekeeping & Honey Mission (NBHM) of National Honey Board (NHB). Accordingly, 50% of the sanctioned budget i.e. Rs. 64,48,050.00 during 2020- 21 financial year and again the rest 50% of the sanctioned budget i.e. Rs. 64,48,050.00 during 2021- 22 financial year has been received by ATARI Kolkata from the Council



Figure 1: 7 days physical training on scientific beekeeping at Port Blair KVK, ICAR-CIARI, A & A Islands

surface of the globe then man would only have four years left to live” and this may be quite true for the availability of huge amount of food, because of the existence of bees. About 60-70% agricultural / horticultural crops depend upon honeybees for cross pollination. Honey is the prime hive product. Other useful products are bee wax, propolis, pollen, royal jelly, bee venom etc. The growing market potential for honey and its products has resulted emerging of bee keeping as an economically viable and socially



Figure 2: 7 days physical training on scientific beekeeping at Kalahandi KVK, OUAT, Odisha

for organizing training on scientific beekeeping by 15 KVKs under ATARI Kolkata and subsequently, Rs. 4,60,575.00 has been released to each selected



Figure 3: Hands on training on scientific beekeeping at Sundargarh-I KVK, OUAT, Odisha



Figure 4: Input distribution after 7 days physical training on scientific beekeeping at Nimpith KVK, RAKVK, West Bengal

KVKs of Andaman and Nicobar islands (Port Blair), Odisha (Cuttack, Dhenkanal, Gajapati, Kalahandi, Keonjhar, Jharsuguda, Puri, Sundargarh-I) and West Bengal (Cooch Behar, Dekshin Dinajpur), Murshidabad-II-Sargachi, Nadia-I-Gayespur, South 24 Parganas-Nimpith, Birbhum).

KVKs conducted 26 physical trainings each of 7 days involving 653 participants with a batch of 25 participants in each training and 5 KVKs organized online training of 3 Days with a total of 163 participants on scientific beekeeping. The most



Figure 5: Trainees of training on scientific beekeeping at Jharsuguda KVK, OUAT, Odisha

significant achievements of the training included effective skill development on scientific beekeeping, enthusiasm and interest creation among the rural youth, especially women for beekeeping entrepreneurship.



Figure 6: Hands on training on scientific beekeeping at Dhaanyaganga KVK, Sargachhi, Murshidabad, West Bengal

Table: Beekeeping training undertaken by 15 KVKs under ICAR- ATARI, Kolkata

State	Number of KVKs selected for Bee Keeping Training	Name of KVKs	No of Physical training conducted	No of persons trained in Physical training	No of Online training conducted	No of persons trained in Online training
A & N Islands	1	Port Blair	3	78	0	0
Odisha	8	Cuttack, Dhenkanal, Gajapati, Kalahandi, Keonjhar, Jharsuguda, Puri, Sundargarh-I	11	275	1	50
West Bengal	6	Cooch Behar, Dekshin Dinajpur, Murshidabad-II- Sargachi, Nadia- I-Gayespur, South 24 Parganas-Nimpith, Birbhum	12	300	4	113
Total			26	653	5	163

Impact of Scientific Beekeeping Training

A total of 116 trainees have started scientific beekeeping as a new venture after receiving beekeeping training. The following success stories depict the impact of beekeeping training.

Success Story

Success story 1:

Trainee's name:

Shri. Kumarabar Samal



Address: C/O- Rajkishore

Samal,

Vill.- Baharbampu

PO- Ghantalo

Block- Nischintakoili

Dist- **Cuttack**

Pin-754209

State- Odisha

Mobile Number: 9583486887

Background: Shri. Kumarabar Samal, aged 40 is an educated, smallholder farmer cultivating rice, vegetables and fruits in his 1.5-acre land. His family consists of 6 members. He earns Rs 15000 per month where he faces difficulties to run the family smoothly. He has started lease out lands to support his livelihood. But one day he came to KVK for some new enterprises for his livelihood support. The experts of KVK listened his farming practices, earnings and opportunities around his homestead land. The KVK expert Dr. Tusar Ranjan Sahoo advised him to enrol a seven days training programme on "Scientific Beekeeping" which was scheduled on 3rd week of March, 2021 with the support from NHB, DAC & FW, Govt of India.

Training impact: After completion of 7-days training including exposure visit to OUAT, Bhubaneswar, Shri. Kumarabar Samal was quite enthusiastic. He purchased 2 boxes from local apiarist and could able to catch swarm bee groups and started keeping there.

Further, he began making of bee boxes with his own effort and started maintaining all boxes with colony division. He always keeps constant touch with KVK experts sharing his new experiences and within 3 months of starting, he increased his bee colony from 2 to 7 and thereafter 17. Then he sold 11 colonies @ Rs 1000.00 per colony earning Rs. 11000.00 from bee colony. He could able to extract 6 kg honey and earn Rs. 3000.00 @ Rs. 500.00 per kg honey. Now-a-days, his family members are always busy with beekeeping activity. He is helping other youths to start bee keeping in and around his localities.

Benefit realized :

Income from colony selling: Rs. 11000.00

Income from honey selling: Rs. 3000.00

Total Income: Rs. 14000.00

Conclusion: Shri. Kumarbara Samal could enhance his income to Rs. 14,000.00 within 9 months after starting bee keeping from 10 boxes and he is interested to keep more number of bee boxes in near future.

Success story 2

Trainee's name:

Shri. Pranotosh Chandra Pal

Address: C/O- Prabhas Chandra Pal

Vill.- Mokdumpur,

PO- Bhikahar

Block- Tapan

Dist-**Dakshin Dinajpur**

State- West Bengal

Contact No.: 9614420402



Background: Bee keeping is proven to be an income generating enterprise under favourable conditions. But management of bee keeping, selling and marketing of honey remains a big challenge for apiculturist due to lack of knowhow and paucity of honey processing unit in the area. Shri. Pranotosh Chandra Pal, a 38 years old rural youth, belongs to a very poor and land less family. He has ten members in his family. He had no certain income source. He could not be able to support his family. He came in contact with Dakshin Dinajpur KVK in 2022. The KVK experts suggested him to take the training on beekeeping. He underwent 7-days training on bee-keeping sponsored by NHB, DAC & FW, Govt of India.

Training impact: In the month of January, 2022, Dakshin Dinajpur KVK approached rural youths to impart training on beekeeping at KVK, and discussed the issues they were facing for managing the bee hives, processing of honey and selling the bee products. In the month of February, 2022, Dakshin Dinajpur KVK organized a 7-days training on bee-keeping for the second batch. Out of fifty trainees, six trainees started bee keeping. Shri. Pranotosh Chandra Pal is one of them. Shri. Pranotosh participated a 7-days training on bee-keeping in February, 2022. After the training, 10 bee-boxes were provided to Shri. Pranotosh by Dakshin Dinajpur KVK. Further, he purchased 40 bee-boxes out of his own capacity. With the technical and logistical support from KVK, he purchased an initial of 40 bee hives at a total cost of Rs. 35,000.00 and set up a honey production unit and selling point at his house.

Benefit realized: Within a short span of time, Shri. Pranotosh Chandra Pal produced 500 kg of litchi honey and sold and earned Rs. 20,000.00. Further, he produced honey and earned a total gross income of Rs. 1.0 lakh with a net profit of Rs. 45000.00.

Conclusion: Pranotosh, who had been forced to move from Tapan, Dakshin Dinajpur to Kolkata in 2017-18 due to extreme poverty and hardship, has now become a successful entrepreneur. He has achieved the confidence.

Now, he does not want to look back. The journey of Shri. Pranotosh Chandra Pal may be an example for becoming a successful bee keeping and honey producing entrepreneur to the unemployed youths and landless farmers.

Success story 3

Trainee's name:

Shri. Gopal Neogi

Address:

Vill + PO: Chu Maipith
Nagenabad,

Block: Kultali

Dist.- **South 24 Parganas**

State- West Bengal

Pin- 743383



Contact No. 9735167419

Background: Shri. Gopal Neogi is a marginal farmer having less than 2.2 bigha land. He used to venture the deep Mangrove forests of Sundarbans to collect wild honey, even taking life risk. From agriculture and wild honey collection, he used to earn less than Rs. 7500.00 which was not sufficient to support his family. Soon he became indebted to the local Mahajan who would lend money at steep interest.

Training impact:

After knowing the beekeeping training facility at Nimpith KVK, Shri. Gopal Neogi joined in a 7-days beekeeping training. He was surprised to know that he could easily avoid the risk of tiger attack in the jungle if scientific beekeeping was adopted. After taking the training, he joined the "Nolgora Sundarban Madhu Unnayan SHG" to start scientific beekeeping with *Apis mellifera* (Italian honeybee). Presently, the group is having 630 colonies of *Apis mellifera* and 15 colonies of *Apis cerana*.

Benefit realized :

After deducting all the recurring expenses and bank interest, Shri. Gopal Neogi earns Rs. 1.50 lakh per annum, as share money.

Conclusion:

Shri. Gopal Neogi is now fully engaged in beekeeping. He is also a member of the Bonphool

FPC, where the honey is processed and branded as Bonphool Honey. The honey is available at Biswa Bangla and also sold through Amazon. Through this arrangement, the beekeepers are

getting assured market at a reasonable price. Moreover, the profit of the FPC is also shared among the members.

16.0 Training and Capacity Building:

Nodal Scientist: Dr. S.K. Mondal

The exercise of Training Need Assessment (TNA) and preparation of Annual Training Plan (ATP) for all categories of employees were initiated in the year 2015-16. In continuation, ICAR-ATARI, Kolkata has performed TNA and prepared ATP for the year 2021. 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 successfully been uploaded in ERP system by individual employees. During the year 2021, out of 14 employees of the institute none opted for training through Training Information Management System (TIMS) but one training of administrative staff was performed on TSA and GeM modules.

16.1 Capacity Building of Farmers through Training Programmes on Profitable Dairy Farming and Livestock Management

Nodal Officer: Dr. S. K. Roy

A special programme on capacity building of farmers for profitable dairy farming and livestock management was conducted by 22 KVKs of this zone to train 3365 farmers and farm women from the category of SC/ST, OBC and others. The main objective of the programme was to provide skill on profitable dairy farming and livestock management for improved socio-economic condition of the

farmers. The broad areas covered were dairy, poultry, piggery, goatery, feed management, disease management, veterinary health care, value



addition of dairy products etc. The capacity building programme help the farmers adopting new technologies for better quality of animal production, value addition, product development etc. The duration of all the programmes was of 3 days conducted across the zone. The overall



achievement indicates that altogether 1820 women farmers underwent the programmes against 1545 male farmers. The participation of women farmer was more in all the three categories against male farmers. Broad areas covered and number of participants is presented in the following Table giving state-wise details.



Sl. No	Name of the State	Title of the training	No. of Participants								Grand Total
			SC/ST		OBC		Others		Total		
			M	F	M	F	M	F	M	F	
1	West Bengal	Cattle Farming, Goat Farming, Management of Dairy Farming, Dairy and Poultry based Integrated Farming for sustainable livelihood, Backyard Poultry Farming, Production of Value Added Milk Product, Livestock Disease Management and others.	377	516	88	84	395	346	860	948	1808
2	Odisha	Ration planning in dairy cows, Profitable Dairying, Farming and Livestock Management, Backyard Poultry Farming, Dairy Farming, Commercial Poultry Farming, Goat Farming and others.	124	262	126	83	228	181	492	512	1004
3	Andaman & Nicobar Islands	Dairy Farming, Goat Farming, Poultry Farming and others	0	0	146	212	47	148	193	360	553
Grand Total			501	778	360	379	670	675	1545	1820	3365

17.0 Ongoing Programmes:

17.1 Skill Development Training programme (Other than ASCI)

Nodal Scientist: Dr. S.K. Mondal

As a part of capacity development of farmers in

various job-oriented aspects of agriculture and allied sectors, KVKs of this Zone also conducted different skill development training programmes (of less than 200 hours duration) during the period under report. The details 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	0	0	0	0	0	
Odisha	11	480	167	104	268	531576
West Bengal	7	170	130	63	178	93800
Total	18	650	297	167	446	625376

17.2 National Farmer's Portal

Nodal Scientist: Dr. K.S. Das

In the era of digitization, farmers were facilitated with receiving updated information on their agricultural business through smart phones, internet, touch screen kiosks, agri-clinics, mass media, common service centres, kisan call centres etc. The Central and State Government Organizations, Krishi Vigyan Kendras, Meteorological Department, State Agriculture Universities, ICAR Institutes,

Department of Animal Husbandry, Dairying and Fisheries and others are sending different advisories to the agricultural farmers through SMS in their language using National Farmers' Portal/*mKisan* Portal platform (www.mkisan.gov.in). All 59 KVKs under ICAR-ATARI Kolkata sent SMSs on agricultural related information (crops, seeds, pesticides, disease incidences, fertilizers, farmers' insurance, farm machineries, storage, market price of agricultural produce, package of practices, various extension activities, weather forecasts etc.)

to the farmers of their concerned district. During the year 2021, KVKs of Andaman and Nicobar Islands, Odisha and West Bengal sent 5, 440 and 177

advisory, respectively which benefitted more than 3.31 crore agricultural farmers.

State wise distribution of SMS advisories and number of beneficiaries during 2021

State/UT	No. of advisory count	No. of beneficiaries
A & N Islands	05	10667
Odisha	440	23121082
West Bengal	177	9946914
Total	622	33078663

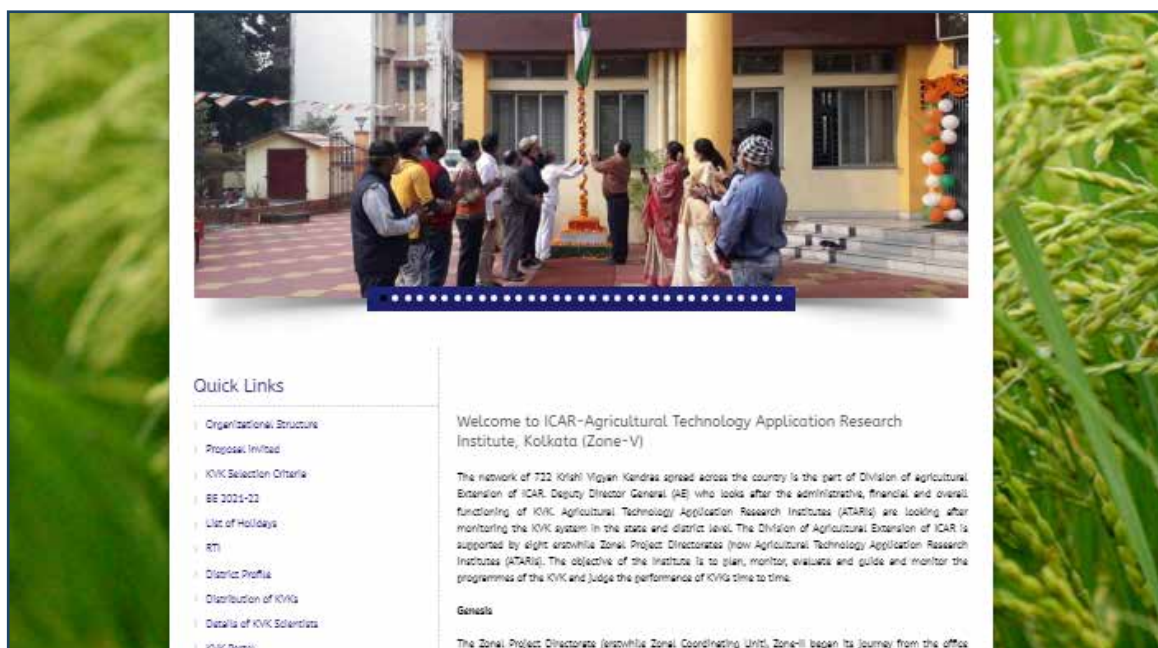


17.3 Institute Website

Nodal Scientist: Dr. K.S. Das

During the year 2021, the website pertaining to ICAR-ATARI Kolkata was regularly updated for latest information on KVKs, host organizations, personnel

of ATARI Kolkata, past/present/upcoming events, publications, proceedings of meetings/ review workshops, awards, news, KVK websites and many others. The website can be accessed through logging in www.atarikolkata.org.



17.4 Externally NABARD Funded Project on Promotion of Agro Forestry

Nodal Scientist: Dr. Avijit Halder

NABARD funded project entitled, 'Agro Forestry and Value Chain Management for Doubling Farmers' Income in New Alluvial Region of West Bengal' has been sanctioned no.NB.WBRO/2807/FSDD-FSPF/ICAR-ATARI/2020-21 dated 29.03.2021 and 1st Instalment fund (20%) released from NABARD, Kolkata on 14.05.2021. The project was launched for its activities at Purba Medinipur on 27.07. 2021. The goal set to double farmer's income by 2022 is central to promote farmer's welfare in the country. The present project has been implemented through the

fuel, to check soil erosion, conserve soil moisture and increase the soil fertility, to generate employment opportunities for rural people and to manage land efficiently so that the system can contribute in doubling farmers' income.



Figure 3: Planting materials and input distribution among the selected farmers

The villages were selected after the discussion with the line departments, DDM, NABARD, Purba Medinipur and the local body of the villages. The selected six villages are Dabuapukur, Rupchak, Sundarnagar, Saraswata, Atberia and Harijhama. Majority of the farmers of the villages are with various available resources under small land holdings situations. Awareness and motivational program was organized to make understand the importance of different aspects of agro-forestry. An attempt has been made to establish two kinds of agro-forestry model under the project. Model 1: Fruit plants (Mango+Guava+Ber etc) - Forest plants (Lambu+Kadamba+Sonajhuri etc) - Vegetables (Cucurbits/tuber crops/Leafy vegetables) and Model 2: Fruit plants (Sapota+Jackfruit+Aonla etc) - Forest plants (Subabul+ Nim+ Gamhar+Jam etc) - Spices (Ginger+Turmeric).



Figure 1: Online launching program of the project on 27th July 2021

KVK network in Purba Medinipur, West Bengal at six villages from Panskura block of the district Purba Medinipur involving 300 farm families (50 families from each village) during a period of 3 years from 2021- 22 to 2023- 24. The objectives of the project are to utilize the available farm resources properly, to maximize per unit production of food, fodder and



Figure 2: Training programme on vegetable crop managements under this project



Figure 4: Field visit by DDM, NABARD, Purba Medinipur with KVK Scientists

As an established technology, agro-forestry may be the best technology in the selected area to integrate various available resources to make the agriculture productive, profitable and sustainable. Various trainings on growing and management of vegetables, transplanting, care and management of fruit plants, nursery management of forest and fruits plants, propagation technique of fruits crops were organized at the villages. Thereafter, various Fruit Plants (4800 numbers) like Mango, Guava, Ber, Sapota, Jackfruit and Amla at the cost of Rs. 128000.00, Forest Plants (6300 numbers) like Lambu, Sonajhuri, Kadam, Subabul, Neem, Gamar and Jamat the cost of Rs. 94,050.00, Vegetable Seeds (Spinash, Red Amaranthus, Cucurbits) at the cost of Rs. 7,500.00 and Vegetable Seedlings (Chilli, Brinjal, Tomato, Cauliflower) at the cost of Rs. 18000.00 were given to 300 farmers.

17.5 Externally NABARD Funded Project on Model Integrated Farming across Six Agro-Climatic Regions of West Bengal

Nodal Scientist: Dr. Avijit Halder

NABARD funded project entitled, 'Formulation of Area Development Schemes and Development of Area-Specific Software Template for Model Integrated Farming across Six Agro-Climatic Regions of West Bengal' has been sanctioned no. No. NB.WBRO/736/FSDD-FSPF/ICAR-ATARI/2021-22 dated 19.08.2021 and 1st Instalment fund (20%) released from NABARD, Kolkata on 26.11.2021. The project was launched for its activities in the whole West Bengal on 04.02.2022. The Chief Guest, Dr. Swarup Kumar Chakrabarti, the Hon'ble Vice-Chancellor, Uttar Banga Krishi Viswavidyalaya, Pundibari, Cooch Behar appreciated to take up such kind of unique project for developing strategies of integrated farming (IF) for different agro-climatic regions that would enable adequate employment and income generation, especially for the smallholder farmers, in West Bengal. Dr. S. K. Roy, Director, ICAR-ATARI, Kolkata highlighted the importance of IF for doubling farmers' income in West Bengal. Mr. Awadesh Kumar, General Manager of NABARD, Kolkata indicated that developing a software template would give a pictorial view of customized IF based on farmers' demand, available

resources including the potential combination of the components and also provide a clear view of possible return to the farmers for well understanding.

The objective of the project is to explore technically feasible, economically viable, area-specific existing models of IF across six agro-climatic regions of West Bengal. Thus, District and KVK under six agro-climatic regions of West Bengal have been selected purposefully. These Districts and/ or KVKs are: (i) Under Northern Hill Region: (1) Darjeeling, (ii) Under Terai and Teesta Region: (2) Coochbehar, (3) Jalpaiguri, (4) Uttar Dinajpur, (iii) Under Old Alluvial Region: (5) Dakshin Dinajpur, (6) Malda, (7) Murshidabad (Additional KVK), (iv) Under New Alluvial Region: (8) Nadia, (9) Burdwan, (10) North 24 Parganas, (v) Under Red and Laterite Region: (11) Bankura, (12) Birbhum, (13) Purulia, (14) West Medinipur, (vi) Under Costal Saline Region: (15) South 24 Parganas: Nimpith, (16) South 24 Parganas: Narendrapur (Additional KVK). A systematic desk study was completed for primary selection of SWOT alternatives/ factors under each SWOT component/ group considering common features and/ or region-specific unique feature(s) covering different aspects like technological, economic, environmental, social etc. A total of 60 existing IFs in six agro-climatic regions of West Bengal has already been selected randomly in 15 districts by 16 KVKs situated in different districts of West Bengal. The existing IFs in the district have been selected in such a way that 10 IFs would be considered from each agro-climatic regions of West Bengal and thus, a total of 60 IFs would be considered under study. A set of questions was finalized to collect data for SWOT analysis. Data collection for SWOT analysis is in progress. An attempt will be made for a quantitative SWOT analysis using Analytic Hierarchy Process (AHP).

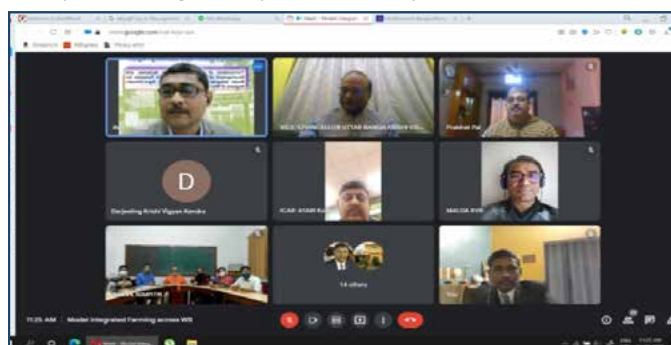


Figure 1: Online launching program of the project



Figure 2: Data collection for SWOT analysis KVK Scientist at the farmer's field at Murshidabad, WB



Figure 3: Data collection for SWOT analysis KVK Scientists at the farmer's field at Coochbehar, WB



Figure 4: Validation of questionnaires for data collection on IF with KVK Scientist at the farmer's field at South 24 Parganas, WB

17.6 Research Advisory Committee (RAC) approved Institute Project entitled 'A Study on Capacity Development Programs of the KVKs for Augmenting Livestock Production and Farmers' Income in Eastern India'

Principal Investigator: Dr. Avijit Halder

Co-Investigators: Dr. S.K. Mondal, Dr. K.S. Das, Dr. P.P. Pal, Dr. Rupak Goswami, Dr. Tapas Kumar Dutta, Dr. Subashis Roy

The project entitled, 'A Study on Capacity Development Programs of the KVKs for Augmenting

Livestock Production and Farmers' Income in Eastern India' aims at strengthening the capacity of the livestock farmers across agro-climatic regions in Eastern India. Capacity development is the key for agricultural extension activity and a major mandate of Krishi Vigyan Kendra. In India, the farm households access lesser information on livestock technology as compared to accessing information on modern technology for crop farming. No database is available on Capacity Development Programs (CDPs) in livestock sector in KVK network system. The questions of what and how capacity development programs are appropriate to a given socio-economic milieu under certain agro-climatic region. Hence, the present project is designed to explore the relevance of various CDPs of the KVKs in terms of livestock production and farmers' income and make available reliable database for decision-making process for particular agro-climatic region in Eastern India.

The present research is designed based on ex-post evaluation using a quasi-experimental design. The quantitative as well as qualitative research approach based on two principles covering collection of data through discussion, interviews, observations etc and use of triangulation of methods to allow cross validation of information will be followed. The project will involve various stakeholders like the farmers, KVK's SMSs, State Animal Resource Development Officers, Pani Bondhu, Co-operative Society officials, University Professors and ICAR Institute's Scientists. The duration of the proposed project is 2 years.

A desk study has already been conducted involving all KVKs across agro-climatic regions in Eastern India to analyze archival records, such as reports, notes, correspondence, and so forth. Data on capacity development programs of livestock farming have been collected from 18 KVKs of Eastern India for further analysis and delineating a typology of CDPs based on the intended stakeholders' perceptions and program outcomes, ranking the CDPs, assessing the relative relevance of existing CDPs of the KVK system and figuring out the contribution of CDPs

on livestock production and income of the farmers. KVKs offer many training programs to the farmers and it is expected that they will translate into increased farm income following a causal pathway. A small pilot study has been completed to identify the pathways of training's impact on trainees' incomes as perceived by the farmers, field-level staff and experts. Considering all the stakeholders' opinions and concerns about how the system of impact creation should be drawn, how it works and how one component affects another, we used Fuzzy Logic Cognitive Mapping (FCM) to develop a dynamic system modeling. Such system may be called a mental model of stakeholders which can be elicited by formal techniques of cognitive mapping. The FCM elicitation usually takes stakeholders' opinions into account, thus helping us to understand a system comprehensively, often in a workshop environment. Thus, a workshop was organized at Sasya Shyamala KVK of South 24

Parganas district involving goat keepers and Pani Bondhu (field-level livestock extension workers). The concept of FCM was explained to them and asked the participants to draw a (cognitive) map of how KVK's training on goat farming had affected their income. They drew the pathways, involving causally linked system elements separately and then developed group cognitive map (a single map developed by a group of participants). The experts, mostly SMS (Animal Science), university professors, and scientists were facilitated either via telephonic conversation or face-to-face visits and they drew the cognitive maps individually. These maps were collected from them separately. The participants drew the pathways constituted of elements, and pair of linked elements were assigned a weight between -1 (extremely high negative causal relation) to +1 (extremely high positive causal relation). All these maps were amalgamated to form two separate common cognitive maps for 1) farmers and Pani Bondhus and 2) experts.

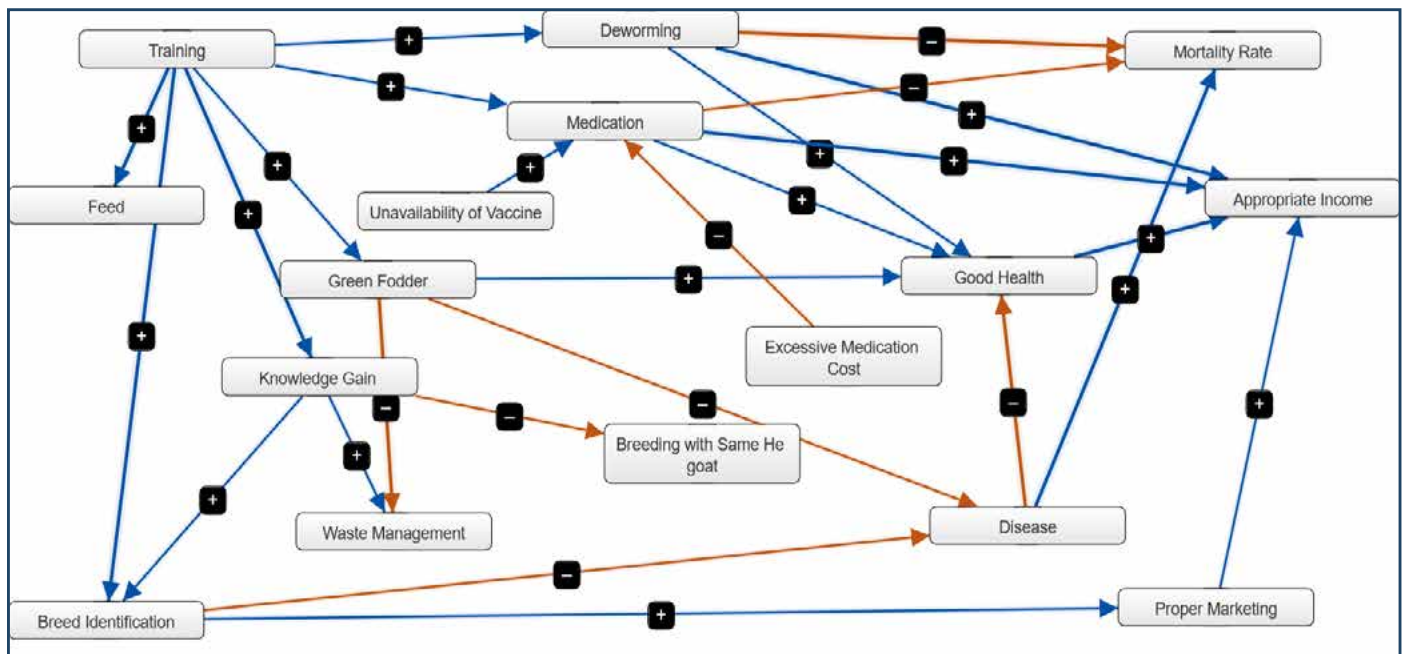


Fig. 1: Farmers' and Pani Bondhus' shared amalgamated cognitive map. The nodes denote factors/elements through which the impact of training transitioned to higher farm income (reported in Table 1). The blue ties with '+' sign denote positive relations among two factors/elements, while the orange ties with '-' sign denote negative relations. The thickness of lines represents tie strength.

Table 1: Centralities of system elements in the Farmers’ and Pani Bondhus’ shared cognitive map

Component	Indegree	Outdegree	Centrality	Type
Training	0	2.75	2.75	driver
Knowledge Gain	0.5	0.65	1.15	ordinary
Breed Identification	0.7	0.7	1.4	ordinary
Disease	0.5	1	1.5	ordinary
Feed	0.5	0	0.5	receiver
Green Fodder	0.45	1.15	1.6	ordinary
Deworming	0.35	1.45	1.8	ordinary
Unavailability of Vaccine	0	0.2	0.2	driver
Medication	0.85	1.4	2.25	ordinary
Excessive Medication Cost	0	0.2	0.2	driver
Mortality Rate	1.45	0	1.45	receiver
Waste Management	0.75	0	0.75	receiver
Breeding with Same He goat	0.2	0	0.2	receiver
Good Health	1.85	0.5	2.35	ordinary
Proper Marketing	0.4	0.2	0.6	ordinary
Appropriate Income	1.7	0	1.7	receiver

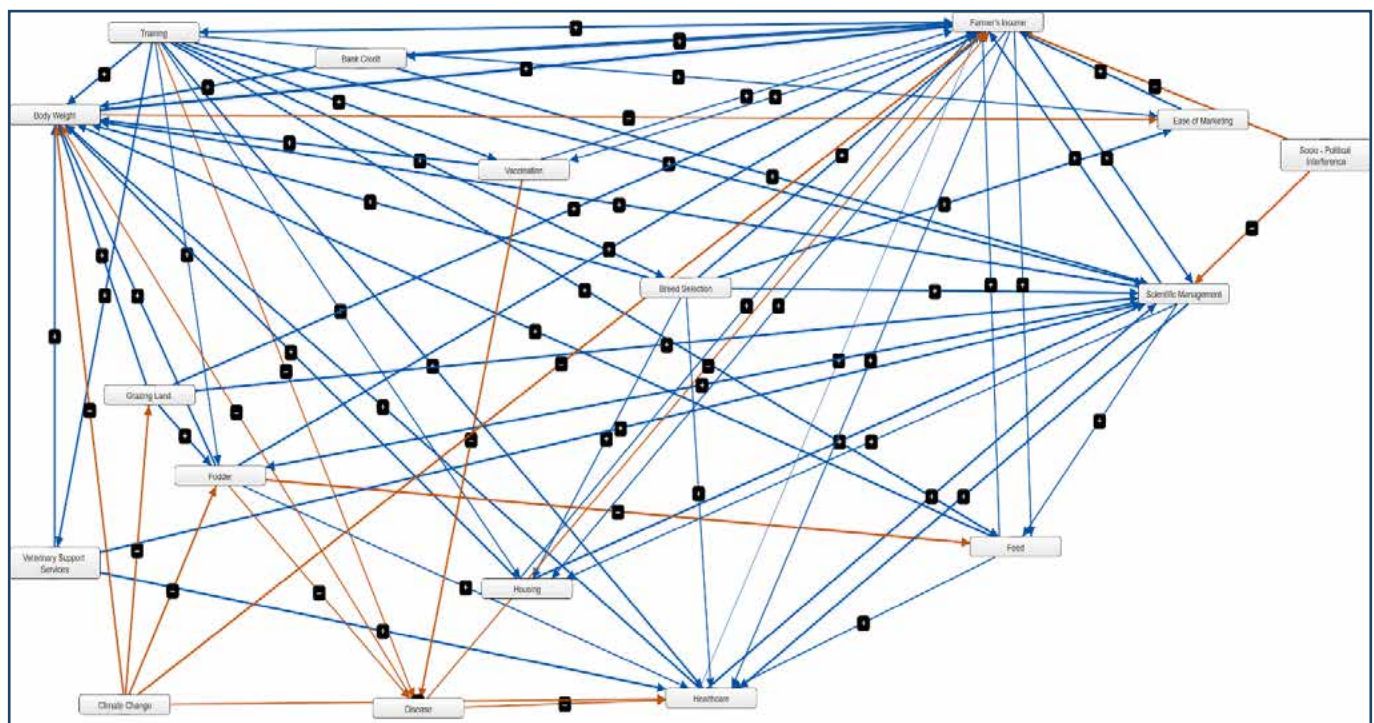


Fig. 2: Experts’ shared amalgamated cognitive map. The nodes denote factors/elements through which the impact of training transitioned to higher farm income. The blue ties with ‘+’ sign denote positive relations among two factors/elements, while the orange ties with ‘-’ sign denote negative relations. The thickness of lines represents tie strength.

Table 2: Centralities of system elements in the experts' shared cognitive map

Components/elements	Indegree	Outdegree	Centrality	Type
Training	0.30	5.78	6.08	ordinary
Housing	1.38	1.38	2.76	ordinary
Healthcare	4.42	1.33	5.75	ordinary
Breed Selection	0.67	3.44	4.11	ordinary
Feed	1.70	1.37	3.07	ordinary
Fodder	2.20	2.53	4.73	ordinary
Grazing Land	0.50	2.80	3.30	ordinary
Veterinary Support Services	0.50	1.85	2.35	ordinary
Vaccination	0.90	1.40	2.30	ordinary
Disease	1.30	1.15	2.45	ordinary
Scientific Management	5.60	3.18	8.77	ordinary
Bank Credit	0.40	1.50	1.90	ordinary
Climate Change	0.00	2.60	2.60	driver
Socio - Political Interference	0.00	1.20	1.20	driver
Body Weight	7.74	1.06	8.80	ordinary
Ease of Marketing	1.00	0.62	1.62	ordinary
Farmer's Income	7.23	2.65	9.89	ordinary

The cognitive map of farmers' and Pani Bondhus' (Fig. 1) is simpler, but more pragmatic and 'field-oriented'. 'Good health' shows the highest indegree centrality (number of arrows coming towards it). The training demonstrates the highest outdegree (number of arrows going out from it), since its impact has been studied (the system driver). Farmers and Pani Bondhus' focus 'deworming' as an important factor (Table 1), since it affects health, disease etc., and they can take care of this at the farm level. The experts' cognitive map is more complicated, with a greater number of ties, as they might have considered a lot more connections among factors/elements due to their academic knowledge coupled with working

with the farmers. The cognitive map of the experts (Fig. 2) and Table 2 show that 'body weight' is the highest indegree centrality, while 'breed selection' is another critical factor which controls many other factors such as 'health', 'weight' etc. The maps indicate various pathways through which training exerts effects on a farmer's income. These maps can further be subjected to scenario analysis, where we can put different realistic scenarios (possible at the village level) to see how training's effect can be optimized by the KVKs and local stakeholders of animal husbandry by suitably following the semi-quantitative model developed in our study. The work is in progress.

18.0 New Initiatives Undertaken

18.1 Network Project on Aspirational District

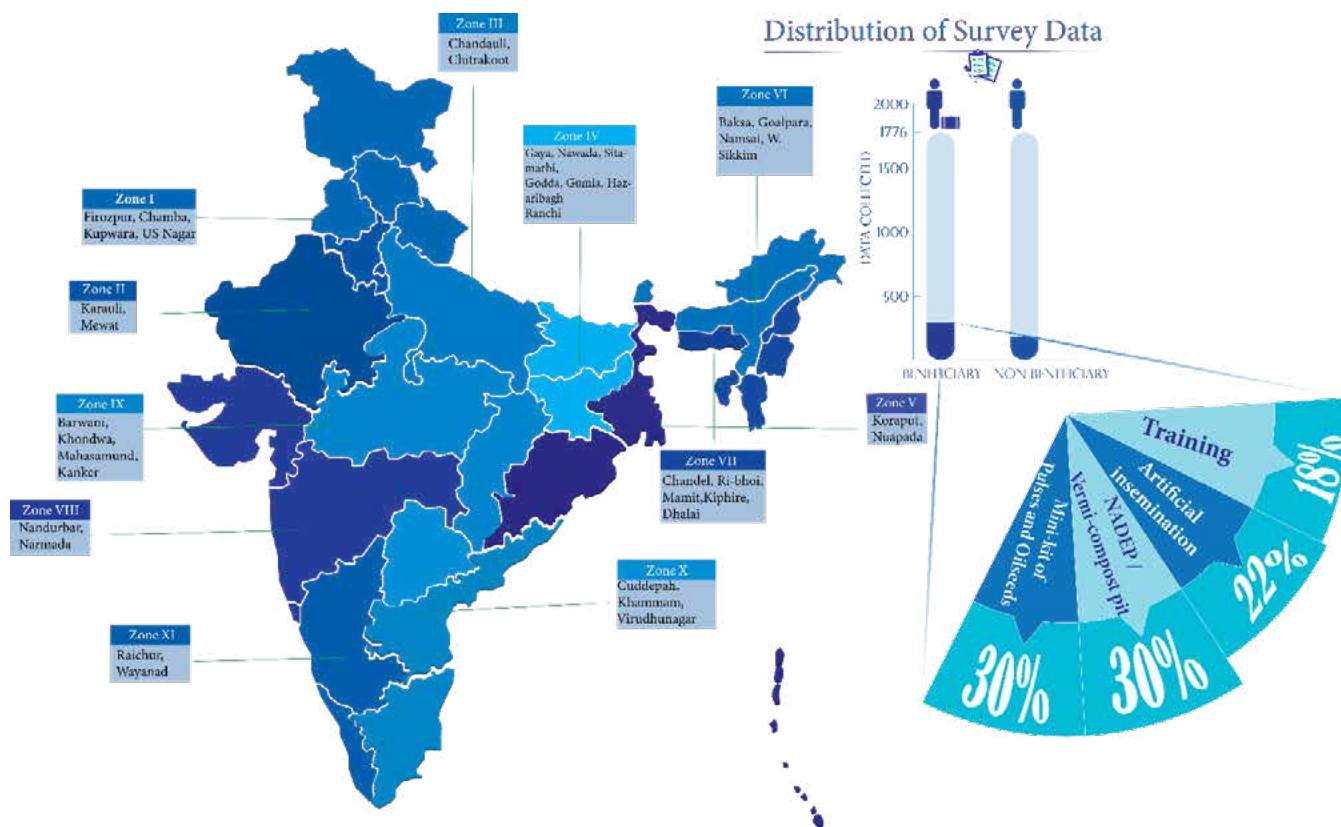
Principal Investigator (PI) Dr. S.K. Roy

Co - PI : Dr. K. S. Das

The nation is currently focused on a high economic growth trajectory. However, in several studies it was found that, the economic growth is not reflecting in certain regions of the country in terms of human development index. While different states have their unique strengths and soundness, parts of them can suffer from challenges in improving basic infrastructure and livelihood. To look after this problem and achieve a well distributed developmental scenario in India, Govt. of India under the chairmanship of Hon'ble PM has taken an initiative to improve performance of under-developed pockets during 2016. In this concerted

effort five sectors namely, health and nutrition, education, skill development, infrastructure and agriculture were focused to make a dramatic rise in ranking of the country in terms of the HDI. A total of 112 districts across the country was identified for this purpose and were named *Aspirational Districts*.

To achieve higher agricultural productivity and profitability in aspirational districts, ICAR in collaboration with state line departments and other stakeholders had conducted 3 staged programs during 2017-2019 named *Krishi Kalyan Abhiyan (KKA)*-I, II and III. Recently, during 2020 ICAR-ATARI Kolkata has conceptualized a network project across India to assess the impact of the KKA programs in terms of agricultural productivity, income generation, livelihood security etc.



The zone-wise distribution of sampled districts for conducting the survey under Network project on Aspirational District.

To serve this purpose, pen-paper based interview through survey schedule has been planned. Following proper randomized sampling scheme 33% of the intervened (i.e. 37 districts) districts were selected to conduct this survey. From Zone-V, two KVKs of Odisha namely Koraput and Nuapada were got selected. The primary data has been planned to be recorded from benefitted as well as non-benefitted farmers residing from those 37 districts. To optimize all forms of error a large sample size of 3552 (benefitted+ non-benefitted) is targeted for survey. The survey schedule consists two part, one for collecting general information and other for collecting intervention related information. It was finalized during August, 2021 and the same was circulated with the selected KVKs of all 11 ATARIs. After several brainstorming virtual meeting the survey process was illustrated. With utmost care the KVKs are conducting the survey with farmers in vernacular medium. To select the beneficiaries, four types of interventions namely, distribution of pulse and oilseed mini-kit, preparation of vermi-compost pits, artificial insemination and training programs were chosen. By February, 2022 first phase of data collection has been completed where 469 survey schedules have been received. The data was used for understanding primary trend of the parameters and was presented in RAC meeting held on 26th Feb, 2022. Currently rest of the data collection is going on to complete the sample size at the earliest. To ease the data collection of different network project a sum of Rs. 460000 has been given to different KVKs of Zone V. Out of the budget of 1400000 a net amount of 1050613 has been utilized in the year of 2021-22.

18.2 Krishi Kalyan Abhiyan, Phase III- Training Programme (2021-22)

Nodal Scientist: Dr. K. S. Das

All 112 Aspirational District KVKs were given responsibility to conduct capacity building trainings for farmers under *Krishi Kalyan Abhiyan, Phase-III- Training Programme* for consecutive three years since 2020-21. The programme was started from July, 2020. During first 90 days of 2020-21, 6 training programmes on diversified farming practices for doubling farmers' income involving 180 farmers was targeted. For rest of the year (2020-21), the target was



of 18 training programmes involving 540 farmers. During 2nd year (2021-22) and 3rd year (2022-23),



24 training programmes involving 720 farmers for each year was targeted under the programme. The



training achievements of 10 Aspirational District KVKs under ICAR-ATARI Kolkata during the year 2021 have been presented in the table.



Particulars	Name of KVKs										Total
	Bolangir	Dhenkanal	Gajapati	Kalahandi	Kandhamal	Koraput	Malkangiri	Nabarangpur	Nuapada	Raygada	
Total no. of training programmes conducted	49	0	0	21	9	18	26	59	16	20	218
No. of farmers trained											
Male	1095	0	0	214	20	301	576	900	326	340	3772
Female	120	0	0	319	205	234	204	575	84	160	1901
Total	1215	0	0	533	225	535	780	1475	410	500	5673

18.3 Nutri-sensitive Agricultural Resources and Innovations (NARI) and Nutri-SMART Villages

Nodal Scientist: Dr. S. K. Mondal

During the year 2021, one new project (rather a

concept), namely, NARI was implemented through selected 6 KVKs; the details of the project are given below.

Project Details	No. of Units to be formed	No. of KVKs to be involved	Budget estimate per KVK (Rs. in lakh)*		
			Capital	Revenue	Total
<p>Food security must lead to Nutritional Security,</p> <p>To focus on gender empowerment and nutrition,</p> <p>Demonstrations to promote nutrition-sensitive agriculture, capacity development and gender mainstreaming,</p> <p>Interventions: family farming, linking agriculture to nutrition, skill development among women and youth,</p> <p>Bio-fortification of locally available food, round-the-year dietary pattern, nutri-thali</p> <p>Nutrition Smart villages, etc.</p>	12	<p>Odisha: 4 (Jajpur, Koraput, Nuapada, Angul);</p> <p>West Bengal: 2 [Uttar Dinajpur, North 24 Parganas (Ashokenagar)]</p>	0	5.16	5.16

* The amount has been worked out from the EFC provisions for these two projects.

As per the above guidelines, the selected KVKs under ICAR-ATARI Kolkata were implementing the project with the action plan as detailed below:-

In Odisha, 4 KVKs have been selected based on their technical expertise, manpower availability and the potential district to undertake the following activities-

- Identifying Nodal officer at KVK level keeping the technical aspect of the project in view.
- Conducting one On-farm trial on food quality, nutritional aspect of agriculture, tackling mal-nutrition in mothers and children and other related aspects with a multidisciplinary approach

- Demonstration on Nutritional garden, nutrient rich varieties of different crops, agricultural crops and human nutrition, bio-fortification of locally available food, round-the-year dietary pattern etc.



- Capacity development through training and skill development programmes on these aspects towards creation of nutrition-smart villages
- Addressing gender issues through increasing women's participation



Similarly in West Bengal, 2 selected KVKs undertook the same activities as mentioned above.

Besides, a new project on Nutri-SMART villages has been approved by RAC and the project is being implemented in 12 KVKs (10 from Odisha and 2 from West Bengal). Rs. 0.10 lakh has been allocated from NEMA for undertaking this project

18.4 Gramin Krishi Mausam Seva (GKMS) Through District Agromet Unit (DAMU)

Nodal Scientist: Dr. F. H. Rahman

ICAR maintains Agromet observatories as well as Automated Weather Stations (AWS) and record Agromet observations at its Institutions, National Research Centres, Project Directorates, Krishi Vigyan Kendras (KVKs) etc. to generate agrometeorological information for use in studies of crops, pests and diseases, soil, agroforestry, livestock, horticulture, Agricultural Physics, Soil Science etc. Such data will help ICAR Institutes to study crop-weather relationship, relationship between crop-weather and pest/disease and to develop region/location specific agromet predictive models. In view of that, 24 KVKs of this Zone, 10 from Odisha and 14 from West Bengal, have been selected in two phases to establish DAMU i.e. Phase-I having 16 KVKs and Phase-II having eight KVKs. The main activity of a District AgroMet Unit

(DAMU) is aimed at lending support to the farm planers and farmers by disseminating advance information related to weather condition through block level agromet advisory bulletin for day to day agricultural operations, minimizing crop loss and proper utilization of land and natural resources. As of now, DAMU at seven KVKs of West Bengal and eight KVKs of Odisha have been functioning. These KVKs are providing weather forecast bulletins to the farmers since the inception of the Project. Weather forecast bulletins and special bulletins are generated in English and local languages by DAMUs and communicated to the farmers well in advance. Agromet Advisory Bulletins are prepared twice a week by each DAMU and circulated among all the farmers of the district. KVKs having DAMU prepared Special Bulletins in English and regional languages as per the forecast issued by India Meteorological Department (IMD), Regional Meteorological Centre (RMC) Kolkata and Meteorological Centre (MC) Bhubaneswar to circulate to the farmers of the district well in advance of severe cyclonic storms 'YAAS' and 'JAWAD' in the months of May and December respectively over Odisha, West Bengal and neighborhood during this year. This has tremendously helped the farmers to a great extent in minimizing the loss during the severe cyclonic storm. KVKs took initiatives in popularizing of 'Meghdoot' and 'Damini' mobile Apps for outreach of Agromet Advisories and help individuals keep updated about thunderstorm/lightning likely to strike in their locations. The KVKs are enhancing outreach and dissemination of Agromet advisories using new and effective means of communication i.e. Emails, WhatsApp, KVK Facebook page and SMS (in m-Kisan portal) are being used to deliver Agromet advisory bulletins to registered members of different farmers clubs, FPOs, line departments and ultimately to reach the farmers. With the help of RMC/MCs, DAMUs are also using social media and whatsapp groups consisting of AMFUs (Nodal Officer, Technical Officer), DAMUs (Nodal officer, SMS-Agromet) and concerned officials viz. DAOs etc. for quick dissemination of weather forecast, nowcasts, alerts & warnings, and agromet content to farmers at village level. They are utilizing this channel effectively for sending information on very high impact weather events like thunderstorm

& lightning to farmers to reduce the casualties and other losses. To acquaint the farmers with the importance of the weather based agro advisories, DAMUs organize several Farmers Awareness Programme (FAP) and trainings are also conducted to cover all the blocks and Farmers and Farmwomen of the district.

Meeting on Financial Module developed in Agromet DSS was conducted by IMD on Feb 4, 2021. Training on “Preparation and Dissemination of Agromet Advisories at Block level under GKMS scheme” for SMS (Agromet) and Agromet Observer of DAMUs

was conducted by IMD during Mar 11-12, 2021. A meeting was jointly organized by ICAR and IMD to discuss ‘Support from State Agriculture Department for Effective Implementation of GKMS Scheme for the benefit of Farming Community in the Country’ on Apr 27, 2021. An interaction session to discuss various matters/issues of GKMS (DAMU) at KVKs of Odisha and West Bengal was organized by ICAR-ATARI Kolkata on July 19, 2021.

The Annual Review Workshop 2021 of GKMS was organized by ICAR-ATARI Kolkata on July 30, 2021 attended by all DAMU KVKs of the Zone.



Farmers Awareness Programmes (FAPs) conducted by the KVKs to make them aware about effect of climatic/weather aberrations and its impact on agricultural production and strategies to mitigate

the situations. A number of FAPs during the year was conducted by the KVKs along with the number of farmers benefitted are mentioned below:

KVK	No. of Programmes	No. of farmers benefitted
17	45	1352





Agromet Advisory Bulletins are prepared by each DAMU in English and regional languages as per the forecast issued by IMD and RMC Kolkata and MC Bhubaneswar and circulated to the farmers of the district in advance about weather forecasts like

rainfall, hailstorm, cyclonic storms, etc. A number of AAS during the year was prepared and circulated by the KVKs along with the number of farmers benefitted are mentioned below:

KVKs	Number of AAS Bulletin	Beneficiaries
17	1911	56125

তারিখ	১০/১১/১৯	১১/১১/১৯	১২/১১/১৯	১৩/১১/১৯	১৪/১১/১৯
কৃষ্ণিমত (মি.মি.)	১১	১১	১১	১১	১১
সর্বোচ্চ তাপমাত্রা (°C)	২৬.০	২৬.০	২৬.০	২৬.০	২৬.০
সর্বনিম্ন তাপমাত্রা (°C)	২৬.০	২৬.০	২৬.০	২৬.০	২৬.০
সর্বোচ্চ আর্দ্রতা (মি.মি.)	১০	১০	১০	১০	১০
সর্বনিম্ন আর্দ্রতা (মি.মি.)	১১	১১	১১	১১	১১
কালোমে বতরবে (মি.মি.সে.)	১১.১	১১.১	১১.১	১১.১	১১.১
কালোমে বতরবে (মি.মি.)	১১	১১	১১	১১	১১
মেঘের আচ্ছাদন (হেক্ট)	১	১	১	১	১

তারিখ	১০/১১/১৯	১১/১১/১৯	১২/১১/১৯	১৩/১১/১৯	১৪/১১/১৯
কৃষ্ণিমত (মি.মি.)	১১	১১	১১	১১	১১
সর্বোচ্চ তাপমাত্রা (°C)	২৬.০	২৬.০	২৬.০	২৬.০	২৬.০
সর্বনিম্ন তাপমাত্রা (°C)	২৬.০	২৬.০	২৬.০	২৬.০	২৬.০
সর্বোচ্চ আর্দ্রতা (মি.মি.)	১০	১০	১০	১০	১০
সর্বনিম্ন আর্দ্রতা (মি.মি.)	১১	১১	১১	১১	১১
কালোমে বতরবে (মি.মি.সে.)	১১.১	১১.১	১১.১	১১.১	১১.১
কালোমে বতরবে (মি.মি.)	১১	১১	১১	১১	১১
মেঘের আচ্ছাদন (হেক্ট)	১	১	১	১	১

18.5 Doubling Farmers' Income

Nodal Scientist: Dr. Avijit Haldar

The Government of India (GoI) announcement of doubling farmers' income (DFI) by 2022 and its implementation must have a direct impact on almost half of the population to realize a sense of income security to farmers in a time bound manner

to reduce agrarian distress and promote farmers' welfare. Accordingly, KVKs of Andaman and Nicobar Islands, Odisha and West Bengal under ICAR-ATARI, Kolkata, Zone V have selected villages and undertaken various activities like FLD, OFT and Training in those villages for achieving DFI. A total of 6181 numbers of DFI success stories have been documented in this zone (Table 1).

Table 1: Summary of DFI Success Story under ATARI Kolkata

Name of State	No of DFI KVKs	No of DFI Success Stories where income is actually doubled
Odisha	33	3460
West Bengal	23	2664
Andaman & Nicobar Islands	3	57
Total	59	6181

In Odisha, the success stories of 3460 farmers were recorded by 33 KVKs. Out of that, data was analysed for 692 farmers. The overall net income of a farmer increased from Rs. 1,18,078/- to Rs. 2,88,144/- (144.03% increase) from 2016-17 to 2020-21 (Table 2). The highest income was fetched from fishery sector (Rs. 98,717/-) having the share of 34.3% with 179.4% increase in income and 4.4% increase in share in

2020-21. Farm and non-farm enterprises contributed the second highest income (Rs. 74,095/-) having the share of 25.7% with 188.0% increase in income and 3.9% increase in share in 2020-21. Livestock, horticulture and field crops sectors showed 115.7, 102.8 and 77.9 % increase in income, respectively. However, % share in total income of these three sectors decreased from 2016-17 to 2020-21.

Table 2: Increase in income of the farmers from 2016-17 to 2020-21 in Odisha

Crops and Enterprises	Net income (Rs/household at current prices)		% share in total income		% increase in income
	2016-17	2020-21	2016-17	2020-21	
Field crops	13385	23808	11.3	8.3	77.9
Horticulture	20077	40713	17.0	14.1	102.8
Livestock	23554	50811	19.9	17.6	115.7
Fisheries	35331	98717	29.9	34.3	179.4
Farm and non-farm enterprises	25730	74095	21.8	25.7	188.0
Overall	1,18,078	2,88,144	100	100	144.03

In West Bengal, a total of 2664 farmers were surveyed by the 23 KVKs, 586 farmers' data was analyzed. The overall net income of a farmer increased from Rs. 1,26,033/- to Rs. 3,24,052/- (157.10% increase) from 2016-17 to 2020-21 (Table 3). The highest income was recorded in fishery sector (Rs. 1,05,626/-) having the share of 32.6% with 163.5% increase in income and 0.8% increase in share in 2020-21. Farm and non-

farm enterprises contributed the second highest income (Rs. 82,300/-) having the share of 25.4% with 170.2% increase in income followed by income (Rs. 56,828/-) from horticulture sector having the share of 17.5% with 167.2% increase in income in 2020-21. The livestock and field crops sectors showed 151.4% and 103.8% increase in income in 2020-21, respectively.

Table 3: Increase in income of the farmers from 2016-17 to 2020-21 in West Bengal

Crops and Enterprises	Net income (Rs/household at current prices)		% share in total income		% increase in income
	2016-17	2020-21	2016-17	2020-21	
Field crops	14170	28880	11.2	8.9	103.8
Horticulture	21266	56828	16.9	17.5	167.2
Livestock	20053	50418	15.9	15.6	151.4
Fisheries	40081	105626	31.8	32.6	163.5
Farm and non-farm enterprises	30463	82300	24.2	25.4	170.2
Overall	126033	324052	100.0	100.0	157.1

In Andaman and Nicobar Islands, 3 KVKs recorded the success stories of 57 farmers. The overall net income of a farmer increased from Rs. 55,800/- to Rs. 1,42,152/- (163.7% increase in income) from 2016-17 to 2020-21 (Table 3). The highest income (Rs. 40,556/-) was recorded in farm and non-farm sector followed by fishery (Rs. 34,707/-), livestock

(Rs. 34,336/-), horticulture (Rs. 20,021/-) and field crops sectors (Rs. 12,532/-). From 2016-17 to 2020-21, % increase in income was highest in fishery sector (215.5%) followed by horticulture (170.3%), farm and non-farm enterprises (156.9%), field crops (153.8%) and livestock (106.0%).

Table 4: Increase in income of the farmers from 2016-17 to 2020-21 in In Andaman and Nicobar Islands

Crops and Enterprises	Net income (Rs/household at current prices)		% share in total income		% increase in income
	2016-17	2020-21	2016-17	2020-21	
Field crops	4937	12532	40.0	38.5	153.8
Horticulture	7407	20021	60.0	61.5	170.3
Livestock	16668	34336	135.0	105.5	106.0
Fisheries	10999	34707	89.1	106.6	215.5
Farm and non-farm enterprises	15789	40556	127.9	124.6	156.9
Overall	55800	142152	100.0	100.0	163.7

To achieve the income double or more from 2016-17 to 2021-22, a number of interventions have been made in agriculture, animal husbandry, fishery, farm and non-farm sectors at the farmer's field by the KVKs of Odisha (33 number), West Bengal

(23 number) and Andaman and Nicobar Islands (3 number). Sector-wise interventions in Odisha, West Bengal, Andaman and Nicobar islands are mentioned below.

Odisha:

1. Sector-specific Interventions

1.1 Field crops

- Promotion of BPH/WBPH tolerant low land rice var. Hasanta
- Cultivation of drought tolerant paddy var. Swarna Shreya
- Varietal substitution with Sahabhazi Dhan
- Promotion of protein rich rice variety-CRdhan 310
- Promotion of aromatic rice production Var. Nua Acharmati, Kalajeera
- Cultivation of Pulses, viz. Black gram var. PU-31, Ujjala, Pigeon pea var. PRG-176, Green gram var. IPM 2-3, IPM 02-14, PU 30, Tarm 1 and Arahar var. Bada kandul, UPAS 120, Asha, LRG 52, PRG176 etc.
- Popularization of Oilseeds, viz. Mustard var. Parvati, Uttra, PM 28, Groundnut var. Dharani, Smruti, Devi, TG 38, Niger var. Deomali, Utkal Niger 150, Sunflower var. Hybrid LSFH-171, KBSH41 etc.

- Introduction of improved Maize var. Pioneer 3401
- Promotion of Sweet Corn var. Sugar 75, Misti
- Promotion of Ragi var. Bhairabi, Chillika, Budimandia, Arjun
- Introduction of Cotton var. Tulasi
- Promotion of ICM of various crops
- Crop diversification
- Soil test based fertilizer application
- Management of Blast and Sheath Blight in paddy
- Intercropping
- Mechanical sowing/ transplanting, DSR, mechanical weeding and threshing,
- Green manuring of Dhaincha for salinity management
- Paira cropping system
- Integrated Nutrient Management
- Integrated Pest Management

1.2 Horticultural crops

- Promotion of wilt resistant Tomato var. ArkaRakshak and Arka Samrat
- Promotion of HYV Brinjal var. Akshita 30
- Cultivation chilli variety Arkaharitage, Ragini with INM practice
- Cultivation of Papaya var. CO2, Ranchi dwarf, Honey dew, Red lady etc
- Promotion of Banana var. G9
- Promotion of Watermelon var. Augusta, Kiran etc
- Large-scale cultivation of off-season vegetables like tomato, chilli, cauliflower, cabbage etc.
- Protected cultivation of high value vegetables like colored cauliflower, cabbage, broccoli, pochchoi, celery, parseley, lettuce, brussels sprouts etc.in low cost structure.
- Promotion of yard long Bean var. Arka Mangala
- Cultivation of beetle vine in shade net
- Intercropping in the orchards with Turmeric var. Roma and Surama and Zinger var. Suprabha and Kalimpong
- Introduction of high yielding Tuber crops like Sweet Potato, Yam
- Micronutrient management in vegetables
- Micro-irrigation and mulching for water management in vegetables

1.3 Animal husbandry

- Feeding of farm made feed
- Probiotic supplementation
- Rearing of backyard poultry rainbow roaster
- Rearing of poultry variety Kadaknath and Banaraja
- Rearing of OUAT synthetic colour broiler in semi-intensive system
- Japanese quail farming
- Feed supplement with Azolla
- Feeding of OUAT Mineral mixture
- Bypass fat supplementation

- Semi-intensive goat farming
- Deworming practices

1.4 Fisheries

- Composite Pisciculture with proper stocking density
- Introduction of “Jayanti Rohu” in composite carp culture
- Fish seed production in small tanks
- Improved feeding and disease management practices

1.5 Farm and non-farm enterprises

- Vermin compost production
- Paddy straw and oyster mushroom and spawn production
- Homestead nutritional gardening
- Apiary
- Horticultural nursery for seedlings of fruits and plantation crops, and vegetables
- Value added product from tomato
- Seed production of cereals, pulses, oilseeds and fodder crops

West Bengal:

1.1 Field crops

- Promotion of sub-mergence stress tolerant paddy var. CR-1009, Swarna Sub-1, Bina 11, Luna Swarna
- Cultivation of aromatic rice production var. Gobindovog, Tulaipanji, Kalonunai, Radhunipagol etc.
- Introduction of Pulses, viz. Black gram var. WBU109, IPU 2-43, Vallab Urd1, PU 31, Pigeon pea var LRG-41, Laxmi, Chickpea var. NBeG-49, Anuradha,, Jaki-9218, RVG 202, Green gram var. IPM 02-14, IPM-205-7(Virat), PDM 84-139 and Lentil var. Pusa Agati-4717, WBL-77, KL-320, PL-08, HUL-57 & IPL-406 etc.
- Popularization of Oilseeds, viz. Mustard var. PM-28, Parvati, Pusa Mustard 26, B-9, PAN-70, Groundnut var. Dharani, Devi, TG-37A, TAG-24. AK-12-24, Kadri 6, Soybean var. PS 1368, JS

- 9752, Sesame var. Savitri, CUMS 17 (Suparva), SWB-32-10-1, Linseed var. Deepika, Shekhar, Sharada, Azad alsi-1, Rapeseed var. PusaMahek, Kashinath, Sunflower var. Hybrid LSFH-171, KBSH 53, MSFH 17, Dibakar etc.
- Seed production of paddy, green gram, sunflower etc
- Potato cultivation
- Improved package of practices of field crops like Paddy, Jute along with different pulse and oilseeds
- Popularization of improved Jute var. JRO-204 and CRIJAF SONA for improving fiber quality during retting
- Introduction of kharif onion var. Agrifound dark
- Crop diversification
- Soil test based fertilizer application
- Intercropping
- Integrated Nutrient Management
- Integrated Pest Management
- Popularization of drum seeder and tranplanter, DSR etc.
- Use of farm tools and implements towards farm mechanization

1.2 Horticultural crops

- Popularization of improved varieties of vegetables like French Bean var. Contender, Green Peas var. Arkel, Cauliflower var. Pusa Synthetic, Pusa Snowball 1,2, Valentina, Carotena, Cabbage var. Red Ball, Royal Ball, Broccoli var. Centauro, Sultan including Chilli var. Bullet, Panai etc.
- Introduction of wilt resistant tomato var. ArkaRakshak and Arka Samrat
- Cultivation of improved variety of Elephant Foot Yam var. Bidhan Kusum, Gajendra, Colocasia, Ginger, Turmeric var. Suranjana, Suguna etc.
- Cultivation of Capsicum, Broccoli, Pointed Guard, Strawberry etc
- Promotion of off season vegetable cultivation including use of UV sterilized polythene paper

- Protected cultivation of high value vegetables like coloured cauliflower, cabbage, broccoli, celery, parseley, lettuce, etc. in low cost structure
- Introduction of kharif onion var. Sukhsagar and Agri Found Red
- Promotion of multitier horticulture
- High value flower cultivation of marigold, tuberose, gladiolus, gerbera etc.
- Orchard development with Ber var. Apple, BAU, Guava var. Khaja, Dragon fruits var. Red Fleshed etc. proper management
- Improved production technology of tissue cultured banana
- Micro irrigation and use of mulching technology
- Micronutrient management
- Development of horticulture nursery for seedlings of fruits and plantation crops, and vegetables

1.3 Animal husbandry

- Animal feed preparation using locally available ingredients and marketing
- Improved management, feeding and health care of dairy cattle
- Goat farming of Black Bengal goat with proper care and management
- Popularization of improved poultry variety like Kadaknath, Vanaraja, Kaveri etc.
- Duck farming with Khaki Campbell
- Introduction of Turkey variety White Broad Breasted
- Pig farming with improved variety like T & D, Ghungroo etc.
- Feeding location specific mineral mixture
- Feed supplement with Azolla
- Popularization of deworming practices

1.4 Fisheries

- Composite fish culture with proper stocking density
- Diversified fish culture
- Air breathing fish culture with Magur, Singhi etc

- Shrimp (*Litopenaeus vannamei*) production
- Biophyton culture for GIFT Nile Tilapia culture in periphyton and
- Introduction of Green Water Bioflocs Technology (BFT)
- Fish seed production of IMC, Asian catfish, Scampi etc.
- Ornamental fish culture with Gold Fish, Angel, Guppy etc.
- Fish feed preparation and marketing
- Pond based integrated farming system

1.5 Farm and non-farm enterprises

- Vermicompost production
- Organic manure production through Waste decomposer
- Paddy straw and oyster mushroom and spawn production
- Homestead nutritional gardening
- Beekeeping
- Lac cultivation
- Drudgery reduction through effective use of farm tools and Implements
- Seed production of cereals, pulses and oilseeds

Andaman & Nicobar Islands:

1.1 Field crops

- Introduction of medium duration (110- 120 days) low land paddy var. CARI Dhan-1, CARI Dhan-2 and CARI Dhan-3
- Promotion of CARI 7 Seed Production
- Popularization of pulses, viz. Black gram var. VBN-(Bg)-8, and Green gram var. CO 08 etc.
- Improved package of practices of field crops
- Integrated Nutrient Management
- Integrated pest and disease management
- Application of different organic amendments like poultry manure, coconut husk etc.
- Use of farm tools and implements towards farm mechanization

1.2 Horticultural crops

- Popularization of improved varieties of vegetables like cabbage, cauliflower, tomato, chilli, cucurbits etc.
- Intercropping in the orchards with turmeric, yams and ginger
- Improved package of practices for seed spices and trees spices
- Improved cultivation practices of plantation crops like coconut and arecanut
- Improved cultivation practices of medicinal plants
- Promotion of off season vegetable cultivation
- Protected cultivation of high value vegetables
- Micronutrient management
- Development of horticulture nursery for seedlings of fruits, plantation crops, vegetables and ornamental plants.

1.3 Animal husbandry

- Promotion of balanced nutrition in livestock
- Improved management and health care of livestock
- Popularization of improved poultry variety like Nicobari, Vanaraja etc.
- Duck farming with Andaman local duck
- Goat farming with Andaman local goat
- Pig farming with Andaman and Nicobari pigs

1.4 Fisheries

- Improved management of capture fisheries
- Promotion of cage culture under aquaculture
- Air breathing fish culture with Magur, Singhi etc
- Development of backyard hatchery for freshwater prawn production
- Promotion of brackish water aquaculture
- Ornamental fish culture with Gold Fish, Angel, Guppy etc.
- Promotion of integrated mangrove-based aqua farming system

1.5 Farm and non-farm enterprises

- Vermicompost production



Figure 1: Production of vegetables round the year under DFI program at the farmer's field in Port Blair of Andaman and Nicobar islands

- Homestead nutritional gardening
- Beekeeping



Figure 2: Popularization of SwarnaSub-1 paddy variety under DFI program at the farmer's field in Cuttack district of Odisha



Figure 3: Diversification through fishery under DFI program in Kendrapara district of Odisha



Figure 4: Introduction of dragon fruit under DFI program in Uttar Dinajpur district of West Bengal



Figure 5: Integration of fish and pig production under DFI program in North 24 Parganas district of West Bengal



Figure 6: Application of LED light for leafy vegetables production in low-cost poly house under DFI program in Howrah district of West Bengal

18.6 Formation and Promotion of FPO

Nodal Scientist: Dr. Avijit Haldar

The aim of formation and promotion of Farmer Producer Organisation (FPO) is to catalyse transformation of agriculture sector, where small and marginal holdings less than 2 hectares constitute over 80% of farmers' population and distressingly have ownership of a minor share of land. This Scheme aims to achieve inclusive and sustainable transformation through the creation of a holistic and supportive ecosystem for the formation of 10,000 FPO in India by 2023-24, and their nurturing, handholding and capacity building over a five year period from their inception, to facilitate the development of vibrant and sustainable income oriented farming that would lead to the overall socio-economic development and wellbeing of agrarian communities. The rationale for setting up farmer producer organisations is based on the premise that collectivisation of farmer producers, particularly smallholder farmers, has a direct effect on increasing farmer incomes, through securing production by increasing productivity and reducing costs of cultivation, adding value to production through reducing transaction costs, up scaling trade and bulk selling of the produce or its further processing into downstream products, enabling access to technology, increased bargaining power and integration with value chains and above all increasing market access and power. Further, it is in their democratic functioning based on Cooperative Principles, that FPO most definitely have an advantage and are seen as the way for taking small and marginal farmers forward, through offering them better and more dignified livelihood options and living.

The National Cooperative Development Corporation (NCDC) is an Implementing Agency (IA) under the Central Sector Scheme, "Formation and Promotion of 10,000 Farmer Producer Organisations" through Cluster Based Business Organisations (CBBOs) who are professional organisations that are engaged by NCDC to function at the Block level for formation and nurturing

of FPOs. CBBOs have a critical role in the entire process right from cluster identification, baseline study, community mobilisation, registration of FPO as cooperative, training and capacity building of FPO and farmers, business planning for FPO, regular interface with other institutions including research, dissemination of information to farmers, incubation and handholding, reporting and data collection, FPO rating, assisting FPO in financial management and accounting. CBBOs are supposed to train FPOs in subject matters covering topics ranging from organisational management/behaviour, crop husbandry, value addition, processing, marketing, trading, export, supply chain, grading, branding, packaging, accounting, auditing, compliance requirements, incubation, Information and Communications Technology (ICT) and Management Information System (MIS) as may be relevant for promotion of FPOs including case studies in best practices, if any.

The Competent Authority of NCDC and thereafter Agricultural Extension Division of ICAR, New Delhi has sanctioned and released an amount of Rs.2,32,00,000/- (Rupees two Crore Thirry Two Lakhs only) for Formation and Promotion of FPOs by KVKs and ICAR Institutes, as CBBOs during 2121-22. Accordingly, Rs. 8,00,000.00 has been received from the Council on 02.07.2021 and then each Rs. 4,00,000.00 has been given to ICAR-National Rice Research Institute, Cuttack and KVK, Nuapada for the formation of FPOs at Balasore Sadar and Remuna of Balasore district and Komna and Boden of Nuapada district of Odisha, respectively. Both CBBOs have completed baseline survey, identified potential commodities in cluster, organized awareness program and mobilized farmers for inclusion in FPO membership, formed Farmers' Interest Group, submitted application for registration, made linkages with line Depts., other business organizations, E-business portal, conducted district level stakeholder meeting, facilitated for preparation of business plan and opening bank account, mobilized equity share and conducted review meetings.

Table: Status of FPOs under ICAR- ATARI, Kolkata

Sl. No.	Name of CBBO	Name of FPO	District	Block	Registration Number & Date of Registration	Commodity Identified	No. of Members (Male and Female)
1	ICAR-National Rice Research Institute, Cuttack	PurbaBaleswar 4S\$R FPO	Balasore	Remuna	Registration Number: 1418/BLSD.24.09. 2021dated 24 th September 2021	Vegetables & Coconut	450 (Male360 & Female:90)
2	Do	UpakulaBaleswar 4S4RFPO	Do	BalasoreSadar	Under process (documents submitted)	Vegetables & Coconut	150 (Male:105 & Female:45)
3	Krishi Vigyan Kendra, Nuapada, OUAT	Sidheswar FPO	Nuapada	Komna	Under process (documents submitted)	Millets, Oilseeds & Minor Forest product	65 (Male:41 & Female:24)
4	Do	Sibashakti FPO	Do	Boden	Under process (documents submitted)	Millets, Oilseeds& Minor Forest product.	65 (Male:45 & Female:20)



Figure 1: Sensitization of farmers at Balia, BalasoreSadar of Balasore district, Odisha



Figure 2: Issuing of registration certificate PurbaBaleswar 4S\$R FPO



Figure 3: Stakeholder meeting at Komna, Nuapada district, Odisha



Figure 4: Training at Boden of Nuapada district, Odisha

18.7 Kisan Sarathi

Nodal Scientist: Dr. Avijit Haldar

'Kisan Sarathi' is an Information Communication and Technology (ICT) based interface platform for supporting agriculture at a local niche with a national

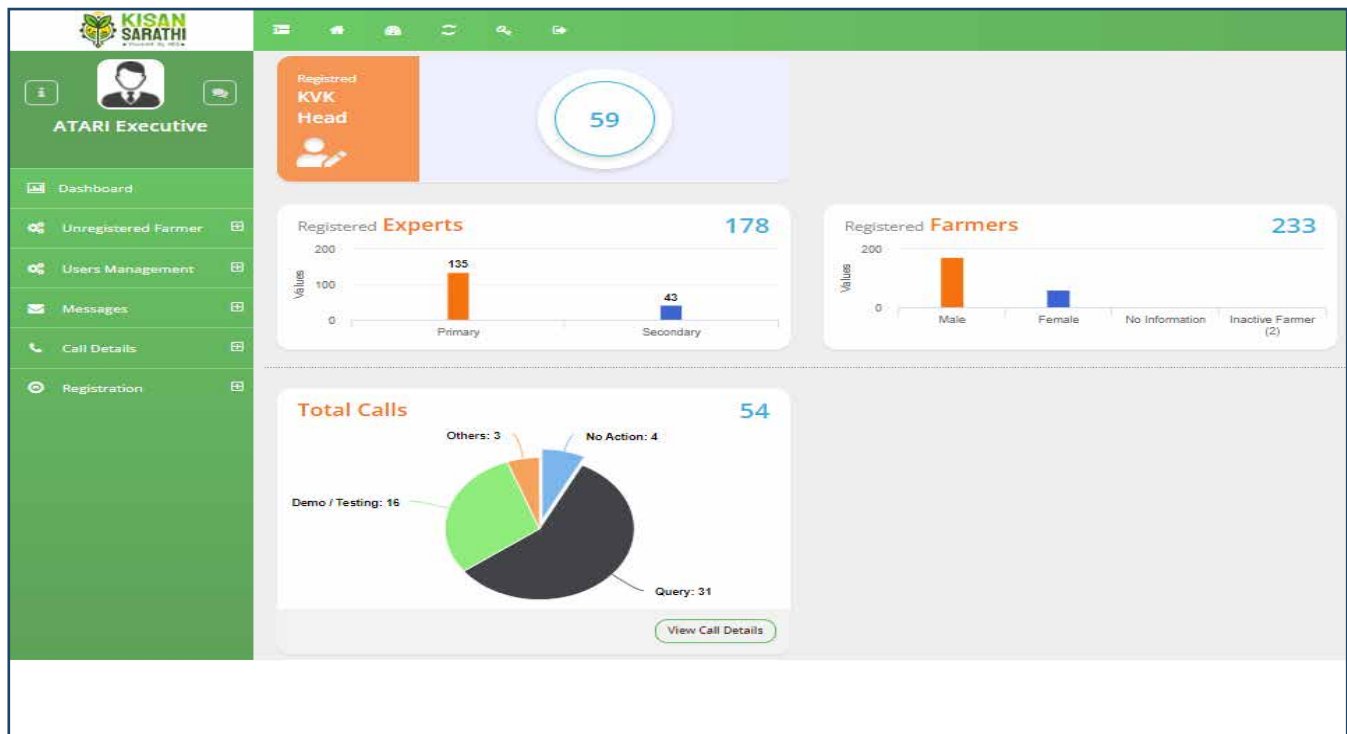


perspective. This digital platform was launched jointly by Shri. Narendra Singh Tomar, Minister for Agriculture and Farmers Welfare with Shri. Ashwini Vaishnav, Minister for Electronics and Information Technology, through video conference on 16th July 2021 on 93rd Foundation Day celebration of Indian Council of Agriculture Research (ICAR) to facilitate farmers to get 'right information at right time' in their desired language.

With the 'Kisan Sarathi' digital platform, the farmers can interact and avail personalised advisories on agriculture and allied areas directly from the respective scientists of Krishi Vigyan Kendra (KVKs).

'Kisan Sarathi' initiative is highly valuable not only in addressing the location specific information needs of the farmers but also in Agricultural Extension, Education and Research activities of ICAR. Using this digital platform, farmers can get information about crop and crop production, among other things that will help them in improving the quantity and quality of their produce. With the help of the Kisan Sarathi platform, farmers will be able to get information about good crop practices, good livestock management practices and many other basic things. Moreover, farmers can also learn new farming techniques and/ or technologies using the 'Kisan Sarathi' platform,

Under 'Kisan Sarathi' platform, 59 KVKs with 178 experts of KVKs under ICAR-ATARI Kolkata have been registered during 2021. A total of 233 farmers of this zone have already been registered from different districts of Andaman & Nicobar islands, Odisha and West Bengal. A total of 54 calls/ queries have been made so far. This initiative of KisanSarathi definitely empowers farmers with technological interventions to reach farmers in remote areas.



18.8 IFFCO Nano Urea (liquid) Trials at ICAR - KVKs in different Agroclimatic Zones (KHARIF - 2021)

A trial on IFFCO Nano Urea (liquid) was conducted during Kharif 2021 in the states of Odisha and West Bengal for rice and maize. The basic purpose of the trial was to assess the effect of Nano Urea (liquid) on yield, monetary benefit as well as difference in cost of fertilizer over the conventional practice of the farmers. It was observed that 16.7% yield was recorded in CIARI Dhan 2 in A&N Islands

followed by highest monetary benefit and BC ratio. Monetary benefit to the extent of Rs.11,460 was also accrued in West Bengal when applied in paddy B11 variety followed by 1.85 BC ratio. In Odisha, though better yield (12.9%) was recorded in maize but monetary benefit to the extent of Rs.6732 was achieved in respect of rice (variety Upahar). The overall assessment indicates that the Nano fertilizer developed by IFFCO had positive impact on yield, monetary benefit, fertilizer cost and BC ratio. The summary of the trials are presented below.

Sl. No	State	Crop	Variety	Increase in Yield in IFFCO practice (IP) over Farmers Practice (FP)		Monetary Benefit in IFFCO Practice over Farmer Practice	Difference in Total Fertilizer cost in IFFCO Practice over Farmers Practice	Economics
				Kg	%			
1	Odisha	Rice	Upahar	396	10.55	6732	255	1.43
2	Odisha	Maize	CP-333	400	12.9	5500	200	1.71
3	West Bengal	Paddy	GB 3	600	10	9960	960	1.85
4	West Bengal	Paddy	B11	700	12	11460	960	1.80
5	West Bengal	Paddy	AJIT	600	11	9960	960	1.78
6	A & N Islands	Rice	CIARI Dhan 2	602	16.7	13665	1009	2.54

18.9 Celebration of Poshan Maah Tree Plantation Campaign

Poshan Abhiyan is a flagship programme of Govt. of India to improve nutritional outcomes for children, adolescent girls and pregnant/lactating mothers by leveraging technology in a targeted approach and through convergence. It is more like a People's



Movement than a mere ritual. This programme incorporates inclusive participation of public representatives of local bodies, Govt. organizations, public and private sectors apart from girls, women and others.

With a view to ensure community mobilization and bolster People's Participation for addressing mal nutrition among the targeted population, all the

KVKs of Zone V celebrated Poshan Maah during September 2021 with primary focus on 17 September through organizing various programmes in the presence of VIPs (MP, MLA etc.), farm women, school children and others. During this day 61919

number of plants distributed/planted followed by distribution of 5806 number of vegetable seed packets. Altogether, 6962 persons participated in this day long programme. The details are given in the following table.



Table: Participation in Poshan Maah programme

Zone	State	Number of KVKs organised program	Total Number of VIPs (MP, MLA & Others) attended program	No. of Girls attended program	No. of Farmers attended program	Total participants	Number of plants planted / distributed	Number of packets of vegetable seed distributed
Kolkata, Zone V	A & N Islands	3	3	87	154	241	1529	211
	Odisha	33	121	1615	2188	3803	32790	3404
	West Bengal	23	58	1047	1871	2918	27600	2191
	Total	59	182	2749	4213	6962	61919	5806

19.0 Other Programmes

19.1 Observance of Vigilance Awareness Week 2021

Nodal Scientist: Dr. Avijit Haldar

Vigilance Awareness Week 2021 was observed from 26th October to 1st November 2021 at ICAR-ATARI Kolkata and KVKs under Zone V, which was commenced



with an Integrity Pledge taken by all officials and staff on 26th October 2021 at 11:00 am for upholding the highest standards of ethical conduct, honesty and integrity. This year the main focus of Vigilance Awareness Week

essay competition, quiz competition, debate competition, awareness campaigns were organized by different KVKs under ICAR-ATARI Kolkata.



19.2 Celebrated of 'Mahila Kisan Diwas 2021'

Nodal Scientist: Dr. S.K. Mondal

Considering the multi-dimensional role of women in agriculture and allied sectors, the Ministry of Agriculture and Farmers' Welfare



was 'Independent India @75: Self Reliance with Integrity'. ICAR-ATARI Kolkata organized a talk on 'CCS Conduct Rules', which was delivered by Shri Ashish Roy, Ex Joint Director (Admn.) & Registrar, National Academy of Agricultural Research Management Rajendranagar, Hyderabad on 1st November 2021. To mark the occasion, various programs like panel discussion, workshop, seminar,



had decided to observe October 15th every year as 'Rashtriya Mahila Kisan Diwas 2021'. The KVKs under ICAR-ATARI Kolkata celebrated 'Mahila Kisan Diwas' on 15.10.2021 at their respective districts. The scientists of KVKs emphasized the importance of the day, role of women in agriculture, women empowerment through SHG formation, entrepreneurship development and many others. On that occasion, women farmers were provided

with different skill development trainings to improve their scientific knowledge for agricultural



production, nutritional security and livelihood income. The successful women farmers were also felicitated with awards and recognitions by the KVKs to encourage other women farmers in the district. The summary of various programmes organized by the KVKs in Odisha and West Bengal has been given in the table.



State	No. of KVKs organized the programme	Seminars organized		Training programmes organized		Gosthis organized		Exhibitions organized		Total	
		No. of activities	No. of participants	No. of activities	No. of participants	No. of activities	No. of participants	No. of activities	No. of participants	No. of activities	No. of participants
Odisha	17	5	187	18	420	5	151	13	128	41	886
West Bengal	16	6	249	14	561	3	113	3	143	26	1052
Total	33	11	436	32	982	8	264	271	67	1938	

19.3 Observance of 'World Food Day 2021'

The 'World Food Day 2021' is observed to mark the anniversary of the founding of the Food and



Agricultural Organisation (FAO) of the United Nations, every year on 16th October with the objectives at tackling global hunger and striving to eradicate hunger across the world. The theme for

the year 2021 was 'Our actions are our future. Better production, better nutrition, better environment and a



better life'. Forty three KVKs of this Zone took part in the celebration on 16.10.2021. The vegetable crops planting materials distribution; training programmes on *Nutri-garden* and *Nutri-thali*, balanced diet preparation, food grain protection during storage, backyard poultry farming, production of food item through organic farming etc. were among the various activities undertaken on the eve of food day celebration. The Farmers-Scientist interaction was also organized by the KVKs to solve the problems of farmers for food grain production. The state-/UT-wise summary of different activities of KVKs under ICAR-ATARI Kolkata are given in the table.

State	No. of KVKs organized the programme	Seminars organized		Training programmes organized		Gosthis organized		Exhibitions organized		Total	
		No. of activities	No. of participants	No. of activities	No. of participants	No. of activities	No. of participants	No. of activities	No. of participants	No. of activities	No. of participants
A & N Island	03	0	0	01	34	02	44	0	0	03	78
Odisha	22	06	210	26	776	05	202	04	15	41	1106
West Bengal	18	07	281	11	506	03	150	03	140	24	1044
Total	43	13	491	38	1316	10	396	7	155	68	2228

19.4 Conducting 'National Milk Day 2021' by KVKs

Nodal Scientist: Dr. K.S. Das

In India, every year 26th November is conducted as 'National Milk Day 2021'. The day is being observed since 2014 to commemorate the birth anniversary of the Father of India's White Revolution, **Dr. Verghese Kurien**, nicknamed as '**Milkman of India**'. Some of our KVKs viz. Bankura, Birbhum, Cuttack, Sonapur, S 24 Pgs (Nimpith) and others celebrated 'National Milk Day 2021' on 26.11.2021 at the KVK campuses. The scientists educated farmers



including women and school children focusing on the sustainability of dairy sector, empowerment of women through dairying, Govt. schemes available



for animal husbandry and dairying, inclusion of milk and dairy product in daily diet as complete food, problems in consuming adulterated milk and other related issues on that occasion.

19.5 Celebration of 'World Soil Day 2021'

Nodal Scientist: Dr. F.H. Rahman

The "World Soil Day 2021" programme was celebrated on 5th December, 2021 at all 59 KVKs under ICAR-ATARI Kolkata. On the occasion, farmers were made aware with the basic knowledge of soil, about deterioration of soil health and ways it could be



restored for optimizing agricultural production through using bio-fertilizer, vermi-compost, FYM, Dhaincha, liquid manure, decomposer, humic



acid, *Trichoderma viridae*, *Pseudomonas fluorescence*, azolla etc. A total of 1021 soil health cards were also distributed among the farmers at the KVKs by the scientists and other senior officials in the respective districts. The state-wise summary of the programme has been given below.



Name of State	No. of KVKs organized the programme	No of participants attended			
		Farmers	Scientists	Students	Total
A & N Islands	3	92	13	12	117
Odisha	33	1485	152	350	1987
West Bengal	23	1121	101	378	1600
Total	59	1698	266	740	3704

19.6 Celebration of 'Independence Day 2021'

The 'Independence Day 2021' was celebrated at ICAR-ATARI Kolkata on 15th August, 2021. All staff members of ATARI Kolkata assembled in front of the institute to celebrate the day with utmost fervour, zest and a spirit of patriotism for marking the innumerable sacrifices of the freedom fighters of our country. The Director, Dr. S. K. Roy highlighted the role of freedom fighters and discussed the importance of the day. He urged everybody to work for the development of the nation.



19.7 'Parliamentary Standing Committee for Hindi' visit to ATARI Kolkata

Nodal Scientist: Dr.S.K. Mondal and Mr. R.C. Pradhan

The 'Parliamentary Standing Committee for Hindi' led by Smt. Seema Chopra, Director, Official Language, ICAR, New Delhi and Sh. Manoj Kumar, Chief Technical Officer, Official Language, ICAR, New Delhi visited ICAR-ATARI Kolkata on 22nd November, 2021 to review the progress made regarding the use of Official



language. The Committee visited different components of ICAR-ATARI Kolkata office and finally, met with the Director, scientists and other



staff members at the conference hall. Dr. S. K. Roy, Director, ICAR-ATARI Kolkata welcomed the dignitaries and narrated in details about the use of Hindi language by this institute for different official communications. Dr. Roy handed over books/

documents to the Committee members which were published from this office in Hindi. The Committee interacted with all the staff members and suggested different ways to incorporate Hindi language in official activities. However, at the end of the day, the Committee were very satisfied with the activities of ICAR-ATARI Kolkata in using Hindi language in spite of this office comes under 'Ga Chhetra'.

19.8 Observance of 'Constitution Day 2021'

Nodal Scientist: Dr.A. Haldar

The 'Constitution Day' was observed at ICAR-ATARI Kolkata on 26th November, 2021. On the occasion, all staff members assembled at the conference hall



of the institute for a pledge taking ceremony under the leadership of Dr. S. K. Roy, Director, ICAR-ATARI Kolkata to commemorate the adoption of the Constitution of India. The day was also celebrated by the KVKs of this Zone.



19.9 Jal Shakti Abhiyan

With continuous climatic change, the immediate effect that has been observed is erratic rainfall, flood, drought etc. in several parts of the country. For a better sustainability, the Ministry of Jal Shakti, Govt. of India has taken an initiative for saving the water resources. Inspired by the Hon'ble Prime Minister's impetus on saving water, the Jal Shakti Abhiyan (JSA) was conceived as a time-bound, mission-mode water conservation campaign. In this campaign rainwater harvesting, renovation of water bodies, recharge structures, watershed development,



afforestation etc. were promoted. All the 59 KVKs of Zone V were also a part of this campaign and they extended their strength to promote the awareness for water resource conservation. They conducted



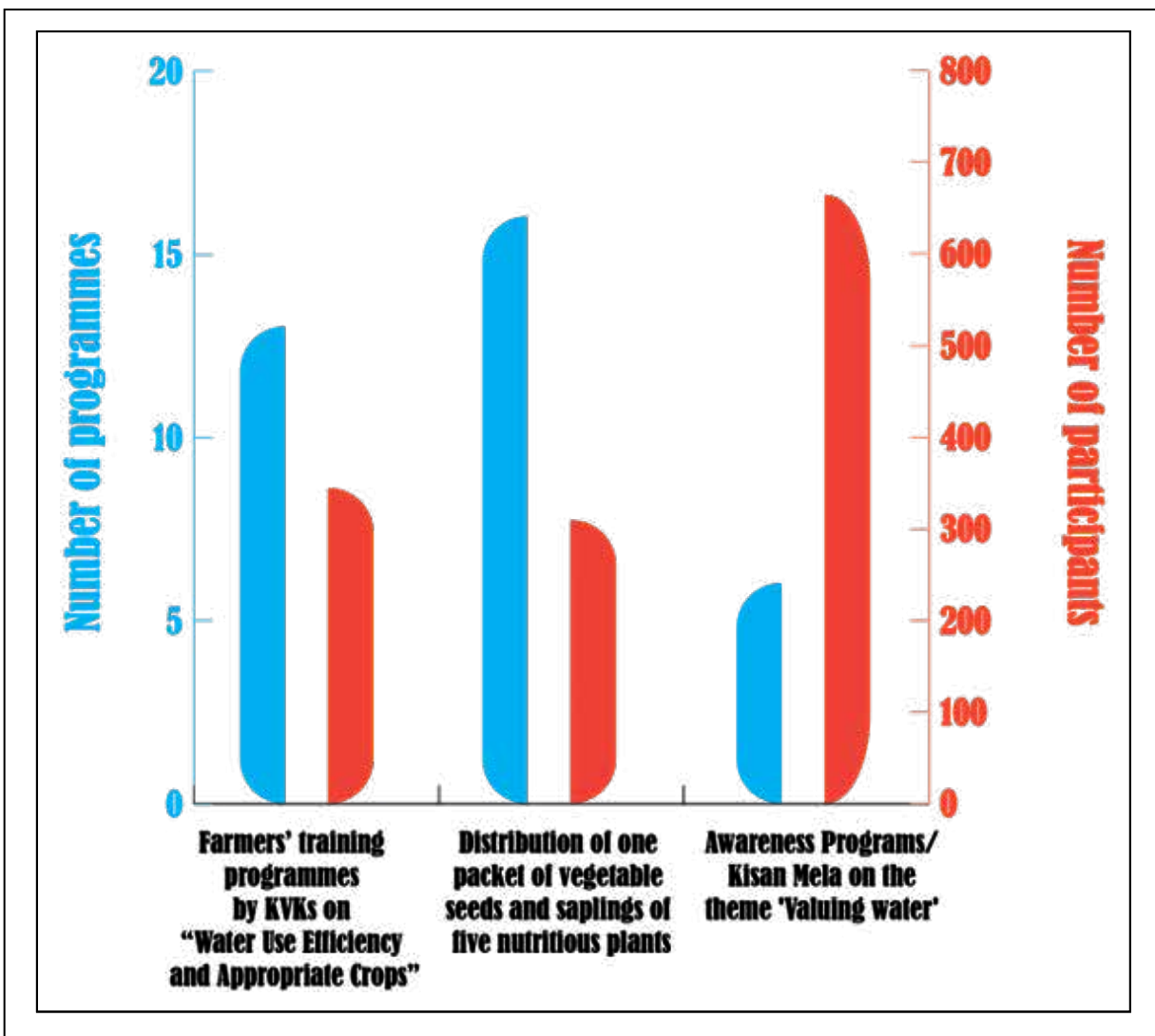
trainings on water use efficacy and also trained farmers to grow crops that are appropriate for water conservation. Vegetable seeds and saplings of five nutritious plants (Moringa/Local Fruit plant/Local Medicinal plant) were also distributed to farmers to encourage them plantation. Awareness programs/



KisanMela (one KisanMela per KVK on the theme 'Valuing water') was also conducted in the area of micro irrigation systems, Rain water harvesting, water conservation, efficient water management for livestock and efficient water management for aquaculture. The number of trainings and number of participants in the training are depicted both in the following table and graphically. A total of 2410 saplings and 222 seed packets were distributed among farmers. The programmes were conducted between 22 April to 30 November, 2021.

Activity	No. of program	No. of participants	No. of Seed packets	No. of saplings
Farmers' training programs by KVKs on " Water Use Efficiency and 'Appropriate Crops"	13	343		
Distribution of one packet of vegetable seeds and saplings of five nutritious plants (Moringa/Local Fruit plant/Local Medicinal plant) to farmers	16	308	222	2410

Activity	No. of program	No. of participants	No. of Seed packets	No. of saplings
Awareness Programs/ Kisan Mela (One Kisan Mela per KVK on the theme 'Valuing water' on following thrust areas (Micro irrigation systems, Rain water harvesting, Water conservation, Efficient water management for Livestock, Efficient water management for Aquaculture)	6	663		



20.0 Selected Success Stories

KVK Nicobar

20.1 Natural Pig Farming at Car Nicobar Island improved livelihood of Nicobari tribals



Generally, the Nicobari tribal farmer rear pigs in traditional way *i.e.* Natural farming Shri Benjamin of Perka village, Car Nicobar, Nicobar, A&N Islands - 744301 (Contact: 9474299822) started his pig farming in the year 2006 alongwith his traditional

coconut crop. The local Nicobari pigs were used for rearing with the coconut feeding. The farmer use coconut from his plantation to feed his pigs in the evening @ 2 coconuts per adult pigs per day. They practice minimum management of pigs and it farrows in the jungle and comes to the dwelling for feeding. Rest of the time it scavenges to meet its nutritional requirement. The farmers beat bamboo drum in a particular pattern to call their pigs which are identified with ear notching. They castrates male piglets after weaning by traditional methods by removing the testis by incision using knife and the wound is smeared with turmeric powder and left open for drainage. The wound heals naturally. They prepare creep-feeder structure using bamboo for feeding coconut to the piglets. The natural pig farming practiced by Nicobari tribe is sustainable in the island conditions and need no input from outside. Shri Benjamin got 4500 coconuts per ha and 6.24q of live pig weight from his traditional pig farming. Every Nicobari tribal are rearing pigs



in traditional way and pigs are very auspicious and highly valued by Nicobarese.

KVK Angul

20.2 Skill development in poultry farming brought success to small farmer

Mr. Dipen Kumar Pradhan of Village-Balasingha, Block-Angul, Dist-Angul (Contact: 6371626090) has a landholding of 0.6 ha. The young farmer has established his farm in his own effort after going through skill development training from Krishi



Vigyan Kendra, Angul during the year 2018-19. He initiated a 200 capacity poultry farm where he is rearing Aseel, Kadaknath, Sonali, Vanaraja, Desi etc. Looking into the market demand, he is



rearing these new improved breeds of birds and earning a good profit. He is in regular contact with KVK and taking advice from KVK regarding new technologies for increasing his enterprise. The farmer used to get an annual net income of Rs. 60,000/- from poultry farming. He faced problems like low weight gain in poultry birds. With

interventions like proper feed management with supplementation of probiotics @ 0.05% in poultry feed and increasing the unit size, he is now getting



an annual net income of Rs. 1,85,000/-. At the age of 26 years he is able to earn an amount of Rs.16,000/- per month from this poultry farm and support his family financially. The poultry litter that comes out from the farm is being utilized in agricultural and



horticultural activity with a good return from that sector also. Now five more farmers of his village initiated new poultry farms under his guidance.

KVK Boudh

20.3 Off-season vegetable cultivation with livestock keeping gave better profitability

Sri Pradeep Kumar Bhanja of Vill- Lambakani, GP- Harbhanga, Dist- Boudh (Contact: 9556135707) had 3.0 ha of land. Though Sri P. K. Bhanja was a medium farmer but he was innovative and dynamic. Being exposed to multifarious activities of KVK he was inspired for cultivation of such crops that can give

more return per unit area. He attended training on off-season vegetable cultivation organised by KVK. He was also supplied with extension literature of



off season vegetable cultivation. Later he expressed his interest for such crops which can be cultivated in off season. He was included as beneficiaries in mandatory activity of KVK like OFT, FLD. Now he cultivates Paddy, Greengram, and Vegetables. Besides he is also rearing livestock like kept cows, Chicks, fingerlings etc. He is also raising vegetable seedling in low cost plastic tunnel during Kharif season. After meeting his own demand for vegetable seedling he also sale surplus seedling to other



farmer. Sri. P. Bhanja set himself as a role model for farmer of his village & other neighbouring village. Other farmers of his village have also started off season vegetable cultivation in a 6 acre of area. More than 45 nos of farmers are also motivated by him. Farmers of other adjacent village like Badhigaon, Khuntiapada, Nuapalli have also started off season vegetable cultivation in small scale initially.

KVK Khordha

20.4 Educated farmer formed FPO and made profitable agri-business

Sri Biswajit Sahoo, a resident of Vill.- Taradapada, P.O. - Garedipanchan, P.S. - Balipatna, Dist. - Khordha (Contact: 6372411449) had a land holding of 1.5 ha. Sri Sahoo, a rural youth aged about 24 years, completed his education in intermediate and ITI in fitter trade. He opted to be self-employed without seeking any govt. or private job and follow his fathers' occupation in agriculture and allied sector. During his involvement in agriculture, he learned about improved pointed gourd variety Swarna Alaukik from KVK Khordha. He visited ICAR-Central Horticultural Experiment Station (CHES), Bhubaneswar as per advice from KVK during the year 2019. He procured few numbers of poly plants of Swarna Alaukik, which was very less as per his requirement. The scarcity in the availability



of the variety made him to start the production of poly plant material in his own farm. To gain the knowledge on production he contacted KVK during 2020 and seeks advice from the expert. KVK came forward and trained him through method demonstration, telephonic advisory and motivational support. With the technological backstopping from KVK, he is able to produce poly plant sapling at his back yard area. In the year 2020, he produced 5000 poly plants of Swarna Alaukik variety and earned about Rs. 60000. In the year 2021, he established "Senapati Nursery" and expanded his business through production of 16000 poly plants of pointed gourd and teasel gourd (variety ArkaNeelachal Shanti) and earned about Rs. 192000 within a period of 5 months. His effort has been well recognized among the pointed gourd growing

farmers of Khordha District. He is one of the leading member of "Jayadev Chara UtpadakSangathan" that has been formed with support from KVK Khordha in Baliana and Balipatna blocks of Khordha district for production and supply of quality planting materials of pointed gourd and teasel gourd. Sri Sahoo, the proprietor of 'Senapati Nursery' is supplying poly



plants of pointed gourd (variety Swarna Alaukik) and teasel gourd (variety ArkaNeelachal Shanti) to the farmers of Khordha district and expanded his business to other districts like Cuttack, Jagatsinghpur and Puri of Odisha.

KVK Hooghly

20.5 Backyard poultry farming resulted in improved livelihood



Soumya Das of Vill. - Potue, P.O. - Bighati, P.S. - Bhadreswer, Dist. - Hooghly is a dynamic and energetic small farmer. He is the only earning member of his family. He mainly depends upon agriculture for his livelihood.

But he has an interest in poultry farming since long ago. That's why he himself started backyard poultry farming. Afterwards he faced many problems regarding feed management, protective measures etc. So, he made contact with KVK to learn scientific poultry farming technology. Keeping in view the interest of Mr. Das, KVK has decided to involve him under ARYA project and accordingly he was given training and support for development of backyard poultry as an enterprise. Within a short period of time he made it a successful venture. At present his earning has reached to 1.3-

1.5 lakh per year through production and selling of egg and meat. He made contact with different SHGs

for selling his product. Now he became popular in his area. His details of production are given below:

Sl. No.	Item	Production (kg)	Market Price (Rs.)
1	Meat	700	154000 (@Rs. 220/kg)
2	Eggs	15000	75000 (@Rs. 5/pc)
Total			229000

He has been provided training and support for development of backward poultry unit. Technical guidance has also been provided for production of poultry as he is hard-working and interested. He will start compost production from poultry litter

rural youths made contact with him for information and showed interest for poultry farming. His success will motivate other farm women, farmers, and rural youths and increases the possibilities of horizontal expansion of the technology in the area.



very shortly which will be additional avenue for him. Change in his economic status of the youth due to adoption of this venture was around Rs. 130000/- per annum.



He made his enterprise a successful one within a short period of time, so he became popular in his area. The other villagers show interest by seeing his success. Many of them have made contact with him and KVK also. His interest in poultry farming and his effort made him a successful entrepreneur in the locality. He is becoming popular in the area. Many

KVK Murshidabad-II (Dhaanyaganga)

20.6 Nutri-garden by marginal farm woman helped in family nutritional security

Mrs. Rupali Hazra of Vill. Mahula, Beldanga I Block, Dist. - Murshidabad (Contact: 9647563920) is an enthusiastic housewife. Apart from house hold work she has keen interest on different agricultural activities and practicing such work in land adjacent to the house hold. After communication received

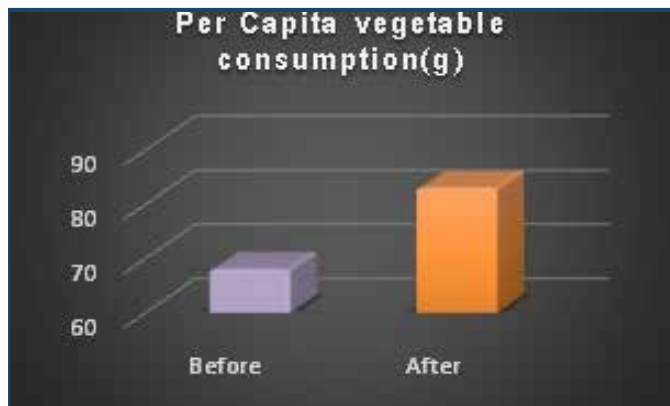
from the Dhaanyaganga Krishi Vigyan Kendra, she brought twenty two farm women under the umbrella of Nutritional Security Group. All the



farm women were poor and all of them belonging to marginal farm family. They also had not much previous experience on farming by themselves. All of them had varying piece of land adjacent to their house hold which were either as fallow or planting with few vegetables in unplanned manner. Being member of farming family, they possessed essential farming implements/ tools, irrigation devices, plant protection machinery. The entire work was chalked



out in three distinct phases (a) Training along with distribution of vegetable seed kits and other inputs (b) Field visit, monitoring and motivation for adopting technology (c) After harvesting of 1st season crop, interaction and feedback analysis. The vegetable seeds viz. Palak, Radish, Coriander, Fenugreek, Carrot were distributed to each participants. As per the information received from them, it was the first time for them that they had been motivated for establishment of Kitchen and Homestead Garden. A season wise crop planning (Crop sequence) was advised and opportunity extended to them for



selection of crop as per their food habit. Concept of seed treatment, compost preparation, intercropping of vegetables, basic ideas of organic farming and bio-fertilizer were disseminated to them. The seeds of palak, coriander and fenugreek were broadcasted. On the other hand, carrot and radish were planted in a specified distance and manner as learned in the training. The two times field visit was made by the KVK functionaries. They were discussed with other members of the group to perform accordingly. It does not reflect a lot on family income enhancement at initial stage of operation. But it will produce significant development through continuous practice in long term. In present pandemic situation the cost of vegetables are very high and fluctuating. The farming family belongs to marginal category, even some them do not have much agricultural land. Under this situation production of vegetables in their own household ensure their nutritional security and diversification in their daily diet. If present activity converts in monetary value, it results Rs. 1200/- per month for three months duration.

The farmwomen firstly enjoy the production of vegetables by their own. It creates an opportunity for them to receive institutional support and



interact with Government officials on different



village issues. It is also a step towards successful 'Self Help'. By taking part in the programme, their prestige within their own family is enhanced by making contribution. Some of the technical trips like seed treatment, organic farming, use of bio-fertilizer, bio-pesticides, farm composting can easily be disseminated through result demonstration. This

may be an instance for their male counterpart to adopt the technology in farming system. It became a milestone in the Mahula village that the farm women who never came out from their own household interact with Government officials and take part directly in agricultural operation vis-a-vis ensuring family nutritional security through establishment of kitchen garden.



21.0 Publications:

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- Gautam D, Vats A, Pal P, Halder A and De S. 2021. Characterization of Anti-Müllerian Hormone (AMH) Gene in Buffaloes and Goats. *Frontiers in Veterinary Science*, **8**:627094. [doi: 10.3389/fvets.2021.627094].
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- Mondal S K, Das K S and Roy S K. 2021. Effect of various control measures on predator incidence and production performance in Lac insect (*Kerria lacca*). *Asian Journal of Research and Review in Agriculture*, **3**(4): 46-49.
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II. Book

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- Mukherjee S, Rahman F H, Bej N K and Das S. 2021. Assessment of bio fungicides to control blast in rice in red and lateritic belt of Paschim Medinipur district of West Bengal. *Indian Journal of Extension Education*, **56**(4): 226-232.
- Dey Gupta M, Mondal S K, Basu D, Pan S and Mitra K. 2021. Empowering rural women through backyard poultry farming: Adoption of Haringhata Black in tribal district of West Bengal. *Indian Journal of Animal Sciences*, **91**(12): 1118-1121.
- Mondal S K, Das K S, Roy S K and Rajkhowa C. 2021. Physical characteristics and chemical composition of Mithun (*Bos frontalis*) carcass. *Journal of Veterinary and Animal Science* (Revision submitted).
- Mondal S K, Pal D T, Das K S and Roy S K. 2021. Nutrient composition of preserved fodder grasses of Nagaland used for feeding of Mithun (*Bos frontalis*). *Indian Agriculturist* (In press).
- Udgata J, Pal P P, Mishra P, Sahoo H K, Dutta S, Ghosh S and Roy S K. An assessment of knowledge gap in ginger cultivation at Jharsuguda district of Odisha. *Indian Agriculturist* (Accepted).

III. Technical bulletins

- Rahman F H, Bhattacharya R and Nandi S. 2021. NICRA Newsletter: Towards Climate Smart Agriculture. Published by Director, ICAR-ATARI Kolkata, **7**(1): 1- 8.
- Sen HS, Mandal B, Ghorai D, Sahu N C, Rahman F H, Murmu K, Chandra S, Bandyopadhyay S and Sarkar D. 2021. Fertilizers and Environment

News. Published by the Society of Fertilizers and Environment, 7(1): 1-16.

Das K S, Mondal S K, Murmu S, Roy S K, Pal P P, Haldar A and Rahman F H. 2020. ATARI Kolkata News. Published by the Director, ICAR-ATARI Kolkata, 4(1): 1-12.

Das K S, Mondal S K, Murmu S, Roy S K, Pal P P, Haldar A and Rahman F H. 2020. ATARI Kolkata News. Published by the Director, ICAR-ATARI Kolkata, 4(2): 1-12.

Das K S, Mondal S K, Murmu S, Roy S K, Pal P P, Haldar A and Rahman F H. 2021. ATARI Kolkata News. Published by the Director, ICAR-ATARI Kolkata, 5(1): 1-12.

Rahman F H, Nandi S and Bhattacharya R. 2021. GKMS Newsletter. Published by the Director, ICAR-ATARI Kolkata, 2(1): 1- 8.

Roy S K, Pal P P, Das K S, Rahman F H, Haldar A and Mondal S K. 2020. ICAR-ATARI Kolkata Annual Report 2020. Published by the Director, ATARI Kolkata, pp: 1-116.

IV. Invited lectures

Das K S. 2021. Delivered lecture on 'Antibiotic resistance' in farmers' awareness programme to celebrate 'World Antimicrobial Awareness Week 2021' through audio mode held on 24th November, 2021 organized by Birbhum KVK, WB.

Haldar A. 2021. Delivered lecture on 'Integrated Farming System in West Bengal: Case studies, opportunities and challenges' in a virtual meeting on 'Promoting integrated farming in West Bengal- Challenges and strategies' held on 14th July, 2021 organized by NABARD, Kolkata.

Haldar A. 2021. Delivered online lecture on 'Portable meat production and retailing facility (P-Mart)- A novel technology for hygienic meat production from sheep and goats' held on 24th September, 2021 organized by ICAR-NRC Meat, Hyderabad.

Haldar A. 2021. Delivered online lecture on 'Livestock: A game changer in agricultural farming practices' in 21 days national training course held on 17th December, 2021 organized by DEE, UBKV, Coochbehar, WB and Agro Environmental Development Society, Rampur, UP.

Pal P P. 2021. Delivered online lecture on 'Farm entrepreneurship: A way forward' in 21 days national training course held on 8th December, 2021 organized by DEE, UBKV, Coochbehar, WB and Agro Environmental Development Society, Rampur, UP.

V. Abstracts presented in national/international seminars, conferences etc.

Bhattacharya R, Sahoo T R, Mishra P, Mohapatra N M, Mishra S N and Rahman F H. 2021. The response of green manuring of sesbania aculeate on growth and yield of rice in flood prone area of coastal Odisha. In: National webinar on 'Stewardship of agrochemicals for upkeeping environment' organized by the Society for Fertilizers and Environment in collaboration with Bidhan Chandra Krishi Viswavidyalaya, Nadia on Mar 30-31.

Udgata J, Parida D, Bhattacharya R and Rahman F H. 2021. Assessment of balance nutrition (N, P, K, Zn and B) and green manuring on yield, nutrient uptake, economics and soil fertility of rainfed rice (*Oryza sativa* L.) in drought prone areas of Odisha'. In: National webinar on 'Stewardship of agrochemicals for upkeeping environment' organized by the Society for Fertilizers and Environment in collaboration with Bidhan Chandra Krishi Viswavidyalaya, Nadia on Mar 30-31.

VI. News items

- » Two days webinar on 'Review workshop for finalizing Action Plan 2021-22 for KVKs of Odisha' for ICAR, KVK Portal and ICAR-ATARI Kolkata website.
- » Two days webinar on 'Review Workshop For Finalizing Action Plan For The Year 2021-22 For KVKs Of West Bengal and A& N Islands' for ICAR, KVK Portal and ICAR-ATARI Kolkata website.

- » Webinar on 'Concluding zonal workshop of NICRA KVKs of Zone-V' for ICAR website.
- » Two days webinar on 'Annual Zonal Workshop for KVKs under Zone V' for ICAR, KVK Portal and ICAR-ATARI Kolkata website.
- » **Online 'Second Annual Review Workshop of GKMS of Zone V'** for ICAR and ICAR-ATARI Kolkata website.

22.0 Awards and Recognitions

22.1 Recognition of ATARI Scientists

Dr. P. P. Pal, Pr. Scientist of this institute has been awarded with 'ISEE Fellow Award 2021' in



ISEE National Seminar 2021 for his significant contribution in the field of Agricultural Extension held at Banaras Hindu University (BHU), Varanasi during 4th to 6th October, 2021.

Dr. K. S. Das, Pr. Scientist of this institute has been conferred with 'Reviewer Excellence Award' by Agricultural Research Communication Centre, Karnal, Haryana on 14th July, 2021 for recognition of his significant and outstanding contribution as reviewer of 'Indian Journal of Animal Research' journal.

23.0 Distinguished Visitors

23.1 At ATARI Kolkata

- Dr. P. Das, Former DDG (AE) and Chairman, RAC, ICAR, New Delhi
- Smt. Seema Chopra, Director, Official Language, ICAR, New Delhi
- Sh. Manoj Kumar, Chief Technical Officer, Official Language, ICAR, New Delhi

24.0 Personnel (As on 31.12.2021)

Staff position of ICAR-ATARI Kolkata as on 31.12.2021 has been presented in the table below:

Sl. No.	Name	Designation
1	Dr. S.K. Roy	Director
2	Dr. P.P. Pal	Principal Scientist
3	Dr. A. Haldar	Principal Scientist
4	Dr. S.K. Mondal	Principal Scientist
5	Dr. F.H. Rahman	Principal Scientist
6	Dr. K.S. Das	Principal Scientist
7	Shri. Rama Chandra Pradhan	Asstt. Administrative Officer
8	Smt. S. Pal	Private Secretary
9	Shri S. Mukherjee	Asstt. Finance & Accounts Officer
10	Shri A.D. Banik	Assistant
11	Shri D. Debnath	Driver (T-2)
12	Shri S. Saha	UDC
13	Smt. A. Roy	SSS
14	Ms. J. Basak	SRF, CFLD-Pulse
15	Ms. R. Bhattacharya	SRF, NICRA
16	Shri S. Ghosh	SRF, NEMA
17	Shri S. Murmu	SRF, FFP
18	Ms. B. Ghosh	SRF, CFLD-Oilseed
19	Shri S. Khutia	DEO, CFLD-Pulse - NFSM
20	Shri S. Nandi	Project Assistant, GKMS
21	Er. S. Paul	YP-I, NEMA
22	Shri A. Dewanji	YP-II, MIS-FMS

Joining/Relieving/Promotion/Demise

Superannuation

- Dr. Sati Sankar Singh, Former Director, ICAR-ATARI Kolkata has been superannuated from his ICAR service on 31.12.2021 (afternoon).



Joining

- Dr. Suren Murmu has joined as SRF of FFP at ICAR-ATARI Kolkata on 10.09.2021 (forenoon).

Relieving

- Sh Roshan Lal, AAO was relieved from ICAR-ATARI Kolkata on 24.06.2021 (afternoon).
- Dr. Subhramalya Dutta, SRF of ARYA project has been relieved from this Institute on 31.12.2021 (afternoon).

Promotion

- ❖ Sh. Somnath Mukherjee has joined as AF&AO at ICAR-ATARI Kolkata on 07.10.2021 (forenoon).
- ❖ Sh. Ramachandra Pradhan has joined as AAO at ICAR-ATARI Kolkata on 16.10.2021 (forenoon).
- ❖ Mrs. Sulekha Pal, Private Secretary of Director, ICAR-ATARI Kolkata has been placed to 3rd MACP (financial upgradation).



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